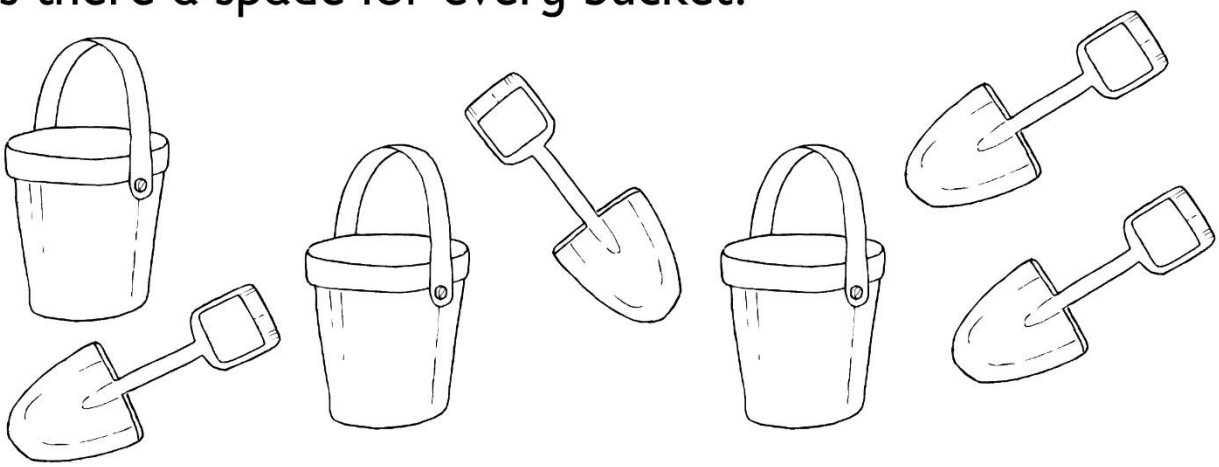
00 NumberSense

PROMPTS, STRATEGIES & SOLUTIONS

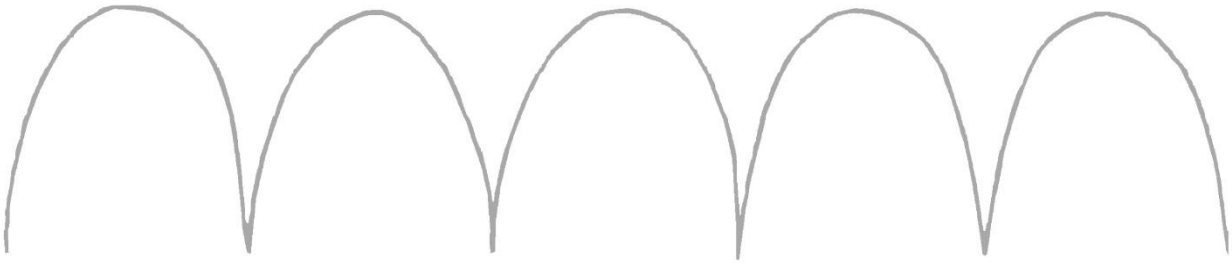
English

Teacher Guide

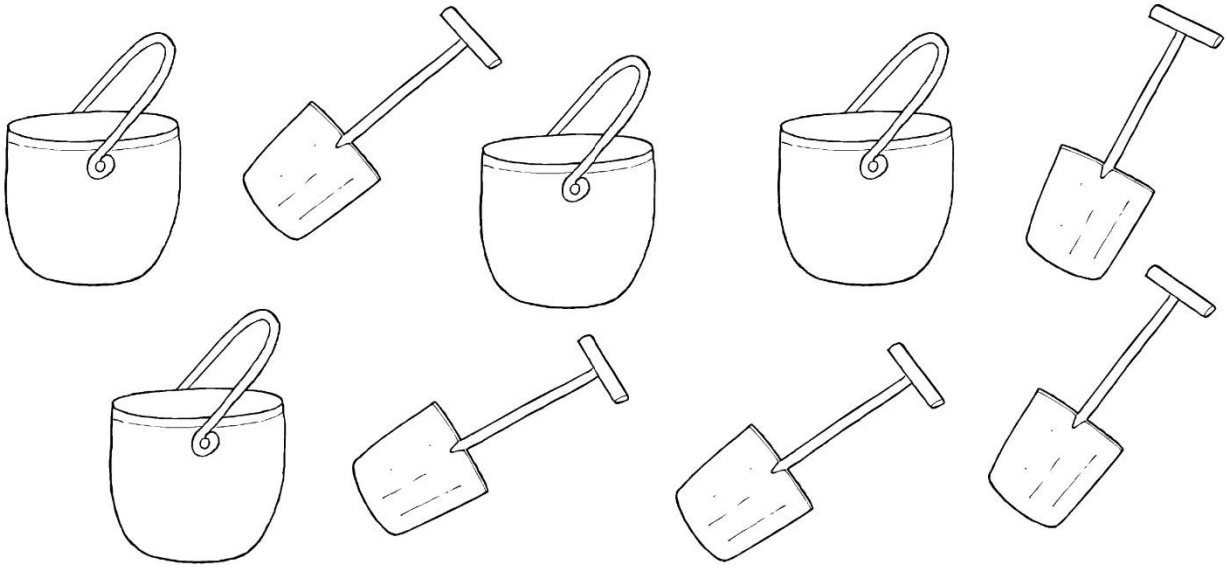
Is there a spade for every bucket?



