TEXTILES IN THE LOWER SCHOOL: A study of teaching methods and assessment procedures.

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Abstract

This thesis investigates the teaching of Textiles to lower school pupils, and reports on classroom research into teaching methods and assessment procedures.

The thesis contains four sections. The first is a personal and general introduction to the topic. The second gives the historical and theoretical background, and then discusses the role of the Textile teacher, with especial regard for the assessment of non-verbal abilities of pupils in the 11-14 age range. The third section selects three classroom studies which demonstrate the writer's successful solution to assessment problems, and presents an overall summary and set of conclusions drawn from the classroom projects. Finally the fourth section considers the contribution which the subject of Textiles can make to the National Curriculum.

The contention is that Textiles in the lower school can provide a substantial component of a technological education, and that this component can be assessed in a 'designerly' way.
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SECTION ONE

INTRODUCTION
INTRODUCTION

"The more a child is helped to understand the why and wherefore of things, and the more her reasoning power and sense of proportion is developed, the greater of course is the value of education."

Extract from the "Suggestions for the Consideration of Teachers" circular 730 September 1909.

Identification for the Study

Cultural pressures have brought about the demise of certain subjects from the school timetable, whilst others have survived the winds of change. Textiles is one of the survivors. This research bears witness to the dedication of countless teachers who have used their expertise in recognition of the relevance of their subject for a technological world.

Historical surveillance of Textile teaching draws us back to the 19th Century, where we can view the beginnings of pedagogical understanding for practising teachers. In 1892 Amy K. Smith published a book entitled "Needlework for Student Teachers". The widespread use of this volume was celebrated in ten editions. The authoress favours the "Demonstration Method" of teaching, and believes that with this mode of presentation it is as easy to teach thirty pupils as it is to teach one. She instructs the teacher to use large scale equipment, to face the class and to direct
the children clearly in a series of step by step instructions for sequential tasks. Needle threading for example has seven steps:

1. Pick up cotton.
2. Point the end.
3. Take up the needle.
4. Cotton to the eye.
5. Pass it through.
6. Catch hold of cotton.
7. Show threaded needles.

This detailed methodology brings to mind a vision of thirty serious little girls, sitting primly, listening carefully, following the commands, and all succeeding at once to thread a No. 5 sewing needle. It does not correspond to my first teaching practice experience when I found myself coping with a repeating queue of boys and girls who could not manage to thread their needles.

The same book contains an Introduction by Lady Wolverton, who praises the advancement in scholastic opportunities for girls. Whilst she is pleased to see an extension in the range of subjects offered to girls, she is emphatic that a woman's education is not complete if she cannot make a wardrobe of clothes for her husband and children.

"Needlework" she says "encourages cleanliness and accuracy .... Interest the roughest girl in a bit of needlework and she will sit quiet for hours" Indicating that motivation must
have been just as important for the 19th Century teacher as it is to the teacher of today.

Later editions of the book conclude with advice for teachers in the form of extracts taken from the handbook of "suggestions for the consideration of Teachers" (1909). One of these has retained its relevance, and was much in evidence when I started my teaching career in a Leicestershire High School in 1979. The suggestion was that pupils should be encouraged to "understand the why and wherefore of things". At this time most secondary schools were operating an established "Design circus" which required small groups of children to make a rotating journey through the various Design subjects on the timetable. In the course of this journey pupils would be guided to achieve a coherent experience of Design principles. Needlework had changed in nature, content and name, and was now called Fashion and Fabrics, or Textiles. It was studied by both boys and girls.

In my school the Design area was mostly open plan thus allowing some flexibility between Textiles and Art. I was therefore in a position to develop my interest and expertise in aspects of printed and dyed fabric work. As the only Textile specialist in the school I inherited a responsibility for the development of a suitable syllabus. I sought effective means of teaching, and as my methodology improved so did my empathy with the pupils. Before long I came to envisage a syllabus for Textiles which would unite the love
of my subject with a concern and respect for the teenagers in my classroom.

In planning the syllabus I soon found that reference material for Design often concentrated on C.D.T. and that Textiles often appeared as part of Home Economics courses. There was an obvious need for academic research into the teaching of Textiles. It was here that the impetus for the research began.

Initially the direction and purpose of the study were rather confused and too extensive. A specific concern had to be isolated from the many. My instinctive perception of the subject was to view it as tactile, aesthetic, skills based and non-verbal. I felt that these experiences were educationally worthwhile, as well as being useful to other areas of the curriculum. Investigations of these aspects led to the more succinct suggestion that the subject of Textiles might provide opportunities to improve non-verbal thinking skills. With this in mind a classroom study was eventually conceived.

Aims, Objectives, and Procedures

I was concerned to achieve the underlying aim of the project which was to consolidate a more intimate involvement with the subject of Textiles and in so doing, to improve teaching and learning in my classroom.
I also hoped that the investigational work would culminate in a strong justification for the continued inclusion of Textiles on the school curriculum.

There was, lastly, an aspiration to indicate a future direction for teachers of Textiles.

More specifically it was decided to:-

1. Review the history of the subject and follow its evolution from the Domestic Craft subject of "Needlework" to its present day context within the Design department.

2. Relate the content of the subject directly to adolescents in the 11-14 age group, observing a commitment to encourage their cognitive development.

3. Identify the specific nature of Textiles and explore this more thoroughly in an observational classroom study within the High school Environment.

4. Investigate assessment procedures in Design and devise a suitable method of recording pupil progress during the classroom study.

5. Evaluate teacher performance during the study, probably through the use of a pupil questionnaire.

6. Analyse the outcome of the classroom study and from this analysis prepare suggestions for an innovative and a purposeful way forward.
I began the research with an historical overview of Design Education. This is outlined in Section 2.1 of the study, which demonstrates how the escalation of industrialism and materialism provided a backdrop for an increasing technological awareness within practical craft subjects.

The section brings eight key aspects of Design Education into focus. These aspects are seen as common elements within the subjects taught. Design is distinguishable from other Faculties or Departments by the fact that each teacher is responsible for a unique specialism. The role of the Design teacher is thus presented as one which must unify experiences, by making the part meaningful to the whole. This can only be achieved through the reinforcement of the Key Design principles.

The section concludes with the recognition that Design has an absence of tradition. This absence allows teachers freedom in which to adopt appropriate futuristic attitudes.

Section 2.2 continues the historical vein by tracing the subject of Textiles back to its origins on the school timetable. The section begins by paying respect to the influences of certain Artistic Movements, to the Educational Reformers and to the Bauhaus as part of the external forces which gave shape and form to the subject.
There follows a detailed account of the position and responsibilities of Needlework as a curriculum subject from 1840 to the Mid 20th Century. The first notable date being 1862 when Needlework became a compulsory school subject for girls. The historical landmarks of the Education Acts can be seen to either impose constraints or, alternatively, facilitate growth and expansion. In this way the review carries us into the radical changes of the 1960's, noting the suggestions of the Newsome Report and marking the advent of comprehensive education. Section 2.2 ends by introducing Needlework by its new title of Textiles, and by placing it within the family group of practical subjects converging together under the heading of Design.

It is recognised that this is not yet a contemporary position, however this part of the research was conducted prior to the implementation of the National Curriculum. The implications of this initiative are therefore fully explored in the final section of the thesis.

In Section 2.3 the Research concentrates on pupils who now study Design as part of their general education. The section begins by earmarking a particular age group of pupils, that is, those who are taught in the Leicestershire High Schools. These pupils find themselves in a comparatively unique position, quite free from external examinations. This section explores the cognitive development of adolescents with particular reference to the 11-14 age group. Some
theories of cognitive growth are discussed, namely those of Piaget, Bruner, Werner and Vygotsky. The educational possibilities drawn from these cognitive theories are then applied to Design. An overall picture gradually emerges which offers Design teachers a responsibility for nurturing the cognitive growth of the young adolescent.

Section 2.4 continues by exploring the specific role of the Textiles teacher within a design department. It finds that Textiles teachers can pursue the aims of Design in a unique way. It highlights Textiles as a creative subject which can shape a personal involvement for pupils by a tactile experience. The section identifies areas of concern for pupils in a Textiles class, and further to this suggests some learning activities which might take place in pursuit of these studies.

It becomes clear that Textile teachers, too, have their responsibilities in nurturing cognitive development. Their task to utilise the naturally occurring properties of their materials to promote effective learning, stimulate perceptual awareness, encourage creativity and develop non-verbal skills and thinking.

With this premise unveiled Section 2.5 examines more closely the intrinsic nature of non-verbal abilities and investigates the difficulties of assessing these abilities. It becomes obvious that existing non-verbal tests are inappropriate for
Design teachers to use in the classroom and a more "designerly" approach to evaluating learning is suggested. This is perceived as a continuous process of self assessment based on the tasks which pupils undertake in their lessons. This proposal is the catalyst for the classroom research which is outlined in Section 3.

Section 3.1 outlines the scheme of work for the classroom study. It discusses the design of an on-going self assessment for pupils which will record the work done during the study period. It explains how such a Record will be kept, the reasons for keeping it, and its precise content. Section 3.1 also introduces a questionnaire which was planned to aid the evaluation of the classroom teaching.

Section 3.2 is an in-depth report on the study. This clarifies the aims and objectives of the project and describes how the study proceeded and progressed. It looks at the three topics which were taught as part of the 1st year course on spinning, weaving and dyeing, and evaluates the self-assessment Record Card for each topic. The section ends with an overall analysis of the completed record cards plus questionnaires.

Section 3.3 extends the study to Second year pupils at the Martin High School. It outlines the content of the Record Cards designed for this older age group, and reports on the teaching methods plus procedures employed. It compares the
results of the two classroom studies, and confirms the contention that the Record keeping process is a valid educational experience.

Following in section 3.4 are details of further study which was carried out with first year pupils in the entirely different situation of a City Community College.

Section 3.3 makes a conclusion on the classroom studies by summarising the evolution of the project, by reviewing its aims and objectives and by studying the methodology employed. As an objective and constructive criticism it looks at problems encountered and determines the pertinence of the recording system in "Textiles" within the Design syllabus. It recognises the improvements to classroom teaching and pupil learning which became apparent as a result of the project.

In Section 4 there is reference to the National Curriculum and the future of Textiles is considered in this new light. It is suggested that the subject could make a valuable contribution to a technological education, and the relevance of this research is reviewed specifically in this context. Finally it prescribes new aims for the subject of "Textiles" in the next decade.
SECTION TWO

2.1: WHAT IS DESIGN EDUCATION?
WHAT IS DESIGN EDUCATION?

**Historical Background**

Design is a relatively new subject on the school timetable, its emergence coincides with comprehensive education, when Design departments became purpose built areas to house a variety of practical subjects. Design has its roots in both art and craft subjects and its appearance on the school timetable has been a very gradual process, it has not been an homogeneous development and there still remains some confusion over subject matter and teaching methods.

Historically education in Design and Craft has been motivated by commercialism. Britain, as an industrial and trading nation depended on the skills of engineers and the innovation of manufacturers. Craft or manual training workshops developed as a means of transmitting skills as efficiently and economically as possible.

Trade schools in the early 19th Century provided basic instruction combined with workshop skills. The British and Foreign schools society and the National Society made provision for teaching Needlework to girls and thus established a pattern of teaching lower class girls a useful practical activity. Manual instruction was efficiently recognised as a school subject within the elementary code on the 5th June 1890. Centres were established to serve
neighbourhood schools, and the teaching of craft skills was often undertaken on a peripatetic basis, thus tending to give a label of low status to the teachers involved, they were often considered as only "amateurs".

The teaching of craft skills was strictly disciplined and outlined in the "Handbook of Suggestions for Teachers and Others concerned in the Work of Elementary Schools" published in 1909. Craft skills were to be taught as a series of graded exercises.

The Fisher Act of 1918 noted the importance of handicraft for less able pupils, but it was not until the 1920's that Handicrafts began to be established in Teacher Training Courses. In 1935 a committee of the Council for Art and Industry recognised the need for manual instruction in schools to include some design work. It reported that the separation of the subjects of Art and Woodwork and Metalwork without the coordination of the respective teachers was a fundamental defect.

In 1938 the Spens Report recognised the need to echo the creative elements in the activities of the community in the school curriculum. By 1944 the Education Act had entitled all children to receive an appropriate education and this included practical instruction and training. Craft
subjects were now examined at both School Certificate and Higher School Certificate Level, but this did little to improve their general status. Humble beginnings had labelled them already as vocational and non-academic subjects.

Throughout the 1940's and the 1950's Art and Craft were taught as materials based subjects, any design work only arose incidentally as a result of the nature of the materials used. Views were however changing, and a new understanding was emerging. The Newsom Report of 1963 "Half Our Future" saw the need for pupils to participate in "real tasks" and the reorganisation of the school system along comprehensive lines forced educationalists and teachers to rethink the content of the curriculum for general education.

The New Curriculum

The traditional academic curriculum had to be reappraised. In order to achieve a fully comprehensive education for all a radically differing content was needed. In terms of the practical subjects the advancement of technology had lessened the need for pupils to be adept at craft skills. Domestic appliances became much more universal and easy access to machines, sophisticated tools, and ready made affordable items decreased the need for craftsmanship. There was hardly any perceived need or advantage to spend time on making something when it was possible to buy it directly for little extra cost, and no inconvenience.
The obvious reasons for learning craft skills had certainly diminished but new concerns were now in evidence. There were new kinds of practical decisions to be made. People wanted ideas, innovations, new materials, improved efficiency and better living standards, and the pressing problems of pollution and depletion of resources had to come into focus. Teachers of practical crafts could no longer rely solely on traditional methods they had to make their subject matter relevant to the children of the sixties.

Art and craft subjects viewed anew had an importance which, perhaps, had not been fully appreciated before, in many ways they could, in fact, meet the needs of young people growing up in a technological society. They afforded an opportunity for experience, skill and understanding related to the concern of shaping the environment.

Now teachers were faced with accepting the responsibility for this role. A way of achieving the new aims was to redefine Art and Craft education as "Design". Wood and metalwork teachers could realise the importance of technology and make their subject relevant to the 20th Century, Art teachers could develop visual awareness through new dimensions such as town planning and architecture, Home Economics teachers could use the logical structure of design method in planning and organising a home. The role of the teacher was ultimately to support pupils in the quest of solving problems, rather
than to guide them stage by stage through graded skills to
some predetermined end product.

The schools council project "Education through Design and
Craft" (1968) saw the teacher as effectively sharing the
activities of the developing pupil; that is, experiencing,
initiating, creating and making decisions. Design was viewed
as a subject "concerned with the identification and solution
of problems in the use of materials that occur in the social
system in which our students will be adults".

Logically to cope with this new subject, comprehensive
schools were often built with purpose built Design faculties.
The grouping of practical subjects provided a common ground
for Design Skills and a useful way of approaching existing
subject specialisms. The fragmented parts became a whole and
the usage of the term Design Education was established.
However, having evolved from complex, diverse and
contradictory sources the new subject inherited teachers of
subject specialisms, and of widely differing motives, roles
and experiences, its problem now was how to achieve a
coherent approach.

Design Education in Schools Today

In a highly technological age we have to be predisposed
towards machines, we have to utilise, maintain and improve
them. Micro technology has become unavoidable, we have to
learn to make positive reactions to a continually increasing technological environment. Moral decisions about the future have to be made since the responsibility for inventions cannot be ignored. Cosmopolitan high speed travelling societies need new forms of fast and efficient communication. Visual symbols have not only to be absorbed and understood, but interpreted quickly. The human brain has to become reaccustomed to dealing with information fed to it in non-verbal form. At this late end of the 20th century the need for psychological satisfaction also becomes more apparent. The worshipping of machines, and the power of money do not necessarily lead to spiritual or self-contentment, the old craft skills represent the therapeutic alternative for the unemployed and those with excess leisure time, and also satisfy the need for creative fulfilment. First-hand experience of making and doing help people to identify themselves within the context of the modern world.

How can Design Education attempt to cater for all these apparently differing areas of concern? The R.C.A. report "Design in General Education" (1979) defines Design as:

"the field of human experience, skill, understanding and imagination that is concerned with the conception and realisation of new things and events".

Archer (1979) portrays this field of knowledge which we call Design, as quite distinct from the Scientific and Humanistic
studies which traditional educationalists have adhered to. He calls this distinct area of knowledge the "3rd R". The three R's being reading, writing, and wroughting. Wroughting is that area of the curriculum which is concerned with making and doing.

Science is concerned with understanding based on observation, measurements, and the formulation and testing of theories by experiment; Humanities is concerned with understanding based on contemplation and expression of human values, and the understanding of spiritual values based on criticism, evaluation, and discourse; the third area of understanding, states Archer, is based on the body of practical knowledge concerned with sensibility, invention, validation, and implementation. Cross (1982) supports this view and suggests that there are in fact "designerly ways of knowing" that is ways of knowing which use non-verbal concrete modes of thought and communication. These ways of knowing are distinct from those used by the Sciences and the Humanities.

The common element which all teachers of Design can promote is the development of unique attitudes which will not be acquired from other school disciplines, and the application of these particular ways of knowing.

The means for achieving this lie in imparting specialist skills, and techniques peculiar to the subject of Design. The Design Council report "Design Education at Secondary
Level" (1978) recommends that Design should be an essential part of the education of all pupils up to the age of sixteen. It should encourage creativity and the creative examination of problems concerning human relationship with the environment; it should encourage a critical appreciation of emotional and aesthetic values relating to modern technology and the built environment; it should develop powers of discrimination, judgement, evaluation and communication. These areas of Design can be approached no matter what the particular specialism of the teacher concerned, thus the C.D.T. teacher, the Art teacher and the Textile teacher all have common general aims. The breakdown of these aims into specific areas for concern gives a blueprint for Design Education.

Awareness

Design has a commitment to raise the level of awareness of each individual pupil to its best potential. Children who are encouraged to use all their senses in their perception of their world will make the most positive interaction with their environment. Awareness begins on a personal level with pupils exploring their own reactions through the senses of sight, sound, taste, touch, smell and bodily orientation. The subjective experience of handling differing materials is a lesson in itself, provided the attention of the pupil is brought to bear on the subject.
This emotional awareness of response to materials and artefacts can be expanded into a physical and mental awareness. Physical awareness of self has been explored by Fenton (1973). He promotes the use of the Alexander Technique to raise pupils' consciousness of self in the environment. Evidence of this method used in his own school proved that as children become more aware of themselves their receptivity increases and they become more alert and retentive. Fenton sees the body as an instrument capable of increasingly skilled use, co-ordination and performance; he stresses the importance of developing muscular skills in movements in order to provide both mental and physical health. The sensory system can in fact be trained to detect very small differences in sensation. Promotion of physical awareness can encourage efficient handling of tools, where physical energy is deployed in the best possible way.

Social and environmental awareness are also areas of concern for Design. A complex relationship exists between Design Technology, society, and the natural and man-made environment. The environment should satisfy the needs of the people but not at the expense of its future. Heightened awareness should bring about a concern for all aspects of the environment. Pupils should learn to value the positive potential of technology and to realise that it must be used wisely and with discrimination in order to benefit society. It should be possible for pupils to consider the relationship of technology to society's cultural and emotional health.
Each pupil should develop a social commitment. Shaw and Reeve (1978) suggest that this area of social concern can be covered in Design by nurturing a caring attitude amongst pupils; they should be actively encouraged to care about other individuals, about society and its relationships to the individuals within it, and to care for the quality of objects and artefacts, but not in a materialistic sense. This caring element of Design, which could be developed through an increased awareness should aim at developing the growth of responsible citizens.

Perception

Design should also attempt to foster an awareness of the way in which individuals perceive their world. Each pupil will perceive the world in a unique way, colouring sensory information with previous relevant experience. Kelly (1955) suggests that in this way children build up their own personal construct systems. Philips (1981) proposes that in the classroom situation Design teachers can raise the awareness of an individual's personal construct, and encourage the formation of new and different constructs which can be shared with other pupils, thereby communicating other modes of perception to members of the group. Looking at experiences from another's viewpoint increases tolerance and understanding, and will increase appreciation of design qualities. A knowledge of the way in which we perceive the
world will help pupils to plan a design effectively and to develop a discerning attitude towards design in the community.
Non-Verbal Thinking

Design teachers can improve the levels of perception in their students by deliberately developing non-verbal thinking methods in the classroom. The working vocabulary of any designer, no matter what his chosen field, consists essentially of non-verbal codes (Cross 1982). Non-verbal codes are the designer's thinking tools, he uses them to translate abstract requirements into concrete reality and vice-versa.

The development of this skill in dealing with non-verbal codes would seem to be related to the right side of the brain. In "The Right Brain" Blakeslee (1980) states that there are many other kinds of thought besides verbal thought. Just as we make visual images in the brain, so we can form images of sounds, feelings and taste. To simplify the hypothesis, we might say that the right side of the brain operates directly on sensory images, whilst the left is more generally concerned with verbal thought processes. The right side of the brain is in Blakeslee's view, that part of the brain which we have previously called our subconscious. Both halves of the brain can in fact think, feel and remember but only the left hemisphere can adequately verbalise; since the right brain does not express itself in words it has consequently become our unconscious mind. Eastern philosophies such as Zen, Taoism, and Yoga have concentrated on raising this unconsciousness and in bringing about
awareness. In the West we could begin to concentrate on recognising that human experience is determined as much by the nature of the mind, and the senses, as it is by the external world which the mind perceives.

Education in Western societies has developed through the medium of language, and non-verbal knowledge has virtually been ignored. This situation will only change if teachers know and use their own non-verbal consciousness. Children should be allowed to make non-verbal discoveries, and then analyse their findings. Guided "discovery methods" have been well developed in Nuffield Science Courses; children are led through practical experiments and encouraged to make their own conclusions, with the teacher. Blakeslee gives examples of how children can learn through graphical "play", finally translating intuition into mathematical equations. In Design practical problems are often overcome by sudden insight, or intuition. Talking about these solutions, that is, allowing the left brain to verbalise the right brain's thinking, makes learning a more complete activity. Recall of the lesson should also be improved since the pupils will have both imagery and words in their minds.

An instructive understanding of concepts can thus be founded and used in conjunction with verbal comprehension. Most teachers are aware that verbal material can be reinforced by imagery, hence the use of visual aids in the classroom. Memory of holistic images can be a very efficient storage for
facts. When using both halves of the brain effectively as a cooperative unit pupils can improve achievement levels. Highly creative individuals seem to do this instinctively; Blakeslee quotes Einstein:

"The words or the language as they are written or spoken do not seem to play any role in my mechanism of thought. The physical entities which seem to serve as elements in thought are certain signs and more or less clear images which can be "voluntarily" reproduced and combined.

There is of course, a certain connection between these elements and relevant logical concepts. It is also clear that the desire to arrive finally at logically connected concepts is the emotional basis of this rather vague play with the viewpoint that this combinatory play seems to be the essential feature in productive thought - before there is any connection with logical construction in words or other kinds of signs, which can be communicated to others."

Phillips (1981) suggests that teachers of Design might deliberately concentrate on the right brain, aiming thereby, to raise the level of awareness in the senses; in other words to focus attention on the learning capabilities of the right brain. Rather than leaving the coordination of left and right to chance it can now be understood and actively developed. The education of the right brain allows more scope for speculation on the potential of human development.
Creativity

The development of the right brain should encourage a creative approach to Design. Problems cannot always be solved by longitudinal reasoning, sometimes refreshing originality can give new and better solutions to problems. If creative thought is broken down into four stages, these can be represented as preparation, incubation, inspiration, and verification. In any Design problem the preparatory stage is the investigation of the problem; the incubation takes place at a subconscious level, and the right brain can initiate an inspired solution; the verification puts the bright idea into the test. Design teachers can encourage inspiration by making room for divergent thinking in the classroom, and by placing emphasis on quantity, variety and originality of solutions to problems.

This kind of thinking has not always been encouraged in schools, many children developing differing ideas makes hard work for the teacher. Torrance (1962) states that parents and teachers often actively discourage creative thinkers, because such enquiring minds require too much attention, and non-conformist children make disorder within a group. Torrance believes that too much emphasis is placed on pupils learning facts rather than on expressing attitudes towards facts and applying knowledge. Too much credit is given
perhaps to written work when not all thinking can be expressed in verbal form.

Guildford (1959) and Getzels and Jackson (1963) have provided some interesting studies concerned with reassessing creative thought. There is evidence to suggest positive relationships between IQ and divergent thinking. Despite the difficulties involved in the rating of the creative mind it can only be an understatement to realise that human development would be stilted without the active expression of the imagination. Design teachers therefore have a vested interest in developing the powers of creative thought.

Ideas can be generated by organising brainstorming sessions amongst groups of children, (Osborne 1953) and lateral thinking can improve the fluency of creative thought (De Bono 1970).

A wide variety of materials in the classroom can spark off information and visualisation, enabling pupils to build images and systems in the mind's eye. Making models and communicating ideas by drawing fosters the use of latent creative powers. Without inspiration for new ideas and the ability to communicate these ideas little progress could be made in the material world. Advanced industrial societies would not survive or develop without the contribution of creative thought. Design as a creative subject can build
experiences, cater for sudden insights and attempt to translate visions into actuality.

Making and Doing

Evolving a creative idea into a practical reality often appears to be the main activity in any Design Department. Children themselves always associate Design with the concrete operation of making something. Making and doing is the visual evidence of a Design lesson, and although it is not necessarily the end product which is important the manufacture of artefacts does have an importance in Design. Individuals can express their own unique and creative thought patterns through the procedure of making, a link is thus formed between inner consciousness and outer realities. The importance of this has been recognised by progressive educationalists like Froebel and Pestalozzi in the 19th and early 20th century.

The Design and Craft approach is a practical way of developing the wider aspects of learning. It is not possible to learn skills only through theoretical means, or by watching someone else perform them, the vital key is to do it oneself. Manipulative craft skills can be developed and improved in the construction of artefacts. Using materials extends handling skills and dexterity in the use of tools. Discovering how different materials work and relate to each other develops a child's inventiveness and creativity. A
knowledge of the behaviour of materials, processes, and forms of energy, and the ways in which they can be controlled can be built up and stored for further reference.

Aesthetics

By the nature of their subject teachers of Design are always involved in the aesthetic appreciation of objects and artefacts. Whether one is intending to actively design oneself, or to make use of someone else's design, aesthetic judgements are usually considered. The design of any given object speaks volumes to all those who make contact with it. Is it in good or bad taste? Does its form follow its function? What is the shape, form colour and position of this artefact in the environment actually conveying to its public? A style and arrangement of furniture in a stranger's house makes us form an image of that person, his clothes project his personality. Everything which has been designed speaks to the world. Lawson (1980) regards Design learning as understanding the meanings that other people ascribe to the things in the environment, and experimenting with relationships between them. Each individual is therefore concerned to a greater or lesser extent with Design, and Design in general education is clearly important for all pupils. Teachers of Design should therefore be concerned to consider the aesthetic awareness of the pupils they teach.
Communication

Since all design carries messages to people it is obvious that Design in the classroom has to be concerned with aspects of communication.

The use of graphics in today's society covers an extensive area of study for any student of Design. Metropolitan life demands that information caters for a cosmopolitan population, it has to cross language barriers and be quickly absorbable, therefore pictorial signs and symbols are steadily becoming more universal than words. It can no longer be justifiable to debase non-verbal information as non-intellectual. Written information has an indisputable value, but other ways of imparting ideas have to be given status in schools. Drawings, plans, and models conveniently convey useful information, and use of the camera and video equipment cannot be ignored.

Problem Solving

If one asks the question "Why does the Design profession exist?", an element of the answer would be that it exists in order to cater for the material needs of society. People need things, designers make things to solve the problems and satisfy the needs. A designer's task is perhaps ultimately concerned with solving problems. Often the problems will be ambiguous, and part of the designer's task may be to actually
define the problem in the first instance. If schools are going to develop the "third R" they have to encourage their pupils to think like designers. Problem solving has to be part of the syllabus.

Shaw and Reeve (1978) outline a linear path for problem solving, beginning with the identification and definition of the problem, investigating and collecting information, and proposing solutions. Up to this point thinking can be seen to be divergent. Relative data has been gathered, freely investigated and a variety of alternatives devised. Having chosen a suitable solution thinking can then be focused on the development of an idea, and now becomes convergent. The realisation of any idea needs to be evaluated by the pupils, this plays a critical part in the development of sound judgement.

The approach to problem solving in Design has to be flexible and its relevance to the outside world needs to be as real as possible. Adults meet many problems daily, and familiarity with solving problems in general can be brought to bear on individual incidents.

The most difficult aspect of problem solving is the recognition that a problem actually exists. Taking other people's solutions for granted, accepting the status-quo, not looking, and not thinking are ways of opting out of responsible citizenship. Each person is responsible to
himself, as well as to others, and should want the maximum benefit of mankind's thinking for the good of humanity. It might be that no solution is the right answer to the problem, it might mean that compromise has to exist in order to satisfy all criteria, it might require massive changes in attitude and outlook and opinion. Problem solving should endeavour to encourage an enquiring mind and the courage to be able to declare at the end of the day that the answer is not satisfactory and needs improvement or even rejection. Problem solving is concerned with decision, and choice and the responsibility for reshaping the environment.

The Role of the Design Teacher

Design is a multi-media subject which covers a host of inherent activities. It deals with the raising of awareness, with perception, with non-verbal thinking, with creativity, with making and doing, with aesthetics, communication and problem solving. Design teachers have to unify all these aspects into a meaningful whole, whatever their particular specialism may happen to be.

Design teachers have to set about their task in a practical way because they are concerned with educating areas of the brain which are not exploited to the full in other subject areas. They have to impart "designerly ways of knowing", they have to allow pupils the experience of handling tools and materials, and of solving problems of a practical nature.
Design is concerned with human survival in the future so its teachers have to develop in their pupils a caring attitude towards world resources, and all its people; a respect for materials and their use in the environment; and a personal responsibility for decision making. Design teachers have to raise sensitivity, awake creativity and promote active social participation. Zanker (1971) describes this as striving to develop fully orientated persons.

Design of course, is still in its infancy. Its relative history on the school timetable is short, it does not have tradition, nor vast stores of knowledge to adhere to. The very nature of Design gives it an everchanging content and context, as it constantly seeks to progress and advance forwards in time. Design teachers have to utilise the best of its Art and Craft orientated past and experience, with the most relevant up to date knowledge and sophistication. As falling roles threaten the structure of the curriculum Design teachers have to be flexible in their acceptance of new ideas and must continue to think first and foremost as designers themselves.
2.2: HISTORY OF NEEDLECRAFT IN THE SCHOOL CURRICULUM
A HISTORY OF NEEDLECRAFT IN THE SCHOOL CURRICULUM

This research is primarily concerned with the teaching of Textiles as a subject at High School level. It now exists as one of a family of subjects known collectively as "Design". Design subjects, as already stated, cover many inherent creative activities, if the current position of Textiles and its future role within the family grouping are to be fully comprehended it is pertinent to trace the subject's development and to recognise those influences which have helped to shape and form it.
1. **Outside Influences**

**The Educational Reformers**

A history of Needlecraft in British schools reveals periods of advance which were responses to outside stimulus.

New philosophies of education were already being explored by the late 19th century. Changes in the educational climate were leading to a more progressive attitude. Dewey was concerned that education should consist of personal experiences related to real life in the social order; thus giving practical subjects more respectability. The Dewey school in Chicago (1896-1903) evolved the experimental method of teaching where children were encouraged to enquire, experiment, analyse, and evaluate situations. Subject boundaries were broken down and more appropriate teaching methods employed. (Meyhew and Edwards 1936)

Maria Montessori was working with young children. She recognised three areas of development: Motor education, Sensory education and Language development. Motor education was concerned with Kinaesthetics, with everyday movement, and care of the body. Sensory education was to help children be aware of sensory input and to encourage the development of sound reasoning and judgement based on the individual's perception of the world. Apparatus in the form of three-dimensional coloured shapes assisted the learning process.
Language development occurred through the use and development of these basic exercises. (Standing E.M. 1962)

Froebel had devised a series of educational "gifts" and "occupations" to introduce concepts such as colour, material, form, motion, direction, reaction, time, space, balance and geometric truths to the Kindergarten age group. The gifts also made preparation for drawing skills. The occupations used to develop the ideas presented in the gifts were:

i. Perforating
ii. Sewing
iii. Drawing
iv. Colouring and painting
v. Paper weaving
vi. Mat weaving
vii. Paper folding
viii. Paper cutting/mounting/stenciling.
ix. Pea work
x. Cardboard modelling
xi. Clay work
These gifts were intended to nurture progressive growth in the powers of construction and understanding; the occupations were to further develop these formal ideas in materials. Learning by doing was important to both mental plus physical well-being. (Bowen 1893)

In Sweden there were major developments in the teaching of Handwork. The Sloyd method derived from the Froebel system, and concentrated on teaching woodwork and handicraft in formal sequential steps with the opportunity for self directed learning and creativity. In London Solomon Baxter began a modified version of the system which was to be a fore runner of educational woodwork in this country.

In Germany the Werkbund was formed. This was an organisation concerned to create a link between art and industry. One of its aims was to reform product design and educate the German consumer, it also promoted the reform of artistic education in schools. Herman Muthesius was employed at the German embassy in London in 1896 to report regularly on contemporary developments in Art and Craft education.

In England the cumulative effects of growing industrialism were responsible for many changes within the educational system. Manufacturers needed Designs for their popular calico prints and were having to seek these from abroad which was not advantageous to the British economy. When the case was brought before Parliament the Privy Council for Trade was
resolved to establish a School of Design at Somerset House. This opened in 1837 and became known as the Department of Practical Art, under the secretaryship of Sir Henry Cole, whose inspiration supported a number of exhibitions which provided a challenging educational stimulus to the fine arts and practical sciences, and resulted in the emergence, by the middle of the century, of 90 Art Schools with an established central organisation and a national curriculum.

Industry's search for beauty sought the advice of Artists. Ruskin was an influential teacher in this respect. He gave lectures to Manchester industrialists encouraging them to study the works of the Great Masters, especially Titian. Ruskin's message was to encourage the marriage of beauty and utility. Sillitoe (1933) notes the infiltration of this influence into education:

"Not only calico printing but domestic needlework also received a healthful stimulus from the movement. Some of the effects may be seen today on the walls of the sewing rooms of training colleges for teachers of domestic subjects, notably at Manchester."

The English Arts and Craft movement cofounded by Morris and Ruskin encouraged the new thinking in education. Morris worked on a number of crafts, among them fabric printing, he stressed a knowledge of the materials and processes as a means of humanising the life of his time. Contemporary with Morris' designs for printed fabrics were those of Art
Nouveau, the most advanced sectors of which, inspired by Morris, attributed great influence to the educational influence of beauty. They believed that the beauty of an object should be derived from its artistic merit. Those who leaned most closely towards the theories of Morris maintained that the artist should not disdain to produce models for consumer objects, the objects should be made under the direct control of the designer so as not to weaken authenticity. Design should therefore relate to both material and function. (Naylor G 1971)

The educational reformers were commonly concerned with the development of the inner self and the teaching of the whole person. It was important that pupils should actively participate in the learning process and not merely listen passively to facts. This was the new understanding of the psychology of learning, the child was seen as a developing organism passing through well defined stages of learning and development, and education needed to be synchronised to this development.

The Influence of the Bauhaus

The Bauhaus was founded in 1919 when the Academy of Art and the School of Arts and Craft in Weimer, Germany, amalgamated. It was under the Directorship of Walter Gropius and its purpose was to make clear "the unity underlying all branches of design". (Constantine & Lawson 1973)
The Bauhaus contributed to design, architecture and art, and brought about new teaching methods in Art and Design, it also contributed significantly to the development of technology. The Bauhaus was "primary to the rediscovery of the importance of expressing texture, structure, and broken colour, and in finding new aspects of pattern with the vertical horizontal format of woven cloth" (Constantine and Lawson 1973). In the weaving workshop at the Bauhaus the first fabrics produced were pictorial weavings and tapestries worked under the influence of Paul Klee. There was emphasis placed on materials; and synthetics like cellophane and rayon were exploited. The subject matter eventually became abstract and concrete.

The Bauhaus initiated the "Basic Course" in Design. This was a six months introductory school course concerned with materials, colours, textures, structures and compositions. The basic course was originally taught by Johannes Itten. It was Itten's belief that Scientific research and technology must be balanced by inward looking thinking and spiritual forces. Itten drew upon the Froebelian system and the Montessori system, educating through the senses and using Froebels theory of contrast to explore basic principles such as colour in design.

Itten requested his students to search the environment for tactile experiences of materials. The textural qualities of
natural and man made found objects were exploited in Froebelian and Montessori terms and Itten taught his students to use bodily movement to experience the perception of form eg: "swinging arm movements to follow the evenly curved, continuously moving line of the circle would precede attempts to represent the circle graphically on paper". (Cross 1980).

In a logical progression the students would first discover an awareness of form through the senses, then they would represent the form in modelling materials and finally transfer the form into two dimensional graphics.

The preliminary course was an exercise in perception, discovery and manipulative skills. Cross (1980) states that "the evolution of general statements or basic laws of form and colour, and the subsequent grammar of visual expression was therefore a direct result of the experimental approach to teaching which Itten developed between 1919-1923 at the Bauhaus." The powerful influence of the Bauhaus was to subsequently filter through to schools and educational establishments throughout Europe.

2. Needlework in the School Curriculum 1840-1870

The influence of the various Artistic Movements, the Educational Reformers, and the Bauhaus was not immediate in British Schools, it had a more subtle affect and was brought about by a few enlightened teachers rather than the majority. The mainstream of education in the early 19th century was
provided by the National, and the British and Foreign Schools Society. Studies involved Bible readings, writing and some limited numeracy. Kay Shuttleworth first introduced Needlework to the curriculum in 1840 although it did not achieve any prominence until 1846.

Sillitoe (1933) relates that Kay Shuttleworth included Needlework for logical reasons aimed at encouraging girls into domestic service, which was losing good employees as more and more of the population found work in the factories. It was also an attempt at the practical teaching of personal hygiene, and a way of equipping future wives and mothers with useful homemaking skills. It enabled schools to deal with the immense problems of dirt and rags. To work cleanly counted for merit and it was therefore deemed necessary to provide facilities for washing hands at school. The essential amenities of sinks, and eventually lavatories, gradually allowed for the absorption of the "Ragged Schools", which in 1848 claimed some 17,000 pupils who were considered too dirty to attend other schools.

The status of Needlework on the curriculum suffered from the outcome of the Newcastle Commission reporting in 1861. In a bid for "National Economy" payment by results was heavily enforced and teachers concentrated on the lucrative 3Rs, leaving peripheral subjects to flounder. However the Revised Code of 1862 insisted that the subject was to be compulsory. Teaching methods at this time probably did little to enhance
the subject; girls were expected to stitch long seams and hems by hand, and there was no scope for creativity. The sewing machine although invented, was not yet in general use. Knitting was also taught via the practical production of socks and cuffs. Needlework, however, was the one subject on the curriculum which formed a link between home and school. Household sewing was often indeed sent in to be done during the Needlework lesson at school. (Sillitoe 1933)

3. The Education Act 1870

The first Education Act was passed in 1870 and established School Boards to supplement the voluntary System. The Code curriculum was expanded to include Domestic Economy for girls, covering a general knowledge of elementary housewifery and hygiene as well as food.

