

Number

This document is part of a set that forms the subject knowledge content audit for Key Stage 1 and Key Stage 2 maths. Each document contains: audit questions with tick boxes that you can select to show how confident you are (1 = not at all confident, 2 = not very confident, 3 = fairly confident, 4 = very confident), exemplifications; explanations; and further support links. At the end of each document, there is space to type notes to capture your learning and implications for practice. The document can then be saved for your records.

Question 3

How confident are you that you understand and can support children to identify small quantities through perceptual or conceptual subitising?

1

2

3

4

How would you respond ...?

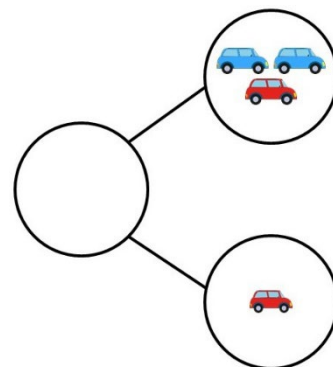
a. How would you support a child to perceptually subitise using real-life examples, such as flowers in the outdoor area?



b. What questioning techniques would you use to assess children's ability to conceptually subitise the whole quantity?



c. How can perceptual subitising be used to develop children's rapid recall of number facts?



Responses

Note your responses to the questions here before you engage with the rest of this section:

Did you notice that...?

- a. Children require lots of opportunities to perceptually subitise in different situations. Patterning is an important precursor to this and using arrangements such as a dice face will support children to make the connection. Use images and real-life examples, such as fruit placed on a plate in different arrangements, to give the children practice in 'seeing' how many there are without relying on counting. In the image used, if a child is not able to spot the 5, they may well be able to identify the 4 and the 1; the square pattern of 4 is one that children appear to be able to spot more easily. As they will only be able to subitise to around 5, it is important that an appropriate number of objects are used to develop perceptual subitising, in different arrangements from those they may be familiar with.
- b. Conceptual subitising is the ability to recognise small amounts within a larger amount to find the overall total. This is an important part of developing understanding about composition. It is important to give children the opportunity to discuss what they can see and different children may group the dots in this image in different ways. Ask children to explain the groups they can see and then look for other groups within the whole or ask what numbers they can see hidden within the number. There are many answers to this activity and it provides an opportunity for children to see the same thing differently and to learn about combining numbers in different ways.
- c. The understanding that numbers are composed of different numbers will support children to compose and decompose numbers, which in turn will support rapid calculation. For example, exploring how amounts can be partitioned will support children to ultimately 'know' that 4 is made of 3 and 1 or 2 and 2. This will allow them to manipulate numbers when calculating. For example, when presented with the calculation $7 + 4$, children can use their understanding of numbers being within numbers to split 4 into 3 and 1, using their number bonds to 10 to bridge: 'I know that 4 is made from 3 and 1. 7 and 3 is 10, and 1 more, makes 11, therefore 7 add 4 is 11.'

Subitising: what is it and why is it important?

Subitising is being able to recognise numbers of things without counting them. It is a natural ability that develops from a very young age and can be developed through teaching.

Most adults can subitise up to five objects through **perceptual subitising**. However, larger numbers of objects can be subitised by 'breaking' or 'seeing' smaller groups of numbers within the larger one. This is referred to as **conceptual subitising**.

Subitising is a skill that develops instinctively in young children. When they begin to develop their understanding of number, they use visual memory and a sense of patterning to recognise amounts. Children are able to distinguish the difference between one dot or two dots at two years old. Through exposure to different numbers of objects, they build a bank of images that they can then associate with the number fact. For example, many children are able to recognise the number patterns used on a dice by age 5. The structured images allow them to link the symbol with the word, building an understanding of the cardinal value.

Playing games involving dice exposes the children to the images and creates links between the dot pattern and the number of moves being made, steps they need to make or items they need to collect. When children are building this recognition, they can be encouraged to look for numbers within numbers to develop conceptual subitising. For example, can they see a dot pattern for 4 and 2 within 6?



Within the classroom, you can use a range of objects in different arrangements to help children become familiar with numbers being positioned in different ways. For example, you could use ten frames, multilink or counters or everyday objects such as buttons, stones, leaves or fruit.

As you increase the number to develop perceptual subitising, facilitate lots of discussion around how the children have grouped the items to help them find the quantity in the set. This can then lead to exploring how numbers are composed and related addition and subtraction facts. For example, in this image, children may see three dots and one dot, with a whole of four dots. This can then be used to explore the number facts.



$$1 + 3 = 4$$

$$3 + 1 = 4$$

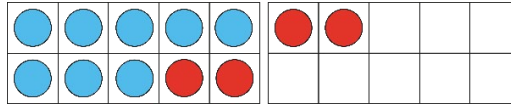
$$4 - 1 = 3$$

$$4 - 3 = 1$$

As children become more confident, provide opportunities to explore more complex dot patterns; they can look for the numbers within a larger quantity.

The recognition that a whole is made up of different parts is essential for children when developing skills in calculating; it allows them to manipulate numbers to make the calculations easier.

For example, when calculating $8 + 4$, it is easier if you know that 4 can be broken into 2 and 2. You can then add the 2 and 8 to make ten, before adding 2 more.



Securing children's understanding in the composition and decomposition of number will help develop their confidence and their ability to manipulate numbers and enhance their mathematical fluency.

Common errors in this area may include:

- relying on counting strategies, rather than seeing the quantity
- counting the same dot in two different groups when perceptually subitising.

What to look for

Can a child:

- explore the numbers within a number, identifying a variety of ways to decompose?
- represent the number in a variety of ways, using a range of manipulatives to explain?
- describe numbers using appropriate place value language?

Links to supporting materials:

NCETM Primary Professional Development materials, Spine 1: Number, Addition and Subtraction:

- Topic 1.3: Composition of numbers: 0–5

Notes:

Key learning from support material and self-study:

What I will focus on developing in my classroom practice: