

# Teaching maths in the Covid-19 recovery period: guidance for secondary schools

This document provides guidance to support secondary teachers while students are returning to school after a period of sustained school closures. It will also be relevant if periodic school closures are needed in the future.

We recognise that the safety, and the physical and mental well-being of students, is of prime concern to teachers as schools re-open and new arrangements begin to take shape. Teachers will be aware that some students have experienced significant difficulties and trauma, and that the impact of lockdown on students from disadvantaged backgrounds may have been greater. We offer this guidance to help teachers and students to return to a caring, positive, and stimulating classroom experience.

## What might students have missed?

### *Content*

During school closures many students accessed online learning resources which provided them with opportunities to practise skills and techniques, and to revise topics they had previously learned. Whilst this will have been a valuable experience, it is unlikely to have enabled them to move on significantly with new learning. Without expert guidance from their own teachers who know the subject and the students well, students may have missed out on development of deep conceptual understanding during this time.

### *Pedagogy*

Many online learning resources offer step by step tasks and exercises, with feedback for the individual. Whilst this can be focused and supportive, it rarely provides the rich and engaging interactivity of the classroom environment, where students learn together, guided and inspired by an expert teacher. The teacher's role in planning, explaining, questioning, drawing out students' ideas, managing interactions and monitoring learning is of the utmost importance in enabling students to develop a deep and connected understanding of maths. The teacher has a crucial role in watching and listening to students, collectively and as individuals, and offering support and challenge. Allied to this, explaining thoughts and ideas to others and hearing others do the same is important for students.

## How can we rebuild and reinvigorate students' learning?

In order to support students as they return to learning in school together, it is vital that attention is paid to both *what* is taught (content) and *how* it is taught (pedagogy).

### *Recovery content*

Teachers will need to be aware that:

- after a sustained period of school closure, students should not be expected to simply pick up content where they left off

- in any group, there will be wide variation both in *extent* and *quality* of learning that students have experienced during school closures
- teachers will need to make decisions about which areas of content to prioritise
- Some maths topics provide particularly strong underpinning of the curriculum, enabling students to build future learning on secure foundations, and these topics should be prioritised.

The [NCETM Secondary Mastery Professional Development materials](#) provide comprehensive guidance on key ideas, the knowledge that underpins them, and approaches to teaching these. (1)

*Research indicates that following a prolonged period of school closure, student outcomes were better when 'teachers focused on "what has to be learned" instead of getting through a lot of curriculum' (2), and where teachers targeted learning to address gaps, rather than attempting full curriculum coverage (3).*

Try to avoid:

- 'rushing through' a crowded scheme of work to 'catch up'; this is ineffective and can be demotivating.

Instead, try to focus on:

- securing students' deep conceptual understanding in key topics which prepare the way for future learning.

## *Finding out where students have made progress*

Teachers will need to be aware that:

- students' experiences during school closures will have been very varied. Some may be apprehensive about returning to the classroom; some will be concerned about content they may have missed.

Try to avoid:

- making general assumptions about the learning they may or may not have done during this time
- setting formal tests too early.

Instead, try to focus on:

- in-class observations, questioning and checking to find out about students' understanding and attainment; this will inform planning and reinvigorate student learning in a supportive way
- looking out for wider gaps – a prior attainment picture that is more mixed
- looking out for surprises – some students will have progressed in unexpected areas, bringing opportunities to reset learning by assigning competence in new ways.

## Recovery pedagogy

Teachers will need to be aware that:

- after a prolonged period where students' learning has mainly been in isolation, it will be important to make the most of opportunities for interactive, meaningful and collaborative learning
- effective deployment of support from the [National Tutoring Programme](#) may provide opportunities to vary groups and group sizes, and offer pre-teaching strategies for some students (4)
- mathematical talk is a very important part of learning (5). Students who discuss and debate mathematical ideas grow in confidence, understanding and attainment
- the pedagogical processes referred to above are a vital element of the maths teacher's toolkit and should be used alongside other approaches such as individual study, teacher explanation and modelling, and practice exercises.

Try to make the most of the opportunities where:

- learning is interactive and takes place in whole class or group collaborative settings
- students can talk about their maths and share their ideas, whilst adhering to protocols regarding classroom layout and social distancing.

Managing productive in-class discussions and question-and-answer sessions is a high-level skill and poses significant pedagogical challenges in teaching. Students need time to get used to the expectations and protocols too. A helpful model proposed by Stein et al (6) to support such interactive and responsive teaching involves the following processes:

- **anticipating** likely student responses to cognitively demanding mathematical tasks
- **monitoring** students' responses to the tasks
- **selecting** particular students to present their mathematical responses
- purposefully **sequencing** the student responses that will be shared
- helping the class make mathematical **connections** between different students' responses and between students' responses and the key ideas.

## And if schools close again...

Teachers will need to be aware that:

- if local closures take place, they need to be ready to return to online teaching and learning for periods of time.
- during lockdown, professional use of online platforms increased dramatically. Use of professional collaborative networks will support teachers to share good practice and become confident with new ways of teaching.
- a 'flipped classroom' approach (where students undertake some work on their own ahead of shared classroom or online activity) can help to increase the effectiveness of these strategies. (7)

Try to:

- distinguish between activities that students can usefully do on their own (e.g. watching video clips, using individualised learning platforms) and those where interactivity is productive (e.g. live online teaching, Q&A via 'chat' function, in-program responses, polls, quizzes)
- use strategies which develop students' self-regulation and metacognition (awareness of and control over one's own learning). (8)

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## References

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3. <https://corwin-connect.com/2020/04/visible-learning-effect-sizes-when-schools-are-closed-what-matters-and-what-does-not/>
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7. <https://www.nfer.ac.uk/media/2019/nesm02.pdf>
8. [Quigley, A., Muijs, D. & Stringer, E. \(2019\) \*Metacognition and self-regulated learning: guidance report\*. Education Endowment Foundation](#)