

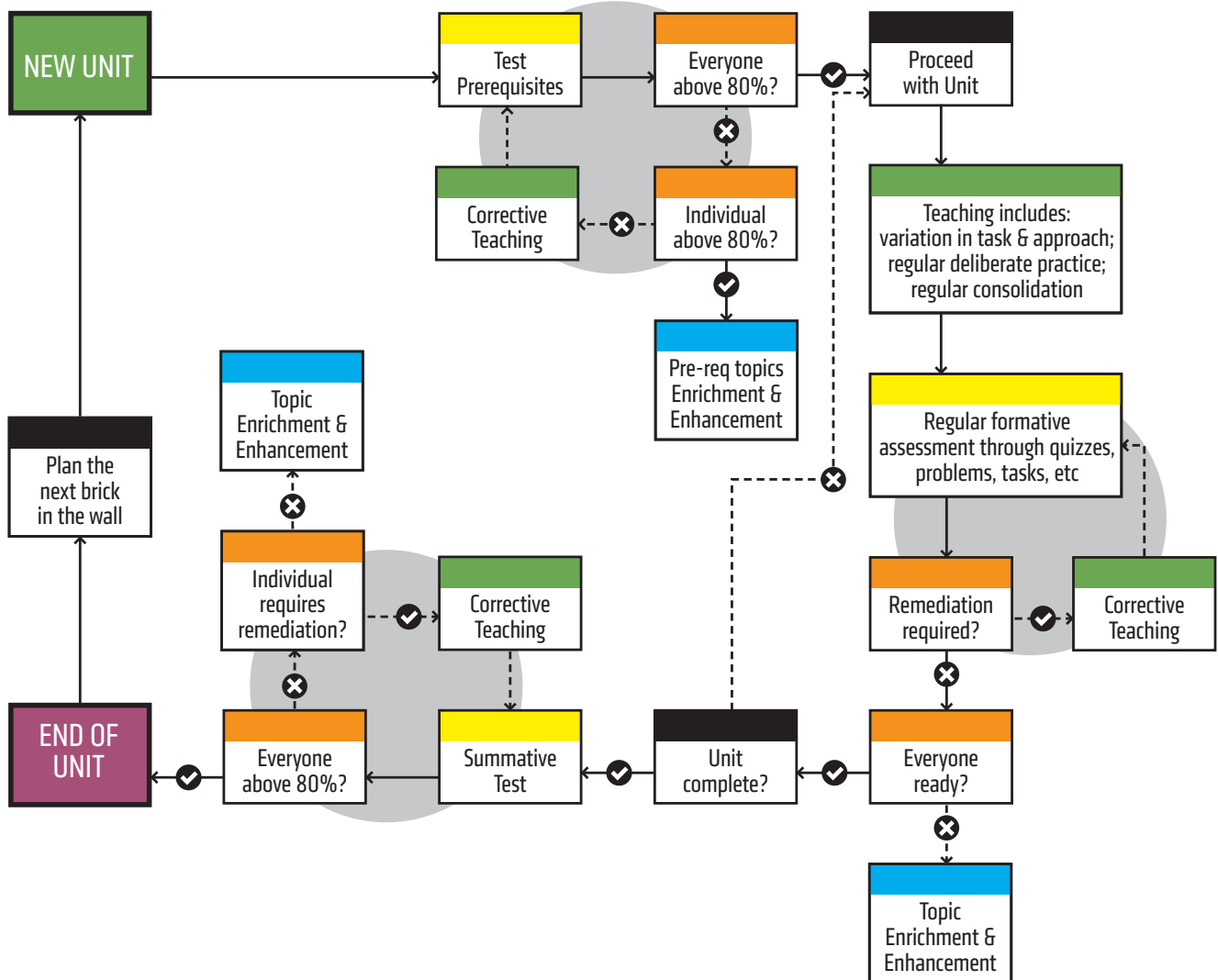


MASTERY LEARNING CYCLE

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KEY

Assessing	Teaching	Decision	Non-compulsory content	Process
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New unit

The planning, design and sequencing of units is important to ensure that, as the journey through mathematics progresses, new concepts and learning is being built on top of appropriate foundations.

Test prerequisites

Test design is critical here. Often, tests used in mathematics education reveal little about whether a child has actually grasped a concept or not – rather, tests tend to reveal whether a child can repeat something they have been shown. Performance is not a good proxy for learning!

Everyone above 80%?

It is tempting to move on without this benchmark being reached. After all, teachers have internal and external pressures on them, which encourage behaviours of moving through content quickly. A fear can exist that content will not be covered. However, although early units will typically take 40% more teaching time, this time is recouped later in the course, when pupils will be able to travel more quickly through units because the prerequisites are truly secure. The threshold of 80% is only as useful as the design of the questions / tasks / problems. Designed badly, 80% (or any other mark) can be utterly meaningless.

Corrective Teaching

This 'corrective teaching' must be distinct from prior attempts to teach the concept, which the individual failed to grasp. A different approach is deployed at each cycle.

Teaching includes...

There are aspects of school level mathematics that pupils must acquire fluency in if they are to be able to access the rest of the subject and move to greater expertise in more demanding situations. The fundamental, non-negotiables are:
1. Numerosity, 2. Place value, 3. Base 10 system, 4. Arithmetic, 5. Proportional reasoning

Regular formative assessment...

It is the design of these tasks, questions, problems, quizzes that is key to success. Formative assessment design is intellectually demanding and complex. Matching the concepts with intelligent assessment questions is high priority. These questions must reveal whether or not an individual has grasped the concept.

Topic Enrichment and Enhancement

Pupils should be given real opportunities to be intellectually challenged. They should be able to celebrate their own depth of knowledge and success, by grappling with significantly complex problems. This must include opportunities to conjecture, generalise and reason.

Summative Test

A successful pass in the summative test should be equally rewarded and celebrated, regardless of when the pupil passes. A good analogy here is a driving test. A driver is not considered less of a driver because they passed on their third test rather than their first.

Plan the next brick in the wall

Like a jenga puzzle, new mathematical learning rests on earlier mathematics. The 'bricks' must be carefully planned - a pathway that makes sense and builds the wall appropriately - if the course (rather than just a unit) is to be successful.