



THIRD SPACE
LEARNING

The Secondary School Guide to Effective Maths Interventions

How to plan, structure and teach one to one maths lessons to raise attainment in the pupils who need it most

SLT Guides

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Introduction

Here at Third Space Learning, we've provided online one to one maths tuition to students in schools across the UK since 2013. We've learnt a lot along the way about what makes an effective one to one intervention programme - including what not to do!

In this guide, we'll share the knowledge and expertise we've acquired from providing one to one maths support to over 170,000 students to help you get the most out of your own in-school interventions.

While this guide focuses on one to one interventions, many of the tips and strategies can be applied to small group learning.



Why do schools choose to implement interventions?

School interventions are highly specific additional activities, usually in maths and English at primary school, focusing on the specific needs of one or more children.

Schools implement interventions for many reasons, all of which stem from a particular student or group of students requiring additional support over and above classroom teaching.

- ✓ Even in well-planned and well-delivered lessons, it's not always possible to give every student the support they need in a class of 30.
- ✓ Interventions are a good way to address individual gaps and misconceptions.
- ✓ More focused support can boost engagement and confidence as well as attainment.
- ✓ Many students will feel more willing to attempt work they find challenging away from their peers.

Why are maths interventions particularly important?

In maths, unaddressed gaps are especially problematic. The nature of the subject means children's learning needs to build on a solid understanding of essential foundation concepts.

A student who has, for example, not grasped the values of numbers at foundation stages will struggle much more with understanding the concepts of addition and subtraction. As these gaps escalate, they cause students to fall further and further behind as they struggle to keep up in class. This also has a huge impact on confidence and self-esteem and can lead to 'maths anxiety', thus creating a vicious cycle.

It's for this reason that the link between KS2 performance and eventual KS4 performance is stronger in maths than any other subject. Students who leave primary school without the skills and knowledge required will find it harder to catch up in secondary school. Maths is based on building knowledge and other subjects don't necessarily require prerequisite skills.



Maths skills have a profound long-term impact on both individuals and society, and early difficulties in maths tend to be compounded as students move through their education. This drives a particularly strong link between maths attainment at Key Stages 2 and 4. There is therefore an urgent need to tackle learning loss in maths, particularly at primary school level.

'A Space for Maths' - CFEY Report - Loic Menzies, Baz Ramaiah and Catherine Boulton

Why one to one?

Children's gaps are different so the more personalised and focused you can make your interventions the more effective they will be at raising attainment.

Research suggests that one to one tuition is one of the best ways of achieving this.



On average, one to one tuition is very effective at improving student outcomes. One to one tuition might be an effective strategy for providing targeted support for students that are identified as having low prior attainment or are struggling in particular areas.

Research from The Education Endowment Foundation into one to one tuition

Here are some of the advantages of one to one tuition:

- ✓ Target and address individual gaps and misconceptions
- ✓ Adapt pitch and pace of delivery to suit each student
- ✓ Encourage students to verbalise their maths
- ✓ Drive engagement by framing questions around each student's hobbies and interests
- ✓ Integrate formative assessment throughout
- ✓ Build confidence away from the rest of the class
- ✓ Target Pupil Premium and other per-student funding
- ✓ Save costs in the long run as students make accelerated progress

How to plan your one to one intervention strategy

- 1 Review existing interventions
- 2 Identify your target groups
- 3 Set your success criteria
- 4 Decide who will run the interventions
- 5 Allocate your funding
- 6 Identify the right topics to teach each student
- 7 Schedule your interventions

1 Reviewing existing interventions

Gather any available data on interventions you've led over the past few years.

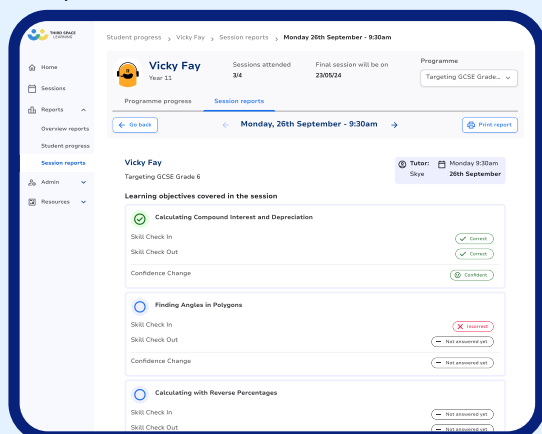
It's not always easy to do, but try and look at the percentage of students who've met targets and compare this to students who were not taking part.