Trace the waves.



Is there a spade for every bucket?



Things to think about

Comparing collections

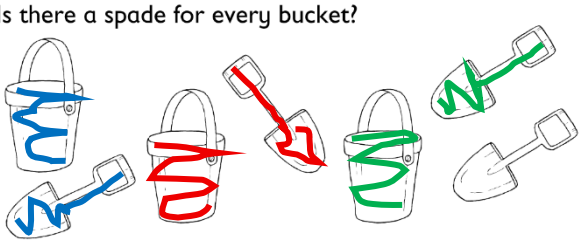
This question requires children to compare collections. There are two main ways:

- Comparing by matching
- Comparing by counting

The phrasing of the question encourages comparing by matching as it is asking if every object in one set can be paired with an object in the other set. It is based on one-to-one correspondence and physical pairing.

Comparing by counting is a more advanced strategy where they count each set and compare the two totals.

Is there a spade for every bucket?



COMPARING	
Compares by matching	Compares by counting

Comparing by matching

Comparing by counting

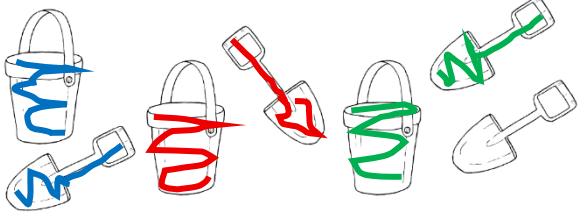
Exploring the concept concretely

Create a similar problem. For example: Are there enough apples for everyone to have one?

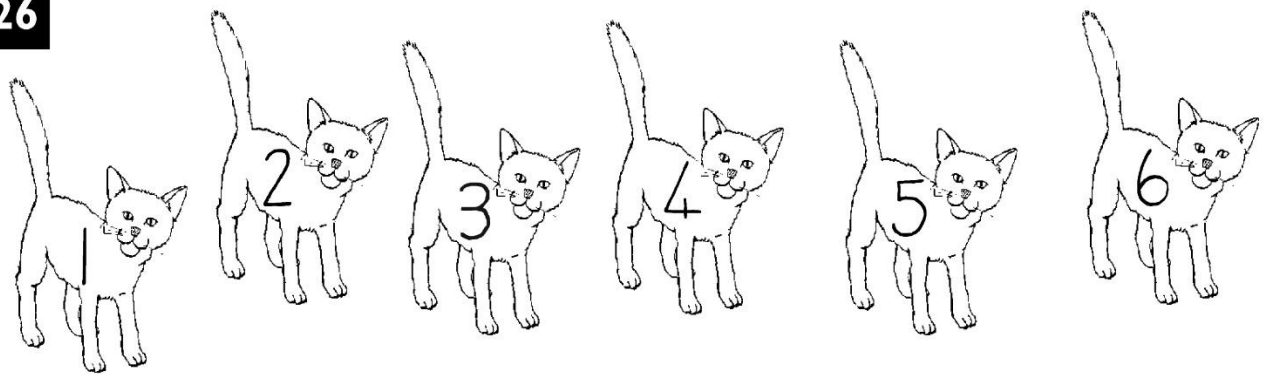
Transferring these skills onto paper

Because the pictures in the book can't be moved, it might be helpful to show the children how to colour each pair a different colour to indicate a match.

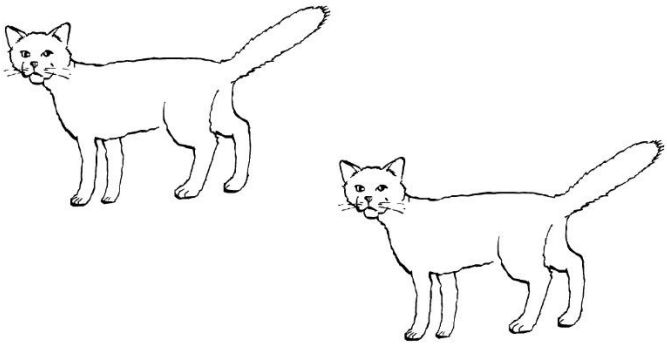
Is there a spade for every bucket?