Mrs Ayscogne Floyer pioneered the teaching of Needlework when she started an association at Louth in Lincolnshire. She became an examiner of school Needlework in 1873 and soon recognised the need for a more efficient teaching process. She opened the London Institute for the Advancement of Plain Needlework in 1878 (Yoxall 1965). The training concentrated on the "collective method" of Needlework teaching which required children to chant mechanically in unison the sequence of movements involved in their sewing or knitting.
In 1876 the system of payment by grant allowed schools presenting certain subjects for examination double the former grant for successful results, that was two shillings per head. This was an optional course and plain needlework still remained compulsory. It would seem that HMIs treated Needlework with respect and there are several accounts of inspectors attempting to master the basic skills for themselves so as not to appear ignorant before the school mistress. (Sillitoe 1933)

4. The Appointment of a Directress of Needlework

As women members of School Boards became more numerous, more attention was given to the subject. A Royal Commission on Technical Instruction was formed in 1881, its purpose being "To enquire into the Instruction of the Industrial Classes of Certain Foreign Countries in Technical and other Subjects for the Purpose of Comparison with that of the Corresponding Classes in this Country". The report of the Commission provided impetus to the cause of practical education recommending education in practical subjects for all types of schools. Science and Art classes were to be established and maintained by School Boards, and Local Authorities.

In 1883 the position of Directress of Needlework was appointed to advise the Department in Needlework matters. This office was held briefly by Miss Emily Jones and was followed by the appointment of the Hon. Mrs. Colborne. Part
of the duties of the Directress were to listen to lessons
given by pupil-teachers in Training Schools and so slowly
began the realisation of the importance of teaching method.
(Sillitoe 1933)

5. Needlework on the Curriculum 1896-1918

Some educated young women on leaving school were beginning to
follow Domestic subjects as their profession. Some became
appointed to positions of importance, and became influential
in directing the policies of Technical education. Some links
were thus established between schools and colleges of
Domestic Arts, and some forward thinking headmistresses began
to give more time to Needlework and establish some lessons in
Cookery (Yoxall 1965). A certain Mrs Pillow was commissioned
in 1896 to conduct an investigation into the teaching of
Domestic subjects. She recognised that whatever the social
class of a girl she would also have a homelife to live and
could therefore not afford to be ignorant about "personal
health, health in the home, and comfort in the home". Her
conclusions were that there should be some subject in school
which dealt with homelife and management. Her investigations
showed the leading role which Needlework was acquiring in
some schools:

"In many high schools a lesson of one hour weekly is given to
all the girls, and during a part or the whole of the year an
optional class is held on one afternoon weekly, when girls
learn to sew and to cut out small garments. Some schools
teach dressmaking upon some simple system of measurement. In some cases special needlework teachers are engaged for these classes, and girls are prepared for a Needlework examination held by the London Institute of Plain Needlework. Classes for knitting, mending and darning are also held. Although the needlework classes are very general, it should be mentioned that in some schools girls who are learning Latin are excused from attending the needlework classes. It is a point worthy of note that some of the optional classes are stated to be 'largely attended'." (Quoted in Sillitoe 1933)

The Association of Teachers of Domestic Science was founded in 1896 and offered membership to all teachers holding diplomas and certificates in Domestic subjects. The Association held an annual conference to discuss ideas about the teaching of Domestic subjects, and was also responsible for modifying existing opinion on teaching methods and examinations. (Yoxall 1965)

Several women were appointed to the Inspectorate in 1896 and this further influenced the development of girls crafts. A report issued in 1912 by the Chief Woman Inspector indicates some provision needed to be made for connecting the handiwork of children in infant schools with the elementary teaching of Needlework. The report recognised the need for more variety in the work and suggested that children should bring in mending regularly from home, quoting the example of some schools which arranged mending days in conjunction with home
wash days. Lessons in altering and cutting down clothes into smaller garments were also advocated. Fine stitching, it argued, should not be insisted upon lest it impaired the vision of young pupils. The importance of creativity was just beginning to be recognised. Motivation could be improved by stimulating projects of work, and the strict supervision of perfect stitching was less important. Physiological studies of the development of children also revealed that plain sewing was not suitable for very young children. Some progressive ideas in education were beginning to permeate down to the classroom.

The Board of Education Act was passed in 1899 and this created a central authority for all forms of Education including secondary. The code of Regulations issued by the Board in 1909 made it clear that "provision should be made in the case of girls, for instruction of a practical character in the elements of housewifery." Whilst the implementation of cookery and Domestic Science proved to be relatively problematic Needlework retained a stronger position, largely because it was a compulsory subject for all candidates training as elementary school teachers. The London Institute for the Advancement of Plain Needlework also continued to train teachers and held examinations three times a year in theory, practical work and class teaching. It also took the responsibility for examining Needlework from secondary schools and awarded proficiency certificates in six grades. Needlework was well established in higher grade schools and
pupil teacher's centres and when these became secondary schools under the Education Act of 1902 Needlework continued to be part of the curriculum. (Sillitoe 1933)

The Board of Education Consultative Committee in Practical Work in Secondary Schools issued a report in 1913 which reinforced the view that handwork should be given a definite place in secondary education, it placed a value on systematic work with the hands as a necessary constituent of a liberal education. The definition of handwork was now extended to woodwork and metal work for boys, gardening and domestic subjects for girls. The report suggested the following syllabus: (Sillitoe 1933)

8-10 Years: Paper cutting and folding; Paper and cardboard modelling; Plastic modelling with clay or plasticine; Brushwork; Crayon drawing; introductory Needlework.

10-12 Years: The same further developed and applied where possible; light Woodwork; for boys especially
(At some point during these years the work for boys and girls might bifurcate according to their separate needs.)
12-14 Years: Advanced Woodwork; Plastic Modelling; Gardening etc.
(Boys)

14 Years & over: Metalwork; Woodcarving; or manufacture of scientific apparatus; advanced Plastic Modelling; Gardening.

12-14 Years & over (Girls) Needlework; Cookery; Laundry Work; Housewifery; Gardening.

The syllabus allowed for free and technical drawing and painting to be correlated with the subjects as applicable. Needlework was stated as demanding and affording opportunity for the training of accuracy of hand and eye, a lively aesthetic attention and vigilance in devising means to ends. Girls entering secondary school at the age of twelve should have a basic grounding in Needlework studies with attention given to the use of coloured thread, the combination of usefulness and beauty throughout all objects they made, practice in measurement and cutting out from the beginning, the development of the idea of a garment with places of strain to be strengthened, and the consequent application of strips and stitchery as in binding, taping, gussets etc. The dressing of dolls was also to be included. School Needlework was to lay foundations of skill and interest which could further be developed in the home. (Sillitoe 1933)
6. The Fisher Act 1918 and Post-War Changes

The Fisher Act raised the school leaving age to 14 years and asked LEA's to provide appropriate instruction in practical subjects for the more intelligent and older pupil. A broader curriculum for elementary schools was devised, together with opportunities for free access to secondary schools. The Fisher Act also stressed the importance to some children of learning by doing. The Act enabled LEA's to establish continuation schools for the part time education of adolescents who left school before the age of 16. In these schools practical subjects were to be given prominence.

Many new teachers would obviously be required to meet the new standards and so followed the "Code of Regulations for the Training of Teachers". Domestic subjects needed teachers too, especially in the new continuation schools, for classes of adolescent girls who were interested in their own appearance and wanted to make their own dresses. A need for Third Year Courses began to emerge in Training Colleges for those students who wanted to study a subject at advanced level. Schemes of work were initiated and submitted to the Board, which agreed with the proposals and Third Year Courses began. It was now possible to study the secondary subject of Needlework to a higher level. (Sillitoe 1933)

The effect of the War was to cast strong influences upon schools. A wider range of intellectual occupations had
opened up for women and Domestic subjects were to suffer in consequence. Careers for girls demanded a solid academic foundation and Domestic subjects lost status. Needlework fared best since it was a useful economy, considering the rising cost of clothing.

A report from the Consultative Committee in 1920 stated that:

"adequate facilities should be offered to girls who show special aptitude for manual instruction to receive it under the same conditions as boys, and that similar facilities should also be offered to boys in Domestic subjects". (Quoted in Sillitoe 1933)

The report having considered differentiation of curriculum between the sexes, left secondary schools free to follow their own deliberations. It was to be several decades before most boys and girls actually did follow identical handicraft courses.

In 1926 the Consultative Committee for the Board of Education reported on "the Education of the Adolescent" under the chairmanship of Sir Henry Hadow. This report gave greater emphasis for free expression and recognition of children learning through their own interests. Boys and girls were to:
"delight in pursuits and rejoice in accomplishments - work in music and act; work in wood and metals; work in literature and in the record of human history - which may become the recreations and the ornaments of hours of leisure in later years" (Quoted in Sillitoe 1933)

The quality of practical work in schools was to be inspired by the Hadow Report (1926) and the Board of Education made many recommendations to teachers of crafts in its series of publications of the "Handbook of Suggestions for Teachers". The Spens Report of 1938 reinforced the advice by announcing that:

"both the conservative and creative elements in the activities of the community must be represented in the curriculum and a larger share must be found for those activities which are creative".

7. The 1944 Education Act

The 1940's saw "Secondary Education for All" under the definition of the 1944 Education Act. The Tripartite system was enforced and the school leaving age was increased by another year to fifteen. (MaClure 1965)

The Arts and Crafts subjects came to be materials based and any design work arose primarily from the nature of the
material. Illustrative of this, the 1944 Education Act states, with reference to metalwork that:

"A few exceptional boys, perhaps not more than two or three each year, may possess, in addition creative imagination….. from these few may be expected some success in design at the end of a four year course."

Robertson (1952) stressed the importance of creativity in Needlecraft, and explained how Needlework and Embroidery had often come to be separated on the school timetable, with embroidery sometimes being taught by Art Teachers instead. A group of Needlewomen headed by Rebecca Crompton had actively demonstrated that embroidery should be alive and free, they divorced it from its source of garment making and emphasised freedom, spontaneity, and textural qualities, with the purpose of "stimulating the imagination, giving textural delight, expressing feeling and mood". Materials and threads were used as a palette in much the same way as the artist uses paper and paint. This expressive mode of Needlecraft was very different from the disciplined type of decorative embroidery used in dressmaking. For the most part Needlework lessons in the 40's and 50's remained formal, and preparatory designs were often worked in the Art room.

The 1944 Act had stressed that everyone should receive an appropriate education and the practical subjects often seemed
to be more appropriate to the less academic pupil. The status of craft subjects was once more under attack.

8. The Newsom Report and the Effect of Comprehensive Education

Developments in technology during the decades following the Second World War brought many changes into schools. The evolution of comprehensive education and departmental reorganisation within the schools was to alter the structure of the curriculum notably. The Newsome Report (1963) recognised that:

"To make people more observant of the world about them, more responsive, and more discriminating is potentially to enrich their personal lives a great deal."

This developing of awareness was now a new aim for general education. Newsom also saw that there was much:

"unrealised talent especially among boys and girls whose potential is masked by inadequate powers of speech and the limitations of home background ...... the country cannot afford this wastage, humanly or economically speaking"

It recommended that these pupils should have substantial craft or practical courses providing experience in the use of tools and different kinds of materials this approach echoed
the Crowther Report (1959) which had emphasised the intellectual challenge brought about through practical experience.

As the new Design Departments developed Needlework acquired new and varying titles such as "Fashion and Fabrics", "Textiles", "Dress and Design". It was now part of a family of subjects concerned with:

"the identification and solution of problems in the use of materials that occur in the social system in which our students will be adults"

(Schools Council 1968)

The subject of "Needlecraft" was now to be viewed in a different context within a curriculum which was seeking to offer a more general experience for the pupil. The experience of Design was now to give pupils an awareness of the relationship between themselves, society and environment through the medium of different materials, and in the case of Needlecraft, through the medium of textiles.

Archer (1975) had suggested that there were two main aims of Design:

i. To develop Design awareness as an element in the analysis of any suitable subject.
ii. To use Design as a generic term for a given segment of human experience, skill and knowledge (comparable to Science or Humanities) and to develop educational approaches in relation to this broad concept.

The Schools Council Projects Art and Craft Education 8-13, (1975) also saw two forms of Art and Craft education, one which: "observes the child's experiences and develops from this the values implicit for a visual tactile, and spatial education" and one which: "observes what is provided for him in the form of learning structures based on things we feel he should know and be able to do, and assess how he works with them".

It can be seen that the traditional subject of Needlework now had a tremendous challenge ahead in order to achieve these aims and responsibilities in a design situation.

In many schools Design Departments divided their time into rotational courses which became known as "the circus". Pupils were able to taste each subject area in the department before opting for longer courses in the third year and after. Teachers were faced with finding a suitable syllabus and there was considerable uncertainty about the image of the subject and its status in the school curriculum. Searching for some of these answers the Schools Council published a bulletin in 1977 entitled "Needlecraft in the School
Curriculum”. This document gave Needlecraft the responsibility for the following areas of the curriculum:

a. A relatively large element of practical work.
b. The search for fulfilment of some general educational aims through practical experience (getting on the inside of a process) rather than through abstract reasoning.
c. A concern for the interdependence of problem, process, medium, function and form.
d. A greater concern than is usual in other disciplines for effective modes of operation, involving linear thinking as well as spatial, simultaneous and intuitive responses.
e. The relatively major importance of personal solutions to problems and personal value judgments.

The committee felt that whilst Needlecraft should be mainly concerned with Dress it should also consider the creative use of yarn in embroidery, and collage, knitting, crochet and weaving, soft furnishing and toy making and the experience of many traditional crafts and modern materials. It should also include topics such as consumer education and research, related historical studies, textile science, textile design, dyeing and printing, topics which offered opportunities for integration with other areas of the curriculum. Needlecraft should be concerned overall with concrete experience, personal judgements, solutions and aesthetic values.
The Bulletin looked at the interpretation of Needlecraft in a variety of schools and in conclusion states that:

"Needlecraft is one, if not the only area of the curriculum which has the potential to develop these elements (individual skills, and personal judgment) through concrete experience, and it has a claim to a degree of uniqueness through the intensely personal nature of the products which are its currency.

In a rapidly changing society needlecraft is able to respond in the most personal and direct way to children's needs to express their individuality within the society. What developments the future holds is impossible to foretell, but it is important that the children have, through education in needlecraft, developed the skills necessary to meet that challenge, and a confidence to express them in their own individual way."

The Schools Council Working Paper 55 (1975) stressed the importance of Aesthetics in the Curriculum. It argued that craft subjects should provide opportunities for children to gain experience in the means of self-expression and that the teacher's task should be to keep a balance between free exploration and directed experiences to achieve the maximum intellectual growth, this was another area of concern for the Needlecraft teacher.
Andrew Fairbairn (1980) summed up the attitude of many teachers in purpose built Design departments, they:

"feared the disappearance of individual subjects, the loss of craft skills. Some saw Design as a lifeline hastily thrown to handicraft teachers who grouped it and used it to update their image"

Fairbairn also stresses the advantages of Design departments:

"It is not easy to classify subjects like ceramics, embroidery, or fashion since these studies cross and recross the boundaries of the main headings - what counts is the opportunities offered to excite the mind and imagination, so challenging the curiosity, inventive powers, and manipulative skills."

and

"girls who at one time trained in the routines of Dressmaking and Needlework have found the more exciting area of "Fabric and Fashion" a concern with their values and interest, and so have boys."

Almost a century and a half has passed since Kay Shuttleworth, for logical and practical reasons, thoughtfully introduced the disciplined subject of Needlework to his curriculum. Rows of girls no longer dutifully chant out the movements of their needles, many influences have decreed that the boys and girls in the Design departments of the 1980's
and 1990's should be actively involved in exploring the possibilities of Textiles. The aware teacher aims at meeting those principles of education which challenge the pupils at their own level of development. There is creative expression, problem solving, decision making, discrimination, manipulative development and the opportunity to handle many differing materials. The future of Textiles as a Design subject, is now concerned with consolidating the educational ideals through the learning process.
2.3: COGNITIVE DEVELOPMENT IN ADOLESCENCE AND ITS IMPLICATIONS FOR DESIGN EDUCATION IN LEICESTERSHIRE HIGH SCHOOLS
The Leicestershire High School

In Leicestershire the abolition of the 11+ Examination led to the development of a two tier comprehensive system. The 'Leicestershire Plan' was the reorganisation of county schools into this two tier system. It began as an experiment in 1957 in areas of the county which had suitable buildings, namely Hinckley, Oadby, and Wigston. In 1959 it was decided to reorganise the remaining schools in the county in a similar way.

For social, educational and psychological reasons it was decided to keep the schools small. 700 pupils in the lower tier, 1400 in the Upper tier. Pupils were to transfer from the primary sector at 11, and from the lower tier to the upper tier at 14. This left the lower tier free from examination constraints. The lower tier thus concerned itself with pupils aged 11-14 years, and became known as the High School.

Special consideration was given to the Design areas in Leicestershire High Schools. The original Art, Home Economics, Needlework, Woodwork, Metalwork, and Pottery areas were centred in one space, and visually connected. The intention was to achieve a:
"bonding together of these areas, which depend on a common understanding of Design considerations"

A N Fairbairn 1980

As this ethos was specifically engendered so too could Design teachers concentrate on the particular needs of the younger adolescent. Within this context Textiles had a special role to play. As a Textiles teacher in this situation it seemed appropriate that there should be an overall commitment to encouraging the cognitive development of young teenagers through the subject matter. It was therefore essential to understand the learning processes which operate at these age levels.

Cognitive Development in Adolescence

Cognition refers to those processes involved in knowing.

Cognitive development can therefore be defined as: "the process by which people understand their world and operate as intelligent beings within it". Phillips 1980 Cognition includes many types of mental processes such as perceiving, thinking, and imagining. Theories of cognitive development are concerned with the way in which people acquire and use knowledge to come to terms with their world.

As children grow up thought becomes more abstract and particularly so during the period of adolescence.
Adolescence is the time extending from puberty until full adult status is achieved. The most apparent stages of development are physiological and result in physical growth, bodily changes and emotional response to new situations.

The nervous system matures during the teenage years and nerve fibres develop further contacts between each other. It is likely that the complexity of the brain is greatly increased during the early years of adolescence. Lateralization of the brain also becomes more marked. Studies by S F Witelson (1975) indicate that the right hemisphere of the brain in boys becomes specialised for spatial processing earlier than in girls.

This maturation of the nervous system and the increased complexity of the brain allows for the capacity to think and generalise on a higher level. A child with a high IQ in the same cognitive stage as his peers may be able to solve problems more quickly, but some degree of maturation is necessary before the next stage of cognitive development can be reached. Individual and personal experience affect cognition, as do environmental influences. Some adults rarely use higher levels of thought.

Attaining the new level of thought is a gradual process and may be quicker to develop in some areas that in others, thus enabling abstract thought in some subjects before others. The new stage in thinking allows for a greater level of
control and freedom in intellectual operations, and thinking can take place in terms of abstract symbols, rather than only concrete events. Information can be organised and related to new situations, and the adolescent can think about his own thinking, and begin a true awareness of self.

Piaget's theory of Cognitive Development

This higher level of development in thinking was initially recognised by Inhelder and Piaget in "The Growth of logical Thinking from Childhood to Adolescence" (1958). It is the final stage of thinking in a systematic development of intelligence. Piaget called this level of thought the "Formal stage of Thinking" preceded in his epistemology by three previous stages:

The Sensorimotor Stage, which occurs from 0-2 years and in which knowledge of objects has its origins in interactions between person and object.

The Preoperational stage, which covers the ages from 18 months to about 5 years, and in which language symbols are used and objects can be symbolised, so that a box in a child's play maybe a truck or a train.
The Concrete Stage, of middle childhood when thinking is limited to thinking about things. The child begins to handle problems of classification, and begins to understand relationships between objects.

The final stage of thought is the Formal Stage or propositional stage which sees the emergence of adult like thinking, and in which a number of new capabilities become evident. The adolescent can produce more complex expectations when faced with certain kinds of data. Logical thought is not so restricted and statements can be manipulated. The adolescent can say: "If such and such an influence played a part, then such and such an influence should follow."

It is now possible to structure and coordinate actions upon relations, and thinking more often determines action and perception. The average adolescent is capable of an analysis of a situation, consideration of all possible arrangements, making an hypothesis and confirming or denying the truth by testing.

The adolescent is thus thinking beyond the present task and is able to form theories, make assumptions and draw conclusions which need not be directly related to present factors. He or she can deal with propositions as well as events.
Adolescents have freedom, mobility and flexibility of thought, they can think about things which are outside the range of their experience, such as the nature of the universe. The new thought patterns demand more control, irrelevant thoughts have to be dismissed, and pertinent information held. Many aspects have to be considered before a conclusion is reached.

Piaget places the change to formal thinking at around 11 or 12 years. Until this stage children cannot solve problems like the following:

"Edith is fairer than Susan, Edith is darker than Lily, who is the darkest of the three?"

Flexibility and control of intellectual operations increases between the ages of 13 and 14 and the adolescent becomes much more concerned with possibility. A system is established to discover all possible combinations before constructing a rule from which future predictions can be made. Gallagher and Noppe (1976) illustrate this type of reasoning with an experiment in balance. An 8 year old child faced with the problem of finding the correct weight to make a crossbar balance, uses a trial and error approach, there is no grasping of proportion or of the relationships between distance and weight. The adolescent faced with the same problem concludes that distance and weight have some relationship, the smaller the distance the greater the weight
required. The adolescent's approach is to explore the effects of variables, weight, and length, by holding one of the variables constant and observing the effects of the other. Then there follows an attempt to integrate weight and length into a general law. This is a hypothetical, deductive type of thinking. The adolescent shows the ability to derive a proportion from two or more variables of a complex relationship, and is able to suggest the possible effect of one or more of the variables upon another. The capacity to combine and separate variables in a hypothetical, deductive framework becomes apparent only at this formal stage of development. This reversible manoeuvring between reality and possibility is the fundamental property of adolescent thought.

The Combinational System of Formal Operational Thought

The adolescent is also capable of generating all possible solutions to a problem. Inhelder and Piaget (1958) called this the combinational system of formal thought. Siegler and Liebert (1978) demonstrate this by asking subjects age 10-13 years to find the correct combination of switches to run an electric train. The more help they were given the better they did, but the older children did better overall, and also made more use of written records to help solve the problem.

The combinational system refers to the complete matrix of all possible variables in a given problem. Within the
The combinational system is the set of logical operations, called the INRC group, which constitute the theoretical foundation of the formal style of thought.

The four operations of the INRC group are Identity, Negation, Reciprocity, and Correlativity. **Identity** refers to some initial given problem, **Negation** is the undoing of that operation. **Reciprocity** is undoing the effect of the initial operation by changing another variable, and **Correlativity** is the negation of the reciprocal change.

In simple terms as described by Everett Dulit (1972). If the initial operation is putting weight into a previously balanced scales, then Negation would be removing the weight, Reciprocity would be moving the pan, or adding a weight to the other side to restore balance, and Correlativity would be undoing the reciprocal change, leading to the same effect as was created by the initial operation.

According to Piaget the combinational system and the INRC group facilitate the formal stage thinker, enabling him or her to read logical conclusions and guidelines from given details of data. The subject now has the capacity to operate with proportions, and the ability to hold all variables constant except the one in question. The full range of possibilities is generated by the thought process, and dealt with within the combination system.
Piaget's liquid experiment illustrates the concept of the combinatory system. Boys of 12-14 years were shown five bottles each filled to the same level with colourless fluids. The bottles are numbered 1-5. On the table are a number of empty glasses the experimenter shows the subject a glass of yellow coloured fluid and instructs the subject to achieve the same result from mixing the liquids in the bottles. The formal operational thinker would be expected to systematically work through all combinations of the liquids in all possible ways, in an attempt to search for an understanding of the complete problem and arrive at the truth.

The adolescent is more capable of discarding an hypothesis if he can improve it with a better one. He has the ability to control his thought processes enough to delay conclusions while considering other possibilities.

Acceptance of a Lack of Closure

The adolescent can also realise that the final conclusion to a problem could be made with more information. Lunzer & Morris (1968) called this ALC or Acceptance of a Lack of Closure. When given a verbal problem such as this one reported by Peel in 1966.

"Only brave pilots are allowed to fly over high mountains. This summer a fighter pilot flying over the Alps collided
with an aerial cable railway, and cut a main cable causing several people to fall in the cars to a glacier below. Some people were killed and many others had to spend the night suspended above the glacier. Was the pilot a careful airman? Why do you think so?"

Adolescents would ask for more information about weather conditions etc before making a conclusion. Young children would not do so.

Conservation

During the stage of concrete operations the child will learn that when the shape of an object is changed it still contains the same amount of material. A fat sausage of clay contains the same amount of clay as a longer thinner sausage rolled from the same piece. Conservation of substances can be more difficult if the material is not familiar, or if the change is one of state.

When a container of water is tilted and the subject is asked to choose a picture that shows the orientation of the water level, choosing the horizontal shows that the subject conserves. Harris and Hanley and Best (1977) found that men and boys do better in this test than women and girls.
The conservation of mass is established first, followed by weight and volume at the end of the concrete operational stage.

The understanding of the concept of conservation is important because it gives rise to an awareness of reversibility. Not until this stage is reached can the child construct a bead chain in which the original pattern is reversed. The ability of any operation constitutes an important gain in the intellectual growth of the child. The operational child can thus approach a problem in more than one way.

At the level of formal thought it is necessary to possess a high degree of reversibility skills, it has to be possible to move freely from the possible to the real. This reversibility implies a decentering process and the ability to take the point of view of others.

**First and Second Order Operations**

Reasoning about things and events can be called a first order grouping of operations, operating upon these, or their results is a second order grouping of operations. The second order grouping occurs in formal thought pattern and gives rise to new relations of a logical kind. It is now possible to imply and contradict statements derived from operations formed at the concrete level.
Second order operations concern proportions, mechanical equilibria, probabilities, correlations and multiplicative compensations, and include combinational operations.

Summary of Piaget's Stage of Formal Thinking

Piaget's research suggests that logical and mathematical thinking develops from the sensori-motor stage of the infant to the controlled and systematic handling of operations of the concrete operational, and formal operational stages. The stage of formal operations from about the age of 11 years upwards is called Era IV by Piaget. It includes reasoning about reasoning, construction of systems of all possible relations or implications, hypothetical deductive isolation of variables and the testing of hypothesis, and operations upon operations.

Thomson (1959) states that in the formal stage of thinking:

"Logical or propositional operations are formed which constitute a high contained system independent of any concrete contents and which also serve as a means of coordinating operations acquired at earlier stages into a single system".

He also notes that:
"Hard facts can be dealt with and the world of experience analysed and manipulated".

The use of formal thinking, however, is related to personal and environmental characteristics. Adolescence is the time at which formal thought first emerges, but is not commonplace among all adolescents. Elkind (1975) showed that out of 469 students between the ages of 12-18 years only 47% could demonstrate conservation of volume. In replication studies of Piaget's research Elkind concluded that adolescents who have reached the stage of formal operations may or may not necessarily apply them to all problems. Girls especially seemed less likely to apply formal operations in science. Other studies by Hobbs, and Graves support the view that the universality of formal operations remains in question.

Dulit (1972) suggests that up until adolescence the development of intelligence is a clear sequence of stages, as defined by Piaget, through which every child passes, but from early adolescence onwards only a modest proportion of the population will follow the road to formal thinking styles. Formal stage thinking is rather the optimal extension of earlier cognitive stages. Dulit states:

"Formal thinking appears to be a kind of "cognitive maturity". It integrates all that has gone before. It is far from commonplace among adolescents or adults. In that sense it is more ideal than typical, more potential than
actual. It has important quantitative aspects, varying degrees of access for a given individual being common and partial degrees of access being more common in the normal population than either full or zero access. Like most other aspects of psychological maturity, it is potentiality only partially attained by most and fully attained only by some."

**Correlates of Formal Thought**

Psychological growth during adolescence determines that formal thought patterns are possible, but cognitive development theories suggest that it is a child's activities and actions which underlie thinking. Research shows that there is much individual variation in the rate of progression through the stages of formal thought and in the ways in which people approach and solve problems.

**Field dependence and Independence**

The way in which a child perceives his environment will depend upon the stage of development, his personality, and his knowledge. Children who are field independent can keep an item such as their own body or an object separate from the environment, or a field embedding context. Field dependents cannot do this. Embedded figure experiments show that there is a correlation between field dependence and cognitive development. Fleck (1972) correlated field independence and concrete operations in school children, and
Neimark (1972) found correlation between field dependence and Piagetian combinatory tasks.

By measuring how quickly children could identify embedded figures, and by measuring their ability to match one of six pictures with a standard picture, after a short delay, Neimark was able to assess field independence and reflectivity against the transition from concrete to formal operations. Neimark found that both field independence and reflectivity are related to cognitive development.

Leone (1974) also concluded that field independents are superior to field dependents on cognitive tasks.

**Personality**

Research would indicate that those individuals whose personality traits enable them to view life in an analytic way, may be more capable of analysing factors in a problem, and more capable of deducing solutions. Personality and cognition are thus intertwined.

**Intelligence and Creativity**

Studies by L W Yudin (1966) indicate that intelligence is linked to the acquisition of formal thought. Boys of average intelligence made good progress in formal operations between the ages of 12 and 14 years, those below average intelligence
made more progress later between the ages of 14 and 16. Keating (1975) also showed that between the ages of 11 and 13 years boys of superior intelligence used formal thought more often than those of average intelligence.

Intellectual ability can be broken down into three areas, that of general ability (g) that of verbal and numerical ability (v-ed) and that of practical mechanical and spatial ability (km). Spatial ability is the ability to perceive and retain mental impressions of the form of a shape of pattern as a whole. Mechanical ability is dependent on knowledge and experience of mechanical apparatus and operations. Km ability is in evidence by 11 years old although it is usually less well developed in girls. Development of km ability increases into the late teens.

The adolescent with greater control over thinking can make good use of this imagination, thinking about what might be possible allows for more original solutions to be created from the imagination. Smart and Smart (1973) state that research on creative people indicates that they: "are high in flexibility, fluency, drive, involvement, openness, curiosity, autonomy, independence of judgement, self confidence, self acceptance, humour, empathy, desire for complexity, and easy tolerance of ambiguity .... often extremely vigorous both mentally and physically, they lead complex lives, in touch with a complex universe. They contact and use the unconscious life liberally and with broad
and flexible self awareness. They can easily regress to primitive fantasies, naive ideas, and tabooed impulses, and then return to rationality and self criticism."

Highly creative people often use divergent thinking patterns and their brain-waves differ from average people. Highly creative people produce alpha-waves about 40% of the time, and increase this rate when involved in creative tasks. They are more able to get in touch with unconscious memories, and can focus their attention directly. They will use both primitive and highly rational thought, choosing which ever is appropriate.

Language

Verbal language appears to support the development of formal thinking. Language during adolescence becomes increasingly sophisticated, and allows the expression of new and complex ideas. Whilst language in itself will not guarantee high level thinking, nor can formal thought be limited to verbal thought, language is the tool used to express experiences in symbolic form, and thoughts can be progressed and externalised through language use.

Some researchers, notably Vygotsky and Whorf, have put forward the idea of cognitive activity or thought which is not directly related to speech. Whorf put forward the hypothesis that the nature of one's language determined
cognitive processes, and that language therefore mediates cognitive behaviours such as problem solving, intelligence and perception (Staats 1968).

Similarly Vygotsky was of the opinion that thoughts are identifiable entities that might be expressed in words, but that meaning mediates thoughts before they are verbally expressed (Veer and Valsiner 1991).

From this evidence it would appear that: "thought, language, sensory perceptions, action, cultural influences and innate neurological mechanisms are complexly interrelated and independent" (Cross 1984).

Moral Thought
The development of formal operations leads to a new view of the external and the physical. The discovery of subjective experience, and the transcendental becomes possible. The adolescent who has reached the stage of formal operations has the cognitive capability of moving to principled moral reasoning. Religions, metaphysical and epistemological, and aesthetic concepts and values can all arise at this stage of adolescent development.

The highest stage of moral development, that is moral autonomy, is dependent on the attainment of formal reasoning, the adolescent develops a sense of ethical responsibility based on abstract principles of right and wrong. Kohlberg (1972) has expanded Piaget's cognitive developmental theory
to moral development, and distinguishes three levels of moral development: **the preconventional level** prevalent during childhood when moral decisions are based on self interest and material considerations; **the conventional level**, when morality conforms to social conventions, most adolescents and many adults operate on this level; and **the post conventional level** when decisions are based on autonomous principles of justice.

Kohlberg further divides these three levels into six stages of moral development, and adolescents progress through several of these stages. Kohlberg's stages of moral development can be linked to Piaget's stages of cognitive development. The change from concrete to formal operations corresponds to the change from the preconventional to the conventional stage of morality. Tomlinson, Keasey and Keasey (1974) however, suggest that the attainment of formal thought is necessary only for post conventional moral thought.

**Other Theories of Cognitive Development which have significance for Design Education**

Phillips (1980) believes that the cognitive development theories of Bruner, Werner, and Vygotsky are important to Design Education.
Bruner states that the most elementary form of cognition is that of categorising. People categorise events and experiences. Innate curiosity is the basic motif for learning, and people will make discoveries whatever their environment happens to be.

Cognitive development is continuous and integrated rather than a sequential series of stages, the development of intelligent behaviour is the combined result of internal and external forces. Development according to Bruner, is the improved organisation of simple components. At first an infant makes random attempts to pick up an object and place it in the mouth, eventually after some mistakes the act will be achieved. Human vision guides the development of voluntary hand movements. This co-ordination of movement into a correct sequence is the basis for all skilled physical action.

Human beings bring order into their world and make sense of it by processing information through action, imagery and language. At first past events will be represented through appropriate motor responses, so segments of the environment will be represented in a muscular or physical way. Bruner terms this enactive presentation. Later percepts and images are selectively organised to summarise events. Transformed images stand for events in much the same way as a photograph.
Visual information is the most important. Bruner calls this **iconic representation**. **Symbolic representation** occurs lastly, now language represents the environment. The transformation to this stage of development starts at the age of 2 years, with the use of language, the child begins to speak in simple sentences and is possibly thinking. Language becomes the means for transforming experience. Once the child has internalised language it becomes possible to represent and transform the regularities of the environment with greater scope. The individual thus gains greater control over the environment. The child develops the ability to go beyond the immediate present and can deal with past events. Bruner sees language as the instrument of thought. Bruner suggests that the development of intelligence depends upon representation and integration, time is not a major concern in the development, Environmental conditions may modify responses. According to Bruner the principle emphasis in education should be placed on skills in handling, seeing, imagining and symbolising. (Bruner 1966)

**Werner**

Heinz Werner defined cognitive development as a process of change occurring within an individual. The individual growth of a child, in Werner's view, parallels the evolution of the human race. Development of the child does not depend only on maturation, but also on psychological processes.
Werner categorizes mental functions at differing levels. The lower level functions appearing before the higher. Eventually low level functions reach a level where they dominate the functioning of the organism and then higher level functions take over. A young child's thought moves from the concrete to the abstract. At first the child learns the meanings of verbal symbols in a concrete setting by touching, pointing to, and naming objects, then the child gradually acquires meanings and concepts in a verbal setting. (Russell 1956).

Werner suggests that we represent the world internally by symbols of images, gestures, language, and mathematical notation. In order to do this we have to differentiate certain aspects from others.

Werner describes cognitive development as the process by which we organise increasingly complex differentiations. Development is thus a shift from undifferentiated processes to differentiated processes.

At first differentiation is simple or primitive the young child knows a few large categories, as language develops the child uses whole phrases to describe events, this is **holophrasic** language.
When language evokes pictorial representation of the object and associated feelings, *syncretic thought* takes place. Young children particularly use syncretic thought processes.

Analytic thoughts follow syncretic thought these are separate from the previous modes of thought and are more differentiated and abstract. From this time onwards analytic and syncretic thought are both available and used in appropriate situations.

Werner states that all responses are reactions of the total organism to the total stimulus. He defines perception in terms of: "an experience which corresponds to a particular relation between organismic state and stimuli from an object."

Studies in perception by Werner show that children have less differentiation between their own bodies and the world, the external world of the child is egocentrically bound to the position of the body. Werner suggested that physiognomic properties of the environment are perceived directly by innate processes. In Werner's view this is possible because visual perception in young children is linked to the perception of affective and postural events originating in the body. (Wallach and Kogan 1965). Witkin extended this idea into the concept of field independence.
Therefore according to Werner cognitive development begins in a global way, when whole qualities are dominant. Syncretic modes of thought allow parts to become integrated with the whole, and analytic development is selective attention towards parts.

Vygotsky

According to Vygotsky language development is most important to cognitive development. The cognitive development of the infant is determined by action and direct experience, sounds are used to express sensation. During the first two years thinking is linked to action, and the first words are used purely to attract attention, or release frustration.

From the years 2-7 speech is defined as ego-centric. Thought is now verbal and directed by inner speech, and children use words to communicate their ideas to others. Ego-centric speech gradually gives way to inner speech which is used to express personal thoughts to oneself. External speech is used to express thoughts clearly to others.

Thought can be non-verbal, as in visualisation of scenes or objects and the transition from thought to speech is not always straightforward. Language allows the expression and elaboration of simple thoughts and ideas. Theoretical thought has also to be transferred to concrete situations.
Adolescents especially may be confronted with the problem of expressing abstract ideas, they have to learn how to solve practical problems using theoretical knowledge.

EDUCATIONAL IMPLICATIONS OF COGNITIVE THEORIES APPLIED TO DESIGN

A general aim of Education is that it must contribute to the normal all around development of the child.

If an individual reaches the most mature stages of cognitive, moral and ego development then he or she is equipped to think of the widest implications and possibilities, able to understand and apply the universal principles of justice and human dignity, and also able to see personal needs in the light of the requirements of freedom pertaining to others. The highly developed person has broader perspectives, and should be a more humane and ethical person.

Piaget claims that mature thought emerges through a process of organisation of psychological structures which result from interaction with the environment. A set of universal ideas is thus redefined by an individual through his own experiences. The events in the child's experience are actively organised, and cognition develops as the child uses past experiences to deal with the environment. The child's position in the environment requires thought and symbolic representation and interaction. Each stage of cognitive
development stems from the previous, and children move through the stages at varying paces. Attainment of the following stage in a child's development is obviously a valid aim for the teacher.

Kohlberg and Mayer (1972) state that to enable the child to take the next step forward the following points should be considered:

1. Attention to the child's modes or styles of thought.
2. Match of stimulation to modes of reasoning one stage above the child's own.
3. Arousal, among children, of genuine cognitive and social conflict and disagreement about problematic situations.
4. Exposure to stimuli toward which the child can be active, in which assimilatory response to the stimulus situations is associated with "natural feedback".

Cognitive developmental theory integrates internal states of mind to behaviour in the environment, the meaning of a child's experience will depend directly upon the relationship of the experience to his own personal situation.