Alternatively, compare progress made for students whilst taking part in the intervention with progress over the previous period.

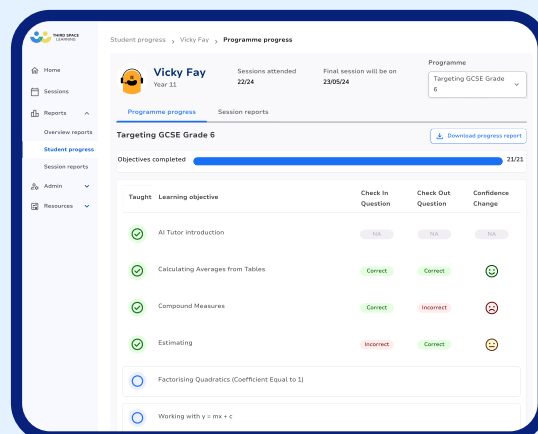
For some interventions, this may be easier than others and it may depend on the tracking and monitoring systems available to you.



Students signed up for one to one support from Third Space Learning receive individual session reports as well as an ongoing progress report which is updated after each session. These enable schools to clearly and easily measure the impact of the intervention on each student.



Session reports show content covered and progress made in each session



Progress reports show how gaps are being addressed and knowledge secured over time

2 Identifying your target groups

You'll probably already have an idea of the students in your school who would benefit from additional one to one maths support.

Schools who sign up to Third Space Learning tend to choose the following groups of students to receive the weekly online one to one maths lessons:

- ✓ Year 7 students who did not meet age related expectations in year 6
- ✓ Students in receipt of Pupil Premium
- ✓ Students whose education has been particularly badly affected by school closures
- ✓ Students with Special Educational Needs, most notably Dyslexia and Autism
- ✓ KS4 students at risk of not achieving their target GCSE maths grade

Whilst many schools - understandably - leave their maths interventions until Year 10, as this is when the need is often greatest with the impending GCSE examinations, it's often more effective to start lower down the school.

This means you should spend a good amount of time building solid maths foundations and helping to really secure KS3 content, meaning students will be able to hit the ground running when it comes to KS4 and GCSE revision.

3 Setting your success criteria

Clearly, data showing that an intervention has been effective in raising student attainment is the best way to measure success, but you may also wish to consider some other criteria:

- ✓ Has the students' class teacher(s) noticed any improvement in the cohort?
- ✓ Have there been any positive changes in confidence and engagement?
- ✓ Do students look forward to the additional one to one support?
- ✓ Are students now more willing to participate in class?

Documenting where you'd like to see improvements - and how you're going to measure this - is a great way to make sure any interventions you implement have the desired effect on your students.

4 Deciding who will run the interventions

Ideally, any one to one maths interventions will be delivered by tutors or staff who specialise in maths as they'll be best placed to develop your students' maths skills and ensure they've built the necessary building blocks to succeed. That said, given the shortage of maths specialists in secondary schools, you may choose to look to an external maths intervention.



Where schools choose to use staff who might not be maths specialists, research from the Education Endowment Foundation suggests that they will be most successful when they are 'experienced, well-trained and supported – for example, delivering a structured intervention.'

Research from The Education Endowment Foundation into one to one tuition

Advantages of an external intervention

> + = = % < - = + x % +

Less impact on staff workload

Using external providers frees up your teachers to do what they do best.

> + = = % < - = + x % +

Easier to manage

A good external provider will take care of managing the intervention with minimal disruption to the school.

> + = = % < - = + x % +

Additional funding

Schools can use their Pupil Premium funding to help with the cost of external tutoring.

> + = = % < - = + x % +

Better monitoring and reporting

It's in an external provider's interest to provide detailed progress reports to ensure you can see impact and continue to use them.

