Chapter Two - Practical Assessment for Learning

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The first I want to say about ‘Assessment for Learning’ is that it is not a set of techniques or recipes but rather a way of thinking. If you are using ‘traffic lights’ or drawing names out of a pot in order to choose who answers a question, you may or may not be using assessment *for* learning. Assessment for Learning (AfL) involves both you *and your pupils* knowing what they need to learn, establishing how well the pupils are learning from any activities in which they engage and modifying learning plans and activities in order to enable each pupil to continue to increase their learning. In fact Perrenoud (1998) stated that when AfL is truly in place it will seem to disappear as teacher and learner move together towards enhanced learning. AfL should not be seen as a series of add-on idea, but a fundamental way of thinking about and planning lessons.

As teaching has historically often been ‘done to’ learners, when you learned to teach you may not have had a series of ideas from your own experience which will enable you to think about and plan your teaching in the way demanded by AfL. Therefore this chapter sets out to provide some practical ideas for increasing Assessment *for* Learning in your classroom to help you evaluate and accelerate the learning of your pupils.

Developing the way of thinking that is Assessment for Learning demands that for every lesson you:

- find out about what learning, relevant to what you intend to teach, your pupils bring to the lesson;
- decide what your pupils need to learn during the lesson and how you will share this with them;
- know how they, and therefore you, will recognise if they have been successful in learning;
- check how learning is proceeding on a regular basis and modify your plans if and as necessary;
- consider how they might receive feedback that will help them to continue to learn; and
- strive to be sufficiently flexible to maximise learning for all your pupils.

Each of these aspects works with the others to develop the classroom ethos that characterises AfL: where teachers and pupils are working together in a quest to improve pupils' mathematical knowledge. However for convenience each will be considered in turn.

Finding out what learning your pupils bring to the lesson

Assessing prior learning is a very important part of teaching; you do not have the time, nor is it a good idea, to attempt to teach your pupils ideas they already know. As a classroom teacher you will use some data to help you make decisions about what to teach, but it is unlikely that this data will be as up-to-date or detailed as you would like it to be. Knowing that a pupil is 'working at the expected level' can mean so many things. Can she work fluently with proportionality, using fractions, decimals and percentages, or does she find one of these forms of number more problematic than the others? No matter what data is recorded the information it gives will only

tell you about generalities and for teaching you need much more fine grained information. Therefore at the start of each and every topic that you teach, plan to get useful insight about your pupils by using an activity that will give you sufficient information to teach the class new mathematics. You could:

- use mind mapping – Ask the pupils to work in pairs to complete a mind map of all the words and ideas that they know associated with the topic in question on a mini whiteboard or an A3 piece of paper. They could draw pictures if they need to or have forgotten key vocabulary. Asking pupils to include pictures, examples of questions or real-life applications will help them explore their knowledge further. Working in pairs means that they can prompt one another to remember ideas that are 'on the tip of their tongue' so that they report more fully on the current state of their knowledge.

- use **KWL** sheets- ask each pupil to write their name and the topic on a sheet of paper and then to divide the sheet into three columns; label the first **K** , the second **W** and the third **L.** Under the first column they should write all the words and ideas they **K**now about the topic you have introduced, in the second they should be encouraged to write things they have heard about and **W**ant to know more about, leave the third column blank for now, they can add what they **L**earn to this column later. Collect in the sheets and modify your plans accordingly. Don't forget to include in your teaching as many of the ideas that they say they want to know about as you can. Ask the pupils to start to fill in the **L** column after a couple of lessons.

- test your pupils at the start using the ‘end of topic’ test – if you already have a test that defines what the pupils have to know, understand and do at the end of the time devoted to the topic, then use it at the start of the topic. Make sure that they understand the point is to find out what they can do and what they need to learn and therefore you don’t mind if they cannot answer any of the questions. Ask them to answer the test as honestly as they can so that you can plan to help them learn what they need to learn. If you want to spend less time on this they could just traffic light (red for ‘cannot do’, amber for ‘heard of it but cannot remember’ and green for ‘can do’) the questions rather than answering them in full. This will let you know which ideas they need to review and which ideas you need to concentrate on helping them learn.

Each of these ideas will require about 15 minutes of lesson time, but if that is at the beginning of a lesson you will have to be very flexible in how you use the rest of the lesson; you cannot just continue as though you don’t have the information the pupils have worked hard to give you. Therefore you might find it more useful to do one of these activities in the last 15 minutes of a lesson prior to starting a new topic or unit, so that you have time to think about what your pupils are telling you and plan accordingly.

Deciding what your pupils need to learn during the lesson and letting them know

Deciding what your pupils need to learn may seem, at first, the least complex of the ideas that underpin Assessment for Learning. A suitable scheme of work may have been constructed for your pupils using a national curriculum, examination syllabus or agreed learning plans within

your department or school, and this can serve as a natural starting place for establishing what the pupils need to learn in any lesson. However a scheme of work can only let you know what you *might* expect to teach your pupils. In order to decide what learning you intend to happen in the lesson you will also need to take into account what you have found out about the prior learning of this class, their interests and particular abilities. You might for example:

- find when planning a series of lessons on plotting quadratic graphs from tables that you need to spend a lesson revising the manipulation of negative numbers first.
- find when teaching linear equations that the pupils have developed a good understanding of one-step and two-step equations from previous lessons, and so you need to move on to more complicated equations.

Once you have all this information you can include the pupils in knowing what the learning intentions are for the lesson. It is crucial when using the principles of AfL that every lesson has a planned learning intention and that the pupils know the lesson will have been planned with a learning intention in mind. What is *not* crucial is to write the learning intention or objective on the board at the start of the lesson. Of course writing the learning intention on the board may be school policy and therefore you will be expected to do this. When you share what the pupils are intended to learn with them, encourage them to think about what they already know and therefore how they will continue to progress, as this will build good learning habits.

There will be lessons where you do not state the learning intention at the start, not because you do not have one in mind, but rather that you want the pupils to tell you what the learning intention was at the end of the lesson. Sometimes when you are using a rich task, an activity or

problem solving exercise, you may end the lesson by asking the pupils to tell you what they learned during the lesson, which may be different for each pupil. Mathematical learning must not be constrained by the learning intention, which is why I prefer to use the term ‘intention’ to ‘objective’. It is important that the pupils know that all lessons are intended to enable them to learn more about mathematical ideas and thinking; it is neither important nor reasonable to always expect the learning to exactly fit in with your initial plans.

Differentiation may well be necessary in your planning as a result of finding out what your pupils bring to the lesson. You will find when planning for every lesson some pupils will have had experiences that others have not. It is your job to find out what your pupils bring to the lesson and to respond to what you find out with ways that they can fill any gaps that may prevent them accessing the intended learning. There may be several different gaps apparent in any one class. Offering learning tasks and activities that either helps to fill those gaps, or consolidates or progresses the understanding of those who do not appear to have gaps is good differentiation.

Making sure your pupils, and therefore you, recognise where and how they have succeeded in learning

Knowing exactly what you have learnt and how you have been successful builds resilience in learning, and enables pupils to experience the positive feelings of making progress. They will then be better positioned to be able to continue the struggle to understand and learn to deal with any misconceptions or other barriers to learning. Therefore designing ways to enable pupils to know exactly how successful they are in their learning is important.

- Most lessons or sequences of lessons can have success criteria or learning outcomes which set out how the pupils can measure success for themselves. For example you can draw a good straight-line graph if you:
  - use a sharp pencil and a ruler
  - are able to use a given equation for the graph to find a sufficient number of appropriate co-ordinates
  - draw horizontal and vertical axes and label them at equally spaced intervals, suitably scaled to allow you to show the important features of the graph
  - join the points with a ruler.

- Many of the examples of success criteria above can be broken down further depending on what the class needs to learn about. 'Using an equations for a graph to work out sufficient appropriate co-ordinates' could take several lessons, as the pupils learn to recognise how to work out y given x and x given y and what x and y mean in the first place. Success criteria should indicate success for the pupils in any given lesson. Carefully set out success criteria can become assessment criteria both for you in marking work and for the pupils themselves in peer-assessment activities.

- Success criteria can link from one lesson to another; in the above example some pupils may have understood that you need three points to draw a straight line graph, but others pupils may not have understood this point. Hence some pupils will move in the next lesson onto thinking about 'where do I need those points to be?' (appropriate co-ordinates) whilst others

will continue to explore ‘sufficient co-ordinates’, or working with linear equations. Lessons that take account of the pupils’ success measured using the criteria are lessons that the pupils know are built around their needs and ultimately lessons that enable all to succeed. You could photocopy the success criteria, so that the pupils can stick them in their books and cross off the ones that have been achieved as they move through the topic.

- Success criteria can be designed for the whole class or for individuals and can indicate how the class (or individual) should behave in order to learn successfully. For example if you want the class to work as a group in order to learn some mathematics you might set out criteria for this.

TASK: Pupils can set their own criteria for success and this is a powerful way to help them develop as independent learners and to judge their own success. With a class that is used to using success criteria in lessons, ask the pupils to define what success will mean in a particular lesson. If they forget to include something important you can say so and add it in. Consider if setting out success criteria in this way takes more time than writing success criteria yourself and also consider if working this way helps the pupils know they are able to decide for themselves what success means.

All of these ideas are about helping pupils to guide their own learning effort, to be able to assess what they need to learn and, in the best case scenario, to sort out for themselves how they can best do that. However they are also very useful for you because they help you:

- plan the lesson. Once you have worked out what success in a particular idea or concept looks like, it becomes easier to choose activities that will enable that success.
- decide what questions to ask. The questions you use in the lesson should be designed to probe pupils' understanding of the criteria.
- know what the pupils have learned and what they are finding difficult and therefore help you know where to intervene and how.

Checking how that learning is proceeding on a regular basis

Checking how the pupils' learning is going can be seem simple enough, you just ask them. However you will not have time during every lesson to ask each individual pupil a probing question. Here are a few suggestions to make sure you gather as much high quality information as possible.

- Ask questions worth asking and give the pupils time to answer them. It can be easy to be lulled into a false sense of security when everyone seems to be able to answer short, undemanding questions, or when you ask 'do you understand?' and all the pupils nod. The best way for you, and the pupils themselves, to know whether they understand is to ask a planned and probing question and allow the pupils time to think about it before answering.

- Take five minutes for the pupils to discuss in pairs what they have learned so far in the lesson. Ask them to identify something they feel good about and then something they feel unsure about. Ask two or three pairs what they feel they have learned and ask for hands up to

show if others also feel confident about this aspect. Now ask for things they are unsure about or ‘issues’: take two or three answers, again with votes, and then ask if there is anything else that hasn’t been mentioned. Make an obvious note of these ‘issues’, and make sure you offer ways to address the issues, either straightaway or if it is more appropriate start the next lesson dealing with those ‘issues’.

- Use exit passes. Give each pupil a piece of rough paper and ask them to write an answer to a probing question, or what they feel confident about and what they still have issues with, or to draw a mind-map. The idea is that what they include on this paper is something that will provide information about their progress. The pupils will hand these in as they leave the room. Try giving out the exit passes at the start of the lesson to remind the pupils to think about checking their learning.

TASK: Choose a topic that you will teach in the near future. Think about one or two questions that would probe your pupils’ understanding of that topic. Write down these questions so that you can use them to check your pupils’ progress when you teach the topic.

The point of these ideas is to get responses from all pupils in the class which inform you about your pupils’ learning. As a teacher you will find staying in control of all of the class difficult at times and your attention can easily be consumed by a few pupils, so it is important to plan activities that will enable you to review and respond to all of your pupils without marking all of their books every lesson.

Giving feedback that will help your pupils continue to learn

As discussed in the previous section, helping pupils know they are successful learners is vital and the 'ticks' teachers have have written next to their pupils' answers for centuries. can do that. However there is more to good feedback than check marks and scores out of 10. Your pupils will learn best if they know where and how they have been successful in their learning ***and*** how best to continue to be successful. Effective feedback will allow pupils to both know where and why they have been successful and know what to do next to continue to learn and develop their understanding of mathematics.

It is crucial that pupils have the time and opportunity to act on the advice given. If books are marked and comments given but there is no time set aside to read and act on those comments then pupils will just glance at the comment. The best 'improvement advice' requires the pupil to do something. It might suggest that a pupil:

- quickly acts on your advice to correct a question in the homework or try a similar one which you have written in their book in order to demonstrate they understand what they're doing.
- reads a page in a textbook, tries out some questions and then writes a sentence (with diagrams) on 'what I must not forget to do'.
- goes and sits with a given person for five minutes and discusses a particular idea and then returns to their place and records the important ideas discussed, possibly completing some specific questions at home to ensure that they have understood.
- writes three questions (with answers), an easy one, a medium one and a hard one so that they think about the concept as a whole and consolidate their understanding.

- finds the same topic in a more advanced textbook and makes a mind map of the topic they have just learned and where the ideas lead onto next.