Both cognitive and moral development are related to ego development, since all three contain beliefs about the physical and social environment. Increasing self awareness, and awareness of the world incorporates the development of moral, aesthetic, cognitive, and metaphysical thinking.
If education is organised for the development of cognition, it has to rely on methods of stimulation through a sequence of stages which apply to all children. Development should be continuously encouraged by direct educational experience, but this does not always happen.

McKloskey and Kleinbard (1974) state that a relevant curriculum for young adolescents should aim to fulfil their genuine needs, and involve significant tasks. It should offer active learning through experience, observation and involvement; be a challenge, and provide a chance to do something meaningful; it should promote maturity and responsibility, and stimulate cognitive and personal growth. Adolescents should be given the opportunity to put theoretical ideas into practice, and practical work should stimulate more ideas and further learning. Learning should be related to the real world outside the classroom, and there should be room for collaboration between adults and pupils, pupils should also have the chance to serve the community.

A properly planned Design course at secondary level could satisfy all these criteria and enable young people to take their first steps towards cognitive maturation. By the third year, at 14 years boys and girls should be looking for the explanation of facts and theories, searching for evidence of truths, developing genuine stable concerns and interests, and be giving objective opinion. Design can actively develop
cognition and the associated affective learning and thinking skills, leading gradually to the attainment of individual potential.

Pupils in Design do not have to sit still and absorb facts in a passive manner. They are free to learn by the act of doing, and most importantly Design renders the opportunity for the development of cognitive abilities associated with the right hemisphere of the brain, abilities which are systematically neglected in schools which favour a more academic tradition.

**Design Education and Piaget's Stage Theory**

Piaget's theory of cognitive development states that children move through a sequential series of stages in cognition. The early stages of development are concrete, global, learning stages and it is through these early experiences that the child learns how to control the environment. Teachers of Design can actively increase a pupil's concrete experience by supplying many opportunities for practical work and by creating a "learning by doing" environment. Design skills in early adolescence should give a pupil holistic, pictorial, and personal experience, they should also be used to develop concrete modes of cognition.

Research (Dulit 1972) has shown that many adolescents do not use formal levels of thinking, Design offers a chance for the
development of appositional thinking, that is non-verbal, and visuo spatial in style, in contrast to formal propositional thought. This is of benefit not only to those who may not have a great potential for formal thought, but also to those whose creative inclinations require the opportunity to use both divergent and convergent modes of thought. Dyslexic pupils may also benefit considerably from Design lessons as research quoted by A Cross (1984) indicates that dyslexics have a tendency to perform well at right hemisphere tasks, and show less interhemispheric activity than normal children. In Design dyslexic pupils have the chance to offer solutions in non verbal forms.

To date research into the development of appositional thinking styles is limited but therapists often seek the unconscious mind (or right brain) and appositional thought modes by using hypnosis or other means. It would seem that Design could be a crucial subject for encouraging integrated thought and awareness.

Piaget’s stage of formal operations requires a more abstract mode of thought which is generally well catered for in British Schools. Our Educational System places great emphasis on academic performance, and subjects which do not stress achievement in this sphere suffer a low status label. Some aspects of Design however can surely be seen to have concern with formal operational thought.
It is at the age of 11 to 12 years that pupils move into formal thinking patterns. Solving problems in Design can encourage flexibility and mobility of thought. Meeting the criteria of any Design brief requires the organisation of ideas and the consideration of all aspects of a problem before a solution can be derived. Pupils can be encouraged to delay choosing a final solution until they have explored all the possibilities.

The handling of materials can assist the understanding of conservation. Direct experiences with metals, wood, plastics, textiles, clay, and food, could be chosen by the teacher to illustrate this concept.

N Cross (1981) recommends that Design Students be encouraged to develop field independence. Problems in the real world, cannot be solved until they are recognised. Finding a significant pattern in the total mass of information and isolating it is a skill to be practised. Cross quotes Jones (1970) who emphasises the importance of "transformation" in Design, that is sorting out the information related to a Design problem and recognising the character of the Design, simplifying the problem by altering the form, and emphasising certain aspects, whilst paying attention to others. Cross states that:

"The Designer needs to perceive pattern, structure and meaning in the fields of data".
Since we are all "designers" of our own lives this must be one skill which is entirely relevant to each and every pupil. Design teachers can offer something of value which is not part of any other subject on the curriculum.

Creative thinking in Design helps the development of divergent thought patterns. The search for solutions should be as thorough as possible, even the absurd idea may have some worth upon investigation. A Cross (1984) quotes Bogen and Bogen (1969) who recognise that education often limits appositional thought, because it over emphasises the academic subjects. They suggest that the availability of both styles of thought is important for the creative solution of complex problems. An individual who has access to both styles of thought increases the potential for the successful solution to problems. Design teaching should aim therefore to encourage both appositional and propositional thinking styles.

The adolescent must be allowed to use his or her potential for the search for alternative solutions, and must be taught to avoid using only quick and obvious solutions to problems. A pupil who can be guided to make a discovery non-verbally and then verbalise his findings is truly practising the creative process. A fact learnt in this way is also much less likely to be forgotten than a verbal fact which is memorised.
The development of intellectual thought increases during adolescence and the development of mechanical and spatial abilities can especially be encouraged in Design lessons.

At the formal thought stage the adolescent has to make the jump from reality to possibility. The principle of reversibility is a decentering process, the adolescent is required to take the view of others in order to make new considerations. The encouragement of social interchange is therefore a major concern for any implementation of Piaget's theory for this age group. Discussion and group problem solving are essential aspects of a curriculum for adolescents, and Design is obviously one suitable subject where this approach can be implemented.

The individual should also be encouraged to talk about his own work because the progression of internal representation and the encoding of information are supported by verbalisation. It must be remembered too, that there is now evidence to suggest that there may be areas of cognitive activity not represented by speech, therefore limiting expression to verbal means only is not an adequate means for appositional modes of cognition.

Verbal instruction from the teacher whilst demonstrating Design skills helps to focus the attention of the pupils onto the important things. Learning can then proceed by a
feedback process as pupils experiment with handling tools and materials for themselves. The Design teacher should use language carefully to direct attention during the learning process.

Expressing theoretical ideas in practical form is also an area where adolescents need help in which to learn. For example a pupil in a mathematics lesson may be capable of working out the area of given circles using the correct mathematical formula, but it may not occur to that pupil to use that formula in a Design class when making a pattern for a cushion. Practical experience gives reality to the concept.

The adolescent begins to acquire ethical and social and moral reasoning skills and Design teachers are in a position to introduce a responsibility and concern for the environment. A caring attitude can be fostered and problems which are created by technology can be explored, and those solved by technology can be evaluated. Design education can encourage pupils to imagine the environment as it might be.

**Bruner's Theories and Design Education**

Bruner recognised categorisation as the most elementary mode of cognition, in the classroom the Design teacher can help children to identify categories by ensuring the availability of a wide range of materials and equipment and the pupils
can be guided to understand the relationship between materials and tools.

Traditional skills can be taught but also innovative handling can be allowed and a creative attitude fostered. The Textile teacher might ask, "How might two pieces of fabric be joined together?" rather than teaching the rudiments of a plain seam without allowing further exploration.

Bruner places emphasis on intrinsic rewards rather than extrinsic rewards. The pupils learn for themselves the satisfaction of making and modelling, and the principle emphasis in education according to Bruner should be placed on skills in handling, seeing, imagining and symbolising. These are all activities which are native to the Design classroom.

The heart of the educational process consists in providing aids and dialogues for translating experience into more powerful systems of notation, and organising. Knowing for Bruner, is a process rather than an end result, and the goal of Education is to teach the pupil how to establish new knowledge, and not how to memorise known results.

Bruner believes that skills can be taught to a child of any age if the subject matter is broken down into component parts. Teaching tennis, for example, can be broken down into a series of separate components for learning, beginning with simply catching a ball, or being in the right place at the
right time. In other words co-ordinating vision, actions, posture and attention, and subsequently leading on to other components which make up the game. Gradually the components are integrated into larger components until the whole activity is completely fluent.

Gallwey (1974) exploited the technique of "Inner Tennis". He claimed that the key to better tennis instruction is to concentrate on teaching the non-verbal self, and to improve the relationship between the verbal and the non-verbal selves, in other words to use the right and left hemispheres of the brain as an efficient team. Gallwey describes the non-verbal self as the "unconscious doer" this is the self which learns non-verbally how to program the complex series of skills involved in the tennis game. "Natural" sports players have the right hemisphere of the brain in control of the situation. For instance, a skier "may not even know verbally whether he puts weight on the inside or outside ski while turning - yet he obviously knows on a non-verbal level". (Blakeslee 1980).

Complex skills in Design can also be broken down into more simple components, and instinctive handling of tools can be allowed and encouraged by thoughtful demonstration of use.

Ultimately the emphasis in Design activity should be on the means whereby rather than end result. Very often teachers (and pupils) make assessment in terms of achievement. Design
teachers must realise and practice the doctrine that end product is not solely important. What does count is the learning throughout the design process. Pupils need to be continually aware of what they are doing and why.

Pupil assessment in Design should take the learning process into account. The learner should not only have the opportunity to solve problems but also to conjecture and question opinion.

**Werner's Theories and Design Education**

Phillips (1980) summarizes Werner's theory as an holistic approach, which is most applicable to Design situations. Werner believes that imagery, holistic perceptions, feelings, emotions, and interpretations are combined by an individual in syncretic activity. Events, experience and information may be communicated directly, and all types of cognitive functioning are used by individuals. According to Werner sensuous experience is also relevant to cognitive development. For Design teachers this means that visual and tactile experience can be explored most thoroughly. Teachers can also develop the skills involved in thinking in visual and spatial forms.

Children should be encouraged to notice the experience of touching and handling materials. Their attention can be brought to focus on tactile activities: Perceptions of shape, form and colour and movement can be heightened by an
imaginative teacher. Pupils can be taught to search with care and attention, to select particular details irrespective of the whole field of view, thus encouraging accuracy and clarity, and relevant differing amounts of cognitive conscious awareness. Cognitive activity and energy can be directed to what is important rather than wasted in too much effort in the wrong direction.

Vygotsky's Theories and Design Education

Vygotsky believes that the components of thinking, that is action, pictures and symbols, are present from infancy throughout life, and that these components can be used whenever appropriate.

Design teachers can encourage non-verbal thought through visualisation. Vygotsky also realises that the adolescent has to learn how to put theoretical knowledge into practice, this, as already mentioned, has particular relevance to the pupil in Design. (Phillips 1980)

An Overall View

All the different elements in adult cognition are not just added to one another, they fit together in different patterns at different points in a child's life.
Gallagher and Noppe state that the first goal of education is to:

"create men who are capable of doing new things, not simply of repeating what other generations have done — men who are creative, inventive, and discoverers."

The second goal is to:

"form minds which can be critical and not accept everything they are offered . . . . ."

(Gallagher and Noppe 1976)

An education which aims to develop cognition, encompasses all these ideals. Applying research about cognitive growth to teaching in Design should have a resounding impact on the content of the Design Curriculum. The process by which children think and solve problems at different stages of development should be a major area of focus.

Whatever the particular specialism Design teachers can put more emphasis on categorisation, on reversibility, on the child's own active participation in personal cognitive growth, more emphasis on encouraging divergent and appositional modes of thought, more problem solving and more problem finding.
Unfortunately there has in the past, been too much emphasis on only one thinking style. Design teachers can begin to restore the balance by encouraging direct concrete experience, non-verbal expression, and by generally evolving situations which allow the right hemisphere to be dominant.

Mature cognition requires development in both aspects of thought and Design teachers are in a position to integrate styles of thought through the teaching of their own specialisms. The next sub-section (2.4) accordingly investigates the role of Textiles within the Design Curriculum.
2.4: THE ROLE OF TEXTILES WITHIN THE DESIGN CURRICULUM
THE ROLE OF TEXTILES WITHIN THE DESIGN CURRICULUM

Whilst retaining the unique character of their subject, textile teachers are part of the Design grouping and should therefore be teaching in a way which is consistent with the overall aims of Design.

They should be committed to encouraging cognitive development in pupils of all abilities. As previously explored, the cognitive development of a child can be seen in terms of the results of their actions upon the environment, and the concepts which children develop stem directly from concrete references. In this way knowledge is built from action and any information of past experiences. Each child is engaged in constructing an individual reality based on personal experience. Traditional education unfortunately places less emphasis on concrete experience and activity in the child and more emphasis on verbal instruction from the teacher.

Design education can seek to redress this balance and provide suitable experiences for children to assimilate, and consequently hope to bring about new structures in the child's mind ideally enabling him or her to deal more efficiently with the environment.

Educational innovators throughout this century have recognised the importance of making and doing:
"When one knows that our intellect is not developed by the direct approach, that is by the cultivation of intellectual pursuits themselves, but one knows rather that a person who is unskilled in the movement of his fingers will also be unskillful in his intellect having less mobile ideas or thoughts, and that he who has acquired dexterity in the movements of his fingers, has also mobile thoughts and ideas and can penetrate into the essence of things, one will not undervalue what is meant by developing the outer human being, with the aims that out of the whole treatment of the outer man the intellect shall arise as one part of the human being. (Steiner 1920 quoted by F Corlgren 1976)

On this premise Textile teachers should be concerned with:

- raising personal awareness in their pupils
- improving perceptive skills
- encouraging non-verbal thinking
- promoting creativity
- providing opportunity to "make and do"
- fostering aesthetic awareness
- teaching the means of problem solving
- and developing skills in non-verbal communication.

Textiles is a subject which can encompass and pursue these collective aims and it can do this in a unique way.
In view of its history Textile teaching should have undergone a metamorphosis from the tedious supervision of plain seams and neat hemming to the much broader and more effective exploration of fabric and threads, which can be seen in some schools today. The subject is now well equipped to offer a commitment to the philosophy of Design teaching.

The timetabling of Design subjects into the rotating Design circus has sometimes resulted in condensed courses in the production of this or that artefact. This may incidentally satisfy some of the criteria for Design education, but this type of approach is not comprehensive and does not fulfil the concerns of a Design curriculum which aims to encourage cognitive development in all children to their best potential. The experience of Textiles should be a unique opportunity for each pupil to consider something relevant about his or her own personality and character in relation to the world in which they live. It is this personal nature of the subject which was stressed by the schools Council Bulletin "Needlecraft in the School Curriculum" (1977). Textiles might be termed the "soft option". Fabrics have qualities which are not provided by wood, metal or clay. The tactile experience of handling fabrics is a contrast to the harsher realities of C.D.T. Fabrics bring gentle emotions to the fore. Materials may be furry, cuddly, warm, sensuous, soft they can be held and worn next to the skin for protection and comfort, they arouse feelings which are less aggressive than those aroused in other Design areas. A whole
new range of tactile experiences is opened up when the qualities of fabrics are thoroughly explored.

Textiles is also a quiet option, only the hum of sewing machine can be heard when the children are absorbed in their tasks. Although it may be necessary to encroach on other areas for the loan of a hammer and a piece of wood in order to complete a project, the general tone of the classroom is a quiet tone, and there are many children who appreciate this contrast in atmosphere. A suitable stimulation in this peaceful room can set the imagination wandering into many different realms.

"Difficult" children often respond well to this therapeutic tone, which, although "quiet" and "soft" should also be a hive of activity in which the children are engaged in work which is developing their perceptions, encouraging awareness, and shaping cognitive abilities, all in accordance with Design ideals. The study of Textiles is also essentially relative to pupils because they are surrounded by materials for all of their lives. Each child has some previous relevant knowledge which they can bring with them and use in the Textile area. Clothing is a basic need of man, and textiles satisfy many everyday problems. To be unaware of textiles is to be limited in the extreme since we clothe our bodies, decorate our homes, and use textiles both commercially and industrially.
The Textile area is able to promote aesthetic awareness by encouraging children to notice their surroundings and to make wise personal choices. The schools council working Paper 55 states that those subjects which are concerned with aesthetics should be:

"providing opportunities for children to develop an understanding of this part of their culture, to develop the skills needed to practice these arts, and all to find out by means of self expression."

this may be considered a general ongoing aim of the Textile teacher.

The study of Textiles, however, is not only an aesthetic study, any investigation into fibres leads to a venture into science, which can be further explored in the laboratory. In contrast to Needlework lessons Textiles is a much wider concern encompassing both the Arts and Sciences. There is ample opportunity for making and doing in the Textiles' classroom, soft artefacts and clothes can be designed by the pupils and made up, and craft skills can be practiced and perfected. The promotion of creative thought patterns during these activities is, of course, also significantly important to Design. Projects can be introduced as briefs, containing problems to solve in a similar way as a problem might be presented to a pupil in C.D.T.
The Textiles' teachers task is to implement a syllabus which will not only retain the individuality of the subject, but also enrich it, and yet simultaneously stretch its boundaries and increase its flexibility, so that it becomes an unquestionable member of that family of subjects now called Design.

The Contribution of Textiles to Design

On examination it would seem that there are three main areas within the subject of Textiles. These might be defined as:

1. The origin of fibres and the construction of fabric.
3. Constructing with fabric, that is the making of 3D artefacts, and clothes.

The Schools Council working Paper No 42 "Education in the Middle Years' stresses the importance of sequence in learning material. Learning will not be successful if it is left to:

"haphazard spur - of - the - moment experiences"

A sequential learning program of subject matter related to the learning process should be planned in order to:
"maintain interest, to be logically consistent, to be cognitively comprehensible, and to provide a 'map' of the subject"

This is especially important when the subject is taken in concentrated doses as it is in the Design Circus. The three areas identified form a logical framework, and the learning content within each respective area can be adapted to patterns of thought which are natural to children between the ages of 11 and 14.

Bruner has emphasised that any subject can be effectively taught to any child at any stage of development, if the content is a carefully planned progression beginning with concrete experiences.

When secondary school children are introduced to new subject matter they will initially operate on an intuitive level, and early concrete experiences will help when similar concepts are dealt with later at an abstract level. The child of eleven will be most familiar with concrete modes of expression, and will only be a novice with formal thought. In Piaget's terms children of this age will learn by their own acts on the environment. Wadsworth (1978) makes the point that:

"Cognitive development does not proceed as a consequence of the child talking, listening to others talk, reading, or
watching television. Cognitive development arises out of the activity of the child."

It is logical therefore to allow the first year pupil in the Textiles class to act on the environment, the environment in this case being one which is rich in textiles. The child can therefore handle materials and construct an individual reality concerning what is touched, looked at, thought about, and generally perceived. No amount of instruction is going to replace the child's own exploration at this stage.

The basic elements of colour, texture, shape and form are common to all the subjects within Design and need to be explored in each area in relationship to the individual subject and the individual pupils concerned. Looking at the first area defined within the subject of Textiles and considering the child's need to explore in order to learn a suitable and natural starting point could be texture.

The imaginative teacher will be able to set up a suitable situation in the classroom. Perhaps the children could be left to their own devises with a large box containing a selection of fabrics, they can sort through the variety and pull out pieces of material to feel and drape around themselves. The teacher can capitalise on the children's keenness to imitate by dressing up, and can use this spontaneous activity to broaden tactile experience. The activity can culminate in a discussion about the fabrics and
the children might select the fabrics they prefer and explain why they do so. New descriptive words can be recorded by the children in their note books. Comparisons can be made between woven and knitted fabrics and this could lead into looking at fabric construction under the microscope.

The word "Textile" can be introduced at a suitable time and the children might further broaden their tactile experiences by touching a number of man-made and natural found objects with their eyes closed. A list of objects paired with the child's own descriptive words can be made. The simple game of determining the nature of an object which is not visible can increase the child's tactile awareness. Making pencil or wax rubbings of local textiles may also be a suitable activity at this stage. Simple tactile collages could also be produced.

From this general approach the teacher can bring the children back together to focus more directly on fabrics, and the pupils can use their new tactile awareness to differentiate between various types of fabrics. The names of some fabrics can be introduced and the difference between man-made and natural fabrics made clear. Looking at fleece, cotton bolls, and silk worms, can be included at this stage.

The child's awareness of texture in the environment should now be increased and his own reactions to various tactile experiences will have been shared and noted. Interested
children will be asking questions and these can lead the teacher to introduce the first skills in Textiles, those concerned with producing cloth. The teacher may consider introducing topics on spinning, weaving, and knitting. Weaving is an ancient craft invented by people who needed cloth in their everyday life. Choosing weaving as a first activity is in keeping with a natural order of progression, and in keeping with Werner's view that the individual growth of the child parallels the evolution of the human race. Before ancient peoples could decorate cloth they had to learn how to make it!

The children might collect suitable weft materials from home and the emphasis can be on the textural qualities of the weaving. The teacher can cater for all abilities in this choice as even the least able child can usually manage simple plain weaving, whilst the more advanced pupil can try further skills like rya knotting. Attention can be focussed, too, on colour and pattern, and symmetry in design. Each child can develop his own interests and a simple card loom can be completed quite quickly, enabling the pupil to visualise the end result and achieve it before the interest wanes. The finished piece of work can become a picture, or hanging, or simple artefact which the child can take away with him at the end of the course. If the work can be displayed at school the children are able to see the collective results of their own learning and application.
If time allows pupils can try making some natural dyes to colour a selection of yarns. This is particularly exciting because the results are variable and can be left as a surprise for the children to discover. Pupils can then develop their own recipes.

This short course in the first year could also offer the opportunity for children to learn how to spin. Some children may also look at knitting, especially if this is a craft which they have not tried before. An open-ended approach in this first year allows the individual child to pursue personal goals within a well structured area. The content of the course should aim at providing concrete experiences with textiles, through exploration, activity, and making; it should encourage non-verbal thinking; and try to develop an awareness of tactile perception with particular reference to textiles; and it should introduce some new skills.

In the second year children will now have gained some early experience in formal thought patterns, they should be learning now how to think and plan ahead. The Textile teacher can help pupils to develop this forward thinking by encouraging pupils to visualise their ideas and thoughts through the use of drawings and sketches. Second year work can follow logically on from first year work and could begin by looking at very simple ways of decorating a plain woven fabric. Some children may have already experimented with
colour and pattern and natural dyes in the first year. The focus might initially be one of colour and any colour work which has been developed in the 2D area can be referred to, and basic colour terminology can be revised. All the children could now be involved in the dyeing of fabric made more interesting and involved by introducing "tie and dye" with an emphasis on controlling the patterns produced. Some children can use their knowledge of natural dyes and use their own recipes from the first year work, others can try chemical dyes and the result and colours can be compared and discussed afterwards. Interested pupils can look at the history of dyeing fabrics and make reference to historical costume to see which colours were popular in ages past.

Tie and dye gives scope for much manipulative work in tying and accurately folding, and introduces the concept of simple pattern. Cloth can be dyed many times in different colours and the effects of over-dyes can be recorded by the children. Some of the children may like to dye their own T-shirts and thus display their own talents by wearing the results. If time allows those with an interest in this area can make up the tie dyed cloth into simple cloths or articles of their own choice.

Dyeing can be organised as a group activity and as such as much value in the cognitive development of the pupils involved. Plans can be shared and discussed; according to Piaget group problem solving is an essential aspect of the
adolescent's curriculum, and a tie dye project could be organised with this aim in mind. Carol Stanton (1984) writing for NADER uses Raths' criteria in Stenhouse (1975) to judge the inherent worth of activities involved in a tie and dye project. She concludes that the project would be worthwhile because if properly organized it allows pupils to share in both the planning of the activity and its results.

A tie and dye project in the classroom is also a good lead into other methods of decoration. Some pupils will already be curious. The next question to be answered is "How else could you decorate a plain length of cloth?" Shortage of time may require optional projects to be introduced. Groups of pupils can choose different areas of study which may include batik, screen printing, lino printing, embroidery, or combinations of these, depending of course on the resources available. The teacher can organise these activities with his own discretion, making sure that each pupil sees the results of all alternative topics. This diverse number of simultaneous activities in the classroom can be valuable, as Stanton (1984) points out Bruner reminds us that:

"If a curriculum is to be successful in the classroom it must contain different ways of activating children, different ways of presenting sequences, different opportunities to skip parts while others work through."

(Bruner 1966)
Screen printing and lino printing are excellent media for working with repeat patterns, a concept which many children find difficult until reciprocity is well established. Working with patterns may well facilitate this area of cognitive development.

All of the topics mentioned, including embroidery and applique work, require dexterity and the handling of tools for different purposes, they are also creative projects which require forethought and visualisation. The mixing of dyes and printing inks extends colour vocabulary and knowledge, and the nuances of different printing mediums can be aesthetically appreciated. The possibilities for the production of finished articles are endless and can be left to the child's own imagination and interest. This may vary from making a simple one colour design on a T-shirt to producing a length of cloth printed in several colours and also made up into a finished garment or article, thus including learning how to use a sewing machine. The learning processes involved are many and various, and even the least able child will be able to achieve satisfying results.

In the third year pupils will have begun to establish formal thought patterns and can now be encouraged to translate abstract ideas into concrete reality. Their own interest in personal appearance also makes this an excellent time to introduce "clothing" as a project. Their previous relevant
knowledge now covers the origins of fibres and fabrics, the construction of fabrics, and the dyeing and decoration of fabrics, the question of how fabrics can be used, once produced, can now be answered.

The third year pupils might begin their course with a brief survey of their home, simply listing everything they can find which is made from textiles. The results of this research collectively shared may bring some surprising results. If the first project is Clothing pupils might consider why people wear clothes and a look at fashion past and present could be an interesting background project.

Designing their own garment is an exciting prospect and making their own paper pattern is an excellent way of transferring formal ideas into concrete reality. How can a flat piece of material become a shirt, or a dress, or whatever? Working out a paper model is the first step and quickly discoveries will be made about proportion and include the difficult concept of constructing a 3 dimensional shape from something which is originally 2 dimensional. The emphasis, which previously in years 1 and 2 has been centred on texture, colour and pattern, is now falling on shape and form.

The making up of garments requires the use of the sewing machine and the development of new skills and coordination. Some children may have already used the sewing machine in
their second year and they can improve their skills by choosing a more demanding project. Others may be unfamiliar with sewing machines and their work, by necessity, will be more simple. Pupils can also be encouraged to decorate their garments and thus use previously acquired skills and knowledge.

If the third year group contains boys and girls the making of clothing may be considered too feminine by the boys, (although this attitude eventually becomes eroded, if terms like "dress" and "needlework" are avoided.) An alternative topic which is a favourite with girls and boys alike is soft sculpture. The pupils choose an everyday artefact and recreate it in fabrics. This proves to be a very popular activity with pupils producing giant copies of sweet packets, crisp packets, and coke cans, which can be used as floor cushions in their own rooms. A further advantage of this topic is that it is economically viable and an old sheet or curtain can be dyed to the right colour, and recycled cloth may provide the right texture at little cost.

This project also provides an excellent lesson in proportion, since the original article is increased (or more rarely decreased) by an exact number of times. All lettering and decorations of the original article become proportionally larger (or smaller) and the concept of producing a 3 dimensional form from a 2 dimensional textile remains.
There is an interesting perceptual element in this project too, articles look surprisingly different when their size and textural qualities are significantly altered. Pupils of this age are often too easily influenced by the advertising media, and this project also offers a chance to look objectively at the chosen article, and actively reconsider its qualities. If the brief stipulates that all details on the original must appear on the copy, this can raise many questions about packaging design, which can be discussed in the classroom. Projects in packaging might lead off from the soft sculpture activity and can be explored graphically in the 2D area. Soft sculpture is not however limited to packaging, other possibilities include food and plastics, and wood and metal objects. Looking at the work of artists who have worked in this area can also be a stimulus for ideas.

The soft sculpture project offers the opportunity to improve skills on the sewing machine and includes the possibilities of applique work and other types of embroidery which may not have yet been practiced. The skills of seaming fabric are the same in principle as those needed when fashioning garments, so technical skills are not lost by choosing this alternative.

By making paper models pupils can come to an understanding of the form of an object or garment, this is an element which is missed completely if pupils work only from commercially prepared paper patterns. Many pupils never understand the
tissue pieces, and cannot follow a cutting out layout or the instructions, merely relying on the teacher's explanations.

Making their own pattern builds the concepts in concrete form. Less able pupils manage well in this, and measuring becomes a practical and meaningful experience, which is understood because it has a real use. If a commercial pattern needs to be used at some later stage the instructions are more readily understood and not followed unknowingly.

These, and other ideas, for projects in the third year should be aimed at encouraging the young adolescent pupils to use their own potential for the search for alternative solutions. The first idea may not be the best idea and pupils at this stage should be learning to avoid the quick and obvious solutions, and should be stretching their minds to find better answers. Projects should also be aimed at facilitating the fundamental characteristic of adolescent thought, which is the reversible manoeuvering between reality and possibility, thus encouraging a flexibility of thinking which allows for thorough searching of all possible solutions to problems. Even at this stage pupils still need to act on the environment and then verify their findings. If pupils are to restructure their own thought patterns they must be allowed the freedom to actively operate on the environment, in preference to repeatedly carrying out teachers' instructions. The adolescent in the third year can be
expected to think beyond the present, plan ahead, and experiment with individual ideas.

On analysis the first three years of Textiles seem able to make a substantial contribution to the cognitive development of the young adolescent. Children have the opportunity to handle fibres and fabrics and tools, and as such are actively engaged in acting upon the environment. In learning about the relationships between tools and materials categorisation is reinforced. The decoration of fabrics allows freedom for creative expression. Non-verbal thinking can be developed throughout the course by visualisation of ideas in drawing and modelmaking. There is room for problem solving, and space for developing skills in reversibility. All of these activities are positive attributes for the nurturing of cognitive growth.

The Need for Research

When one takes an overall view of the learning activities which take place in a Textiles classroom it is possible to see that the Textile teacher can in fact consciously attempt to initiate "right brain" cognitive thinking.

Buchan (1985) makes the metaphorical point that it is useless to train a dog to jump through hoops of fire, unless that feat will be of some use to the dog after the training is completed. Similarly it might be argued that it is useless
merely to teach children skills which will be of no use to them in later life. Only a small percentage of pupils who study Textiles will go on to become craft specialists. It must be understood that the educational value of the subject has a much deeper intrinsic worth which is highly relative for every pupil. The content of the subject must be presented in such a way as to reach the right hemisphere of the brain, or the unconscious mind. This would seem to be particularly important when the child is still at a concrete stage of development and less familiar with formal analytical thought. If the Design subject of Textiles can be shown to achieve this aim, than it would be true to say that it is indeed fulfilling a worthy educational task. The Textile teacher can use a particular pathway to a creativity which is latent and implicit in the right brain. This creativity is not always apparent because years of neglect in an educational system which offers more respect to those who are left brain dominant has caused its development to suffer. As Zdenek (1985) states:

"Just as a muscle will atrophy from lack of use, the right hemisphere of the brain also suffers when it isn't encouraged".

Many centuries ago Socrates deduced that the art of teaching lies in eliciting the already present from the depths of an individuals mind. The research of Sperry has given us new knowledge about the functions of both hemispheres of the
brain. Design teachers can use this understanding to search out and develop in their pupils those qualities peculiar to the right brain, which designers have intuitively always used.

A Cross (1980) states that:

"Design teachers should be proficient in a number of nonverbal communication skills and competent in a good many more"

and N Cross (1980) cites French (1979) who states that:

"It is in strengthening and uniting the entire nonverbal education of the child, and in its improvement of the range of activity of his thinking, that the prime justification of the teaching of Design in schools should be sought . . . "

In the same vein Phillips (1981) suggests that:

"If teachers of Design would concentrate their efforts on developing the functions of the relatively neglected right hemisphere of the brain, in a similar way to that in which they can encourage the growth of lesser developed cognitive approaches, then they would be making a significant contribution to education. Design education could aim to:
a) raise the level of consciousness of the area of the brain that deals with holistic, impressionistic perceptions and
b) raise the level of awareness in such senses as those concerned with touch, and sound, as well as those of taste, smell, movement and orientation."

Textile teachers can use the naturally occurring properties of the materials they work with and present these to children in such a way as to encourage perceptual awareness, creativity, and non-verbal thinking. Tactile awareness can be especially developed through this subject in this way. Craftwork activities such as weaving, and knitting, fabric printing, and embroidery, encourage creativity, and are non-verbal ways of expressing emotion, and communicating ideas. Designing clothes and soft artefacts helps to develop an awareness of the way in which we perceive the world in which we live, and other people, in relation to it and ourselves.

Unfortunately Textiles, and indeed other craft subjects, has suffered all too often from a low status image. Few parents have been concerned if their child left school unable to sew. Reading, writing and numeracy skills have always been awarded more important status than craft skills. Indeed it is only just becoming apparent that education has been neglectful of the total possibilities.
In "Learning and the Global village (1971) McLuhan and Leonard remark that:

"In fragmenting all of existence, Western civilisation hit upon one aspect, the literate and rational, to develop at the expense of the rest. Along with this went a lop-sided development of one of the senses, the visual. Such personal and sensory specialisation were useful in a mechanical age, but it is fast becoming outmoded. Education will be more concerned with training the senses and perceptions than with stuffing brains. And this will be no loss for the intelligent. Studies show a high correlation between sensory bodily development - now largely neglected - and intelligence."

Far too little importance has been attached to the education of the senses and the emotions. The study of Textiles in schools can help to alter this balance, and the recognition that this subject can aid cognitive development, may accordingly alter its status on the curriculum.

Textile teachers may often witness the cognitive development of their pupils, they may see evidence of improved thinking skills which seem to stem from working directly with materials, and from solving practical problems. Guilford (1970) supports the view that practice in the art of problem solving may help to develop divergent thinking skills:
"In everyday life the majority of problems we meet have no unique answers, hence divergent thinking is commonly called for. Even when the well determined answer is possible, as in mathematics, we are often forced to resort to considerable divergent thinking before the acceptable answer comes."

Children who are frequently exposed to the conscious experience of using divergent thinking may become better at handling everyday situations.

Bruner asserts that exposure to certain experiences will unlock human capacities. He asks:

"Are we mindful of what it takes by way of exposure to certain forms of experience to unlock human capacities of certain kinds, whether in looking at art, or for manipulating abstract symbols . . . ?" (Guilford 1962)

It is increasingly important for human beings to unleash the latent powers of the brain, people need to make wise, informed decisions, in order to keep technological advancements on an appropriate level. Non-verbal material constantly bombards consumers and they are endangered if their responses are made unwittingly. Design education has a responsibility to educate in a non-verbal way and the subject of Textiles shares in that responsibility.
Research is now needed to establish the contention that skills in Design can encourage and improve right hemisphere thinking.
TEXTILE WORK FROM LEICESTERSHIRE SCHOOLS 1980 - 1989
PUPILS OF THE MARTIN HIGH SCHOOL LEICESTERSHIRE
DISPLAYING CLOTHES MADE IN THEIR TEXTILE LESSONS
1982-1987
SOFT SCULPTURE WORK MADE BY PUPILS OF THE MARTIN HIGH
SCHOOL LEICESTERSHIRE 1986
2.5: THE NATURE OF NON-VERBAL SKILLS AND THEIR ASSESSMENT IN THE CLASSROOM
Non-Verbal Reasoning Tests:

A variety of non-verbal reasoning tests have been developed by psychologists. These usually involve solving "picture puzzles". The pupil is required to select the correct solution to a pictoral pattern sequence from a number of suggested answers.

One such test is the non-verbal D H Test as shown in Fig 1.

As well as these Standard Non-Verbal Tests, there have also been tests specifically developed to measure creativity traits, and divergent thinking abilities.
Several ink blots were chosen because they appeared to be useful in exacting diagnostic information. The blots are mounted on white card and the subject may look at them from any angle. The blots are presented in an ordered sequence and the subject is asked to say what the blots seem to mean. The examiner records the time taken, and the initial response to a card, also the position of the card, then he goes over the test again with the subject, asking about the various responses. The validity of this test is much questioned, there can be no "right" answer and the test makes no demand on literary or academic skills.

Another example of a projective test is the "thematic Apperception Test". (TAT Test). This was devised in 1935 by Murray and Morgon. It consists of 30 picture cards, and one blank card. The cards show human figures in different poses and actions. The examiner uses appropriate cards and actions and the subject is asked to tell a story based on the picture.

Projective tests also make use of graphic and plastic art materials, and dolls which are used to reconstruct family situations. These tests are designed to make the subject delve within himself for answers, and inhibitions and conscious controls are by-passed.
the instructions are given orally and the examinees respond without the use of language. Sometimes directions are given in pantomime, and the answer may be pointed to.

Geometric drawings and three dimensional materials are also used. The examinee may be asked to manipulate objects, fit parts of figure together, or set up a colour design. Other problems involve completing paper and pencil mazes, determining the number of cubes in a pile, drawing in missing parts of pictures, and solving spatial relationships. These tests generally seem to be useful as a supplement for data obtained from verbal tests, they rely on spatial and perceptual abilities.

Other non-verbal tests include mechanical aptitude tests and projective tests, and non-verbal reasoning tests.

**Mechanical Aptitude Test:** These measure spatial abilities, perceptual speed, manual ability, and mechanical reasoning. Examples are ACER "Mechanical Reasoning Test" and the "Bennett Hand Tool Dexterity Test".

**Projective Tests:** An example of a projective test is the Rorshack Ink Blot Test. This was developed in 1942 it is designed to give information about the subject as a whole functioning personality and shows how the subject uses intelligence.
correlate these mental processes with reasoning abilities, critical thinking and the creative imagination. However his results were not encouraging.

It wasn't until 1903 that the first textbook on educational measurement was published by E L Thorndike. He initiated the first scales for measuring educational achievement. Also in the early 1900's A Binet was developing a valid, objective, practical measure of educability. He introduced the concept of mental age and his scale became a model for other mental tests.

A rapid development in educational testing had begun and a variety of testing programmes ensued. Some of these became Standard Tests in education, and are used by psychologists and educators as a tool for assessing aspects of mental abilities. These standard Tests include well known intelligence tests like the Wechsler Scale for children, and the Stanford Binet Intelligence Test. These kind of tests are derived from sampling techniques and normative comparisons.

Standard Non-Verbal Tests

Some of the Standard Tests have been developed to measure non-verbal abilities. Close scrutiny of these tests, however, reveals that they often measure similar abilities to those of intelligence tests. They are most useful when the person to be examined is not English speaking, or when the person in question has a speech problem. They are constructed so that
The problem immediately arising from this contention is one of assessment. Many Design teachers may feel that assessment is a left-brained activity of measurement which has no place in the Design classroom. It is of course the "process" or the "means whereby" which is essentially important in the education of the child. The real problem is not that Design teachers do not wish to record progress but that they usually have to do so in a "non-designerly" way. Non-verbal modes of thought are of educational value across the curriculum, so it is pertinent to look at some ways in which a more relevant assessment might proceed.

**Educational Assessment of Non-Verbal Abilities**

Bel (1972) outlines the history of Educational assessment. He records that academic tradition left a legacy of testing by written examination. In fact the earliest Renaissance Universities tested academic standards by oral public disputations on controversial topics. It was difficult to make accurate judgements about these performances and the validity of them gradually diminished.

The difficulties of grading oral examinations thus led to their disappearance and to their replacement by written examinations. This became the accepted procedure for measuring academic abilities.

In the 19th century James M Cattell developed a system for measuring, precisely, sensory and motor skills. He tried to
5. Implementation: That is the ability to visualize a practical activity and to follow it through, selecting the most appropriate means for achieving the desired results and realisation of the idea.