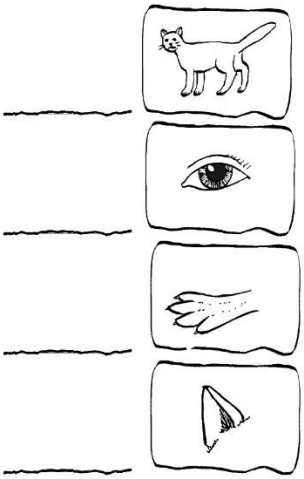


There are two opportunities to practice on this page and then more on pages 8, 9 and 16.

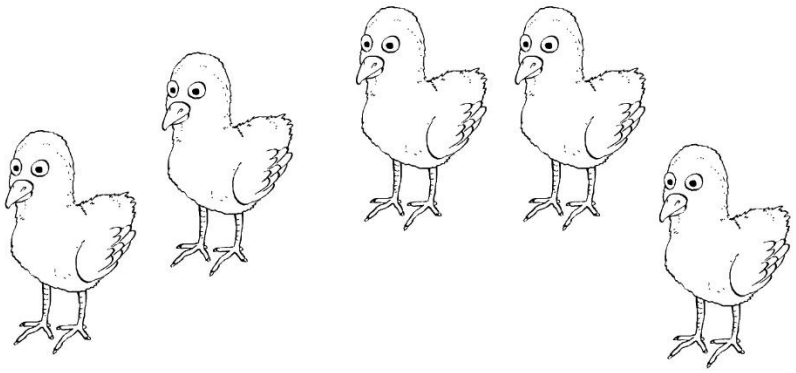


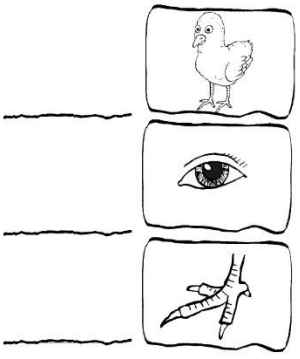
How many?





How many?

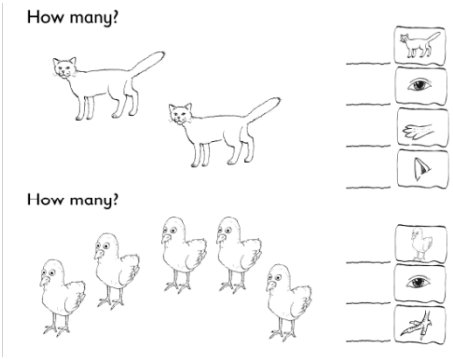




Trace the frog's hops.

Things to think about

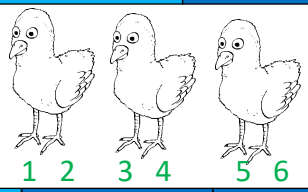
Grouping and unitising



This format of counting different things in the same picture is used extensively in the workbooks. It exposes children to the type of thinking that will develop into the concepts of **grouping** and eventually **unitising**.

GROUPING (Compiled from multiple sources)		
Sorting and classifying: • Begin intentionally grouping (sorting) according to colour, shape, size or function. (age 3-4)	**Grouping for counting:** • Begin grouping to help count efficiently. • Start lining objects up, making groups and organising collections. (age 4-5)	**Equal grouping and early multiplicative thinking:** • Increasingly understand grouping as "how many groups" and "how many in each group". • Make equal groups, repeated groups and structured arrangements. (age 5-7)

Unitising grows out of repeated experiences with grouping. **Unitising** is the ability to see a *group of items as a single unit* and then to treat that unit as countable.



Unitising is a big developmental leap in early mathematics and it underpins place value, multiplication, measurement and fractions later on. Without unitising, children stay stuck in counting-all strategies.

Counting eyes/arms/legs one-by-one	Recognising pairs of eyes/arms/legs	Thinking "every child has 2 eyes" – a repeatable unit = unitising

We expect children to count items individually at this stage.

UNITISING (Compiled from multiple sources)			
Pre-unitising: Count individual items one-by one. Do not see groups as individual entities. (approx. age 3-5)	**Perceptual unitising:** Treat a group as a "chunk" only if its **visibly obvious**. May use subitising. (approx. age 4-6)	**Figurative unitising:** Mental grouping. Begins skip counting. (approx. age 5-7)	**Abstract unitising** Treat units within units (e.g. tens and ones). Units become composite and flexible. (approx. age 6-8+)

Eventually the aim is to shift children's thinking from counting items one-by-one to treating groups as chunks. This is a long process and will be developed throughout the Foundation Phase.

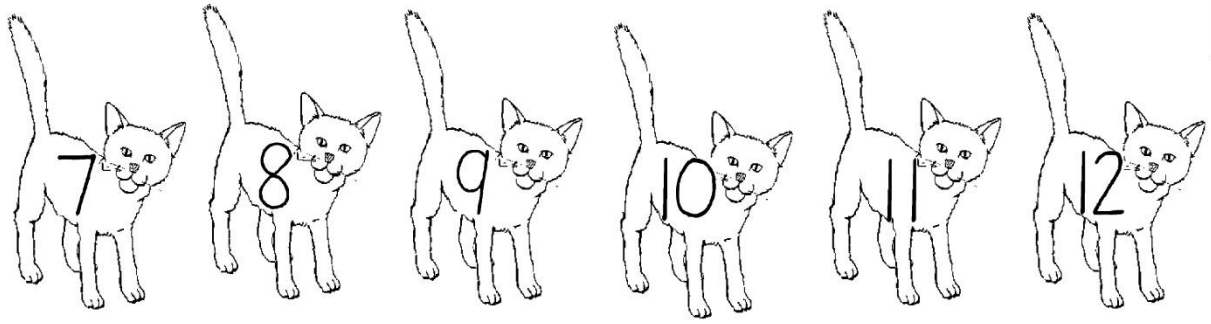
Concrete activity ideas

Building multiple people with multiple parts to create awareness of grouping.

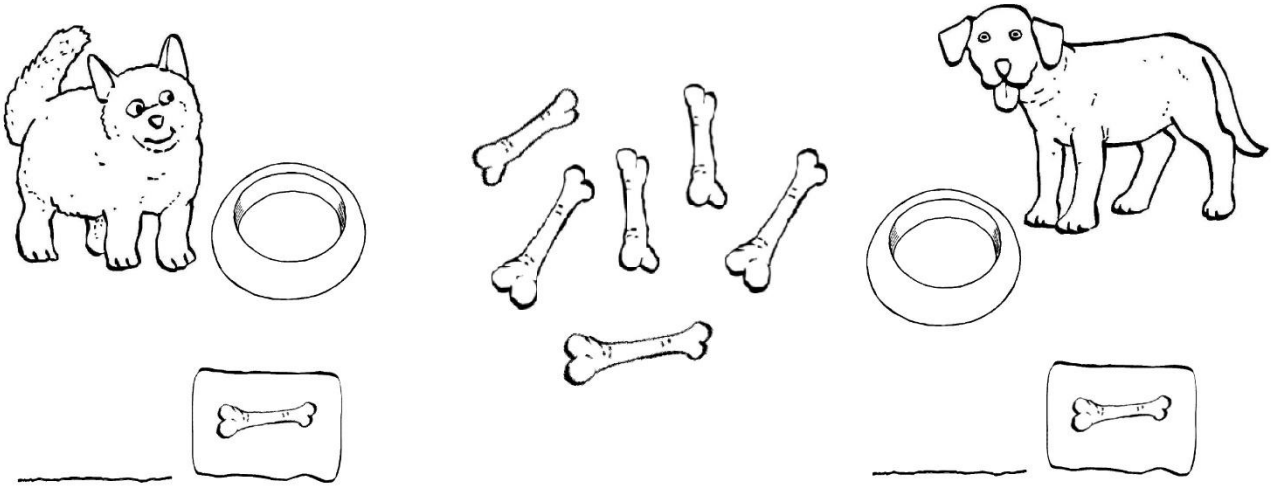
Prompt questions:

- How many people did you make?
- How many arms do they have altogether?
- How many legs do they have altogether?
- How many eyes do they have altogether?

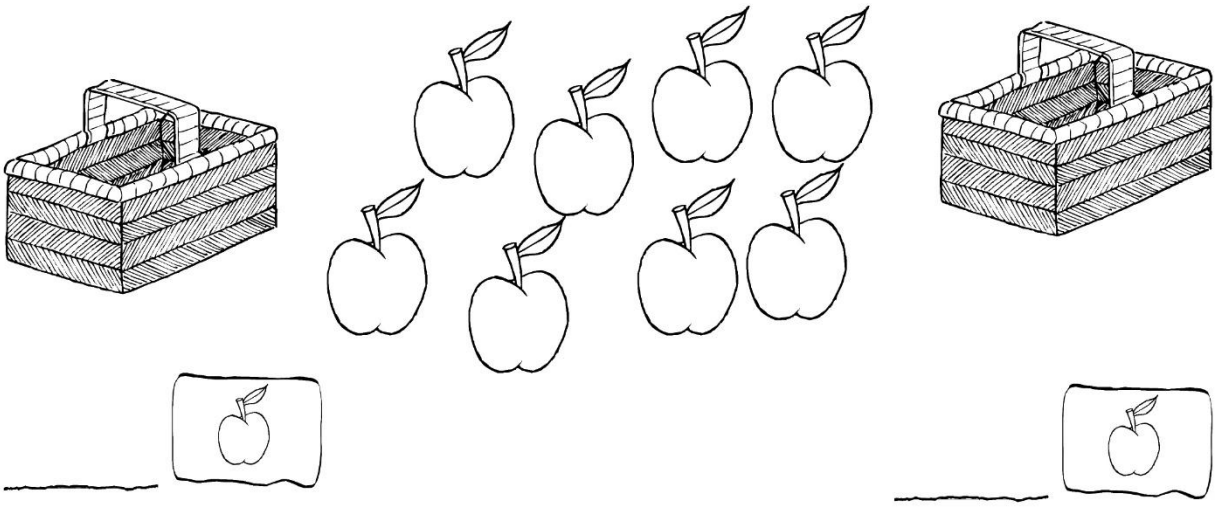
Count individual shoes and pairs of shoes.



Share the bones equally. Write the number.



Share the apples equally. Write the number.



Trace the numbers.

4 5 6 7 8 9 10

Things to think about

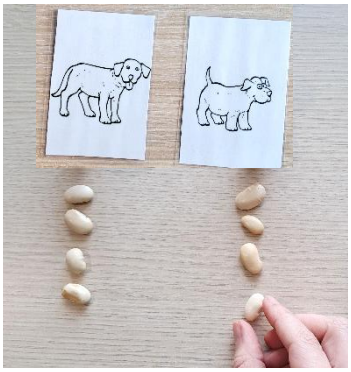
Sharing

This is the first time sharing appears in the Workbooks, but children should be familiar with the concept from exposure to concrete sharing problems.

EARLY SHARING				(Compiled from multiple sources)
Sense of social fairness but can't calculate.	Equal distribution through action giving one item to each person.	Think mathematically before acting (for simple scenarios with small numbers) assuming whole numbers.	Emergence of partitioning (splitting objects).	Division strategies.

First, do a concrete example:

There are 8 bones and 2 dogs. Share the bones equally between the dogs.



How did you do it?

I gave them out, one for you, one for you, one for you until they were all done.

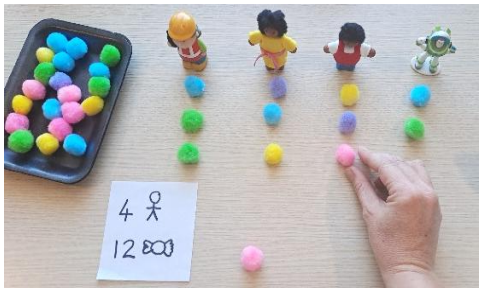
Action-based strategies like the one above are common for this age and involve one-to-one sharing using concrete materials.

I gave each dog two and then I saw I have enough left to give each dog another two.

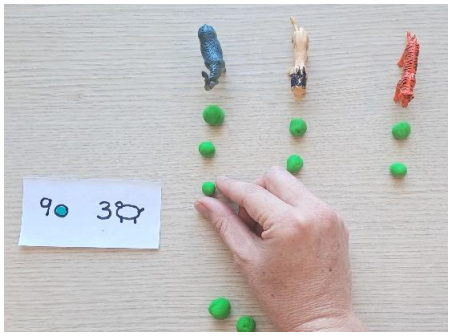
This strategy is more advanced, and illustrates what we hope to see as the numbers get larger.

More concrete activities

An example of practising concrete one-to-one sharing.



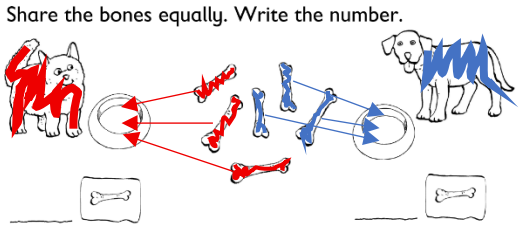
Use playdough to make balls of food for the animals and share the food.



Transferring these skills onto paper

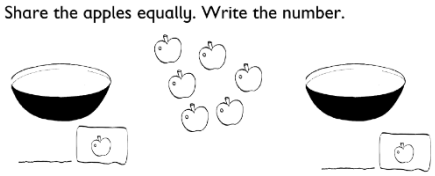
Check that children have an effective method of indicating which bones/apples marbles go into which bowl/basket – making sure that every bone/apple has been allocated to a basket.

Using two colours can be helpful:



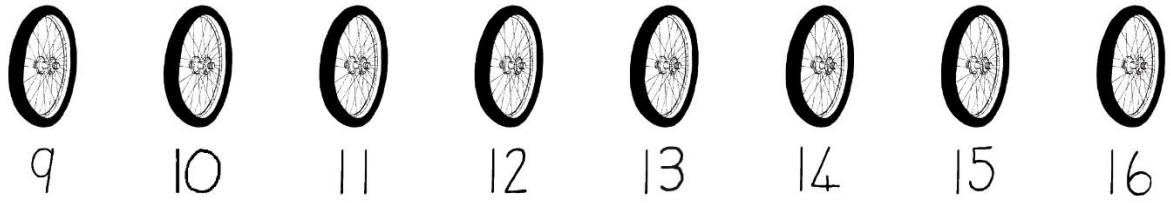
More opportunities to practice

There are lots more opportunities for children to practice this concept in this format:

