SERVICES FOR SCHOOLS

Diagnostic Mathematics Tasks

Year R Summer term to Year 1 Spring term

A set of half-termly mathematics tasks supporting diagnostic assessment to find gaps in pupil learning and inform teaching and planning.

Contents

Introduction

This resource has been designed to support Year R and Year 1 teachers in using diagnostic assessment to inform teaching that addresses significant gaps in pupil learning. The booklet contains a series of mathematical questions/activities which will enable teachers to progressively explore pupils' knowledge, conceptual understanding, and skills from the end of the summer term in Year R to the spring term in Year 1. The tasks cover a range of mathematical domains including Number, Place Value and Calculation.

How to use

The activities are intended to be used by class teachers or teaching assistants (under the direction of a class teacher), for short focused one-to-one pupil conferencing with pupils whose gaps in knowledge and conceptual understanding need a more forensic approach than might be possible in a whole class lesson.

Each task has:

- Some suggested questions focused on both assessment of the pupils' subject knowledge and their reasoning to inform next steps in teaching.
- The purpose for using the task with Foundation Stage Profile and National Curriculum links.
- Common misconceptions (from Spring term Y1).
- Suggestions for next steps in learning.

It is recommended that, as one-to-one conferencing is intensive, sessions last no more than 20 minutes. During the session, more than one task could be used to support discussion.

Understanding the layout of the tasks

Colour-coded for ease of reference for different terms.

Key task/mathematical activity for the pupil.

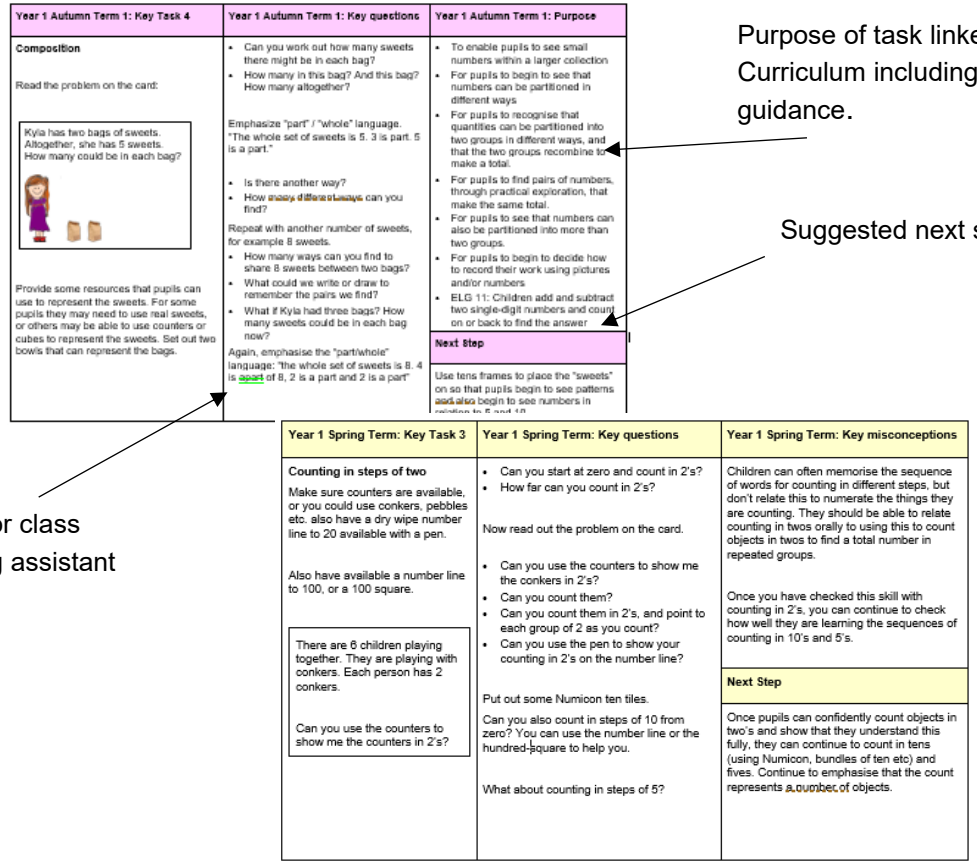
Purpose of task linked to National Curriculum including non-statutory guidance.

Suggested next step.

Key questions for class teacher/teaching assistant

Common misconceptions from Spring term linked to National Curriculum.

Suggested next steps to help address misconceptions.



Year 1 Autumn Term 1: Key Task 4	Year 1 Autumn Term 1: Key questions	Year 1 Autumn Term 1: Purpose
Composition Read the problem on the card: Kyla has two bags of sweets. Altogether, she has 5 sweets. How many could be in each bag? Provide some resources that pupils can use to represent the sweets. For some pupils they may need to use real sweets, or others may be able to use counters or cubes to represent the sweets. Set out two bowls that can represent the bags.	• Can you work out how many sweets there might be in each bag? • How many in this bag? And this bag? How many altogether? Emphasize "part" / "whole" language. "The whole set of sweets is 5. 3 is part. 5 is a part." • Is there another way? • How many different ways can you find? Repeat with another number of sweets, for example 8 sweets. • How many ways can you find to share 8 sweets between two bags? • What could we write or draw to remember the pairs we find? • What if Kyla had three bags? How many sweets could be in each bag now? Again, emphasise the "part/whole" language: "the whole set of sweets is 8. 4 is apart of 8, 2 is a part and 2 is a part"	• To enable pupils to see small numbers within a larger collection • For pupils to begin to see that numbers can be partitioned in different ways • For pupils to recognise that quantities can be partitioned into two groups in different ways, and that the two groups recombine to make a total. • For pupils to find pairs of numbers, through practical exploration, that make the same total. • For pupils to see that numbers can also be partitioned into more than two groups. • For pupils to begin to decide how to record their work using pictures and/or numbers • ELG 11: Children add and subtract two single-digit numbers and count on or back to find the answer **Next Step** Use tens frames to place the "sweets" on so that pupils begin to see patterns and also begin to see numbers in