6. Discrimination: The ability to distinguish and differentiate. This would include the ability to make aesthetic choices, to make the appropriate choice of materials, and to choose the correct tools. Also the ability to use field independence, (to keep objects separate from their environment).

7. Perceptual Awareness: That is the ability to use and be inspired by environmental stimuli to be aware of and consciously consider one's relationship with the environment. To make full use of the senses.

8. Technical Skills: The ability to use a knowledge of colour, shape, texture, line and form, and knowledge of materials, to their best advantage for any given project.

It is contended in this research study that these Design skills, essentially non-verbal in their nature, can be improved through work done in Textiles lessons, and that the quality of non-verbal thought may also be improved through this practice.
activity. It would seem that non-verbal ways of knowing are extensively used by individuals.

In the Design classroom non-verbal thinking, as described is an indispensable implement for pupils working through the Design process. It can be used effectively in the following activities which are all integral to the Design process:

1. **Manipulative Skills:** The ability to carry out practical processes using the appropriate tools and techniques.

2. **Communicative Skills:** The ability to communicate ideas through graphical means.

3. **Investigative Enquiry:** The ability to look for information using resources, such as objects, pictures, sound, and other non-written material, and to produce a solution based on observation and experimentation.

4. **Creativity and Originality:** The ability to initiate and develop ideas and images to look for alternative solutions or configurations to expressive and functional modes of work. To use divergent thinking skills.
visible size, proportion, area, shape, colour etc can be taken in immediately. The same amount of information would be difficult to assimilate so quickly if it were presented in written form.

It is likely then that manipulative and communicative non-verbal skills will be improved through Design teaching. These are two obvious areas, there are however less obvious skills inherent in the subject, which have a significance not only for Design but also across the curriculum. This is one reason why a strong justification for Design teaching can be made.

A. Cross (1980) quotes Balchin and Coleman (1965) in this context. She supports their recognition of the fact that there are certain "underpinnings" of education - other than those of literacy, numeracy, and verbal articulation. These are skills of visual, spatial relationships. They include such things as appreciation of size, shape, area, distance, direction, recognition of pattern, colour, understanding of perspectives in sketching and photography, understanding maps and computer graphics. Cross explains that this type of skill has been called "graphicacy" and that it encompasses many non-verbal modes of thought. She realizes through the work of historian E S Fergusson (1977) that research often requires the ability to read and interpret information directly from pictures, and from objects in the environment, and from the environment itself. Cross also notes the work of art theoretician Arnheim (1970) who believes that visual perception is in itself a cognitive
demonstration is of key importance when pupils are learning how to perform a task efficiently. Language is secondary in this situation, being used to draw attention to details and to reinforce teaching points. Anyone who has attempted to learn a new craft by relying on written material alone will appreciate this. How much easier the work becomes if someone says "Let me show you how to do it".

In the classroom pupils will almost always be involved in making this or that artefact, and most teachers would expect that this particular aspect of non-verbal activity would lead to improvements in dexterity and motor skills. It would surely be reasonable to suppose that the non-verbal type of thinking which helps the child to organise what he is doing may also improve. This theory can probably best be tested by observation of the remedial child who may have many difficulties with written material, and yet goes from strength to strength in a Design class. Barber (1982) states categorically that practice in the arts involves qualitative experience for the individual, not achieved in any other way. The Design teacher may often see evidence to support this.

A second obvious area where non-verbal skills are used extensively is in the ability to use graphics. That is to express ideas and solutions through drawings, or plans, or other graphic means. Once again language is of secondary importance, if not entirely unnecessary. How much easier it is to explain an idea by a sketch, all the information is at once
Non-verbal skills in the classroom

Some clarification of the nature of non-verbal skills is now necessary.

Hamilton (1980) suggests that perceptual psychomotor skills, though essentially motor in nature, have a large cognitive component which influence much of the information processing activities concerned with performance and learning. It is this cognitive component which is of interest to Textile and other Design teachers.

In the classroom the most obvious non-verbal skills are those which we see happening before us, as the pupils are actively engaged in making something. These manipulative, handling skills demonstrate the child's ability to carry out practical processes using the appropriate tools and techniques. They are non-verbal skills, that is, they could be acquired without the use of language, and do not necessarily require verbal reasoning.

The child who watches the teacher perform a task in demonstration, will much more readily be able to approach a similar task, than a child who is merely told what to do, or given written instructions without any demonstration. The
Figure 1
READ THE FOLLOWING CAREFULLY

1. Do not turn to page 2 until you are told to do so.
2. Each page contains four puzzles, and there are 96 puzzles altogether. Most of them are easy, but a few are quite hard. You will do a short practice test first.
3. Work steadily on without wasting any time.
4. If after you try a puzzle you find you cannot do it, do not waste time but go on to the next.
5. You will have fifty minutes, and you will be told when twenty-five minutes have passed.
6. Write your answers on the answer sheet. Be sure that you do not mark or write on the test-booklet.
7. Take care to write your answers in the correct spaces on the answer sheet.
8. If you write an answer in the wrong space, or if you write a wrong answer, score it out. Make any alterations clearly.
9. When you are told to stop, stop working at once.
10. Ask no questions after you have been told to start.
END OF TEST

LOOK OVER YOUR WORK TILL TIME IS UP
Creativity Tests

Whilst schools have come to rely on basic measures provided by intelligence and achievement tests, creative abilities have been less regarded. J P Guilford (1950) can be credited with the attempt to redefine intelligence so as to include creative traits. He evolved a series of tests emphasizing divergent thinking, originality, fluency of ideas, flexibility, sensitivity to defects and missing elements and the ability to elaborate and redefine. His tests were appropriate to children, teenagers, and adults.

Getzels and Jackson (1962) supported Guilford's view of creativity. They contended that the usual practices in schools not only neglect creative pupils but actually damage their inventiveness.

In the 1960's Getzels and Jackson administered a series of tests to measure creative thinking, and the tasks in these tests included word association, uses for things, finding hidden shapes, making up the moral for an unfinished fable, and making up problems from complex paragraphs containing numerical statements. Getzels and Jackson concluded that tests of hypothesis making do not correlate with tests of academic intelligence. Innovative creativity and capacity seemed to be independent of intelligence.

In the same decade E P Torrance working at the University of Minnesota constructed tests of creativity which were suitable
for use in schools. He chose tasks which use both verbal and non-verbal responses, these included such things as:

1. Asking all the questions one can think of about a picture.

2. Suggesting changes in a toy which would make the toy more fun to play with.

3. Listing as many uses as possible for a common place object.

4. Drawing a picture around a curved shape and giving the picture a title.

Scores would be awarded for these tasks according to the number of relevant answers (ie fluency), and according to the number of different categories of response, also for originality, and for the amount of detail used in an answer. The tests have no "right" answers, and actually call for many suggestions to be made. The measurement of results have been constructed to allow responses to be scored for more than one dimension of creativity.

Torrance published the "Minnesota Tests of Creative Thinking" in 1962. This includes the "Block Printing Test" in which children are given a small block of wood (2" x 1 3/4" x 1/2") and a booklet of absorbent paper, they are required to discover
how many different kinds of mark they can make, and may use these creatively, as they decide.

From his research Torrance concluded that traditional methods of measuring intelligence assess only a few of man's thinking abilities, and that creative thinking abilities make a valid contribution to the acquisition of information and educational skills.

Piaget's Testing Methods

Piaget was aware that the ability to read is not necessarily indicative of logic or knowledge. His methods of assessment require the child to listen and speak but the emphasis is on understanding.

For example in assessing whether or not the child concerned has attained conservation of volume, the following procedure would take place:

1. Purpose of task: To assess the child's understanding of solid volumes and the principle that a change in shape does not result in a change of volume.

2. Materials: 80 or 90 one inch wooden blocks.
3. Methods: Child is shown a "building" of blocks. 4 blocks high with a base of 9 blocks in a 3 x 3 arrangement. The child is told that each block is a room and is asked to make a building that will have the same number of rooms on a base of 4 blocks in a 2 x 2 arrangement, and another on a base of 6 blocks in a 2 x 3 arrangement.

At the end of the building session the child is asked if his building has the same number of rooms as the original. Reasoning is elicited from the child and counter suggestions made by the examiner. The child is asked to logically justify his judgement, and successfully resist counter suggestions.

In this test the child of 12 years is usually able to "invent" the relationship between shape and volume.

If carefully carried out by a trained examiner this test is valid and reliable.

Piaget's careful testing methods would be too lengthy to adopt in a classroom situation, however, a valuable addition to any assessment procedure in the Design classroom would be individual pupil/teacher discussions about work. This may happen incidentally as work is in progress, but it could be a more structured part of an evaluation or assessment strategy.
Problems Encountered with Educational assessment of Non-Verbal Abilities

The problems of educational measurement of non-verbal abilities appear to be persistent. Any outcome of education should make an observable difference to the pupil, but the difference may be qualitative rather than quantitative. Most educators have approached the problem by trying to measure the difference in a quantitative way, despite the difficulties in securing accurate scales of measurement. Evaluating the quality of teaching is also important as feedback obviously helps educational standards to improve, however there seems to be only limited progress in this direction in Design Education.

The question of what should be measured is extremely important. A useful command of verbal knowledge is only one aspect of a person's mental abilities. Unfortunately words are too often the means employed for the learning activities which take place in schools. It is surely important that effective outcomes are recognised as well as cognitive outcomes.

Grading Design work puts emphasis on end product which can be harmful, because it turns the child's attention away from the activity of creating, to a concern for the result which is centred on the product. In the West we have inherited a tradition of learning which is geared for end - result in terms of examinations. Those who obtain less passes are the failures. Ways of learning too are often taken for granted.
In the Western world for example motor skills are taught by constant practice and attention to position and timing. In contrast, some Eastern methods concentrate on altering perceptions, such as those described by Herrigl (1953). In "Mastering the Art of Zen Archery" the student was not allowed to release the arrow until he had an awareness about himself, the arrow, the bow, and the target. Eventually the arrow was released and sped immediately to hit the bulls eye. Similar methods are introduced in Inner Track learning which is now becoming more wide-spread and relies on the learning powers of the right brain.

The Standardised Educational tests, which have been surveyed in this section, have been developed by psychologists and are not intended for general use by teachers in the school curriculum. The Intelligence Tests measure an ability to solve problems in a written test and give an indication of a person's general intelligence. The non-verbal tests such as the D H Test (Appendix 9) may offer a means of assessing non-verbal abilities against an external reference, but the content of the tests is not concerned with "designerly knowledge", or "designerly ways of thought". In fact the Non-verbal tests are merely an alternative, (and sometimes necessary) way of measuring general intelligence.

It seems that there is as yet no universally accepted method for qualitative measurement of creativity. There are difficulties in arriving at an accurate method of scoring for
tests asking for imaginative responses. The reliability and validity of all creative tests is in question. It is also difficult to develop a content for tests of creative thinking when it is possible to behave creatively in an infinite number of ways. Creativity tests seem to be attempting to measure some dynamics of mental functioning which are not explicitly defined. Creativity in the classroom is at best only approximated by standardised tests.

The Design teacher requires an educationally valid and acceptable mode of assessment. Standardised non-verbal tests and creativity tests do not contain pointers for the way forward.

Assessment of Pupils in the Design Classroom: Present Practice and New Suggestions

The problem of assessment has long been a dilemma for Design teachers. Methods which are appropriate for other subjects do not measure Design abilities, and standardised tests offer no solutions as they do not cover all of the highly specialised thinking which occurs in Design subjects and they are quite unsuitable for general classroom use. All of the aforementioned standardised Non-verbal tests are also Norm-referenced, that is the grading in the tests refers to a range of results obtained from a sample made during the design of the test. It might be more useful to look at Criterion-referenced tests. These were developed in the 1960's and were
designed to give a picture of individual performance without regard to how that performance compares to the performance of other individuals. A range of skills are specified and the subject is assessed in the mastery of these skills. A wide range of criterion referenced tests have now been developed. The common feature of which is that performance is referenced to some stated objective. An example of criterion-referenced tests are those developed by the NFER for measuring proficiency in English.

Criterion referenced tests are useful in craft subjects where the mastery of certain non-verbal skills is essential to progress. Checklists, progress records and charts can all contribute to criterion referenced information. Objectives are stated, acceptable levels of performance are determined and methods are found to assess attainment or mastery of skills. Such tests are probably the most useful kind of test for Design teachers to adopt for assessment and evaluation in the classroom. Criteria based on the students needs and abilities can be developed for subject areas with Design.

The GCSE "Art and Design Guide for Teachers" now gives three examples of assessment sheets which might be used in Art and Design Departments (Figs 2 and 3). The GCSE "Home Economics Guide for Teachers" reprints as an example of a practical assessment form, one which has been adapted from the "London Regional Examining Board 1986 Basic Catering Syllabus Mode 2". (Fig 4) This gives six criteria judged on 5 occasions, a total
ART DEPARTMENT SELF-ASSESSMENT SHEET

Teaching Group

Name

Project Title

List and Description of Work

1. How much of my work did I complete satisfactorily?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Reasons:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) All of it</td>
<td></td>
</tr>
<tr>
<td>(b) Most of it</td>
<td></td>
</tr>
<tr>
<td>(c) Some of it</td>
<td></td>
</tr>
<tr>
<td>(d) None of it</td>
<td></td>
</tr>
</tbody>
</table>

2. How did I work during the lessons?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Reasons:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Very hard</td>
<td></td>
</tr>
<tr>
<td>(b) Quite hard</td>
<td></td>
</tr>
<tr>
<td>(c) Not very hard</td>
<td></td>
</tr>
<tr>
<td>(d) Not at all</td>
<td></td>
</tr>
</tbody>
</table>

3. How do I feel when I look at my work?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Reasons:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Very pleased</td>
<td></td>
</tr>
<tr>
<td>(b) Quite pleased</td>
<td></td>
</tr>
<tr>
<td>(c) Not very pleased</td>
<td></td>
</tr>
<tr>
<td>(d) Disappointed</td>
<td></td>
</tr>
<tr>
<td>(e) I do not care</td>
<td></td>
</tr>
</tbody>
</table>

4. Did I produce my best possible standard?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Reasons:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Yes I did</td>
<td></td>
</tr>
<tr>
<td>(b) No I could have done better</td>
<td></td>
</tr>
<tr>
<td>(c) No, I could have done much better</td>
<td></td>
</tr>
</tbody>
</table>

5. What have I learnt from this project, and how could I have improved it?
Figure 3
Internal Assessment

Name

Ability In

1. Observation/Response

2. Control of Formal Elements
   (line, form, shape, colour, tone, pattern, texture)

3. Sensitivity in use of Materials

4. Interpretation of Information
   (written and verbal)

5. Motivation

6. Confidence

Pupil response/comment

Art Department

Pupil/Teacher Assessment

Consider the questions in each box carefully. Write down your answers as honestly as you can. Try to give more than one-word answers and try to explain what your answers mean. Your teacher will talk to you about your answers when you have finished.

**ORGANISATION**

How well do you prepare? Do you always get your equipment and materials together quickly and quietly?

**FORMAL ELEMENTS**

Do you know what: LINE, TONE, COLOUR, FORM, SHAPE, PATTERN, TEXTURE, mean? How do they appear in your work?

**OBSERVATION/RESPONSE**

Have you looked really hard at the models you have been given? Have you drawn, painted or modelled accurately what you have seen?

**SENSITIVITY**

Is there care and thought in your work? And in your use of the materials you are given to work with?

**INTERPRETATION**

How well do you understand spoken and written instructions? Do you ask questions? Is your understanding reflected in your work?

**MOTIVATION**

Do you show interest? Do you finish each piece of work carefully? Do you concentrate hard?

**CONFIDENCE**

What do you think about your own skill and ability? Do you believe all your work is the best you can do or could you do better?
<table>
<thead>
<tr>
<th>Practical abilities</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A organising self and materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can organise self and resources to carry through given work efficiently and to completion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Manipulative skill</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can display manipulative dexterity in a range of food work productions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Using tools and equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can select and use safely and efficiently a range of tools and equipment of varying complexity</td>
<td></td>
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<tr>
<td>D Presenting work</td>
<td></td>
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<tr>
<td>Can produce and present simple and more complex products in a form appropriate to function</td>
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<tr>
<td>E Working with others</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Can co-operate with others in carrying through a variety of tasks to completion</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Working hygienically</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can work consistently in a hygienic manner</td>
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</tr>
</tbody>
</table>

Total ticks:

6 criteria judged on 5 occasions—30 marks.

The judgement the teacher makes will reflect the stage in the course and the increasing complexity of the work as the course progresses.

A tick (✓) will indicate evidence of ability.

A cross (X) will indicate that there is insufficient evidence in that term.
30 marks, a tick indicating evidence of ability, a cross indicating insufficient ability.

The self-assessment pupil form is valuable in that it allows pupils to practice discrimination, to view their own performance honestly in retrospect. Learning then has personal feedback, and a sense of involvement is engendered. Both pupil and teacher share in the responsibility of evaluation, and realistic aims for future projects can be decided. Both the teacher assessment forms from the "Art and Design Guide", and the "Home Economics Guide" eliminate the necessity of grading work. Grades given by teachers are unavoidably subjective in that they record an impression. Different teachers will have their own individual standards and marks may vary accordingly. Single grades referenced to only an unexplained average do not reveal enough information. To ensure that teachers within a department have some comparability in marks, marking schemes have to be employed with agreement between the teachers involved. Marks can also be scaled, and pupils ranked in order of attainment. Standardised tests in which raw scores are referred to a table of norms and converted to scores which take account of age and sex are useful in certain circumstances, a pupil's performance relative to the norm of a group could thus be expressed. This may be considered less important for some Design subjects than others. Design teachers usually wish to assess pupils in their mastery of skills and not by performance relative to other pupils. The pupil in Design is striving to attain a level of individual competence.
The GCSE National Criteria for Art and Design reminds teachers that assessment techniques must

a) identify those measurable qualities which have been defined as assessment objectives.

b) give the opportunity to all candidates, whatever their aptitude or ability, to demonstrate their skills.

c) recognise the importance of artistic process as well as product.

This project is concerned with the Textiles teacher who wishes to assess the non-verbal abilities of pupils in a High School environment. A criterion referenced assessment or evaluation programme would be suitable for children of this age range who are not concerned with examinations, and who do not need to compete against each other.

The GCSE guidelines offer some support but are probably too formal for younger pupils. The assessment sheets resemble official forms and although they may be typographically correct they could not excite the young designerly mind. A more graphic approach is most surely required.
This project will comply with the recommendations of the National Criteria but will try to initiate a more "designerly" approach to assessing non-verbal abilities.
SECTION THREE

3.1 SCHEME OF WORK FOR CLASSROOM STUDY
SCHEME OF WORK FOR CLASSROOM STUDY

In the light of the preceding research it was decided to develop a classroom study which would encourage and develop non-verbal thinking skills through the subject of textiles. Progress, as well as attainment was to be recorded. For this purpose a Record card was to be designed and issued to the pupils. The Record card was to be on-going and completed by the pupils themselves thus allowing them to participate in evaluating their own work, this was considered an important part of the Design process.

The classroom study was scheduled to begin in the summer term of 1987. It was to take place in the Martin High School in Leicestershire. This is a school for pupils of ages 11-14 situated in a small town with a semi-rural catchment area. It was decided to confine the research, at least initially to one first year group, over a normal eight week cycle of the Design circus. This consisted in total of thirty two lessons, each 55 minutes long.

The Design of The Record Card

The initial problem was to design a Record card, which would be appropriate for such a study. Part of the consideration had to be concerned with proceeding in a "designerly" way, and in thus producing a suitable card, which would be attractive to eleven year old pupils, as well as functional for its purpose.
Self-assessment forms which were looked at were generally dull in design terms. They were often typed forms of criteria with empty boxes which were to be ticked or otherwise filled in, either by pupils, or by pupils and teacher. It seemed to be important to the ethos of this study that any documents issued by a Design department should be designed to promote a "designerly" mode of thought.

A colourful assessment sheet is much more appealing to the younger pupil and can still be considered a formal document if pupils are encouraged to treat it with respect.

Reproducing colourful documents is an expense which the school could ill-afford, therefore a compromise was needed. It was finally decided to use plain coloured card as a background for dense black type faces.

The card was chosen deliberately in preference to paper as being a more durable and therefore permanent medium. Card folders would store easily and could support lightweight samples which were intended to be included as part of the Record. The size was decided as A4, convenient for storage and large enough to encourage good sized drawings.

It was also decided to produce one Record sheet for each topic studied and to keep these clean by providing an outside cover. The cover was to be illustrated by an outline title which meant
that some individualisation could take place, but that formality could also be retained. Pupils could be allowed to colour in the title with pencil crayons, as they so wished.

The Record sheets were to have a uniform layout with the same type faces being used throughout.

Words were deliberately kept to a minimum, and were to be used as a prompt, rather than an instruction. Obviously teacher explanation was important to supplement this idea. The emphasis was to be on demonstration and explanation, rather than on reading. This decision was made because the project was concerned with non-verbal activities, and did not want to involve itself with too much written instruction. Also some children in the group were poor readers and the simple written words which were chosen did not discriminate against their abilities in language.

Each record card allowed space for individual decoration, as well as careful recording. The children were actively encouraged to proceed in a designerly way.

The overall aim was for each pupil to complete the course with an attractive accurate, mostly non-verbal record of their personal achievement, and a self assessment of their own work. The Record Cards could then be used by the teacher, alongside practical work, as evidence of the pupils progress through the course.
A further long term aim of the project would be to provide a set of Record cards for various topics at increasing levels of skills for pupils of different abilities and ages. Pupils could then work through the appropriate levels and keep their Record cards as part of their personal profile.

The Record cards were designed with visual impact in mind, rather than merely being a container for a verbal account of achievement.

A sample of the Record card can be seen in Fig 5.

**Keeping The Record**

It was hoped that the Record card would maintain motivation, and provide a positive way of evaluating both learning and teaching. Each child was therefore to be encouraged to take pride in the recording work. Time was to be allowed at the end of each lesson for Record cards to be completed. This was to be done in consultation with the teacher. Encouragement would be given during this time for tasks which proved difficult, and for goals which were not reached. Pupils were to be allowed to repeat tasks if necessary or appropriate.
textiles' achievement record

name __________ form __
what to do

1 Design a YES/NO symbol. Use as required.
2 Design a rating system to show FAIR, GOOD, EXCELLENT. Use when needed.
3 Record the number of YES answers you make, and the number of each rating.
4 Complete each section carefully. Good effort will be commended.

<table>
<thead>
<tr>
<th>number of YES scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>total FAIR ratings</td>
</tr>
<tr>
<td>total GOOD ratings</td>
</tr>
<tr>
<td>total EXCELLENTS</td>
</tr>
<tr>
<td>time</td>
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<td>------</td>
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</tr>
</tbody>
</table>

Rating
<table>
<thead>
<tr>
<th>time</th>
<th>Can you do these stitches?</th>
<th>design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Draw here</td>
</tr>
<tr>
<td></td>
<td>plain weaving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>oriental sogmak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rya</td>
<td></td>
</tr>
<tr>
<td></td>
<td>wrapping</td>
<td></td>
</tr>
<tr>
<td>Threads used</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Weaving
Content of the Record Card

The content of the Record card was planned to be an on-going self-assessment of non-verbal learning activities taking place in the Textiles lesson. The activities themselves were organised to cover the following areas (as previously defined in sub-section 2.5)

1. Manipulative Skills
2. Communicative Skills
3. Creativity and Originality
4. Investigative Enquiry
5. Implementation
6. Discrimination
7. Perceptual Awareness
8. Technical Skills

With respect to these specific areas a list of criteria which were pertinent to the first year course gradually took shape.
These were as below:

1. **Manipulative:** Child shows ability to spin wool using simple wooden spindle. Child can handle both wet and dry wool sympathetically, and can wind the wool into hanks. Child can produce the following types of weaving: Plain weave, oriental soumak stitch, Rya knotting, tapestry weave. Child can handle dyeing equipment in an appropriate way.

2. **Communicative:** Child can produce flow diagrams, charts graphs etc to show progress and processes of spinning and dyeing activities. Child can produce a simple and suitable design for card loom weaving.

3. **Creative:** Child can use own initiative to produce imaginative ideas for dyeing and weaving topics.

4. **Investigative:** Child can use environment to discover materials for dyes and for weaving.

5. **Implementation:** Child is able to plan a project and see it through to completion.

6. **Discriminative:** Child uses appropriate tools and materials. Child shows the ability to make aesthetic choices concerning materials, texture colour and presentation.
7. **Perceptive**: Child shows perceptual awareness in this instance with particular regard to texture and colour.

8. **Technical**: Child uses knowledge of colour, shape, form etc in planning and production during the project.

The Record sheets for the three topics of SPINNING, WEAVING, AND DYEING were then designed to incorporate the recording of the achievement of the listed criteria. Words and written instruction were deliberately minimised and simplified in accordance with the non-verbal approach to this project.

As pupils were to participate in the assessment procedure they were instructed to Design their own symbols for use on the card. A summary sheet was provided in the Record where positive answers could be counted as successes, and commended in line with the current school policy for good work.

**Evaluation of Teaching During the Study**

The Record Card is designed to record the pupils learning, and the pupils are of course learning with the guidance and help of the teacher. Since the purpose of this project is to improve not only learning but also teaching, some evaluation of teaching is also required.
It is suggested that the pupils be issued with a questionnaire at the end of the eight week course. This would question the pupils' feelings about the course and about the teaching received.

The proposed questionnaire is as follows:

(Fig 6)

The questionnaire will be used with the record cards to evaluate the teaching and learning during the course. It is hoped that pupils will have worked more autonomously, more confidently, and more enthusiastically as a result of the project.

At the end of the course pupils will each spend some time with the evidence of the record cards to support their non-verbal achievements. The teacher will indicate ways in which work could be improved and will sign the record card as proof of achievement for each child.

The teacher will then be able to use the record card as an aid when writing a written statement about the progress of each child. In this way both teacher and pupil should receive positive feedback about the teaching-learning situation.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons?
2a. Have you enjoyed the projects which you have done?
2b. Which was your favourite project?
3. Have you learnt some things which you did not know before?
4. Did you always understand exactly what you had to do?
5. If you did not understand something, were you able to ask questions?
6. Was your teacher helpful if you were having problems with your work?
7. Did you ever feel "too scared" to ask something in the lesson?
8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer.
9. Did you find it difficult to "evaluate" or mark your own work?
10. Do you think it is a good idea to mark you own work?
11. Were you pleased with your Design work?
12. Is there anything you would like to change in your Design lessons? Could they be improved in some way?
3.2 : REPORT ON CLASSROOM STUDY
REPORT ON CLASSROOM STUDY

The research began with the intention of awakening personal awareness of classroom practice, and hoped thereby to improve teaching method and content. The investigation into the teaching of the subject of Textiles led to the hypothesis that certain tasks carried out in the classroom are conducive to improving non-verbal thinking skills. The aims of the case study were to encourage and to develop such non-verbal thinking skills.

It was decided to confine the case study to one group of first year pupils.

First Year Case Study

Subjects: The subjects chosen for this study were a first year group of mixed ability pupils. There were eleven girls in the group, and eight boys. All the pupils were aged between 11 and 12 years.

Time: Those pupils chosen for the study were timetabled for four fifty five minute periods on a six day timetable over an eight week section of the Design circus which was then operating in the school. The fifty five minute periods were arranged as two double periods. One of these periods was a morning session, the other was an afternoon session.
Situation: The study took place in the open plan Design area. There was access to the Home Economics area, which was not being used as a teaching area at that time. Gas and electric cookers were available for use. In the Textile area one large sink was available.

Reason for the Study: The cognitive development of young teenagers was reviewed with particular reference to Piaget, Bruner, Vygotsky, and Werner. It was contended that textile teachers could make a significant contribution to this development by concentrating on encouraging the growth of lesser developed cognitive approaches through the media of fabrics and fibres, and related materials. The Textile syllabus was therefore designed to be particularly appropriate to the non-verbal development of young adolescents. The total three year span of the course allowed it to evolve in a sequential order as below:

Year 1 - construction of fabrics
Year 2 - decoration of fabrics
Year 3 - use of fabrics in designing clothes and artefacts.

The first year course was primarily concerned with providing concrete experiences through exploration, activity and making. Three craft skills were introduced in the first year course, these were the skills of spinning, weaving, and dying.
General Aims and Objectives

The overall aims of the first year course were to improve the manipulative, communicative, investigative, creative, implementative, discriminative, perceptive and technical skills (as previously defined). The objectives for the eight week course were

1. Pupil should be able to spin wool, using a simple wooden hand spindle. Pupil can handle wet and dry wool appropriately and can wind wool into hanks. Child can produce the following types of weaving: Plain weaving, oriental soumak, rya knotting and tapestry.

2. Pupil can produce a simple and suitable design for loom weaving (worked on a small card loom).

3. Child is able to use the environment to discover material for dyes and weaving.

4. Child is able to use initiative to produce imaginative ideas for dyeing and weaving.

5. Pupil is able to plan a project and see it through to completion.

6. Child is able to use the appropriate tools and materials. Pupil also shows ability to make
aesthetic choices concerning materials. Colour texture and presentation.

7. Child shows perceptual awareness with particular regard to texture. Child shows tactical awareness.

8. Child uses knowledge of colour, texture, and shape in planning and producing practical work.

**Evaluation of Work Done**

As learning to evaluate one's own work is an essential part of learning to design it was considered essential for the children to be involved in evaluation of their own work. An on-going self-assessment record was the solution arrived at. Primarily it was non-verbal abilities which were important, it was therefore necessary to record the self-assessment in a way which reduced verbal statements to a minimum. A self assessment record card for each of the three projects of spinning, dyeing and weaving was designed using graphic ways of recording, such as charts, drawings, symbols and graphs.

On each project card the pupils were asked to record the number of lessons which they spent on each project. This allowed a certain amount of flexibility, the children were informed of an appropriate time limit for each project but were able to adjust this slightly for their own individual purposes.
The self-assessment cards required the pupils to design their own symbols for YES and NO. They could then use these as an indication of whether or not they achieved the specified objectives. For example on the spinning record pupils were asked. "Can you start spinning by yourself?" In reply they were able to use their own symbol for YES or NO.

Similarly each pupil provided his or her own rating system for FAIR, GOOD and EXCELLENT work. Finished practical work was rated by each child according to this scale. Negotiation with the teacher was important in this evaluation.

When the three record cards were completed the number of YES scores could be added and each category of ratings totalled. High scores in these totals merited an "official" commendation from the teacher.

The record cards were issued to the pupils during the first lesson of the eight week block. The three cards were stapled together to form a booklet with a front cover, for the child's name and as a protection for the cards. The cover was individualised by each pupil colouring in the outlined title. This was done with great care and respect, as the record cards were introduced as an important document.

The method of recording was carefully explained and the children were instructed to set about designing their own personalised symbols. At the conclusion of the introductory
lesson a special storage space was made available for the cards.

Projects - (Procedures)

The first project was spinning. For practical reasons the room was rearranged for this exercise. Fleece is a material which is light enough to be blown off tables by the slightest draught of air, if not well organised small pieces of fleece would be drifting around the room. With this reason in mind the tables of the room were pushed back and a space was made for a circle of chairs. The fleece was placed in the centre of the circle on clean newsprint. This rendered it possible for everyone to reach the fleece easily, and for it to be contained in a small space. This arrangement of the room also allowed for easy sharing of equipment, such as scissors, and carders, all could be passed easily around the circle or stored in the centre as required.

Although the initial use of the circle came about for reasons of tidiness, it soon became apparent that the circle was a more social approach to learning. Each child had a comfortable space in which to work, but was not isolated from any other member of the group. It was easy for any one pupil to attract the teacher's attention. It was also much more convenient for the teacher to immediately recognise signals for help, or attention. A group feeling rapidly developed in this context,
and as everyone's work was visible, there was an eagerness to do well. A warm spirit of co-operation also seemed to develop.

An introductory talk about the history of spinning followed by a demonstration of practical spinning began the course. The pupils previewed the record card for spinning and were aware of the objectives which they were expected to achieve.

The texture of the greasy wool fleece was compared to other fibres, and provoked much exclamation and recoiling at first. Pupils were intrigued to learn that the greasy feeling came from the lanolin in the fleece which could in fact be extracted and used in beauty creams. The practical work proceeded with pupils attempting to spin their first yarn on a hand spindle. Time was allowed at the end of the lesson for clearing away and for filling in the record cards. When the room was tidy and pupils seated the cards were distributed, and each child filled in his/her own progress on the Spinning card. The time in lessons was recorded by each pupil colouring in the appropriate number of "time squares". Each pupil then designed a chart to show their own progress with the newly acquired skill. This proved to be quite a challenge at first, and some pupils were unclear about how to proceed. Other pupils provided suggestions and eventually the class made a beginning.

Subsequent spinning lessons followed a similar pattern, and excitement began to mount as some of the spindles became heavy with hand spun yarn. Some children experienced frustration.
when the yarn broke easily, or was difficult to join. This had to be recorded or illustrated on their record cards. The quicker pupils were eager to help those who found problems. Some children worked in pairs helping each other to keep the spindle rotating whilst new fleece was joined in.

At the end of each lesson the pupils recorded their progress on the record cards. When a suitable amount of yarn had been produced the card for the spinning project was completed by adding samples of spun yarn, and by each pupil evaluating their own progress as fair, good or excellent. A decision on this was reached in negotiation with the teacher. When several of the pupils were nearing completion of the spinning project the second craft skill was introduced, this allowed pupils the flexibility of moving on or continuing with their tasks, as appropriate to each individual.

The second project was that of Natural Dyeing. The spun yarn was washed and dried and made into hanks ready for dyeing. Now the pupils were divided into smaller working groups of three or four children. Each group had access to a sink and a cooker in the adjoining Home Economics area. The mordanting process was firstly demonstrated to the whole group and suggestions were made for suitable dyeing materials. Each group had the responsibility of collecting their own plant materials. Some materials were available in school, for those who found this exercise to be a problem, and also to widen the choices of probable colours. Samples of dyed yarn were also provided.
The method of dyeing yarn was demonstrated, and the method was clearly written out on the blackboard. Books were also available for reference.

The pupils prepared their own plant material by chopping it up and containing it in small nylon bags which could easily be placed into and removed from the dyebath by an attached string tie. Pupils were free to experiment with different dyestuffs. Extra yarn was also there for experimentation.

The record cards for natural dyes asked the pupils to draw the plant material which they used, in some cases this required a trip to the library for reference. For example a child using tea leaves as a dye source needed to find a reference for the original tea plant. This brought about a search among the wild flower and plant books in the library, and generated more ideas for further experimentation. Many children were keen to continue the project at home. A space was provided on the record card for the dyeing recipe. This could be interpreted quite freely and did not necessarily require a written recipe, however most pupils opted to do this from their own preference. A sample of dyed yarn was to be attached to the record card and a rating for the project was required. Once again the number of lessons was recorded on the card.

The weaving project was the third and longest part of the course. Pupils spent eight to ten hours on this project. They
were keen to complete a tapestry picture and take it home, extra hours were sometimes added when pupils worked at home.

The weaving project was introduced by demonstration in the Textiles room. The demonstration was given to the whole group and the weaving cards were warped as a whole class activity. Pupils were then free to work on either dyeing or weaving. Some pupils returned to the spinning activity on occasions and made extra yarn.

Weaving work cards were provided, these allowed for individual progress. Pupils were able to ask for help whenever they found it prudent to do so.

The children were able to use their own spun and dyed yarn in the weaving process, other yarns were also provided. Several open boxes served as collection places for donations of yarn from pupils. Yarns were grouped according to colours. In this way a substantial amount of yarn was shared among the group.

Texture and colour were both important considerations in this project.

Pupils were expected to demonstrate ability in 4 different weaving stitches. Success of these was recorded in the record sheets. The amount of time spent on the weaving was also recorded. Each pupil was asked to produce a tapestry picture. The design for this was planned on graph paper and transferred
eventually to the record card. Samples of yarn were also collected. Each pupil once again evaluated his or her own work.

The final part of keeping the record card involved adding up the totals of 'Yes' answers and the totals of each rating score. These were entered onto the record cards. Pupils who felt that they had done well were then able to claim "commendation" slips which would be kept with their folders. The commendation slips were in keeping with the school ideology of rewarding good work with a commendation stamp. The commendation slips were a typed out record of the pupils name, date, work completed and commended, and the teacher's signature. This could then be formally recorded in the school commendation book.

On completion of the project work, pupils were asked to answer a questionnaire about the course.

**Analysis of Completed Records**

Stenhouse (1975) argues that "effective curriculum development of the highest quality depends upon the capacity of teachers to take a research stance for their own teaching". This project has made use of an approach which Stenhouse might define as "social, anthropological" that is, that it "relies on observation, rather than quantification" Stenhouse regards such classroom research as an attempt by the teacher to more fully
understand and structure classroom practice. This is the essence of this particular classroom study. As objectivity is of key importance Stenhouse suggests that the teacher should make use of an outside trained observer in the classroom, or use video-tape recordings. In this case study it was not possible to do either of these, therefore extra care was needed to analyse the record cards as objectively as possible.

Pupils were asked to present their record card with their completed practical work. A report was then written on each child's progress through the course. (see Appendix One)

The problems encountered were those commonly associated with assessment on the Design circus. The pupils were first years, and as such had personalities and abilities unknown to the teacher, the only available data being general grades estimated by primary school teachers. Although it was relatively easy to determine the exceptionally weak and the brightest children, it was difficult to determine the potential abilities of those pupils in between these two points. Eight weeks is a very short time in which to make any judgement about a child's ability. Some children need much time in which to become familiar and at ease with the new surroundings.

New materials and skills also take time to become accustomed to. The layout of the room and learning the whereabouts of stores and materials also presents problems for some children. This can be partly overcome by placing most of the equipment
and materials in a central position, this was practised whenever convenient, although timetabling sometimes prevented the kind of preparation which would have been preferred. As far as possible the materials were put out before the start of the lesson.

When it was necessary to move furniture, this had to be done by the children at the beginning of the lesson.

The short length of time also demands a concentration of course material. The children were expected to work hard, those who didn't quickly fell behind. Some children did not complete their record card, clearing away had to be done before the record cards were filled in. Slowness in tidying up and collecting pens etc often hindered the filling in of the cards. One or two children were suspected of deliberate slowness in clearing away. The organisation of time was considered part of the Design process (ie "working to a deadline"). Pupils were asked to record the amount of time they spent on each area of work. Complete flexibility was discouraged, each child should have found time to complete three projects. In practice because of absence or interruptions to lessons, or very weak ability some children did not complete the recording of all the tasks.
<table>
<thead>
<tr>
<th>TASKS</th>
<th>COMPLETED</th>
<th>INCOMPLETED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinning</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Weaving</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Dyeing</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>

Although the recording was not always completed in every case, the practical work was attempted by all the pupils.

