

Does assessment for learning matter in maths?

THE 2017 WHIZZ INSIGHTS • PART 3

Formative...?
Summative...?

Can you
assess
understanding?





Introduction

Recently, it's become clear that too many children in the UK learn maths on a surface level.

That's why the new SATs format prioritises reasoning skills, why the 2014 National Curriculum emphasises deeper understanding, and why mastery approaches are becoming so popular.

For teachers to teach deeper mathematical knowledge and skills, they need to be able to assess whether students have first grasped the foundations.

But at the same time, the abolition of National Curriculum Levels has made formative assessment tougher for many teachers: in a [2015 survey](#), over 75% of headteachers agreed that their school found the removal of levels difficult.

At Whizz, we work to make formative assessment a powerful tool for teachers, instead of another box to be ticked. We know that when formative assessment is effective — when it really is assessment for learning — it doesn't just help teachers to understand whether students are ready to learn at a deeper level, it also helps students get there.

That's why we dedicated Part 3 of the 2017 Whizz Insights to the question: 'Does assessment for learning matter in maths?'

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Focus on the foundations

To teach for deeper learning, teachers need to know whether their students can handle rich, complex maths problems.

But this doesn't mean that assessment for learning should always focus on such problems. We need to be careful about confusing summative assessment — assessment *of* learning, which evaluates learning at the end of a unit — with formative assessment — assessment *for* learning, which provides feedback for students and teachers to use as they learn and teach.

In formative assessments, it can be far more valuable to assess whether students have the right foundations; the basic skills they need before they're ready for deeper thinking.

If a student is not fluent with her basic multiplication skills, she'll never be able to solve a multi-stage problem using it, no matter how hard or how many times she tries.

Her teacher needs to know that she's struggling with simple multiplication. However, this struggle may not be obvious if the student is assessed with a complex reasoning task: there's so much going on there that the real weakness may be hard to spot.

To assess for learning, we need to focus on the foundations. A sheet of basic sums or a times tables test can be more use to teachers' planning than a complicated problem from a SATs past paper, even if the final goal is to solve problems like the ones in the paper.

By focussing on the foundations, assessment for learning can give us a clear view of the precise strengths and weaknesses that summative assessment often misses. This gives teachers the information they need to take action in the classroom, building basic skills so that students are ready for deeper learning.

Every maths topic is linked to others; new knowledge and skills have to be built on top of previous learning.

Make each lesson part of a journey

Part of assessment for learning is involving students in the learning process, getting them to reflect on learning objectives and outcomes. But teachers need to be careful: this approach can turn each lesson into a single unit.

It's a familiar approach: You start the lesson by sharing the learning objective with the class, then end the lesson by having the class reflect on whether they've met the objective. Next week, you all move on to the next learning objective.

There are two problems here.

- First, as every teacher knows, students think in the most amazing ways. Students can seem comfortable with the material, rate themselves highly in their teacher's carefully designed self-assessment, and then forget it all before the next lesson.
- Second, every maths topic is linked to others; new knowledge and skills have to be built on top of previous learning. Part of the confidence that makes a mathematician comes from understanding the way that topics fit together.

Assessment for learning needs to tell us whether students remember their learning, and that they can draw the links between lessons and topics. Done right, it can also help students achieve those things.

A quick re-cap at the start of a new lesson — whether that's a written test, group activity or an interactive game — can be a powerful tool for teachers. So can simple activities which bring learning from maths lessons into other parts of student's lives: try splitting into fractions for PE groups.



Assessment for learning needs to escape the best fit approach



Expose gaps, don't hide them

The old National Curriculum levels used a 'best fit' approach, taking an overall view of a student's assessment scores. So, students can 'fit' a level even when they have severe gaps in their learning.

That's a big problem when you're teaching maths.

As we saw earlier, every maths topic is connected. New knowledge and skills have to be built on top of previous learning, and deeper success happens when students start to understand how concepts fit together.

When learning gaps are hidden behind a best fit score, teachers don't have the information they need to take action and fill in the gaps. When that happens, students' weaknesses in one topic don't just hold them back from deeper understanding in that topic, but stop them learning new topics that build on it.

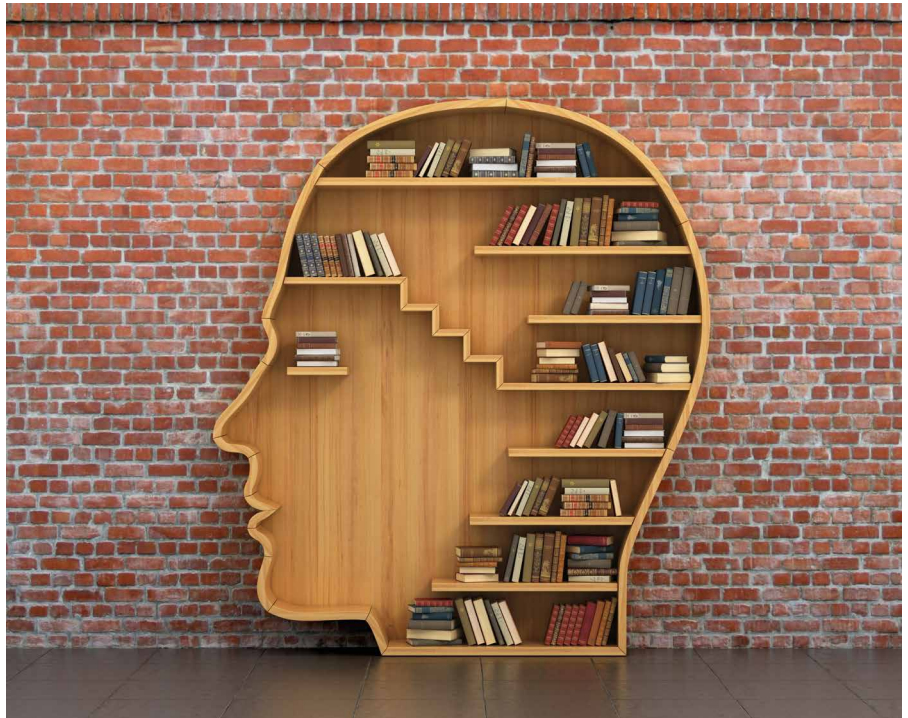
The challenge increases when you remember that two students working at the same best fit level can have very different learning gaps. As a result, they can have very different learning needs. But if all the teacher has to go on is an overall level, they can't plan teaching for each student's individual needs.

Assessment for learning needs to escape the best fit approach. Teachers do need to know their students' overall level, but in day-to-day planning and formative assessment, it's much more important that they have a clear view of each child's specific needs.

To do this, assessment for learning needs to use clear, concrete questions and avoid vague judgements: 'You are able to tell which of two fractions is larger' should be dropped in favour of 'You know that $\frac{2}{5}$ is bigger than $\frac{1}{4}$ '.

With clear, concrete criteria like this, assessment for learning can show teachers precisely where students' learning gaps are, allowing them to make targeted interventions on specific issues.

Want to find out more?



['Inside the Black Box: Raising Standards Through Classroom Assessment'](#)

Paul Black and Dylan Wiliam

The seminal paper which proposed 'Assessment for Learning' is always worth reading (or re-reading).

['Life After Levels'](#)

Daisy Christodoulou

The Head of Assessment at ARK Schools gives her views on some of the issues with NC levels, and how assessment for learning can do better, in this informative seminar video.

['Assessment for Learning in Mathematics'](#)

The National Centre for Excellence in the Teaching of Mathematics (NCETM)

Some useful advice and suggestions for reading from the NCETM.