> + = = % < - = + x % +

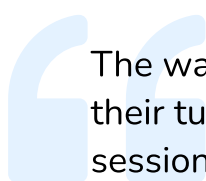
A more evidence-based approach

External providers will have data from thousands of students and schools to inform the most effective intervention approach.

> + = = % < - = + x % +

More ratings and reviews

You'll be able to read case studies and reviews from other schools who've used the provider to help decide if they're right for you.



The way the tuition is set up is seamless. The kids get on, they connect with their tutor and they love it. One of the Deputy Heads recently observed a session and he immediately said "This is fantastic!". I was thrilled that he had the opportunity to see how engaged the students were.

Darren Madourie, Head of Year 11, Holte School, Birmingham

5 Allocating your funding

Many schools use their Pupil Premium funding to fund their interventions. For the 2024/2025 academic year, eligible secondary students will receive **£1,075**.

While schools will no longer receive additional ring-fenced tutoring funding such as National Tutoring Programme funding or Recovery Premium from September 2024, the DfE is still strongly encouraging schools to continue to offer one to one maths interventions such as tutoring:



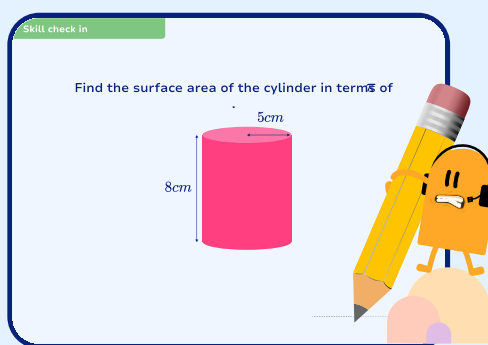
Tutoring is an effective and well-evidenced targeted approach to increase the attainment of disadvantaged pupils. Tutoring should supplement and be linked explicitly to high-quality classroom teaching. We strongly encourage schools to continue to fund tutoring using Pupil Premium from September 2024, following the final year of the NTP.

Department for Education – Using Pupil Premium: Guidance for School Leaders – February 2024

6 Identifying the right topics to teach each student

One to one interventions are effective because they can be targeted to close each student's individual gaps and misconceptions, so it's vital to diagnose these prior to starting your chosen intervention programme. Rather than teaching each student the same content, you'll want to set time aside to identify what will be most beneficial for each individual student. Alternatively, if you're using an external provider, make sure you speak to them about how they make sure the intervention is personalised.

- ✓ **Ask their maths teacher.** They will be able to tell you which areas the students struggle with and whether these are common throughout the class or if different students have different gaps.
- ✓ **Use assessment data.** You may already have formative assessment data to show you which areas different students struggle with. Alternatively, your external intervention provider may use a diagnostic assessment.



For example, before each Third Space Learning session, all students complete a skill check in question to assess their understanding of the maths concept. If they struggle and need further support, AI tutor Skye walks them through the concept step by step to close gaps and address misconceptions. Those with sufficient understanding move straight to more challenging questions. Each lesson ends with skill check out to assess student progress.

You'll want to think about whether it's more important to you to align completely with what topics are being taught in class, or whether you'd rather focus on addressing individual gaps. It's often worth speaking to the class teacher who will be able to tell you whether they think pre-teaching would be the most valuable way to use the intervention, or a child has specific learning gaps that need closing, or if it is just a case of building a child's confidence and fluency in number recall.



Tuition is more likely to make an impact if it is additional to and explicitly linked with normal lessons, so even if you're focusing solely on gaps, you may wish to try to align these with what's happening in class as much as possible.

Research from The Education Endowment Foundation into one to one tuition

At Third Space Learning, we've developed an approach to tutoring that gives schools flexible options:



Weekly one to one tutoring: for schools who want to remain completely in control, teachers can choose topics for each student each week.

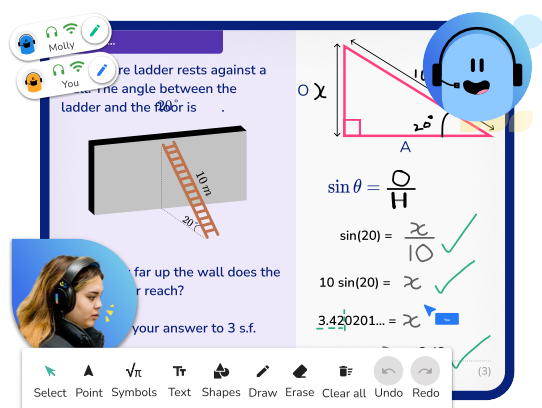


Intensive GCSE revision: schools can double or even triple each student's weekly sessions in the spring and summer term for extra revision but zero additional cost.



On-demand tutoring: if students demonstrate a lack of understanding during the lesson, schools can launch sessions on demand to give learners extra practice for that particular maths concept without impacting their weekly session progress. Students can complete this session straight after their maths lesson, or even at home as part of their homework.

Schools are free to choose different options for each student.



As well as thinking about which topics to teach and how this aligns with what's being taught in class, you'll also want to think about the order in which topics are taught. We recommend focusing on core concepts such as place value first, which will have an impact on all other areas of the maths curriculum.

If your interventions are focusing on GCSE revision, it can also be useful to think about which topics come up most frequently, are worth the most marks, and trip students up most often.



At Third Space Learning, we've analysed past papers, QLA data and our own internal programme data to inform the best possible GCSE revision programme, helping schools make the most of the lead up to GCSEs.

7 Scheduling your interventions

First, you'll want to decide how long you'd like the intervention to last, and indeed how long each session should run.

Duration



Short, regular sessions 3-5 times a week over a set period of time result in optimum impact.

Research from The Education Endowment Foundation into one to one tuition

In our experience, we've found that 30-45 minute sessions three times a week is about the right length to maximise fluency and retention while still giving enough time for exploration and greater depth with more difficult misconceptions.



With access to unlimited students and sessions for one low annual fee, schools using Third Space Learning can keep students on the programme for as long as they like, but most schools rotate their cohort every 1-2 terms.

Timetabling

The relationship between your students and the person delivering the intervention is key, so it's important to try and schedule your interventions so that students can learn with the same person in each session.



At Third Space Learning, students learn with the same AI tutor every time, helping to develop consistency for the student and reduce anxiety and cognitive load. Because Skye is an AI tutor, schools can schedule sessions up to every 5 minutes and change session slots when needed.

You might choose to run your interventions at the same time as your classroom maths lessons or outside of this time.



The most popular approach for schools using Third Space Learning is to schedule the sessions outside of their timetabled whole class maths lessons. This means students aren't missing out on valuable time with their teacher but have dedicated time to consolidate their learning and close outstanding gaps.

Whatever lesson your students will be missing for the intervention, the less disruption you can cause to them and the rest of their class, the less they will be missing valuable learning opportunities. Rather than taking students out one at a time, can you run the intervention with multiple students at once?



For schools using Third Space Learning, multiple students can receive one to one support from Skye in the same time slot, minimising disruption and making it much easier to timetable.

Space

You'll also need to consider where you have space to run your intervention. If possible, find a quiet location for your interventions away from distractions where the student is able to go every week to focus fully on the lesson and maths.

Planning

As well as scheduling the interventions themselves, you'll also need to set aside some planning time.

How much time you need to set aside generally depends on who is delivering the intervention. If it's a non math specialist, you may need more time to identify exactly what topics you'd like to be taught and to whom, and to ensure the intervention teacher is clear on what to teach in each lesson.

In this typical scenario a specialist interventions teacher would be spending 30-50 minutes per student delivering the intervention as well as 10-20 minutes prep; in addition there is likely to be 10 minutes input from each student's class teacher. In comparison, if using an external provider, they will do the prep and delivery that the teacher would otherwise do, leaving only the class teacher input to do.

If you opt for an external provider, you may need to set aside less time.



Schools using Third Space Learning need only a few minutes per student each week to review the upcoming lessons, written by maths teachers and specialists, and past progress reports.