There was some difficulty in monitoring every pupil in the ten minutes allowed at the end of the lesson for the filling in of the record cards. The weaving project was the last project to be attempted and although theoretically this should have taken the longest amount of time to complete only two pupils did not finish recording their progress. This could have been because it was the project which most pupils enjoyed. The practical work was a tapestry picture which was eventually mounted in a polystyrene window frame and taken home. Also the basic weaving skills were not always new to the children, some of the pupils had practised elementary weaving at their primary schools. As this was the last project to be undertaken it may have been that the recording had been adopted as an habitual part of the lesson. This was one of the hoped for outcomes of the research project. The recording of spinning and dyeing projects were left incomplete by seven and eight pupils respectively.
Those pupils who did not complete the recording were pupils of generally low abilities. More time was needed for those pupils to fill in the record cards. A remedy to this problem in future studies might be to allow pupils more access to the record cards during lesson time, so that they could fill them in at any time during the lesson. This would also solve the problem of 'remembering' what happened in the lesson. Pupils could record events immediately as they occurred rather than waiting until the end of the lesson.

Two main questions needed to be addressed by this pilot study, what did the pupils learn, and how worthwhile was the learning? The first of these questions could be answered by the record cards themselves. Certain objectives had to be obtained before sections of the record card could be filled in. For instance, the spinning card required pupils to state whether or not they could start spinning by themselves. If a YES answer was put here then the pupils had achieved one objective on the course. A space for a sample of the spun yarn was included on the record card and the pupils were asked to rate their overall performance on the task. The sample would be the best sample which the pupils could produce. Examples of good hand spun yarns were available for pupils to handle so that they could compare their own achievements. None of the pupils were satisfied with uneven, lumpy yarns. Every child was striving to produce an even yarn of medium thickness. Most of the children were highly critical of their own work and were not
satisfied with even slightly lumpy yarn. Quantity also seemed to be important to the pupils, although this was not stressed as an objective.

In criticism of the record cards, it would be fair to say that more crucial objectives could have been used. In any future study of this kind there would need to be a reference of several hand spun yarns, graded from poor to good and excellent qualities. These could then be used as a comparison by the pupils. Although one would wish to encourage high standards some of the children were perhaps too critical of their first attempts and became frustrated when they did not achieve excellent results immediately.

Very concise and detailed objectives would help to make achievements easier to identify. This is the main criticism of the project.

The children did learn the basic skills of spinning, weaving, and dyeing. This can be ascertained by the record cards. Samples and drawings of the work done give an indication of the standards achieved, but more precise objectives could have been included, especially for the brighter pupils, who quickly achieved that which was required. Possibly an extension record card could be added for those pupils who acquired the basic skills very easily. For example, the spinning card could have asked for decisive counts of twist in the yarn, or defined thicknesses of yarn. Although the record cards allowed
children the freedom to experiment with the skills which they had acquired, provision for recording the experimentation in more detail would have been more informative.

At the other end of the scale there were some children struggling to attain the simple objectives. The message contained in this is that the range of expected skills needs to be very wide if it is to accommodate every pupil, and allow each one to reach his or her best potential.

The dyeing card was perhaps the weakest card in terms of objectives. An improvement of this card could allow for more experimentation and then ask for precise colours to be obtained. More room for samples of dyed yarns could also be provided. The limitations on this are again those of time. An interested pupil could well spend all of the time investigating just one aspect of the course work. Bearing in mind that the nature of the Design circus is to provide a "taster" of subject matter, this could not be catered for. More precise objectives might however help the pupils to evaluate their own work more effectively. A dyed yarn which is not uniform in colour may in fact add interest to a piece of practical work. A space for "comments" may be appropriate, (this could if necessary be written by the teacher, or taped). The dyeing card required the children to record one sample yarn and their own recipe for the dye which they used. None of the children were very precise about weights and measures in this section. Once again time limited experimentation. Some children only dyed one
amount of yarn, although the time allowed was flexible the children needed direct supervision in the kitchen area and time could only be allocated when this was possible. All the children were able to observe the mordanting and dyeing of yarn, even if they did not complete the task as an individual.

Collecting plant material was a responsibility given to the pupils. Those who were well motivated achieved this enthusiastically. Some pupils did conveniently "forget" the task and either borrowed from friends or used school material. Availability of dyestuff in a rural community should have not become a problem. A section on the card asked for the source of dye material to be recorded as a drawing. This often involved researching in the library for diagrams and photographs of plants and for names of plant materials found locally. Again the record card could have required more detailed information from brighter pupils.

The weaving card was the most successful of the record cards. Four clear objectives were required before the pupil could go on to design a practical piece of work. Some exceptions to this had to be made in order to accommodate the pupils of very limited ability. Two pupils had very weak manipulative skills and only achieved one objective.

The weaving record asked pupils to collect samples of thread which could be included in their design work, and also asked for a drawing of the completed design. Some pupils were less
able at drawing than weaving, and a modification of this element of the recording could be a drawing of the proposed design and a photograph of the finished work. This would give a clearer indication of the standard of practical work.

Most of the pupils found some difficulty in evaluating their own work. Many were eager to seek out the teacher's opinion before suggesting their own evaluation. In this respect the record keeping was very valuable, in that it encouraged personal criticism and forced children to enquire of themselves if their work was indeed their personal best, this necessitated a deeper delve into their own experience. The evaluation also raised some discussion amongst the pupils about subjectivity in grading Design work. Frequently a child would ask of the teacher "Well, what mark would you give?" As evaluation is part of the Design process, this procedure was a particularly valuable activity.

The final part of the record keeping involved totalling the ratings and the "Yes" answers. High scores merited a "commendation" (part of the school's policy for rewarding good work).

There was a general enthusiasm for completing the record cards with care. Pupils were encouraged to take a pride in their record keeping. Motivation in lessons was probably improved by a desire to be able to use a "Yes" answer. At the end of the session each pupil was asked to fill in a simple questionnaire.
about keeping a record of their work. The questionnaire was distributed during the last week of the school term. Five children were absent and did not complete it. The completed questionnaires are contained in APPENDIX TWO.

Analysis of the Questionnaire

The project had set out to improve teaching and learning in the Textiles' classroom. Part of the purpose of the questionnaire was to clarify if pupils had in fact been encouraged to work hard in the Design lessons, had their motivation been improved? The positive answers to questions 1-7 on the questionnaire did indicate that an enjoyable learning experience was taking place.

The table below shows the number of positive answers as given to the relevant questions.

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>YES</th>
<th>SOMETIMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you worked hard in Design lessons?</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>2. Have you enjoyed the projects?</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>3. Have you learned some things which you did not know before?</td>
<td>13</td>
<td>1</td>
</tr>
</tbody>
</table>
4. Did you always understand exactly what you had to do? 8 6

5. If you didn't understand were you able to ask questions? 14 0

6. Was your teacher helpful if you were having problems with your work? 14 0

7. Did you ever feel too scared to ask something in the lesson? 0 2

Some of the children were not always sure about methods of procedure when new skills were introduced, this was made apparent by the answers to question 4 on the sheet ("Did you always understand exactly what you had to do?") Part of the problem seemed to be that pupils could not see a demonstration properly when they were part of a large group. Repeated demonstrations were given to those children who were not sure, and there was opportunity for all of the children to ask for help and advice at anytime. This is supported by the positive answers to questions 5 and 6.

Questions 8, 9 and 10 on the questionnaire were designed to elicit the pupils response about keeping a record card. Twelve out of fourteen pupils felt that the record card was a useful
document. The pupils were equally divided in their opinions about question 9, which asked if they had experienced difficulty in evaluating their own work. Seven expressed some difficulties and seven found no problems associated with this. Four of the pupils thought that they should have a responsibility towards evaluating their own work. Most of the children however, felt that "marking" was the teacher's role. This attitude was clearly expressed by ten children. As work in most of the subjects studied by the pupils is graded by teachers this would seem to be a logical response. Self motivation needs to be encouraged, and Design teachers can play an active role in this.

GCSE Design courses ask pupils to evaluate their own work, and it is important for younger pupils to begin to look at their own work with discrimination, and to ask themselves how it might be improved. The aim is constructive criticism. Pupils who are still in the concrete mode of thought find this more difficult than those already using formal thought processes. It would be pertinent for subsequent record cards to contain questions which would help the pupils with final evaluations.

The majority of the pupils were pleased with their Design work, and did not want to change their Design lessons in any way. Only one pupil expressed displeasure with his practical work.
The response to the questionnaire indicate that the record keeping was a worthwhile activity for most of the pupils and that the learning experience in the Textiles lessons had been a positive experience.
3.3: CLASSROOM STUDY TWO
CLASSROOM STUDY TWO

The second classroom study involved extending the research to second year pupils. A set of Record cards were designed for the second year syllabus which was primarily concerned with the topic of decoration.

Content of the Second Year Record Card

Once again the content of the Record card was planned to be an on-going self assessment of non-verbal learning activities taking place in the Textiles lesson. The activities were organised to cover the same areas as defined for the first year course ie:

1. Manipulative Skills
2. Communicative Skills
3. Creativity and Originality
4. Imaginative Enquiry
5. Implementation
6. Discrimination
7. Perceptual Awareness
8. Technical Skills

With respect to these specific areas a list of criteria was compiled which were pertinent to the second year course. These were as below:
1. **MANIPULATIVE** Child can apply powder paint to paper neatly using a small brush. Child can handle various printing equipment, including screens, and squeegees, in an appropriate way. Child can use a craft knife safely to cut both paper and card. Child can use glue properly.

2. **COMMUNICATIVE** Child can communicate ideas through drawing, and plans and through graphic designs for a T-shirt print.

3. **CREATIVE** Child can use own initiative to produce imaginative ideas for a T-shirt design. Child can design a personal environment suitable for sleeping in.

4. **INVESTIGATIVE** Child can investigate the possibilities of using objects for printing. Child can research the general topic of decoration, collecting pictures form magazines, samples etc.

5. **IMPLEMENTATION** Child can produce a screen printed T-shirt. Child can use cardboard to create a model bedroom.

6. **DISCRIMINATION** Child is able to make choices concerning colour, pattern and shape. Child is able to choose appropriate tools and materials to complete work set.
7. **PERCEPTUAL AWARENESS**  Child may develop skills in reciprocity, child shows growing awareness of colour in design. Child shows appreciation of size and proportion.

8. **TECHNICAL SKILLS**  Child is able to use knowledge of colour shape and form in practical work. Child aspires to use mathematical knowledge of scale and proportion to create a model room.

The Record sheets for the three topics of The Colour Circle, Colour in the Home, and Colour in Clothes, were subsequently planned. Once again words and written instruction were deliberately minimised and simplified in accordance with the non-verbal approach to the project. Pupils were to be involved with the assessment procedure, and were instructed to Design their own symbols for use on the card. A summary sheet was provided in the Record card where positive answers could be counted as successes and commended in line with the current school policy for good work. (Example of the Record card for the second year study can be seen in fig 7.)

**Reasons for the Second Year Study**

It was decided to extend the classroom study to two age groups in order to gain a more comprehensive overview of the Recording System. First year pupils had responded well to the self-assessment procedure and appeared to be better motivated than other groups of children. Extending the study to another group
textiles’ achievement record

name __________________ form ___
colour
IN THE HOME

Rating

samples

Drawing of model
of children allowed this hypothesis to be put to the test again.

As the study intended to initiate a suitable system for recording achievements throughout the lower school it was necessary to experiment with another age group, and for convenience of timetabling a second year group was chosen for the study.

One of the aims of the project was to improve teaching and learning in the classroom. The introduction of the Recording System in the first year had shown positive results in both these aspects with this particular year group, it was now necessary to work on improving standards in other parts of the curriculum.

Whilst the first year syllabus was largely skills based, the second year syllabus offered a different challenge, the emphasis this time was on artistic activities, with pupils involved in work of a more creative nature. It was hoped that the Record cards would also prove to be useful in recording achievements in these activities.

Projects and Procedures

All of the second year topics were planned to improve dexterity and manipulative skills, they required the deft and safe
handling of tools for different purposes such as the craft knife.

The first topic involved learning about, and understanding theories of colour, and was concerned with the technical skills of applying paint to paper. The two subsequent projects of screen-printing and making a model bedroom were designed to encourage the application of the knowledge of colour theory, and also offered opportunity to use differing media for differing situations. These two projects were creative in their approach and required forethought and visualisation of ideas, encouraging more use of formal thought processes through these activities. The second year course was also planned to develop individual interests in aspects of Textiles work. Some pupils for instance may find a particular affinity with printing as a method of expression - this interest could then be expanded into the model bedroom project as pupils could decide to print their own wall-paper or fabrics to use in their models.

In recognition of the fact that group activities are also valuable at this stage of cognitive development (re Piaget's theories of cognition) pupils are encouraged especially to work as a co-operative team sharing plans, equipment and ideas. This aspect of development was particularly encouraged by the printing project. The first topic was the "Colour Circle" this involved discussion about theories of colour, drawing on pupils
scientific knowledge. Pupils were asked to paint a colour circle for their Record Folders which they could refer to as necessary. A space was provided for any supplementary notes which pupils might choose to make, (in any form which they chose), and for a rating of their own painting skills in the completed circle. Colour was to be mixed and applied carefully, and laid flat onto the paper. Good organisation of painting equipment was expected. This was a formal exercise which provided a contrast to other working methods which pupils had experienced in previous Textile lessons. Some formal thought processes could be employed in the understanding of colour theory, and the concrete experience of mixing and painting the colours supported the theory work.

The amount of time spent on each topic needed to be carefully rationed. It was necessary to use the Art area for the printing activity and this had to be pre-arranged, pupils were therefore required to work to deadlines, and flexibility of timing was more limited than it was on the first year course. This was construed as a positive constraint, and an exercise in self discipline. Pupils who completed work quickly were encouraged to experiment with other media. For instance some pupils who finished their painting exercise more rapidly than the majority tried some crayon work with colour as an extension of the topic.

Pupils painted the colour circle on white cartridge paper and cut it out to glue into their Record cards as a permanent
reference for future work. They then rated their performance in this activity, designing a symbol to indicate their achievement. Working directly into the Record card was a useful way of emphasising the importance of the Record keeping activity.

The second project was Colour in Clothes. Initially some time was spent in introductory discussions about the psychology of colour, and pupils then began to think about using colour as a means to decorate a plain white T-shirt. Restrictions of time limited this second activity and it was decided that a very valuable learning experience could be gained from a screen printing project. This involved using many non-verbal skills, and also required that pupils should co-operate with each other in the execution of their work. It allowed, too, for the possibility of working with repeat pattern which was useful in establishing skills of reciprocity. The mixing of printing inks was an opportunity to apply knowledge of colour theory to a real situation in a practical context, colour vocabulary and sensitivity being thus extended.

The project was very relevant to pupils of this age group, both boys and girls alike were keen to produce something of their own design which they could wear.

Pupils made an initial set of designs on white cartridge paper, trying out several ideas and colour combinations. (If available use could be made of computer software for the
designing activity.) The final design was chosen and paper stencils were cut for each colour to be used. This was very profitable in terms of understanding printing method, and in explaining colour separation. Stencils were cut in clean newsprint with sharp craft knives, requiring careful concentration. As mistakes could not be rectified clumsy work had to be repeated. Pre-cut stencils were stored flat between sheets of sugar paper. It was possible for able pupils to work in three colours within the given time span. Slower pupils could make designs involving simpler or fewer stencils.

The printing activity took place around a purpose built print-table with a suitable surface. Ten pupils could comfortably work together at the table. It was necessary for children to work in pairs, and to help each other, one acting as an assistant for the other, in turn, holding the screen steady and passing equipment as required. This was a useful exercise in itself, needing co-operation, patience, and unselfish attitudes to work. This provided a sharp contrast to the many competitive learning activities which take place in classrooms.

Many talents came to light during the printing sessions. Some of the slower less able pupils were very successful in this activity. Order and organisational skills were notably improved as it was soon apparent that chaotically arranged equipment led to accidents. Pupils practised on paper and when a perfect print was achieved the T-shirt was ironed and prepared for the final print. In this way no T-shirts were
spoilt. The end result was excitedly anticipated as the lifting of the screen revealed the result of several weeks work.

Clearing away was a shared responsibility, pupils becoming aware that equipment which was not cleaned properly could spoil future work.

Many pupils developed a keen interest in printing which could be expanded in Art lessons, and pursued further in the 3rd year Textile lessons.

On the Record card the objectives were concerned with:

a) preparing accurate tracings for the stencils from the master design.

b) cutting careful stencils.

c) mixing inks properly from primary colours and adding the binder to achieve the appropriate colour.

Any mistakes in these activities would lead to poor registration, and uneven colour in the final print. Pupils were able to pin-point their problems effectively when considering whether or not they had achieved these objectives. A drawing of the T-shirt design was also included on the Record Sheet, and space was allowed for those pupils who printed on
the back of their T-shirt as well, to make two drawings. A final rating of the printing activity was required, and this completed the topic.

The final project concerned Colour in the Home. Introductory sessions involved looking at colour in environment and the topic was designed especially to place the teenager in his or her own ideal surroundings. Pupils were able to plan their own room with no constrictions of cost. This activity was immensely popular with boys and girls and plans were drawn with much enthusiasm.

The basic room was provided as a pre-printed cut-out which pupils simply had to stick together. A basic bed, and cupboard could also be used by those pupils who felt that they needed some help, or a starting point. All other furniture was designed and made by pupils. Experiments were constructed in paper and the final models made in thin card. Each pupil planned a colour scheme, with co-ordinated soft furnishings which had to be made appropriately, this introduced some boys to sewing for the first time.

The project required investigational work, pupils were asked to search for useful items to recycle for modeling materials. Boxes were provided for the collecting of various items such as small cartons, toothpaste caps, plastic pots, off cuts of wallpaper and carpet. A local shop provided carpet samples and small pieces of fabric were taken from off-cuts of school
materials. Pupils proved to be extremely resourceful and willing to share their efforts.

Some children printed their own wallpaper, using small found objects dipped in ink to create repeat patterns. Detail was delighted in, with pupils making tiny dressing table items, drawers which opened to reveal their contents, and wardrobes complete with fuse-wire hangers and tiny jumpers knitted on cocktail sticks. Work was continued willingly and enthusiastically at home. The models were of an excellent standard.

The Record card required a drawing of the model, a collection of samples of fabric, and snippets of carpet etc, and a final rating of the model this could be filled in gradually as the work progressed, although most pupils preferred to leave the drawing until the last lesson when the model was completed.

The final part of keeping the Record Card involved adding up the 'YES' answers, and the totals of each rating score. These were entered onto the Record Card. Pupils who felt that they had achieved highly were then able to claim "commendation" slips which would be kept with their Record folders. This final analysis of achievement was made in negotiation with the teacher.
Analysis of the Completed Second Year Record Cards

Pupils were required to present their Record cards with their completed practical work. A report was then written on each child's progress (see Appendix Four).

As the second year pupils were familiar with the Textile area and with the equipment they were more confident in their approach to work. Pupils and teacher were also known to each other and this made the assessment procedure an easier task.

It was decided to make the Record Cards accessible to pupils throughout each lesson, this was to avoid the "last minute rush" which had sometimes occurred during the first year trial. Record Cards could therefore be filled in at any time at the pupils own discretion. Several reminders were issued to draw pupil attention to this task. It proved to be a more satisfactory method of organisation, and pupils often welcomed the change of activity during the long afternoon session.

Almost all of the Record Cards were entirely completed as the table below indicates.
With reference to the first task (the Colour Circle) it was probable that the time allowed may have been too short as five pupils did not finish. This could have been because the task was quite formal, and some pupils who were unused to this approach worked very slowly.

All pupils completed the T-shirt project, and all pupils completed the model bedroom, although three pupils did not fully complete their Record Cards for this last task. Ability did not seem to be a relevant factor in the completion of the Record Cards, both able and less able pupils were finishing tasks within the time allowed.

It was necessary to ascertain what the pupils had learnt and how worthwhile the activities were. The first question could be answered by analysis of the Record Cards. Pupils were achieving the objectives required this can be seen from the table below:
All pupils achieved some measure of success and negative answers only appeared for one or two aspects of their work. They were also able to identify their problems very easily and could understand why they had not achieved successful results, this was a direct outcome of using the Recording system. Reference to the Record card also proved to be invaluable when speaking to pupils about their achievements and their problems. Pupils were able to realise that they could overcome their problems if they identified them, and then concentrated on improving those objectives which they had found difficult.

The objectives were pitched at an appropriate level for all abilities. The more able pupils began their work with complicated designs and so the objectives became correspondingly difficult to achieve and more appropriate for their own standards. Weaker pupils were advised to begin with more simple designs and were therefore still able to achieve the stated objectives.

Each pupil printed a T-shirt with a degree of success. All the T-shirts were wearable and there were no serious mistakes. Every pupils worked through the printing process and therefore
each child gained an understanding of screen-printing methods, this was aided by the fact that the achievement of the objectives, as stated in the Record cards, highlighted each stage of the print making activity. The result of this was that each pupil was conversant with the screen-printing process.

All the pupils were involved with mixing paints and dyes. Initially pupils were asking questions such as "How do I make green?" etc. When the printing activity began pupils were able to answer these questions based on their own experience of making the Colour Circle for their Record, or they could refer to the Record to confirm their thinking. Most of the pupils improved awareness of colour in design. This was evident in their practical work. In the model bedroom project the girls were very confident in their planning of colour schemes, the boys asked for more help, and were more inclined to make aesthetic mistakes.

The model bedrooms were very successful. As pupils worked in paper first they were able to find out which construction worked, corrections could easily be made to unsuccessful photo-types. All pupils achieved adequate models. Some were exceptional in detail and quality. Several photographs were taken of the excellent results. Whilst the end products were pleasing it was even more satisfying to know that the "Means whereby" had been a valuable experience. When the children presented their work and Record Cards at the end of the session
they were articulate about their skills, and able to discuss their own achievements in a clear and logical way. The Record Cards seemed to prompt more critical statements from the children about their work.

There were less skills based objectives contained in the second year course as compared with the first year course, this was because the syllabus aimed at instilling a creative approach to using colour. The second year Record Cards were perhaps more graphical in their nature. It was considered to be important that the syllabus dictated to the Record Card, and that objectives were not arrived at merely for the purpose of assessment procedures.

Most of the pupils still found it difficult to evaluate their own work, they wished to seek second opinions and confirmations from others. Once again this was a valuable aspect of the Record keeping, as it focused the child's attention directly to their achievements.

It was possible to ascertain what individuals had learnt from their experiences in Textiles by discussion with pupils, with reference to practical work in conjunction with their Record cards. In fact the children themselves were able to state what achievements they had made.

A report was written for each second year pupil who took part in the study (Appendix 4). These reports indicate that the activities which the pupils were engaged in were worthwhile.
All of the pupils achieved a measure of success, new skills were acquired and many pupils developed new interests. Motivation was good and the level of enjoyment in lessons was undeniably high.

**Conclusions Drawn From the Second Year Study**

There were less problems with the second study. Organisational methods had already been tried and tested and pitfalls could easily be avoided. Explanations to pupils about procedures were also less difficult to implement as likely questions could be anticipated.

It was very clear during the second year course that the pupil motivation was good. It seemed likely that the use of the Record cards was an added incentive to achievement.

Pupils knew what was expected of them and were eager to succeed. Learning problems could be identified and extra help provided in weak areas. The Record cards were a useful resource for both teacher and pupil, and they provided a clear indication of the learning process.

In short the second year study confirmed the observations made in analysis of the first year study.
The results of the study pointed to a way forward for Textile teaching in the lower school, this was to be a systematic approach to learning in which achievements could be readily recorded by pupils as evidence of success, which could be accredited as they deserved.
FIRST AND SECOND YEAR PUPILS AT WORK
MARTIN HIGH SCHOOL, LEICESTERSHIRE 1987-1988
3.4: A POSTSCRIPT : THE STUDY IN A NEW SITUATION
In September 1988 I was redeployed to a different teaching situation. This offered an excellent opportunity to repeat the study.

The new school was a City Comprehensive School; Babington College, Leicester. This catered for pupils aged 11-18 years. The school was relatively new, 5 years old, and the catchment area was urban. The pupils were of multi-racial backgrounds.

The school had a well equipped Design department, Textiles being taught in a separate room next-door to the Home Economics rooms.

It was decided to repeat the study with a first year group of pupils. The results would then provide a comparison for the original study.

Subjects for the Study

The subjects for the study were a mixed ability group of 1st year pupils. Although the pupils had a range of differing abilities, the general level of attainment was much lower than the levels of attainment in the original study. Many of the children had difficulties in reading and writing, and some were working in a second language. Reading ages were as low as 6 1/2. Three of the children were also visually impaired, so
this presented a new challenge for the study within the group. There were 14 boys and 7 girls, all aged between 11 and 12 years.

Time:

The school worked to a 5 day timetable, and the first year pupils were timetabled for a ten week cycle of two lessons per week. One in the afternoon of 1 hour and 35 minutes duration and one in the morning of 1 hour and 45 minutes duration.

The Project

Although the amount of time was relatively long, the pupils were of an overall much weaker ability and many had learning difficulties and problems. Work progressed at a slower pace than in the previous study. It was therefore decided to take one central aspect of the study and to pursue this carefully. It was decided to work with the weaving topic. The Record Card for weaving was suitable to use in the new situation, but it was not possible to reproduce it in card, as the school only possessed a simple photo-copying machine. An enlarged copy of the Record sheet was reproduced for the most severely visually impaired pupil.
Aims and Objectives

The overall aims of the first year course were to improve the manipulative, communicative, investigative, creative, implementative, discriminative, perceptive and technical skills, (as already defined). The objectives for the course were as follows:

1. Pupil should be able to make a simple card loom, and produce the following types of weaving: plain weaving; oriental soumak; rya knotting; and tapestry.

2. Pupil is able to produce a simple and suitable design for a tapestry picture to be woven on a card loom.

3. Child can use environment to discover ideas for weft materials. Child can make suitable collections of weft materials.

4. Pupil can use initiative to produce imaginative ideas for weaving designs.

5. Pupil can plan a project and see it through to completion.

6. Child can choose and use the appropriate tools and equipment. Pupil can make aesthetic choices concerning
materials, colour, texture and presentation.

7. Child can use knowledge of colour, texture, and shape in planning and producing practical work.

Evaluation of Work Done

It remained essential for pupils to be involved in the evaluation of their own work. The self assessment Record Sheet for weaving was to be used. Pupils were asked to record the number of lessons which they spent on the project. This was useful as it indicated any absences. Pupils were required to design their own symbols for YES and NO, they could then use these as an indication of whether or not they had achieved the required objectives. Pupils were also required to give their practical work a rating symbol indicating FAIR, GOOD, or EXCELLENT. Once again negotiation with the teacher was important in this evaluation. Worthy efforts were to receive a merit award in accordance with the school system for rewarding good work. The Record sheet was issued to the children during the afternoon session. The children needed more time to complete the sheet than in the previous study. It was also less disruptive if all the pupils filled in their Record Sheet at the same time. This was an important factor in the particular school environment. The method of recording was carefully explained and a support teacher was available to help the slowest children and the visually impaired pupils.
Methods and Procedures

Weaving was introduced in context as one was of producing cloth from spun fibres. Pupils first explored the textural qualities of different types of yarns. One afternoon was spent outside collecting suitable weft yarns from the local environment. The support teacher helped the visually impaired pupils with this activity. Pupils were also encouraged to look for interesting weft materials at home.

The children needed help to warp up their cardboard looms. Some of them had poor manipulative skills and could only achieve the required tension with help. This initial activity needed one whole lesson. Weaving was introduced by demonstration. Woven fabrics were looked at and handled, and the children were asked to look at their own clothes and decide which were made of woven cloth. Some work cards were provided for more able pupils who wished to work at a faster pace, but these proved to be unnecessary, all of the pupils required support in their learning activities. Boxes of textured yarns were provided and the children were encouraged to donate yarns from home. There was only a limited response to this request, and most children relied on school materials.

An emphasis was placed on texture and colour, pupils were expected to demonstrate ability in 4 different weaving stitches, as they achieved success they were able to record this on the Record sheet. During this part of the course
pupils were able to look at woven and knitted fabrics under the microscope with the support teacher.

When the basic processes had been practised pupils were asked to make a simple design for a woven tapestry picture, into this they could incorporate personal ideas and feelings, and use the basic 4 stitches. Beads and buttons were also provided. A drawing of the final piece of practical work was made on the Record sheet. The tapestry picture was then window mounted in white polystyrene. In discussion with the teacher a final rating was negotiated.

A report was written for each child based on the Record sheet, the practical work and observation of work in process (See Appendix 7).

Analysis of the Record Sheet

The Record sheet was not changed from the original format. It was decided that the objectives were clearly set out and that even the weakest pupils would understand what was required. The non-verbal approach also meant that poor readers would not feel intimidated.

All of the pupils completed the Record sheet and most pupils enjoyed recording their achievements. For some this was quite eventful as they had to work very hard to achieve the stated objectives. Drawing skills were not well developed and some
pupils lacked confidence in producing a drawing of their final design. Overall, however, the Record sheet was set at the correct level, providing a challenge for every pupil. The pupils enjoyed the different activities which they were asked to do, such as collecting small samples of yarn for the Record sheet. Great care was exercised in completing the sheets, colours were chosen carefully, and yarns cut and glued as neatly as possible. Pupils were very proud of their work. Some were quite shy about the final evaluation of their work.

The experience of recording achievement was very positive. Pupils were able to state exactly what they had learnt in simple terms such as, "I can do rya knotting". Motivation was good throughout the course.

Analysis of the Record sheets revealed that the course was beneficial to all pupils. None of them could weave initially so every child acquired a new skill which helped them to improve manipulative skills, encouraged creativity, and increased confidence in making choices. All of the pupils took away a completed and framed tapestry picture. The table below indicated the number of pupils who were successful at the specified objectives on the Record sheet.
<table>
<thead>
<tr>
<th>Processes</th>
<th>Number of children who mastered the process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain Weaving</td>
<td>21</td>
</tr>
<tr>
<td>Soumak</td>
<td>21</td>
</tr>
<tr>
<td>Rya</td>
<td>16</td>
</tr>
<tr>
<td>Wrapping</td>
<td>15</td>
</tr>
</tbody>
</table>

(Total number of Children = 21)

All of the pupils achieved at least 50% of the specified objectives.

It was possible to discern from this information where pupils were experiencing the most difficulties and to consider ways of helping pupils to overcome these problems. For instance one of the visually impaired pupils could not master the "wrapping" stitch because this involved wrapping the weft yarn around a number of warp threads. When these warp yarns were pulled together in this way it was impossible for this pupil to
distinguish one from another. Varying the texture of the warp yarn or using strongly contrasting colours seemed to be a solution to this problem.

The presentation of the Record sheet together with the practical work at the end of the session provided an opportunity for discussions with individuals about effort and attainment. (This was facilitated also by the presence of the support teacher in the classroom who could work with the remainder of the class while these discussions took place). Pupils revealed that they were enjoying the learning process, that they had increased their knowledge of working with yarns, and that they could distinguish between a knitted and a woven fabric. The pupils had a very clear expectation of what they should have achieved, and were able to identify their weaknesses. They liked the positive aspect of recording success on the Record sheet and enjoyed working towards small identified goals. The pupils also valued the experience of evaluating their own work. The Record sheet helped to maintain motivation and interest in the course work.

Information from the Record sheet provided the basis for an internal teachers report. The evidence contained in these reports indicates that non-verbal skills and abilities were improved by the learning activities which took place during the project. The reports were also a useful reference point on parents evening.
Keeping a Record of work proved to be a valid experience for the pupils and a worthwhile exercise for the teacher. Suitable Records could now be designed for use with second and third year pupils in the lower school.
3.5 AN OVERALL SUMMARY OF THE CLASSROOM BASED WORK
AN OVERALL SUMMARY OF THE CLASSROOM BASED WORK

The thrust is from the nomethic to the ideographic dividing the students out from one another like the opening out of a fan, not with a view to classifying them or ranking them in order of preferability, but ideally, with a view to showing that each is in a class of his own".
Rowntree 1977

Initial Findings

This research aimed at improving the quality of teaching and learning in the subject of Textiles at lower school level.

Initially it was a journey through the history of Design education in this country. It traced the teaching of Textiles back to its domestic and industrial origins in the 19th century. It saw the context in which the subject arose and noted the influences of the Art and Craft movement, of the Bauhaus, and the Educational Reformers. The subject evolved steadily from these beginnings, and adapted itself to the radical changes which have been taking place in schools this century.

Although in recent decades the subject has often been regarded as a low status subject on the school timetable it has steadfastly remained.
Once it was the province of girls alone, now boys routinely pursue the subject up to the age of 14, and sometimes beyond.

This research has traced the demise of the painstakingly hand stitched seam to the advent of technology. Firstly the sewing machine, then the electric machine, now the computer. Whilst handmade buttonholes, and flat fell seams may still have their place, the Textiles room now offers a wider scope of activity, encompassing skills based on ancient crafts such as weaving, and spinning, as well as fabric printing technologies, and the fashioning of clothes, and scientific exploration into fabric construction and properties. All of this and more may be expected from today's Textiles teacher.

The two important factors for the teacher are the art and craft of the subject, and the pupils themselves. The Textiles teacher needs an ultimate love of the craftwork involved, this is to be imparted to the pupils with sincerity in the hope of raising their awareness through the materials with which they will work.

The Syllabus

The initial findings indicated that the syllabus must be planned so as to be subservient to the needs of the children. It became clear that the educational value of Design work lies in the physical and mental processes which go into its making
and shaping. This survey therefore had to look at the way in which children think and learn.

The right side of the brain is nurtured by creative thinking. The Design curriculum has much to offer therefore to the balanced development of human thinking, it offers ample opportunity to use right brain thinking. Skills in creative thinking can be promoted by Design teachers. Students of Lower School age are only beginning formative thought and as Design Education works in a concrete mode, problem solving and formative thinking arise from making and doing activities. Abstractions can gradually come into use, by becoming realities.

The Design teacher is also in a favourable position to foster moral awareness and certain facets of character. In a wider sense a concern for appropriate technology can be cultivated, and in a local sense group work can engender a spirit of co-operation and responsibility. Tolerance and less selfish attitudes can be encouraged. Individual traits such as self-reliance, perseverance, initiative, good organisation and tidiness, can all be pursued. Aesthetic value judgements can be discussed as the opportunity arises.

Character building through handicrafts has long been recognised. S H Glenister (1953) quotes Rousseau on the subject:
"If instead of keeping a child at his books, I keep him busy in the workshop, his hands work to the advantage of his intellect, he becomes a philosopher, while he thinks he is becoming simply an artisan".

Part of the Design teacher's task is to ensure that the work carried out is not seen as mindless and is not under-rated.

Working with materials also has an emotive core. Effective learning is another element of Design which cannot be overlooked. This is particularly relevant to young teenagers who are just reaching puberty and may well be in the throes of some emotional trauma.

The research has looked closely at the development of the adolescent, and has aimed at appropriating the "Textiles" syllabus directly to the needs of the 11-14 age group. It was hoped that by endeavouring to develop fresh awareness, new thinking processes, and by encouraging decision making about materials, the seeds of moral responsibility towards world resources would at least be sewn.

In consequence of these searchings a sequential plan for Textiles within Design at lower school level was formulated. In general the approach was to consider Textiles as an art form, and as a technology, to look at the way in which textiles are constructed, the methods used to render them more
decorative, and the ways in which they can be fashioned into clothes or artefacts.

Methodology

The new syllabus was put into practice with the first year group of pupils from the Martin High School. Spinning, natural dyeing, and weaving were attempted by the children as described in section 3.2

The methodology employed was essentially based on holistic principles with the class working at their task in a logical sequence, from a whole class activity of spinning together in a circle, then collecting plant material and working in smaller groups in the kitchens to extract dyes, and finally working individually to create tapestry pictures. Thus beginning with the whole and working down to the parts.

The first year course included a visit from a felt-maker who brought many examples of her work for the children to handle. She demonstrated her craft to the pupils and this extended their knowledge of wool as a material.

It also provided much fun and enjoyment as the children were able to work outdoors at pounding the wetted fleece with their bare feet. (Another experience of non-verbal activity.) There was jubilation as the first felted wool was revealed.
FELT MAKING AT THE MARTIN HIGH SCHOOL

LEICESTERSHIRE 1987
Achievements were recorded at the end of each lesson on the specially designed Record Cards. Good effort was rewarded. The course proved to be a satisfying and worthwhile experience for pupils and teacher alike.

The second classroom study was equally well received. The chosen group of 12 / 13 year olds explored the topic of "Decoration" with a special emphasis on colour. As the pupils were slightly older a more analytical approach was used. Pupils were presented with the theory of the colour circle, they practised this for themselves and then worked on designs for T-shirts, and on colour schemes for bedrooms. This allowed them to explore the use of colour in differing media. There was a strong element of self-expression deliberately included because of its relevance to this age group. Pupils were encouraged to share resources, and had to work as a cooperative team at the printing table when they produced their T-shirts.

The Record cards were available throughout the lesson and pupils were free to complete details of achievements as they occurred. This assumed a responsible and maturing attitude from all pupils.

The third classroom study took place in an entirely different situation at a City Community College. First year pupils pursued a weaving project, working individually but with encouragement to share resources. The Record keeping was this time more structured as pupils needed more help to complete the
recording process. Once again a positive and encouraging result was obtained.

The Recording Process

Throughout the three classroom studies it was evident that the children were enjoying the learning process. They moved through the Textiles experience with an increased awareness, acquiring knowledge of working with new materials, finding ways of solving problems, developing their thinking and their understanding of design processes, and learning skills. Their ideas were communicated through drawings, and other graphic means, and their achievements were rewarded. The teacher in the classroom was a facilitator of this learning process.

As any design process contains an element of evaluation it was deemed important to involve the pupils in constructive criticism of their own work. It was decided that an on-going appraisal of achievement would also avoid the pit-fall of "end result marking" and give due recognition and acknowledgement to the thinking, making, and doing process inherent in the design task. From this decision was born the "Record of Achievement for Textiles". This document was duly issued to each pupil and completed by them in collaboration with the teacher as described in the classroom studies. It was designed especially to encourage graphic abilities, and therefore did not lean too heavily on verbal modes of recording, it relied instead upon
the making of drawings, the keeping of charts, and the collecting of samples.

The "Record of Achievement for Textiles" contained a criterion referenced self-evaluation scheme which specified the skills, understandings and abilities that the pupils were required to achieve. For example, the weaving project required pupils to attempt four basic weaving processes.

The record keeping was positively received by the majority of the children in the studies. It offered a precise statement of what each pupil had learnt, and therefore gave a detailed feedback to both teacher and child. The pupils were able to see their own progress and identify their personal areas of weakness, and the teacher was able to discern whether or not learning objectives had been satisfied. Once problems were identified effective remedial help could be supplied. It was also easier to monitor pupils thinking processes and redirect these if necessary. End products could be viewed in their rightful context, the Design process could be seen to have order, and the delight of sudden insights, or the mastering of difficult skill could at once be noted and recorded thus reinforcing the success. There was no longer any need to rely on the child's or teacher's memory of what was done.

The Record card proved to be an excellent way of increasing the teacher's knowledge of individual pupils. This of course is extremely useful when children pass through a Design area in
only six or eight weeks, and when reports on the child may have to be written sometime after the teaching and learning experience has actually taken place. It also proved to be a useful resource on parents evenings.

(The completed Record cards for the three studies can be seen in Appendices 3, 5 and 6).

Some Problems Encountered

The process of recording achievement does take up an amount of classroom time. This was overcome to a certain extent in the second classroom study when the Record cards were made available for the children to use throughout the lesson as they themselves decided. When the study was carried out in the City Community College a more structured approach had to be maintained as the pupils were not mature enough to respond to the responsibility of working with less direction from the teacher. The time spent on recording work must be seen as part of the learning process, and in this way it becomes a valued part of the lesson. Rushing to complete Record cards at the end of the lesson negates the achievements and this must of course be avoided. In a long Design lesson a change of activity is often a breath of fresh air, and concentration can be restored by focusing on a different aspect of the task. The most fruitful approach seems to be a flexible one, whereby time is allocated during the lesson to record achievements, but where pupils are allowed access to their cards on an individual
basis if required, and where time can be allowed at the end of a lesson for a final check that all achievements have been noted. The help of a support teacher for less able pupils is invaluable, and this also gives the class teacher more time for negotiations with pupils about their work.

It is important that the keeping of a Record does not disrupt or takeover from the normal content of the lesson. The Record should be an integral part of the design process, and as such an integrated part of the children's work.

The mixed ability grouping of the children put certain constraints onto the Design of the Record Card. If all of the children were to achieve success then the Record needed to address a very basic level of skill as well as extend the brighter pupil. In the first year course the weaving Record card satisfied the whole range of ability, this was substantiated in the third study when the same Record card was used for a lower ability range. The children were still able to understand and cope with the recording process, although some individuals needed the help of a support teacher. On completion of the first study it was felt that the dyeing and spinning Record cards needed some modification, suggestions for alterations to the cards have been outlined in Section 3.2.

The objectives for the second classroom study were more creative and graphical in content, requiring pupils to make
detailed drawing of their design work, and to collect and display samples. Analysis of the completed cards suggested that the objectives were accurately pitched for the full range of ability, less able pupils were able to work at their own level and make satisfying progress, whilst the brighter pupils could pursue their ideas to relevant standards. The classroom studies confirmed that the difficulties of working with mixed ability groupings can be addressed and overcome by careful forethought in the planning of objectives.

The problem of assessment in Design is on going. Dedicated crafts people find joy in the working with materials, there are those who would argue that there is no place for formal assessment in Design, and that children should be allowed to make and do within the environment of the classroom, and in this way personal growth will occur and learning take place for the individual, and that this process is an end in itself, requiring no grade. Unfortunately the school is part of a system which intends to categorise and to judge, and to compare. Recording achievements is one method of recognising the learning process, and avoiding the marking of end products in isolation from their making. It may not be an ideal system for Design teachers, but it is a pertinent compromise.

D E S Recommendations

The process of recording achievements in Textiles as suggested by this study, could be appropriate as an element of the Pupil
Profiling and Record of Achievement policies recommended by the DES. When the classroom studies took place it was a government intention to ensure that all pupils should leave school with a summary document composed of:

- Personal profiles
- Portfolios of work
- External reports
- Assessments
- Examination results
- Leaving certificates.

Although the introduction of the National Curriculum has delayed the initiation of these plans, many schools have ventured to work towards such a requirement and have placed emphasis in the curriculum on process learning, with stresses on skills and new methods of acquiring knowledge and information. Courses in GCSE, TVEI and CPVE are all based on developing pupil centred learning. These systems of teaching are concerned with assessing pupil - progress in a cumulative way. They involve the pupils in self-assessment, and record keeping in the form of diaries, scrapbooks, drawings, photographs, and tape recordings.

These initiatives have derived from the recognised inadequacy of the examination system. An increased amount of information about skills and performance is needed by a majority of employers, especially as the job market is so competitive.
The recommendations of the DES were that pupils should be encouraged to keep accounts of their progress and achievements across the curriculum. The accounts should be known as the "formative" process. Every so often, perhaps yearly, a "summative" statement should be made by the tutor, based on information already collected and presented.

The final summative statement is the pupils' personal "Record of Achievement" which he or she takes away from school on leaving.

The "Record of Achievement" is defined as a:

"systematic, comprehensive, descriptive assessment of a pupils academic and non-academic achievements, attributes and interests".

It is intended that "Records of Achievement" should be documents which recognise accomplishments beyond those measured by formal examination systems, that they should be recorded as a process of learning, as part of the curriculum content. Key aspects of education should be recorded such as knowledge, understanding, practical skills, creativity, aesthetic judgement, and personal and social skills. In this way it is intended that a "Record of Achievement" should offer a rounded, comprehensive picture of what a pupil can do. Achievements would be recorded in subject areas by subject teachers.
Pertinence of the Classroom Studies

The method of recording developed in this study is appropriate to the subject within the particular schools where the research took place, and it is probable that this recording process could be part of a whole school response to government proposals.

The pupils are expected to make efforts to meet certain criteria within the subject of Textiles. It is a way of successfully monitoring pupil progress. The Record was designed especially to encourage graphic ways of recording data, and does not utilise lengthy verbal ways of recording statements. It is a document which the child owns and it tells of the skills which that child acquired at a specific time in his/her school career. Rather than leaving school with an ambiguous grade for Design the pupil takes away evidence to support abilities, a document which shows that he/she knows how to spin or weave, photographs and drawings of work done and graphs and charts recording progress.

As the curriculum develops the Record can be added to or modified. New criteria can be introduced, others may have to be changed. As the assessment is on going the chance of a final grade being based on an exceptional piece of work is avoided.
The Record cards proved to be pertinent in several ways as summarised below:

1. The completed Records provided confirmation that individual pupils were meeting specific objectives in their learning, and that they were acquiring non-verbal skills and enjoying the tactile experience.

2. The pupils had a clearer indication of the standards they were expected to achieve, and some chance to take an active role in the evaluation of their efforts to meet those standards.

3. The Record cards improved motivation. They helped pupils to maintain an interest throughout the course.

4. The Record keeping allowed pupils to proceed at a personal pace and effort was immediately rewarded by the satisfaction of recording a YES answer of a GOOD rating. Each pupil was fully involved with decision making processes related to personal progress.

5. The Record keeping seemed to encourage an atmosphere of cooperation rather than competitiveness. Pupils appeared more ready to help each other.
6. The Record cards provided positive feedback for both Teacher and Pupil.

7. The Teacher was able to use the Record Cards as an aid to identifying particular pupils with particular problems. This ultimately improved the quality of teaching.

8. The completed cards provided an overall picture of each child's progress, and not only an end result.

9. The cards provided a stimulus for discussion with pupils about their work. Especially useful with more reticent pupils. Teacher - Pupil relationships improved through the Record keeping progress.

10. The Cards proved to be useful for future initiatives in Design. An extension of the Record keeping to other years and other subjects would be a viable possibility. In the third year a similar scheme could offer support for optional choices made in preparation for examinations.

11. The Record keeping was sympathetic to current initiative prompted by the D E S and could be adapted for years 4 and 5 in upper schools to form part of the National recommendations for Records of Achievement.
In final conclusion it is clear that the study indicated a positive way forward for a cumulative, graphical, self-assessment scheme. Some fine adjustments to the criteria used, and to classroom organisation would be necessary before the scheme could be adopted as a permanent inclusion in Textile courses. In the first year study advantages outweighed disadvantages and multiple benefits arose from the Record keeping process. The initial contention that certain Design skills, essentially non-verbal in nature can be improved through work done in Textiles was verified by the positive outcome of the self assessments. These were interpreted by the teacher and appear in this context in Appendix 1.

The secondary contention was that the quality of non-verbal thought may also be improved through the experience of Textiles. This is much more difficult to ascertain as no convention exists with which to measure qualitative improvements. A continuation of this study at some future date may pursue this in more depth and detail. At the present time a subjective viewpoint would compare the quality of the performances of this sample of pupils with those who have experienced Textiles before in the same school. Whilst recognising the inadequacy of this method for research purposes, it can still be reported that the outcome of this comparison would be favourable.
In certainty it can be said that the record keeping process, as part of a new approach to Textile teaching led to a radical improvement in both teaching and learning.
SECTION FOUR

4.1: TEXTILES INTO THE 1990'S
TEXTILES INTO THE 1990's

The opening of the new school year of 1989 brought with it the advent of the National Curriculum, to be introduced progressively over the next eight years, so that the whole of a pupil's educational experience will be gradually redefined. Subject teachers will therefore be reviewing syllabi, and some teachers will be more involved in changes than others.

The National Curriculum comprises of three core subjects - English, Mathematics, and Science, and seven other foundation subjects listed as Technology (including Design), History, Geography, Music, Art, Physical Education, and for 11-16 year olds a Modern Foreign Language. Whilst the Education Reform Act of 1988 does not actually detail the content of the subject matter Statutory Instruments (or 'Orders') will be used to outline the programs of study for each of the foundation and core subjects.

When Textile teachers first pursue the National Curriculum they may feel somewhat indignant that their subject, which after all has been present on school timetables since 1862, attains a seemingly brief regard. There may be some fear that its individual character will be submerged as the subject succumbs to the demands of the new curriculum. It must be remembered that in establishing a foothold in Design Education and in making the necessary radical changes to its fundamental form, Textiles also succeeded in remaining true to its traditional
values; its versatility can now be restated as it works to acquire a status in the National Curriculum.

A Place on the Curriculum

Where then is the place for Textiles within the new system? HMI's recommend nine areas of experience for all pupils, these are:

1. Mathematical
2. Scientific
3. Social and Political
4. Aesthetic and Creative
5. Linguistic and Literary
6. Ethical
7. Spiritual
8. Technological
9. and Physical

It would seem reasonable to suggest that elements of Textiles would fit either into an aesthetic and creative experience, or into a technological experience. Textiles undoubtedly possesses a degree of creativity. It allows pupils to respond emotionally to sensory experiences, and through a tactile approach it promotes the use of the imagination; and the development of perceptions; the visual outcomes also require pupils to make discriminative and aesthetic choices. These qualities are inherent in the subject, but as an area of
experience it has more to offer, and so the question arises as to whether or not Textiles could fulfil the requirements of a technological experience.

To answer this question we must determine exactly what the National Curriculum expects of "Technology". It is a subject which has made its appearance on the school timetable only recently, within the last decade. Its debut is a response to the needs of society and its content is more diverse than might be expected. Its place on the curriculum is not merely a facility to introduce children to the use of computers - it is rather a realisation of the urgent need to prepare young people for a very complex industrial future, a future in which many human work skills will be automated by machines. Education today has to accommodate a technological philosophy because technology persistently pervades all human issues.

How are schools going to face up to this mammoth challenge?

B.K. Down (1986) gives three underlying aims for a technological education, these are:

1. "preparing children, morally, and politically, for understanding and being critically aware of the social issues of technology"

2. "learning how to employ technological devices, wherever appropriate"
3. with particular reference to C.D.T., developing an "involvement in, and understanding of the areas of technology that can be related to designing and making"

To incorporate these ideals the educational experience of technology must be in essence cross-curricular. It is directly concerned with all human needs, i.e., the provision of shelter, food, clothing, maintaining health, communication, electronics, biotechnology, fuel extraction, and alternative technologies. It aspires to teach pupils how to control their environment and to do this they have to become aware of differing human conditions and points of view; they need knowledge and understanding of materials, resources and energy; they must be conscious of problem solving strategies and know how to communicate ideas effectively; and moreover they must learn how to respond in a positive and disciplined way for the increased benefit of the whole human race.

No single subject on the school timetable could contemplate achieving such vast aims, but within a cross-curricular framework individual subject areas could identify their own responsibilities. I believe a thoughtfully designed Textile syllabus can address several major components.

Moral and social issues cannot be confined exclusively to the Humanities. It was suggested in Section 2.1 that Design subjects should nurture a caring attitude and be attentive to encouraging responsible citizenship. Environmental
improvements can be brought about through the use of textiles. For example a Textile project might be set to instigate the designing and making of soft toys for local handicapped children/creche/or nursery. Pupils would be expected to make an analysis of the existing situation, determine specific needs, carry out research, and select appropriate solutions. In Textile lessons more emphasis could certainly be placed on serving local community needs.

Textiles can also be presented to pupils in an historical and cultural context with the purpose of raising awareness of design in society. A study of clothing and the development of the fashion industry lends itself to the nurturing of human attitudes, values, and morals. This is quite appropriate for the requirements of Technology within the National Curriculum.

Pupils must understand the purpose of the activities in which they are engaged. Many Textile projects contain a strong personal element, pupils often design and make artefacts and garments for their own use. It is relatively easy for pupils to clarify the purpose of these activities if the outcome is to satisfy their own needs. Once personal needs are recognised emphasis can be directed towards establishing a concern to satisfy the needs of others through the processes and outcomes of design and technology.

The subject of Textiles can also contribute towards the second aim, it can teach pupils to employ appropriate technological
devices. Computers should be accessible for Textile teachers. Software already exists which can be useful in Textile projects. The B.B.C. "Image" program for instance can be used as a starting point for designing. If the computer is linked to a video camera and colour printer the resultant designs can be very lively and exciting. An experimental tapestry project using the subject of "faces" was pioneered in this way as part of a first year project at the school in which I now teach. If access to computers is available this sort of software aids the process of designing and can extend imaginative possibilities. Many variations of proportion, colour, size, pattern etc. can be manipulated in just one or two lessons. This is very advantageous when time is at a premium on the Design circus.

Computer-aided sewing machines and knitting machines are also in use in some schools, and can be used effectively in G.C.S.E. and 'A' level courses.

A technological experience should offer a wide range of technologies, not just expertise in one aspect. Retaining a Textile element within the curriculum extends the possible range of experiences. Textiles deals with simple technology - "low tech", it uses well tested traditional equipment such as scissors and spindles, spinning wheels and looms, but it also aspires to high technology in the use of "Hi-Tech" equipment such as sophisticated sewing machines, knitting machines, overlockers and computers. The Textile industrialists are not lacking in their use of technology, school links with industry
through visits and work experience can help to expand technological experience. From scissors to lasers pupils who study Textiles to Upper School level should have the opportunity to learn the appropriate use of a wide range of technological equipment.

The third aim, is to include an involvement in, and an understanding of the areas of technology than can be related to designing and making. This is applicable not only to C.D.T., but also Textiles.

Gillingham (1988) defines the experience of technology as a:

"disciplined process, using resources of materials, energy and natural phenomena to achieve human purpose"

he states also that technology is about:

"helping students to become competent and confident and able to respond positively to a wide variety of situations where personal judgement and action are required to identify needs and solve problems where a range of solutions are possible"

A well planned Textile syllabus would conform to these descriptions. This research has found that the subject is a disciplined process, with its own body of esoteric knowledge. The syllabus can be ordered in a logically consistent and sequential manner beginning with the origin of fibres and the
construction of fabrics, then exploring the decoration of fabric, and lastly using the fabric in the production of artefacts and garments.

The subject relies on resources of materials and energy. For example a first year project on spinning and weaving could contain the following:

the collection of fibres for spinning, the use of energy to spin them, an investigation into the evolution of the spinning industry, experiments with spindles and spinning wheels, visits to a Textile factory, the collection of plant material for natural dyes, the dyeing process, the making of simple woven artefacts, the use of various types of loom, the achievement of human purpose in the designing and making of the practical woven item.

Almost any activity taken from a well organised Textile syllabus would satisfy these descriptions of technological experience. For example a pupil might be asked to design and make a garment for a particular purpose. Making a garment is a disciplined process, it has its own background of knowledge and technical skills, it demands a consideration of materials, it utilises the naturally occurring properties of the chosen fabric, it introduces the constraints of economy, it uses energy (in the form of the sewing machine) it satisfies the human need to clothe oneself in an appropriate way. The pupil who designs and makes a garment is asked to respond in a
positive way to make judgements, to solve problems, to transform a 2 dimensional design into a 3 dimensional reality, to achieve a fit and to find one answer amongst many possible solutions.

From this we may infer that technological experiences do take place in the Textile classroom, there is:

1. identification of problems and investigation
2. generation of ideas
3. invention and innovation
4. implementation, making and doing
5. awareness and use of technological equipment
6. decision making
7. creating solutions
8. evaluation and personal development

These activities depend on the skill of the teacher, who must make them visible activities which are open for assessment.

Certain aspects of Textiles are indeed closely aligned to a technological experience for example the nurturing of non-verbal skills. Here I believe Textiles can shine proudly. Gillingham (1988) states that:

"the use of the imagination and creativity requires students to see with their 'minds eye'. The development of this non-verbal form of thought has been characteristic of design and
technological activity, throughout history. This imagination is initially realised through drawings, diagrams, plans, models, prototypes and simulations. Eventually it is reproduced in the final form of a product artefact or system. Imaging is a distinctive feature of the creative thinking of designers and technologists, it is a form of thought different from and complementary to verbal modes. Its development forms an important aspect of technological education."

This activity of mental picturing is a necessary process for the pupil involved in a Textile project. If a pupil is required to design a woven tapestry, using the skills of weaving which he has acquired and practised in the preceding lessons, then that pupil must at first visualise his idea. The pupil might make graphic images of what he knows, and his initial picturings of mind however inconfident, may be expressed in some simple form, these can then be a spring board for new ideas, or can be rearranged, or newly composed into a new form. Creativity is thus given expression, roads are opened for divergent thinking skills. Other examples can be given too, for instance: a pupil engaged in designing his own bedroom might make a careful 2D plan on graph paper, which could later become a 3D scale model, or perhaps an idea for a garment can be conceived as a series of fashion drawings.

Non verbal imaging skills can also be stimulated by collections of interesting artefacts, such as shells, fir-cones, pieces of driftwood etc. Sound too may be useful, tapes could be
listened to. Senses other than the visual can be harnessed. Pupils can also be encouraged to search the environment in an investigative way, seeking out ideas which may be used in designs. The pupil can be encouraged to decide either in a logically reasoned, or instinctive manner, on what is appropriate for the intended purpose.

The aware teacher can use the experience of Textiles to develop non-verbal perceptive and technical skills. The limits of shape and form can be explored extensively through the enjoyment of fabrics. It is verifiable through this research that Textile teachers stand in an excellent position to actively encourage the development of non-verbal thinking and imaging skills in their pupils. This also means that Textiles has an important role within the curriculum as these skills can be useful in other subjects.

It has been suggested that Technology in the classroom is especially concerned with problem solving, and with identifying problems and recognising the need for change. There is opportunity here for a new emphasis from Textile teachers, problem solving skills can be activated by the solving of Textile problems, just as they can by solving other design problems.

Textile projects also allow pupils to use their knowledge of scientific and mathematical skills. These skills from other areas of the curriculum can be applied to Textiles studies, for
instance a dyeing project requires the practical use of chemicals for a specific purpose, a knowledge of botany is useful in identifying and collecting plant material for dyes, mathematical skills are practised in the weighing of materials and both a scientific and an artistic understanding of colour are necessary. A fabric printing exercise requires careful measurement, an understanding of the laws of pattern, and a mechanical knowledge of printing as well as an artistic approach to design work. This practising of knowledge and skills from other disciplines is yet another component of a technological experience.

Work in Textiles helps to familiarise pupils with the Design process, and the designing tasks can be appropriate to real life situations with suitable constraints of time and money applied in a realistic and meaningful way. Pupils involved in designing their own garments for instance, must be personally concerned in aspects of budget and economy. Community projects also can be planned with due regard for such matters. The National Curriculum for Technology expects pupils to generate achievable designs whilst taking into account such restraints.

To reiterate: it is possible to see that Textiles courses have a functional purpose within a Technological education, they can demonstrate a responsibility towards the basic aims. They can help to bring about an awareness of design in society, and help pupils to come to an understanding of the purpose of design activities - they can familiarise pupils with appropriate
technological equipment; and through the use of materials they can cultivate non-verbal imaging skills, encourage the development of problem solving skills, and allow for the application of scientific and mathematical knowledge.

A comparison of the Textiles Experience to the Attainment Targets of the National Curriculum

A closer scrutiny of the contents of the National Curriculum for Technology will reveal more precisely the relevance of Textiles to the school timetable of the 1990's.

Under the new proposals a pupils education is divided into 4 key stages as follows:

<table>
<thead>
<tr>
<th>Key Stage</th>
<th>Age of Pupil</th>
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<tbody>
<tr>
<td>1</td>
<td>6 - 7</td>
</tr>
<tr>
<td>2</td>
<td>8 - 11</td>
</tr>
<tr>
<td>3</td>
<td>12 - 14</td>
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<tr>
<td>4</td>
<td>15 - 16</td>
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</tbody>
</table>

A secondary school curriculum is therefore concerned with key stages 3 and 4. The content of key stage 3 is applicable to lower school level, and therefore pertains directly to the content of this research.
Within each Key stage is contained the knowledge, the skills, and the understanding which pupils of all abilities are expected to achieve. These are summarised as Attainment Targets. In Technology there are 5 recommended Attainment Targets, contained within 2 profile components. Attainment Targets 1-4 make up the Design and Technology Capability, and Attainment Target 5 applies to the Information Technology Capability.

Each Attainment Target has 10 levels, 10 statements of what pupils should know, understand and be able to do. In addition to this a program of study is outlined for each key stage. This ensures that pupils will be taught the necessary skills and processes which will enable them to meet the objectives defined in the Attainment Targets.

If we collate the relevant information for key stage 3 and then look at the first year project on Spinning, Dyeing, and Weaving which evolved through this research we can ascertain to what extent this project conforms to the new proposals. It must be remembered that a 10 week course on the Design Circus will not be expected to encompass all of the expectations. An holistic approach has to be adopted, it is hoped that pupils will achieve suitable levels across the range of Design subjects by the age of 14.
The results of this exercise can be viewed in (Appendix 8) and are summarised in fig (8). It can thus be determined that the suggested first year project is viable as part of a first year experience in Technology. It covers all aspects of the programme of study entitled "Working with materials", and within the Attainment Targets it satisfies Attainment Target 2 levels 2 - 6. It also satisfies Attainment T3 levels 2 - 6 and Attainment T4 levels 2 - 5.

Other Textile projects discussed in this research would also satisfy aspects of the programs of study, and cover the Attainment Targets to acceptable levels. Obviously the Design curriculum for any school will have to be planned as a coherent whole, with specialist teachers working together to fulfil the total requirements of the National Curriculum.

Assessing Experience in Textiles

"In recent years feedback for pupils studying Technology has often taken the form of self assessment goals, as illustrated by the example in fig 9. Pupils are requested to tick the appropriate statement in the first column, and staff tick their choice of appropriate statements in the second column. Discrepancies can then be discussed, and the pupil is graded according to the responses. A graded assessment system in CDT has also been developed, this allows pupils to achieve their own potential at their own pace, it also recognises the fact that pupils are better motivated if they know what standards
<table>
<thead>
<tr>
<th>ATTAINMENT TARGETS WHICH ARE SATISFIELD BY THE FIRST YEAR PROJECT</th>
<th>Satisfying Human Needs</th>
<th>Communicating Ideas</th>
<th>Developing and Using</th>
<th>Working with Materials</th>
<th>Key Stage 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation</td>
<td>Planning &amp; Making</td>
<td>Design &amp; Generating Opportunities</td>
<td>Identifying needs and opportunities</td>
<td>Developing &amp; Using</td>
<td>Programmes of Study Levels</td>
</tr>
</tbody>
</table>

1st Year: Spinning, Weaving & Dyeing Project
Thinking carefully about a problem - ANALYSIS

1.1 You understand part of the task. You are able to see how it might concern society.

1.2 You have understood the various parts of the problem. Have you thought of new problems?

1.3 You have carefully considered how to tackle the problem.

1.4 You have made use of some resources in solving the problem.

1.5 You have made good use of resources and explained how they helped you.

Putting a plan into operation - SYNTHESIS

2.1 You have thought about 2 different ways to solve the problem.

2.2 You have thought about more than 2 possible ways of solving the problem.

2.3 You can explain why you have chosen your solution to the problem.

2.4 You have worked hard on your solution.

2.5 You have produced a solution to the problem.

2.6 You have produced a "good" solution to the problem.

2.7 You have produced a "high quality" solution to the problem.

2.8 You have chosen the appropriate materials and used them correctly.

Looking again at the problem - EVALUATION

3.1 You have compared your solution to the original problem.

3.2 You have found that your solution solves part of the
original problem.

3.3 You are able to prove how your solution answers parts of the original problem.

3.4 You have looked for good and bad points in your solution.

3.5 You have suggested where improvements to your solution might be made.

Telling other people about your task - COMMUNICATION

4.1 You have used a suitable form of communicating.

4.2 You have used a variety of materials and ways to communicate.

4.3 You have communicated your solutions effectively.

The outside world - SOCIETY

5.1 You have shown how the problem is relevant to Society.

5.2 You have attempted to evaluate the effect your solution will have on Society.
are expected of them. The "GACDT" conforms to the standards of the National Curriculum and is consistent with the aims of the GCSE. There are 16 levels of increasing difficulty which pupils can aspire to, and level 10 is a GCSE Grade A pass. The "GACDT" provides relevant information about individual progress, and can be supplemented by computer software for 'Records of Achievement'.

Textiles has no similar accreditation system, presently most Textile examinations at GCSE level form an option of the "Art and Design" paper, or else are contained within "Home Economics". The autonomy of Textiles is in the balance, and Textile teachers need to show new initiatives in assessment procedures.

Now courses in GCSE, TVEI, and CPVE are basing development on pupil centred learning, the stress lies on skills and methods of acquiring knowledge, understanding and information, they assess pupil progress in a cumulative way. Assessments are criterion referenced, individual pupils are not compared with others, rather their assessment is a record of what they can achieve at a particular point in time. This type of assessment involves the pupils who must be aware of objectives and targets and who must be able to measure their own achievements against a list of criteria. In OCEA Maths for example pupils are asked to colour in a target once they have achieved a particular skill. Discussion with the teacher is also an integral part of this type of assessment.
Textile teachers can learn from these techniques of assessment. My own research at lower school level has led to the structure of a continuous self assessment program for Textiles. This utilises some of these principles. Pupils are issued with their own Record Cards where they can keep an account of their own learning. The approach is a graphical one encouraging non-verbal means of recording achievements in keeping with the essential nature of the subject. Pupils are required to design their own ratings system; to indicate by appropriate means their achievements of specific objectives; and to record the time spent on specific tasks; they must also chart their own progress, collect samples and make drawings.

Three classroom studies showed that pupils of mixed abilities responded positively to the scheme. Record Cards were kept with pride and enjoyment and a new sense of purpose was realised. On completion of the course each pupil owns a Record of their work which can be kept as part of a growing profile, and the teacher has gained a clear indication of individual progress.

This is a suitably dynamic approach to assessment, particularly appropriate for younger pupils in the secondary school. It is more exciting than ticking boxes, and is a less formal, though none-the-less relevant means of recording progress. An approach to Textiles for the 1990's needs to incorporate such a lively assessment procedure.
Government proposals for the next decade, throughout any given key stage, are that pupils will be assessed according to statutory arrangements at 7, 11, 14, 16. The details of these arrangements are not at the time of writing, yet published but it is clear that teachers will be expected to keep a continuous assessment of each pupil's progress through the Attainment Targets and that such record keeping will be essential for discussions with pupils and their parents. The Record cards derived through the outcome of this research have served a similar purpose and could be modified to pertain more directly to specific Attainment targets.

Aims for Textiles Teachers in the Next Decade

This research foresees that Textiles could enter into the technological future of Design, indeed certain aspects of the subject seem to be ideally suited to such development.

Textiles teachers must meet the challenge of the National curriculum by aspiring to renewed energy, necessarily innovative methodology, and autonomous assessment procedures. The traditional aims of Textiles should not be foregone, but rather revitalised. In the light of this research the following aims are suggested as a positive way forward of Textiles teachers of the 1990's.
1. To look for enlightened means of evoking creative and aesthetic responses through the use of fabrics and threads.

2. To raise personal awareness of pupils and to strive to extend this into a wider social concern.

3. To use sensitivity to the human condition as a reason for the investigation and the pursual of appropriate solutions to both personal and community problems.

4. To alter the emphasis of problem solving and encourage pupils to seek improvements in their environment.

5. To enrich communicative skills and to consider mixed media and increased opportunity for graphical expression of ideas.

6. To make use of computers as an aid to Design skills.

7. To show an essential concern for the prosperity of non verbal skills and non verbal thinking abilities.

8. To engage in developing and inspiring making and doing activities.

9. To provide security for the implementation of ideas.
10. To discern ways of raising perceptual awareness in pupils.

11. To seek sophisticated means of refining the technical skills of pupils.

12. To encourage the application of relevant technical, scientific, mathematical, humanitarian and artistic knowledge.

13. To endeavour to record, and to evaluate achievement in a purposeful and meaningful way.
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Appendices

Textiles in the Lower School

A study of teaching methods and assessment procedures
APPENDIX ONE

CLASSROOM RESEARCH 1987

The classroom research took place during the summer term. One first year group were issued with Textile Achievement Record Cards. The group consisted of 19 first year mixed ability pupils. Time was allowed at the end of each lesson to keep the Record Cards up to date. The total amount of time was somewhat reduced by unscheduled events which took place during the term and resulted in missed lessons. However most of the pupils completed the course work.

At the end of the session the Record Cards were collected in and each pupil was able to discuss his/her card with the teacher. The teacher was then able to complete a report on each pupil. The reports are collected in this Appendix.

The Reports were kept by the teacher as a reference for future programs of work. They were not intended to be issued to parents, although the information contained in them was useful for writing the standard issue school report. The breakdown of information into the eight categories was very helpful for the teacher in identification of strengths and weaknesses. They were also a useful reference for the teacher to consult before Parents evening.

The Reports clearly indicated which objectives had been achieved by which child. It was clear to see that all the pupils had some measure of success, confirming the contention that practical activities in "Textiles" can improve non-verbal abilities.
MANIPULATIVE SKILLS
Joanna found some problems as she is a left handed pupil. However she overcame problems with scissors and was able to cope with the weaving stitches.

COMMUNICATIVE SKILLS
Joanna was able to communicate her ideas clearly by drawings and graphs. She very much enjoyed this aspect of Design, spending time on completing her Record Card in a colourful way.

CREATIVITY
Joanna had many ideas and was able to generate her own responses to new situations. She was quickly able to employ new skills in an imaginative way.

INVESTIGATIVE ENQUIRY
Joanna was able to look for ideas and information, both at home and at school. She was eager to find plant materials for the dyeing project.

IMPLEMENTATION
Joanna was able to visualize her practical activities; she could plan her design work and carry it through to completion.

DISCRIMINATION
This pupil was able to make informed choices about materials, and could choose the appropriate tools to complete her craft work.

PERCEPTUAL AWARENESS
Joanna was a sensitive girl, able to use her surroundings as a stimulus for her craft work.

TECHNICAL SKILLS
These were advanced in Joanna's case. She had a sound understanding of colour, and shape and texture, and used these to advantage in her work.

GENERAL COMMENTS
Joanna benefitted from the course she was able to use her imaginative skills, and enjoyed the weaving project because of this aspect. She quickly learned how to spin and was able to produce a fine yarn after only six lessons. She was proud of her work and was glad to show her parents her Record Card.
MANIPULATIVE SKILLS
Gayna had some problems with manipulative skills. She found particular difficulties with mastering the weaving technique. However, after persistent effort she achieved plain weave and some plain weave.

COMMUNICATIVE SKILLS
Gayna lacked confidence in drawing and other graphical skills. She enjoyed the colouring part of the Record Card.

CREATIVITY
Gayna found it difficult to initiate her own ideas, and needed much encouragement to proceed with tasks. She liked choosing yarns and colours for her weaves and showed more confidence in this.

INVESTIGATIVE ENQUIRY
Gayna did not pursue this aspect of the course, she relied on yarns which were available in school. Repeated absence prevented Gayna from attempting spinning and dyeing, but she was able to observe these activities.

IMPLEMENTATION
Gayna was able to plan her weaving activity, and carried some of her ideas through to completion. Limited ability and absence prevented completion of work.

DISCRIMINATION
Gayna was able to make choices concerning colour and yarn. She was able to choose the correct tools for her weaving project.

PERCEPTUAL AWARENESS
An area of weakness for Gayna. She needed to make more use of environmental stimuli, for instance. She could have found more interesting weft yarns to use.

TECHNICAL SKILLS
Gayna's strongest skills were in her understanding of colour and texture.

GENERAL COMMENTS Gayna was a weak pupil of limited ability. The course was beneficial to her as she made achievements in a new craft which she had not tried before. Her poor manipulative skills were much exercised by the dexterity required in weaving. She was pleased with the weaving work which she completed.
NAME  CINDY BRUNSDEN  TEXTILES REPORT

MANIPULATIVE SKILLS
Cindy was able to achieve 3 out of 4 weaving processes. She found the technique of spinning very difficult to master.

COMMUNICATIVE SKILLS
Cindy did not find this aspect of the course easy. Her Record Card was not completed although she did attempt several tasks.

CREATIVITY
Cindy was able to suggest some ideas for her own work when prompted but she did not work on her own initiative.

INVESTIGATIVE ENQUIRY
Cindy did not pursue this part of the course as she was content to use school materials and did not search for plants or weft yarns at home.

IMPLEMENTATION
Cindy was capable of planning a practical project, but motivation was lacking and finishing her work was a chore.

DISCRIMINATION
Cindy was able to choose colours and weft materials with confidence. She could also identify the correct tools for her work.

PERCEPTUAL AWARENESS
Cindy was aware of environmental stimuli, but was not concerned to use them in her work, unless prompted to do so.

TECHNICAL SKILLS
Cindy was able to use her knowledge of colour and texture to complete her weaving.

GENERAL COMMENTS
Cindy did not enjoy keeping a Record of her work. She found evaluation of her own abilities difficult. The Record Card became a useful indication of how much time she actually wasted. Achievement was below the expected level for her ability.
NAME ANNETTE FARMER Textiles Report

Manipulative Skills
Annette gained confidence in her own ability and was pleased when she mastered the skills of spinning and weaving.

Communicative Skills
Annette was of an average ability, but lacking in confidence. She shied away from drawing but was able to cope with producing graphs and symbols.

Creativity
Annette was able to generate her own ideas and work on her own initiative. She took her weaving home several times and enjoyed working on it without help.

Investigative Enquiry
Annette was alert to the possibilities of finding yarns and related materials out of school. She searched for her own materials for dyeing.

Implementation
Annette planned her work thoroughly and was able to implement her ideas and see her projects through to completion.

Discrimination
Annette had a discriminative approach to selection of yarns and materials. She was able to use the correct tools for her work.

Perceptual Awareness
Annette was aware of her surroundings and could use them as a stimulus for her work, particularly with regard to colour, taking some ideas from landscape etc.

Technical Skills
These improved as the course progressed. Annette showed a keen appreciation of texture and colour and used her knowledge of these in her weaving project.

General Comments
The course was useful to Annette; she became involved and interested in both spinning and weaving. Initially Annette found the record keeping rather a chore but at the end of the course she was pleased to look back and note her achievements.
NAME ZOE MACE TEXTILES REPORT

MANIPULATIVE SKILLS
Zoe mastered 3 out of 4 processes in the weaving topic. Her dexterity improved considerably during the course and she was particularly competent with the spinning process.

COMMUNICATIVE SKILLS
Zoe enjoyed drawing and making colourful charts. Although she found planning her recording quite difficult, she made an attempt at most aspects of the Record Card.

CREATIVITY
Zoe enjoyed the process of making, but was sometimes stuck for ideas and needed prompting. She was more confident in her use of colour and was quite original in her choices.

INVESTIGATIVE ENQUIRY
Zoe looked for her own plant materials to use as dyes. She was also competent in her searching for wool yarns bringing several items in to school from home.

IMPLEMENTATION
Zoe could plan a practical project and with some help and guidance was able to implement her ideas and complete her work to a satisfactory standard.

DISCRIMINATION
Zoe was able to make informed choices about her work. She was able to use the correct tools for her projects, and enjoyed choosing colours and yarns.

PERCEPTUAL AWARENESS
Zoe needed some help to notice environmental stimuli, but once prompted was able to proceed on her own initiative.

TECHNICAL SKILLS
These improved as the course progressed. Zoe was particularly confident in her use of colour and texture. Line and form needed some guidance.

GENERAL COMMENTS
Zoe benefited from keeping the Record card. She was a slow worker, not used to succeeding and was very pleased to be able to prove her achievements. She worked very hard throughout the course.
MANIPULATIVE SKILLS
Neil’s manipulative skills were very poor. He struggled to master basic plain weaving, and found it difficult to control the weft thread, and handle yarn.

COMMUNICATIVE SKILLS
These were very weak, Neil was not confident about completing the Record Card, although he did produce a fine drawing of his tapestry weaving.

CREATIVITY
Neil had to work hard to find creative ideas, he mostly suffered from a lack of confidence, and needed prompting and guidance in this area.

INVESTIGATIVE ENQUIRY
Neil did not pursue this with any enthusiasm, preferring to rely on school materials.

IMPLEMENTATION
Neil was disappointed with his weaving, and would have liked a second attempt, but time did not allow this.

DISCRIMINATION
Neil lacked confidence when making choices and was unclear about appropriate tools for his work.

PERCEPTUAL AWARENESS
This pupil was not naturally aware of environmental stimuli, he needed constant help to utilize ideas.

TECHNICAL SKILLS
These were weak, but improved during the course. His best achievements were in use of colour.

GENERAL COMMENTS
Neil was a pupil of limited ability in Design. He benefitted from this course by improving several skills, and he liked the idea of having a Record of his work, although he struggled to complete it, and worried about some aspects of the Recording work.
NAME ANDREW MARPLES TEXTILES REPORT

MANIPULATIVE SKILLS
Andrew mastered 3 out of 4 weaving processes, he learned how to handle the woven fleece and was able to spin a satisfactory yarn in 5 lessons.

COMMUNICATIVE SKILLS
Andrew was able to communicate his ideas and progress in a clear form. He enjoyed designing symbols for the ratings.

CREATIVITY
Andrew was able to generate his own ideas and could then proceed with some help.

INVESTIGATIVE ENQUIRY
Andrew did not actively pursue this aspect of the course.

IMPLEMENTATION
This pupil was able to plan and execute his work to a satisfactory standard.

DISCRIMINATION
Andrew showed discrimination in his choice of procedure and tools. He found choice of colour quite difficult.

PERCEPTUAL AWARENESS
Andrew needed to be reminded of possible stimuli from the environment. He was able to accept advice about this.

TECHNICAL SKILLS
Andrew showed a keen knowledge of line and shape, but was rather confused about colour and texture, the dyeing project was interesting for him in this respect.

GENERAL COMMENTS
Andrew became much more aware of the textural qualities of yarn. The Record Cards established Andrew's competence in the technical skills of weaving and spinning. He was satisfied with his own progress, and particularly enjoyed the natural dyeing topic.
MANIPULATIVE SKILLS
Sharon completed all four weaving processes, and showed a keen dexterity in the spinning process, handling yarn and spindle competently.

COMMUNICATIVE SKILLS
Sharon was able to communicate her ideas in a graphical way, making good use of colour in her work on the Record Cards.

CREATIVITY
She showed a bright capability in generating ideas and was able to work on her own initiative.

INVESTIGATIVE ENQUIRY
Sharon showed an imaginative quest for this aspect of the course, seeking out yarns from friends and family, and searching for plant materials for dyestuff.

IMPLEMENTATION
This pupil was able to implement her own ideas. She planned carefully and completed all three projects.

DISCRIMINATION
Sharon was able to make wise choices about colour and texture in her work. She could use the appropriate tests for the projects concerned.

PERCEPTUAL AWARENESS
Sharon was able to make use of environmental stimuli in her work. She was keen to investigate new materials.

TECHNICAL SKILLS
She showed technical competence, particularly with regard to colour and texture in her work.

GENERAL COMMENTS
Sharon enjoyed keeping the Record Card because she was able to review her own progress, and chart her successes. She found this very rewarding, and remained enthusiastic throughout the course.
MANIPULATIVE SKILLS
Dany was a capable pupil. He mastered all 4 of the weaving processes, and was able to spin a satisfactory yarn in six lessons.

COMMUNICATIVE SKILLS
Dany was able to communicate his ideas in a clear, concise and graphical way. He enjoyed keeping a neat and colourful record.

CREATIVITY
He showed an imaginative ability to generate his own ideas for practical work. Dany enjoyed designing the symbols for the ratings.

INVESTIGATIVE ENQUIRY
Dany remained interested in the projects and was keen to search out of school for useful yarns and ideas.

IMPLEMENTATION
Dany's work was well planned and executed with care. He completed all projects and used his time most effectively.

DISCRIMINATION
This pupil was able to make discriminating checks about yarns and materials. He was able to identify the correct tools for his work.

PERCEPTUAL AWARENESS
Dany used his environment in a positive way, looking for ideas for his practical projects. He was keen to find dye stuff to colour his yarn.

TECHNICAL SKILLS
These were well managed. Dany was particularly capable at utilizing line, colour and texture in his work.

GENERAL COMMENTS
This project was beneficial to Dany, he was eager to experiment with new skills and the Record Card provided motivation for his continued perseverance.
MANIPULATIVE SKILLS
Amanda was very skillful at both spinning and weaving and quickly mastered the basic techniques.

COMMUNICATIVE SKILLS
These were very advanced. Amanda was able to complete charts and drawings in a clear and appropriate way.

CREATIVITY
Amanda had inspired ideas of her own and was able to work on her own initiative. She was very confident in her use of colour and texture.

INVESTIGATIVE ENQUIRY
This pupil was keen to pursue her work out of school, taking an interest in relevant materials, and collecting materials from home.

IMPLEMENTATION
Amanda made a sensible plan for her work, using her time effectively and completing all her projects. Work was skillfully produced with care for detail.

DISCRIMINATION
A very discriminating pupil, able to make informed choices about her work, and able to decide confidently on which tools to use.

PERCEPTUAL AWARENESS
Very alert pupil, keen to use all stimuli to their best advantage.

TECHNICAL SKILLS
Quite advanced for her age group. Amanda was able to use her knowledge of shape, form, colour and texture to produce a pleasing piece of tapestry work.

GENERAL COMMENTS
The Record Card helped to sustain Amanda's interest in the course. She was very keen to complete it, and obviously enjoyed the challenge of devising appropriate charts and symbols.
A very successful project.
MANIPULATIVE SKILLS
These were quite good and improved during the course. Simon mastered all but one of the weaving processes, and spent a long time conquering spinning techniques.

COMMUNICATIVE SKILLS
Simon communicated his ideas in a graphic and skillful way. He enjoyed planning charts and designing symbols. Simon completed the Record with a keen interest throughout.

CREATIVITY
Simon had ideas of his own about his work and working methods. He was able to work on his own initiative.

INVESTIGATIVE ENQUIRY
Simon investigated many aspects of his projects at home. He was interested in spinning, and natural dyes, and collected plant material from home.

IMPLEMENTATION
Work was carried through with a clear and decisive attitude. All aspects of course work were completed.

DISCRIMINATION
Simon showed a discriminating mind in choosing yarns and selecting colours. Very confident pupil.

PERCEPTUAL AWARENESS
Simon was aware of environmental stimuli and used these in his work.

TECHNICAL SKILLS
Competent use of knowledge of colour, texture, and shape.

GENERAL COMMENTS
The Record Card encouraged Simon to maintain interest in his work. He wanted to succeed and enjoyed the personal challenge of keeping the Record.
MANIPULATIVE SKILLS
Amy mastered 3 out of 4 weaving processes, but could not produce really neat unaided. She spent most of her time on the weaving project.

COMMUNICATIVE SKILLS
These were probably adequate, but Amy was lazy about completing her Record card, and disliked drawing.

CREATIVITY
Amy had some ideas of her own but was very poorly motivated and would not proceed of her own accord.

INVESTIGATIVE ENQUIRY
Amy did not pursue this out of school, and was content to rely on school materials for her weaving.

IMPLEMENTATION
This was very slow. Amy did have a plan for her weaving but struggled to complete it, she often wasted time.

DISCRIMINATION
Amy was capable of making informed choices about colour and materials, and she was aware of the correct tools for her work.

PERCEPTUAL AWARENESS
Amy did not take a keen interest in her surroundings, she was rather more interested in herself. Constant prompting needed.

TECHNICAL SKILLS
These were adequate, but not practised. Amy was capable of using her knowledge of colour and texture in her weaving work.

GENERAL COMMENTS
Amy was not involved with her work. Several personal problems hindered her progress. The Record Card probably produced some incentive, she was quite upset that it wasn't completed at the end of the course. It served as a good illustration of lack of effort.
MANIPULATIVE SKILLS
These were performed slowly and timidly, much confidence was gained over the course.

COMMUNICATIVE SKILLS
Rebecca was neat and careful in this respect, but very slow. She always ran out of time before completing her Record.

CREATIVITY
Some ideas were initiated by Rebecca, but she lacked the confidence to proceed without a tremendous amount of help.

INVESTIGATIVE ENQUIRY
Rebecca showed interest in this aspect. Taking her weaving home, and looking for plant dyes at home.

IMPLEMENTATION
Good intentions, but very slow pace. Rebecca did complete her weaving, but used a lot of extra time.

DISCRIMINATION
Very sensitive and discerning pupil. Able to make informed choices about colour and texture, but needed reassuring quite often.

PERCEPTUAL AWARENESS
A keen awareness of surroundings, and Rebecca was able to use stimuli in her work.

TECHNICAL SKILLS
These were carefully attended to, Rebecca showed a sound knowledge of colour, shape, and texture in her work.

GENERAL COMMENTS
The Record Card was beneficial to Rebecca who was aware of her slowness and afraid of failure. The Record Card proved her success at weaving and Rebecca was very satisfied with her tapestry project.
MANIPULATIVE SKILLS
These were weak. Matthew completed only two or three processes. He did not attempt spinning.

COMMUNICATIVE SKILLS
Matthew delayed completing his Record Card, although he could draw reasonably well, and did enjoy using colour.

CREATIVITY
Matthew was able to find ideas for his weaving with some help and guidance. He found visualizing practical projects difficult.

INVESTIGATIVE ENQUIRY
Matthew did not pursue this aspect of the course, preferring to rely on school materials.

IMPLEMENTATION
Matthew planned a woven tapestry and completed it, although organization was haphazard.

DISCRIMINATION
Matthew found it difficult to choose colours and yarns. He was often confused about tools and processes.

PERCEPTUAL AWARENESS
Not a very alert pupil. Matthew needed prompting and help to notice environmental stimuli.

TECHNICAL SKILLS
Matthew improved some skills on this course. Especially those related to colour and texture.

GENERAL COMMENTS
Matthew lacked motivation and had to be coaxed to fill in any of his Record, preferring to sit and daydream. Some achievements were highlighted by the Record; some confidence was gained. Concentration span extremely limited.
MANIPULATIVE SKILLS
Lorraine mastered three out of four weaving processes, and acquired the ability to spin a satisfactory yarn.

COMMUNICATIVE SKILLS
Lorraine worked hard to complete her Record Card in an attractive and informative manner. Although of poor general ability, Lorraine did very well in this aspect of the course.

CREATIVITY
Lorraine had several lively and imaginative ideas, but needed some help to focus her mind on designing her tapestry picture.

INVESTIGATIVE ENQUIRY
Lorraine showed interest and enthusiasm in searching for materials out of school.

IMPLEMENTATION
She was able to complete all aspects of the course, and was particularly pleased with her weaving project.

DISCRIMINATION
This pupil showed a keen discriminative mind for colour and texture. She was able to choose without help and produced balanced Design work.

PERCEPTUAL AWARENESS
Lorraine was very alert to her surroundings and could use stimuli from the environment in her work.

TECHNICAL SKILLS
Although Lorraine's knowledge of technical skills was quite weak, she progressed well, utilizing her strengths of colour sense and awareness of textural qualities.

GENERAL COMMENTS
Very pleasing work. Lorraine gained a lot from experiencing this course. She was eager to conquer her tendency to chatter so that she could gain on her Record Card, even moving voluntarily away from her friends so that she could work more diligently. The Record Card inspired and motivated this pupil to much higher standards.
NAME  LIAM SMART  TEXTILES REPORT

MANIPULATIVE SKILLS
Liam mastered all 4 weaving processes, and thoroughly enjoyed this project. He was able to spin a reasonable yarn.

COMMUNICATIVE SKILLS
These were not well developed. Liam did not feel confident about drawing or using colour. Line work was satisfactory.

CREATIVITY
Liam had some imaginative ideas, and could develop these with some help.

INVESTIGATIVE ENQUIRY
Liam collected some plant material for his dyeing project.

IMPLEMENTATION
This pupil was quite active in practical lessons, but did not enjoy recording his progress.

DISCRIMINATION
Liam was able to choose his own yarns and decide which colours to utilize in his work.

PERCEPTUAL AWARENESS
With some prompting Liam managed to make good use of the classroom environment.

TECHNICAL SKILLS
He was able to use his knowledge of colour and shape and texture, and improve these skills.

GENERAL COMMENTS
Liam was involved with the materials in the course. He enjoyed the processes involved and the Record Card helped to identify his problem areas.
NAME  NEIL SMITH  TEXTILES REPORT

MANIPULATIVE SKILLS
Very weak. Neil found it difficult to hold the bodkin for weaving, and could not cope with even basic processes.

COMMUNICATIVE SKILLS
Very limited, with considerable coaxing he completed his Record for weaving, but was very reluctant to do any work at all.

CREATIVITY
Neil found imagination of practical ideas almost impossible, he wanted to be given ideas, not think of them himself.

INVESTIGATIVE ENQUIRY
Neil did not pursue this element of the course, preferring to rely on school materials. Effort was lacking.

IMPLEMENTATION
Slow and unconcerned, Neil was often wasting time instead of working. His weaving was eventually completed.

DISCRIMINATION
This pupils skills in aesthetic choices were very poor. He needed alot of help to make decisions.

PERCEPTUAL AWARENESS
Neil was surprisingly alert in this respect, using the view from the window as stimulus for his tapestry picture.

TECHNICAL SKILLS
These were not well developed. Neil needed help to use his knowledge to compose a practical project.

GENERAL COMMENTS
Poor effort. Negative attitude. Neil was very sure that he didn't want to do a "girls" subject. The Record Card helped to identify several weaknesses.

MANIPULATIVE SKILLS
Paul mastered 3 out of 4 weaving process, and proved to be confident at spinning yarn, although this was more difficult than he expected.

COMMUNICATIVE SKILLS
Very well expressed. Paul enjoyed designing symbols, and charts and liked the challenge of the Record Card.

CREATIVITY
This pupil had many creative ideas and was able to focus on an imaginative topic for his tapestry.

INVESTIGATIVE ENQUIRY
Paul was keen to look for weft materials and dyestuff out of school.

IMPLEMENTATION
Paul was capable at implementing his ideas, being able to work towards his intention in a competent and sure way.

DISCRIMINATION
A discerning pupil able to make informed choices, or ask appropriate questions before choosing. Good use of colour.

PERCEPTUAL AWARENESS
Keen awareness. Paul looked everywhere for ideas and enjoyed finding unusual stimuli to use in his work.

TECHNICAL SKILLS
These improved throughout the course. Paul tried hard to increase his knowledge and improve his standards.

GENERAL COMMENTS
The Record Card was a useful tool for Paul, who enjoyed the challenge of achieving definite goals. It sustained motivation for this academic pupil.
MANIPULATIVE SKILLS
Mikila completed 3 out of 4 weaving processes, and was also able to spin a reasonable yarn.

COMMUNICATIVE SKILLS
These needed some practice. Mikila did not like drawing, and found designing symbols difficult.

CREATIVITY
She was an imaginative pupil, able to think of suitable ideas for her weaving project.

INVESTIGATIVE ENQUIRY
Mikila was able to look for wett yarns at home, and was also interested in finding dyestuffs.

IMPLEMENTATION
Good effort to complete work, she carefully kept to her ideas and made steady progress.

DISCRIMINATION
Mikila was able to choose suitable yarns and colours for her work.

PERCEPTUAL AWARENESS
Mikila was aware of the classroom environment and used it positively.

TECHNICAL SKILLS
These improved during the course. Colour and texture were her best investments.

GENERAL COMMENTS
A beneficial course. Mikila was able to complete most of the course, but had some problems with filling in the Record. Weaknesses were in communication skills, this was identified specifically because of the Record keeping.
APPENDIX TWO

This Appendix contains the Questionnaire which was completed by pupils at the end of the first classroom study.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.

Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? **YES**.

2.(a) Have you enjoyed the projects which you have done? **YES**.
2.(b) Which was your favourite project? **The bedroom**.

3. Have you learnt some things which you did not know before? **YES**.

4. Did you always understand exactly what you had to do? **YES**.

5. If you did not understand something, were you able to ask questions? **YES**.

6. Was your teacher helpful if you were having problems with your work? **YES**.

7. Did you ever feel "too scared" to ask something in the lesson? **NO**.

8. Do you think that keeping a "Record of Achievement" is a good idea? **YES**. Explain your answer. **You can look back to see what you have done.**

9. Did you find it difficult to "evaluate" or mark your own work? **YES**.

10. Do you think it is a good idea to mark your own work? **YES**.

11. Were you pleased with your Design work? **YES**.

12. Is there anything you would like to change in your Design lessons? **NO**. Could they be improved in some way? **Don't know**.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? quite
2. (a) Have you enjoyed the projects which you have done? yes
(b) Which was your favourite project? spinning
3. Have you learnt some things which you did not know before? no
4. Did you always understand exactly what you had to do? yes
5. If you did not understand something, were you able to ask questions? yes
6. Was your teacher helpful if you were having problems with your work? yes
7. Did you ever feel "too scared" to ask something in the lesson? no
8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. yes to see how well you are
9. Did you find it difficult to "evaluate" or mark your own work? no
10. Do you think it is a good idea to mark your own work? yes
11. Were you pleased with your Design work? yes
12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? no.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons?  yes
2. (a) Have you enjoyed the projects which you have done? yes
2. (b) Which was your favourite project? The bedrooms
3. Have you learnt some things which you did not know before? yes
4. Did you always understand exactly what you had to do? no
5. If you did not understand something, were you able to ask questions? yes
6. Was your teacher helpful if you were having problems with your work? yes
7. Did you ever feel "too scared" to ask something in the lesson? no
8. Do you think that keeping a "Record of Achievement" is a good idea? not sure
   Explain your answer.
9. Did you find it difficult to "evaluate" or mark your own work? no
10. Do you think it is a good idea to mark your own work? yes
11. Were you pleased with your Design work? yes
12. Is there anything you would like to change in your Design lessons? no
   Could they be improved in some way? don't know.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Yes.

2.(a) Have you enjoyed the projects which you have done? Yes.
2.(b) Which was your favourite project? "Weaving & Spinning."

3. Have you learnt some things which you did not know before? Yes.

4. Did you always understand exactly what you had to do? Yes.

5. If you did not understand something, were you able to ask questions? Yes.

6. Was your teacher helpful if you were having problems with your work? Yes.

7. Did you ever feel "too scared" to ask something in the lesson? No.

8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. Well yes because you know how hard you worked and so does the teacher.

9. Did you find it difficult to "evaluate" or mark your own work? No.

10. Do you think it is a good idea to mark your own work? It appears.

11. Were you pleased with your Design work? Yes quite pleased.

12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? I don't know.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons?  
   
2.(a) Have you enjoyed the projects which you have done?  
2.(b) Which was your favourite project?  

3. Have you learnt some things which you did not know before?  

4. Did you always understand exactly what you had to do?  

5. If you did not understand something, were you able to ask questions?  

6. Was your teacher helpful if you were having problems with your work?  

7. Did you ever feel "too scared" to ask something in the lesson?  

8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer.  
   
9. Did you find it difficult to "evaluate" or mark your own work?  

10. Do you think it is a good idea to mark your own work?  

11. Were you pleased with your Design work?  

12. Is there anything you would like to change in your Design lessons? Could they be improved in some way?  
   

YES YES Lettering YES NO YES NO YES NO YES NO
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.

Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons?
   Yes, I think so.

2. (a) Have you enjoyed the projects which you have done?
   Most of them, I think.

2. (b) Which was your favourite project?
   Weaving.

3. Have you learnt some things which you did not know before?
   Definitely.

4. Did you always understand exactly what you had to do?
   Not really.

5. If you did not understand something, were you able to ask questions?
   Yes.

6. Was your teacher helpful if you were having problems with your work?
   Yes.

7. Did you ever feel "too scared" to ask something in the lesson?
   Of course not.

8. Do you think that keeping a "Record of Achievement" is a good idea?
   Explain your answer. Yes. I do. It lets teachers keep a check on what people are doing.

9. Did you find it difficult to "evaluate" or mark your own work?
   Yes, I think so.

10. Do you think it is a good idea to mark your own work?
    No. Teachers should.

11. Were you pleased with your Design work?
    It was O.K.

12. Is there anything you would like to change in your Design lessons?
    Could they be improved in some way?
    Multi-choice design lessons wouldn't be bad. Choose what you want to do.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.

Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? YES

2. (a) Have you enjoyed the projects which you have done? YES
2. (b) Which was your favourite project? Weaving

3. Have you learnt some things which you did not know before? YES

4. Did you always understand exactly what you had to do? No

5. If you did not understand something, were you able to ask questions? YES

6. Was your teacher helpful if you were having problems with your work? YES

7. Did you ever feel "too scared" to ask something in the lesson? No

8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. YES so the teachers can see how much progress you have made.

9. Did you find it difficult to "evaluate" or mark your own work? YES

10. Do you think it is a good idea to mark your own work? No

11. Were you pleased with your Design work? YES

12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? No.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Sometimes

2.(a) Have you enjoyed the projects which you have done? Yes
2.(b) Which was your favourite project? Weaving

3. Have you learnt some things which you did not know before? Yes

4. Did you always understand exactly what you had to do? No

5. If you did not understand something, were you able to ask questions? Sometimes

6. Was your teacher helpful if you were having problems with your work? Yes

7. Did you ever feel "too scared" to ask something in the lesson? Yes

8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. Yes so that the teacher can see how your progress is

9. Did you find it difficult to "evaluate" or mark your own work? Yes

10. Do you think it is a good idea to mark your own work? No

11. Were you pleased with your Design work? Yes

12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? No
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Yes.

2. (a) Have you enjoyed the projects which you have done? Yes
   (b) Which was your favourite project? Weaving

3. Have you learnt some things which you did not know before? Yes.

4. Did you always understand exactly what you had to do? Yes.

5. If you did not understand something, were you able to ask questions? Yes.

6. Was your teacher helpful if you were having problems with your work? Yes.

7. Did you ever feel "too scared" to ask something in the lesson? Yes.

8. Do you think that keeping a "Record of Achievement" is a good idea? No
   Explain your answer. Because you want to do it copy and you want know how to do it.

9. Did you find it difficult to "evaluate" or mark your own work? Yes.

10. Do you think it is a good idea to mark your own work? No.

11. Were you pleased with your Design work? Yes, and No

12. Is there anything you would like to change in your Design lessons? No
    Could they be improved in some way? No.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Yes
2. (a) Have you enjoyed the projects which you have done? No
2. (b) Which was your favourite project? Summer Project
3. Have you learnt some things which you did not know before? Yes
4. Did you always understand exactly what you had to do? No
5. If you did not understand something, were you able to ask questions? Yes
6. Was your teacher helpful if you were having problems with your work? Yes
7. Did you ever feel "too scared" to ask something in the lesson? No
8. Do you think that keeping a "Record of Achievement" is a good idea? No because it wasn't very good
9. Did you find it difficult to "evaluate" or mark your own work? Yes a bit
10. Do you think it is a good idea to mark your own work? No
11. Were you pleased with your Design work? No
12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? Yes
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Yes

2.(a) Have you enjoyed the projects which you have done? There are all right.
2.(b) Which was your favourite project? Young

3. Have you learnt some things which you did not know before? Not really

4. Did you always understand exactly what you had to do? Yes

5. If you did not understand something, were you able to ask questions? Yes

6. Was your teacher helpful if you were having problems with your work? Yes

7. Did you ever feel "too scared" to ask something in the lesson? No

8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. Yes, because you can look back at the end of the year and see what you have been doing.

9. Did you find it difficult to "evaluate" or mark your own work? No

10. Do you think it is a good idea to mark your own work? Yes

11. Were you pleased with your Design work? Yes

12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? Not really
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles. Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Yes
2. (a) Have you enjoyed the projects which you have done? Yes
2. (b) Which was your favourite project? Weaving
3. Have you learnt some things which you did not know before? Yes a little
4. Did you always understand exactly what you had to do? Not quite
5. If you did not understand something, were you able to ask questions? Yes
6. Was your teacher helpful if you were having problems with your work? Yes
7. Did you ever feel "too scared" to ask something in the lesson? No
8. Do you think that keeping a "Record of Achievement" is a good idea? Yes
   Explain your answer. A good idea
9. Did you find it difficult to "evaluate" or mark your own work? Yes
10. Do you think it is a good idea to mark your own work? Yes
11. Were you pleased with your Design work? Not really
12. Is there anything you would like to change in your Design lessons? Could they be improved in some way?
   No but I could do better
   on my weaving.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Yes.
2. (a) Have you enjoyed the projects which you have done? Yes.
2. (b) Which was your favourite project? Weaving.
3. Have you learnt some things which you did not know before? Spinning and Dying.
4. Did you always understand exactly what you had to do? Yes sometimes.
5. If you did not understand something, were you able to ask questions? Yes.
6. Was your teacher helpful if you were having problems with your work? Very.
7. Did you ever feel "too scared" to ask something in the lesson? Not at all.
8. Do you think that keeping a "Record of Achievement" is a good idea? Yes because it helped me to think back on what I had done.
9. Did you find it difficult to "evaluate" or mark your own work? No.
10. Do you think it is a good idea to mark your own work? No not really.
11. Were you pleased with your Design work? Yes.
12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? Not really because I think it is organised good already.
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.

Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? **YES**
2. (a) Have you enjoyed the projects which you have done? **YES**
   (b) Which was your favourite project? **Weaving**
3. Have you learnt some things which you did not know before? **Yes**
4. Did you always understand exactly what you had to do? **Yes**
5. If you did not understand something, were you able to ask questions? **Yes**
6. Was your teacher helpful if you were having problems with your work? **Yes**
7. Did you ever feel "too scared" to ask something in the lesson? **No**
8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. **Yes because you can keep a record of what you have done.**
9. Did you find it difficult to "evaluate" or mark your own work? **No**
10. Do you think it is a good idea to mark your own work? **No**
11. Were you pleased with your Design work? **Yes**
12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? **No, because they are good as they are.**
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.

Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Yes
2. (a) Have you enjoyed the projects which you have done? Yes
2. (b) Which was your favourite project? Weaving, because it was quite interesting.
3. Have you learnt some things which you did not know before? Yes, I have learnt different stitches.
4. Did you always understand exactly what you had to do? Yes.

5. If you did not understand something, were you able to ask questions? Yes, Miss Wain is very helpful.
6. Was your teacher helpful if you were having problems with your work? Yes, she explained everything to you.
7. Did you ever feel "too scared" to ask something in the lesson? No, because she doesn't tell you off often unless you are naughty.
8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. Yes, because you can keep a record of what you have done, and how well you have done it.
9. Did you find it difficult to "evaluate" or mark your own work? No.

10. Do you think it is a good idea to mark your own work? No, because you could put it as excellent when it quite bad.
11. Were you pleased with your Design work? Yes, when I took my folder home, my mum and dad liked the work that I have done too.
12. Is there anything you would like to change in your Design lessons? Could they be improved in some way? No, they are quite interesting as they are.
These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? **YES**
2. (a) Have you enjoyed the projects which you have done? **YES**
2. (b) Which was your favourite project? *Dying (Spinning)*
3. Have you learnt some things which you did not know before? **YES**
4. Did you always understand exactly what you had to do? **No, not always**
5. If you did not understand something, were you able to ask questions? **YES**
6. Was your teacher helpful if you were having problems with your work? **YES, most of the time.**
7. Did you ever feel "too scared" to ask something in the lesson? **No**
8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. **Yes, because if you do a good piece of work the teacher would see how good it was.**
9. Did you find it difficult to "evaluate" or mark your own work? **No**
10. Do you think it is a good idea to mark your own work? **No**
11. Were you pleased with your Design work? **YES**
12. Is there anything you would like to change in your Design lessons? **No**, Could they be improved in some way? **No**
DESIGN QUESTIONNAIRE

These questions are about your Design work, in Textiles.
Please answer as truthfully as you can.

1. Have you worked hard this term in Design lessons? Fairly hard in most lessons.
2. (a) Have you enjoyed the projects which you have done? YES
2. (b) Which was your favourite project? Dying
3. Have you learnt some things which you did not know before? YES quite a lot
4. Did you always understand exactly what you had to do? Most of the time
5. If you did not understand something, were you able to ask questions? YES, always
6. Was your teacher helpful if you were having problems with your work? YES
7. Did you ever feel "too scared" to ask something in the lesson? NO
8. Do you think that keeping a "Record of Achievement" is a good idea? Explain your answer. YES because you know what you can and can't do.
9. Did you find it difficult to "evaluate" or mark your own work? YES because I was biased towards my work.
10. Do you think it is a good idea to mark your own work? NO
11. Were you pleased with your Design work? YES
12. Is there anything you would like to change in your Design lessons? NO
Could they be improved in some way? NO not really.
APPENDIX 3

A sample of the completed Record Cards for the First Year Study.
textiles' achievement record

name

Simon Palmer
what to do

1. Design a YES/NO symbol. Use as required.
2. Design a rating system to show FAIR, GOOD, EXCELLENT. Use when needed.
3. Record the number of YES answers you make, and the number of each rating.
4. Complete each section carefully. Good effort will be commended.

<table>
<thead>
<tr>
<th>number of YES scores</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>total FAIR ratings</td>
<td>1</td>
</tr>
<tr>
<td>total GOOD ratings</td>
<td>1</td>
</tr>
<tr>
<td>total EXCELLENTS</td>
<td>3</td>
</tr>
</tbody>
</table>
spinning

**progress**

Design a graph to show your own improvements

<table>
<thead>
<tr>
<th>time</th>
<th>Can you start by yourself?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rating</td>
</tr>
<tr>
<td></td>
<td>sample</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exclent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brilliant</td>
</tr>
<tr>
<td>Very good</td>
</tr>
<tr>
<td>Good</td>
</tr>
<tr>
<td>Fair</td>
</tr>
<tr>
<td>Rubbish</td>
</tr>
</tbody>
</table>

Lessons: 1, 2, 3, 4, 5, 6
# Weaving

<table>
<thead>
<tr>
<th>time</th>
<th>Can you do these stitches?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>plain weaving</td>
</tr>
<tr>
<td></td>
<td>oriental soumak</td>
</tr>
<tr>
<td></td>
<td>rya</td>
</tr>
<tr>
<td></td>
<td>wrapping</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threads used</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>design</th>
<th>Draw here</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>time</td>
<td>plants</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>Draw here</td>
</tr>
</tbody>
</table>

**Rating**

![Rating](image_url)

**Sample**

![Sample](image_url)
textiles' achievement record

name  Johanna Day

form  II
what to do

1. Design a YES/NO symbol. Use as required.
2. Design a rating system to show FAIR, GOOD, EXCELLENT. Use when needed.
3. Record the number of YES answers you make, and the number of each rating.
4. Complete each section carefully. Good effort will be commended.

<table>
<thead>
<tr>
<th>number of YES scores</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>total FAIR ratings</td>
<td>0</td>
</tr>
<tr>
<td>total GOOD ratings</td>
<td>0</td>
</tr>
<tr>
<td>total EXCELLENTS</td>
<td>2</td>
</tr>
</tbody>
</table>
## Progress

Design a graph to show your own improvements

<table>
<thead>
<tr>
<th>time</th>
<th>progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Very Good</td>
<td></td>
</tr>
<tr>
<td>Super</td>
<td></td>
</tr>
<tr>
<td>Cloud</td>
<td></td>
</tr>
</tbody>
</table>

Can you start by yourself?

Rating

Sample
weaving

<table>
<thead>
<tr>
<th>time</th>
<th>Can you do these stitches?</th>
<th>design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>plain weaving</td>
<td>Draw here</td>
</tr>
<tr>
<td></td>
<td>oriental soumak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rya</td>
<td></td>
</tr>
<tr>
<td></td>
<td>wrapping</td>
<td></td>
</tr>
</tbody>
</table>

Threads used
<table>
<thead>
<tr>
<th>time</th>
<th>plants</th>
<th>rating</th>
<th>sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="Plant Drawing" /></td>
<td></td>
<td><img src="image" alt="Sample Image" /></td>
</tr>
</tbody>
</table>

**recipe**

First of all, we got a bowl and put some water in it and mixed in 20g of alum and 1/4 oz of cream of tartar and we put our spinning in the bowl and soaked it for about an hour with heat, the heat was used by a cooker. Then we dried it with a drying cabinet. Then next lesson we did dyeing. We gathered something for dyeing with. I chose onion skins. We put our spinning in an enamel bowl with some water and our onion skins, we boiled it and then let it simmer and we stirred it every 15 minutes with a stick. My turned a yellowy colour.
APPENDIX FOUR

CLASSROOM RESEARCH 1988 SECOND STUDY

The classroom Research for the Second study took place during the summer term of 1988. A second year group were issued with Textile Achievement Record Cards. The group consisted of 14 second year mixed ability pupils. Time was allowed during each lesson to keep the Record up to date.

At the end of the session the Record Cards were collected in and each pupil was able to discuss his/her Record card and practical work with the teacher. A Report was then compiled for each pupil. The Reports can be viewed in this Appendix.

As with the First year study the Reports became an exceedingly useful reference for the teacher. The indicated clearly areas of strength and weakness in non-verbal Design skills. It was pleasing to note that all pupils showed some measure of success.
MANIPULATIVE SKILLS
Lee was capable with the painting work and his skills with the craft knife were very good.

COMMUNICATIVE SKILLS
Lee was able to communicate his ideas through drawings.

CREATIVITY
Lee had some ideas of his own for his model bedroom, but his T-shirt design was copied.

INVESTIGATIVE ENQUIRY
Lee collected bric-a-brac from home to recycle in his model.

IMPLEMENTATION
Lee worked hard to produce his practical work. He carried through his ideas and achieved his aims.

DISCRIMINATION
Lee could choose the correct tools for his work, but had problems with colour, he could not mix the inks effectively.

PERCEPTUAL AWARENESS
Colour awareness was weak. Leigh found difficulty with colour theory and needs more practice at mixing inks.

TECHNICAL SKILLS
Excellent. Lee was conversant with printing processes, and accurate when making his model.

GENERAL COMMENTS
The Record Card was useful for Leigh, he was very pleased with his achievements and was able to identify problem areas.
NAME SARAH BROOKER  TEXTILES REPORT

MANIPULATIVE SKILLS
Fair. Sarah had some problems with handling a paint brush, finding that her hand shook. She also found cutting stencils rather difficult.

COMMUNICATIVE SKILLS
Sarah was able to communicate her ideas through sketches and plans. Drawing work was not confident.

CREATIVITY
Sarah had some good ideas and was able to use these in her work.

INVESTIGATIVE ENQUIRY
She was keen to collect items from home for her model bedroom, and enjoyed working in the library.

IMPLEMENTATION
Very determined effort to complete all tasks. Sarah worked hard and carried through all of her ideas.

DISCRIMINATION
Sarah made informed choices about colour. She was also able to decide which were the appropriate tools for her work.

PERCEPTUAL AWARENESS
Sarah showed a keen understanding of colour theory. She was also quite clear about scale and proportion in her model.

TECHNICAL SKILLS
These were adequate although some aspects were difficult for Sarah to control. She understood the printing process.

GENERAL COMMENTS
The Record Keeping was useful for Sarah as it helped her to identify her problems and she was able to try and improve in these weaker areas.
NAME CINDY BRUNSDEN.  TEXTILES REPORT

MANIPULATIVE SKILLS
These were rather untidy, but Cindy made some improvements to her skills during the course.

COMMUNICATIVE SKILLS
Lively drawings and plans, produced rather quickly but in an expressive way.

CREATIVITY
Bright ideas, original thoughts.

INVESTIGATIVE ENQUIRY
Rather haphazard, good intentions but rather forgetful. Cindy also talked a lot in class which prevented a more serious investigative attitude.

IMPLEMENTATION
Cindy completed her T shirt, model bedroom, and colour circle. She enjoyed making everything.

DISCRIMINATION
She was able to choose the correct tools and equipment for her work. Choice of colour was confident and expressive.

PERCEPTUAL AWARENESS
Cindy had a good understanding of colour, but found scale and proportion more difficult.

TECHNICAL SKILLS
These were adequate, but not very careful. Cindy was a little inclined to rush her work. Good understanding of the painting process.

GENERAL COMMENTS
An improvement from 1st yr work. The Record Cards showed a lively interest in work and were completed with enthusiasm.
NAME  SONIA HART.       TEXTILES REPORT

MANIPULATIVE SKILLS
Sonia found painting quite difficult, she also had some problems with using a craft knife.

COMMUNICATIVE SKILLS
Sonia was able to express her ideas through sketches and plans.

CREATIVITY
Sonia had some original ideas which she endeavoured to express in her work.

INVESTIGATIVE ENQUIRY
Good. Sonia was able to collect items from home for her model bedroom. She enjoyed searching for pictures etc in the library.

IMPLEMENTATION
Good. Sonia approached her work with determination, and made a good effort to succeed.

DISCRIMINATION
Sonia was able to choose colours with confidence, and could decide on appropriate tools for her work.

PERCEPTUAL AWARENESS
Sonia showed a clear sense of colour and a good awareness of size and proportion in her model.

TECHNICAL SKILLS
Here Sonia had some problems, she found some of the techniques difficult to execute.

GENERAL COMMENTS
A good effort. Sonia showed a determination to overcome difficulties, this is reflected in her recording.
MANIPULATIVE SKILLS
Jenny was rather slow and nervous, she found paint very difficult to use and decided to crayon her colour circle. She was able to use a craft knife after some practice.

COMMUNICATIVE SKILLS
Jenny was able to communicate her ideas through drawings and plans.

CREATIVITY
Jenny had ideas of her own, and was able to suggest ways of pursuing them. Her confidence improved gradually.

INVESTIGATIVE ENQUIRY
Jenny was enthusiastic about collecting materials for her model making project.

IMPLEMENTATION
Although Jenny was a slow worker, she completed all of her tasks, and was able to carry through her ideas. She painted a colour circle, but was not satisfied and so repeated the exercise in coloured crayons.

Jenny was able to make choices concerning colour. She could choose the correct equipment for her work, and appropriate methods.

PERCEPTUAL AWARENESS
Jenny was able to understand colour theory, and her model bedroom indicated a clear awareness of proportion and scale.

TECHNICAL SKILLS
Jenny was very nervous at first, but coped better as her confidence improved.

GENERAL COMMENTS
The Record Card was excellent for improving Jenny's confidence. She was very pleased with her achievements, and each success helped to improve her work.
MANIPULATIVE SKILLS
Mayhur found painting quite difficult, he could not achieve a flat colour. He also had some problems with using a craft knife and needed help to make his stencils for printing.

COMMUNICATIVE SKILLS
Mayhur coped adequately in this respect, although he did not enjoy drawing.
Mayhur particularly enjoyed the printing process and liked making graphic images in this way.
Mayhur found it difficult to initiate his own ideas, and needed prompting.
His model bedroom was the most creative aspect of his work.

INVESTIGATIVE ENQUIRY
Mayhur was keen to collect items from home for use in his model bedroom work.

IMPLEMENTATION
Mayhur completed all the tasks, and was able to carry through his ideas.

DISCRIMINATION
He found colour work a problem and needed help to make colour choices. He was able to use the correct tools for his work.

PERCEPTUAL AWARENESS
Mayhur had some problems regarding colour and needed help to overcome this. His perception of proportion and size and scale were good.

TECHNICAL SKILLS
Mayhur understood the printing process and was familiar with screen printing procedures.

GENERAL COMMENTS
Good effort. Willingness to overcome problems. The Record Cards helped to identify weaknesses.
MANIPULATIVE SKILLS
Sarah worked very slowly and carefully. She was able to use a craft knife skillfully, and her model bedroom was very neat.

COMMUNICATIVE SKILLS
Sarah had a problem with language, and was more confident about drawing than speaking. Her design work helped her to express her thinking.

CREATIVITY
Sarah had a very conservative approach to her work. She did not want to try out new approaches to work.

INVESTIGATIVE ENQUIRY
Sarah was keen to bring in items from home to use in her modelling work. She enjoyed using the library.

IMPLEMENTATION
Slow but sure. Sarah completed her T-shirt and her model bedroom.

DISCRIMINATION
Sarah was able to make choices about colour. She could also choose the correct tools for her work.

PERCEPTUAL AWARENESS
Sarah showed a keen sense of colour, and a good understanding of proportion and scale in her model.

TECHNICAL SKILLS
These were able and confident.

GENERAL COMMENTS
Sarah refused to speak to anyone, and so the Record Card proved to be an invaluable way of following her ideas.
MANIPULATIVE SKILLS
Excellent. Simon could manipulate and control all tools to a high standard.

COMMUNICATIVE SKILLS
Very good. Simon could communicate his ideas through detailed drawings, and plans.

CREATIVITY
A very creative approach to work. Simon could visualize ideas and suggest interesting ways of pursuing them.

INVESTIGATIVE ENQUIRY
Very good. Simon made efforts to find unusual items which he could recycle in his model.

IMPLEMENTATION
Simon worked consistently hard to implement his ideas.

DISCRIMINATION
Simon made informed choices in all aspects of his work.

PERCEPTUAL AWARENESS
Very good. Simon had a clear understanding of colour theory. He was careful to use proportion correctly in his model.

TECHNICAL SKILLS
Well developed. Simon also used his interest in photography to photograph his model for the Record Card.

GENERAL COMMENTS
Excellent attitude to work. Simon was pleased to record his achievements and was very proud of his work.
MANIPULATIVE SKILLS
Amy found painting quite difficult and she had some problems with stencil cutting at first.

COMMUNICATIVE SKILLS
Amy was able to communicate her ideas through sketches and plans. She was not very confident about drawing.

CREATIVITY
Amy had ideas of her own and could suggest ways of proceeding with her work.