This ‘improvement advice’ will require at least some lesson time. Acting on individual feedback given through book marking or orally in the lesson should be thought of as one of the many varied learning activities that enable pupils to learn mathematics.

TASK: Next time you can access some pupils’ work, or using some you have available already, write ‘two stars and a wish’ for about five pupils. That is for each pupil you will point out two things that they have done well in their work and then write some ‘improvement advice’, a wish, that they can act on to continue to improve.

Being sufficiently flexible to maximise learning for all your pupils

When you ask a question or watch a group of pupils working together you will find something out. You may be lucky and find the respondent to your question understands the idea you have just explained and you can carry on with your next planned activity. However, what if the question reveals the respondent has no clue what you are asking? Or that they are fully conversant with both the ideas you have just explained and the ones you intended to explain next? You will need to be flexible.

In order to be able to say that you are using AfL you must be prepared to change the subsequent learning activities in the light of the information you uncover. You will get used to using your

subject knowledge in order to do this but here are some standbys to help out while you build your experience.

1. Ask challenging questions towards the end of the lesson so that you have more time to plan how you are going to respond. If you do this often your pupils will know you want them to put in some effort in constructing their answers as you will act on what you find out.
2. Have a few copies of several different textbooks available. If a pupil ‘doesn’t get it’ or has ‘done all this before at primary school’ point them to a suitable textbook and tell them to select explanations to read and questions to do that will help them to move forward. Asking pupils to take responsibility for their own learning is appropriate, providing you support them in doing so. By offering a variety of materials they can choose a layout or explanation that makes sense to them.
3. Ask pupils to work together so that discussion is part of their effort to understand and move forward:
    - seating someone who ‘sort of gets it’ with someone who ‘has no idea’ can help both of them to broaden their understanding.
    - asking pupils who have fully understood the ideas to work together to think about where the ideas could be used ‘in real life’, or what connections those ideas have with other ideas that they have learned this year, can help to make mathematics more interesting and engaging.
4. Ask the pupils to work in pairs to write an easy, medium and a hard question. This requires pupils to work at their own level and then to extend their understanding. Ask the

pairs to swap their questions with another pair, the second pair will complete the questions and then the group of four should discuss the answers. Then discuss as a class what made a 'good' question in this topic, what issues do the pupils still have? Explain there and then or use the issues to plan the next lesson.

***NOW TRY THIS*:** Find a class list of pupils that you know well. Pair up the pupils into 'learning buddies', choosing pupils who can help one another out (these should not be people they normally sit with). Tell the pupils who their 'buddies' are and say that if they are stuck they should go and discuss their work with their 'buddy' before asking for help from you as teacher. You could use this idea for a 'rich' activity such as those in Chapters Six, Eight and Ten. Try this out over a period of two weeks. Reflect on how well this works for this class and whether you want to extend this way of working.

You will notice that most of these ideas require your pupils to work collaboratively to help one another continue to move forward with their learning. This is important. Many teachers, especially when they start, think that they are the only one in the room who knows what to do. Most people find learning with another is the best way to improve and you should make use of this in the classroom. Activating the pupils as learning resources for one another (Wiliam 2011) means there will always be someone available to help if a pupil gets stuck and there will be someone for the pupil who is zooming forward to try out ideas with and to challenge those ideas. Research (for example Gartner et al. 1971 and Goodlad and Hirst 1989) has also shown that pupils who explain ideas to others both consolidate the ideas for themselves and deepen their

understanding. Any classroom where everyone sits in silence for every lesson is not maximising learning.

Summary:

In this chapter you were invited to think about the principles of Assessment for Learning and how to introduce those principles into your lessons. The ideas discussed included:

- what Assessment for Learning is and what it is not;
- how to find out about your pupils' prior learning;
- deciding on what your pupils need to learn during the lesson and how you can let them know;
- how you and your pupils can recognise if they have been successful in their learning;
- checking how that learning is proceeding on a regular basis;
- providing feedback that will help pupils continue to learn;
- ideas that can allow you to be sufficiently flexible to maximise learning for all your pupils.

Further reading

Lee, C. 2006, *Language for Learning Mathematics – Assessment for Learning In Practice*, Maidenhead UK: OUP

Wiliam, D. 2011 Embedded Formative Assessment, Bloomington, IN: Solution Tree Press

Black, P., Harrison, C., Lee, C., Marshall, B. and Wiliam, D. 2004, *Working Inside the Black Box,* NfER Nelson