Reception Guidance

#MathsEveryoneCan

The Counting Principles

Following research from Gelman and Gallistel in 1978, it is vital that teachers understand the five counting principles.
(Gelman, R. & Gallistel, C. (1978) The Child's Understanding of Number. Cambridge, MA. Harvard University Press.)

1

The one-one principle. This involves children assigning one number name to each object that is being counted. Children need to ensure that they count each object only once ensuring they have counted every object.

Children will sometimes count objects more than once or miss an object out that needs to be counted. Encourage children to line up objects and touch each one as they count saying one number name per object. This will also help to avoid children counting more quickly than they touch the objects which again shows they have not grasped one-one correspondence.

The Counting Principles

2

The stable-order principle. Children understand when counting, the numbers have to be said in a certain order.

Children need to know all the number names for the amount in the group they are counting. Teachers can therefore encourage children to count aloud to larger numbers without expecting them to count that number of objects immediately.

3

The cardinal principle. Children understand that the number name assigned to the final object in a group is the total number of objects in that group.

In order to grasp this principle, children need to understand the one-one and stable-order principle. From a larger group, children select a given number and count them out. When asked 'how many?', children should be able to recall the final number they said. Children who have not grasped this principle will recount the whole group again.

The Counting Principles

4

The abstraction principle. This involves children understanding that anything can be counted including things that cannot be touched including sounds and movements e.g. jumps.

When starting to count, many children rely on touching the objects in order to count accurately. Teachers can encourage abstraction on a daily basis by counting claps or clicks. They can also count imaginary objects in their head to encourage counting on, this involves the children visualising objects.

5

The order-irrelevance principle. This involves children understanding that the order we count a group of objects is irrelevant. There will still be the same number.

Encourage children to count objects, left to right, right to left, top to bottom and bottom to top. Once children have counted a group, move the objects and ask children how many there are, if they count them all again they have not fully grasped this principle.

Key Language for teachers

Cardinal - The number that indicates how many there are in a set.

Classification – The identification of an object by specific attributes, such as colour, texture, shape or size.

Conservation (of number) – The recognition that the number stays the same if none have been added or taken away.

Numeral - The written symbol for a number; e.g. 3, 2, 1

Ordinal - A number denoting the position in a sequence e.g. 1st, 2nd, 3rd, etc or page 1, page 2, page 3...

Partition - Separate a set into two or more subsets e.g. Partition a set of socks into plain and patterned.

Subitise - Instantly recognise a small quantity, without having to count how many there are.

Number - Number can be:

- a count of a collection of items e.g. three boxes,
- a measure e.g. of length or weight, or
- a label e.g. the number 17 bus

Quantity - The amount you have of something e.g. a cup of flour, three boxes, half an hour.

Important links and websites

The NCETM Early Years area

The aim of this section is to help teachers and practitioners in Early Years settings have a clearer understanding of how children build early number sense, and to provide tips on how best to support that learning.

https://www.ncetm.org.uk/resources/51439

Number Blocks

Numberblocks, first broadcast in January 2017, is a pre-school BBC television series aimed at introducing children to early number.

Snappy animation and loveable characters combine with engaging storylines to gently introduce concepts of number to support early mathematical understanding.

https://www.bbc.co.uk/cbeebies/shows/numberblocks

NRICH

The NRICH Early Years resources aim to further develop young children's natural problem-solving abilities in the context of mathematics.

https://nrich.maths.org/early-years

Learning Trajectories

$[LT]^2$ is a web-based tool for early childhood educators to learn about how children think and learn about mathematics and how to teach mathematics to young children (birth to age 8).

https://www.learningtrajectories.org/

Early Math Collaborative

The Erikson Institute Early Math Collaborative is transforming the understanding, teaching and learning of early mathematics from the ground up.

https://earlymath.erikson.edu/

Autumn Progression

Number and Place Value	Numbers to 5	One, two, three
		Four
		Five
Addition and Subtraction	Sorting	Sorting into groups
Number and Place Value	Comparing groups	Comparing quantities of identical objects
		Comparing quantities of non-identical objects
Addition and Subtraction	Change within 5	One more
		One less
Measurement	Time	My day

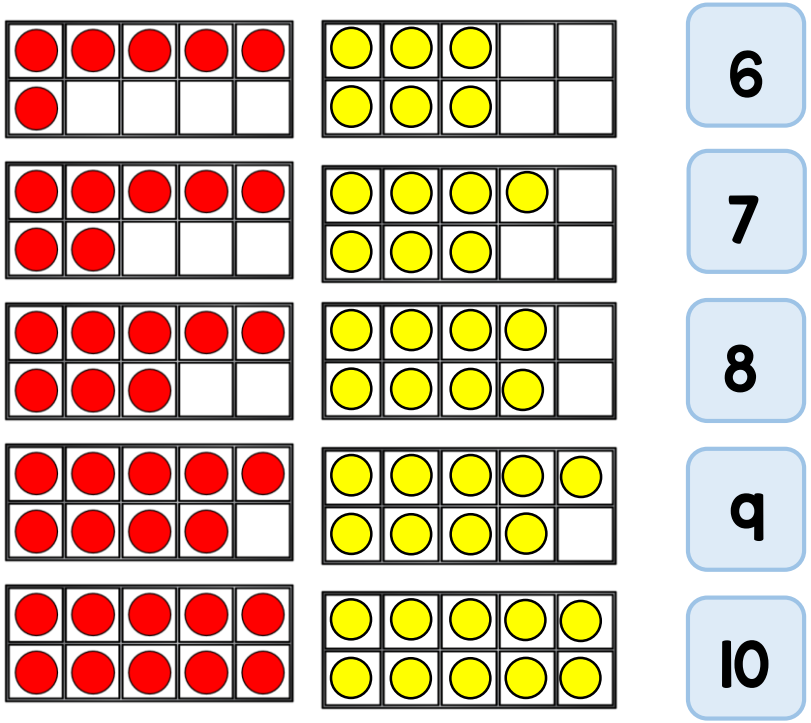
Spring Progression

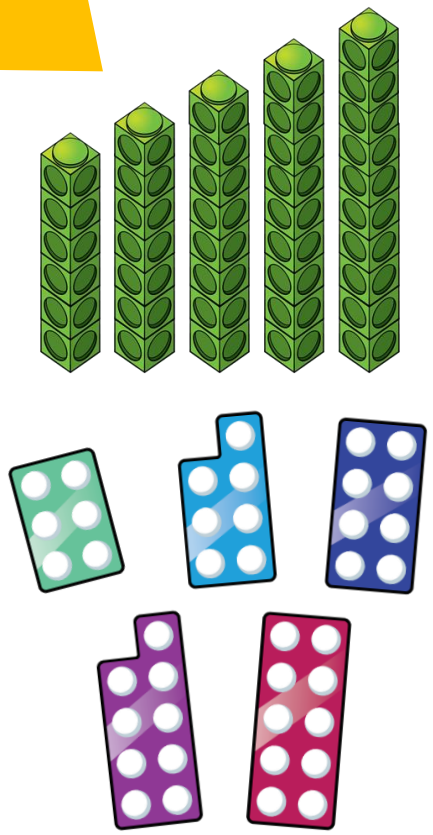
Addition and Subtraction	Numbers to 5	Introducing zero
		Number bonds to 5
Number and Place Value	Numbers to 10	Counting to 6, 7 and 8
		Counting to 9 and 10
		Comparing groups up to 10
Addition and Subtraction	Addition to 10	Combining two groups to find the whole
		Number bonds to 10 – ten frame
		Number bonds to 10 – part-whole model
Geometry	Shape and space	Spatial awareness
		3-D shapes
		2-D shapes

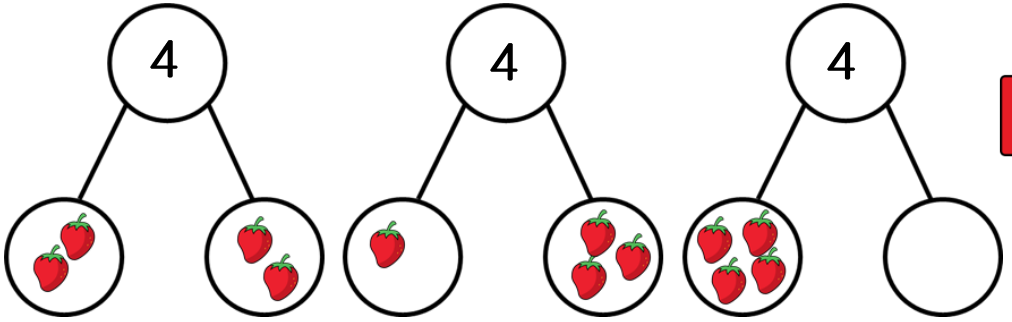
Summer Progression

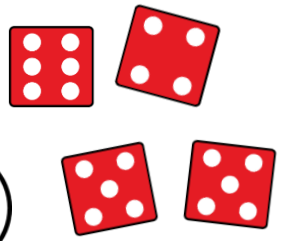
Geometry	Exploring patterns	→ Making simple patterns
		→ Exploring more complex patterns
Addition and Subtraction	Count on and back	→ Adding by counting on
		→ Taking away by counting back
Number and Place Value	Numbers to 20	→ Counting to 20
Multiplication and Division	Numerical patterns	→ Doubling
		→ Halving and sharing
		→ Odds and evens
Measurement	Measure	→ Length, height and distance
		→ Weight
		→ Capacity

Key Representations









Notes and guidance

As children begin to count beyond 5, encourage them to build step patterns to help them see that each number is one more than the number before.

The 10 frame can be used to help them subitise these quantities and explore the 5-and-a-bit structure and the pair structure. For example, they will see 6 as five and one more or as 3 pairs of 2, both of which will be useful in their later maths work.

A key learning point here is that numbers are made up of smaller numbers. They can be made up of two parts or more than two parts. They can be made up of equal parts or unequal parts.
Encourage the children to arrange quantities in different ways to help them discover their different parts.

Part-whole models are one way to explore the number bonds which make any given number.

Number bonds to 5

Guidance

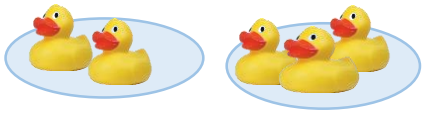
Children begin to understand that numbers can be made by combining smaller numbers, including zero. They use real-life objects and familiar contexts to explore the composition of numbers to 5.
The 5 frame and part-whole models are useful to represent the different parts which combine to make the whole.
Children should be encouraged to record their work using mathematical jottings.

Other Resources

Numberblocks Episode 12: The Whole of Me

5 Little Speckled Frogs song

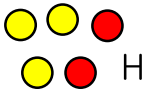
5 little Ducks and 2 pools.



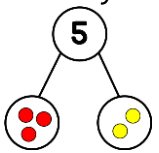
Prompts for Learning

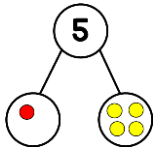
Give the children 5 bean bags.
Ask them to throw them into a hoop.
How many land inside the hoop? How many land outside?
How could you record your results?
(Encourage children to use their own methods of recording their results each time.)
What if you only had 4 bean bags or 3?

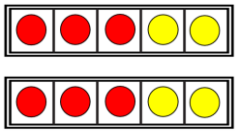
Ask the children to count out 5 double-sided counters.



Shake and drop them onto the table.
How many are red, How many are yellow?
Look at your partners. Is it the same?
Drop them again. What has changed?
Could you show your counters on a part-whole model or a 5 frame?







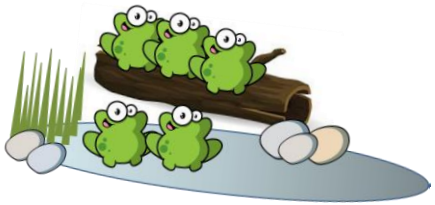
If you had 5 red counters, how many yellow would there be?
(Butter beans with one side painted are more easily manipulated by little fingers.)

Play **Bunny Ears**
Using 2 hands to be the ears, how many ways can you show 5? Can you see what number I have made? Can you make ears the same as mine? Can you make the same number in a different way?

Number bonds to 5

Water

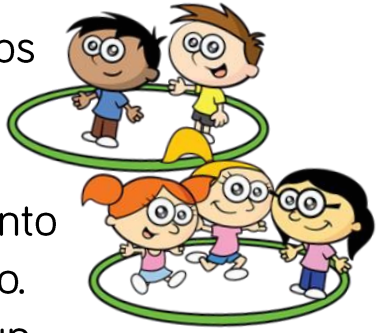
Set up a log and pool and provide 5 speckled frogs for the children to re-enact the song. Encourage the children to sing the song as they play and to count how many frogs are on the log and in the pool at the end of each verse.



Enhancements to areas of learning

Outdoors

Provide 5 children with 2 hoops labelled yes and no.
Children take turns to ask a question and sort themselves into the hoops to answer yes or no.
Count how many in each group.
Can you find a question which sorts the children into 5 and 0?



Number shapes

Use the number shapes to investigate which smaller numbers combine to make exactly 2, 3, 4, or 5
Check by sitting them on top of the whole number.

Is there more than one combination?
Which number has the most combinations?

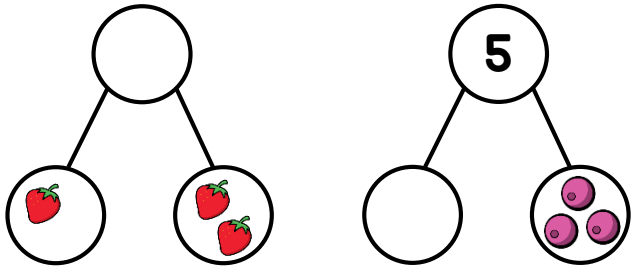
Construction

Provide cubes in 2 different colours.
Ask the children to build a tower of 5.
Compare the towers.
What is the same? What is different?
What if you make towers of 4 cubes?
3 cubes? Can you find different ways to make towers of 2 cubes?

Digging Deeper

What is missing?

Show the children a part-whole model with either one of the parts or the whole missing.



Encourage children to use concrete objects, draw a picture or use their fingers to help them explain how they know what is missing.

Exploring possibilities

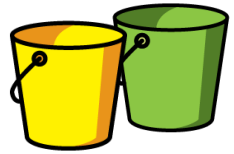
Show the children an empty feely bag.
Together, count 4 cubes into the bag.
Take out an unseen amount.
Ask the children to discuss how many **could** be in your hand and how many **could** be left in the bag.

Key questions

What is missing? How do you know?
Can you draw a picture to show me?
Can you show me with these cubes?

How many cubes could I have in my hand?
How many cubes could be left in the bag?
If I have 3 cubes in my hand, how many will be in the bag?
Could I still have 4 cubes left inside the bag?
If there are 4 in the bag, how many will be in my hand?
Could I have 5 cubes in my hand? How do you know?

Hidden bonds



Show the children 2 buckets.
Explain that you have 3 pebbles hidden inside the buckets.
Ask the children how many pebbles **could** be in each bucket.
How many pebbles could I have in this bucket? In this one?
Could this bucket have 0 pebbles?
Could this bucket have 4 pebbles? How do you know?

Counting to 6, 7 and 8

Guidance

Children continue to apply the counting principles when counting to 6, 7 and 8 (forwards and backwards). They can represent 6, 7, and 8 in different ways and can count out the required number of objects from a larger group.

Placing objects onto a 10 frame will support the children to subitise 6, 7, and 8 to see them as 5 and 1; 5 and 2; and 5 and 3

Other Resources

Days of the Week counting song

1, 2 buckle my shoe

Little Miss Muffet 

The Bad-Tempered Ladybird - Eric Carle

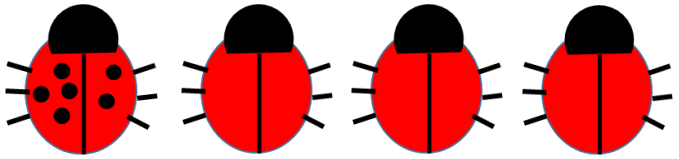
The Very Busy Spider - Eric Carle

Prompts for Learning

Note: All the prompts for counting to 5 can be applied to counting to 6, 7, and 8 in addition to these ideas.

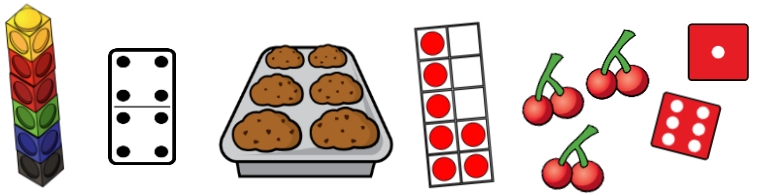
Encourage the children to think about where we see 6, 7, and 8 in everyday life and to make collections of 6, 7 and 8 objects in the classroom.

How many legs does the ladybird have? How many spots? Use counters to add 6 spots to the other ladybirds. Can you find more than one way to do it?



How many colours do you see in the rainbow?
Can you paint a rainbow with 7 colours?
Can you make rainbows using objects around the classroom? How many colours did you use?

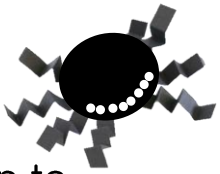
Sort these items into 6, 7 and 8
How else could you show 6, 7, and 8?



Counting to 6, 7 and 8

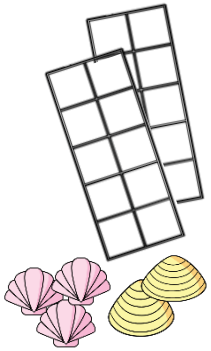
Enhancements to areas of learning

Modelling



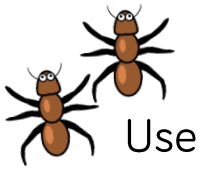
Make springy-leg spiders. Provide card circles for children to collage and strips of black paper. Show them how to fold each strip into zigzags to make 8 springy legs. They could also stick on 8 eyes.

Loose parts



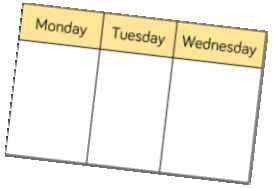
Provide the children with a range of loose parts such as buttons, beads, pebbles, shells, seeds and some ten frames. Ask them to count 6, 7, and 8 items onto the 10 frames. Which 10 frames show 6? Which show 8? Can they see without counting? The children may also enjoy making large 10 frames outside using sticks.

Outdoors



Go on a minibeast hunt. Use magnifying pots to observe the creatures carefully. How many legs can they see? Provide pictures to help them identify what they find. Ask the children to make careful drawings of the creatures they find.

Weather chart



Provide simple templates to show the 7 days of the week.
With the children, record the weather daily.
Discuss what the weather is like today, what it was like yesterday.
Count how many sunny days, windy days, rainy days there have been.
Could we have 8 cloudy days in one week.