Year 1 Spring Term: Key Task 3	Year 1 Spring Term: Key questions	Year 1 Spring Term: Key misconceptions
Counting in steps of two Make sure counters are available, or you could use conkers, pebbles etc. also have a dry wipe number line to 20 available with a pen. Also have available a number line to 100, or a 100 square. There are 6 children playing together. They are playing with conkers. Each person has 2 conkers. Can you use the counters to show me the counters in 2's?	• Can you start at zero and count in 2's? • How far can you count in 2's? Now read out the problem on the card. • Can you use the counters to show me the conkers in 2's? • Can you count them? • Can you count them in 2's, and point to each group of 2 as you count? • Can you use the pen to show your counting in 2's on the number line? Put out some Numicon ten tiles. Can you also count in steps of 10 from zero? You can use the number line or the hundred-square to help you. What about counting in steps of 5?	Children can often memorise the sequence of words for counting in different steps, but don't relate this to numerate the things they are counting. They should be able to relate counting in twos orally to using this to count objects in twos to find a total number in repeated groups. Once you have checked this skill with counting in 2's, you can continue to check how well they are learning the sequences of counting in 10's and 5's. **Next Step** Once pupils can confidently count objects in two's and show that they understand this fully, they can continue to count in tens (using Numicon, bundles of ten etc) and fives. Continue to emphasise that the count represents a number of objects.

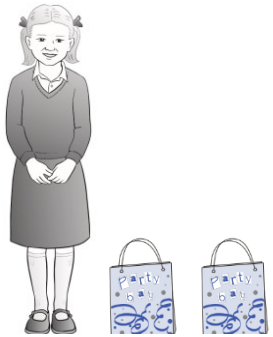
What to look for

In addition to the key tasks, pupils should also have access to a range of concrete resources. For example, structured laminated number lines, counters, tens frames, bead strings, Numicon and a range of counting objects.

Teachers and teaching assistants should take this opportunity to observe how well individual pupils:

- Talk about and explain what they are doing using appropriate vocabulary. In Year R and moving into Year 1, this will be everyday language, developing into the use of some more mathematical language
- model the mathematics using a combination of the available concrete resources and possibly some informal jottings
- begin to use some formal notation when indicated as appropriate in the task (in this case, only + - and =).
- identify the steps needed to solve the problem in the most straightforward way.

Year R Summer Term: Key Task 1	Year R Summer Term: Key questions	Year R Summer Term: Purpose
Counting Have ready counting objects and number cards to 10. Give the pupil a set of objects to count. Watch how they do this. Do they point/move each item one at a time? Do they say one word for one object? Do they count accurately? Do they count accurately when they check? Are they saying the number names accurately, and in the correct order? Can they find the correct number card to label their set?	• Can you find out how many (dinosaurs) there are? • Are you sure – can you check? • Can you count out loud as you count them? • Can you find the correct number to label the set of (dinosaurs)? Repeat with other quantities to 10 and note which pupils are successful with and where they make errors.	• To check accurate object counting. • To check one-to-one correspondence. • To check accurate articulation of numbers to 10. • To check if pupils recognise written numbers and can match these to the correct quantity. • ELG 11: Children count reliably with numbers from 1-20.
		Next Step
		Once pupils are secure and confident counting up to 10 objects, extend this beyond 10 towards 20. Begin to ask pupils to add “one more”.

Year 1 Autumn Term 1: Key Task 5	Year 1 Autumn Term 1: Key questions	Year 1 Autumn Term 1: Purpose
Addition Have available some counters to represent sweets and a number line to 20. Read the problem on the card Kyla has two bags of sweets. She has 6 sweets in one bag and 3 in another. How many sweets does she have altogether? 	• Can you work out how many sweets Kyla has altogether? • Show me how you would work it out? • Could you show me using the number line? Observe if the pupil counts all or is beginning to count on. For example, do they count out 6 sweets, then count out three more, then count all 9 sweets again, or do they count out the 6, then count on "7, 8, 9" as they physically add the extra 3 sweets. Observe if they can line the sweets up on the number line to find a total, or can use the number line in a more abstract way to count on 3 more from 6. • Can you write or draw your calculation? • Explain what you have drawn/written. Observe if pupils choose to draw a picture to show the total number of sweets or choose to use some numbers to represent what they have done. Repeat with other quantities.	• To check if pupils can use their counting skills to find a total. • To check if pupils do this by counting all of the objects (aggregation) or are beginning to count on from the first set without re-counting them (augmentation). • To check if pupils can begin to use a number line and relate this to adding together two quantities. • To check if pupils can choose how to record their work. • ELG 11: ELG 11: Children add and subtract two single-digit numbers and count on or back to find the answer **Next Step** Use objects on a number line or on tens frames.