

# Symbolic relations and combinations

ECE resources

Symbolic relations and combinations involve combining and comparing symbolic number representations. The ability to solve symbolic number problems is the most sophisticated aspect of number development in early childhood, and requires children to have a secure conceptual understanding of numbers, as they determine which of two number words or written numerals is larger, or solve for the sum or difference of two numbers (addition and subtraction). Children need to keep in mind the magnitude of the numbers involved, their order in the counting sequence, and, in the case of arithmetic, how two numerical magnitudes can be combined to create a new, larger number. The key number skills for young children pertaining to symbolic relations and combinations include symbolic magnitude comparison and symbolic arithmetic.

## Symbolic magnitude comparison

This skill involves comparing magnitudes of written numerals or number words, indicating which is more/less/fewer or the most/least (if comparing multiple numbers).

### How to spot this skill being applied in free play

You might hear children:

- Talking about who is older in age ('I'm 5 and you're 4, so I'm older than you')

### How to check for understanding

Create cards with printed numerals, or generate a list of number names, and ask children to determine the larger or smaller of two numbers, or the largest or smallest of four numerals or number names. You could also assess this understanding during a game of War (as described below).

### Guided activities to support symbolic magnitude comparison

- **Snakes and Ladders:** Have children compare the numerals on the spaces that each character is on to determine who is the leader ('you are on 5 and he is on 6, so which is bigger and who is in the lead?'). Note that children will try to use spatial cues instead of magnitude to determine who is in the lead. Be sure to emphasise the size of the numbers to talk about this question.
- **War:** This game is about comparing which numeral/number word is larger or smaller on two cards. You can also compare the number of cards each player has at the end of the game. Be sure to emphasise the number words and point to the numerals on the card so children know what representation you want them to compare. You can use visuals (such as the matching dot card for the numeral) and invite children to compare visual representations of numbers.

## Symbolic arithmetic

Symbolic arithmetic is about children solving addition and subtraction problems using number words or written numerals. They might use counting objects or their fingers to do so.

### How to spot this skill being applied in free play

You might hear children:

- Talking about addition or subtraction (for example, 'I have 4 blocks. If you give me 1 more, I'll have 5', 'You took one of my markers, now I only have 4!')
- You might notice children:
- Playing 'teacher' and drawing addition and subtraction problems on the board.
- Playing with a toy cash register by punching more number buttons for every food item scanned.

### How to check for understanding

Have child solve simple addition and subtraction problems presented verbally or with printed numerals. This can include story problems (for example, Sally has four apples and Bobby gives her one more, how many apples does she have now?) or strictly number operations (for example, what is 4 plus 1?)

### Guided activities to support symbolic arithmetic

- **War:** For an extra challenge, ask children how much more or less one card is than another.
- **Snakes and Ladders:** Ask children, based on the space number their character is on, how many more spaces they would need to reach 10.
- **Cooking activity:** If you have five eggs and you need only four, ask children how many eggs you need to put away.

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