We used a different provider before and it was a nightmare. It wasn't catered to the pupils and I had to check every session each week to make sure it was appropriate. Third Space is much easier the support has been fabulous

Elsbeth Macdonald, Assistant Headteacher, Bishop Challoner Secondary School, Basingstoke



One to one teaching techniques

Many of the same principles that apply to good class teaching apply to 1-to-1, but there are different demands for both tutor and student within a 1-to-1 intervention programme.

Having delivered over 1 million one to one maths lessons to over 100,000 students, we've learnt a lot about the most effective ways to teach one to one.

Here are 20 tried-and-tested techniques for one to one teaching:

- 1 Build interest and rapport
- 2 Get familiar with each student
- 3 Recap prior learning
- 4 Share learning objectives
- 5 Teach key vocabulary
- 6 Use AfL to adjust pitch and pace
- 7 Link learning to students' interests
- 8 Encourage mathematical discussions
- 9 Move from Concrete to Pictorial to Abstract
- 10 Use Variation Theory
- 11 Put questions in a real-world context
- 12 Vary the method used
- 13 Use scaffolded teaching
- 14 Ask questions
- 15 Use bar modelling techniques
- 16 Foster a growth mindset
- 17 Guide the student through the lesson
- 18 Encourage student to think about their own learning
- 19 Reward, praise and encourage the student
- 20 Teach the tutor

1 Build interest and rapport

Students answer some quick questions about themselves with Skye so it can learn more about each individual student.

2 Get familiar with each student

We also ask each student's teacher to let us know if they have any particular additional needs which helps us prepare them better for the programme.

3 Recap prior learning

Skye is prompted to ask questions that create links to prior maths concepts with the current maths concept to help students make connections.

4 Share learning objectives

Students complete a skill check in question for each learning objective to assess students' prior understanding. Based on students' responses, Skye adapts its teaching and scaffolds support.

5 Teach key vocabulary

Ask students to explain terminology in their own words to assess and correct understanding. Our AI tutor uses consistent mathematical language with every learner to ensure they understand the terminology used in their GCSE maths lessons and exams.

6 Use AfL to adjust pitch and pace

If students demonstrate sufficient understanding in the skill check in assessment, Skye moves them straight on to independent practice and more challenging questions for that concept. For struggling students, Skye adapts the lesson to walk them through the concept step-by-step.

7 Link learning to students' interests

During students' initial session, Skye asks them to tell it about their hobbies and interests, as well as questions to understand their academic attainment.

8 Encourage mathematical discussions

Skye is a spoken AI tutor rather than a text-based tutor because we understand the importance of discussion in mathematical learning. Skye encourages active learning and promotes discussion rather than by asking students to verbalise their reasoning. Involving the student in the process of learning promotes a more thorough consolidation of learning and promotes metacognitive development.

9 Use the 'Concrete, Pictorial, Abstract' approach to deepen understanding

Where possible, we use images and diagrams to support students learning to help students to make sense of the mathematics.

10 Use Variation Theory

A key mastery approach to mathematics is conceptual and procedural variation, which enables students to develop conceptual understanding and fluency in parallel. Conceptual variation show students different ideas that underpin a mathematical concept; framing conceptual variation through questions such as 'what's the same', and 'what's different' between representations will help students distinguish the essential and obscure characteristics of a maths concept. Procedural variation is more useful for multi-step operations and comparing successive procedures, such as calculating two different sets of numbers. In your interventions, you can do this by framing questions such as 'what do you notice about...', 'is there a relationship between...'.

11 Put questions in a real-world context

Skye's lessons and questions connect maths learning to real world context to make the learning more relatable and enjoyable for students.

12 Vary the method used

It is important to give students the tools to approach a question on their own, rather than just answer a question correctly. That's why our Skye teaches multiple methods to approach the same problem.

13 Use scaffolded teaching

We find the best way to plug gaps and build confidence is to start with plenty of support and then gradually move towards encouraging students towards independent practice and applying their knowledge to new contexts.

14 Ask questions

Asking a student 'how did you get that answer?' or 'how do you know you're correct?' encourages quality student talk and boosts fluency, reasoning, and problem solving.

15 Use bar modelling techniques

When tackling word problems, these help students choose an operation, or visualise the problem. Taking this online in the intervention sessions helps to make this interactive for our students.

16 Foster a growth mindset

Maths anxiety is a prominent issue and helping students to feel confident to 'give it a go' is really important. Schools have told us that working with an AI tutor eliminates the anxiety some students have when working with traditional tutors. Skye also focuses on praising effort and willingness to try, rather than just finding the right answer.

17 Guide the student through the lesson

The flow of a one to one lesson may not match the flow of a classroom lesson; as such it is important to signpost during the session so that students don't get "lost" in the learning. Skye's sessions all follow an evidence-based I do, we do, you do structure to scaffold learning and reduce cognitive load for the student. If they are familiar with the lesson structure, it's one less thing to focus on.

18 Encourage students to think about their own learning

Your intervention sessions should always include time for metacognition. Try asking 'what we have learned today?', as well as 'how' you have learned it at the end of each lesson. All of our lessons finish with a confidence check out so students can consider and assess their learning and progress.

19 Reward, praise and encourage the student

In an intervention setting where a student may have less confidence, praise can be especially useful. You should take care to phrase corrections constructively and positively.

20 Teach the tutor

One technique we use is reversing roles and asking students to "teach" Skye a concept instead, helping to secure understanding and build confidence.

Structuring your one to one lessons



One to one interventions are best when they're tightly structured.

Research from The Education Endowment Foundation into one to one tuition

You'll want to make sure your intervention lessons follow a consistent structure that you're confident enables your students to make the most of the additional one to one time.

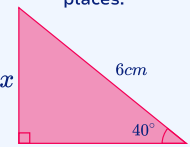
Here at Third Space Learning, our lessons follow a dedicated structure that takes students from guided practice, through to independent practice and finally encourages students to apply that knowledge to a range of different contexts.



GCSE revision lessons

Skill check in

Calculate the side labelled x to 2 decimal places.



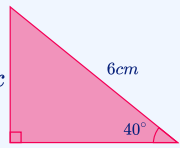
x 6cm 40°

(3)

Skill check in

Let's go through it together.

Calculate the side labelled x to 2 decimal places.



x 6cm 40°

SOH: $\frac{O}{H} = \sin \theta$
CAH: $\frac{A}{H} = \cos \theta$
TOA: $\frac{O}{A} = \tan \theta$

1 Choose the trig ratio.
=

2 Substitute the values.
=

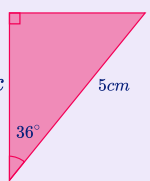
3 Calculate the unknown side.
 x =
=

(3)

Let's go through this together

Your turn...

Calculate the side labelled x to 2 decimal places.



x 5cm 36°

SOH: $\frac{O}{H} = \sin \theta$
CAH: $\frac{A}{H} = \cos \theta$
TOA: $\frac{O}{A} = \tan \theta$

1 Choose the trig ratio.
=

2 Substitute the values.
=

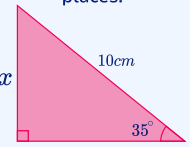
3 Calculate the unknown side.
 x =
=

(3)

Your turn

Skill check out

Calculate the side labelled x to 2 decimal places.



x 10cm 35°

(3)

Skill check out

Confidence check out

Concept

Continuing an arithmetic sequence

👎 Less confident 🟡 Same 👍 More confident



Confidence check out

Recording and sharing student progress

Progress can be recorded in any format which you find useful, but we suggest keeping it short and succinct to save your staff's time.

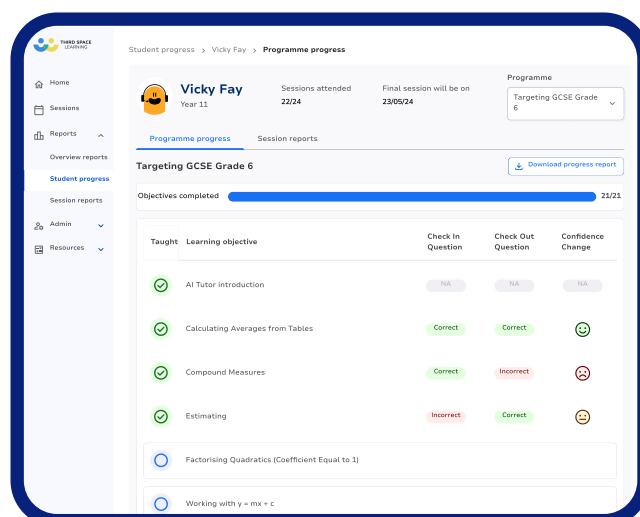
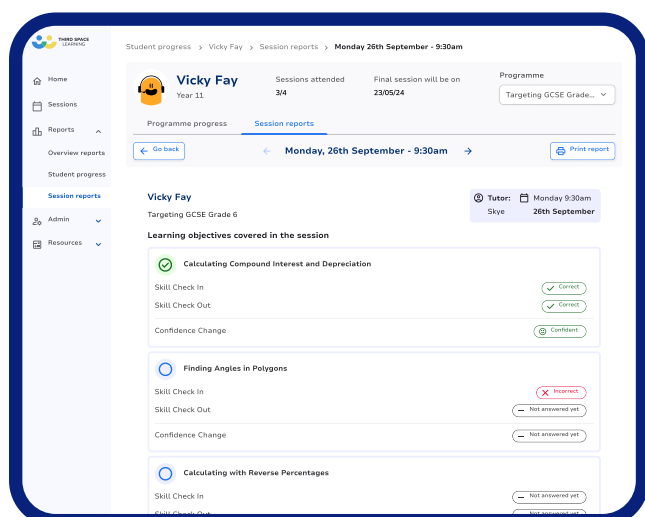
Try using a table with a row for each lesson, write in the learning objective and mark how secure the student was with the concept at the start and end of the lesson on a scale of 1-10.

Alternatively, you could record any learning in their workbook (following on from any teaching). This would mean it could be referred back to by the child, plus it would help with moderation and providing evidence of additional time.

Any progress data should always be shared with the class teacher so that they can adjust the activities they plan for the student in their whole class lessons. As with planning for the intervention, it's important to give the intervention leader and class teacher time to talk over this together. It's best to do this as soon as possible after the 1-to-1 session has taken place.

For this reason, at Third Space Learning, session reports are available on-demand for schools and class teachers immediately after the intervention.

Individual session reports feed into each student's overall progress report, an ongoing track of progress made over time. Progress reports also show which learning objectives students are now completely secure in.



In summary

- ✓ Interventions are necessary for students who require additional support over and above classroom teaching.
- ✓ Interventions are particularly important in maths, where a student falling behind can have more of a detrimental impact than other subjects.
- ✓ An extensive body of research suggests that one to one support is one of the best ways to raise attainment, especially in maths.
- ✓ One to one teaching places different demands on both student and teacher/tutor, so you'll need to make sure you adapt your teaching accordingly.
- ✓ One to one interventions are best when they're tightly structured, so it's worth spending time on finding the right structure that works for your school.

How to plan your one to one intervention strategy

- 1 Reviewing existing interventions
- 2 Identifying your target groups
- 3 Setting your success criteria
- 4 Deciding who will run the interventions
- 5 Allocating your funding
- 6 Identifying the right topics to teach each student
- 7 Scheduling your interventions

- ✓ Recording and sharing student progress doesn't have to be time consuming, but you do need to set aside some time to make sure you're keeping track of progress and adapting lessons accordingly.
- ✓ If you don't have access to maths specialists locally then online one to one interventions will be a better option for you - and just as effective.



If you're looking to implement a one to one maths intervention that's been used and trusted by 4,000+ schools across the UK, we'd love to have a chat about how we can help.



THIRD SPACE
LEARNING

Looking to improve your school's maths results without stretching your budget?

Tutoring from our spoken AI maths tutor Skye gives schools an even more affordable option for every pupil.

- ✓ 90% cheaper than other tutoring providers
- ✓ Curriculum-aligned lessons designed by qualified teachers
- ✓ Discounts available for long-term bookings and MATs

93% of teachers feel Third Space Learning lessons helped their pupils achieve higher assessment scores.

Speak to us

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