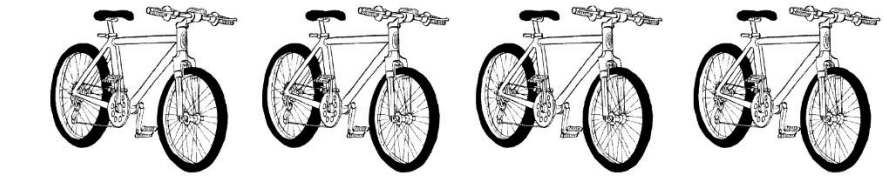


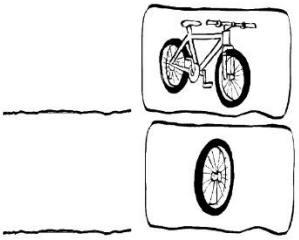
Also on pages 30, 38 and 42 of this Workbook and many instances in Workbook R4.

The next page: 28

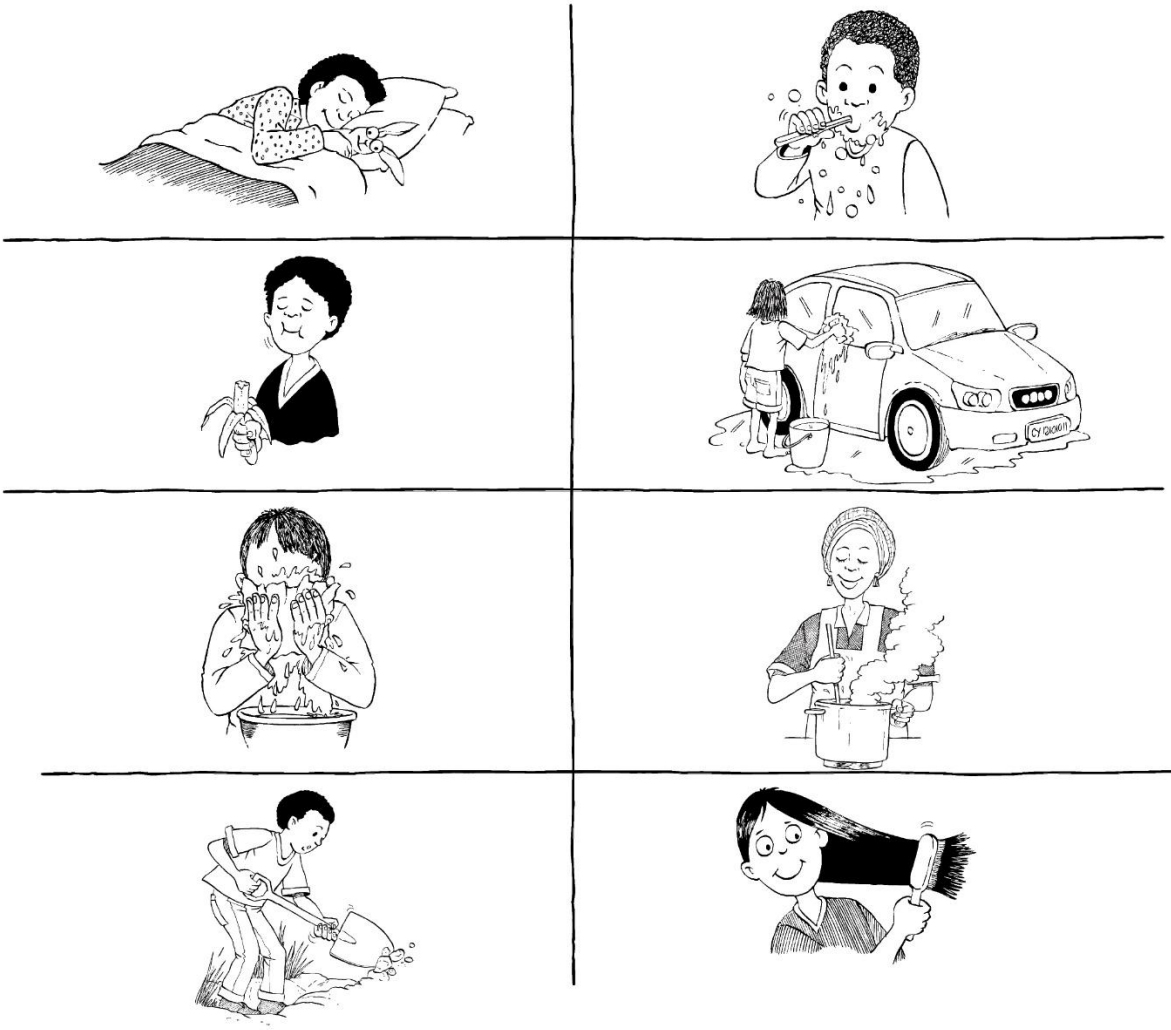


How many?





Which takes the longest? Colour in the picture.

