

Starting maths in bubbles/pods

When starting to work on maths it might be best to begin with tasks that are non-threatening and involve children and adults listening to each other, building a sense of community. Dotty number talks, maths from stories and dice games are good whole group tasks.

Dotty Number Talks for Early Years to Year 6

Looking at dots or arrangements of objects and saying how many there are (without counting if possible), explaining different views:

<https://earlymath.erikson.edu/preschool-number-sense-routine-perfect-for-transitions/> and <https://nrich.maths.org/14005>

You can watch someone working on a dotty number talk with children:

- Foundation Stage (K1 in USA): <https://www.youcubed.org/resources/jo-teaching-visual-dot-card-number-talk/>
- Year 1 (K2 in USA) : <https://learn.teachingchannel.com/video/visualizing-number-combinations>
- Older children: <https://www.youcubed.org/resources/jo-teaching-visual-dot-card-number-talk/>

Here is a link to some dotty cards but you can create your own

<https://nrich.maths.org/content/id/10740/ThirtyDotCards.pdf>

Maths from Stories

This website suggests books for learning about maths through stories

<https://www.mathsthroughstories.org/>

Dice Games for KS2

- Nice or nasty – focus on place value, the adult rolls the dice and each child decides where to place the number; there are lots of variations so this game can be played again and again: <https://nrich.maths.org/6605>
- Dicey addition – focus on place value and addition, the adult rolls the dice and as above the children decide where to place the number: <https://nrich.maths.org/11863>

When establishing rhythms and routines with young children it is possible to weave in some mathematical ideas

- Tidying up: <https://nrich.maths.org/8856>
- Choosing a story to read to class: <https://nrich.maths.org/13894>
- Playing around with the calendar: <https://nrich.maths.org/13731>

When establishing individual and paired maths work, puzzles and games are a good way to encourage children to participate and enjoy maths at school

- Puzzle for EYFS and Year 1: <https://earlymath.erikson.edu/diy-puzzles-made-from-cardboard-can-develop-spatial-thinking/>
- Game-Nim: <https://www.youcubed.org/resources/nim-games-3-12-video/>

Children in school and those at home can work on the same mathematics tasks

- The maths team are continuing to provide weekly packages of ideas for Y1/2, Y3/4 and Y5/6 all starting from the same simple resource/experience that can either be found at home or accessed online; those working with children in schools can access equipment for the same activities. <https://www.babcockldp.co.uk/improving-schools-settings/mathematics>

Email: LDP-SchoolImprovementTeam@babcockinternational.com

Website: www.babcockldp.co.uk/improving-schools-settings/mathematics

Knowing where to start when teaching maths to your group/class

Whilst all children will have been thinking about maths during lockdown, teachers will be less certain of the starting point for their new class in the Autumn Term. This makes assessment at the start of a sequence vital in order to identify where to begin. Before choosing a particular type of mathematics assessment to use, it is best to consider the following question:

What is the reason for assessing the children's mathematical understanding at this point?

The answer to this question will allow you to choose the most appropriate assessment task and the style of delivery.

Possible answers

1. I need to find out each child's current understanding before planning what to teach and I have to evidence individual children's progress
2. I need to plan for a whole class and in order to be sure that the teaching is pitched correctly, I am happy to assess a range of children, rather than every child
3. I need to know whether the children in my class have understood the learning they engaged in at home or in school during lockdown

Below are ideas of different forms of maths assessment that respond to will support your different needs as the children return to school:

1. I need to find out each child's current understanding before planning what to teach and I have to evidence individual children's progress

An assessment task can provide you with evidence of each child's understanding at the start of a sequence, indicate gaps and misconceptions to focus on during the sequence and provide a reference for assessing progress at the end of the sequence. Usually these assessment tasks are based on the question: 'What are the key concepts I want the children to understand in this sequence'. At this time because children have experienced a wide range of maths learning whilst in lockdown, the next question needs to be: 'What comes before the key concepts in this sequence?' So, the assessment task will need to reflect both this pre-requisite understanding and the next intended learning. For example, in a Year 3 sequence where the key concept is about equivalent fractions e.g. $\frac{3}{4} = \frac{6}{8}$, it is important to look back at Y2 expectations and assess these too. In Y2 children are expected to understand $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$. If you get information about these previous ideas from an assessment task this will then allow you to see where the teaching needs to start before you can work on age related mathematics.

Very little needs to be standard about the assessment tasks you create or choose to use but they should always include opportunities for and an expectation of:

- Explaining thinking
- Demonstrating understanding using different representations, e.g. concrete materials, pictures, language, symbols, contexts

Here are some examples of possible assessment tasks for the Y3 scenario above with the Y2 element in *italics*:

- What do you know about fractions? What would you like to learn about fractions? You might want to use the following numbers: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{6}{8}$, $\frac{2}{8}$, $\frac{2}{3}$, $\frac{3}{6}$

OR

- Show me in as many ways as you can why these are both true: $\frac{1}{2} = \frac{2}{4}$ and $\frac{2}{3} = \frac{6}{9}$

OR

- Ruby says that “*One half is the same as one quarter*”; is she right? She also says that “*Two thirds is the same as three sixths*”; is she right? Show me what you think.

There are also assessment tasks from free published online materials for example in the NCETM progression maps with reasoning <https://www.ncetm.org.uk/resources/44672>:

- Which is the odd one out in this trio: $\frac{1}{2}$, $\frac{2}{4}$ $\frac{1}{4}$? Why?
- Which is the odd one out in each of these trios: $\frac{1}{2}$, $\frac{3}{6}$, $\frac{5}{8}$ and $\frac{3}{9}$, $\frac{2}{6}$, $\frac{4}{9}$? Why?

When the children are working on the assessment question you can choose to sit with a group and observe them as they work, perhaps asking questions to probe their thinking. This will allow you to find out their reasoning and you might notice if the question allows the children to get the right answer with the wrong reasoning or get the wrong answer with the right reasoning. Once the children have worked on these assessment questions, you will be able to look at their responses including the reasoning you saw/heard from a group of children and then you can decide where to start in the sequence on fractions. In addition, when you ask the children the same question at the end of the sequence, you will be able to see any progress the children have made from the difference between the beginning and end responses.

You will notice that only one question is suggested for each year group for the key concept. Having just two questions, one from the previous year and one from the current year, designed to probe thinking, allows children to show the depth of their understanding and helps you to choose where to start in planning. The repetition of the two probing questions at the end of the sequence will allow the children's change in thinking to be evidenced.

2. I need to plan for a whole class and in order to be sure that the teaching is pitched correctly, I am happy assess a range of children, rather than every child

If you want to know where to pitch the start of a teaching sequence and you want to be ready to address the misconceptions that are likely to arise then you can choose to use an assessment task with one group of children in the class. Choosing the children to be in the group depends on your situation. For example, they could be drawn from across the range of: previous attainment, engagement in lockdown maths learning, reactions to being back in school together etc. The tasks will be the same as those outlined above (prerequisite and next learning) but you can observe and listen to the children as they think through and respond to the questions. The group could work together on the task whilst you listen to them as they talk together to solve the problem or, by pairing children together, you can listen to the different conversations they have with each other. Through listening and observing you will notice the range of understanding as well as misconceptions and then you can decide where to start when planning the teaching for the whole class.

For example, before a sequence of work on division in Year 5 a teacher could decide the key thing the children need to learn is that they can use known multiplication facts when dividing. They choose tasks from Y4 and Y5 in the NCETM progression documents for multiplication and division:

Y4

$63 \div 9 = 7$ Use this fact to work out:

$$126 \div 9 =$$

$$252 \div 7 =$$

Y5

$3 \times 75 = 225$ Use this fact to work out:

$$450 \div 6 =$$

$$225 \div 0.6 =$$

The teacher chooses a group of about six children as appropriate for the class and puts them into pairs. For example, this could be: two vulnerable children who have been in school throughout lockdown, two quiet children, two outspoken children. The children work on the task in pairs and the teacher listens as the pairs discuss the problems and then together as a whole group the children talk through their answers with the teacher listening as they discuss their methods and solutions. With the information the teacher gleans from the children's conversations and decision making they are able to judge where to begin the sequence.

You will notice that only one question is suggested for each year group for the key concept. Having just two questions, one from the previous year and one from the current year, designed to probe thinking, allows children to show the depth of their understanding and helps you to choose where to start in planning.

3. I need to know whether the children in my class have understood the learning they engaged in at home or in school during lockdown

You may want to find out if the maths learning worked on at home or in school (vulnerable children or children of key workers) has been **understood** and so the assessment needs to allow you to see if the children can apply their understanding in a new context. Questions that contextualise the learning or expect the children to apply the learning to a new situation would be best for this purpose. NCETM Teaching for Mastery: Questions and Tasks for Assessment <https://www.ncetm.org.uk/resources/46689> are ideal for this purpose as they are designed to probe children's understanding, allowing you to see if they have a **deep understanding** of the mathematics.

For example after setting work at home on subtracting with pairs of two-digit numbers, a Year 2 teacher is wondering how much the children have made sense of the tasks and how much they **understand** subtraction. They choose the following contextualised questions from the NCETM materials for the children to complete individually:

- Dan needs 80 g of sugar for his recipe. There are 45 g left in the bag. How much more does he need to get?
- The temperature was 26 degrees in the morning and 11 degrees colder in the evening. What was the temperature in the evening?
- A tub contains 24 coins. Saj takes 5 coins. Joss takes 10 coins. How many coins are left in the tub?

The teacher will then look through the children's responses and decide what more they need to do to secure understanding of Year 2 subtraction for all of the class.

You will notice that only three problems from one question in the NCETM booklet have been used to exemplify Year 2 subtraction. The three problems cover different ways of thinking about subtraction and involve both one and two step problems. Having a small number of problems that have been designed to probe thinking allows children to show the depth of their understanding.

Sources of assessment questions:

- NCETM progression maps with reasoning <https://www.ncetm.org.uk/resources/44672>
- NCETM Teaching for Mastery: Questions and Tasks for Assessment <https://www.ncetm.org.uk/resources/46689>
- NCETM resource tool exemplification– if you choose the area of maths that you are interested in for your year group. Then click on 'show selection' and 6 boxes appear, choose the 'exemplification' box then the questions that come up are ideal assessment questions <https://www.ncetm.org.uk/resources/41211>
- If your school has bought the Babcock LDP downloadable resource from Reception to Year 6: Children as Evidence, these questions will support with ideas for assessment questions <https://shop.babcockldp.co.uk/themes/curriculum/mathematics/children-as-evidence-maths-moderation/>

2020 end of year assessment guidance for Devon primary schools

[End of year assessment guidance](#)

This non-statutory guidance has been provided by the LA to support schools to have an indicative assessment profile for the end of 2020 which does **not** require any further assessment activity with children and does **not** require significant additional workload for teachers. The guidance can support transitions between key stages and also within schools. A live webinar is available for staff on 12 June, the link to book is within the guidance. A recording of the webinar will also be available.