Counting to 9 and 10

Guidance

Children continue to apply the counting principles when counting to 9 and 10 (forwards and backwards).
They can represent 9 and 10 in different ways and can count out the required number of objects from a larger group.
Children may notice that the 10 frame is full when there is 10.
They can use 10 frames, fingers and bead strings to subitise 9 and 10

Other Resources

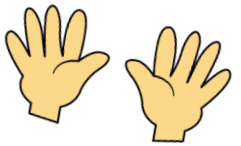
How do Dinosaurs Count to 10? Yolen & Teague
Ten Terrible Dinosaurs – Paul Stickland
Feast for 10 - Cathryn Falwell

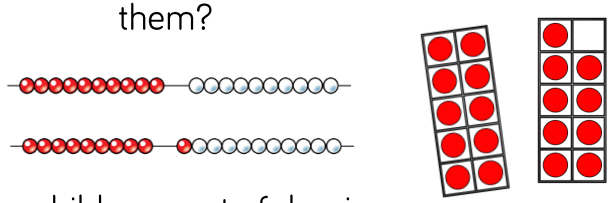
Draw a large hopscotch grid for the children jump along and show them how to play.

Prompts for Learning

Note: All the prompts for counting to earlier numbers can be applied to counting to 9 and 10, in addition to these ideas.

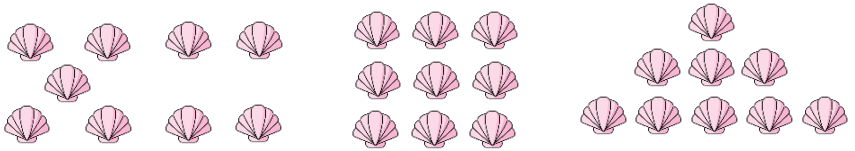
Show me 10 fingers. Now show me 9. Did you need to count? Can we count back from 10?
Show me 10 beads on the bead string. Show me 9.
Show me 10 cubes on the 10 frame. What do you notice?
Show me 9 cubes. What do you notice?
Could you put 9 or 10 buttons on the 10 frame without counting them?





Give the children a set of dominoes.
What do they notice about the dominoes?
Can they sort the dominoes?
How many can they find with 9 spots? With 10 spots?

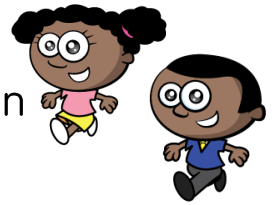
Ask the children to count out 9 or 10 small objects.
Can they find different ways to arrange their items?
What do they notice?



Counting to 9 and 10

Outdoors

Provide a starting line. Ask the children to take 9 giant steps, 9 tiny steps, 9 jumps, 9 tiptoes etc. How far do they travel each time? Who can travel the furthest in 9 giant steps? Who can travel the shortest distance with 9 tiny steps?



Class book

Make a class counting book with a double page spread for each number 1 to 10
Stick in drawings or photographs of objects the children have collected. Discuss the different ways the children have represented each number.

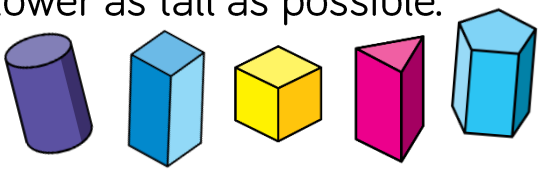
Enhancements to areas of learning

Sand

Make the sand tray into a mini beach by adding pebbles and shells etc. Set out buckets that have the numbers 6 - 10 on the front. Can we put the right number of items in each bucket? Can we take a bucket and go and find up to 10 items?

Construction

Provide a selection of bricks in different sizes and shapes. Ask the children to make the tallest possible tower using 10 bricks.
Which bricks will they choose?
How will they place their bricks to make the tower as tall as possible.



Comparing numbers to 10

Guidance

Children make comparisons by lining items up to compare them directly or by counting each set carefully and comparing their position in the counting order. As the children's sense of number develops so does their knowledge of where each number sits in relation to other numbers.

They understand that when making comparisons a set can have more items, fewer items or the same number of items as another set.

They begin by comparing 2 sets and progress to ordering 3 or more sets.

Other Resources

Cockatoos – Quentin Blake
Mr Magnolia – Quentin Blake

Ask the children to compare pictures from different parts of the stories.

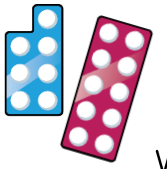
Prompts for Learning

Note: Continue to embed the vocabulary introduced in the Autumn term: *same as more than fewer than.*

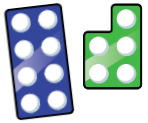
Ask questions to make comparisons for a real purpose.
Are there more children having sandwiches or dinners?
How did you travel to school?
Did more people travel by car or walk today?

Which book shall we read at the end of the day? Can you use cubes to vote for your favourite?

Ask the children to find all the dominoes with 7 spots?
Can they make sets with more than 7 and fewer than 7 spots?
Use the dominoes to play **Who Has More** in pairs.
With the dominoes face down, choose one domino each. How many spots does each domino have? The player with the most spots can collect a point. Can you record your points?



Provide a feely bag filled with different number shapes.
Ask the children to work in groups of 3
Each child takes a number shape from the bag.
Can they identify which number they have?
Work together to compare and order the shapes.
Who has the largest number? Who has the smallest?
Does anyone have the same?



Comparing numbers to 10

Loose parts

Provide the children with a collection of items to sort. Encourage the children to sort the items into sets and then compare the quantity in each set.

Can you find a set with more than this one? Can you find 2 sets with the same quantity?

Outdoors

Play skittles.

Ask the children to record how many skittles they knock down each time.

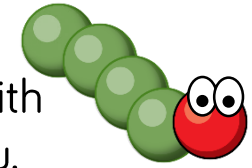
Did they knock more down this time or last time? Did they knock down more or fewer skittles than their friend?

Are there more skittles still standing or more knocked over?

Enhancements to areas of learning

Finger gym

Make a caterpillar by threading 5 beads onto a pipe cleaner.



Ask the children to make caterpillars with more beads and fewer beads than you.

Which caterpillar is the longest?

Which is the shortest?

Can we arrange the caterpillars in order?

Writing area

Ask the children to build or write their name.

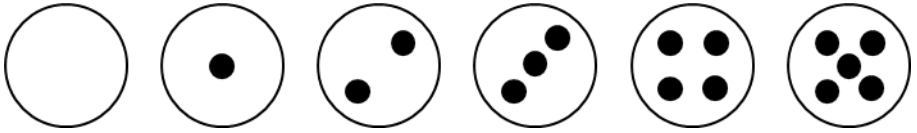
How many letters does their name have?

Do they have more letters, less letters or the same number of letters as their friend?

Digging Deeper

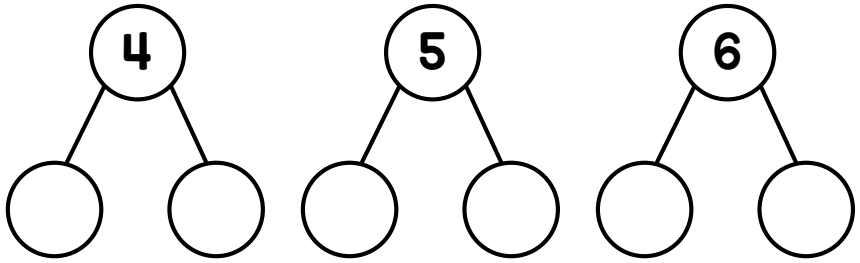
Dot plates

Provide children with dot plates or cards from 0 to 5



Ask the children to arrange the 6 plates onto the part whole models so that they have:

- a pair of plates with a total of 4 dots
- a pair of plates with a total of 5 dots
- a pair of plates with a total of 6 dots



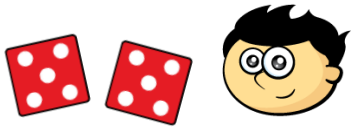
Is there more than one way to solve the problem?

Key questions

How many dots does each plate have?
How many dots are there on these 2 plates together?
Can you find 2 plates which have (4, 5, 6) dots?
Is there more than one way to make (4, 5, 6) dots?
Can you find more than one way to arrange your 6 plates on the part-whole model?

Exploring possibilities

Jack rolled 2 dice and scored 10



Amir scored less than Jack.
One of Amir's dice showed 5.

What other number **could** Amir have rolled?
Is there more than one answer?
Are there any numbers Amir **could not** have rolled?

Combining 2 groups

Guidance

Children begin to combine 2 groups to find how many altogether. They should be given opportunities to do this in many contexts using real objects.

The interactive whiteboard files can be used to create scenes for the children to discuss.

Encourage the children to subitise where possible although they may need to count in ones to find how many altogether.

A part-whole model could be used to show the relationship between the parts and the whole.

Other Resources

Board games such as snakes and ladders – Roll 2 dice. How many spaces can you move altogether?

Quack and Count by Keith Baker

Animals on board by Stuart Murphy

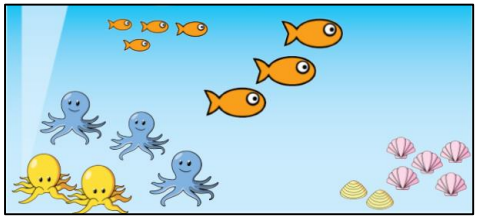
Prompts for Learning

Tell your partner about the leaves.

How many are red? How many are green?

How many leaves altogether?

Provide pictures or small world scenes which provide opportunities for combining 2 groups.



What can you see in the picture?

How many big fish can you see? How many small fish?

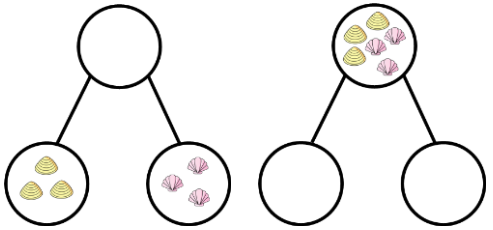
How many fish altogether?

How many yellow shells? How many pink shells?

How many shells altogether?

I spy a group of 3 and a group of 2. What am I looking at?

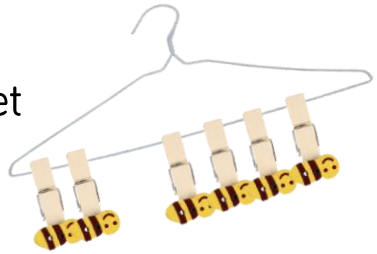
What is the same? What is different?



Combining 2 groups

Finger gym

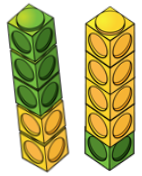
Provide a coat hanger and a basket of up to 10 pegs.
Ask the children to put the pegs onto the hanger and to explore how their number can be partitioned in different ways and recombined to see how many altogether.



Enhancements to areas of learning

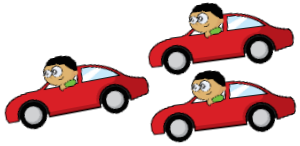
Construction

Provide blocks or cubes in 2 different colours. Ask the children to explore different ways of combining the 2 colours to make towers of different sizes.
Ask the children to compare their towers. Are any of their towers the same?



Snack

Work with groups of up to 8 children.
Explain there are 2 choices for snack.
Choose 2 of the group to be the waiters and ask what everyone would like.
(Ask how they could record this to help them remember.)
How many children are there?
Do they have they have the right number of snacks altogether?



Small world

Look for opportunities to combine 2 groups during independent play. For example, *'I see you have some red cars and some blue cars. I wonder how many cars you have altogether.'*
How many dolls are upstairs? How many downstairs?
How many dolls are there altogether?

Bonds to 10 - 10 frame

Guidance

The children explore number bonds to 10 using a 10 frame.

10 frames can be filled in different ways to show the 5-and-a-bit structure and the pair structure.

5-and-a-bit structure

pair structure

They may also use different representations such as fingers, number shapes or bead strings to explore the bonds to 10.

Other Resources

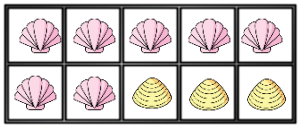
Number Bonds Rhyme

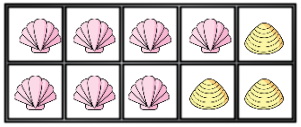
This can be done with finger actions to show the bonds.

5 and 5 add up to 10
6 and 4 make it again
7 and 3 they also do
Guess what! So do 8 and 2
9 and 1, 10 and 0
Learn them all, you're a number bond hero.