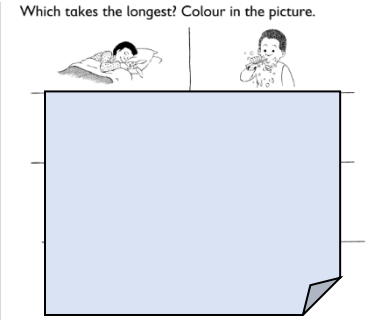


Things to think about

Time - duration

Before children are ready to learn telling time in whole hours (e.g., "3 o'clock"), they need a good understanding of:

- sequencing events,
- daily routines,
- recognising numbers 1 to 12,
- duration
- numbers arranged in a circle.



TIME: DURATION			(Compiled from multiple sources)
Experiential awareness of duration (age 2-4)	**Comparative understanding** of duration (age 4-5)	**Emerging measurement** of duration (age 5-6)	**Early conventional understanding** (age 6-7)

As children's concept of time develops, their understanding of duration becomes **less subjective and emotional** (enjoyable events seem short and unpleasant waiting feels long) and more **objective** as they gain experience in comparing durations of activities and become increasingly aware that events can be measured.
They can increasingly recognise: longer vs shorter activities, faster vs slower events, activities that take "a long time."
They begin understanding that some activities consistently last longer than others and duration can be compared even when events are different.

Which activity do you think will take longer? Why?

Be open to children having differing opinions. Encourage them to give reasons.

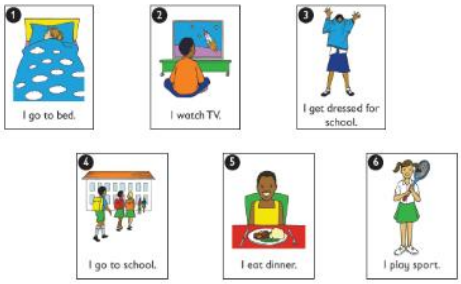
You might want to use a piece of paper to help the children focus on one row at a time.

Activity Ideas

Compare durations of classroom activities. Which takes longer? Doing a puzzle or washing your hands?

vs

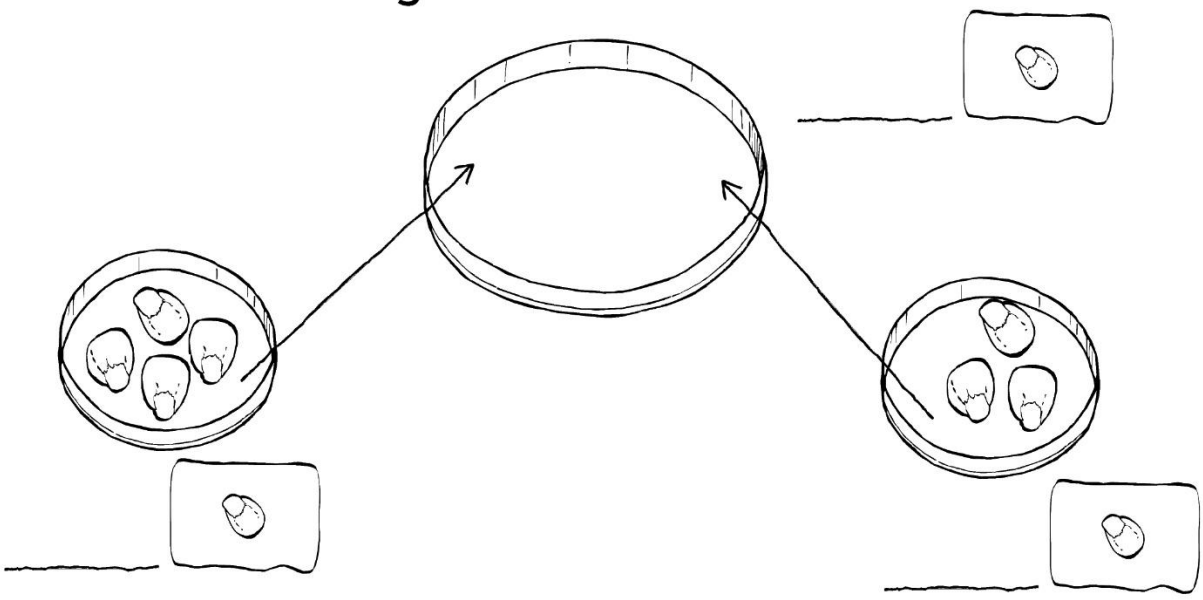
Use the Time (Event) Cards for comparing durations of different activities.



