

Similar attributes, numbers to 20 and the '+' symbol

12



Educational context

In the Calculating activities, children go for a walk to look for symbols in the environment and notice that symbols tell us something. The '+' symbol is introduced alongside the Numicon adding action. Familiar adding activities are revisited using '+', providing important practice to help children begin to memorize adding facts to 10. The Pattern and Algebra activities extend earlier work on sorting and reasoning to focus on exploring similar attributes. In the Numbers and the Number System activities, children are consolidating their ability to build numbers to 20 with structured apparatus, to say the number names and label them with numerals. Children also have the opportunity to read and write numerals for these numbers, establishing a secure basis of understanding before they move on to work on higher numbers. For further educational context and teaching support please see pages 36–41.

Learning opportunities

Pattern and Algebra

- To be able to spot and say when something is the same colour, shape or size.
- To be able to spot and talk about other attributes that allow something to be considered 'the same'.

Numbers and the Number System

- To label Numicon Shapes for 0–20 with numerals.
- To learn to write numerals for 0–20 correctly and in order.
- To read some number words from 0–20.

Calculating

- To use and read the words 'and', 'add', 'plus', 'makes' and 'equals' in adding sentences.
- To recognize and use the adding symbol, '+'.

Words and terms for use in conversation

same, equivalent, different, similar, set, because, reason, odd one out, thick, thin, long, short, wide, narrow, big, small, colour words

number names zero to twenty and beyond, ordinal number words (e.g. first, second, third), growing pattern, growing sequence, order, more, continue, next, numeral, count, between

add, and, plus, makes, equals, altogether, together, total, more, larger Shape, larger amount, adding, adding sentence, adding story

Assessment opportunities

Look and listen for children who:

- Use the words and terms for use in conversation effectively in discussion.

Pattern and Algebra

- Explain that if something is similar, some aspect of it is equivalent.

Numbers and the Number System

- Build numbers 0–20 with structured apparatus and write the numerals for each number
- Read numerals 0–20 and write them in response to hearing the spoken number name.
- Read some number words 0–20 and write the corresponding numerals.

Calculating

- Build and read adding sentences with Numicon Shapes, numeral cards, word cards and symbol cards.
- Recognize and know when to use the adding symbol, '+'.

Explorer Progress Book 1a, pp. 26–29

After completing work on this activity group, give small focus groups of children their Explorer Progress Books and ask them to work through the challenges on the pages. As children complete the pages, assess what progress they are making with the central ideas from the activity group. Refer to the assessment opportunities for assistance.

Children will also have the opportunity to complete their Learning Log (pp. 28–29) where they can reflect on the mathematics they have done so far.

Explore More Copymaster 12: Adding Pairs

After completing work on Calculating Activity 2, give children Explore More Copymaster 12: Adding Pairs to take home.

Securing Foundations

Focus activities

Pattern and Algebra

Finding matching attributes

Activity 1: Playing the attribute game

Have ready: sorting equipment that can be matched by colour, size, shape and type, or Attribute Game – Shapes (cut from photocopy masters 6a and 6b)

Step 1

Give one item of sorting equipment or one card to each pair. Ask them to discuss with their partner everything they notice about it. Listen for children who give clear descriptions. Repeat with different items or cards until children are confident.

Step 2

Hold up two items or cards that share at least one attribute, e.g. colour. Ask children what is the same and what is different about them.

Step 3

Ask a pair to hold up their item or card. Put it where it can be seen. Ask the others to hold up their item or card if it has a matching attribute. Choose one and put it next to the first.

Step 4

Pointing to the second item or card, again ask pairs to hold up their item or card if it has a matching attribute. Choose one and place it next to the second. Repeat several times (e.g. **Fig. 1**).

Look and listen for children who are able to identify all the different attributes of the items or shapes, e.g. colour, shape and size, and those that identify only one at a time.

Step 5

Look at the arrangement of items or shapes and talk through the different criteria used. Was one criterion more popular than another, e.g. were more items chosen for colour than size? Did children find one criterion easier to match to than another?

Numbers and the Number System

Ordering and writing numerals to 20

Activity 1: Labelling Numicon Shapes 1–20 with numerals

Have ready: Numicon Shapes, Number Words One To Twenty (cut from photocopy master 19), Numeral Cards 0–20 (cut from photocopy master 22), individual whiteboards and pens or paper and pencils, *Numicon Software for the Interactive Whiteboard* (optional)

Step 1

Explain that this activity will remind children about how to build, name and write the numbers 0–20. Ask children to build a growing pattern, 0–20, with Shapes. Discuss whether there will be a Shape for zero. Listen for children who suggest that there is no 0-shape because zero represents nothing. Discuss this.

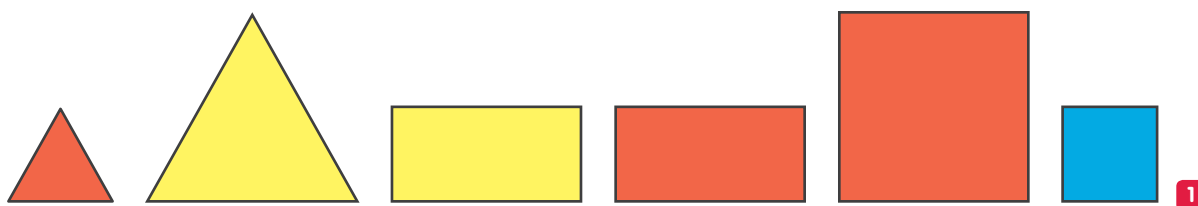
Ask children to name and label each number in the pattern with numeral cards. Look for children who remember the sequence and label the Shapes correctly. Some children may be able to label each number with the number word (photocopy master 19).

Step 2

Ask children to look at each numeral in turn and to explain and show how to write it. Look and listen for children who remember that the 1 is written first for numbers 10–19.

Step 3

Show children Shapes for numbers 0–20 in random order. Ask them to write the matching numerals.



12

Calculating

Introducing the '+' symbol

Activity 1: Going on an outdoor symbol-spotting walk

Have ready: clipboards, paper and pencils, digital camera (optional)

Help children to understand the usefulness of signs and symbols by taking them on a 'maths walk' around the local environment. Look for signs which give instructions or warn or direct people using symbols rather than words, e.g. road signs. Encourage children to make a record of these, e.g. by sketching or taking photos. You can also refer to signs and signals we make ourselves, e.g. beckoning, waving, sign language.

Activity 2: Introducing the '+' symbol and action

Have ready: Numeral Cards 1–10 (cut from photocopy master 21), Words and Symbols for Calculating (from photocopy master 42a and 42b), Explore More Copymaster 12: Adding Pairs

Step 1

Ask children to think of an adding story (something that happened recently) and record it as an adding sentence using numerals and words. Some children may use numeral and word cards, while others can write the adding sentences.

Step 2

Ask children to read out their adding sentences. Write each one on the board. Discuss that all these words take a long time to write.

Remind children about their symbol-spotting walk (Activity 1) and the useful symbols that replaced words. Show them the '+' symbol.

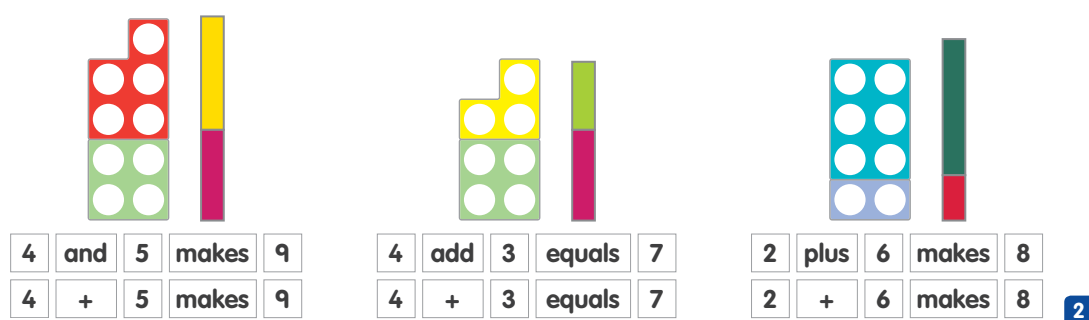
Rewrite the adding sentences on the board using '+' instead of the word 'and', 'add' or 'plus', e.g. **Fig. 2**. Continue to use the written word 'makes' or 'equals'.

Step 3

Say there is an action to help remember the '+' symbol. Model **Fig. 3**, saying, 'I'm putting them together. I'm adding.' Ask children to repeat the words as they do the action. Ask them to read the adding sentences aloud.

It is important that children are given time during Independent practice for this activity to try writing adding sentences using the '+' symbol.

Home After completing work on this activity, give children the opportunity to take home and complete Explore More Copymaster 12: Adding Pairs. This will help children to remember some number facts.



Securing Foundations

12

Activity 3: Turn it over – a game using adding facts

Have ready: two of each Numicon Shape 1–5 in baskets, Numeral Cards 2–10 (cut from photocopy master 21)

Step 1

'Turn it over' is a game for two players which helps children learn adding facts.

For each pair, arrange numeral cards 2–10 face up, in order, in a 3 × 3 grid (e.g. Fig. 4).

One partner chooses two Shapes, 1–5, from a basket, puts them together and says the adding sentence. They turn the numeral card showing the total face down (e.g. Fig. 5) and return the Shapes to the basket.

Step 2

Partners repeat, taking turns, until all the numeral cards have been turned over. Look for children who realize they need to check which totals have not been turned over before selecting Shapes.