Prompts for Learning

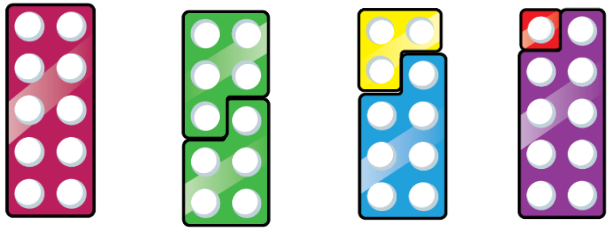
Ask the children to explore different ways of building 10 on the 10 frames using counters, cubes or any loose parts with 2 distinct groups.





You could also partly fill a 10 frame and ask how many more items are needed to make a whole 10 Encourage the children to use the empty spaces to help them see how many more are needed.

In small groups, provide each child with a number shape 10
How many ways can they build a new 10 on top by combining 2 different number shapes?

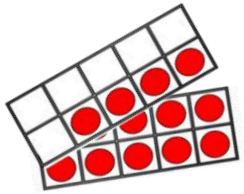


Place one of each of the number shapes 1-10 into a feely bag and have one of each on display for the children to see.
Ask a child to draw out one shape from the bag. Can they represent this on their 10 frame and see which other number shape they need to collect to make 10?

Bonds to 10 - 10 frame

Carpet games

You will need: Ten frame cards showing 1-10 (5-and-a-bit and pair structure)



Memory Game: Place the cards upside down. The children take turns to turn over 2 cards. When they find a pair which add to 10, they keep the cards. The player who collects the most pairs wins.

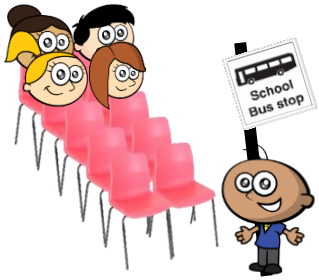
Fish: (For 3-4 players) Share out the cards. The aim is to make bonds to 10 The children take turns to ask any player for a card they need. E.g. If they have a 4, they ask one of the other players for a 6 Once they have made a bond to 10, They put that pair down. The first player to put down all of their cards wins the game.

Bunny Ears Bonds: The children work in pairs to make bunny ears which total 10

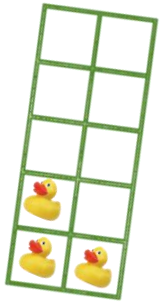
Enhancements to areas of learning

Outdoor

Place 10 chairs into 5 rows of 2 to resemble the seats on a bus. Ask: How many passengers are there on the bus? How many more passengers could ride on the bus? How many are getting on or off at the next stop? How many are on the bus now?



10 hunt



Hide 10 items (rubber ducks, beanbags etc) around the outside area and chalk a large 10 frame onto the ground.

As the children find the items, they put them into the 10 frame.

Prompt the children to use the 10 frame to help them see how many they have found and how many are still hiding.

Bonds to 10 - Part-whole model

Guidance

Children use the part-whole model to continue exploring number bonds to 10

The part-whole model is useful to represent the different pairs which combine to make 10
Encourage the children to move the objects between the whole and the 2 parts. It is also important to show the part-whole model in different orientations so the whole is not always at the top.

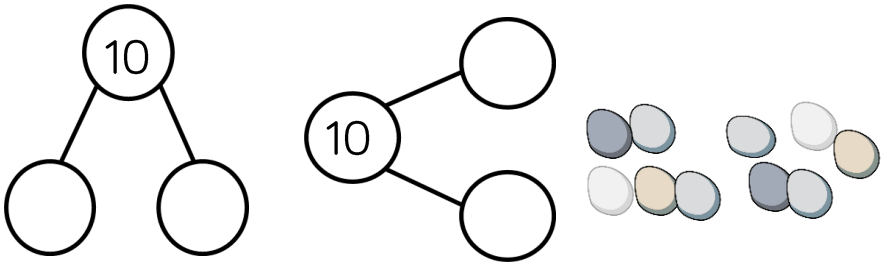
Other Resources

Bonds to 10 can also be explored through outdoor games such as skittles or songs such as 10 green bottles.

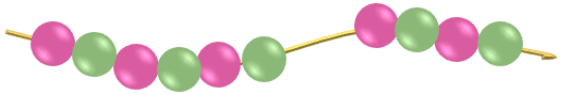
Can they represent these on a part-whole model?

Prompts for Learning

Provide part-whole models and a selection of loose parts.
Ask the children to count out 10 loose parts into their part-whole model. Explore the different ways they can show pairs of number bonds to 10



Provide the children with a selection of beads and pieces of string.
Encourage them to make their own bead strings using 10 beads.



Once they have made their bead strings, ask them to split the beads to show the bonds to 10
How many ways can they find to do this?
Can they show them on a part-whole model?

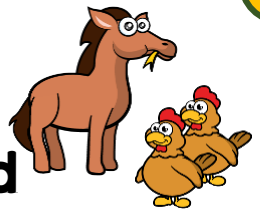
Hide some of the beads in your hand and show the rest of the string.
Can they work out how many you are hiding?

Bonds to 10 - Part-whole model

Outdoors

Provide a bucket and 10 items, such as beanbags, to throw. The children take turns to throw the beanbags.
Ask: How many have landed inside the bucket and how many have landed outside?
Can you record your scores?
What is the highest number you can get into the bucket?

Small world



Ask the children to build 2 fields and collect 10 farm animals.
How many ways can the children find to arrange their 10 animals in the 2 fields?
Can they record the ways they found?

Role Play

Provide 10 teddies or soft toys to encourage children to re-enact **10 in the bed** in their independent play.
Count how many are left in the bed and how many have fallen out each time. Use double-sided counters to represent the bears on a part-whole model.

Enhancements to areas of learning

Outdoors

Provide children with 10 green bottles in a variety of shapes and sizes. Can they arrange the bottles in size order on the wall?
Encourage the children to count how many bottles have fallen and how many are left on the wall after each verse of **10 Green Bottles**.
Can they represent these on a part-whole model?

Digging Deeper

Dice magic

Give each child a dice.
Ask the children to roll the dice.
Explain that you have a secret way to work out what number is on the bottom of each dice without looking.
Tell the children what is on the bottom of all the dice and ask them to check.

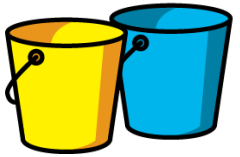
Record the pairs of numbers on the top and bottom.
Can anyone see a pattern?
Can anyone work out how you do the trick?

Allow the children time to take turns trying the trick themselves and then to go home and try it out on their friends and family.