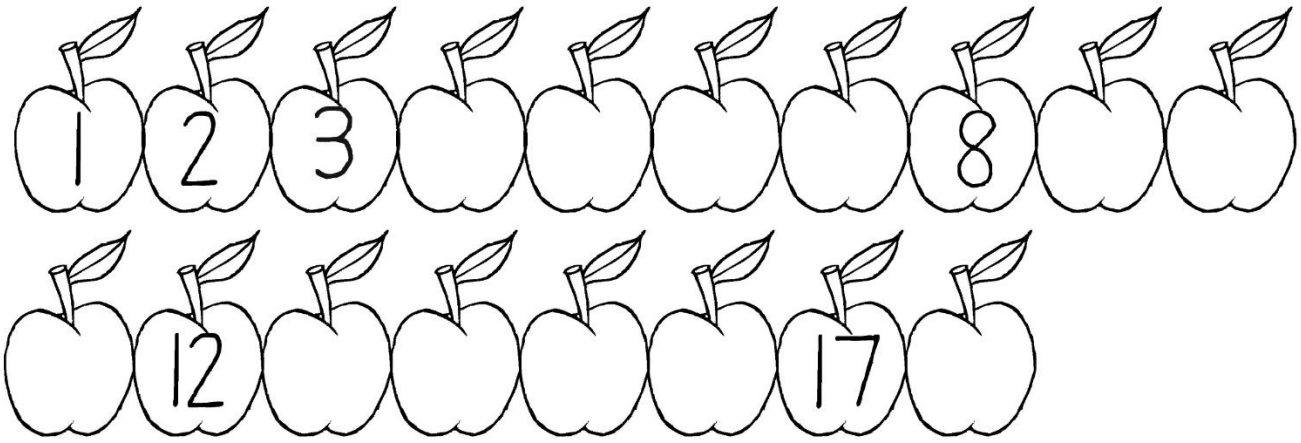
Support emerging measurement by experimenting with informal ways to measure duration, e.g. sand timers, counting claps or with songs.

Share the mealies equally. Write the number.

Put the mealies together. Write the number.



Write the missing numbers on the apples.



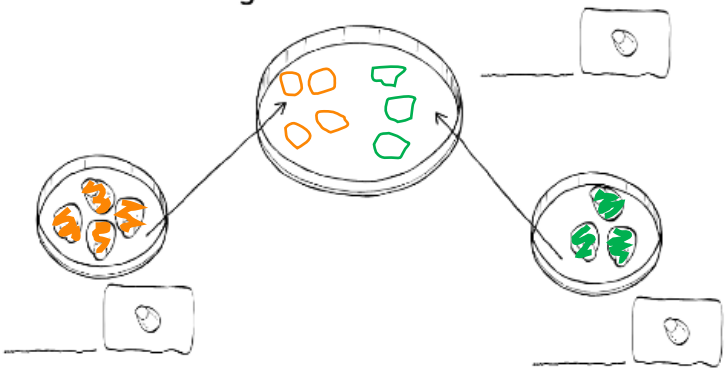
Things to think about

Addition problems (result unknown)

This is the first appearance of the classic addition problem where two quantities are combined and the result is unknown. Children should be familiar with the concept from exposure to concrete addition problems.

ADDITION PROBLEM TYPES		
Result unknown 5+4=_ (age 4+)	**Change unknown** 5+_=9 (age 5+)	**Start unknown** _+4=9 (age 6-7+)

Put the mealies together. Write the number.



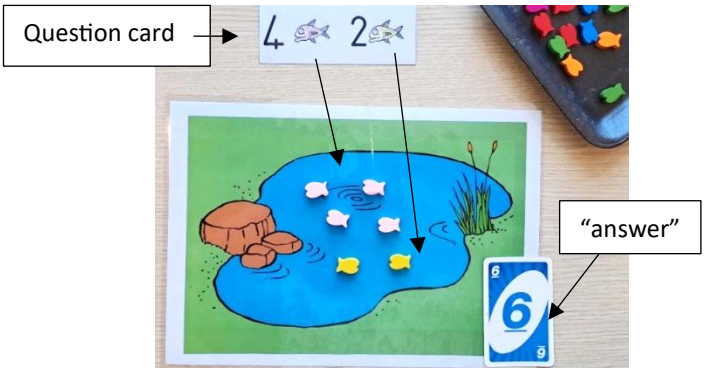
ADDITION STRATEGIES		
Count all (direct modelling)	Counting on	Numerical reasoning

This format requires the children to draw all the objects, prompting a "counting all" strategy.

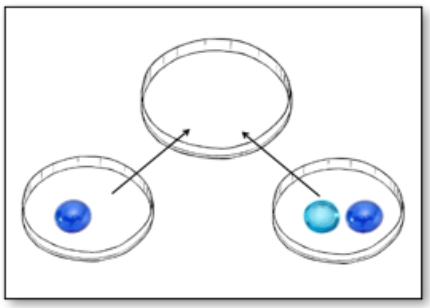
It might be helpful to use two colours.

Concrete practice

Lots of practise with concrete modelling is essential to prepare them for book work.



Using a template to introduce the part-whole model



Print the next page on A3 paper and use it as a template to practice combining two collections of concrete objects.

You can also practise this format concretely like this: