Assessment, Planning and Teaching Mathematics from 8 March to Easter

This document identifies some strategies and resources to support assessment, planning and teaching of mathematics before the Easter break. Questions and Problem of the Week can be found on the HIAS maths Moodle. Online Training - Maths Moodle: Blended Learning Spring 2021 (hants.gov.uk)

Some children will have made significant progress during the recent period of home learning, others less so. Many children will be a bit 'rusty' but after a short period back in school will quickly recover much of their prior knowledge and skills.

Children who have been mostly working at home may be out of practice and need reminders and initial extra support with the following:

- Talking about their reasoning using appropriate vocabulary and language
- Different ways to represent mathematics to support their thinking towards a solution – informal jottings, key representations
- Key facts including number bonds, tables facts and units of measure
- Maintaining their focus when solving a problem or calculation especially if the solution is not immediately obvious
- Recording steps needed to solve a problem
- Working independently if they have had the support of an adult at home

Top Tips for Planning

- Reduce cognitive load by revisiting some familiar tasks that build confidence and support pupils to talk about their reasoning with peers and adults and recall prior learning
- Plan questions that probe understanding and encourage pupils to listen to each other and build on shared ideas
- Use task variation based on a few connected key tasks rather than variety of different tasks to ensure the pace of learning is appropriate for all pupils
- Link fluency practice to the main task
- Take a long- term view when planning for recovering learning

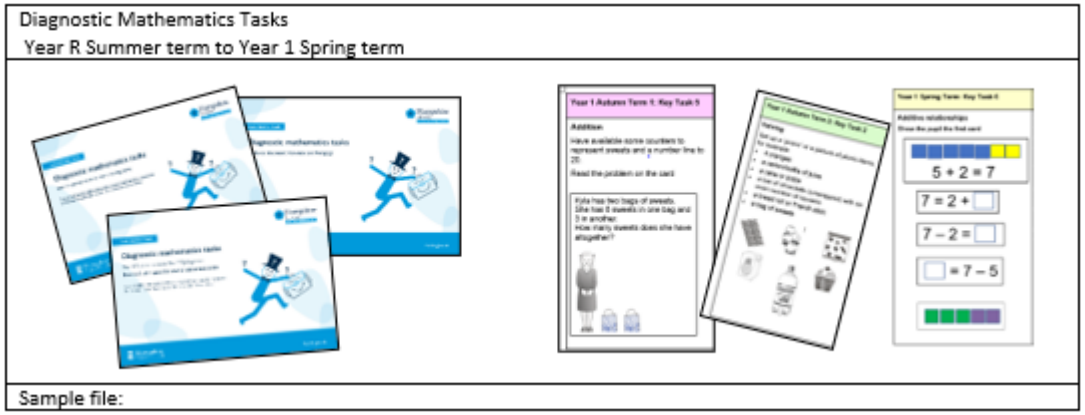
Top tips for teaching strategies to support pupils to recall prior learning

- Use a multi- representational (concrete, pictorial, abstract) approach
- Use the 6 cognitive strategies for effective learning: dual coding, elaboration, spaced practice, concrete examples, interleaving and retrieval practice
- Use questioning to ask pupils to use, apply and recall what was embedded rather than focus on 'correct' answers'
- Offer pupils scaffolds and models to remind them of previous class routines and knowledge
- Encourage them to develop their own mental images and visual models
- Provide vocabulary support and reminders
- Make the steps in reasoning explicit to develop metacognitive awareness (Blended Learning examples problem of the week Online Training - Maths Moodle: Blended Learning Spring 2021 (hants.gov.uk))
- Keep teaching sequences short but frequent during a lesson to ensure pupils can remain focussed
- Notice promptly when pupils are struggling to recall prior learning and need some further help or need more challenge.
- Slow the learning down – focus children on quality rather than quantity

Finding out what pupils know

A conversation whilst working on a task is often more useful than a 'test'. Tasks will offer a wealth of opportunities for diagnostic assessment.