Key questions

What number did you roll?
Do you get the same number on the bottom each time you roll that number?
What do you notice about the top and bottom pairs?
Can you explain how to do the trick?
Can you tell me what is on the bottom of my dice?

Pots to 10



Provide pots labelled with numbers 1-10 and a selection of loose parts such as beads or cubes.
Ask the children to count the correct number of beads into each pot.
Can they find 2 pots which have 10 beads in total?
Is there more than one way to do it?
Can they find a way to make 10 by combining 3 pots?
How can they check they have 10?
Is there more than one possible way?
Can they draw what they found?

Spatial awareness

Guidance

Children hear and begin to use positional language to describe how items are positioned in relation to other items.

They begin to represent real places they have visited or places in stories with their drawings, maps or models. They build life-sized journeys outdoors and travel through them, exploring them from different perspectives.

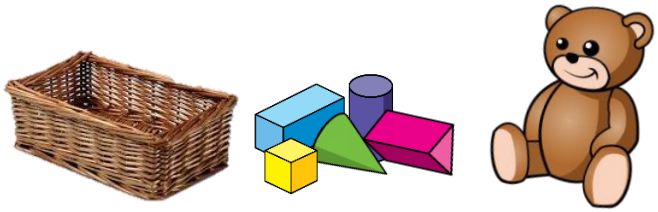
Other Resources

We're Going on a Bear Hunt - Michael Rosen
Rosie's Walk - Pat Hutchins
Little Red Riding Hood - Traditional Tale
Mrs Wishy-Washy - Joy Cowling
Me on a Map - Joan Sweeney

Song: In and Out the Dusty Bluebells

Prompts for Learning

Positional language can be modelled and practised on a daily basis with the children through their play. Tidy-up time in particular is full of opportunities to use positional language for a real purpose. E.g. Put the bricks **into** the basket. Sit teddy **on** the shelf **next to** the books.



Many stories focus on positional language or journeys. Encourage the children to use actions to represent the language such as *over, under, around, through* as you read. Provide opportunities to sequence familiar journeys by drawing pictures or maps. Children could also build models of the route and the places passed or visited along the way.

Outside the children can build large-scale representations of places and journeys.

Spatial awareness

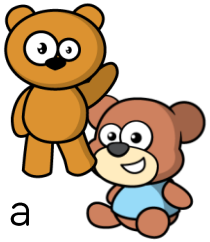
Enhancements to areas of learning

Small world

Modelling and encouraging positional language as the children play in the small world. E.g. 'Where shall we put the horse?' 'We'll put it in the field behind the tree.' 'Where is the doll?' 'The doll is on the chair beside the window.'

Outdoors

Set up your own bear hunt by hiding bears around the outdoor area. Ask the children to describe where they could look and where each bear was found.
You could extend this into everyday practice by having a bear which 'hides' in a different place in the classroom every night for the children to find.



Outdoors

Set up an obstacle course around the outdoor area.
Ask the children to work in pairs – one giving directions to their partner.
E.g. '*Go over the bridge, through the tunnel, around the cones, between the bricks…*'
Encourage the children to create their own obstacle courses.

Reading

As you read together, take the opportunity to build in positional language. Many stories (Janet & Allan Ahlberg - Each Peach Pear Plum, Quentin Blake - Cockatoos) involve pictorial hide and seek. Ask the children to find the hidden objects and to describe where they are.

3-D Shapes

Guidance

Children will naturally explore 3-D shapes through their block play and modelling. They should be introduced to the names of the shapes and be given opportunities to explore similarities and differences between them and to sort them according to what they notice.

Prompt them to consider which shapes are good for stacking, which will roll and why that is.

They should be given opportunities to construct their own 3-D shapes in different ways.

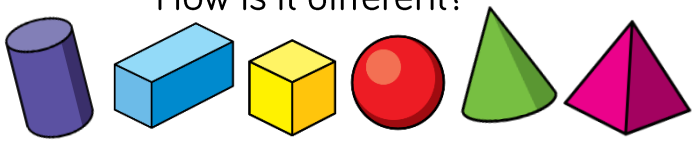
Other Resources

Construction sets which can be used to build models of 3-D shapes.

A variety of everyday objects in different shapes and sizes such as boxes, tubes, balls etc.

Prompts for Learning

Show the children a collection of 3-D shapes. Choose one of the shapes. Ask the children to tell their partner as many things as they can about the shape. Can they find another shape like this? Can they find a different shape? How is it different?

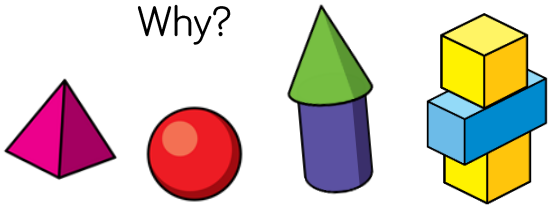


Sort the shapes into groups.

Ask: *'Why did you put these shapes together? How is this set different to this one? Is there another way we could sort them?'*

Build a tower. Which shapes are the best for stacking? Which shapes work best on the top?

Are there any shapes which are not good for building? Why?

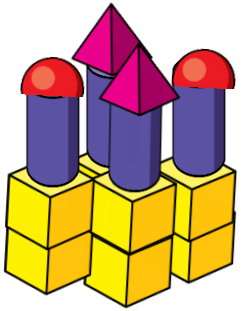


Hold up a shape. Can you find any items in the classroom which have the same shape as this?

Why is it the same?

3-D Shapes

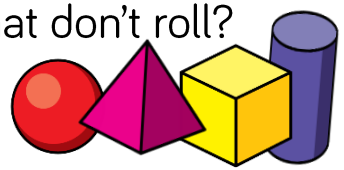
Construction



Provide pictures of palaces, mosques, cities etc.
What shapes can you see in these buildings?
Can you build your own model.
Which shapes will you use?
Which shapes work best at the bottom?
Which shapes work best at the top? Why?

Outdoor

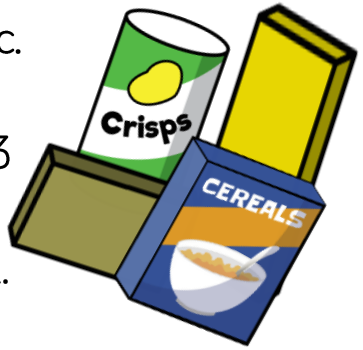
Choose a shape to roll to your partner.
Why did you choose that shape?
Does every shape roll?
Which shapes will roll and which don't?
What do you notice about the set of shapes that roll and the set of shapes that don't roll?



Enhancements to areas of learning

Modelling

Provide a variety of empty boxes, tubes, lids etc.
Ask the children to make a model for a particular purpose. E.g. Build a bridge for the 3 Billy Goats, a new chair for Baby Bear
Encourage them to tell you about their model.
Which shapes were easy to fasten together?
Which shapes were difficult to fasten together?



Dough

Ask the children to make 3-D shapes using the dough.
Ask: Which shapes are the easiest to make? Why?
Which are harder to make? Why?
Did you use any equipment to help you make a flat side?

2-D Shapes

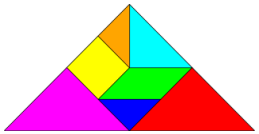
Guidance

Children are encouraged to see 2-D shapes on the flat faces of 3-D shapes. They begin to name some common shapes such as circles, triangles, and rectangles including squares. It is important to show shapes in differentorientations.

Provide opportunities to compare 2-D shapes and say what is the same and what is different.

Encourage them to explore how shapes can be combined or partitioned to make new shapes.

Other Resources



Tangrams and Pattern Blocks, although not technically 2-D, allow the children opportunities to explore how shapes can be combined or partitioned to make new shapes and patterns.

The shape book series - Mac Barnett and Jon Klassen

Prompts for Learning

Show the children a variety of 2-D shapes in different sizes and orientations on the interactive whiteboard. Choose one of the shapes. Ask the children to tell you what they notice.

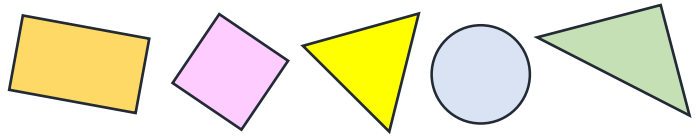
Are the sides straight or curved?

Can they see another shape like this?

What if we turn it around, is it still the same shape?

Can they find a different shape? Why is it different?

Link back to the shapes of the faces on 3-D shapes.



Show the children a picture which has been made of different shapes. E.g. a boat, a rocket, a house.

What shapes can you see in the picture?

How many triangles can you count?

Can you make your own picture using the shapes?

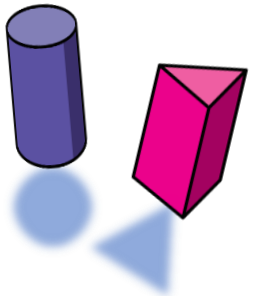
Go on a shape hunt.

Where can you see 2-D shapes on the surface of everyday objects?

2-D Shapes

Printing

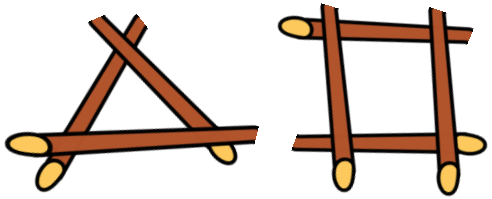
Ask the children to explore which 2-D shapes they make as they print with the flat faces of the 3-D shapes.
Which 3-D shapes will print a triangle?
Which 3-D shapes will print more than one shape?
Can they match the prints to the 3-D shapes?



Enhancements to areas of learning

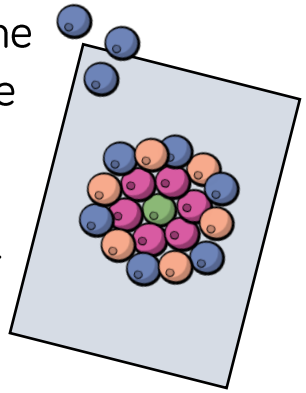
Outdoors

Use planks, sticks or ropes to create large 2-D shapes.
Can they make stick triangles? Squares?
How many sticks did they use for each.
Is it possible to make a circle using sticks?
What would be better for making a circle?



Loose parts

Provide a selection of loose parts and some frames or paper. Ask the children to make pictures and patterns.
Which shapes can they see in their art work? Which loose parts are the best for making curved shapes?
Which make the best straight shapes?



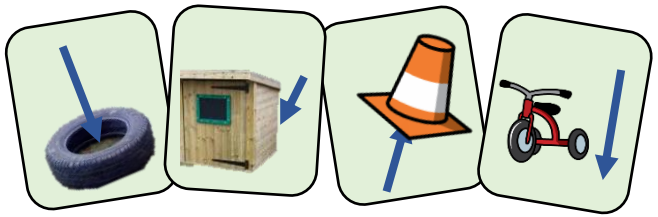
Dough

Press the 3-D shapes into the dough.
What 2-D shape did it make?
Can you make a pattern?
Are there any 3-D shapes which make more than one 2-D shape in the dough?
Which 3-D shapes will leave a square on the dough?

Digging Deeper

Treasure Hunt

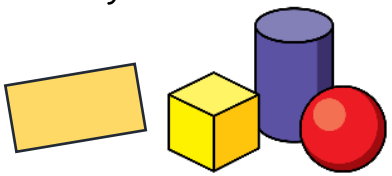
Set up a treasure hunt in your outdoor space by providing a series of pictorial clues.
As the children go to each place in the pictures, they can hunt for the next clue.
Prompt them to use positional language to explain where they need to go.
Hide some 'treasure' in the last place – this could be a special snack, a new story to read or resource for the classroom.

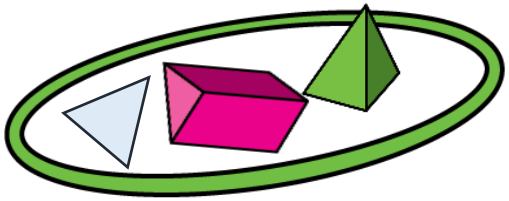


The children might like to continue this by designing their own treasure hunts and hiding pictorial clues for their friends to follow.

What's my rule?

You will need a hoop and a selection of 2-D and 3-D shapes. Think of a rule. E.g. shapes with curved sides, shapes with 4 corners, shapes which have a triangle. Ask children to choose a shape. If it belongs in your set they can put it into the hoop. If it doesn't belong, they put it outside the hoop. Once several shapes have joined your set, ask the children to see if they can identify the rule.





Key questions

What do you notice about all of the shapes?
Can you explain what my rule is?
Why does this shape not belong in my set?
Can you find an item in the classroom which could join my set?
Can you think of a rule to sort the shapes?