2	3	4
5	6	7
8	9	10

4



2	3	4
5	6	7
	9	10

5

Practice and discussion**Whole-class****Getting Started**

- Show children pictures of objects arranged in Numicon Shape patterns. Use the Numicon Maths Story Starters (print from the *Planning and Assessment Support*) or pictures on the *Numicon Software for the Interactive Whiteboard*. Ask children to say the number of objects. Extend by asking children to jot down the numerals for the Numicon Shape patterns.

Pattern and Algebra

- Ask children to compare two objects, stating their similarities and differences. Repeat with different objects.

Numbers and the Number System

- Show numerals for numbers 0–20, in order. Point to two numbers (which are not side by side) and ask children to name the numbers that come between them.
- Write numerals for up to four numbers, 1–20, out of order on the board. Ask children to help you order them.
- Point to the numerals for a number, 1–20, on the Numicon Display Number Line. Ask children to show it using number rods or Numicon Shapes. Repeat for other numbers, 1–20, in any order.
- Show children 10–20 objects grouped into Numicon Shape patterns. Ask them to say the number name or write the numerals.
- Show children a number word (zero to twenty) and ask them to write the numerals.

Calculating

- Whenever possible, use children's names in describing everyday adding situations, e.g. 'When tidying up, Chloe picked up five bits of paper and Rashad picked up three. How many pieces of paper did they pick up altogether?'
- Show adding sentences using Numicon Shapes and/or numeral, symbol and word cards (cut from photocopy masters 21, 42a and 42b). Ask children to make up adding stories using the sentences.

12

Independent

Getting Started

Choose any Getting Started Independent practice activity from Securing Foundations 1–5 that you assess children need to practise. Continue with this until children are secure in giving number names to Numicon Shapes and in building and visualizing Numicon Shape patterns.

Pattern and Algebra

Work in pairs or small groups for Activity 1

Have ready: Attribute Game – Shape (cut from photocopy masters 6a and 6b)

This is a game for two to three players. Children share out the cards and decide who will start. The first player places a card on the table. Children take turns to try to match one of their cards according to one of the attributes (colour, size or shape). If they can, they place it next to the card on the table, making their card the next one to be matched. If not, they miss a turn. The winner is the first to use all their cards. This game can also be played with equipment designed for sorting.

Numbers and the Number System

Paired work for Activity 1

Have ready: Numicon Shapes, Numicon 0–5 and 6–10 Dice, Empty Number Track with 10 Spaces (photocopy master 11 – enlarge to A3 if needed)

Partners fill in numerals for 11–20 on a number track. They take turns to roll a dice, pick up the matching Shape and combine it with a 10-shape to make a teen number. They colour the teen number on their number track. The first to colour all the squares on the track wins.

Calculating

Paired work for Activity 2

Have ready: Numicon Spinners with Spinner Overlays 1 (using overlays 1–5 and 6–10 cut from photocopy master 31), Numicon Shapes, Numeral Cards 1–10 (cut from photocopy master 21), Words and Symbols for Calculating (photocopy masters 42a and 42b)

Each partner spins a number and collects the matching Shape. Partners add their Shapes together, say the adding sentence and set out numeral, '+' symbol and word cards to show it.

Paired work for Activity 2

Have ready: Numicon Feely Bag containing two of each Numicon Shape 1–5, Numeral Cards 1–10 (cut from photocopy master 21), Words and Symbols for Calculating (photocopy masters 42a and 42b)

Partners take turns to take two Shapes from the Feely Bag, add them together and say the adding sentence. They then use the numeral, '+' symbol and word cards to show the sentence.

Paired work for Activity 2

Have ready: Numicon Shapes, two Numicon 0–5 Dice, Numeral Cards 1–10 (cut from photocopy master 21), Words and Symbols for Calculating (photocopy masters 42a and 42b)

Pairs roll both dice, pick up the Shapes that match the numbers rolled, say the adding sentence and build it using numeral, '+' symbol and word cards.

Paired work for Activity 2

Have ready: Numicon Shapes, two sets of Numeral Cards 1–5 in a basket and a set of Numeral Cards 1–10 (cut from photocopy master 21), Words and Symbols for Calculating (photocopy masters 42a and 42b)

One partner chooses two numeral cards from the basket and uses them with '+' symbol and word cards to set out an adding sentence, without the total. The other partner finds the total and records it with the appropriate numeral card. Both partners check. They can use Shapes to help them.

Paired work for Activity 2

Have ready: Numicon Feely Bag containing Numicon Shapes 2–10, Numeral Cards 1–10 (cut from photocopy master 21), Words and Symbols for Calculating (photocopy masters 42a and 42b)

Partners take one Shape from the Feely Bag and combine two or more Shapes to equal it. They say the adding sentence, then build it using numeral, '+' symbol and word cards.