Diagnostics Assessment Tasks Y1- Y6 (Find in 'Maths products' folder Online Training - Course: Diagnostic Mathematics Tasks (hants.gov.uk))



Year 3 Summer Term: Key Task 4	Year 3 Summer Term: Key Questions	Year 3 Summer Term: Purpose
Number and place value William has made a 3-digit number with these cards: 5 6 4 What other 3-digit numbers can he make with these cards? What is the largest number he can make? Provide each pupil with a set of digit cards as a concrete resource to manipulate.	• What number cards does William have? • How will you work systematically to make sure that you have found all the different 3-digit numbers that he can make? • Once you have found them all, how will you convince someone else? • Can you order the 3-digit numbers from smallest to largest? • Opportunity to self-check…Are you sure? Are there any number cards you would like to move? • How could you check your thinking? • Can you explain how you ordered them? How did you know that?	• To recognise the place value of each digit in a three-digit number (hundreds, tens and ones). *[Year 3 NC]* • To compare and order numbers up to 1000. *[Year 3 NC]* • To identify, represent and estimate numbers using different representations. *[Year 3 NC]* • To solve number problems and practical problems involving these ideas. *[Year 3 NC]* **Next Step** Can pupils use greater than (>) and less than (<) symbols to compare numbers and complete missing number problems?

Year 5 Summer Term: Key Task 5	Year 5 Summer Term: Key Questions	Year 5 Summer Term: Purpose
Number and place value 0 — 1 0.75 0.5 0.1 0.25 1.03 0.09 Provide each pupil with a blank number line and the decimal number cards as a concrete resource to label and position number cards.	• Can you position **all** the number cards on this number line? (The exception is 1.03 as $\frac{3}{100}$ larger than one whole). • Which is the easiest number card to position? Why? • Which is the hardest number card to position? Why? • What is the halfway point? How do you know? • Where would you position each of the number cards on the number line? • Do you know what 0.5 is the same as? What is it as a fraction? • How would you record 0.5 on a place value chart?	• To recognise and write decimal equivalents of any number of tenths or hundredths. *[Year 4 NC]* • Pupils should connect hundredths to tenths and place value and decimal measure. [*Year 4 NC – non statutory guidance]* • To extend the use of the number line to connect fractions, numbers and measures. [*Year 4 NC – non statutory guidance]* • To read and write decimal numbers as fractions. [*Year 5 NC]* • To read, write, order and compare numbers with up to three decimal places. *[Year 5 NC]* **Next Step** How could pupils represent each of the decimal number cards on a blank hundred square?

Asking probing questions

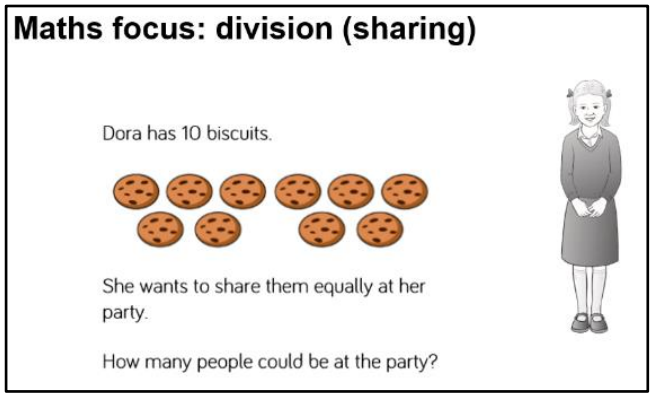
Blended Learning folder: Parents Guide [Parents Guide to Maths Questions_Feb2021_v2.pdf (hants.gov.uk)]

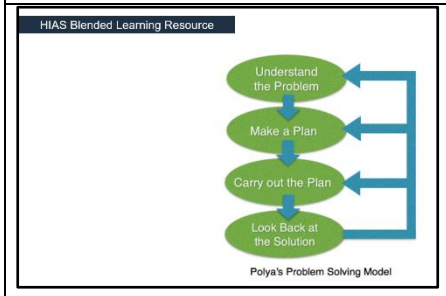
Questions : Key Stage 1	Year 1	Year 2
If I know this, then what else do I know ?	**What else do you know?** If you know this: 12 – 9 = 3 what other facts do you know?	**What else do you know?** If you know this: 87 = 100 – 13 what other facts do you know?
What is the same and what is different?	**What do you notice?** 11 – 1 = 10 11 – 10 = 1 Can you make up some other number sentences like this involving 3 different numbers?	**Missing numbers** 91 + □ = 100 100 - □ = 89 What number goes in the missing box? **What is the same and what is different about the calculations?**
Which is harder and which is easier?	**Hard and easy questions** Which questions are easy / hard? 3 + 7 = 13 + 7 = 3 + 9 = 9 + 9 = Explain why you think the hard questions are hard?	**Hard and easy questions** Which questions are easy / hard? 23 + 10 = 93 + 10 = 54 + 9 = 54 + 1 = Explain why you think the hard questions are hard?
What if I change…?	**Spot the mistake:** 5, 6, 8, 9 What is wrong with this sequence of numbers? **What if change the sequence to:** 3, 4 , 6, 7 What is wrong with this sequence of numbers?	**Spot the mistake**: 45,40,35,25 What is wrong with this sequence of numbers? **What if change the sequence to:** 95, 105 , 110 , 115 What is wrong with this sequence of numbers?
Can you show me and example of…. and another ….?	**Can you show me an addition calculation with a sum of 10?** and another….? and another….?	**Can you show me an addition calculation with a sum of 100?** and another….? and another….?

Questions : Upper Key Stage 2	Year 5	Year 6
If I know this, then what else do I know ?	**What else do you know?** If you know this: 6.7 + 3.3 = 10 what other facts do you know? **Use a fact** 3 x 75 = 225 Use this fact to work out 450 ÷ 6 = 225 ÷ 0.6 =	**What else do you know?** If you know this: 86.7 + 13.3 = 100 what other facts do you know? **Use a fact** 12 x 1.1 = 13.2 Use this fact to work out 15.4 ÷ 1.1 = 27.5 ÷ 1.1 =
What is the same and what is different?	**Making links** 7 x 8 = 56 How can you use this fact to solve these calculations? 0.7 x 0.8 = 5.6 ÷ 8 =	**Making links** 0.7 x 8 = 5.6 How can you use this fact to solve these calculations? 0.7 x 0.08 = 0.56 ÷ 8 =
Which is harder and which is easier?	**Hard and easy questions** Which questions are easy / hard? 213323 - 70 = 512893 + 300 = 819354 - 500 = 319954 + 100 = Explain why you think the hard questions are hard?	**Hard and easy questions** Which questions are easy / hard? 213323 - 70 = 512893 + 37 = 8193.54 - 5.9 = Explain why you think the hard questions are hard?
What if I change…?	13 x 9 is the same as (10 x 9) + (3 x 9) {90 + 27 = 117} 13 x 9 is the same as (13 x 10) - (13 x 1) {130 - 13 = 117}	123 x 9 is the same as (100 x 9) + (20 x 9) + (3 x 9) {900 + 180 + 27 = 1107} 13 x 9 is the same as (13 x 10) - (13 x 1) {130 - 13 = 117}

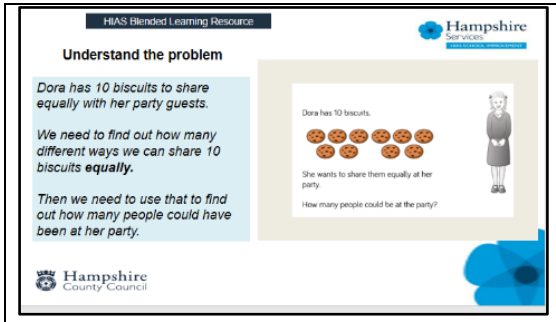
Using a key task to support reasoning and problem solving

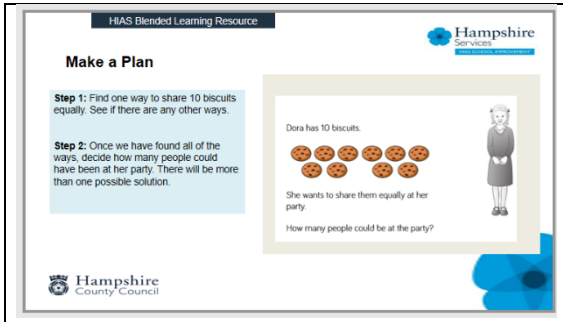
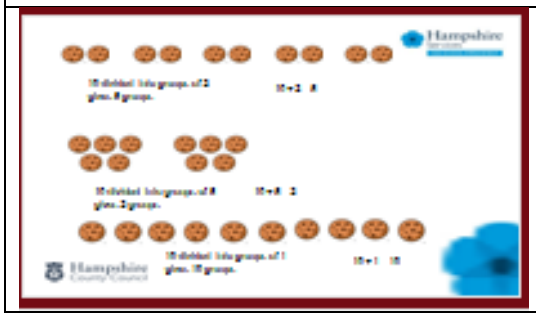
Examples of using tasks Y1-Y6 in Blended learning Folder – 'Problem of the Week' [Online Training - Course: Primary Curriculum Plans and Problems of the Week for Blended Learning (hants.gov.uk)]



Slides	Suggested	Teacher could adapt by
	This slide shows the process used in the Polya model for solving problems.	Using the school's preferred problem- solving framework if more appropriate.

Maths focus: division (sharing) Dora has 10 biscuits.  She wants to share them equally at her party. How many people could be at the party? 	Slide 4: This has the whole task for the resource. This task should be part of a sequence of learning. Pupils may benefit from prior work revisiting key concepts and skills needed to solve the problem. Alternatively, the problem can be used to identify key concepts and skills to revisit in subsequent lessons.	Changing the starting problem to be a little easier or harder for individuals. Chunking the task into smaller steps will support pupils with SEND - this may be through provision of checklists, instructions on a whiteboard or providing one step or question at a time. This helps reduce distractions to avoid overloading working memory. Changes could include: • Removing the numbers initially • Using 'easy' numbers to reduce the cognitive load on the calculation enabling pupils to focus more on the problem and the steps needed • Slow reveal of the task to focus on one 'step' at a time Some pre- teaching of vocabulary and language may help pupils if the problem requires new concepts or the task is part of an introduction to a unit of work.

	**Understand the problem** Prompts have been suggested to help pupils understand the whole problem before thinking about how they might plan/ what they might do to solve the problem. This is suggested 'scaffolding' for temporary support that can be removed when no longer required. Teachers should provide enough support so that pupils can successfully complete tasks that they could not do independently. It is important to gain a precise understanding of the pupil's current capabilities. E.g. • Support could be visual, verbal, or written. • Reminders of what equipment is needed and classroom routines can be useful. • Scaffolding discussion of problem-solving texts: promoting prediction, questioning, clarification and summarising	Support pupil's understanding using words, phrases and key facts prompts as appropriate to group and individual need based on autumn term teaching and blended learning in spring term. Other questions could include: • What maths do you think we need? • Have you worked on a problem like this one before? What steps and strategies did you use?

	**Make a Plan** Prompts have been suggested that might help pupils identify the steps they could take to solve the problem. There may be other ways to solve the problem. This can be explored with groups and individual pupils as appropriate. This involves explicit instruction using a range of teacher-led approaches, focused on teacher demonstration followed by guided practice and independent practice. Explicit instruction is not just "teaching by telling" or "transmission teaching". This relates to the use of Rosenshine's 'Principles of Instruction' **Examples:** • Worked examples with the teacher modelling self-regulation and thought processes by 'thinking aloud' is helpful. • Using visual aids and concrete examples promotes discussion and links in learning	Create the steps needed through discussion with class/ group/ individuals and record using their language phrases as appropriate to support the use of key vocabulary. Could ask pupils who fluently and confidently solve the particular problem example to come up with alternative plans/ steps to solve that problem. Often more than one way to solve a problem.
	A suggested representation of the problem.	This slide could be replaced by a more familiar worked example of teacher modelling or pupil recording E.g • Working walls • Flip chart modelling • Examples of pupil work

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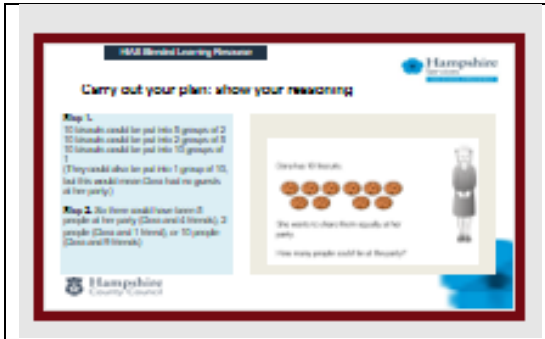
<td> 
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<td>Carry out your plan: show your reasoning.

This slide aims to support pupils being able to show each step towards the solution This often includes the actual calculations needed at each step for that particular example as number sentences.
Jottings/ pictures may be needed to support some pupils in understanding the number sentences.</td>
<td>Steps could be added or removed depending on the needs of different learners.

The aim is to support the pupil as needed to understand and solve that type of problem so that with sufficient practise, they can solve similar problems independently without constant reference to use of the scaffolded steps – achieving mastery of the task</td>
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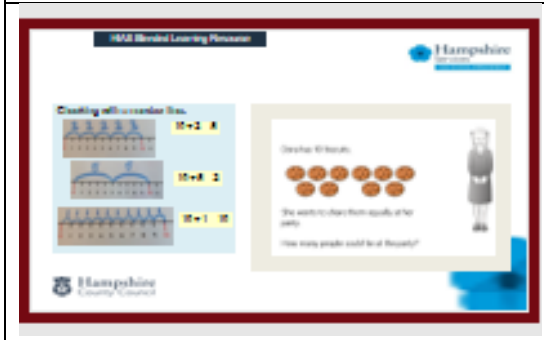
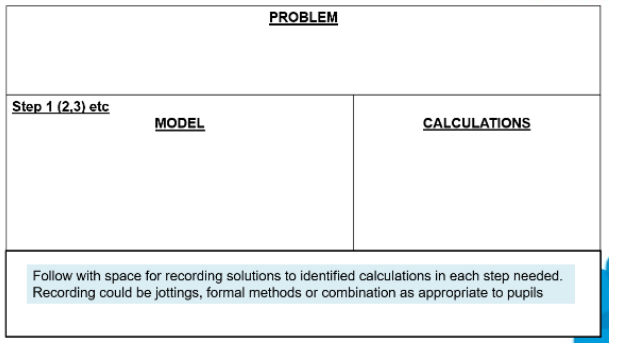
<td>  </td>
<td>Slide showing how the steps in the solution could be recorded.
Opportunities to talk about:
• choice of calculation strategy; mental, jottings and formal methods, depending on the numbers involved
• Appropriate representations using CPA approach
• Recording the answer(S) to the problem</td>
<td>This slide could be replaced by a more familiar school – based example of teacher modelling of recording.

E.g this template below could be used which has been shared and discussed at Core Provision with maths subject leaders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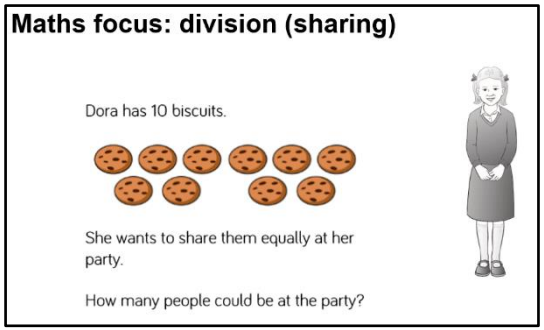
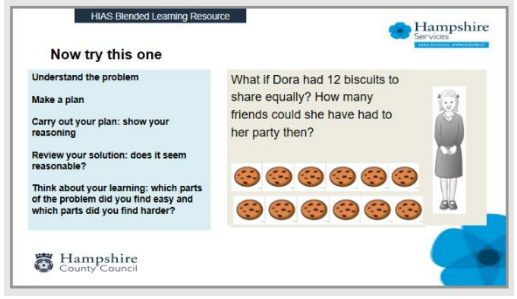
	**Review solution: does it seem reasonable?** A prompt has been provided linked to the problem and or the maths where appropriate. Opportunities to discuss the use of rounding, use of key facts and approximation. **Which steps/ parts did you find easy and which harder?** This slide aims to support the development of pupils' meta-cognitive awareness and feedback to the teacher. Responses to this inform the next steps in learning E.g. Might need a focus on: addressing mis-conceptions and errors; practising and improving fluency in a key skill etc	This slide could be replaced by a more familiar school – based example for reviewing learning or one being used to support blended learning. It could form the basis of a review conversation about the pupil's learning for the week to judge progress made in learning and agree next steps needed for future work. This assessment information should inform planning, teaching and task design.
	**Now try this one** An example of a possible next task for the teacher to consider. Based on assessment for learning the 'next task' could be one or two lessons addressing errors, misconceptions or developing fluency with an aspect of the maths involved before looking at another problem.	To meet the range of needs there could be different 'Now try this one' tasks for groups and individuals supporting the next few lessons. Some pupils may need to have several more very similar examples of the task to develop independence. Eg, perhaps just the numbers changed. Task variation can be used to provide appropriate access and challenge to all. The set of slides can be used by pupils as a WAGGOLL to remind themselves of the reasoning process and or to check the steps needed for variations of the first task.