INVESTIGATIVE ENQUIRY
Quite good. Amy was interested in looking for items which she could recycle in her model. She also enjoyed the library research.

IMPLEMENTATION
Amy pursued her goals with enthusiasm, carrying through her ideas in practical work.

DISCRIMINATION
Amy was able to choose the correct tools for her work. She was confident, too, about colour in her work.

PERCEPTUAL AWARENESS
Colour awareness was good. Amy understood the theory work, and referred to her colour circle quite often.

Perception of size and scale improved with practical TECHNICAL SKILLS application.

These were adequate. Amy understood the printing process.

GENERAL COMMENTS
Improved standards compared to first year work. The Record Card helped Amy to improve her attitude to work, she became more motivated and keen to succeed.
MANIPULATIVE SKILLS
Rebecca worked neatly and carefully, practising high standards. She did not complete her colour circle, but was able to produce a good quality screen print and model. Some problems with stencil cutting.

COMMUNICATIVE SKILLS
Very clear. Rebecca could produce good drawings + graphics to communicate her ideas. A bright approach.

CREATIVITY
Rebecca generated her own ideas, and was keen to express these in her work. She had a good sense of colour and used this expressively.

INVESTIGATIVE ENQUIRY
Rebecca made use of the environment at school and home, she collected materials, and searched magazines for inspirations.

IMPLEMENTATION
Excellent. Rebecca worked consistently well, choosing carefully, and completing her work neatly. She was very clear about her intentions.

DISCRIMINATION
Rebecca was able to make informed choices about colour and working methods. She could decide about tools and materials with confidence.

PERCEPTUAL AWARENESS
Rebecca showed a good understanding of colour theory, and was able to use proportion well in her scale model.

TECHNICAL SKILLS
These were mostly confident, although she did find the craft knife difficult to use at first.

GENERAL COMMENTS
Rebecca enjoyed completing her Record Card. She was very honest about her achievements, she liked being able to evaluate her own work.
MANIPULATIVE SKILLS
Excellent. Paul found painting difficult at first but improved quickly. Cutting skills were almost perfect.

COMMUNICATIVE SKILLS
Paul communicated his ideas through skillful drawings.

CREATIVITY
Paul showed a creative mind, and original trains of thought.

INVESTIGATIVE ENQUIRY
Very enthusiastic. Paul collected many items to use in his model.

IMPLEMENTATION
Consistent hard work. Paul was able to carry through all of his ideas.

DISCRIMINATION
Paul was clear about his choice of methods and equipment. He also made sensible choices about colour.

PERCEPTUAL AWARENESS
Paul understood the colour theory work. He was very careful to use proportion carefully in his model.

TECHNICAL SKILLS
Paul developed a clear understanding of printing processes and wished to experiment further.

GENERAL COMMENTS
Very pleasing efforts. Enthusiastic work. Paul was eager to record his achievements on the Record Card.
NAME  TOM TAYLOR

TEXTILES REPORT

MANIPULATIVE SKILLS
Tom was rather untidy with the paintbrush. He found the craft knife quite easy to cope with.

COMMUNICATIVE SKILLS
Tom could express his ideas through lively drawings. (Although these were sometimes rushed)

CREATIVITY
A bright approach, with quickness of ideas.
Tom had original thoughts about methods of working.

INVESTIGATIVE ENQUIRY
Good. Tom took a keen interest in relevant environmental stimuli, and collected suitable items for his model.

IMPLEMENTATION
Tom carried through all of his ideas, working hard to complete projects on time.

DISCRIMINATION
Tom was clear about which tools to use and also had a good sense of colour.

PERCEPTUAL AWARENESS
Tom showed intelligence in his use of colour and his understanding of colour theory. Perception of size and proportion were good.

TECHNICAL SKILLS
These were well developed. Tom understood the printing process and was keen to experiment.

GENERAL COMMENTS
Excellent attitude. Tom enjoyed keeping the Record Card. His evaluations of his own work were well considered, he could recognize his weaknesses, and made constructive comments about his work.
MANIPULATIVE SKILLS
Sally was able to paint the colour circle neatly. She was confident with the craft knife, and her modelling skills were good. Very organized worker.

COMMUNICATIVE SKILLS
Sally was clear and concise, this was expressed in her simple drawing style.

CREATIVITY
Sally had very conservative ideas and could not be persuaded to experiment further.

INVESTIGATIVE ENQUIRY
Sally was enthusiastic about her model, and collected materials from home to use in its production.

IMPLEMENTATION
Good. Sally was able to proceed in a confident, orderly manner and complete all of the tasks.

DISCRIMINATION
Sally could make informed choices about colour, and could choose equipment in a sensible way.

PERCEPTUAL AWARENESS
Sally had a clear understanding of colour theory, and used this in her work. Her perception of size and scale were adequate.

TECHNICAL SKILLS
These were confidently executed.

GENERAL COMMENTS
Sally worked well, and enjoyed keeping the record. The Record Card helped her to define her problems and to work towards overcoming them.
MANIPULATIVE SKILLS
Good. Nick showed competence in painting, and was confident at handling the craft knife.

COMMUNICATIVE SKILLS
Nick was able to communicate his ideas through sketches and diagrams. He tried hard with drawing skills.

CREATIVITY
Nick's T-shirt design was a copied symbol, but his model was more original.

INVESTIGATIVE ENQUIRY
Quite good. Nick collected various items from home to use in his model.

IMPLEMENTATION
Nick had clear ideas about his work, and implemented these with determination.

DISCRIMINATION
Nick was able to choose the correct tools for his work and could decide on suitable methods.

PERCEPTUAL AWARENESS
Nick's weak area was colour awareness. He found this difficult.

His perception of size and scale was better.

TECHNICAL SKILLS developed.
These were good. Nick could understand the screen printing process, and enjoyed this project very much.

GENERAL COMMENTS
A rewarding session. Nick was pleased to record his achievements and enjoyed his success at printing. He realized his weaknesses and tried to overcome them.
APPENDIX 5

A sample of the completed Record Cards for the Second Year Study
textiles’ achievement record

name SIMON PALMER

form 25
what to do

1 Design a YES/NO symbol. Use as required.
2 Design a rating system to show FAIR, GOOD, EXCELLENT. Use when needed.
3 Record the number of YES answers you make, and the number of each rating.
4 Complete each section carefully. Good effort will be commended.

<table>
<thead>
<tr>
<th>number of YES scores</th>
<th>3</th>
</tr>
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<tbody>
<tr>
<td>total FAIR ratings</td>
<td>0</td>
</tr>
<tr>
<td>total GOOD ratings</td>
<td>1</td>
</tr>
<tr>
<td>total EXCELLENTS</td>
<td>2</td>
</tr>
</tbody>
</table>
A primary colour is one you can make all other colours out of them. A secondary colour is a colour made from two primary colours. Complementary colours are opposite on the wheel. Blue and red create a color with burnt sienna.
colour
IN THE HOME

Rating
EX

samples

Drawing of model
# colour IN CLOTHES

<table>
<thead>
<tr>
<th>Were the tracings accurate?</th>
<th>Were the stencils good?</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inks used</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Did you achieve your colours?</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>EX</td>
</tr>
</tbody>
</table>

[Diagram of a camera with the word 'Praktica']
textiles' achievement record

name Paul Smith

form 21
what to do

1 Design a YES/NO symbol. Use as required.
2 Design a rating system to show FAIR, GOOD, EXCELLENT. Use when needed.
3 Record the number of YES answers you make, and the number of each rating.
4 Complete each section carefully. Good effort will be commended.

<table>
<thead>
<tr>
<th>number of YES scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>total FAIR ratings</td>
</tr>
<tr>
<td>total GOOD ratings</td>
</tr>
<tr>
<td>total EXCELLENTS</td>
</tr>
</tbody>
</table>
colour
IN CLOTHES

Were the tracings accurate?

Were the stencils good?

Inks used: Black, Blue

Did you achieve your colours?

Rating
IN THE HOME

Drawing of model
APPENDIX SIX

Completed Record Sheets for Third study are contained in this Appendix.
<table>
<thead>
<tr>
<th>time</th>
<th>Can you do these stitches?</th>
<th>design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Draw here</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>plain weaving</th>
<th>oriental soumak</th>
</tr>
</thead>
<tbody>
<tr>
<td>rya</td>
<td>wrapping</td>
</tr>
</tbody>
</table>

Threads used

BNL
grati
better
sorer
welldone
im
wo
very
good
Weaving

Design

Draw here

Wrapping

Yes

Nah

Oriental soumak

Plain weaving

Can you do these stitches?

Right
Weaving

Can you do these stitches?

- Bulky
- 50
- Plain weaving
- Oriental soumak
- Wicked
- Good
- Wrapping
- Rya

Threads used

Design

Draw here
**Weaving**

<table>
<thead>
<tr>
<th>time</th>
<th>Can you do these stitches?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<table>
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<td></td>
</tr>
<tr>
<td>rya</td>
<td>3/10</td>
<td>8/10</td>
</tr>
<tr>
<td>oriental soumak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>wrapping</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Threads used**

**Design**

Draw here
Draw here

Weaving

What used
threads

Wrapping

Rya

Oriental Soumak

Plain Weaving

Can you do these stitches?

Good Girl Good
Well Done

End of Row

Juan's Blanket

Time

Edward Blake
<table>
<thead>
<tr>
<th>Wrapping</th>
<th>Rya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back</td>
<td>Star</td>
</tr>
<tr>
<td>Orienal Squam</td>
<td>Plain Weaving</td>
</tr>
</tbody>
</table>

Can you do these stitches?
Weaving

Draw here

Design

Bower Matthew

Wrapping

Rya

Oriental Soumak

Plain Weaving

Can you do these stitches?
Weaving projects

Can you do these stitches?

BANG

yeah!

Hooray

plain weaving

oriental soumak

wrapping

rya

Threads used
<table>
<thead>
<tr>
<th>time</th>
<th>Can you do these stitches?</th>
<th>design</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Draw here</td>
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<tr>
<td></td>
<td>Good</td>
<td></td>
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<tr>
<td></td>
<td>plain weaving</td>
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<td></td>
<td>OK</td>
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<tr>
<td></td>
<td>oriental soumak</td>
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<td>Good</td>
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<td></td>
<td>rya</td>
<td></td>
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<tr>
<td></td>
<td>wrapping</td>
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</table>

Threads used
Draw here

Design

Weaving

Can you do these stitches?

Oriental Soumak

\[
\begin{array}{c}
0 \\
8
\end{array}
\]

\[
\begin{array}{c}
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* \\
* \\
* \\
* \\
* \\
* \\
* \\
* \\
* \\
\end{array}
\]

Plain Weaving

\[
\begin{array}{c}
0 \\
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8
\end{array}
\]

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\begin{array}{c}
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\end{array}
\]

Wrapped

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\begin{array}{c}
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8
\end{array}
\]

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\begin{array}{c}
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\end{array}
\]

Rya

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\begin{array}{c}
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1 \\
8
\end{array}
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\begin{array}{c}
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* \\
* \\
\end{array}
\]

Threads used

Sam's Warping
<table>
<thead>
<tr>
<th>Wrapping</th>
<th>Rya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oriental Soumak</td>
<td>Plain Weaving</td>
</tr>
</tbody>
</table>

**Can you do these stitches?**

Draw here: **Design**

**Time**
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<thead>
<tr>
<th>Draw Here</th>
<th>Design</th>
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<table>
<thead>
<tr>
<th>Wrapping</th>
<th>Rya</th>
</tr>
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<tbody>
<tr>
<td>Oriental Soumak</td>
<td>Plain Weaving</td>
</tr>
</tbody>
</table>

Can you do these stitches?
Draw here: Design

- Wrapped weaving
- Rya weaving
- Oriental soumak
- Plain weaving

Can you do these stitches?
Design

task

Wrapping

rya

oriental soumak

plain weaving

Can you do these stitches?

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 Threads

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## Weaving

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<th>Design</th>
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<tbody>
<tr>
<td><strong>Can you do these stitches?</strong></td>
<td><strong>Draw here</strong></td>
</tr>
<tr>
<td>plain weaving</td>
<td><strong>rya</strong></td>
</tr>
<tr>
<td><strong>oriental soumak</strong></td>
<td><strong>wrapping</strong></td>
</tr>
</tbody>
</table>

**Threads used**

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*Ashif Awan.*
<table>
<thead>
<tr>
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<th>Can you do these stitches?</th>
</tr>
</thead>
<tbody>
<tr>
<td>rya</td>
<td>plain weaving</td>
</tr>
<tr>
<td>wrapping</td>
<td>oriental soumak</td>
</tr>
</tbody>
</table>

**Draw here**
Draw here

Design

Can you do these stitches?

Oriental Square

Plain Weaving

Wrapping

Tyre

Threads

Weaving
APPENDIX SEVEN

Classroom Research study, number three: This took place during the Autumn term of 1989. A first year group were issued with Record Cards. The group consisted of 14 boys and 7 girls, of mixed abilities all aged between 11 and 12 years. Time was allowed at the end of lessons to keep the Record up to date.

At the end of the session the Record Cards were collected in with practical work, and each pupil was able to discuss his/her progress and achievement. A Report was then compiled and kept by the teacher for future reference. Each pupil's report is contained in the Appendix.
Appendix Seven

The findings of research conducted during the summer of 1990 and fall of 1990 are presented in this appendix.

The research was conducted on the campus of the University of California, Berkeley. The research consisted of both qualitative and quantitative methods. The research was designed to understand the experiences of students and faculty in the academic setting.

At the end of the semester, the research was concluded. The research data were collected and analyzed to provide insights into the academic environment. A comprehensive report was prepared summarizing the findings.

Appendix Seven includes the summary report of the research findings.
NAME  Ashif Awan  TEXTILES REPORT

MANIPULATIVE SKILLS
Poor. Ashif struggled to complete the basic weaving process, and could not always keep to "over one under one". Visual skills very impaired.

COMMUNICATIVE SKILLS
Ashif could explain his intentions verbally, but found great difficulty with drawing skills.

CREATIVITY
Ashif had ideas of his own which he endeavoured to express in practical work.

INVESTIGATIVE ENQUIRY
Poor. Ashif did not search for weft materials at home, and relied on school yarns.

IMPLEMENTATION
Determined effort to complete the tapestry weaving, but concentration often wandered. Ideas were eventually consolidated.

DISCRIMINATION
Clear ideas of what he wanted to achieve, but needed help to choose yarns.

PERCEPTUAL AWARENESS
Very underdeveloped awareness of colour, and poor understanding of textural qualities in practical work.

TECHNICAL SKILLS
Weak. Use of equipment limited. Problems with scissors, and small implements.

GENERAL COMMENTS
Ashif had many problems to overcome, visual impairment + leaning difficulties. In the light of this he did achieve positive success and completed a tapestry picture. He very much enjoyed keeping the record, although found it quite a difficult challenge.
NAME  KAJAL ADATIA  TEXTILES REPORT

MANIPULATIVE SKILLS
Kajal coped well with weaving skills although she could not master yea knotting.

COMMUNICATIVE SKILLS
Kajal communicated ideas confidently through lively drawings.

CREATIVITY
Kajal showed a bright interest in her work, and was able to suggest her own ideas.

INVESTIGATIVE ENQUIRY
Kajal collected weft materials from the environment and from home.

IMPLEMENTATION
This was good. Kajal worked hard and was able to follow through all her own ideas.

DISCRIMINATION
Kajal enjoyed choosing colours from her selection of yarns, and was able to pick the appropriate tools for her work.

PERCEPTUAL AWARENESS
Kajal was well informed about colour and could use this in her work.

TECHNICAL SKILLS
Kajal coped well with the skills needed in this course.

GENERAL COMMENTS
A lively approach to work. Kajal was keen to complete her record sheet with positive answers; she was proud of her achievements.
NAME  SHIVIT BAKSHANIA  TEXTILES REPORT

MANIPULATIVE SKILLS
Shivot coped with 3 out of 4 weaving stitches.

COMMUNICATIVE SKILLS
Shivot communicated via lively drawings, and a confident use of felt-pens.

CREATIVITY
Shivot produced lively ideas and could suggest ways of procedures.

INVESTIGATIVE ENQUIRY
Shivot displayed a keen interest in his search for wet materials.

IMPLEMENTATION
Shivot carried through his ideas and produced an interesting tapestry weaving.

DISCRIMINATION
Shivot was confident in his choice of materials and equipment.

PERCEPTUAL AWARENESS
Shivot had a good sense of colour, and an awareness of texture in his work.

TECHNICAL SKILLS
Shivot coped well with the technical skills required.

GENERAL COMMENTS
A good session. The Record sheet confirmed Shivot's achievements and he was keen to make it an important part of his work.
MANIPULATIVE SKILLS
Well executed weaving processes. Paul was successful at all 4 stitches.

COMMUNICATIVE SKILLS
Paul was able to communicate through clear drawings, he was confident in this respect.

CREATIVITY
Paul could generate his own ideas, and was able to suggest ways of using these in a tapestry picture.

INVESTIGATIVE ENQUIRY
Good. Paul collected suitable yarns to use in his weaving.

IMPLEMENTATION
Paul worked well to apply his ideas and create a tapestry picture.

DISCRIMINATION
Paul was able to choose appropriate yarns for his work. Decisions were sometimes slow.

PERCEPTUAL AWARENESS
Paul had a satisfactory awareness of colour and texture in his work.

TECHNICAL SKILLS
Well produced work, with a careful attention to detail.

GENERAL COMMENTS
Good effort. Confident child. Paul enjoyed completing a record of his work; he was pleased to record his successful achievements.
MANIPULATIVE SKILLS
These were capable but kelly lacked confidence. She managed all of the weaving processes but was not pleased with the Rya knots. Kelly communicated through simple sketches.

CREATIVITY
Kelly had several ideas and was able to suggest ways of executing her work.

INVESTIGATIVE ENQUIRY
Kelly collected wet materials from home and from the local environment. She selected from these for her practical work.

IMPLEMENTATION
Kelly worked hard and carried through her ideas into a tapestry picture.

DISCRIMINATION
Kelly needed some support in her choices, but was able to make sensible suggestions.

PERCEPTUAL AWARENESS
Kelly had a sensitive awareness of colour and texture which she used to advantage.

TECHNICAL SKILLS
Kelly coped well with the necessary skills but needed constant reassurance.

GENERAL COMMENTS
The record sheet was useful to Kelly because it helped her to recognize small achievements and gain confidence in her abilities.
MANIPULATIVE SKILLS
Joanna had some problems with rya knotting but was otherwise able to cope with the various weaving processes.

COMMUNICATIVE SKILLS
These were quite good. Joanna enjoyed drawing and using colour, she was able to produce lively sketches.

CREATIVITY
Joanna was able to think of suitable ideas for her practical work, and could suggest ways of working these through.

INVESTIGATIVE ENQUIRY
Joanna collected yarns from home for use in her practical work.

IMPLEMENTATION
Joanna worked hard to carry through her ideas and to complete her practical work on time. She was able to use her ideas effectively.

DISCRIMINATION
Joanna chose her yarns carefully to suggest the colour and texture of a seaside scene.

PERCEPTUAL AWARENESS
Joanna had a clear sense of colour, and texture and used these effectively in her work.

TECHNICAL SKILLS
A capable pupil in this respect. Joanna's work was neatly finished, with an even tension.

GENERAL COMMENTS
A pleasing effort. Joanna was very proud of her practical work and enjoyed completing the Record Sheets as evidence of her success.
MANIPULATIVE SKILLS
Philip was a visually impaired pupil, and so experienced some problems. 3 out of 4 stitches achieved.

COMMUNICATIVE SKILLS
Philip enjoyed drawing although he couldn't distinguish many colours, he was able to sketch his ideas.
Philip had many ideas which he was keen to experiment with.

INVESTIGATIVE ENQUIRY
Philip searched for yarns at home to use as welt material in his work.

IMPLEMENTATION
Philip concentrated extremely hard and implemented his ideas into a practical piece of work.
Philip could make choices about texture and could decide which tools to use.

CREATIVITY
He was very creative.

PERCEPTUAL AWARENESS
Awareness of colour severely limited
Textural awareness good

TECHNICAL SKILLS
Philip coped very well and produced a fine piece of practical work.

GENERAL COMMENTS
Effort very pleasing. The Record Sheet was very rewarding for Philip as it confirmed his hard earned success.
MANIPULATIVE SKILLS
Matthew completed 3 out of 4 weaving processes to an appropriate standard.

COMMUNICATIVE SKILLS
Matthew was able to communicate his ideas through small sketches.

CREATIVITY
Matthew had several ideas of his own and was able to put these into practice in his tapestry weaving.

INVESTIGATIVE ENQUIRY
Matthew collected yarn from home for use in his practical work, he also searched the school environment for Left materials.

IMPLEMENTATION
Matthew's concentration wavered sometimes but he was able to complete his practical work to a satisfactory standard, and see his ideas through to their practical conclusion.

DISCRIMINATION
Matthew was able to decide on a colour scheme and use this in his tapestry. Use of texture was also planned.

PERCEPTUAL AWARENESS
Matthew's perception of colour and texture were adequate, and applied to his projects in a useful way.

TECHNICAL SKILLS
Matthew had some problems with balance in his final practical piece, but otherwise seemed capable.

GENERAL COMMENTS
Matthew enjoyed keeping the Record card. He liked noting his achievements of the various weaving processes, and was keen to earn a merit award.
MANIPULATIVE SKILLS
Cheri was able to complete all 4 weaving processes.

COMMUNICATIVE SKILLS
Cheri's drawing skills were rather immature but she was able to make her ideas obvious, although her sketches were very basic.

CREATIVITY
Cheri had ideas of her own which she wished to pursue in her practical work.

INVESTIGATIVE ENQUIRY
Cheri was keen to collect yarns from home for use in her practical work.

IMPLEMENTATION
Good efforts. Cheri was able to apply her ideas and use them in her practical work.

DISCRIMINATION
Cheri chose colours and texture with confidence. She was determined about her ideas.

PERCEPTUAL AWARENESS
Cheri showed a basic colour awareness, but was able to use this in a suitable way.

TECHNICAL SKILLS
A little clumsy. Finish was not of a high standard.

GENERAL COMMENTS
Good effort. Cheri was keen to improve her drawing. She enjoyed keeping the Record and was very proud of her achievements.
MANIPULATIVE SKILLS
Excellent. Samira completed all 4 of the weaving stitches.

COMMUNICATIVE SKILLS
Samira communicated her ideas through neat and careful drawings.

CREATIVITY
Samira had no problems with generation of ideas, she was very determined about her choices.

INVESTIGATIVE ENQUIRY
Good. Samira willingly searched for weft materials, although she was selective in their use.

EXCELLENT. Samira followed through her ideas, and found ways of executing them in practical terms.

Samira was confident in her choice of equipment and materials.

PERCEPTUAL AWARENESS
Good for the group. Samira showed a sensitive awareness of both colour and texture.

TECHNICAL SKILLS
Samira coped well with the necessary skills. Her work was neatly finished and presented.

GENERAL COMMENTS
Pleasing attitude. Samira was very proud of her Record Sheet and spent a long time in completing it accurately.
NAME NICHOLAS DREJERS

TEXTILES REPORT

MANIPULATIVE SKILLS
Nicholas was able to produce all four of the weaving techniques.

COMMUNICATIVE SKILLS
Nicholas was able to communicate his ideas through lively (but rather unhygienic) sketches.

CREATIVITY
Nicholas had bright ideas which he was able to use in his practical work.

INVESTIGATIVE ENQUIRY
Nicholas collected wett yarns from the environment and from home.

IMPLEMENTATION
Nicholas worked hard to implement his ideas, and completed his tapestry picture.

DISCRIMINATION
Nicholas was able to choose the correct tools for his work, and enjoyed selecting yarns for his weaving.

PERCEPTUAL AWARENESS
Nicholas was rather confused about colour, but was keen to use textural qualities in his work.

TECHNICAL SKILLS
Nicholas coped well with the skills required to complete his tapestry weaving.

GENERAL COMMENTS
Good effort. Nicholas found the Record sheet a useful stimulus. It helped to maintain his motivation.
NAME  STUART DRONFIELD  TEXTILES REPORT

MANIPULATIVE SKILLS
Stuart lacked confidence but was able to manage three out of four weaving processes.

COMMUNICATIVE SKILLS
Stuart communicated his ideas by simple sketches.

CREATIVITY
Stuart showed some confusion in selecting ideas for his work; he tended to “lean” on friends.

INVESTIGATIVE ENQUIRY
Stuart collected yarns and weft materials from home.

IMPLEMENTATION
Good. Stuart worked consistently to produce his practical work.

DISCRIMINATION
Stuart was able to choose the correct tools for his work, and enjoyed selecting yarns.

PERCEPTUAL AWARENESS
Stuart had a good sense of colour and texture and tried to apply these to his work.

TECHNICAL SKILLS
Work was neatly executed, and Stuart coped well with the skills required.

GENERAL COMMENTS
Stuart found that the Record Sheet improved his confidence, because he could record his achievements on a regular basis.
NAME  Antony Dunmore  TEXTILES REPORT

MANIPULATIVE SKILLS
Antony found some of the more complicated weaving processes quite difficult.

COMMUNICATIVE SKILLS
Antony was able to communicate his ideas through concise drawings.

CREATIVITY
Antony was able to initiate his own ideas and produced a suitable design for a tapestry picture.

INVESTIGATIVE ENQUIRY
Antony was able to look for yarns and weft materials at home and at school.

IMPLEMENTATION
His work was carried out conscientiously, and ideas were transformed into practical pieces with success.

DISCRIMINATION
Antony was clear about choices of colour and yarn.

PERCEPTUAL AWARENESS
Awareness of colour and texture were satisfactory. Antony used complementary colours in his tapestry weaving.

TECHNICAL SKILLS
Some problems with these. Lack of confidence seemed to be holding Antony back.

GENERAL COMMENTS
Rather a timid approach. The Record Card certainly helped to boost confidence. Antony enjoyed completing it, and was able to use his drawing talents effectively.
MANIPULATIVE SKILLS
Paul had several problems being both visually impaired and slightly awkward at manipulation of small equipment. He overcame these with determination. 2 weaving processes completed.

Quite good. Paul was able to sketch and draw out his ideas in a clear way.

CREATIVITY
Paul had plenty of ideas for his tapestry picture and was able to choose a suitable one to develop.

INVESTIGATIVE ENQUIRY
Paul was keen to search for weft yarns and materials. He particularly enjoyed softness of yarn.

IMPLEMENTATION
Excellent. Paul endeavoured and persevered to produce his ideas in tapestry form.

DISCRIMINATION
Paul had problems with colour - because he could only distinguish very strong shades. Texture was easier for him to cope with.

PERCEPTUAL AWARENESS
Textural awareness was well developed.

TECHNICAL SKILLS
Paul coped, but had problems with all equipment - especially scissors.

GENERAL COMMENTS
Very determined effort, and a good piece of practical work eventually achieved. Paul was very proud of his tapestry and his Record Card.
NAME  Kuljinder Hundle   TEKSTILES REPORT

MANIPULATIVE SKILLS
Excellent. Kuljinder was precise in the execution of his practical work. All processes were achieved.

COMMUNICATIVE SKILLS
Very clear and neat drawings. Rather small work - Kuljinder could not be encouraged to work more freely.

CREATIVITY
Plenty of ideas for practical work, Kuljinder was able to think of a suitable subject for his tapestry.

INVESTIGATIVE ENQUIRY
Good. Kuljinder was interested in creating a glittering effect - and collected suitable felt materials for this purpose.

IMPLEMENTATION
Great, Kuljinder worked hard to complete his tapestry picture and to bring his ideas to fruition.

DISCRIMINATION
Sharp discriminative powers. Kuljinder was very clear about what suited his intentions.

PERCEPTUAL AWARENESS
Good. Kuljinder had a clear sense of colour and texture in his work, and was able to work towards a definite purpose.

TECHNICAL SKILLS
Advanced for the group. Kuljinder used equipment confidently and was able to mount his own work.

GENERAL COMMENTS
A bright and capable boy who enjoyed the practical experience of weaving, and who liked the challenge of the record card.
MANIPULATIVE SKILLS
Daniel coped well with the weaving processes, but was not satisfied with his "wrapping" attempt.

COMMUNICATIVE SKILLS
Daniel communicated through lively drawings and sketches.

CREATIVITY
Daniel found it difficult to sort out his ideas, and could not immediately decide what to do.

INVESTIGATIVE ENQUIRY
Daniel collected wet materials from the environment, but decided not to use these in his tapestry picture.

IMPLEMENTATION
Daniel found it difficult to concentrate for prolonged periods of time, and implementation suffered because of this.

DISCRIMINATION
Daniel was able to choose the appropriate tools and materials for his work.

PERCEPTUAL AWARENESS
Daniel was able to use his knowledge of colour to good effect in his work.

TECHNICAL SKILLS
Daniel was able to manage the skills required for this course.

GENERAL COMMENTS
The Record Sheet helped Daniel to focus his attention on his work. He was pleased with his eventual success.
MANIPULATIVE SKILLS
Neil managed all four weaving stitches. He was very confident in his approach to work.

COMMUNICATIVE SKILLS
Neil communicated through colourful sketches. Although these were rather untidy in their presentation.

CREATIVITY
Neil had several ideas and could suggest ways of using these in his work.

INVESTIGATIVE ENQUIRY
Neil collected materials from home and from the local environment.

IMPLEMENTATION
Neil managed to follow through an idea and complete a tapestry picture.

DISCRIMINATION
Neil made informed choices about his work. He could decide on the correct tools for his practical project.

PERCEPTUAL AWARENESS
Neil showed a reasonable awareness of colour and texture in his work.

TECHNICAL SKILLS
Neil coped well with the skills required to complete this project.

GENERAL COMMENTS
Confident attitude. The record sheet helped to pinpoint weaknesses, which could then be worked upon.
MANIPULATIVE SKILLS
Very good. Noshina was capable at all of the weaving processes and clearly showed a talent for working with yarns.

COMMUNICATIVE SKILLS
Drawings rather childish but purpose was clearly indicated. Noshina enjoyed using colour.

CREATIVITY
Many useful ideas and sensible choices for tapestry work.

INVESTIGATIVE ENQUIRY
A keen interest in seeking weft materials. Noshina was careful to search for appropriate colours of threads.

IMPLEMENTATION
Good, hard work, and effort to complete the tapestry picture which she had in mind, even though she had some problems with the "tree".

DISCRIMINATION
Good. Choices made on a sensible basis of what would look appropriate in her picture.

PERCEPTUAL AWARENESS
Fairly well developed sense of colour and texture. The "tree" was worked in Rya knots to create a leafy look.

TECHNICAL SKILLS
Good handling of equipment. Tension kept even.

GENERAL COMMENTS
A good effort. The tapestry picture was pleasing. Noshina intended to embroider on the surface of the grass. She enjoyed keeping a Record of her achievements.
NAME MARIE MOORE

TEXTILES REPORT

MANIPULATIVE SKILLS
Marie completed all of the weaving processes. She showed good dexterity in her work.

COMMUNICATIVE SKILLS
Marie communicated through sensitive sketches, and a considered use of symbols.

CREATIVITY
Marie was able to generate her own ideas, and could suggest ways of working.

INVESTIGATIVE ENQUIRY
Marie enthusiastically collected yarns and materials from home for her work.

IMPLEMENTATION
Excellent sustained effort to produce work of a high standard.

DISCRIMINATION
Marie was able to make choices concerning her work, and could use the correct tools for perceptual awareness.
Marie had a well developed sense of colour and texture.

TECHNICAL SKILLS
These were advanced for the group, and Marie's practical work was satisfactory in finishing detail.

GENERAL COMMENTS
Pleasing effort. Marie enjoyed keeping the Record sheet, because she could see her achievements, and was proud of her success.
NAME  PAUL MUMFORD  TEXTILES REPORT

MANIPULATIVE SKILLS
Paul found handling the bead loom quite difficult, but managed 3 out of 4 weaving stitches.

COMMUNICATIVE SKILLS
Paul was able to communicate his ideas through simple sketches.

CREATIVITY
Paul was able to suggest ideas for his practical work, although he needed help to proceed.

INVESTIGATIVE ENQUIRY
Paul was content to use school materials for his practical work.

IMPLEMENTATION
Paul found concentration difficult but did succeed in completing his weaving.

DISCRIMINATION
Paul was able to choose the appropriate tools for his work, but choice of colour was more difficult.

A little confused.
Paul had problems in use of colour.

TECHNICAL SKILLS
Paul found these difficult but managed to overcome problems and finish his work.

GENERAL COMMENTs
Effort variable. The Record sheet certainly helped to focus Paul's attention. He enjoyed recording his achievements.
MANIPULATIVE SKILLS
Ajay was able to manage three out of four
weaving stitches. He was fairly competent
with the bodkin.

COMMUNICATIVE SKILLS
These were average for the group. Ajay was
able to make satisfactory drawings.

CREATIVITY
Ajay could think of ideas and suggest ways
of working them into practical projects.

INVESTIGATIVE ENQUIRY
Ajay collected wet materials from the local
environment and from home.

IMPLEMENTATION
Enthusiastic response to work. Ajay carried
through his ideas into practical work, and

DISCRIMINATION completed his tapestry weaving.
Ajay enjoyed making choices about colour but
needed some help. He could choose the correct tools

PERCEPTUAL AWARENESS for his work.
This was quite good although there was a little
confusion at first about colour.

TECHNICAL SKILLS
Ajay coped well with the technical skills
involved in this project.

GENERAL COMMENTS
Good work. Ajay filled in his Record
sheet with enthusiasm, and was pleased
to see his achievements noted.
APPENDIX EIGHT

Relevant Programmes of Study and Attainment Targets for Key Stage Three

This Appendix contains the Programmes of Study and Attainment Targets which are satisfied by the First Year Spinning, Weaving and Dyeing project.
ATTAINMENT TARGET 2: Generating a Design Proposal

Pupils should be able to generate a performance specification and explore ideas to produce a design proposal and develop it into a realistic, appropriate and achievable design.

The Spinning, Weaving and Dyeing project covers Levels 2 - 5 inclusive as outlined below. Only the more able pupils will achieve all the levels mentioned.

Pupils should be able to:

Level 2
Use talk, pictures, drawings, models, to develop their design proposals, giving simple reasons why they have chosen to make something.

Level 3
Record how they have explored different ideas about design and technological proposals to see how realistic they are.

Use information about materials people, markets and processes, and from other times and cultures, to help in developing their ideas.

Make a design proposal by selecting from their ideas and giving reasons for their choices.

Apply knowledge and skills to select ways of realising the different parts of their design.

Use drawings and modelling including annotated drawings and working models to develop their design proposals.

Level 4
Record how their ideas have developed.

Use information obtained from their own investigations and from other sources to review their design proposal identify where decisions still need to be made; suggest possible courses of action which will improve their original design proposals.

Estimate the resource requirements and check on availability.

Use storyboards to describe and edit design proposals.
Level 5
Record the progress of their ideas showing how they have clarified and developed them.

Seek out and organise information to help them develop their ideas and refine their design proposal.

Extend their first ideas by combining aspects of them to formulate a design proposal and explain why some ideas were not used.

Establish and check the availability of the resources required, adapting their design as appropriate.
ATTAINMENT TARGET 3: Planning and Making

Pupils should be able to prepare a plan to achieve their design, and to identify, manage, and use appropriate resources, including knowledge and processes, in order to make artifacts, systems and environments.

The Spinning, Weaving and Dyeing project covers Levels 2 - 6 inclusive as outlined below. Only the more able pupils will achieve all of the levels.

**Level 1**
Use a variety of materials and equipment to make simple things;

**Level 2**
Use knowledge of the characteristics of materials and components, including constructions kits, to make artefact, systems or environments.

Show that they can use simple hand tools, materials and components.

Describe to others how they are going about their work.

**Level 3**
Choose resources for making by using their knowledge of the characteristics of materials and components.

Use a range of hand tools and equipment, appropriate to the materials and components, with some regard for accuracy and quality.

Consider constraints of time and availability of resources in planning and making.

Improvise within the limits of materials, resources and skills when faced with unforeseen difficulties.

**Level 4**
Choose tools, equipment and processes suitable for making their design and use these appropriately.

Adopt procedures which minimise waste, pay regard to cost and achieve accuracy and finish.

Adopt alternative ways of carrying forward their plan when difficulties are encountered and recognise when help is needed.
Use drawings, diagrams and models, to assist making.

**Level 5**
Use a knowledge and understanding of the properties of a range of materials.

**Level 6**
Combine Knowledge of the properties of a range of materials and processes to identify those most suitable for their design.

Demonstrate by their choice and use of a variety of tools and equipment that they understand limitations and the need for safety and accuracy.

Use knowledge of materials, components, tools, equipment and processes, to change working procedures to overcome obstacles as making proceeds.

Plan and organise making in order to achieve the desired outcome.

Show judgement in seeking advice and information.

Use knowledge of technical and symbolic representations of materials, components and processes to assist making.
ATTAINMENT TARGET 4: EVALUATING

Pupils should be able to develop, communicate and act upon an evaluation of the processes, products and effects of their design and technological activities and of those of others, including those from other times and cultures.

the First Year project covers those levels outlined below. Only the more able pupils will achieve all of the levels.

Pupils should be able to:

**Level 1**
Describe to others what they have done and how well they have done it.
Describe to others what they like and dislike about familiar artefact, systems or environments.

**Level 2**
Discuss with teachers and others how satisfied they are with their design and technological activities, taking into account their original intention and how they went about their task.
Make simple judgements about familiar artifacts, systems or environments, including those from other times and cultures.

**Level 3**
Discuss their design and technological activities with teachers and others, taking into account how well they have met the needs of others.
Comment on the materials and processes used and how the task was tackled.

**Level 4**
Review the ways in which the design has developed during the activity, justifying decisions and appraising results in relation to intentions.
Review the decision making process they used in producing their final artefact, system or environment.
Comment upon existing artifacts, systems or environments, and those from other times and cultures, including appearance and use of resources.
Understand the social and economic implications of some artifacts, systems or environments.

**Level 5**
Justify the materials, components, procedures, techniques and processes used, and indicate possible improvements.
Evaluate the results in relation to the original needs or opportunities, taking into account users' views, cost-effectiveness and scale of production.

Understand that artifacts, systems or environments from other times and cultures have identifiable characteristics and styles, and draw upon this knowledge in design and technological activities.
PROGRAMMES OF STUDY

The Programmes of Study which were addressed by the First Year project are indicated below:

Pupils should be taught to:

Working with Materials
Use equipment safely.
Consider, when selecting and using materials, their physical properties, availability and cost, and the product being made.

Combine materials to create composites with different properties.

Assemble a range of materials.

Take account of the constraints imposed by equipment.

Select equipment to create a quality product.

Work with a variety of media to produce graphic outcomes.

Ensure that the working area is well ordered and safe, and that the equipment is well maintained.

Follow safe working practices.

Understand procedures for dealing with accidents.

Achieve a high quality of accuracy and presentation.

Know that making requires the matching of materials and equipment.

Identify and use machines.

Developing and Communicating Ideas
Explore a range of potential solutions before selecting one.

Satisfying Human Need
Recognise that economic, moral, social and environmental factors can influence design and technological activities.