

Teacher notes: Composition of numbers to 10

Over about 3 weeks, children move from using ten frames to see 'how many' and 'how many more to make 10', through part-whole work on 8 and 9, to finding every way to make 10, and finally to number bonds to 10 including zero and take away. The unit builds a deep, flexible understanding of the composition of numbers to 10 (eyfs.ma.number.1) and lets children notice patterns within those numbers, such as doubles and equal sharing (eyfs.ma.patterns.3), through hands-on, play-based maths rather than recording on paper.

eyfs.ma.number.1 Have a deep understanding of numbers to 10, including the composition of each number.

eyfs.ma.patterns.3 Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Prior knowledge

- Children can count a group of up to 10 objects accurately, touching or moving each one once, and know the last number counted tells them how many are in the group.
- Children can subitise small quantities (instantly knowing how many without counting, for groups of around 3 to 5) and match a numeral to a matching quantity.
- Children have explored the composition of smaller numbers in earlier Reception units, such as splitting 5 and 6 into two parts in different ways using fingers, cubes or small-world objects.
- Children have had experience of 'one more' and 'one less' through songs, number lines and practical counting during carpet time and continuous provision.

Key vocabulary

whole, part, altogether, makes, ten frame, number bond, how many more, equal, pair, take away, left, swap

Common misconceptions

When two parts are pushed together, the child recounts every object from 1 instead of realising the parts combine to make the whole (for example, seeing 4 and 3 but counting '1, 2, 3, 4, 5, 6, 7' from scratch rather than counting on from 4).

Model counting on from the larger part using a ten frame or fingers, and ask 'do we need to count them all again, or do we already know how many this part is?' Encourage children to hold the first part in their head and count on.

The child thinks swapping the order of the parts changes the whole, for example believing that 3 and 7 make a different total from 7 and 3.

Show the same two groups of objects or two ten frames side by side, physically swap their positions, and ask the child to check the total each time by counting altogether. Use the phrase 'it doesn't matter which part we say first, the whole stays the same'.

The child does not see 0 as a real part of a number bond, for example saying that '10 and 0' or '0 and 10' is not a proper way to make 10 because one part looks empty.

Show an empty ten frame alongside a full one and ask 'how many are in this part? how many in this part? do they still make 10 altogether?' Use the word 'none' or 'zero' explicitly as a part, and include it when listing every way to make a number.

When working with part-whole models for 8 or 9, the child confuses which number is the whole and which are the parts, for example saying the smaller part is the whole.

Point to the model and ask 'which group is everything altogether? which groups are the bits inside it?' Use consistent, exaggerated gestures (one big circle for the whole, two smaller circles for the parts) and let the child physically sort objects into the parts before checking the whole.

During take away activities, the child believes the whole amount changes rather than understanding that removing a part leaves the other part, for example thinking 10 take away 4 could be any number rather than a fixed missing part.

Start with 10 objects on a ten frame, physically remove 4 while the child watches, and ask them to count what is left. Link this back to the matching bond ('if 4 and 6 make 10, then 10 take away 4 leaves 6') so take away is seen as the reverse of combining parts.

Assessing through observation

Assess mainly through observation during adult-led sessions and continuous provision rather than recorded work. Watch how children use ten frames, cubes, fingers, beads or small-world resources to represent numbers to 10, and listen to the language they use ('part', 'whole', 'altogether', 'makes'). Note whether children can find more than one way to split 8, 9 or 10, whether they can say a bond to 10 without recounting from 1 (for example seeing 6 and knowing 4 more makes 10), whether they include 0 as a valid part, and whether they can act out a simple take away and say what is left. Capture examples of children explaining their thinking aloud, working with a partner, or noticing a pattern (such as swapping parts, or doubles like 5 and 5) during play.

What comes next

The unit leads into addition and subtraction problems set in real contexts, where children apply their number bonds to 10 to solve 'how many altogether' and 'how many are left' problems during play. It also lays the groundwork for exploring composition and bonds within numbers beyond 10 and for continuing the pattern work from eyfs.ma.patterns.3, such as doubling, odd and even groups, and sharing quantities equally between two or more children.