Spring
Scheme of learning
Reception

White Rose MATHS

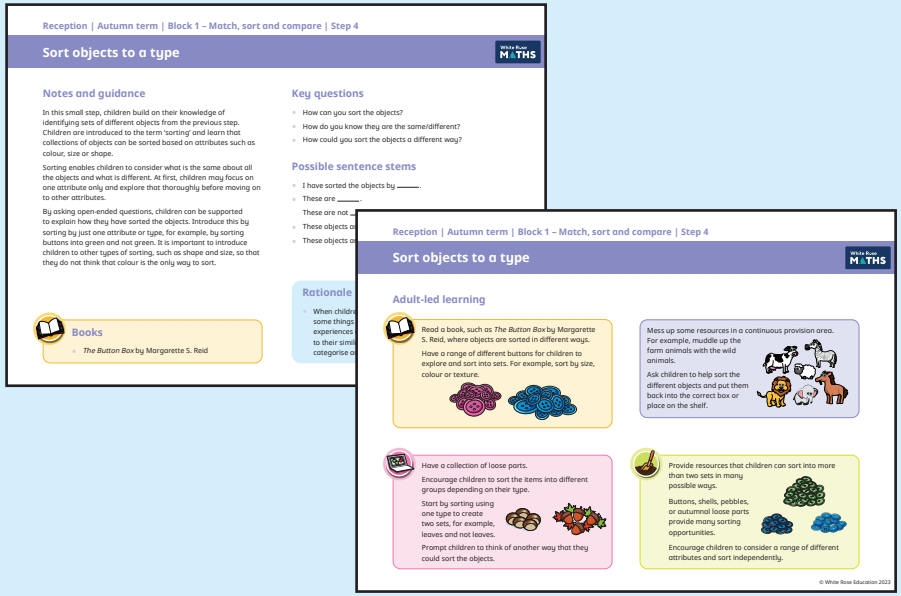
The **White Rose Maths** schemes of learning

Reception guidance

The schemes cover the DfE statutory framework for the EYFS and Educational Programme for Mathematics and will support you to deliver a curriculum that embeds mathematical thinking and talk.

Our schemes support the ethos of the EYFS whilst at the same time enabling teachers to create a mathematically rich curriculum. Additionally, they allow for key mathematical concepts to be revisited and developed throughout the year.

The guidance has been divided into 18 blocks and provides a variety of opportunities to develop the understanding of number, shape, measure and spatial thinking.



Teaching and learning

Our reception schemes support you in teaching the key aspects of the EYFS curriculum. The scheme supports specific teaching through small steps with adult-led activities and continuous provision. The focus is on building up the numbers slowly, so children gain a deep understanding of them and how they are composed. However, this does not mean children should not be counting and discussing larger numbers in routines such as lining up. It is also important that teachers are aware of, and children are supported in gaining an understanding of, the counting principles.

1. The one-to-one principle.
2. The stable-order principle.
3. The cardinal principle.
4. The abstraction principle.
5. The order-irrelevance principle.

These principles are covered in more detail on the following pages.

Reception – Notes and Guidance

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-to-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-to-one correspondence.

1 2 3 4 5

Reception – Notes and Guidance

The Counting Principles

2 The stable-order principle.

Children understand that, when counting, the numbers have to be said in a certain order.

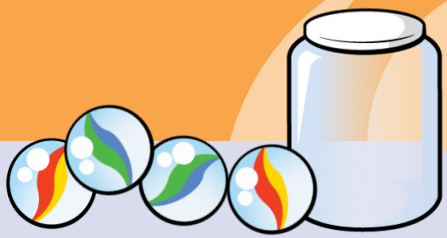
Children need to know all the number names for the amount in the group they are counting. Teachers can therefore encourage children to count aloud to larger numbers without expecting them to count that number of objects immediately.

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-to-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.

Reception – Notes and Guidance



The Counting Principles

4 The abstraction principle.

This involves children understanding that anything can be counted, including things that cannot be touched, such as 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 in which we count a group of objects is irrelevant. There will still be the same number.

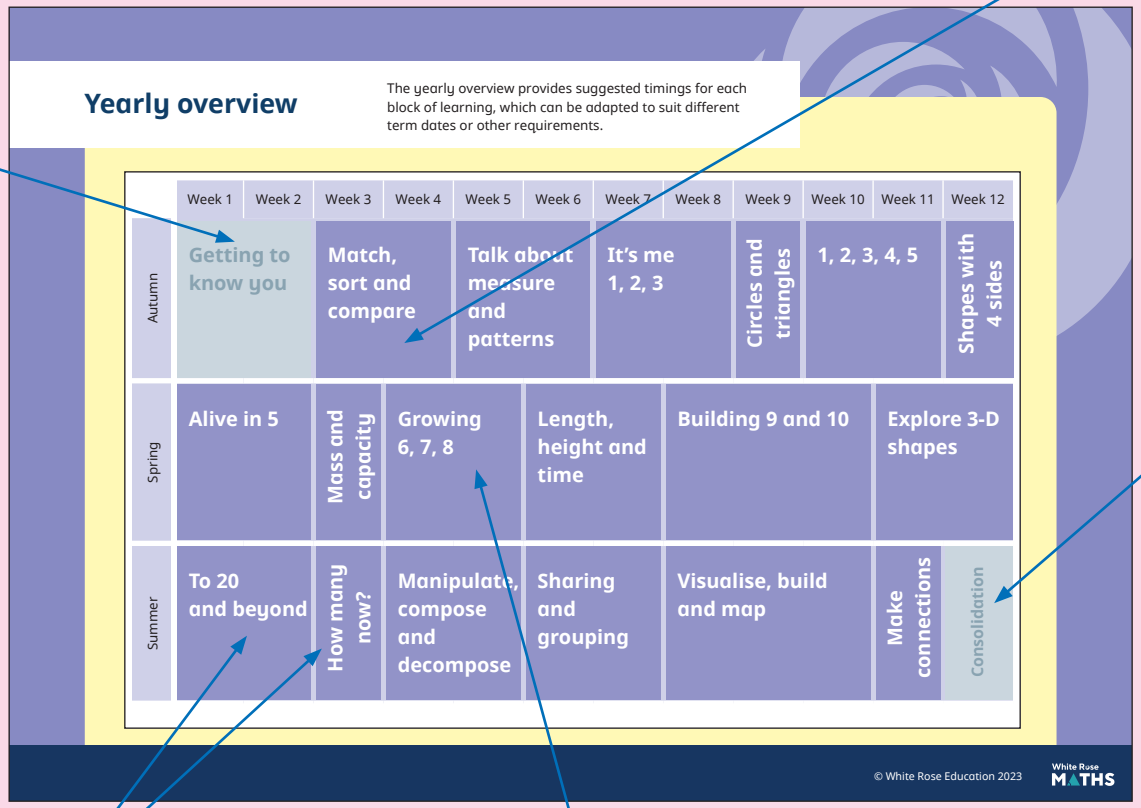
Encourage children to count objects, left to right, right to left, top to bottom and bottom to top. Once children have counted a group, move the objects and ask children how many there are. If they count them all again they have not fully grasped this principle.

Yearly overview

Overview with suggested weekly timings. Block titles are clear and show progress through number and spatial reasoning.

Early blocks focus on use of provision to support key early maths and routines.

The first 2 weeks are for you to get to know children, develop routines and give you the flexibility to complete baseline assessments.



Consolidation weeks allow for a degree of flexibility in the suggested block lengths or to consolidate learning based on the needs of your children.

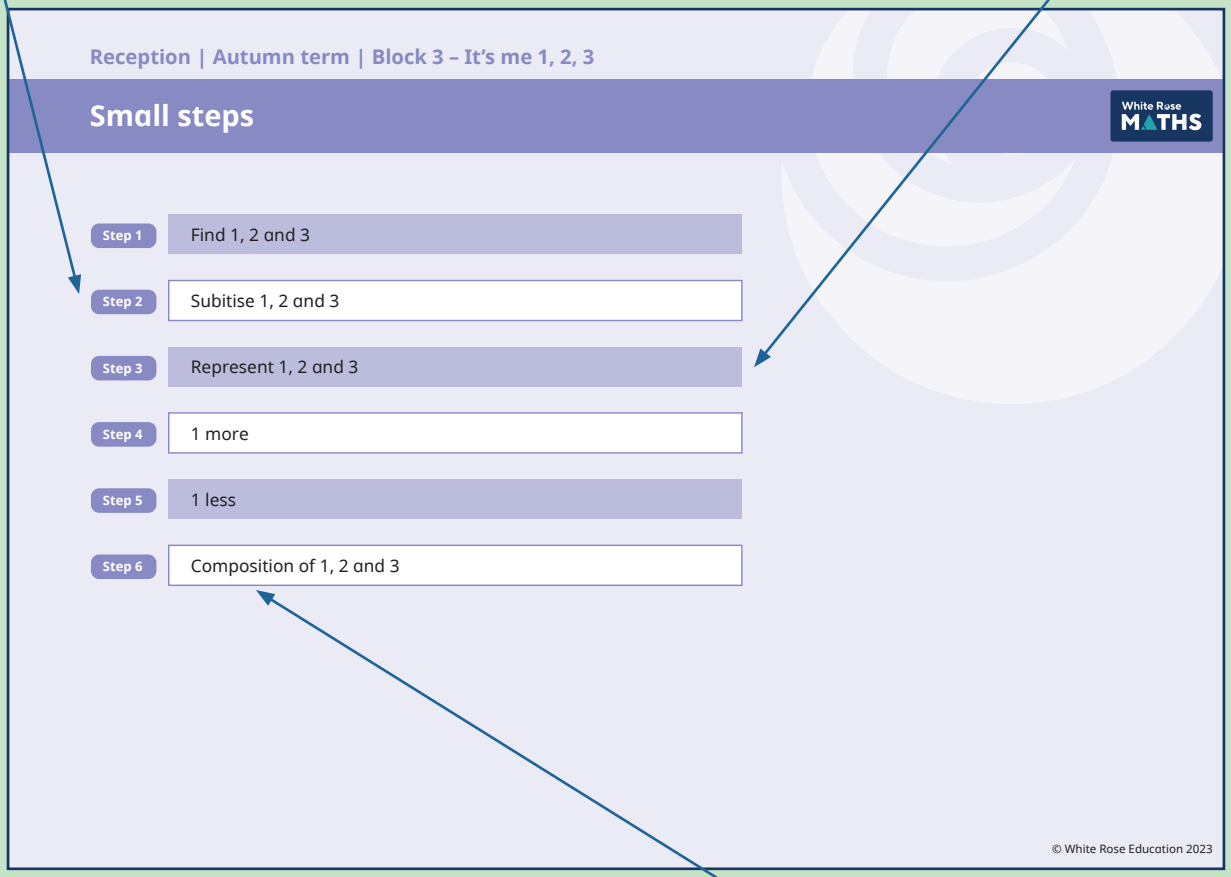
Content is consolidated so all concepts are explicitly taught before assessment for ELG.

Subitising is taught both perceptually and conceptually through the blocks. Concepts such as doubling and 1 more / 1 less is focused on in the progression of the numbers.

Small step breakdown

Each block has sequenced small steps.

Step titles are in the same sequence to help embed learning.



Step titles clearly explain what the teaching focus is.

Activities and symbols

An activity introduced by a reading from a fiction or non-fiction book.

Show children the illustrations from pages 1, 2 and 3 of the story *Anno's Counting Book* by Mitsumasa Anno.

Encourage them to look at the pictures and identify where they can see the different representations of 1, 2 and 3

Where do they see each representation?

How do they see it?

A suggested daily routine to be supported by a teacher.

Daily routine

- When lining up in the day, ask children to join the line depending on different attributes, for example, line up if you have a sister.

An activity that has accompanying teaching slides to support adult-led learning as part of a premium subscription.

Prepare a set of dot plates or number cards which have 1, 2 or 3 dots in different arrangements.

Hold up the dot plates and ask the children how many dots.

Can children show the correct number of fingers?

Ask children if they can match the numerals 1, 2 and 3 to the dot plates.

An activity which includes a rhyme or musical instrument.

Have a pile of beanbags.

Beat a drum either 1, 2 or 3 times.

Children listen carefully and count out 1, 2 or 3 beanbags from a larger group to match the number of beats.

An outside activity or one that uses resources from nature.

Go outside and model how to make simple large-scale patterns, such as stick, leaf, stick, leaf, stick, leaf.

Support children to copy the patterns and see if they can continue them. Encourage children to use loose parts to make simple patterns for a partner to copy and continue.

A digging deeper activity to deepen children's understanding is provided for each small step.

Wrap up a range of boxes, each with a different mass.

Ensure that some of the small boxes are heavy and some of the large boxes are light.

Pick up a box and ask children to predict if it will be heavy or light.

Ask them to test their predictions using a balance scale.

Are all small boxes light?

Teacher guidance

Teacher guidance pages are provided at the start of each block of learning.

Suggested resources that will support children's learning throughout the block, although other resources can be used.

A suggested list of books that can be used to support and spark learning within the block.

Useful ideas to consider when teaching this block to give a practical helping hand.

Reception | Autumn term | Block 3 – It's me 1, 2, 3

Teacher guidance

Key books

- *Anno's Counting Book* by Mitsumasa Anno
- *How to Count to One* by Caspar Salmon
- *Goldilocks and the Three Bears*
- *The Gingerbread Man*
- *A Squash and a Squeeze* by Julia Donaldson
- *The Three Billy Goats Gruff*

Key resources

Top tips

- Having a set of teacher resources available for children in provision will encourage them to independently demonstrate their learning.
- A great alternative to double-sided counters are dried butterbeans. Spray these on one side or decorate as minibeasts for activities in checkpoint 1
- Blank paper plates could be left out for children to design their own dot plates.
- If you do not have a 1-3 dice, you can use a standard 1-6 dice and cover the numbers 4, 5 and 6

Small step guidance

An overview of the content that provides key vocabulary to introduce, relevant subject knowledge and advice on progression.

Reception | Autumn term | Block 3 – It's me 1, 2, 3 | Step 2

Subitise 1, 2 and 3

White Rose MATHS

Notes and guidance

In this small step, children perceptually subitise. This form of subitising refers to instantly recognising the number of objects or items in a group without needing to count them.

Encourage children to subitise groups of 1, 2 and 3 items. This will allow them to develop an understanding of what each number looks like, and what it is made up of. Use images and stories that include groups of 1, 2 and 3 characters or objects to point out and encourage children to subitise. Dice and spinners with dots are useful in helping support children to develop their subitising skills. It is important that they see the dots or other objects in different arrangements so that they don't think a number representation such as 3 always appears in the same way.

Rhymes

- *When I Was One, I Banged My Thumb*

Books

- *How to Count to One* by Casper Salmon

Key questions

- How many can you see?
  How do you know?
- How many are there in each group?
- What can you show me?
- What can you see?

Possible sentence stems

- There are _____ dots altogether.
- There is 1 _____ .
- There are 2/3 _____ .
- I can see _____ without counting.
- I can subitise _____

Links to the curriculum

- *Development Matters* – Reception – Subitise
- *Birth to 5 Matters* – Range 5 – Subitises one, two and three objects (without counting)

Key questions that can be used to develop children's mathematical talk and reasoning skills.

Key sentence stems to further support children's mathematical talk and the use of mathematical vocabulary.

Indicate the statement(s) from Development Matters and Birth to 5 Matters that are covered in the small step.

White Rose MATHS

Adult-led learning

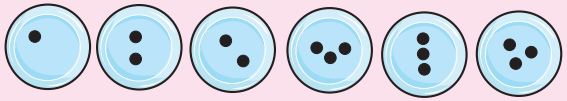
The adult-led learning section provides suggested activities that can be used when teaching this small step. These activities could be delivered to the whole class or in small groups.

Reception | Autumn term | Block 3 – It's me 1, 2, 3 | Step 2

Subitise 1, 2 and 3

Adult-led learning

Prepare a set of dot plates or number cards which have 1, 2 or 3 dots in different arrangements.



Hold up the dot plates and ask the children how many dots.

Can children show the correct number of fingers?

Ask children if they can match the numerals 1, 2 and 3 to the dot plates.

Share stories such as *How to Count to One* by Casper Salmon.

Encourage them to subitise and notice where they see 1, 2 and 3

Where can they see 1, 2 and 3 groups of objects or characters from the story?

Can they show you 1, 2 and 3?

Play a simple track game with small world creatures or characters.

Children take it in turns to roll a 1-3 dice, or a spinner, and subitise the number of dots.

They move the creature or character the corresponding number of jumps.

Who will be the first to reach the finish?

Represent 1, 2 and 3 using small objects.

Cover each amount with a bowl or cup.

Quickly reveal one group of objects and ask children how many there are.

Swap the positions around.

When you stop, can they point to the bowl with 3?

Lift the bowl and see if the children can instantly say whether they are correct.

Continuous provision

This section provides suggested ways that continuous provision could be used or enhanced to consolidate children's learning from the block.

Reception | Autumn term | Block 3 – It's me 1, 2, 3

Continuous provision

Support children to make their own representation cards.

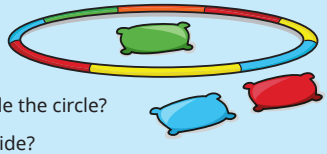
Provide them with a piece of paper and allow them to paint, draw or use collage materials to represent the numbers 1, 2 and 3

Children can create their own dots, dice patterns, or create a picture of something that interests them.

These can then be used to play games such as 'Snap'.

Place a hoop on the ground.

Ask the children to collect 3 beanbags and to take turns to throw them into a circle.



How many land inside the circle?

How many land outside?

Provide an easel or clipboard so that they can record their own scores.

Make dough. Use a recipe that involves measuring using 1, 2 or 3 cups.

Ask children to measure out the ingredients and count the cups.

2 cups of plain flour
1 cup of salt
2 cups of water
2 tablespoons of oil
1 teaspoon of cream of tartar
3 drops of food colouring

Provide a collection of various loose parts or natural objects and some small pots labelled 1, 2 and 3 for children to fill.

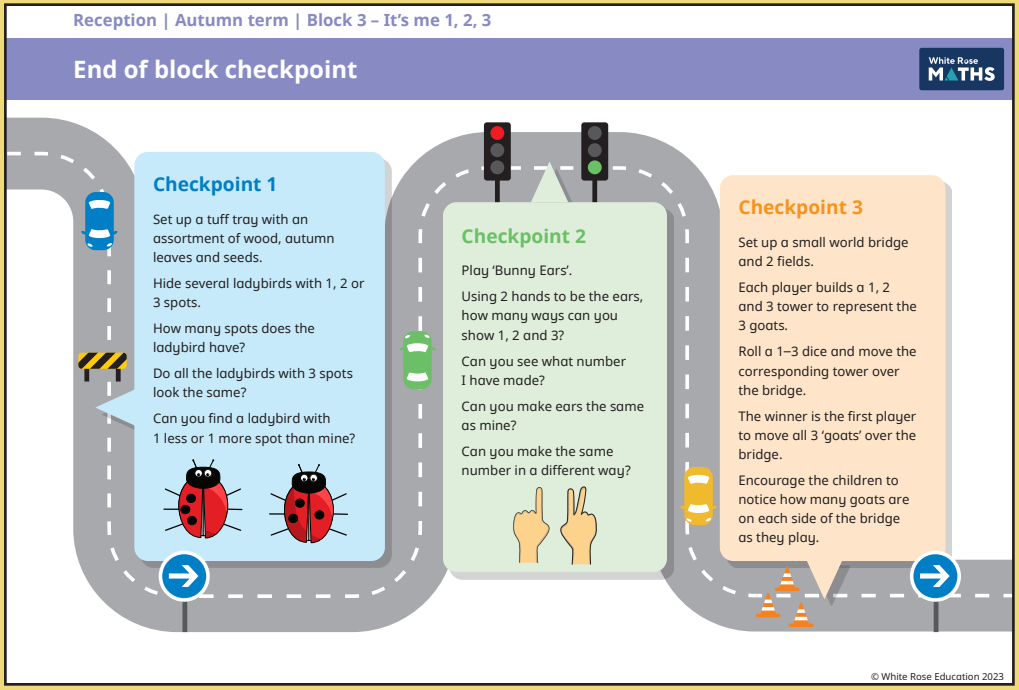
Include some unlabelled pots and encourage children to make their own labels to show how many they put inside.

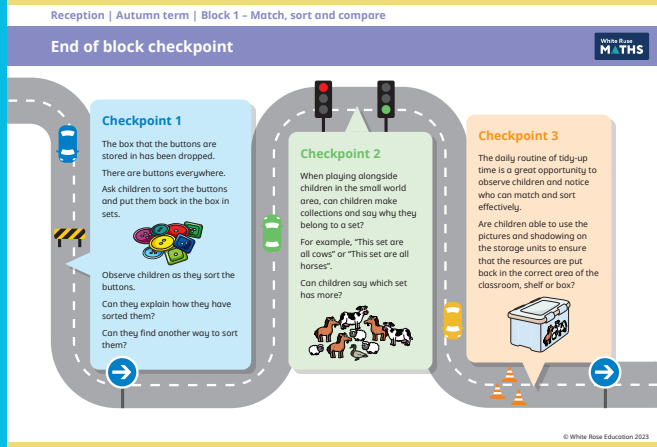
End of block checkpoint

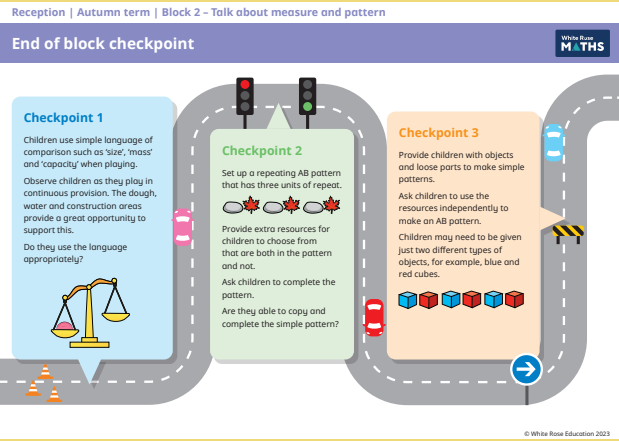
This section provides suggested activities that can be used to assess children's learning from the block.

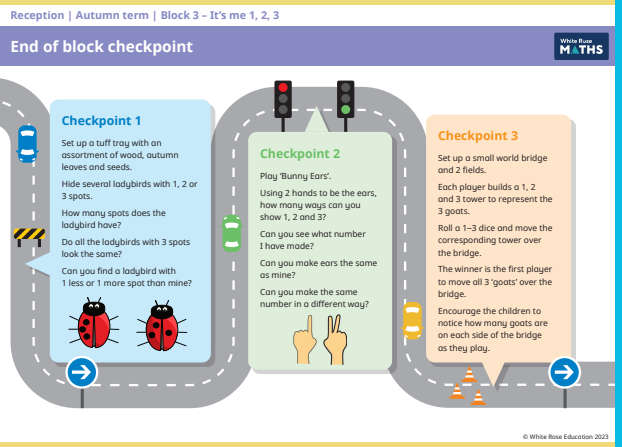
Each block has three end of block checkpoints where adults can observe children demonstrating the knowledge they have gained. These are designed to be fun games or activities to support play-based practical learning.

The end of block assessments from each block can be printed out and joined together on display to show the children's learning journey.







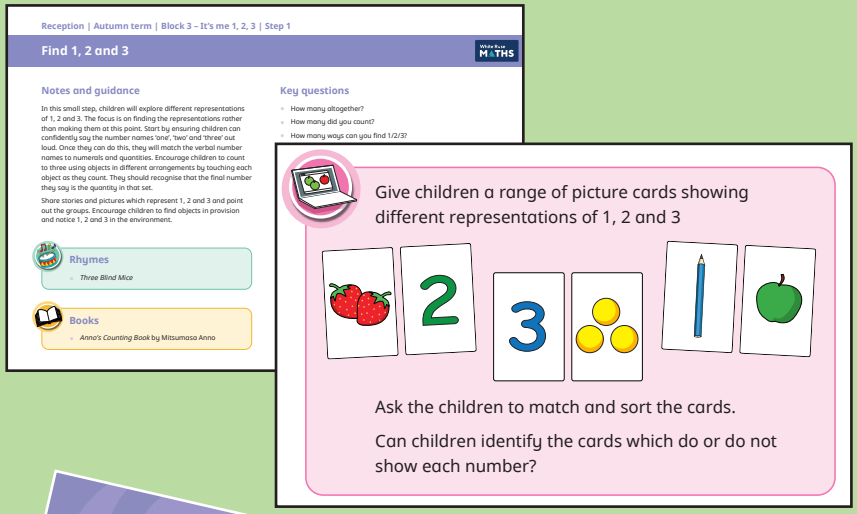


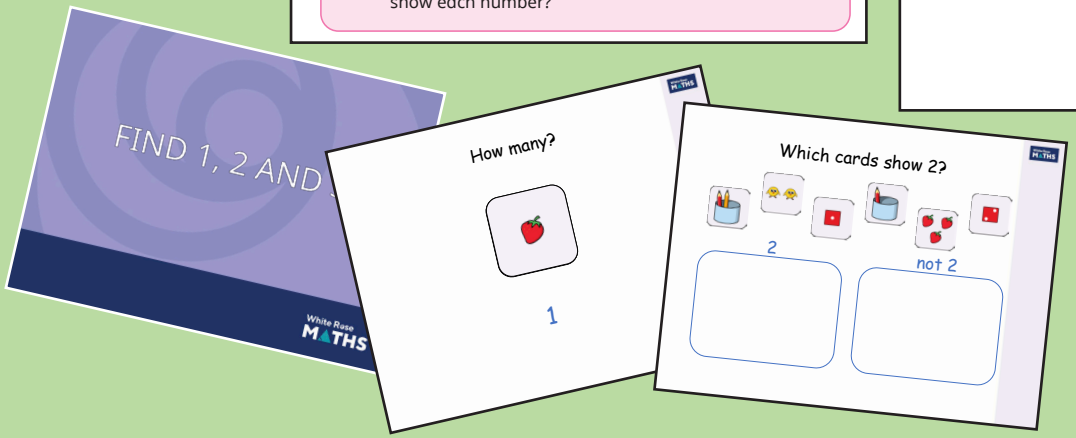
Premium supporting materials

Within the Reception premium resources, there are teaching slides that can be used to support children's learning in each small step. These teaching slides can be used alongside concrete resources.

Within the Reception premium resources, there are also daily starters available to help children revisit and consolidate previous learning.

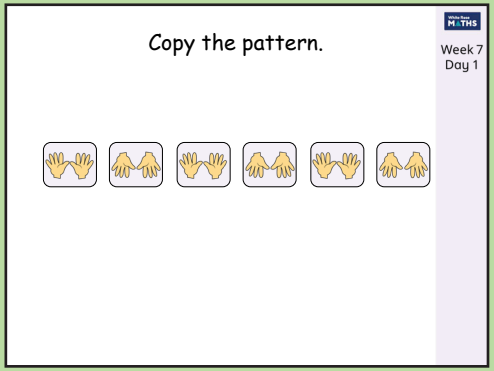
Premium resources – Teaching slides

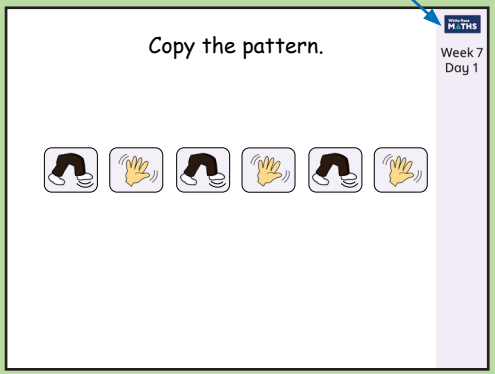




Each set of starters revisits the previous week's learning to support consolidation.

Premium resources – Starter slides





Autumn book list

These books are within the White Rose Maths Reception schemes of learning.
They are not an exclusive list, but support the learning in each step.

Block 1 – Match, sort and compare

- *A Pair of Socks* by Stuart J. Murphy
- *Seaweed Soup* by Stuart J. Murphy
- *The Button Box* by Margarette S. Reid
- *Beep Beep, Vroom Vroom!* by Stuart J. Murphy

Block 2 – Talk about measure and pattern

- *Where's My Teddy?* by Jez Alborough
- *It's the Bear!* by Jez Alborough
- *The Blue Balloon* by Mick Inkpen
- *Dear Zoo* by Rod Campbell
- *My First Book of Patterns* by Bobby and June George
- *We're Going on a Bear Hunt* by Michael Rosen
- *A-B-A-B-A – A Book of Pattern Play* by Brian P. Cleary

Block 3 – It's me 1, 2, 3

- *Anno's Counting Book* by Mitsumasa Anno
- *How to Count to One* by Casper Salmon
- *Goldilocks and the Three Bears*
- *The Gingerbread Man*
- *A Squash and a Squeeze* by Julia Donaldson
- *The Three Billy Goats Gruff*

Block 4 – Circles and triangles

- *Circle, Triangle, Elephant! A Book of Shapes and Surprises* by Kenji Oikawa and Mayuko Takeuchi
- *Triangle* by Mac Barnett and Jon Klassen
- *Shapes, Shapes, Shapes* by Tana Hoban
- *We're Going on a Bear Hunt* by Michael Rosen
- *Rosie's Walk* by Pat Hutchins

Block 5 – 1, 2, 3, 4, 5

- *Witches Four* by Marc Brown
- *Five Little Fiends* by Sarah Dyer
- *Pete the Cat and his Four Groovy Buttons* by Eric Litwin
- *Kipper's Birthday* by Mick Inkpen
- *The Very Hungry Caterpillar* by Eric Carle
- *Stella to Earth!* by Simon Puttock and Philip Hopman
- *Anno's Counting Book* by Mitsumasa Anno

Block 6 – Shapes with 4 sides

- *Bear in a Square* by Stella Blackstone
- *Square* by Mac Barnett and Jon Klassen
- *Shapes, Shapes, Shapes* by Tana Hoban
- *Night Monkey, Day Monkey* by Julia Donaldson
- *The Fox in the Dark* by Alison Green

Spring book list

These books are within the White Rose Maths Reception schemes of learning.
They are not an exclusive list, but support the learning in each step.

Block 1 – Alive in 5

- *Zero is the Leaves on the Tree* by Betsy Franco
- *None the Number* by Oliver Jeffers
- *Anno's Counting Book* by Mitsumasa Anno
- *I Spy Numbers* by Jean Marzollo
- *The Ugly Five* by Julia Donaldson
- *Five Small Stars* by Elizabeth Matterson and Madge Bugden
- *Room on the Broom* by Julia Donaldson

Block 2 – Mass and capacity

- *Who Sank the Boat?* by Pamela Allen
- *Balancing Act* by Ellen Stoll Walsh
- *A Beach for Albert* by Eleanor May

Block 3 – Growing 6, 7, 8

- *Handa's Surprise* by Eileen Browne
- *Sidney the Silly Who Only Eats 6* by M.W. Penn
- *Six Dinner Sid* by Inga Moore
- *1, 2, 3 to the Zoo* by Eric Carle
- *Kipper's Toybox* by Mick Inkpen
- *Quack and Count* by Keith Baker
- *Simon Sock* by Sue Hendra and Paul Linnet
- *Missing Mittens* by Stuart J. Murphy
- *Noah's Ark*
- *Double Dave* by Sue Hendra
- *Minnie's Diner* by Dayle Ann Dodds
- *Two of Everything* by Lily Toy Hong
- *Don't Forget the Bacon!* by Pat Hutchins
- *The Snail and the Whale* by Julia Donaldson

Block 4 – Length, height and time

- *Superworm* by Julia Donaldson
- *Actual Size* by Steve Jenkins
- *Jim and the Beanstalk* by Raymond Briggs
- *I Can Only Draw Worms* by Will Mabbitt
- *Titch* by Pat Hutchins
- *Tall* by Jez Alborough
- *Jack and the Beanstalk*
- *The Giraffe Who Got in a Knot* by Paul Geraghty and John Bush
- *Five Minutes' Peace* by Jill Murphy
- *Mr Wolf's Week* by Colin Hawkins
- *A Dark, Dark Tale* by Ruth Brown
- *Jasper's Beanstalk* by Nick Butterworth

Spring book list

Block 5 – Building 9 and 10

- *Nine Naughty Kittens* by Linda M. Jennings
- *Ten Little Fingers and Ten Little Toes* by Mem Fox
- *Cockatoos* by Quentin Blake
- *How Do Dinosaurs Count to Ten?* by Jane Yolen
- *The 'Ten Little ...' series* by Mike Brownlow
- *Anno's Counting Book* by Mitsumasa Anno
- *One Duck Stuck* by Phyllis Root
- *Mouse Count* by Ellen Stoll Walsh
- *Ten in the Bed* by Penny Dale
- *One Gorilla* by Anthony Browne
- *Mr Willy-Nilly and Zoey's Dream* by Ji-yun Shin
- *Pete the Cat and the Missing Cupcakes* by Kimberly and James Dean
- *Ten Black Dots* by Donald Crews
- *Two of Everything* by Babette Cole
- *Double the Ducks* by Stuart J. Murphy
- *One Odd Day* by Doris Fisher and Dani Sneed

Block 6 – Explore 3-D shape

- *Circle! Sphere!* by Grace Lin
- *Changes, Changes* by Pat Hutchins
- *Naughty Bus* by Jan Oke
- *Rapunzel*
- *Kitten Castle* by Ellen Weiss and Mel Friedman
- *Shapes, Shapes, Shapes* by Tana Hoban
- *Pattern Fish* by Trudy Harris
- *Pattern Bugs* by Trudy Harris
- *Busy, Busy, Busy* by Haneul Ddang
- *The Leopard's Drum* by Jessica Souhami
- *Jamil's Clever Cat* by Fiona French with Dick Newby

Spring Block 1

Alive in 5

White Rose MATHS

Teacher guidance

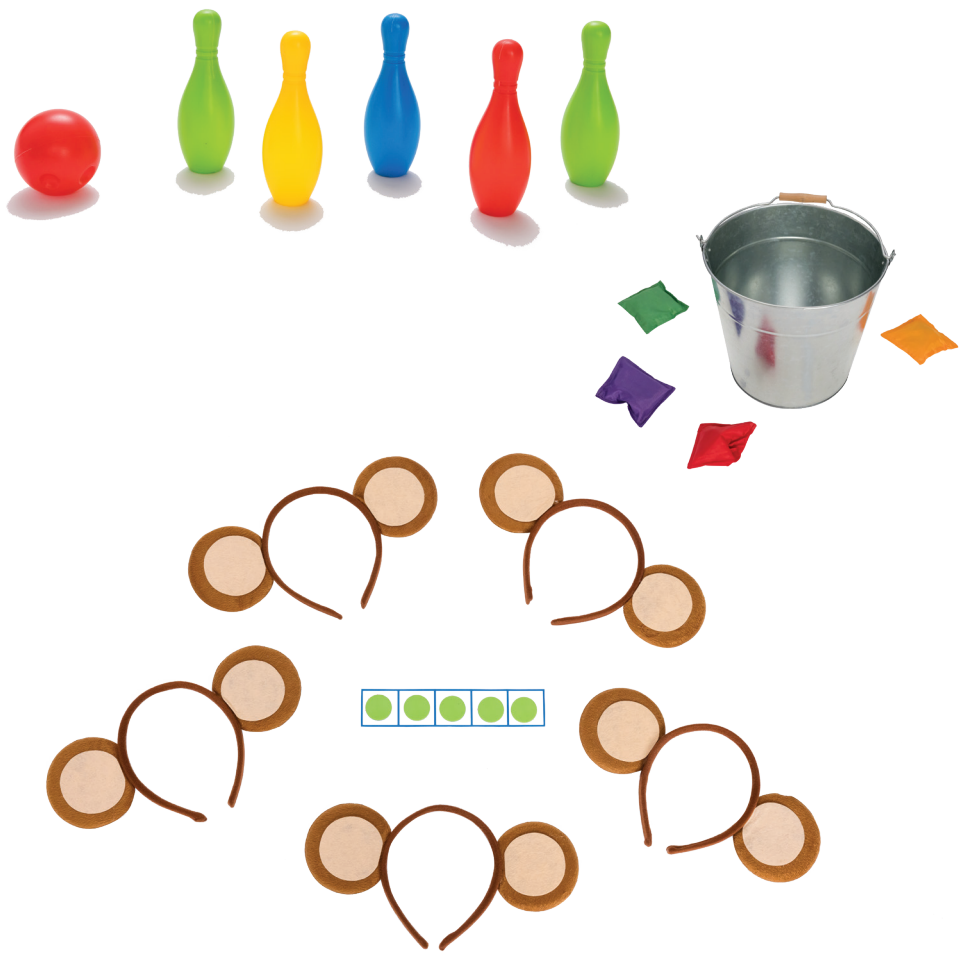
Key books

- *Zero is the Leaves on the Tree* by Betsy Franco
- *None the Number* by Oliver Jeffers
- *Anno's Counting Book* by Mitsumasa Anno
- *I Spy Numbers* by Jean Marzollo
- *The Ugly Five* by Julia Donaldson
- *Five Small Stars* by Elizabeth Matterson and Madge Bugden
- *Room on the Broom* by Julia Donaldson

Top tips

- To make a zero-to-five dice, cover up the six on the dice with masking tape.
- Take real-life photos of compositions you see indoors and outdoors to prompt number talk activities (for example, numbers of cherries growing on a stem).
- Leave blank number tracks and dice in small world provision for children to make up their own themed games linked to their interests. Think about adding well-known characters, such as superheroes, to encourage children to race along a number track.

Key resources



Small steps

Step 1	Introduce zero
Step 2	Find 0 to 5
Step 3	Subitise 0 to 5
Step 4	Represent 0 to 5
Step 5	1 more
Step 6	1 less
Step 7	Composition
Step 8	Conceptual subitising to 5

Introduce zero

Notes and guidance

In this small step, children are introduced to the concept of zero. They will already have some practical understanding of 'nothing there', 'none' or 'all gone'.

Here, they learn that the number name 'zero' and the numeral 0 can be used to represent this idea. Throughout this small step, support children to notice where they see 'zero'. For example, they may notice zero cookies on a plate or see zero leaves on a tree. They can also then be introduced to finding and recognising the numeral in the classroom and outdoor environment.

Provide frequent opportunities in planned activities, as well as in provision inside and out, to apply this understanding (for example, noticing that there are zero children playing in the sand).

Rhymes

- *Five Little Monkeys Jumping on the Bed*

Books

- *Zero is the Leaves on the Tree* by Betsy Franco

Key questions

- Where can you see zero _____?
- Where can you see the numeral zero?
- How many can you see?
- How can you make this amount into zero?

Possible sentence stems

- I can see zero _____ .
- There are zero _____ .
- I know this is zero because...
- I know this is not zero because...

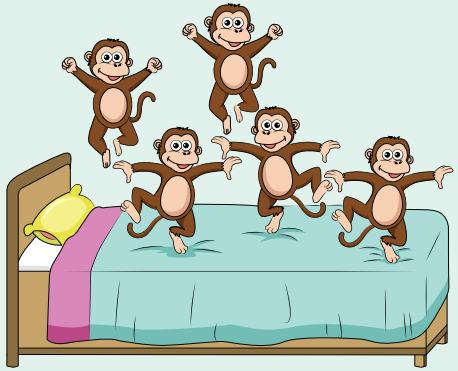
Links to the curriculum

- *Development Matters* – Reception – Link the number symbol (numeral) with its cardinal number value.
- *Birth to 5 Matters* – Range 5
  - Begin to recognise numerals 0 to 10
  - Links numerals with amounts up to 5 and maybe beyond

Introduce zero

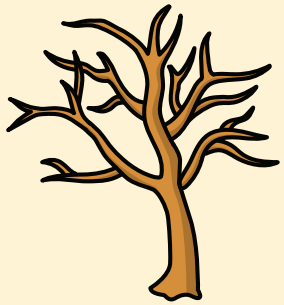
Adult-led learning

Use popular counting back songs such as *Five Little Monkeys Jumping on the Bed*. Encourage children to take on the role of the five monkeys using props such as monkey ears.



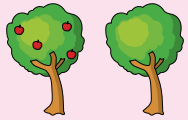
Represent each verse with counters on a five frame, displaying the numerals alongside. Emphasise that when we get to zero, there are no monkeys left to jump.

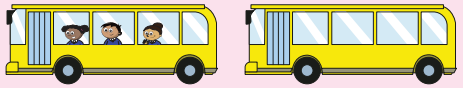
Share stories such as *Zero is the Leaves on the Tree* by Betsy Franco. Encourage children to notice where they see zero.



Children can create their own pages for a class book to represent zero in different ways.

Provide images showing familiar numbers alongside zero to support children's understanding that zero represents the absence of something.

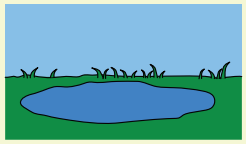


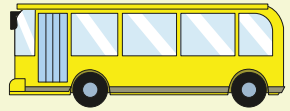


Can children say when images show zero and not zero?

Go on a 'zero hunt' around school or in the local environment.

Prompt children to notice where they see zero. Encourage children to take photographs of the examples they find.





How many different examples of zero can they find? Where can they see the numeral '0'? Does it always mean there are zero items there?

Find 0 to 5

Notes and guidance

In this small step, children build on learning from the previous step and use their knowledge of zero to find an amount to five, including zero.

When exploring numbers to five through games, support children to recognise when zero occurs.

Include resources such as blank number cards or blank faces on a dice. Encourage children to relate these to making the correct number of moves on a track, as well as matching the same amounts.

Prompt children to notice when zero occurs in activities in the classroom as well as in daily routines. For example, there are zero people away today or there are zero apples left.

Rhymes

- *Alice the Camel*

Books

- *None the Number* by Oliver Jeffers

Key questions

- Where can you find/see _____?
- Where can you see zero?
- How many different ways can you find _____?

Possible sentence stems

- I counted _____
- There is/are _____
- I can see...

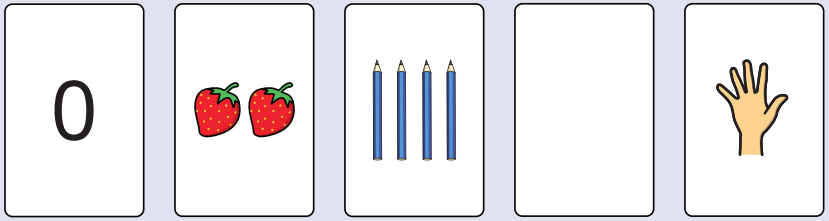
Links to the curriculum

- *Development Matters* – Reception
  - Link the number symbol (numeral) with its cardinal number value.
  - Count objects, actions and sounds.
- *Birth to 5 Matters* – Range 5
  - Begin to recognise numerals 0 to 10
  - Links numerals with amounts up to 5 and maybe beyond

Find 0 to 5

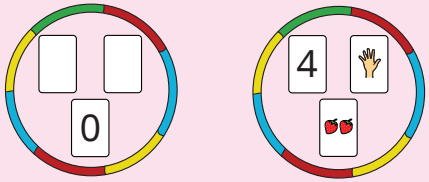
Adult-led learning

Give each child a picture card. Prompt children to find a partner with the same number or amount as themselves.



Encourage children to see if there are more than two cards that match. How does the card represent the number?

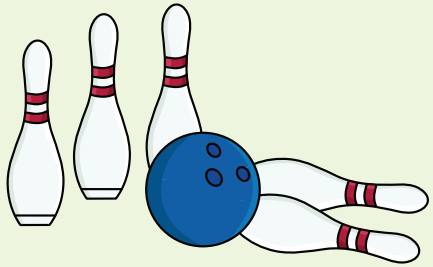
Explore sorting picture cards with different representations. Can children sort them into 'zero' and 'not zero'?



Prompt children to sort the cards and place them in the correct hoop.

Provide equipment for throwing and rolling games such as skittles, beanbags and buckets.

Encourage children to notice when they knock over zero skittles or when zero beanbags land inside the bucket.



Prompt children to record their score.

Children sit in a circle and all place five objects on a five frame.

The first child rolls a 0–3 dice. Prompt them to give that number of objects to the child on the right.

Repeat until they have given away all their objects. The first to be left with zero is the winner!

Subitise 0 to 5

Notes and guidance

In this small step, children continue to develop the skill of perceptual subitising. This form of subitising refers to instantly recognising the number of objects in a group without needing to count them. In this step, the concept of subitising zero objects is introduced, as well as the instant recognition of up to five objects.

Encourage children to represent their subitising by showing the numeral '0', showing no fingers or an empty five frame.

Use images, stories and rhymes that include representations of 0–5 to embed this skill.

Further support children by including blank dot plates and zero representation cards into subitising games.

Rhymes

- *One Birthday Candle*

Books

- *Anno's Counting Book* by Mitsumasa Anno

Key questions

- How many can you see? How do you know?
- How many are there in each group?
- How can you show me _____?
- What can you see?

Possible sentence stems

- There are _____ dots altogether.
- There are _____
- I can see _____ without counting.
- I can subitise _____

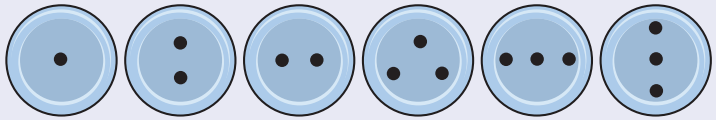
Links to the curriculum

- *Development Matters* – Reception – Subitise.
- *Birth to 5 Matters* – Range 6 – Engages in subitising numbers to four and maybe five

Subitise 0 to 5

Adult-led learning

Show children different arrangements of dot plates showing 0–5

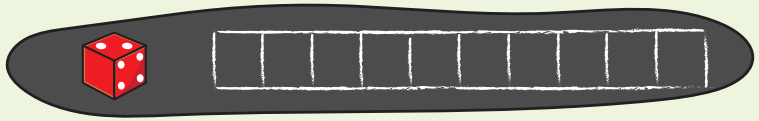


Prompt children to tell you how many they can subitise.

Children represent the amount by showing the correct number of fingers or finding the numeral on a digit card.

Chalk a blank number track on the ground.

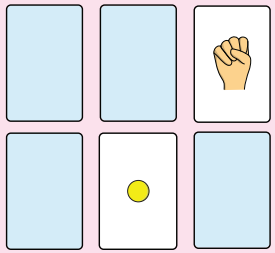
Roll a large 0–5 dice.



Children subitise and jump that number of spaces along the track. The winner is the first to get to the end of the track.

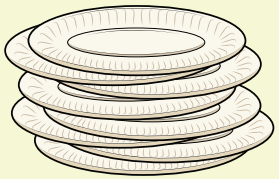
Place six picture cards showing 0–5 face down on the table. Children take turns to turn over two cards each.

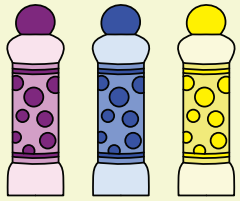
If the two cards show the same quantity, they can keep the cards. Otherwise, they turn the cards face down again.



The winner is the child with the most cards when all the cards have been taken. Once children know the rules, leave the resources out for them to play independently.

Provide blank paper plates and bingo dabbers and prompt children to use the dabbers to make their own subitising dot plates.





Encourage children to make different arrangements of 0–5

Represent 0 to 5

Notes and guidance

In this small step, children build on their understanding of numbers from zero to five. Support children to represent the numbers in many ways and in different practical contexts in order to embed their understanding.

Encourage children to use both counting and subitising skills as a way of checking their representations. Use meaningful contexts, such as number rhymes, and prompt children to represent the numbers they see on five frames.

This will consolidate their understanding that when the five frame is full, this represents 5, and when it is empty, this represents zero.

Rhymes

- *Five Little Monkeys Jumping on the Bed*

Books

- *I Spy Numbers* by Jean Marzollo

Key questions

- How many are there? How many are there now?
- How many different ways can you show _____?
- How many did you count? How do you know?

Possible sentence stems

- There is/are _____
- I counted _____

Links to the curriculum

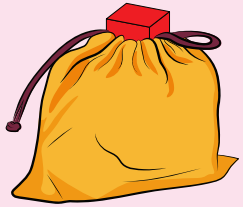
- *Development Matters* – Reception
  - Link the number symbol (numeral) with its cardinal number value.
  - Compare numbers.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - Matches the numeral with a group of items to show how many there are (up to 10)

Represent 0 to 5

Adult-led learning

Put together a collection of items in a feely bag that represent the numbers 0 to 5

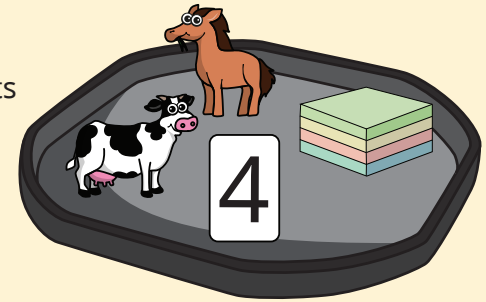
Take each item out and discuss what amount is represented by each object. Ask children to show this amount on their fingers or on a five frame with counters.



Ask children to say why the object represents that number.

Share texts such as *I Spy Numbers* by Jean Marzollo.

Encourage children to make their own collections of objects that represent the numbers 0 to 5



Prompt them to explain why their objects represent the given number.

Prepare a bag containing the numerals 0 to 5

As you pull out a numeral, give children a task to do to represent that number. For example, if you pull out a 2, the children could take two giant strides, do two claps or find two pebbles and bring them back.

Show children rhyme books, such as *Five Little Monkeys Jumping on the Bed*, that represent numbers 5 to 0

Task children to make their own rhyme books in the art area.

What different representations can they show?

Does the rhyme start or end with zero?

1 more

Notes and guidance

In this small step, children build on their knowledge of '1 more' to work with the numbers to 5, including zero. They recognise that zero can be a starting point for counting and the number after 0 is 1

Children should be supported to further embed the stable order principle starting from zero, and to understand that the order of the numbers does not change.

Encourage children to represent the '1 more' pattern as they count and use a variety of manipulatives and contexts to model this.

Use number rhymes that ascend to encourage children to demonstrate their understanding of the pattern of numbers.

Rhymes

- *Crocodile Splash*

Books

- *The Ugly Five* by Julia Donaldson

Key questions

- How many are there?
- How many are there now?
- What is 1 more than _____?
- What is the number after _____?

Possible sentence stems

- _____ is 1 more than _____
- 1 more than _____ is _____
- The number that comes after _____ is _____

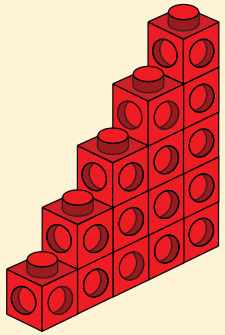
Links to the curriculum

- *Development Matters* – Reception – Understand the 'one more than/one less than' relationship between consecutive numbers.
- *Birth to 5 Matters*
  - Range 5 – Beginning to recognise that each counting number is one more than the one before
  - Range 6 – In practical activities, adds one and subtracts one with numbers to 10

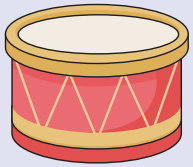
1 more

Adult-led learning

Share stories such as *The Ugly Five* by Julia Donaldson in which the number of characters increases by one each time. Represent this with children using cubes, adding 1 more each time to make towers to five.

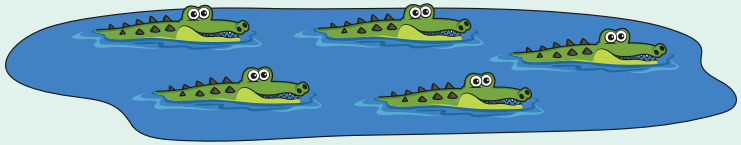


Drum with children and ask them to copy your beats. Remember to also represent zero beats by holding your hand over the drum without hitting it. Once children can copy it, ask them to do '1 more' beat than you with 0, 1, 2, 3 and 4 beats.



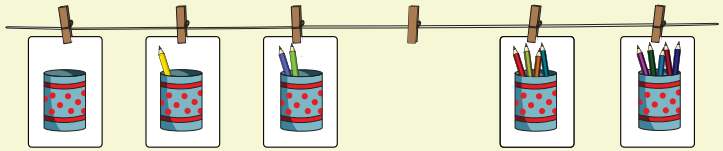
Model rhymes such as *Crocodile Splash* with children.

Use children and props at the front of the class to emphasise the '1 more' pattern and show that the amount increases by 1 each time.



Children can then fill five frames to represent the numbers.

Gather a set of pictures cards numbered 0–5, muddle them up and remove one. Ask children to arrange them on a washing line in order.



Ask children which card is missing and encourage them to use the language of '1 more' to explain how they know.

1 less

Notes and guidance

In this small step, children build on their knowledge of '1 less' from 1–5 to work with the numbers to five including zero. They recognise that when counting back, we can include zero after 1

In the same way as for '1 more', children should be supported to embed the stable order of the numbers from five to zero and understand that the order of the numbers does not change.

Encourage children to represent the '1 less' pattern as they count and use a variety of manipulatives and situations to model this.

Use number rhymes that descend to encourage children to demonstrate their understanding of the pattern of numbers.

Rhymes

- *Five Little Snowmen*

Books

- *Five Small Stars* by Elizabeth Matterson and Madge Bugden

Key questions

- How many are there?
- How many are there now?
- What is 1 less than _____?
- What is the number before _____?

Possible sentence stems

- _____ is 1 less than _____
- 1 less than _____ is _____
- The number before _____ is _____

Links to the curriculum

- *Development Matters* – Reception – Understand the 'one more than/one less than' relationship between consecutive numbers.
- *Birth to 5 Matters* – Range 6 – In practical activities, adds one and subtracts one with numbers to 10

1 less

Adult-led learning

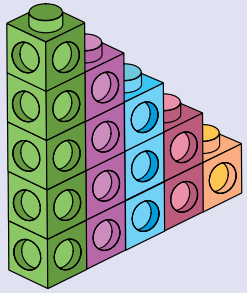
Model rhymes such as *Five Little Snowmen* with children.

Use children and props at the front of the class to emphasise the '1 less' pattern and the amount decreasing.

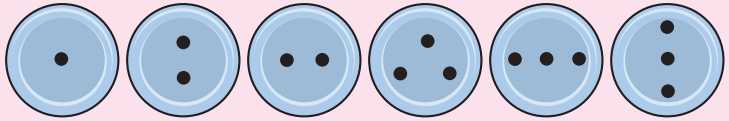
Prompt children to use five frames to represent the snowmen.

Use blocks or cubes to make staircase patterns. Encourage children to notice the 1 more and 1 less pattern.

Provide opportunities for children to build their own staircases. How many items are needed for each step? Prompt them to match them to a number track.



Spread out a range of dot plates on the floor. Show children a dot plate or picture card. Prompt children to find the dot plate that shows 1 less than the one you are holding.



Leave the dot plates out for children to re-enact the activity, taking it in turns to play the teacher's role.

With children, count up to four items into a bag.

Ask them to confirm how many there are in the bag.

Put 1 cube in or take 1 cube out. How many are there in the bag now?

Include examples of 1 less than one is zero and 1 more than zero is one. Once children are confident with predicting 1 more and 1 less, this can be extended to 2 more or 2 less.

Encourage children to use their fingers or five frames to represent the hidden objects.

Composition

Notes and guidance

In this small step, children are guided to explore the composition of numbers from zero to five.

Children will continue to develop the understanding that all numbers are made up of smaller numbers and that this can include zero. Prompt them to notice the different compositions of numbers to five by asking questions such as, "How do you see it?"

Encourage children to recognise that numbers can also be made up of more than two parts. Physically drawing around or moving objects will support children with this. Prompt them to describe both the whole and the component parts of the number.

Rhymes

- *Five Little Peas*

Books

- *Room on the Broom* by Julia Donaldson

Key questions

- What do you see? How do you see it?
- What is the whole?
- What is/are the part/parts?

Possible sentence stems

- The whole is _____
- _____ is a part and _____ is a part (and _____ is a part).
- I see _____ and _____
- There are _____ altogether.
- If _____ is a part, then the other part must be _____

Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up of (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Composition

Adult-led learning

Show children photographs of objects showing different compositions.

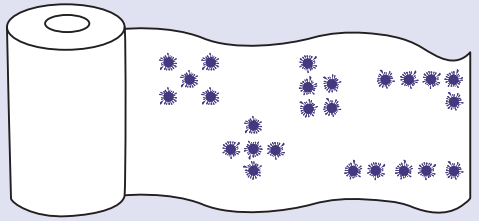
Ask children to tell you what they see and how they see the number of objects in different compositions.

Share stories such as *Room on the Broom* by Julia Donaldson.

Help the witch to make a potion. Encourage children to throw five different coloured beanbag 'ingredients' into the cauldron (or bucket).

Prompt children to see how many land inside the cauldron. How many land outside the cauldron? Do we still have five ingredients? Encourage children to use mark making to record their potion ingredients.

Provide children with large pieces of paper. Represent numbers up to five in different arrangements by using bingo dabbers to dab dots.



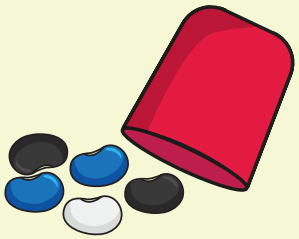
Talk about how children see that number and prompt them to draw around the different groups to show the different compositions.

Spray paint dried butter beans so that one side is a different colour.

Spray some of the butter beans again so that there are three combinations.

Prompt children to shake up to five butter beans in a cup or in their hands and then drop them on the floor.

Encourage children to tell you what compositions they see.



Conceptual subitising to 5

Notes and guidance

In this small step, children build on their learning of composition to five and perceptual subitising to develop their understanding of conceptual subitising. This is the ability to see sets of numbers within other sets, such as seeing the two and three in the number five, without having to count. Children are taught to recognise a whole quantity by recognising and combining these smaller quantities.

Support children to see smaller groups within the whole by using resources that include two colours, such as double-sided counters, sprayed butter beans and two-colour dot plates. Encourage them to notice the groups and subitise them in the same way as they did previously.

Rhymes

- *Five Crispy Pancakes*

Books

- *Anno's Counting Book* by Mitsumasa Anno

Key questions

- What do you see? How do you see it?
- What is the whole?
- What is/are the part/parts?

Possible sentence stems

- The whole is _____
- _____ is a part and _____ is a part (and _____ is a part).
- I see _____ and _____
- There are _____ altogether.
- If _____ is a part, then the other part must be _____

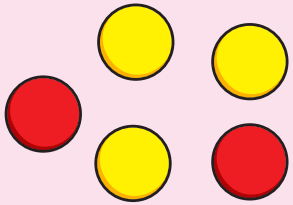
Links to the curriculum

- *Development Matters* – Reception – Subitise.
- *Birth to 5 Matters* – Range 6 – Begins to conceptually subitise larger numbers by subitising smaller groups within the number, e.g. sees six raisins on a plate as three and three

Conceptual subitising to 5

Adult-led learning

Give children five double-sided counters each. Shake them and drop them on the floor.

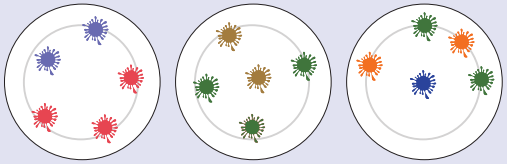


Prompt children to describe how many there are of each colour. How can we describe the parts when all the counters are the same colour?

Act out rhymes such as *Five Crispy Pancakes*. Have pancakes made from card of two colours, with one colour on one side and another colour on the other side. Children flip pancakes and see how they land. How many are one colour? How many are the other colour?

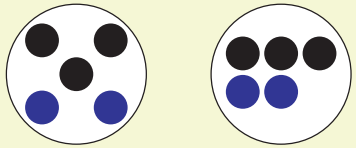
Prompt children to flip the pancakes again. Does the composition change?

Provide children with paper plates or circles of card and bingo dabbers. Encourage children to make their own two-colour or three-colour dot plate cards.



What different arrangements and compositions can they make?

Show children dot plates with up to five dots in different colour combinations. Ask what number they see and how they see it.



Extend this by laying dot plates on the floor. In pairs, children take turns to find two dot plates with the same composition in different arrangements.

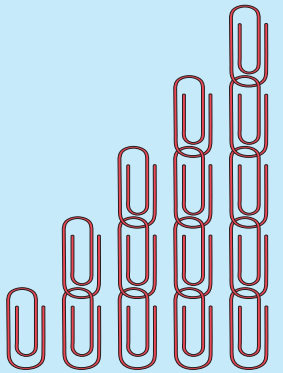
Continuous provision

Provide a range of loose parts and pots labelled 0–5 for children to count items into. Observe to see if they count the items correctly into the corresponding pots.

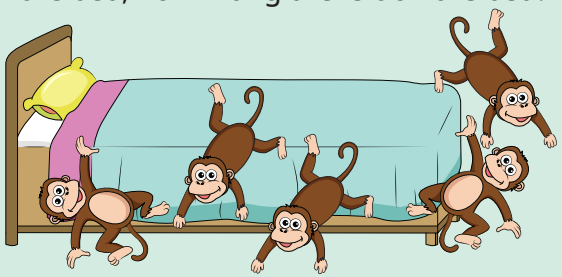
Picture cards and dot plates to represent different quantities, including zero, can also be sorted and matched to numerals.

Encourage children to make their own physical number lines using non-standard units of measure, such as paperclips, to represent the value of each number.

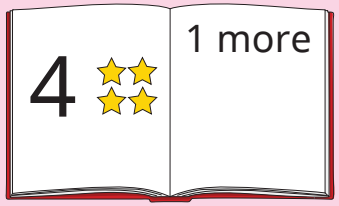
Prompt children to label their number lines with the correct numerals.

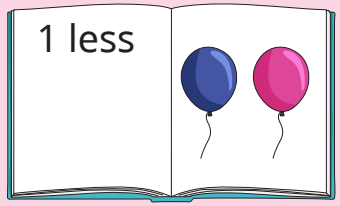


As children play, prompt them to notice where they see zero. For example, could we park zero cars in our car park? If there are five horses and two fields, how many horses could be in each field? If all five monkeys have fallen off the bed, how many are left on the bed?



Provide children with mini blank books and encourage them to make their own '1 more' and '1 less' books.



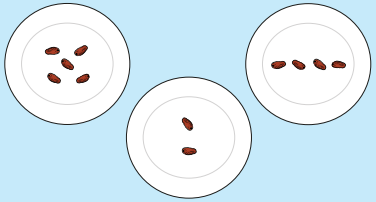


Children could then go on to design their own number books.

End of block checkpoint

Checkpoint 1

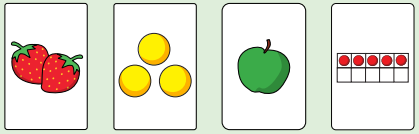
During snack time, ask children to count out a given quantity (for example, five raisins). Prompt them to use the snack to make different arrangements. Then explore what happens if they eat different amounts.



How many are left if they eat them all? How many would they have if they were given one more?

Checkpoint 2

Place dot plates or picture cards representing 0–5 on the floor.

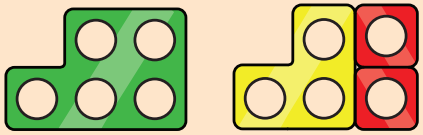


Hold up a numeral and prompt children to use a swatter to swat the correct dot plate or picture card. Encourage children to take it in turns to lead the game.

Checkpoint 3

Give children a range of 1 to 5 number shapes.

Encourage them to use two smaller numbers to make a whole. Children check by placing the two parts on top of the whole number. Is there another way they can make the number?



Can children show a number in three parts?

Spring Block 2

Mass and capacity

White Rose MATHS

Teacher guidance

Key books

- *Who Sank the Boat?* by Pamela Allen
- *Balancing Act* by Ellen Stoll Walsh
- *A Beach for Albert* by Eleanor May

Key resources

Top tips

- Providing different kinds of balance scales can support children to explore mass in their play and investigate objects in different ways.
- Enhancements to provision involving mass, such as a post office or bakery, can support the learning in this block.
- Taking learning outdoors encourages children to make their own balancing materials. Use equipment such as guttering to help children to actively explore finding a balance or not finding a balance in different contexts.
- Explore capacity of spaces using children as the non-standard unit: how many can fit in a hoop, on the carpet, or in the sandpit?

Small steps

Step 1	Compare mass
Step 2	Find a balance
Step 3	Explore capacity
Step 4	Compare capacity

Compare mass

Notes and guidance

In this small step, children build on their learning of simple comparisons from the autumn term to now make more precise comparisons using different units. Children may still be more familiar with the word 'weight' and there is no harm in using this interchangeably with the word 'mass'.

Children will become more familiar with using balance scales and distinguish between the different quantities on either side. Use different kinds of scales so children do not think there is only one way to compare mass. It is important to provide a range of resources to explore, including loose parts, so that children can investigate the mass of different objects.

Encourage children to make their own water vehicles such as boats and explore floating and sinking activities. Experiment with the concept of mass by putting in and taking out objects or animals, linking to stories.

Books

- *Who Sank the Boat?* by Pamela Allen

Key questions

- Which object is heavier? How do you know?
- Which object is lighter? How do you know?
- What has happened to the balance scale?
- Which objects will float/sink?

Possible sentence stems

- The _____ is heavier/lighter than the _____.
- I think the _____ is heavier/lighter than the _____ because...
- The heavier/lighter object is _____ on the balance scale.

Links to the curriculum

- *Development Matters* – Reception – Compare length, weight and capacity.
- *Birth to 5 Matters* – Range 6
  - Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy
  - Becomes familiar with measuring tools in everyday experiences and play

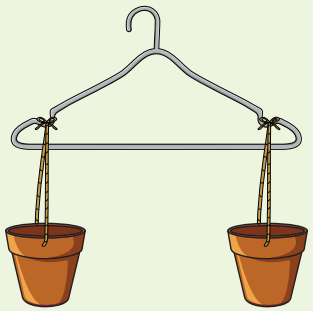
Compare mass

Adult-led learning

Provide two objects, one heavy and one light, and place them on a balance scale. Explain that the heavier object is lower on the balance scale. The lighter object is higher on the balance scale.

Repeat with different objects and encourage children to estimate which will be heavier and which will be lighter. Test their predictions.

Build a home-made balance scale outside using a coat hanger and pots, or a piece of guttering and a crate.



Use the scale to explore which items are heavy or light. How do they know? Prompt children to put more than one object on each side and explore what happens.

Read stories such as *Who Sank the Boat?* by Pamela Allen. Provide children with recyclable junk modelling resources to build their own boats. How many small world characters can they fit in the boat before it sinks?

Prompt children to explore whether this changes for different combinations of animals.

Provide children with a variety of number shapes. Prompt them to explore what happens when they place the number shapes on a balance scale. Support children to notice that the greater the number, the heavier the number shape.

Find a balance

Notes and guidance

In this small step, children will further explore mass and progress to discovering how to find a balance. Prompt children to recognise that the scales are balanced when the objects on each side have the same mass. Explore measuring different objects to see which ones balance and encourage children to say why.

Explain that the line across the balance scale needs to be straight, using gestures to emphasise the horizontal line. Emphasise to children that when balancing a scale, both sides need to have an equal mass.

Task children with exploring how different objects balance and how more than one lighter object will be needed to balance a heavier object. Prompt children to say how many lighter objects balance with one heavier object. Compare to see if there are more or fewer objects on each side of the scale.

Books

- *Balancing Act* by Ellen Stoll Walsh

Key questions

- Which object is heavier/lighter?
- What has happened to the balance scale?
- Which side needs more/fewer to make the scale balance?
- What does it mean when the scale is balanced?

Possible sentence stems

- The scale is balanced because...
- The mass of the _____ is _____ cubes.
- I know the _____ is heavier/lighter than the _____ because...

Links to the curriculum

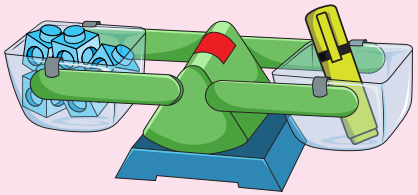
- *Development Matters* – Reception – Compare length, weight and capacity.
- *Birth to 5 Matters* – Range 6
  - Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy
  - Becomes familiar with measuring tools in everyday experiences and play

Find a balance

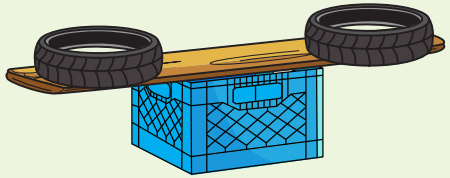
Adult-led learning

Place classroom objects on a balance scale. Add cubes to the other side until the scale is balanced and point out what this looks like.

Prompt children to count how many cubes made the scale balance. Will they need more or fewer cubes to make a different object balance the scale?

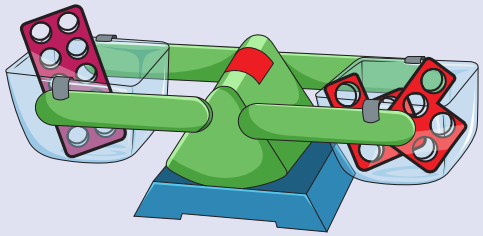


Make a home-made balance scale using objects such as a plank on a crate and explore which objects balance the scale.



Explore how many bricks it would take to make the scale balance with larger objects.

Place one number shape on a balance scale. Encourage children to find a way to balance the scale using different number shapes.



Encourage children to find different ways to make the scale balance.

Deepen understanding by providing objects such as a large feather and a small pebble to address the misconception that larger items are always heavier.

Prompt children to predict which object will need more cubes to balance the scale.

Encourage children to test their predictions.

Explore capacity

Notes and guidance

In this small step, children build on their understanding of 'full' and 'empty' to further investigate different capacities and how they relate to each other. They will explore how non-standard units can be used to measure capacity.

Ensure a range of resources are available in provision so that children can explore capacity easily and build on more complex comparisons in their language and play. Encourage children to use the language 'tall', 'thin', 'narrow', 'wide' and 'shallow' when describing containers and prompt them to experiment filling these using other sized containers. Allow children to use different materials such as water, rice, sand and beads to explore the containers' capacities.

Rhymes

- *There's a Hole in My Bucket*

Books

- *A Beach for Albert* by Eleanor May

Key questions

- How many _____ does the container hold?
- How can you measure the capacity of the containers?
- How many _____ are needed to fill the container?
- Will the container hold more or less _____ than _____?

Possible sentence stems

- The container holds more/less _____ than _____.
- The _____ has the same capacity as _____ cubes/pine cones/marbles.

Links to the curriculum

- *Development Matters* – Reception – Compare length, weight and capacity.
- *Birth to 5 Matters* – Range 6
  - Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy
  - Becomes familiar with measuring tools in everyday experiences and play

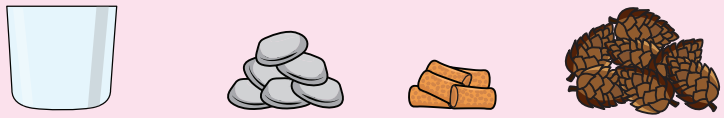
Explore capacity

Adult-led learning

Read stories such as *A Beach for Albert* by Eleanor May. Ask children to make a beach for small world animals. Provide a selection of containers to transport water to their beach. Include one with holes in, one that is too small and one that will be too big/heavy.

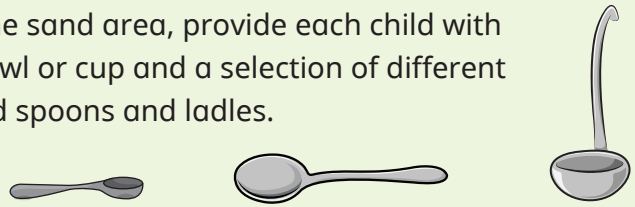
Ask children to predict which container will be the most suitable and then check to see.

Prompt children to explore filling a container with different loose parts, such as pine cones, stones and corks.



Support children to notice whether the container can hold more of one object than another object.

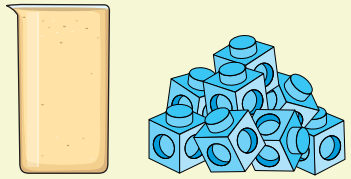
In the sand area, provide each child with a bowl or cup and a selection of different sized spoons and ladles.



Ask them to investigate how many small spoonfuls it takes to fill their container. How many large spoonfuls does it take? How many ladles does it take? Which sized spoon was the best? Why?

Encourage children to first fill a container with cupfuls of sand and then fill another container of the same size with cubes.

Prompt them to talk about which is the most suitable to measure the capacity of the container.



Support children to notice that there are gaps in between the cubes, but the sand completely fills the container.

Compare capacity

Notes and guidance

Children will continue to explore capacity in this small step and will move on to making comparisons. Encourage children to make direct comparisons by pouring from one container to another.

During activities and in provision, prompt children to use smaller pots or ladles to make indirect comparisons by counting how many of one container it takes to fill another. Children can then order the containers from the smallest capacity to the greatest capacity.

Ensure children are provided with opportunities in the outdoor provision to compare the capacity of larger containers. Mud kitchens, sand and water areas all provide opportunities for both direct and indirect comparisons outdoors.

Enacting scenarios such as 'sabotaging snack' in provision can support further discussion and discovery of comparing capacity. For example, all the cups or bowls are different sizes.

Books

- *A Beach for Albert* by Eleanor May

Key questions

- How many _____ of _____ can the container hold?
- Which container has the greatest/smallest capacity?
- What could we use to measure the capacity?
- Does this container hold more or less? How can you find out?

Possible sentence stems

- The container holds _____ cupfuls/spoonfuls of _____.
- The _____ holds more/the most.
- The _____ holds less/the least.

Links to the curriculum

- *Development Matters* – Reception – Compare length, weight and capacity.
- *Birth to 5 Matters* – Range 6
  - Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy
  - Becomes familiar with measuring tools in everyday experiences and play

Compare capacity

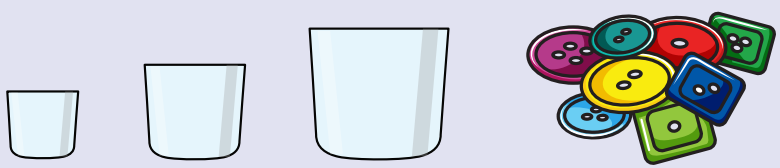
Adult-led learning

Provide a selection of containers of different shapes and sizes and ask children to investigate which holds the most water.

Children could use a small cup to fill each container, counting how many cupfuls the containers hold.

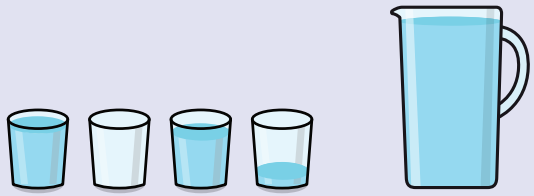
Place the containers in order from the smallest capacity to the greatest capacity.

Provide sets of similar containers in different sizes, such as sets of nesting bowls or boxes. Prompt children to fill the containers with objects such as cubes, buttons or marbles.



Encourage children to compare and order the capacities of the different containers.

At snack time, provide each child with a cup. Ask them to make their cup full, empty, nearly full and nearly empty.



Prompt them to find a container that holds more water than their cup or a container that holds less water than their cup.

Provide children with a tall, thin container and a shallow, wide container.

Ask them to predict which will hold more water.

How could they check? Encourage children to try different methods and prompt them to record the capacity of each container.

To extend further, more containers could be added, and children could order them from the smallest capacity to the greatest capacity.

Continuous provision

Follow a recipe to bake a cake. Weigh out the ingredients using a balance scale with one or two eggs on one side.

Add flour to the other side until the scale is balanced.

Repeat this to weigh the sugar and butter, prompting children to notice when the scale is balanced each time.

Provide a variety of pans, bowls, spoons and ladles.

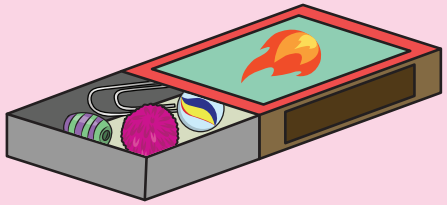
Add daily recipes on a chalkboard and encourage children to measure out cupfuls and spoonfuls of ingredients.

They could also design and create their own recipes.

Set up a pulley system outside. This could be a basket attached to a rope over a tree branch.

Explore how the mass of the basket changes as different objects are placed inside.
Which objects are harder to pull? Which are easier to pull?

Provide children with a small, empty matchbox each.



Ask them to hunt for things to put inside their matchbox. How many objects do they need to fill their box?

End of block checkpoint

Checkpoint 1

Can children use the language 'heavy' and 'light' to explore and compare mass when playing?

Observe children as they play in provision. The dough and construction areas provide great opportunities to support this.

Are children able to describe what they notice when they place objects on a balance scale?

Are they able to find a balance?

Checkpoint 2

In the snack area, provide a variety of jugs of milk and some beakers. Encourage children to take drink orders and make these for other children in the class.

Are they able to use the language 'full', 'empty', 'nearly full' and 'nearly empty'?

Checkpoint 3

Observe children in continuous provision as they explore and compare capacity. The sand, water and mud kitchen provide great opportunities to support these skills.

Encourage children to explore how much water or sand (or how many objects) different containers hold.

Can children predict how many of one container it takes to fill another? Can they explore which containers hold more and explain why?

Spring Block 3

Growing 6, 7, 8

White Rose MATHS

Teacher guidance

Key books

- *Handa's Surprise* by Eileen Browne
- *Sidney the Silly Who Only Eats 6* by M.W. Penn
- *Six Dinner Sid* by Inga Moore
- *1, 2, 3 to the Zoo* by Eric Carle
- *Kipper's Toybox* by Mick Inkpen
- *Quack and Count* by Keith Baker
- *Simon Sock* by Sue Hendra and Paul Linnet
- *Missing Mittens* by Stuart J. Murphy
- *Noah's Ark*
- *Double Dave* by Sue Hendra
- *Minnie's Diner* by Dayle Ann Dodds
- *Two of Everything* by Lily Toy Hong
- *Don't Forget the Bacon!* by Pat Hutchins
- *The Snail and the Whale* by Julia Donaldson

Key resources

Small steps

Step 1	Find 6, 7 and 8
Step 2	Represent 6, 7 and 8
Step 3	1 more
Step 4	1 less
Step 5	Composition of 6, 7 and 8
Step 6	Make pairs – odd and even
Step 7	Double to 8 (find a double)
Step 8	Double to 8 (make a double)

Small steps

Step 9	Combine two groups
Step 10	Conceptual subitising

Find 6, 7 and 8

Notes and guidance

In this small step, children explore finding different representations of the numbers 6, 7 and 8

Support them to first match the verbal number names to quantities and then to numerals. Children should be encouraged to continue to apply the counting principles when they count to 8 and when they represent these numbers in different ways.

Provide opportunities for children to use one-to-one correspondence to count 6, 7 and 8 objects from a larger group. To further develop children's understanding of cardinality, support them to know when to stop counting and that the number they say is the total number of objects in the set.

Rhymes

- *One Potato, Two Potato*

Books

- *Handa's Surprise* by Eileen Browne

Key questions

- How many are there altogether?
- Where can you find 6/7/8? Where else?

Possible sentence stems

- There are 6/7/8 _____ .
- There are _____ altogether.
- I can see...

Links to the curriculum

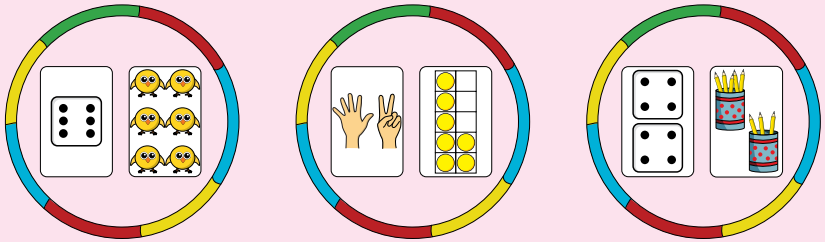
- *Development Matters* – Reception
  - Count objects, actions and sounds.
  - Link the number symbol (numeral) with its cardinal number value.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - Estimates of numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Find 6, 7 and 8

Adult-led learning

Provide children with a range of picture cards showing 6, 7 and 8

Give them three hoops to represent 6, 7 and 8 and ask children to sort the cards into the correct hoop.

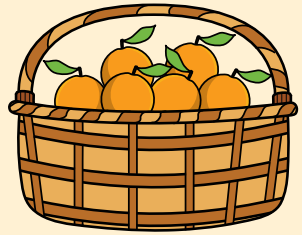


Give each child three dot plates showing a random number of dots from 0 to 8

Hold up numeral cards 0–8, one at a time. Children turn over a dot plate if it matches the numeral. The first child to turn over all their dot plates is the winner.

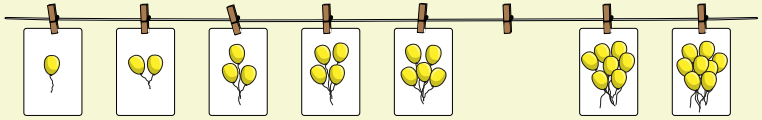
After reading stories such as *Handa's Surprise* by Eileen Browne, provide different pieces of fruit in the snack area. Encourage children to make their own baskets of fruit to show 6, 7 and 8

Prompt them to describe their collections.



Place birthday cards representing 1–8 on a washing line.

Without showing children, remove one of the cards.



Ask children to tell you which card is missing and explain how they know.

This can be extended to removing two cards.

Represent 6, 7 and 8

Notes and guidance

In this small step, children build on their learning of finding the numerals and quantities of 6, 7 and 8 by making their own representations. Encourage them to name their representations and prompt them to match numerals to these quantities. Ask children to draw their representations when noticing amounts, such as the colours in the rainbow or 8 legs on a spider. Prompt children to represent up to 8 objects by introducing them to using a ten frame. Support them to understand that we have 5 if the top row of the ten frame is full. Remind children to fill the ten frame in the five-wise pattern from left to right, so they can see the '5 and a bit' structure. Encourage children to subitise the 5 and start to recognise the pattern of 6, 7 and 8 on the ten frame.

Rhymes

- *I Can Sing a Rainbow*

Books

- *Sidney the Silly Who Only Eats 6* by M.W. Penn
- *Six Dinner Sid* by Inga Moore

Key questions

- How many are there? How many are there now?
- How many different ways can you show 6/7/8?
- How many are there altogether?

Possible sentence stems

- There are 6/7/8 _____. I know this because...

Links to the curriculum

- *Development Matters* – Reception
  - Count objects, actions and sounds.
  - Link the number symbol (numeral) with its cardinal number value.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - Estimates of numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Represent 6, 7 and 8

Adult-led learning

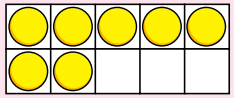
Share stories such as *Sidney the Silly Who Only Eats 6* by M.W. Penn with children. Encourage them to notice where they can see collections of 6

Prompt children to set up their own banquet with different items in sets of 6

To extend this, children could also make their own stories where their character only eats sets of 7 or 8

Hold up a dot plate showing 6, 7 or 8 dots.

Prompt children to represent this number on their ten frame using counters.



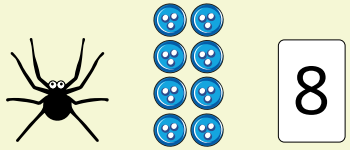
Encourage them to compare their ten frame to their partner's.

Do they look the same?

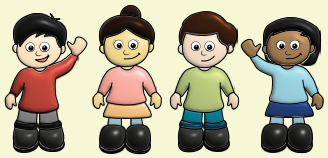
Go on a minibeast hunt outside with children. Use magnifying pots or hand lenses to observe the creatures carefully. How many legs can they see?

Provide non-fiction books to help them identify what they find. Ask children to draw the creatures they see.

Prompt children to make their own collections that represent 6, 7 or 8



Encourage them to explain why they have chosen those objects and why they belong in that collection.



Could an object represent more than one number?

1 more

Notes and guidance

In this small step, children are introduced to the concept of '1 more' when working with numbers up to and including 8

They begin to understand that as they count forwards beyond 5, each number is 1 more and the numbers still increase by 1

Prompt children to recognise the stable order of the numbers and use a range of representations, including '1 more' stories and rhymes, to support this understanding. This can be exemplified on a ten frame as children see the numbers filling more of the spaces and see the pattern of each number. Prompt children to represent the '1 more' pattern as they count and encourage them to act out rhymes and scenarios in places such as the small world area.

Rhymes

- *One Man Went to Mow*

Books

- *Six Dinner Sid* by Inga Moore
- *1, 2, 3 to the Zoo* by Eric Carle

Key questions

- How many are there?
- How many are there now?
- What is 1 more than _____?
- What is the number after _____?

Possible sentence stems

- There are _____
- There are _____ altogether.
- _____ is 1 more than _____
- 1 more than _____ is _____

Links to the curriculum

- *Development Matters* – Reception – Understand the 'one more than/one less than' relationship between consecutive numbers.
- *Birth to 5 Matters* – Range 6 – In practical activities, adds one and subtracts one with numbers to 10

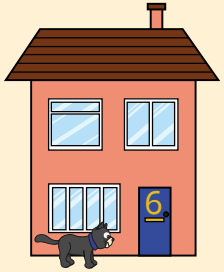
1 more

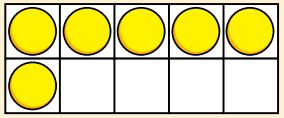
Adult-led learning

Read stories such as *Six Dinner Sid* by Inga Moore.

Use children and props to act out the story.

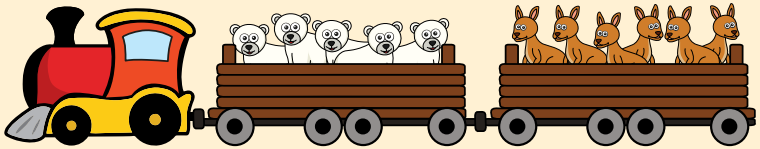
Encourage children to represent how many dinners Sid has eaten each time using counters on a ten frame.





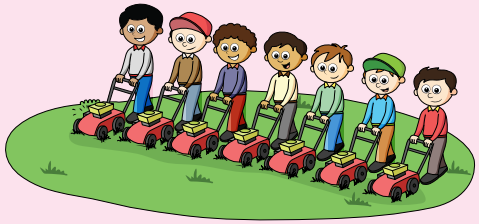
Read stories such as *1, 2, 3 to the Zoo* by Eric Carle with children and stop at the number 8

Act out the story using small world animals.



Encourage children to make their own train to the zoo.

Sing and act out the rhyme *One Man Went to Mow* with children.



Prompt them to build ascending towers to represent the '1 more' pattern.

Encourage children to act out the rhyme independently.

In pairs, children take it in turns to spin a 0–8 spinner.

Prompt them to represent the number with cubes or on a ten frame. Children encourage their partner to represent the number that is 1 more.

Extend this by asking one child to select a number and, without showing their partner, they represent the number that is 1 more. Can their partner tell them what number must be shown on the spinner?

1 less

Notes and guidance

In this small step, children are introduced to the concept of '1 less' with numbers from 0–8

Children begin to understand the relationships between these numbers and notice that, as we count backwards, the numbers get smaller, because we are taking 1 away. To consolidate the stable order principle, prompt children to recognise that the order of the numbers does not change when we count back.

Use stories, rhymes and scenarios that include finding and representing 1 less to support this concept from 8 to zero. Encourage children to count back from 8 to zero and then blast off like rockets to add enjoyment to the start of adult-led activities.

Rhymes

- *Eight in the Bed*

Books

- *Kipper's Toybox* by Mick Inkpen

Key questions

- How many are there?
- How many are there now?
- What is 1 less than _____?
- What is the number before _____?

Possible sentence stems

- There are _____
- There are _____ altogether.
- _____ is 1 less than _____
- 1 less than _____ is _____

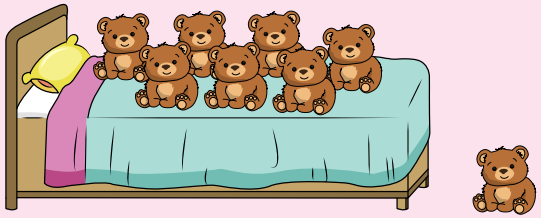
Links to the curriculum

- *Development Matters* – Reception – Understand the 'one more than/one less than' relationship between consecutive numbers.
- *Birth to 5 Matters* – Range 6 – In practical activities, adds one and subtracts one with numbers to 10

1 less

Adult-led learning

Act out the rhyme *Eight in the Bed* with children.



Use counters and a ten frame to represent what happens each time a bear rolls out of the bed. Prompt children to notice the '1 less' pattern as the number decreases. Can they predict what number will come next?

Read stories such as *Kipper's Toybox* by Mick Inkpen with children. Use props to retell the story, showing one toy leaving the toybox each time.

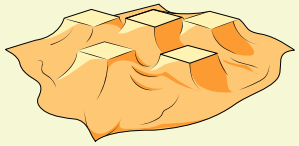
Represent the '1 less' pattern using cubes to make a decreasing staircase model.

Call out a number and prompt children to make a collection of natural objects that represents 1 less than your number.

6

Encourage children to repeat this game independently, with one child calling out the numbers.

Count out six cubes with children and then cover them up so they cannot be seen. Keep the cubes covered but tell children that you are taking away one cube. Ask children how many there are now.



What if we take two cubes away? Encourage children to mark-make to help them to solve the problem.

Composition of 6, 7 and 8

Notes and guidance

In this small step, children explore the composition of numbers to 8

They learn how their skills of perceptual subitising and counting can be used to see and represent the composition of larger numbers in different ways.

Children should be given the opportunity to explore partitioning in many ways with a wide range of objects. Encourage children to find all the ways that they can partition the same number. Prompt children to represent the parts they see, using concrete manipulatives or through mark-making. Providing birthday cards with images that show the cardinal number allows children to make their own number lines that have relevance to them. Children can then be encouraged to explore composition by making their own cards – for example, drawing out the composition of balloons on an 8 card.

Use well-known texts, such as *Quack and Count* by Keith Baker, to point out amounts and then ask children how they see the parts of that number.

Books

- *Quack and Count* by Keith Baker

Key questions

- How many ways can you make 6/7/8?
- What parts can you see?
- What is the whole?

Possible sentence stems

- _____ is a part and _____ is a part.
- The whole is _____
- If _____ is a part, then the other part must be _____
- _____ is a part of _____

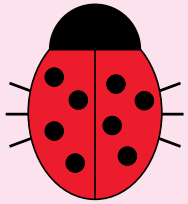
Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Composition of 6, 7 and 8

Adult-led learning

Provide children with blank ladybird templates. Prompt them to use counters to place 6, 7 or 8 spots onto their ladybird.



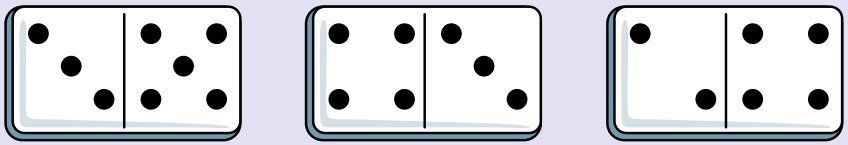
Encourage children to compare their ladybird to a partner's.

What is the same? What is different?

Ask children how many different compositions they can make.

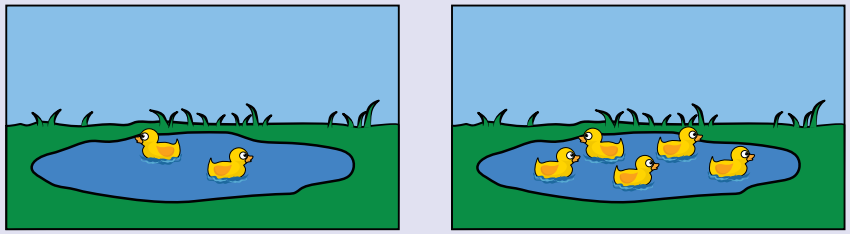
Provide children with a set of dominoes. Ask them to find all the dominoes with 6, 7 or 8 spots in total.

There are four dominoes that total 6, three dominoes that total 7 and three that total 8



What different compositions of 6, 7, or 8 can they find?

Set up a small world scene that includes two parts, such as two fields or two ponds. Prompt children to use sets of 6, 7 or 8 small world animals to explore different compositions. How many animals will go in each part?



Encourage children to find more than one possibility.

Give children 6, 7 or 8 beanbags.

Ask them to throw the beanbags into a bucket.

Prompt them to say how many landed outside the bucket.

Without looking inside, encourage children to say how many must have landed inside the bucket.

Make pairs – odd and even

Notes and guidance

In this small step, children build on their earlier work matching numerals to quantities by now finding and making pairs. They begin to understand that a pair is two. Provide collections of items that come in pairs. Encourage children to arrange quantities into pairs and to notice that some quantities will have an odd one left over with no partner.

Use everyday routines and practical activities, such as talking partners and P.E. games, to point out where we have odd or even amounts. Encourage children to notice pairs and odd and even numbers through games involving matching pairs, such as snap or memory games.

Show children the pair-wise pattern of filling a ten frame and how this can support them to notice odd and even numbers. When objects cannot make a pair, there is an odd number.

Books

- *Simon Sock* by Sue Hendra and Paul Linnet
- *Missing Mittens* by Stuart J. Murphy
- *Noah's Ark*

Key questions

- How many do you have?
- How many do we need to make a pair?
- Is this a pair? How do you know?
- Is this an odd number or an even number?

Possible sentence stems

- I know this is a pair because...
- _____ is an odd/even number because...
- I have _____ groups of 2

Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

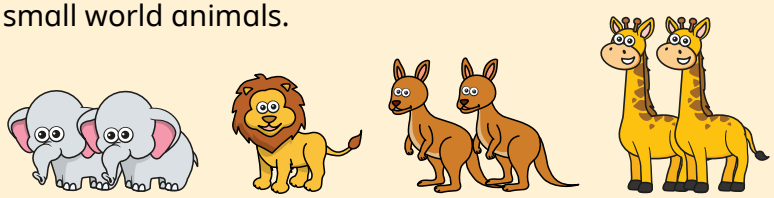
Make pairs – odd and even

Adult-led learning

Read stories such as *Simon Sock* by Sue Hendra and Paul Linnet. Model making pairs with objects such as socks and prompt children to understand that a pair means we have two. Children can make pairs that match or that do not match.

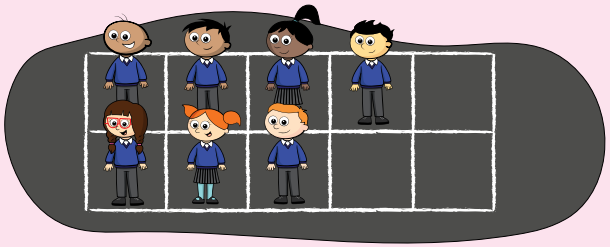
Provide opportunities for them to explore what happens when we have an even or an odd number of socks.

Read traditional stories such as *Noah's Ark*, where the animals go together in pairs. Act out this story with small world animals.

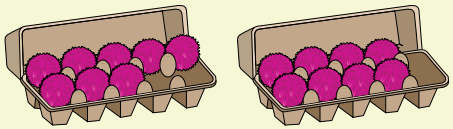


Prompt children to notice when they have an even number of animals and when they have an odd number of animals.

Chalk or tape a large ten frame on the ground. Use children to fill the ten frame in a pair-wise pattern. What do they notice? How many children are there altogether? Are all children in pairs or is there an odd one out?



Provide children with egg boxes with ten dimples and a collection of pom-poms. Prompt children to explore filling the egg boxes in both five-wise patterns and pair-wise patterns with 6, 7 or 8 pom-poms.



Encourage them to talk about what they notice.

What is the same? What is different?

Double to 8 (find a double)

Notes and guidance

In this small step, children are introduced to the concept of doubling and they learn that this means 'twice as many'. They should be given opportunities to see a range of visual representations of doubles and to find them in patterns, in pictures and in arrangements of manipulatives. Encourage children to use familiar equipment to find doubles and make double collections. Books involving doubles are a good way to introduce this concept. It is important for children to build on this skill over time using smaller numbers first.

Prompt children to notice doubles by playing games such as dominoes, where children can use their previous knowledge to match the same number of dots. Model finding doubles, for example, on a dice: "There are 3 here and 3 here, so double 3 makes 6!"

Key questions

- What does double mean?
- Where can you see a double?
- Is this a double or not a double? How do you know?
- What is double _____?

Possible sentence stems

- I have found double _____
- Double _____ is _____
- _____ is double _____

Books

- *Double Dave* by Sue Hendra
- *Minnie's Diner* by Dayle Ann Dodds

Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

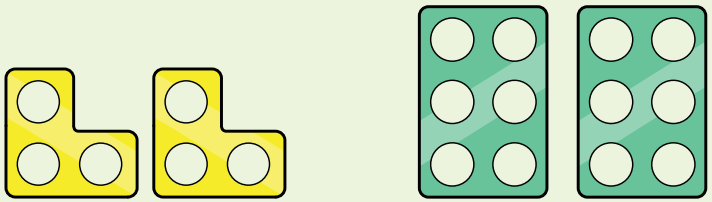
Double to 8 (find a double)

Adult-led learning

Show children images that represent doubles and not doubles.

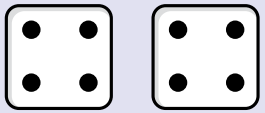
Prompt children to tell you if the representation shows a double or not. How do they know?

Hide a variety of number shapes outside. Give each child one number shape and prompt them to go and find a double by finding another number shape that is the same as theirs.



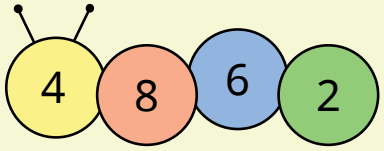
Encourage them to use the sentence stems to talk about the double they have made.

In pairs, provide children with two 0–4 dice. They take it in turns to roll both dice. Prompt children to notice if they have rolled a double or not.



If they do roll a double, then they collect a counter. The first child to collect three counters is the winner.

Play 'Caterpillar Doubles'. Provide a caterpillar game board with the numbers 2, 4, 6 and 8 on the body.



Children roll a 1–4 dice and double the number that the dice lands on. They then place a counter on that number on the caterpillar's body.

The first player to fill their board with counters wins.

Double to 8 (make a double)

Notes and guidance

In this small step, children build on their knowledge of finding a double by now physically making them using manipulatives and their own mark-making. They should be given opportunities to build doubles in many different contexts.

Encourage children to use their fingers and make the same amount on each hand then tap their hands together to show doubles during carpet times.

Building numbers using the pair-wise pattern on ten frames will help children to see the doubles. Mirrors and barrier games are a fun way for children to see doubles as they build and explore early symmetry. Encourage children to say the doubles as they build them, for example, "Double 2 is 4." It is important for children to do this practically and say the double as they are making the representation rather than just reciting number facts.

Provide examples that represent doubles and not doubles for children to sort and explain how they know.

Books

- *Two of Everything* by Lily Toy Hong

Key questions

- What does double mean?
- What double have you made?
- Is this a double or not a double? How do you know?
- What is double _____?

Possible sentence stems

- I have made double _____
- Double _____ is _____
- _____ is double _____

Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Double to 8 (make a double)

Adult-led learning

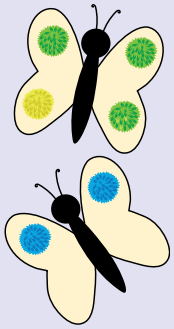
Explain to children that you have a magic doubling pot. When items go in, they are doubled.

As you put items into the pot, prompt children to predict what double will come out.

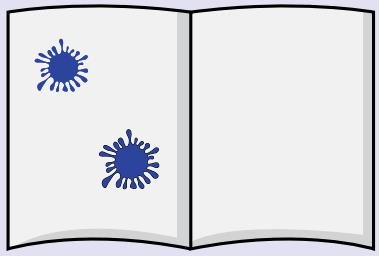
Provide butterfly templates and ask children to use tweezers to place pom-poms on to the wings.

Prompt them to make doubles by adding the same number of pom-poms to each side.

How many different doubles can they make?



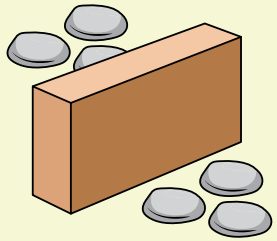
Provide a large piece of paper with a fold down the middle. Encourage children to make doubles by adding spots of paint to only one side of the paper.



Prompt them to fold the paper over to make a double.

Can children predict how many spots there will be now?

Prompt children to sit facing each other in pairs with a barrier between them. Provide them with collections of small items such as pebbles or cubes. Encourage one child to represent a number with the objects.



They show their partner quickly, by lifting the barrier, and then hide the objects again. Their partner then builds the same number. Children remove the barrier and check if they have made a double. Which double have they made?

Combine two groups

Notes and guidance

In this small step, children begin to combine two groups to find how many there are altogether. They should be given opportunities to do this in many contexts using different manipulatives and real-life objects.

Present interesting images for children to look at and point out where they may see the groups. Then encourage children to talk about the groups they see with a partner. Encourage children to subitise where possible, although they may still need to count in ones at this stage to find out how many there are altogether.

Use songs and stories to support bringing two groups of items together. In provision, use real-life objects, such as plates of cream crackers during snack time, to show how two groups can be combined. As children become more confident, support them to show you how they can combine their own groups and to explain their thinking.

Books

- *Don't Forget the Bacon!* by Pat Hutchins

Key questions

- How many can you see?
- How many are there in each group?
- How many are there altogether?

Possible sentence stems

- There are _____ here and there are _____ there.
- There are _____ altogether.
- _____ and _____ make _____

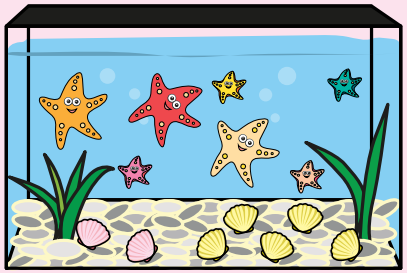
Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Combine two groups

Adult-led learning

Show children pictures that provide opportunities for combining two groups.



How many can children see in each group? How many are there altogether?

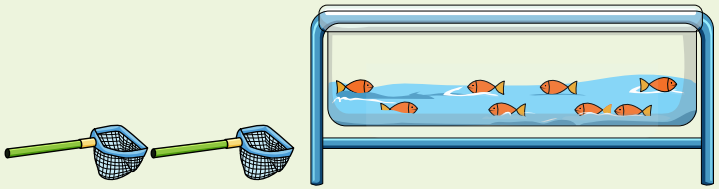
Provide a set of dominoes that include all those with a total of up to 8 spots. Also provide a 'car park' with numbered spaces.

0	1	2	3	4	5	6	7	8

Prompt children to take it in turns to select a domino and to find the total number of spots. They then place the domino in the correct parking space.

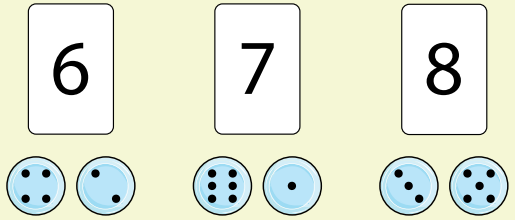
Place up to eight fish in a water tray.

In pairs, prompt children to use nets to scoop up some of the fish.



How many fish does partner 1 have? How many does partner 2 have? How many fish do they have altogether?

Provide children with dot plates that show 1–6 dots and numeral cards 6, 7 and 8



Prompt children to arrange all six dot plates so that they have two plates that total 6 dots, two plates that total 7 dots and two plates that total 8 dots. Encourage them to explore whether there is more than one way.

Conceptual subitising

Notes and guidance

In this small step, children are taught to use their skills of perceptual subitising to recognise the groups within numbers greater than 5, allowing them to conceptually subitise. This is the ability to identify a whole quantity by subitising the smaller quantities that make up the whole number. This skill will support children to develop mental images for addition and subtraction, which helps them to move away from counting on and counting back.

Prompt children to recognise a number by grouping it into small sets. Ask them to say the whole number first and then how they knew by naming the two parts or more that they saw. Model conceptual subitising to children by using stem sentences, for example, "I can see 8. There are 4 here and 4 there. There are 8 altogether."

Use dot plates with two colours to support children to see the two groups within the whole.

Books

- *The Snail and the Whale* by Julia Donaldson

Key questions

- What do you see?
- How do you see it?
- What parts can you see?
- How many are there altogether?

Possible sentence stems

- I can see _____ here and _____ there.
- There are _____ altogether.
- _____ is a part and _____ is a part.
- The whole is _____

Links to the curriculum

- *Development Matters* – Reception – Subitise.
- *Birth to 5 Matters* – Range 6 – Begins to conceptually subitise larger numbers by subitising smaller groups within the number, e.g. sees six raisins on a plate as three and three

Conceptual subitising

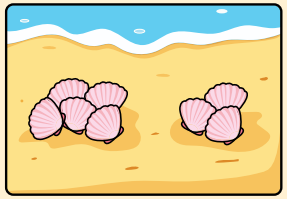
Adult-led learning

Provide children with a set of dot plates showing 0–8 dots arranged in different ways. Support children to see two parts by using two different-coloured dots.

Hold up the dot plates and ask children what groups they can see. How many dots are there altogether?

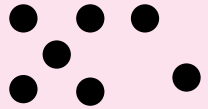
Encourage children to show the correct number of fingers or to show the correct numeral.

Read stories such as *The Snail and the Whale* by Julia Donaldson. Encourage children to subitise the smaller groups they can see and combine them to find how many there are altogether.



Show children different arrangements of dots up to 8

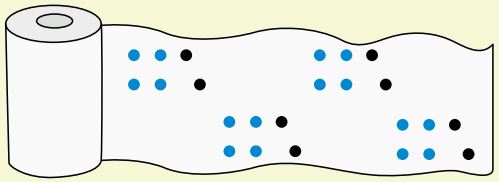
Ensure that you include the same number arranged in different ways.



Ask children what they see and how they see it. Does everyone see it the same way or are there different ways?

In pairs, encourage children to make their own dot arrangements using up to 8 counters. Can their partner say what they can see?

Provide children with different dot arrangements and two different coloured pens.

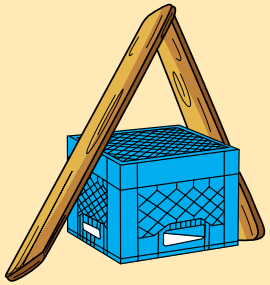


Prompt them to draw around the dots to show two groups. Is there more than one way to do this?

Children could also show more than two groups.

Continuous provision

Prompt children to make 8 houses on a street out of loose parts or construction resources.

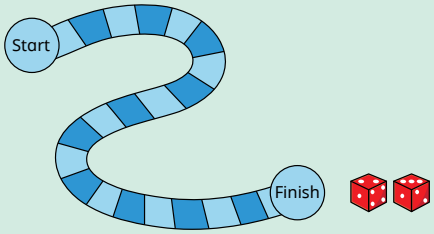


Encourage them to take on the role of a postal worker and deliver a number of parcels to each house on the street. Children recognise the numerals of the house numbers and deliver the corresponding number of parcels, for example, 7 parcels to house number 7

Enhance provision with a variety of resources with which children can make different arrangements. For example, they could pair up socks on a washing line, or arrange finger puppets or small world animals into pairs.

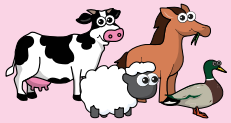
Prompt children to look at the different compositions they can see within groups. Also, encourage children to talk about odd and even numbers.

Provide simple board games and two 1–4 dice.



Children roll both dice and move the required number of spaces on the board. Ask them which two numbers they have rolled and prompt them to combine them to find the total number.

Provide children with mirrors for them to explore doubling quantities of objects or counters.



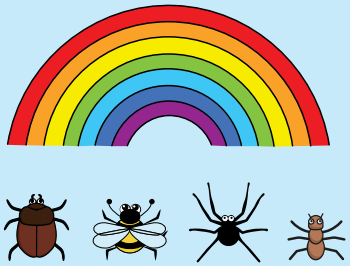
Children represent a number from 1 to 4 with objects and then use the mirror to double it.

Can they say what double they have made?

End of block checkpoint

Checkpoint 1

Provide images of rainbows, insects and spiders to inspire children to recreate these in mark-making and art provision.

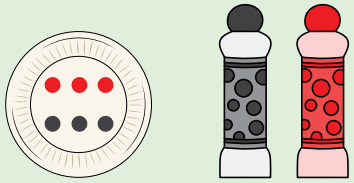


Can children represent 6, 7 and 8 and talk about their creations accurately? This could be used for looking at composition and doubling on ladybirds and butterflies.

Checkpoint 2

Provide children with paper plates and two different-coloured dabbers.

Prompt them to create their own dot plates for the numbers 0–8, using the two colours to show two parts within the whole.



Can children talk about the parts and the whole?

Checkpoint 3

Provide ladybirds with up to 8 spots in different arrangements.

Ask children to choose one ladybird. How many spots does it have altogether? Prompt children to find a ladybird with the same number of spots but in a different arrangement. Can they find a ladybird with 1 less spot and a ladybird with 1 more spot?

Spring Block 4

Length, height and time

White Rose MATHS

Teacher guidance

Key books

- *Superworm* by Julia Donaldson
- *Actual Size* by Steve Jenkins
- *Jim and the Beanstalk* by Raymond Briggs
- *I Can Only Draw Worms* by Will Mabbitt
- *Titch* by Pat Hutchins
- *Tall* by Jez Alborough
- *Jack and the Beanstalk*
- *The Giraffe Who Got in a Knot* by Paul Geraghty and John Bush
- *Five Minutes' Peace* by Jill Murphy
- *Mr Wolf's Week* by Colin Hawkins
- *A Dark, Dark Tale* by Ruth Brown
- *Jasper's Beanstalk* by Nick Butterworth

Top tips

- Having calendars, timers and clocks around the provision helps support children to reference time.

Key resources

Small steps

Step 1	Explore length
Step 2	Compare length
Step 3	Explore height
Step 4	Compare height
Step 5	Talk about time
Step 6	Order and sequence time

Explore length

Notes and guidance

In this small step, children are encouraged to explore objects and begin to use the language of length to describe them.

Begin this process by exploring and describing two objects so that children can see 'long' and 'not long', and 'short' and 'not short'. Ensure that resources in provision are varied and allow children to start to make simple comparisons to develop a sense of 'long and short'. Encourage children to physically move objects so they can see the difference. By using materials such as dough, children can see that materials can be changed by stretching them to make them longer.

Children should be shown how to make the ends of objects line up so that they can see the difference and should be taught that 'length' is the distance between two points. Encourage children to make collections of similar objects, such as sticks outside, to support them in gaining an understanding of length.

Books

- *Superworm* by Julia Donaldson
- *Actual Size* by Steve Jenkins

Key questions

- Which object is long/short?
- Have you found the longest _____?
- Have you found the shortest _____?

Possible sentence stems

- The _____ is long/short.
- This is the longest _____.
- This is the shortest _____.

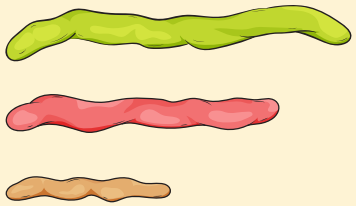
Links to the curriculum

- Development Matters – Reception – Compare length, weight and capacity.
- *Birth to 5 Matters* – Range 6
  - Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy
  - Becomes familiar with measuring tools in everyday experiences and play

Explore length

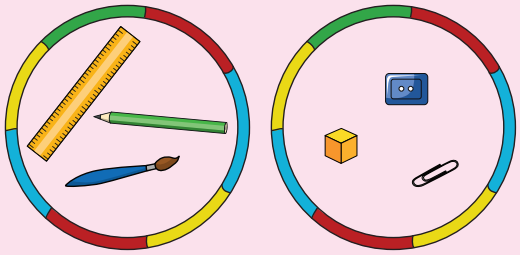
Adult-led learning

After reading books such as *Superworm* by Julia Donaldson, prompt children to use dough to make worms of different lengths.



Encourage them to make a long worm and a short worm. What is the longest worm they can make?

Prompt children to hunt for objects around the classroom. Encourage them to look for long objects, such as a long pencil, or short objects, such as a paper clip.

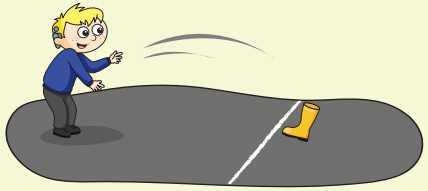


Sort objects into two hoops: a hoop of long objects and a hoop of short objects.

Go on a hunt for (or hide) sticks of different lengths in the outdoor environment. Prompt children to collect and sort the sticks. Encourage them to make a pile of short sticks and a pile of long sticks.

Do we have more short sticks than long sticks or more long sticks than short sticks?

Give each child a small object, such as a beanbag or welly. Challenge children to throw the object as far as they can. Who has thrown their item the furthest? How could we check?



Encourage children to record their distances using their own methods. Have them throw their item again – did they manage to throw it further this time?

Compare length

Notes and guidance

In this small step, children build on their explorations of length to now make comparisons.

Encourage children to use more specific vocabulary to describe an object, such as 'longer than' or 'shorter than' something else. Encourage children to make indirect comparisons using non-standard objects, such as blocks or cubes, to measure items, for example, "The sand tray is four blocks long."

A good way for children to explore the concept of length is by representing their thinking using their own mathematical graphics in mark-making. Encourage them to explain their ideas as they draw these representations.

Reading stories that involve using simple measuring equipment and enacting these scenarios, will encourage children to use the language and actions of measure in their play and own investigations.

Books

- *Jim and the Beanstalk* by Raymond Briggs
- *I Can Only Draw Worms* by Will Mabbitt

Key questions

- Which object is longer? How do you know?
- Which object is shorter? How do you know?
- Which objects are the same length as _____?
- How do you know that this one is the longest/shortest?

Possible sentence stems

- The _____ is longer/shorter than the _____.
- The _____ is the same length as the _____.

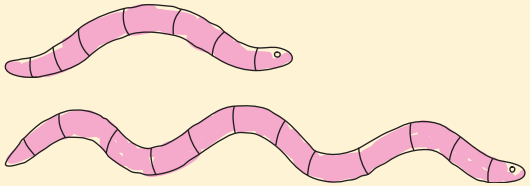
Links to the curriculum

- Development Matters – Reception – Compare length, weight and capacity.
- *Birth to 5 Matters* – Range 6
  - Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy
  - Becomes familiar with measuring tools in everyday experiences and play

Compare length

Adult-led learning

After reading books such as *I Can Only Draw Worms* by Will Mabbitt, explore mark-making with children by prompting them to draw their own worms. This could be on a large scale outside using chalk or inside on a smaller scale.

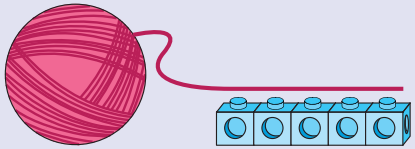


Who can draw a worm longer than mine? Who can draw a shorter worm?

Provide children with ribbons of different lengths, widths and colours. Prompt them to line up the lengths of ribbon in order from longest to shortest.

Challenge children further by showing them a specific length of ribbon and asking them to find a ribbon that is longer or shorter.

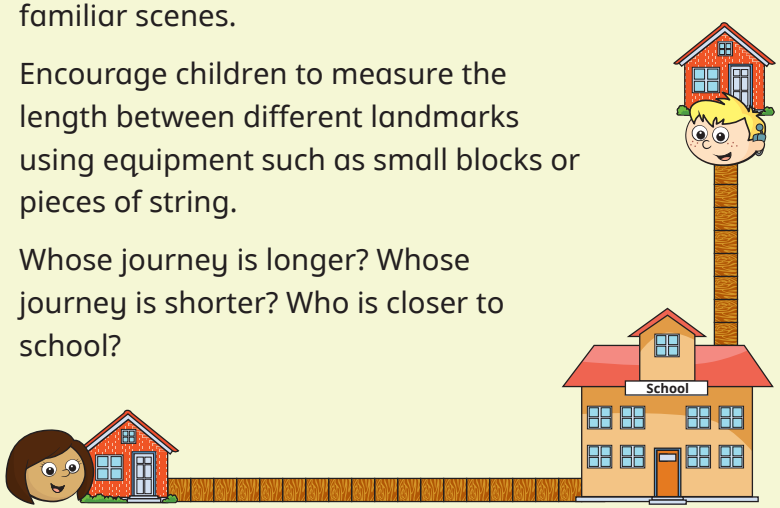
Provide children with wool or string. Prompt them to carefully use scissors to cut the wool to make worms or snakes of different lengths. Encourage children to use equipment such as cubes to measure and compare their worms or snakes.



Use small world resources to create different familiar scenes.

Encourage children to measure the length between different landmarks using equipment such as small blocks or pieces of string.

Whose journey is longer? Whose journey is shorter? Who is closer to school?



Explore height

Notes and guidance

In this small step, children build on the skills they have developed when exploring and comparing length by now exploring height.

Support children to understand that height is a type of length. Children should be introduced to the language of both 'short' objects and 'tall' objects through experiences. Going on walks and seeing buildings and trees that are tall in comparison to themselves and to other objects is a way to support this.

Children will have little concept of their own size to begin with, so drawing around each other and then holding the paper up is a good way for children to recognise how tall they are. Join children in their play to make tall towers and short towers in box modelling or construction, modelling the language of height. Reading stories that use this language will support children to become familiar with the concept of height so that they can then demonstrate this in their play.

Books

- *Titch* by Pat Hutchins
- *Tall* by Jez Alborough
- *Jack and the Beanstalk*

Key questions

- Which object is tall/short?
- Who/what is the tallest?
- Who/what is the shortest?

Possible sentence stems

- The _____ is tall/short.
- I have a tall _____.
- I have a short _____.

Links to the curriculum

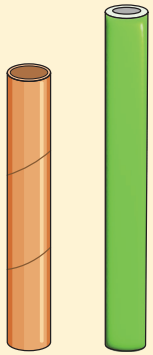
- Development Matters – Reception – Compare length, weight and capacity.
- *Birth to 5 Matters* – Range 6
  - Enjoys tackling problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy
  - Becomes familiar with measuring tools in everyday experiences and play

Explore height

Adult-led learning

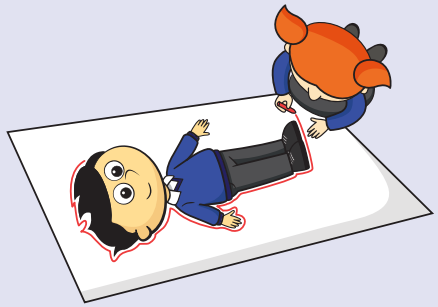
After reading the story *Jack and the Beanstalk*, support children to explore different heights by making their own beanstalk. Provide children with rolled up paper, tubes and recyclable junk modelling to use for building.

Who can make a tall beanstalk? Who can make a short beanstalk?



Provide children with large pieces of paper on the floor. Prompt them to lie down on the paper and help them to draw around each other.

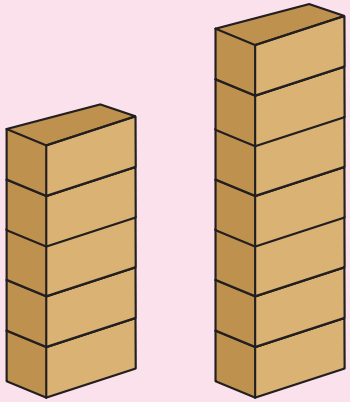
Pin the paper up to support children to see how tall they are.



Prompt children to use a range of materials to build a tower. Challenge them to build a tower the same height as yours, a shorter tower and a taller tower.

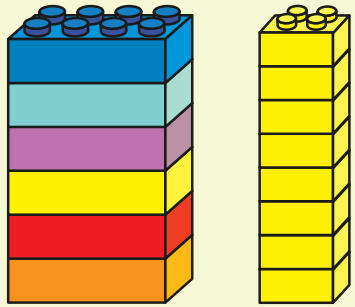
What is the tallest tower they can build?

Support children by modelling effective methods for building taller structures.



Put children into pairs and ask them to build a tower. How tall can they build their tower before it falls down?

Support them to build a tower the same height as their partner's tower and record how many bricks there are in each.



Discuss that two towers the same height can have different amounts of bricks.

Compare height

Notes and guidance

Following on from exploring height, in this small step, children move on to using the language 'tallest', 'shortest', 'taller' and 'shorter' to make comparisons.

Demonstrate how objects and children themselves can be ordered according to height. This can begin with two objects and then extend to ordering more, such as a group of children in the class. Support children in their comparisons by building towers as tall as a partner's tower or as tall as different animals.

Use non-standard units, such as crates, to take learning outside and explore bigger structures. If supported and encouraged by adults in provision areas, children will compare and discuss length and height, using the language of each interchangeably in their play.

Key questions

- Which object is taller? How do you know?
- Which object is shorter? How do you know?
- Who/which is the tallest? How do you know?
- Who/which is the shortest? How do you know?

Possible sentence stems

- _____ is taller than _____.
- _____ is shorter than _____.
- The _____ is the same height as the _____.
- The _____ is the shortest.
- The _____ is the longest.

Books

- *The Giraffe Who Got in a Knot* by Paul Geraghty and John Bush
- *Jack and the Beanstalk*
- *Actual Size* by Steve Jenkins

Links to the curriculum

- Development Matters – Reception – Compare length, weight and capacity.
- Birth to 5 Matters – Range 6 – Becomes familiar with measuring tools in everyday experiences and play

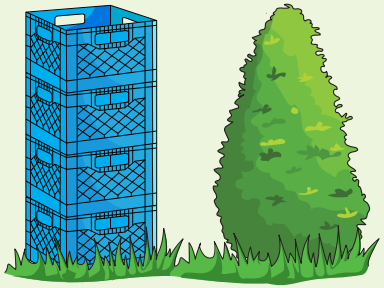
Compare height

Adult-led learning

Choose two children to stand side by side. Ask the rest of the class which child is taller. How do they know? Ask who is shorter. How do they know? Repeat with other pairs of children.

Task children to find a partner who is taller or shorter than them.

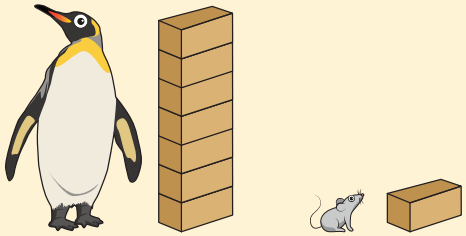
Use crates to measure different structures and fauna outside, such as climbing frames, small trees and bushes. Compare the different heights. Encourage children to make their own choices about what or who to measure.



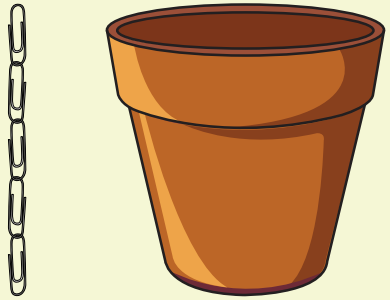
How many crates tall is the teacher compared to the sunflower?

After exploring books such as *Actual Size* by Steve Jenkins, display actual size pictures of various animals in the construction area.

Encourage children to make a tower as tall as a penguin. How is it different to a tower as tall as a mouse?



Encourage children to use simple non-standard units to measure the heights of different objects. For example, use paperclips strung together to measure the height of a pot.



Talk about time

Notes and guidance

In previous steps, children will have already begun to understand simple time differences, such as night and day. In this small step, children are encouraged to talk about time in more detail.

Support children by giving them reference points, such as photographs of events on a journey wall or in a book, so that they can recall past experiences and notice seasonal change. Discuss what is happening tomorrow, next week or at the weekend to support children to talk about the more immediate future.

To give children a concept of time passing, make regular references to time in daily routines, sing songs such as *Days of the Week* and recall the days that have passed.

Rhymes

- *Days of the Week*

Books

- *Five Minutes' Peace* by Jill Murphy
- *Mr Wolf's Week* by Colin Hawkins

Key questions

- What can you do in one minute?
- How long does it take you to ...?
- What is happening this evening/tomorrow/next week/at the weekend?
- What happened yesterday/last week/last month/last year?

Possible sentence stems

- I can do _____ in one minute.
- It takes me _____ to...
- Tomorrow we will...
- Yesterday we ...

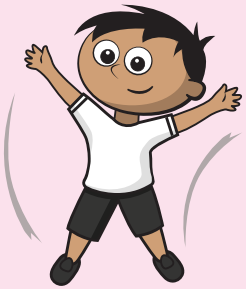
Links to the curriculum

- *Development Matters* – 3 and 4-year-olds – Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'
- *Birth to 5 Matters* – Range 6 – Is increasingly able to order and sequence events using everyday language related to time

Talk about time

Adult-led learning

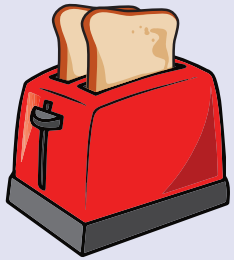
After reading stories such as *Five Minutes' Peace* by Jill Murphy, challenge children to see how many tasks they can complete in one minute.



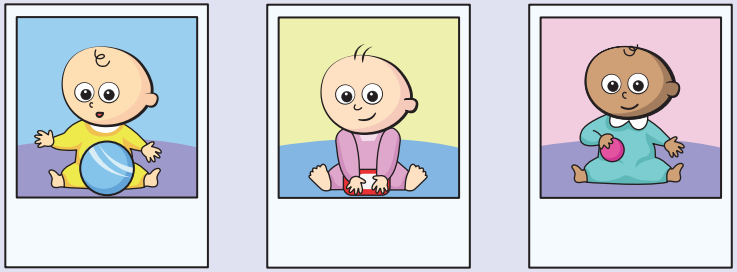
For example, how many star jumps they can do or how many times they can write their name.

During snack time, supervise children to make toast. How does the bread change when you toast it?

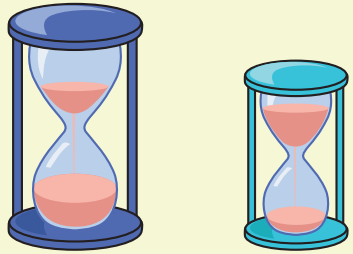
How long does the toast need to be in the toaster to make it golden? What happens if it is toasted for too long? What happens if it is not toasted for long enough?



Ask children and key adults to bring in a photograph of themselves from when they were younger. Prompt them to look at the photos carefully – whose picture is whose? How have they changed?



Provide a range of timers that measure different units of time. Encourage children to explore measuring time in a variety of ways. How many star jumps can they do in 30 seconds or how many beanbags can they throw into the hoop in one minute?



Challenge them to use the timer to measure how long it takes to do various activities.

Order and sequence time

Notes and guidance

In this small step, children are encouraged to use simple strategies to discuss time and then progress to ordering and sequencing simple events. Use calendars to mark off the days leading up to special events to help to show the passing of time. Children will not yet understand standard units of time; however, pointing out when key events are happening, such as the clock showing twelve for lunchtime, can help to develop this. Use real life scenarios to support children to sequence events that require a time, such as baking or preparing snack. Enacting stories that follow a sequence of events or the days of the week will support children to sequence time in simple ways.

Rhymes

- *Days of the Week*

Books

- *A Dark, Dark Tale* by Ruth Brown
- *Jasper's Beanstalk* by Nick Butterworth
- *Mr Wolf's Week* by Colin Hawkins

Key questions

- What did we do yesterday/last week?
- What will we do tomorrow/next week/at the weekend?
- What will we do before/after school?

Possible sentence stems

- Tomorrow is/yesterday was _____.
- First/then/after we will...
- There are _____ days/sleeps until _____.

Links to the curriculum

- *Development Matters* – 3 and 4-year-olds – Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'
- *Birth to 5 Matters* – Range 6
  - Is increasingly able to order and sequence events using everyday language related to time
  - Beginning to experience measuring time with timers and calendars

Order and sequence time

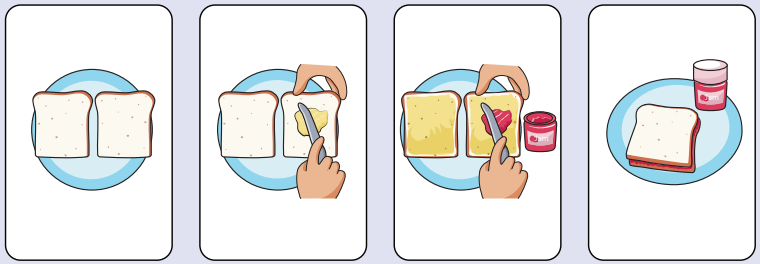
Adult-led learning

Use stories such as *Mr Wolf's Week* by Colin Hawkins or *Jasper's Beanstalk* by Nick Butterworth to support children's learning of the days of the week. Sequence the days of the week and ask children to order and match the key events or pictures from the story to the correct day.

Sing the *Days of the Week* song. Sequence the days of the week to make a class timetable. Order key events that happen on certain days during the week, such as P.E. Place these on the correct days on the weekly timetable.

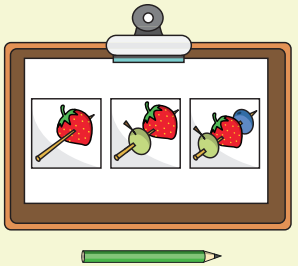
Mon	Tues	Wed	Thurs	Fri	Sat	Sun
			P.E.			

Carry out a simple task such as making a sandwich. Sequence a set of pictures that show instructions of how to carry out the task.



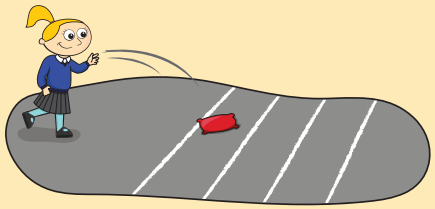
Prompt children to discuss what we need to do 'first', 'next', 'then', 'after' and 'finally'.

Encourage children to think of their own set of instructions for completing a simple task, such as making a drink or snack. Prompt them to draw pictures in the correct sequence or to take photographs in the correct order.



Continuous provision

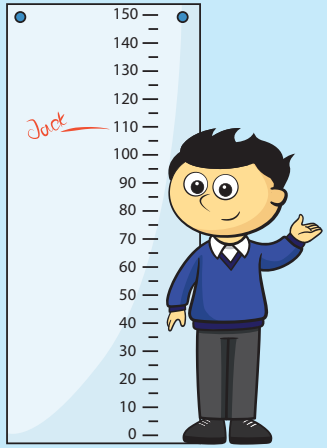
Mark different lengths on the ground using chalk or masking tape.



Encourage children to see how far they can throw their welly or beanbag. Children can compare how far they threw their welly to how far a partner threw theirs. Who has the longest throw?

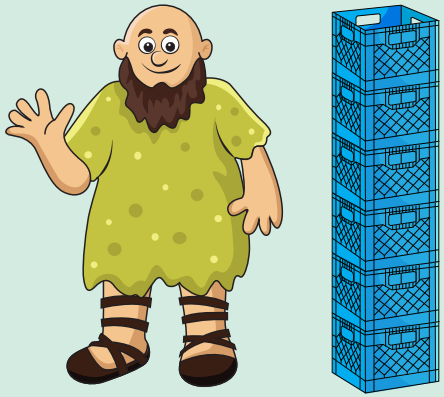
Set up a class height chart and encourage children to stand next to the wall and mark each other's height.

Prompt them to use the language of height to compare the height of different children.

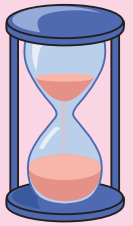


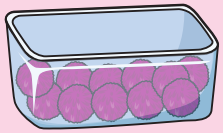
A giant has been in the classroom and has bumped into the walls, leaving marks. How tall could the giant be?

Provide children with non-standard units for them to measure and predict how tall the giant is.



Set up a timer station in provision with timers of different durations and a range of loose parts to fill containers with. Encourage children to fill containers for the duration of the timer.



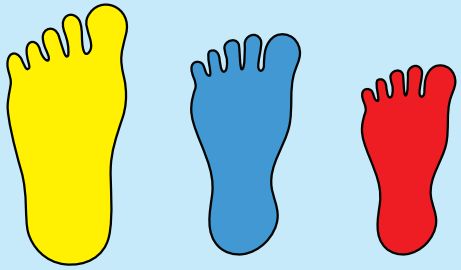


How much can you fill the container before the timer stops?

End of block checkpoint

Checkpoint 1

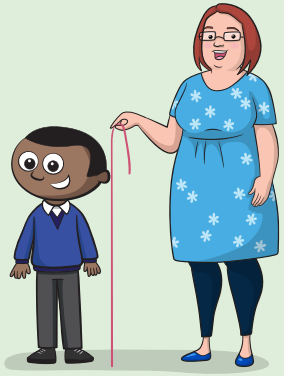
Support each child to make their own footprint. Are they able to find items which are longer than, shorter than or the same size as their foot?



Are children able to use the language of length to compare and order the footprints?

Checkpoint 2

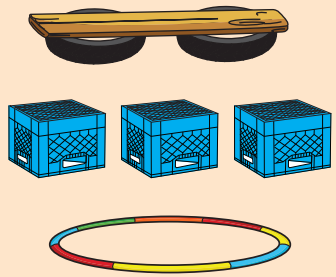
Measure the height of some children using string. Choose one of the pieces of string and play a game of 'Who could it be?'.



Are children able to use the language of height to talk about who is the same height as the piece of string?

Checkpoint 3

Provide children with a range of picture cards showing different obstacles. Encourage children to sequence the pictures to make a set of instructions for a partner using the language 'first', 'then', 'next', 'after', and 'finally'.



Children follow the instructions in the correct order to complete the obstacle course.

Spring Block 5

Building 9 and 10

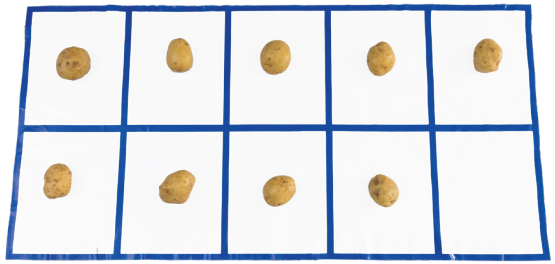
White Rose MATHS

Teacher guidance

Key books

- *Nine Naughty Kittens* by Linda M. Jennings
- *Ten Little Fingers and Ten Little Toes* by Mem Fox
- *Cockatoos* by Quentin Blake
- *How Do Dinosaurs Count to Ten?* by Jane Yolen
- *The 'Ten Little ...' series* by Mike Brownlow
- *Anno's Counting Book* by Mitsumasa Anno
- *One Duck Stuck* by Phyllis Root
- *Mouse Count* by Ellen Stoll Walsh
- *Ten in the Bed* by Penny Dale
- *One Gorilla* by Anthony Browne
- *Mr Willy-Nilly and Zoey's Dream* by Ji-yun Shin
- *Pete the Cat and the Missing Cupcakes* by Kimberly and James Dean
- *Ten Black Dots* by Donald Crews
- *Two of Everything* by Babette Cole
- *Double the Ducks* by Stuart J. Murphy
- *One Odd Day* by Doris Fisher and Dani Sneed

Key resources



Small steps

Step 1	Find 9 and 10
Step 2	Compare numbers to 10
Step 3	Represent 9 and 10
Step 4	Conceptual subitising to 10
Step 5	1 more
Step 6	1 less
Step 7	Composition to 10
Step 8	Bonds to 10 (2 parts)

Small steps

Step 9	Make arrangements of 10
Step 10	Bonds to 10 (3 parts)
Step 11	Doubles to 10 (find a double)
Step 12	Doubles to 10 (make a double)
Step 13	Explore even and odd

Find 9 and 10

Notes and guidance

In this small step, children explore different representations of 9 and 10

As in previous blocks, the focus is on finding the representations rather than making them. Start by ensuring children can confidently say the number names 'nine' and 'ten'. Once they can do this, they will match the verbal number names to numerals and quantities.

Encourage children to count to 10 using objects in different arrangements by touching each object as they count. They should recognise that the final number they say is the quantity in that set.

Share stories and pictures that represent 9 and 10 and have children point out the groups they see. Encourage children to find objects in provision and notice groups of 9 and 10 as well as the numerals. This will prepare children to then be able to make their own representations as they have become so familiar with seeing 9 and 10 in different ways.

Books

- *Nine Naughty Kittens* by Linda M. Jennings
- *Ten Little Fingers and Ten Little Toes* by Mem Fox

Key questions

- Where can you see 9/10?
- How many ways can you find 9/10?
- How many are there altogether?

Possible sentence stems

- I counted/I see _____
- There are 9/10 _____.

Links to the curriculum

- *Development Matters* – Reception
  - Count objects, actions and sounds.
  - Link the number symbol (numeral) with its cardinal number value.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - Estimates (of) numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Find 9 and 10

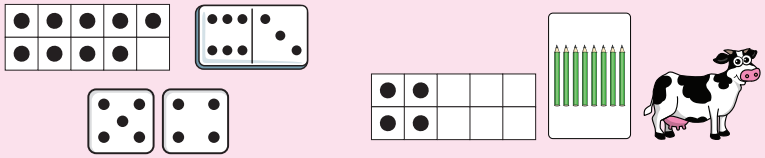
Adult-led learning

Read stories such as *Nine Naughty Kittens* by Linda M. Jennings and *Ten Little Fingers and Ten Little Toes* by Mem Fox with children.

Prompt children to look at the illustrations and identify where they can see the different representations of 9 and 10

Provide children with a range of representations or picture cards showing 9 and not 9

Prompt children to sort the different representations into groups that show '9' and 'not 9'

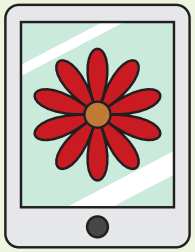


Repeat this activity with representations of 10

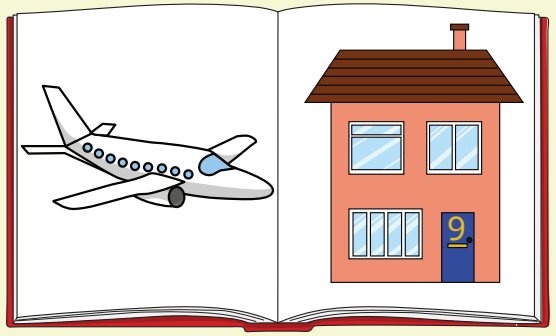
Go on a number hunt in the outdoor environment.

Prompt children to identify where they can see 9 and where they can see 10

Support children to take photographs of the different things they see.



Encourage children to look at books in the book area or library. Challenge them to independently find where they can see 9 and 10 in pictures or where they can spot the numeral.



Compare numbers to 10

Notes and guidance

In this small step, children continue to make comparisons with the numbers and amounts to 10

Encourage children to compare amounts directly by lining the items up with one-to-one correspondence. Through exploring comparison, they will develop an understanding of equivalence and non-equivalence. They understand that when making comparisons, a set can have more items, fewer items, or the same number of items as another set.

Model counting each set carefully and make comparisons by comparing the position in the counting order. As children's sense of number develops, so does their knowledge of where each number sits on a mental number line in relation to other numbers. They begin by comparing two quantities and progress to ordering three or more quantities.

Children may also naturally begin to subitise and compare 9 and 10 on ten frames.

Books

- *Cockatoos* by Quentin Blake

Key questions

- How many different ways can you find 9/10?
- How many did you count? How do you know?
- Which has more? Which has fewer?

Possible sentence stems

- _____ has more/fewer than _____.
- There are more/fewer _____ than _____.
- There are the same number of _____.

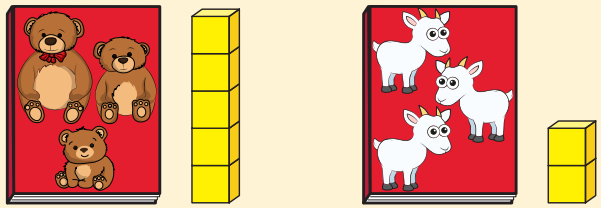
Links to the curriculum

- *Development Matters* – Reception – Compare numbers.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - Estimates (of) numbers of things, showing understanding of relative size

Compare numbers to 10

Adult-led learning

Ask children questions to make comparisons for a purpose. Set up a voting station for them to vote for their favourite book. Display two books and ask children to place a cube next to their favourite. Compare the number of votes by building towers using the cubes. Which is the most popular book?



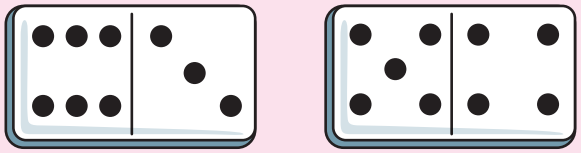
Grab a handful of buttons from a pile of up to 10

Ask children to guess how many you could be holding and check by putting them onto a ten frame.

Prompt children to see how many buttons they can hold in one hand and compare with their partner.

Who has more? Who has fewer? Who has the same?

Provide children with sets of dominoes. Prompt them to sort the dominoes into sets with 9 spots, more than 9 spots and fewer than 9 spots.



Repeat the activity for 10 spots.

After reading stories such as *Cockatoos* by Quentin Blake, compare the number of different characters on the pages.

How many more are there on one page compared to the next page?

Represent 9 and 10

Notes and guidance

In this small step, children further explore representations of 9 and 10 and represent them in different ways. Provide opportunities for children to embed the counting principles when counting to 9 and 10 forwards and backwards. Remind them to touch each object as they count and that the final number they say is the quantity of the set. Encourage children to count and subitise as a way of checking their representations.

Extend how children represent 9 and 10 and support the abstraction principle by including movements such as claps or clicks. Cue children to listen to the number of sounds when banging a drum up to 10 times, and prompt children to show the number of beats on their fingers.

Rhymes

- *Ten Currant Buns*

Books

- *How Do Dinosaurs Count to Ten?* by Jane Yolen
- *The 'Ten Little ...' series* by Mike Brownlow

Key questions

- How many are there? How many are there now?
- How many different ways can you show 9/10?

Possible sentence stems

- There are 9/10 _____.
- There are _____ altogether.

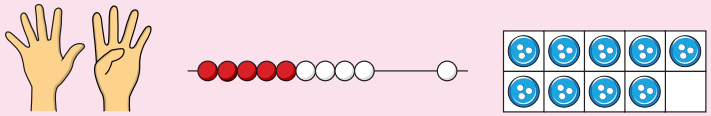
Links to the curriculum

- *Development Matters* – Reception
  - Count objects, actions and sounds.
  - Link the number symbol (numeral) with its cardinal number value.
- *Birth to 5 Matters* – Range 6
  - Matches the numeral with a group of items to show how many there are (up to 10)
  - Estimates (of) numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Represent 9 and 10

Adult-led learning

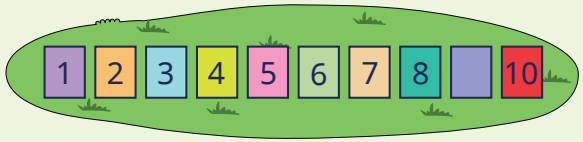
Prompt children to represent 9 and 10 on their fingers. What do they notice? Do they need to count their fingers?



Encourage them to show 9 and 10 in a range of different ways, such as with a bead string, with cubes or with buttons on a ten frame.

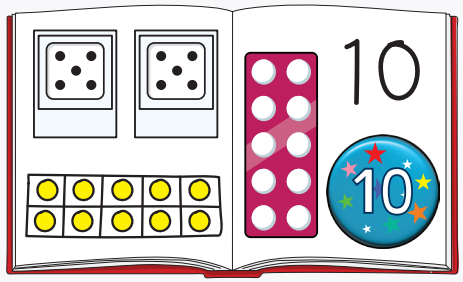
In the outdoor environment, hold up a numeral card from 1 to 10 and ask children to do the corresponding number of actions, such as 9 bunny hops.

Encourage children to help you order digit cards from 1 to 10



Hide one of the cards and prompt children to work out which number is missing.

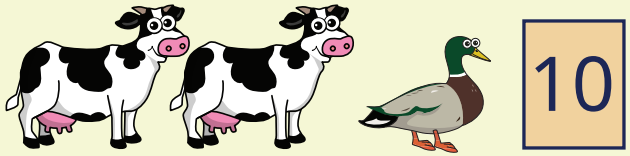
Make a class counting book that shows different representations of the numbers from 1 to 10



Children could draw pictures or stick in photographs of objects to represent each number.

Prompt children to talk about how they have represented each number.

Encourage children to represent 9 and 10 in different ways using objects from around the classroom.



For example, they could show 10 legs using two cows and one duck. Ask children to explain why they have chosen those objects.

Conceptual subitising to 10

Notes and guidance

In this small step, children develop their conceptual subitising skills and start to recognise the groups in numbers to 10

Children use conceptual subitising to identify a whole quantity within 10 by subitising the smaller groups that make up that number. This skill will support children to develop mental images for addition and subtraction, which helps children to move away from counting on and counting back.

Prompt children to recognise a number by grouping it into smaller sets and then saying each amount before confirming the whole number. Use dot plates to support children to see two or more groups within the whole. Encourage children to mark-make and print with bingo dabbers to represent the numbers to 10. They can then subitise where they see smaller groups and draw around them.

Ensure children are given opportunities for developing subitising skills outside as well as inside so these activities are practical and fun.

Books

- *Anno's Counting Book* by Mitsumasa Anno

Key questions

- What do you see? How do you see it?
- What is the whole?
- What are the parts?

Possible sentence stems

- The whole is _____
- _____ is a part and _____ is a part (and _____ is a part).
- I see _____ and _____
- There are _____ altogether.
- If _____ is a part, then the other part must be _____

Links to the curriculum

- *Development Matters* – Reception – Subitise.
- *Birth to 5 Matters* – Range 6 – Begins to conceptually subitise larger numbers by subitising smaller groups within the number, e.g. sees six raisins on a plate as three and three

Conceptual subitising to 10

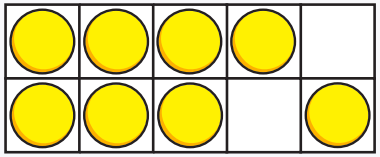
Adult-led learning

Provide children with a range of dot plates to 10

Ask children to talk about what they see and how they see it. Encourage them to talk about the groups they can see within the whole.

Show children an arrangement of up to 10 counters on a ten frame. After a few seconds, hide it and encourage children to build what they saw on their own ten frame.

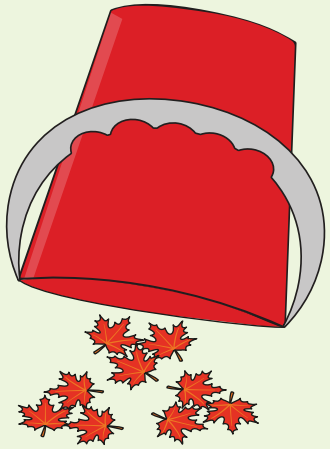
What number was represented and how do they know?



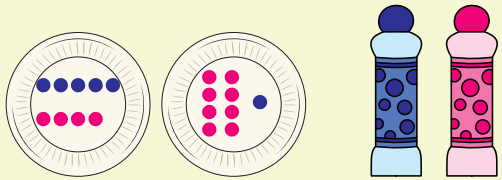
Encourage them to talk about the groups they can see within the whole.

Arrange some objects under a blanket or bucket. Reveal the objects and ask children what they see. Prompt them to use a swatter to swat the correct numeral on number cards arranged around the outdoor area.

Encourage children to talk about what they see and how they see it.



Provide children with paper plates and bingo dabbers of two different colours. Prompt them to make their own two-colour dot plates.



Encourage children to represent the same number in more than one way.

1 more

Notes and guidance

In this small step, children build on their skills of finding '1 more' with numbers to 8 by now recognising this pattern with the numbers to 10

Children understand that as they count on, each number is 1 more than the previous number. They become aware of consecutive numbers and see that amounts increase in size when 1 more is added. They should recognise that the order of numbers when counting does not change and have the stable order principle embedded with the numbers up to 10

Read stories that include the '1 more' pattern and support children to notice and make comparisons as they play in provision.

Rhymes

- *One Potato, Two Potato*

Books

- *One Duck Stuck* by Phyllis Root
- *Mouse Count* by Ellen Stoll Walsh

Key questions

- What is 1 more than _____?
- How many are there now?
- What is the number after _____?

Possible sentence stems

- The number after _____ is _____
- _____ is 1 more than _____

Links to the curriculum

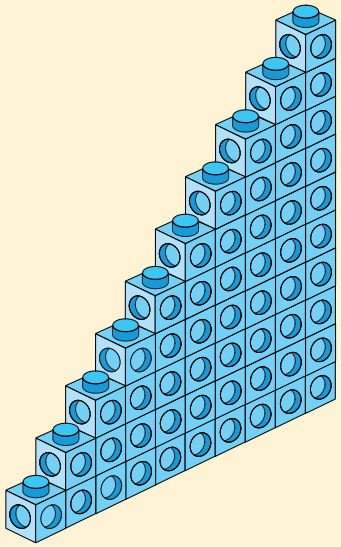
- *Development Matters* – Reception – Understand the 'one more than/one less than' relationship between consecutive numbers.
- *Birth to 5 Matters* – Range 6
  - In practical activities, adds one and subtracts one with numbers to 10
  - Enjoys reciting numbers from 0 to 10 (and beyond) and back from 10 to 0
  - Increasingly confident at putting numerals in order 0 to 10 (ordinality)

1 more

Adult-led learning

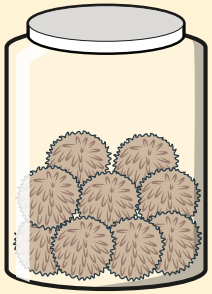
After reading books such as *One Duck Stuck* by Phyllis Root, explore the '1 more' pattern by prompting children to build towers to represent how many animals there are on each page.

Allow children to build the '1 more' pattern with staircase representations.

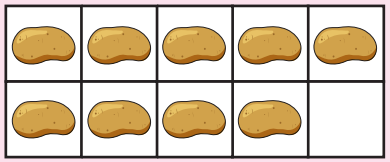


Re-enact stories such as *Mouse Count* by Ellen Stoll Walsh. As you read the story, use props, such as pom-poms in a jar, to represent the mice.

Prompt children to notice that as you add another pom-pom, you have 1 more.



Sing rhymes such as *One Potato, Two Potato*. As you sing the rhyme, represent what is happening by using real objects such as potatoes and place them onto a large ten frame.



Prompt children to see the '1 more' pattern and how the amount increases when a potato is placed on the ten frame. Do children recognise that when the ten frame is full, we have 10?

Provide children with bingo cards showing a selection of numbers from 0 to 9

4	6	9
8		10

Hold up a numeral or a picture representation card. If they have the number that is 1 more than that number, they place a counter over it.

The first one to cover up all their numerals is the winner.

1 less

Notes and guidance

In this small step, children extend their skills of finding '1 more' with numbers to 10 to finding '1 less' with numbers to 10

Children understand that as they count back, each number is 1 less than the previous number. They become aware of consecutive numbers and see that amounts decrease in size when 1 is taken away. They should recognise that the order of numbers when counting back does not change and have the stable order principle embedded with the numbers up to 10

Read stories that include the '1 less' pattern and support children to notice and make comparisons as they play in provision.

Rhymes

- *Ten Green Bottles*
- *Ten Little Men in a Flying Saucer*

Books

- *Ten in the Bed* by Penny Dale
- *The 'Ten Little ...' series* by Mike Brownlow

Key questions

- What is 1 less than _____?
- What is the number before _____?
- How many are there? How many are there now?

Possible sentence stems

- 1 less than _____ is _____
- _____ is 1 less than _____

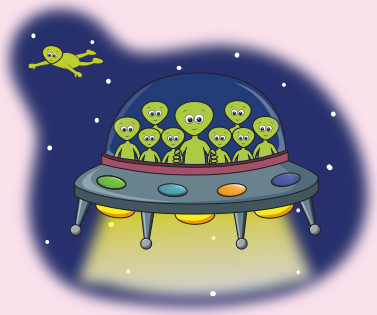
Links to the curriculum

- *Development Matters* – Reception – Understand the 'one more than/one less than' relationship between consecutive numbers.
- *Birth to 5 Matters* – Range 6
  - In practical activities, adds one and subtracts one with numbers to 10
  - Enjoys reciting numbers from 0 to 10 (and beyond) and back from 10 to 0
  - Increasingly confident at putting numerals in order 0 to 10 (ordinality)

1 less

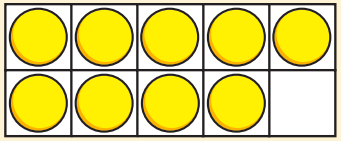
Adult-led learning

Sing and act out the rhyme *Ten Little Men in a Flying Saucer*. Prompt children to build a tower of 10 cubes. As they sing the rhyme and the aliens fly away one by one, encourage children to remove one of their cubes each time.



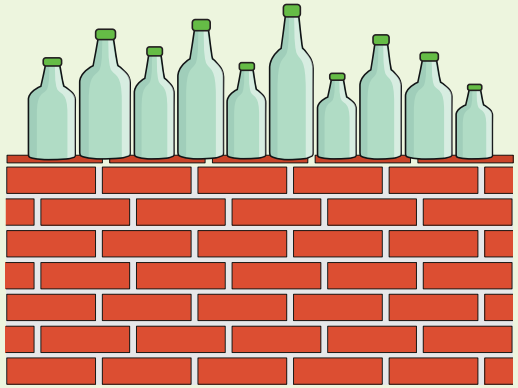
Prompt them to see that as they take a cube away, the number of cubes decreases.

Prompt children to fill a ten frame with 10 counters. Read stories which show the '1 less' pattern, such as *Ten in a Bed* by Penny Dale. As one of the characters falls out of bed, encourage children to take a counter away.

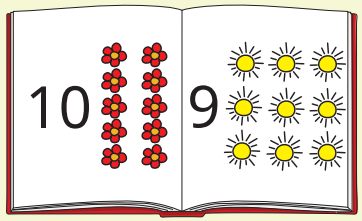


How many are there now?

Build a wall and provide children with 10 green plastic bottles. Sing the rhyme *Ten Green Bottles*. Each time a bottle 'accidently falls', ask how many have fallen and how many are standing.



After reading a book from the '*Ten Little …*' *series* by Mike Brownlow, support children to make their own books that start from 10 and count back. These can be linked to their own interests.



Composition to 10

Notes and guidance

In this small step, children are encouraged to build on their conceptual subitising, '1 more' and '1 less' skills by focusing on the composition of numbers to 10

As children's number sense develops, they learn to see greater numbers as a whole number and its parts at the same time.

Encourage children to represent their different compositions of numbers to 10 by providing varied representations to show the different compositions.

Explore partitioning in different ways with a wide range of objects to develop children's awareness. Play games that explore the composition of numbers to 10 so that children can then emulate these in their own play and self-chosen activities. Sharing stories and images that display different compositions and pointing these out will emphasise this concept to children. Talk to children as they use marks and signs to represent their ideas of composition. Point out composition to ten when playing with children in provision.

Books

- *One Gorilla* by Anthony Browne

Key questions

- What do you see? How do you see it?
- What is the whole?
- What are the parts?

Possible sentence stems

- The whole is _____
- I see _____ and _____
- There are _____ altogether.
- If _____ is a part, then the other part must be _____

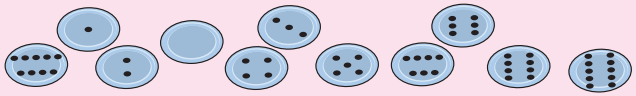
Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Composition to 10

Adult-led learning

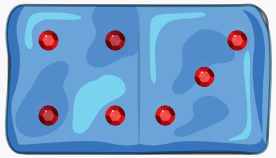
Spread out a range of dot plates from 0 to 10 on the floor.



Use a spinner to select a number from 5 to 10

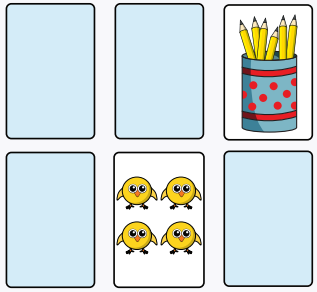
Prompt children to take it in turns to come to the front and collect two dot plates which total that number.

In the dough area, encourage children to make their own domino biscuits from dough.



Prompt them to sprinkle up to 10 sprinkles or jewels on their biscuit, using both sides of the domino to show different compositions.

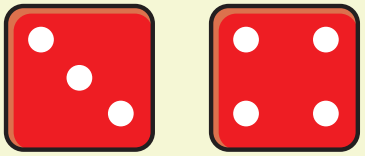
Pick a 'magic number' from 5 to 10 out of a hat and place picture cards representing 0 to 10 face-down.



Children take it in turns to turn over two cards. If they total the magic number, then they get to keep those two cards. The person with the most cards at the end wins.

Give each child a 1 to 6 dice and ask them to roll it.

Explain that you have a secret way to work out what number is on the bottom of each dice without looking.



Prompt children to mark-make to record how many spots are on the top and how many spots are on the bottom. Can they see a pattern?

Bonds to 10 (2 parts)

Notes and guidance

In this small step, children explore number bonds to 10 using real objects in different contexts and build 10 using two parts.

In provision, explore different ways of building the bonds to 10, for example, parking 10 toy cars in two car parks. Ten frames or egg boxes with 10 holes can be partially filled with objects. Ask children how many more we need to make 10

Providing sets of 10 objects in provision supports children to make their own self-chosen explorations of the bonds to 10. Seasonal songs also support children making bonds, using actions with fingers to represent making 10

Rhymes

- *Five Eggs and Five Eggs*

Books

- *Mr Willy-Nilly and Zoey's Dream* by Ji-yun Shin
- *Pete the Cat and the Missing Cupcakes* by Kimberly and James Dean

Key questions

- What is the whole?
- What are the parts?
- How many different bonds to 10 can you find?

Possible sentence stems

- The whole is _____
- _____ is a part and _____ is a part.
- _____ and _____ are a bond to 10
- If _____ is a part, then the other part must be _____

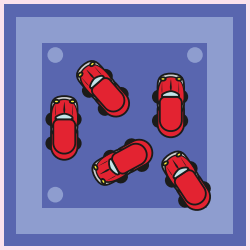
Links to the curriculum

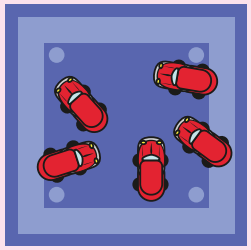
- *Development Matters* – Reception – Automatically recall number bonds for numbers 0–5 and some to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Bonds to 10 (2 parts)

Adult-led learning

Prompt children to explore different ways to represent bonds to 10 with small world resources.





For example, how many ways can you place 10 fairies on two toadstools? How many ways can you place 10 cars in two car parks?

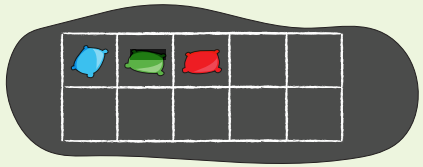
Provide each child with a number shape. Encourage them to make a bond to 10 with a partner.

Which number shapes combine to make a total of 10? Children can check by placing their two number shapes on top of the number 10 piece.

Compare the different tens that are made.

Chalk a large ten frame on the ground and hide 10 objects, such as beanbags, around the outside area.

Prompt children to hunt for the hidden objects and place them on the ten frame as they find them.



As each object is found, ask children how many they have now and how many are left to find.

Provide pots labelled with numbers 0 to 10 and a selection of loose parts, such as beads.

Ask children to count the correct number of beads into each pot. Can they find two pots that have 10 beads in total? Is there more than one way?

If there are 4 beads in one pot, which other pot do we need to total 10?

Make arrangements of 10

Notes and guidance

In this small step, children explore the number 10 and the different ways 10 can be arranged.

Show children different arrangements and ask what they notice. Support children to make patterns with concrete resources to 10 to allow them to become familiar with manipulating numbers. They may also then wish to explore making arrangements of different numbers.

Support children to notice that the overall number is still the same, no matter where they count from or what arrangements they make. This is the 'order irrelevance counting principle'. These activities will help deepen children's understanding that numbers can be made of many different arrangements and each arrangement tells a story about that number.

Using objects of interest, encourage children to make pattern-like arrangements and discuss what the pattern might tell us about the number 10

To deepen children's understanding, prompt them by asking questions such as, "Do 5 and 5 always make 10?"

Books

- *Ten Black Dots* by Donald Crews

Key questions

- What do you see? How do you see it?
- What does this arrangement tell us about the number 10?
- What can you tell me about your pattern?

Possible sentence stems

- I can see _____ here and _____ here.
- There are _____ altogether.
- _____ and _____ are always _____
- I know there are _____ altogether because ...

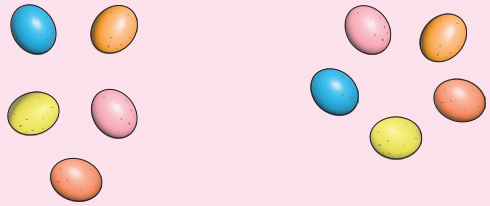
Links to the curriculum

- *Development Matters* – Reception – Automatically recall number bonds for numbers 0–5 and some to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Make arrangements of 10

Adult-led learning

Show children different arrangements of 10 objects. Prompt them to discuss what they notice about how the objects have been arranged.

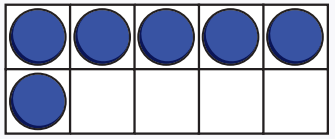


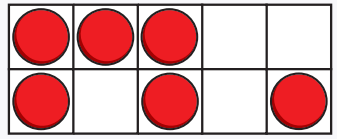
Provide children with loose parts and encourage them to find different ways to arrange 10 items.

Read the book *Ten Black Dots* by Donald Crews and prompt children to talk about what they notice about the different dot arrangements.

Encourage children to make their own black dot pictures.

Model representing numbers to 10 on a ten frame in different ways and talk about what the children notice.

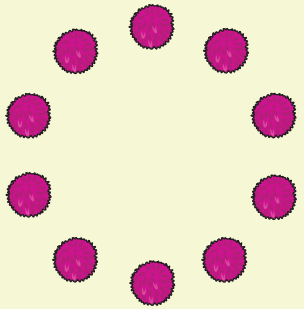




What does each arrangement tell us about that number?

Encourage children to play a barrier game in pairs. One child makes an arrangement of 10 objects, such as pom-poms, that their partner cannot see.

Their partner then has to ask questions about how they have made the arrangement, such as whether the objects are in rows, and tries to make the same arrangement. Remove the barrier and encourage them to talk about what is the same and what is different about the arrangements.



Bonds to 10 (3 parts)

Notes and guidance

In this small step, children explore bonds to 10 further and learn that there can be three or more parts, not just two. Children will need to see this in a variety of different ways, exploring this concept practically to embed it. In provision, explore different ways of building the bonds to 10, for example, with small world animals: 3 ducks in the water, 4 in the grass and 3 on the bridge.

Ten frames or egg boxes with 10 holes can be partially filled with objects, but now with three colours available. Fill the holes with a combination of two colours and ask how many more of a third colour we need to make 10. Providing sets of 10 objects in provision will support children to make their own self-chosen explorations of the different bonds to 10

Rhymes

- *Chuck Chuck*

Books

- *Ten Black Dots* by Donald Crews

Key questions

- How can you show 10 as three parts?
- How can you make the same number in a different way?
- What number have I made?
- How many did you count? How do you know?

Possible sentence stems

- I can see that _____ is made up of _____, _____ and _____
- There is _____ here, _____ there and _____ there, so there must be _____ altogether.

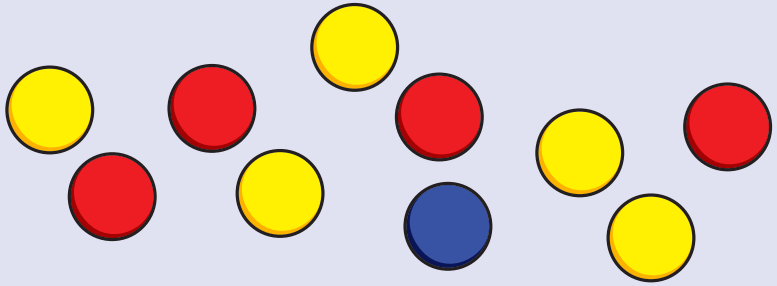
Links to the curriculum

- *Development Matters* – Reception – Automatically recall number bonds for numbers 0–5 and some to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

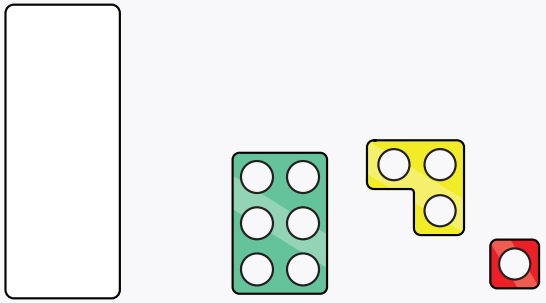
Bonds to 10 (3 parts)

Adult-led learning

Provide children with sprayed butter beans or counters in three different colours. Ask them to count out 10 and shake them in their hand before dropping them. How many are red? How many are yellow? How many are blue?

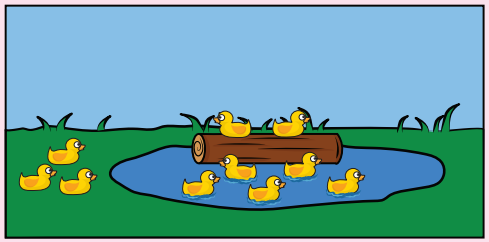


Give children an outline of a 10-piece number shape.



Support them to find different ways of filling their shape with three different parts. How many different ways can they find?

Set up a small world scene such as a field with a log in a pond and 10 ducks. Ask children how many ducks they can see in each of the three areas. Can they move the ducks to find different ways to make 10 in three parts?



Place dice pattern stickers on small world vehicles such as trains. Encourage children to make a train with three carriages so that it has a total of 10 dots.

Challenge them to find different ways to make 10 using three parts.

Doubles to 10 (find a double)

Notes and guidance

In this small step, children build on their explorations and findings about doubles to 8, by progressing to doubles to 10

Children will be used to the concept of doubling and the fact that this means 'twice as many'. Further support children to see a range of visual representations of doubles and identify them in patterns, in pictures and in arrangements.

By repeating these activities, children will naturally be able to find doubles and recognise them in their play. Encourage children to find the doubles to 10 by sorting doubles and 'not doubles', so that they can begin to categorise the numbers and amounts/ representations.

A good way to embed this concept and encourage children to see doubles is to make up rhymes that use the language of doubling. Prompt children to see the doubles to ten in all areas of provision.

Rhymes

- *Doubling Rhyme*

Key questions

- Where can you see a double?
- Is this double or not double? How do you know?
- What is double _____?

Possible sentence stems

- I have found double _____
- There are _____ here and _____ there.
- Double _____ is _____
- _____ is double _____

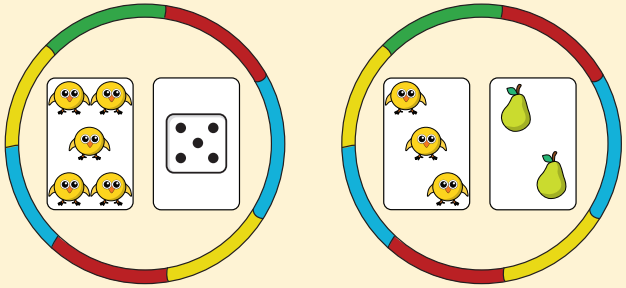
Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Doubles to 10 (find a double)

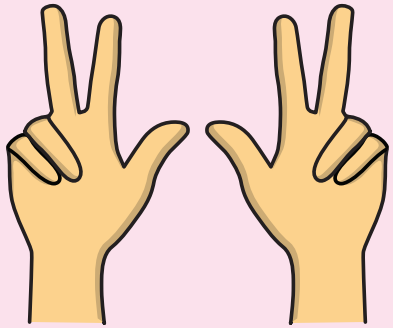
Adult-led learning

Show children images or picture cards that represent doubles and 'not doubles' to 10



Encourage children to say whether the representation shows a double or not. How do they know?

Sing a doubling rhyme together. Encourage children to represent the doubles on their fingers as they sing.

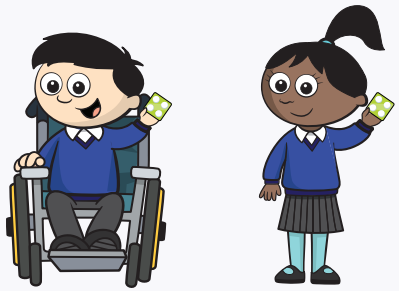


What doubles do they notice?

Give each child a number shape representing a number from 1 to 5

Prompt them to go and find a partner that has the same number as them.

Encourage children to talk about the double they have made using a stem sentence.



Prompt children to make up their own doubling rhyme. Encourage them to perform their rhyme to a friend.

They could mark-make or use manipulatives to help them to represent the doubles as they sing.

Doubles to 10 (make a double)

Notes and guidance

In this small step, children embed their learning of finding doubles to 10 and then make their own sets and arrangements of doubles. If encouraged and supported to do this, children will be naturally curious to explore their own findings.

Encourage children to represent their understanding by making doubles with manipulatives such as counters on ten frames or in activities such as printing. Barrier games are a good way of supporting children to make and describe the doubles they have made. Allow children to explore and demonstrate this both inside and out using large ten frames and encourage them to show their thinking using the pair-wise pattern. Use and enact doubling stories to embed children's understanding and help them make doubles.

Children may also recall that all doubles are even numbers, in relation to their exploration of even and odd numbers.

Books

- *Two of Everything* by Babette Cole
- *Double the Ducks* by Stuart J. Murphy

Key questions

- What double have you made?
- Is it a double or not a double? How do you know?
- What is double _____?

Possible sentence stems

- I have made double _____
- There are _____ here and _____ there.
- Double _____ is _____
- _____ is double _____

Links to the curriculum

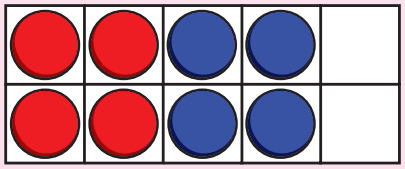
- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6 – Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects

Doubles to 10 (make a double)

Adult-led learning

Provide children with double-sided counters and a dice labelled 1 to 5

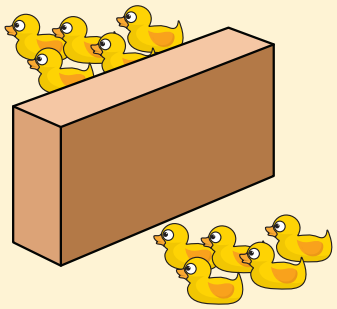
Prompt children to roll the dice and represent that number on a ten frame. Encourage them to then make the double.



Building the double in a pair-wise pattern will support children's knowledge of doubles.

In pairs, prompt children to sit facing each other with a barrier between them. Provide them with collections of small world animals, such as ducks or sheep. Encourage one child to represent a number up to 5 with the objects.

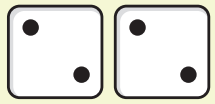
They lift the barrier briefly to show their partner, who builds the same number. Children remove the barrier and check if they have made a double. Which double have they made?



Support children to use number shapes 1 to 5 to print. Encourage them to place the shape into paint and then press it onto a piece of paper twice to double that number.

What double have they made? Prompt children to use the stem sentences to talk about the doubles.

Provide children with numeral cards 2, 4, 6, 8 and 10 in a pile. Prompt them to select one numeral and ask them to build the two numbers that make that double.



Ask children to talk about the double they have made.

Explore even and odd

Notes and guidance

In this small step, children expand on their first introductions to the concept of even and odd numbers.

As mentioned in the last step, children may have recognised the concept of 'even' from their explorations of doubling. This small step allows children to develop this skill by recalling past knowledge as well as recognising new patterns with numbers up to 10 in different contexts.

Encourage children to solve problems by using mathematical graphics to draw out their thinking. By doing this, children can be supported to explain their reasoning of why a number of objects may be odd or even.

Adults can then prompt children to explain how they know by using key questions and supporting them to use stem sentences. By building up this skill over time, children will be more confident explaining their thinking towards the end of the Reception year.

Books

- *One Odd Day* by Doris Fisher and Dani Sneed

Key questions

- Does the group have two equal/unequal groups? How do you know?
- Is the number odd/even?

Possible sentence stems

- I know this in an equal/unequal group because ...
- _____ is odd/even because ...

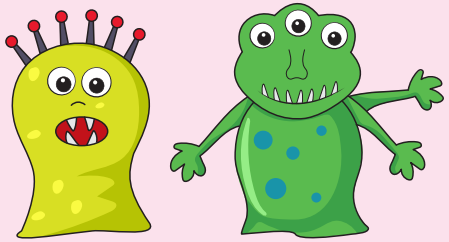
Links to the curriculum

- *Development Matters* – Reception – Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6
  - Shows awareness that numbers are made up (composed) of smaller numbers, exploring partitioning in different ways with a wide range of objects
  - Begins to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-"

Explore even and odd

Adult-led learning

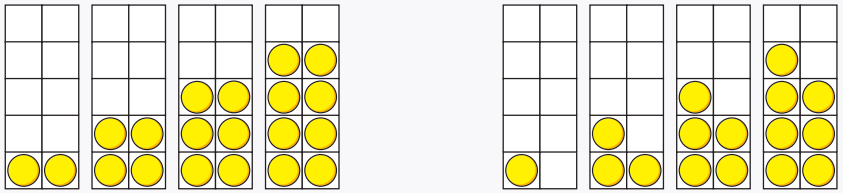
After reading stories such as *One Odd Day* by Doris Fisher and Dani Sneed, encourage children to create their own odd and even pictures.



Look at the pictures together.

Is this an odd or an even picture? How do you know? Encourage children to talk about the pictures. How many odd and even features can they spot?

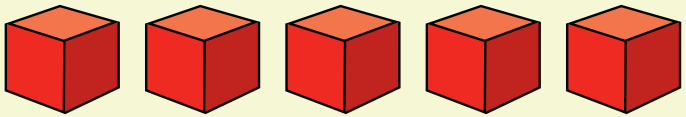
Ask children to explore and build pair-wise patterns on ten frames. Prompt them to sort the ten frames into those which have two equal groups (even numbers) and those which have two unequal groups (odd numbers).



Place number shapes 1 to 10 in a feely bag. Ask children to feel inside the bag and find an odd number. How do they know it is odd? Encourage children to find an even number. How do they know it is even?

Prompt them to sort the number shapes into odd and even numbers. Can we line them up to see the 'odd, even, odd, even' pattern as we count?

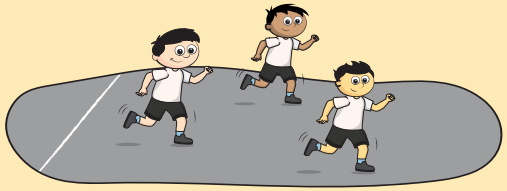
Prompt children to collect an odd number of cubes. Encourage them to check each other's and compare the different quantities. Are all the quantities odd? How could you check?



Ask children to collect one more cube and add it to their set. How many do they have now? Is there still an odd number of cubes?

Continuous provision

Provide a starting line. Ask children to take 9 giant steps, 9 tiny steps, 9 jumps and 9 tiptoes.



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?

Repeat this with 10 of each action. What do they notice?

Provide children with a range of items with letters on, such as blocks or butterbeans, and ask children to build their names with them.

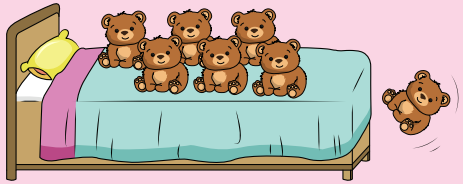
How many letters does their name have? Prompt children to compare the number of letters they have with a partner. Who has more letters? Who has fewer letters? Does anyone have the same number of letters as them?

Provide children with a range of different classroom objects and loose parts.

Encourage them to make a number 9 and a number 10 museum.

Prompt children to talk about why they have chosen those objects and how they represent 9 or 10

In the rhyme area, provide children with props for the rhyme *Ten in the Bed*. Encourage them to sing the rhyme and represent what is happening each time.



Prompt children to make up their own similar rhyme that counts on instead of back, using props to act this out.

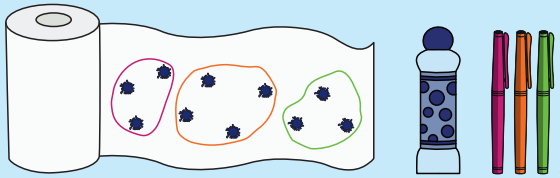
Continuous provision

Set up a game of 'race to 10' for children to play in pairs. Each pair will need a track with 10 spaces, loose parts (up to 10 objects) and a 1 to 3 dice. Children roll the dice and place the corresponding number of objects on the track.

How many do they have? How many more do they need to reach 10?

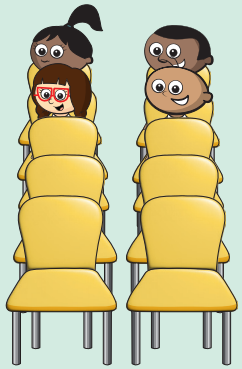
To explore the composition of different numbers, repeat this with different numbers of spaces on the track.

In the mark-making area, provide children with large pieces of paper and bingo dabbers. Prompt them to use the dabbers to make different arrangements of 9 and 10 and then use different coloured felt tips to draw around them.



What different groups do they see? Are they odd groups or even groups?

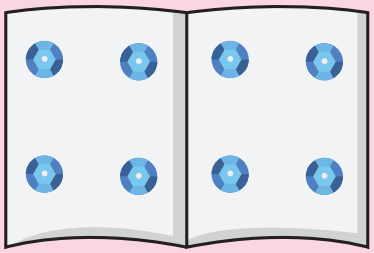
Place 10 chairs into 5 rows of 2 to resemble seats on a bus. Encourage some children to get on the bus. How many passengers are there on the bus?



Prompt children to use their knowledge of bonds to 10 to predict how many more passengers could get on the bus.

Repeat with different numbers of children getting on the bus.

Provide a range of collage and mark-making materials along with some blank folded paper.



Prompt children to explore making doubles by adding spots to each side of the paper. Encourage them to talk about the doubles they have made.

End of block checkpoint

Checkpoint 1

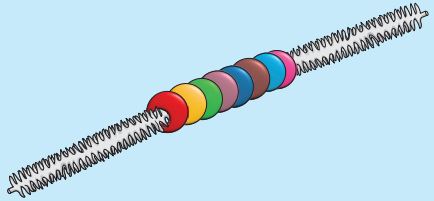
Make a caterpillar by threading up to 10 beads onto a pipe cleaner.

Are children able to make caterpillars with more and fewer beads than you?

Which caterpillar is the longest?

Which is the shortest?

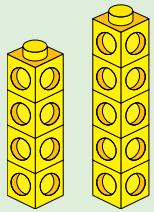
Can we arrange the caterpillars in order?



Checkpoint 2

Provide children with 9 cubes. Prompt them to work in pairs where one person holds the 9 cubes behind their back and breaks them into two parts. They reveal just one part.

The other child in the pair has to work out how many cubes are hiding behind their partner's back.

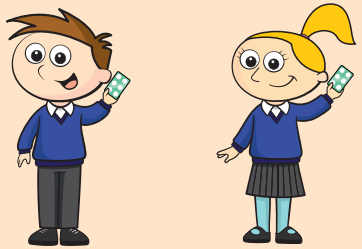


This activity can be varied by giving children 10 cubes or by asking children to snap the cubes into three parts.

Checkpoint 3

Hand out a range of 1 to 10 number shapes so that each child has one shape.

Ask questions and give instructions such as, "Stand up if you have an odd number." Can you find someone with a number shape that is double your number? Can you find someone who has an even number shape or someone who has an odd number shape? Encourage children to talk about what they notice.



Spring Block 6

Explore 3-D shape

White Rose MATHS

Teacher guidance

Key books

- *Circle! Sphere!* by Grace Lin
- *Changes, Changes* by Pat Hutchins
- *Naughty Bus* by Jan Oke
- *Rapunzel*
- *Kitten Castle* by Ellen Weiss and Mel Friedman
- *Shapes, Shapes, Shapes* by Tana Hoban
- *Pattern Fish* by Trudy Harris
- *Pattern Bugs* by Trudy Harris
- *Busy, Busy, Busy* by Haneul Ddang
- *The Leopard's Drum* by Jessica Souhami
- *Jamil's Clever Cat* by Fiona French with Dick Newby

Top tips

- Gather a range of recyclable box modelling resources of different shapes and sizes for children to build with.
- Enhance dough areas with 3-D shapes and real objects for children to experiment with and explore the properties of shapes.
- Encourage children to create patterns linked to their interests by providing a range of loose parts in different areas of provision.

Key resources

Small steps

Step 1	Recognise and name 3-D shapes
Step 2	Find 2-D shapes within 3-D shapes
Step 3	Use 3-D shapes for tasks
Step 4	3-D shapes in the environment
Step 5	Identify more complex patterns
Step 6	Copy and continue patterns
Step 7	Patterns in the environment

Recognise and name 3-D shapes

Notes and guidance

At the start of this block, children will focus on the concept of 3-D shapes and their properties. Children will have already explored some of the properties of these shapes in earlier blocks when sorting objects that are 3-D, looking at 2-D shapes, fitting shapes together and moving them apart. They will have also explored printing with 3-D shapes and recognising the flat face the shape makes.

In this small step, children will learn to recognise and name cubes, cuboids, cylinders, pyramids, cones and spheres. They will recognise that whereas a 2-D shape is completely flat, 3-D shapes are solid objects.

When building and constructing, use the correct shape names to categorise the blocks. To further support children, photograph and label these shapes in provision. Use tidy-up time in the brick area as an opportunity to encourage different groups of children to be responsible for collecting all the cylinders or all the cubes. Share texts that include 3-D shapes and encourage children to identify and name shapes. Prompt them to go and find those shapes in provision.

Books

- *Circle! Sphere!* by Grace Lin
- *Changes, Changes* by Pat Hutchins

Key questions

- What do you notice about your shape?
- Which shapes are the same as yours? Which are different?
- How do you know they are the same/different?
- How can you sort the shapes?

Possible sentence stems

- This shape is a _____.
- This shape is the same/different because ...
- The _____ has flat faces/a flat face/a curved surface.

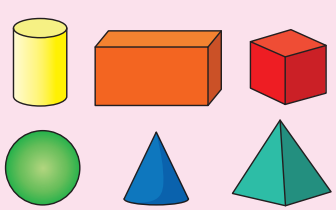
Links to the curriculum

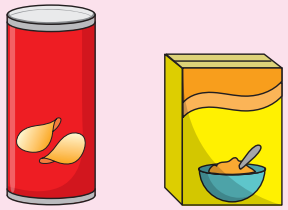
Development Matters – Reception – Select, rotate and manipulate shapes to develop spatial reasoning skills.

Birth to 5 Matters – Range 6 – Investigates turning and flipping objects in order to make shapes fit and create models; predicting and visualising how they will look (spatial reasoning)

Recognise and name 3-D shapes

Show children a range of 3-D shapes and model naming and describing their properties.

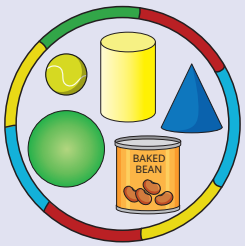


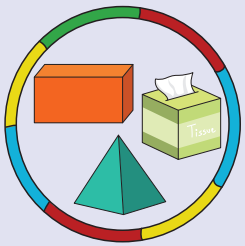


Hold up an object such as a crisp tube or a cereal box. Which of the 3-D shapes is the same as this object? How do you know it is the same? Encourage children to talk about the properties of the 3-D shapes when explaining how they know.

Provide children with a range of 3-D shapes and real objects. Encourage them to sort the shapes into groups within hoops.

Prompt children to talk about why they have sorted the shapes that way. Is there another way we could sort them?

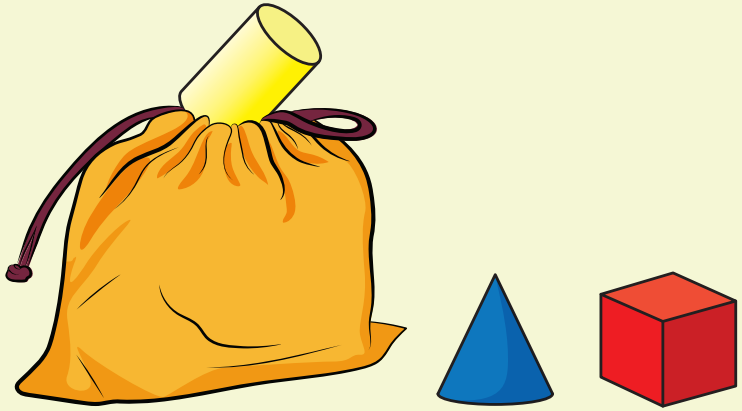




When reading books such as *Circle! Sphere!* by Grace Lin and *Changes, Changes* by Pat Hutchins, encourage children to notice where they can see 3-D shapes.

Prompt children to replicate the images in the stories using 3-D shapes. Ask them to name the shapes as they select them.

Place a range of 3-D shapes in a feely bag.



In pairs, one child selects a shape from the bag without showing their partner. The partner asks questions to try and work out which shape they have selected.

Find 2-D shapes within 3-D shapes

Notes and guidance

In this small step, children extend their knowledge of recognising and naming 3-D shapes to finding and identifying the 2-D shapes on the flat faces of 3-D shapes.

It is important to teach this knowledge through practical exploration, such as making models, and ask children to point out what they notice. Exploring the idea of flat faces and curved surfaces in activities such as printing will support children to see the 2-D shapes within the 3-D shapes. This can be reversed so that children use reasoning skills to find which shape could have made a pre-printed footprint.

Whilst building with children, give reference to what shapes are being used. To emphasise flat faces and curved surfaces, discuss which shapes are better for stacking.

Look at pictures and stories that use 3-D shapes and point out where we can see 2-D shapes on the faces of 3-D ones. Replicating structures in books can help to support this thinking.

Books

- *Changes, Changes* by Pat Hutchins
- *Naughty Bus* by Jan Oke

Key questions

- What shapes can you see?
- What do you notice about your shape?
- Which 2-D shapes can you see within the 3-D shapes?

Possible sentence stems

- This shape is a _____.
- I can see a _____ on the _____.
- This shape has a _____ face.

Links to the curriculum

Development Matters – Reception – Compose and decompose shapes so that children recognise a shape can have other shapes *within* it, just as numbers can.

Birth to 5 Matters – Range 6

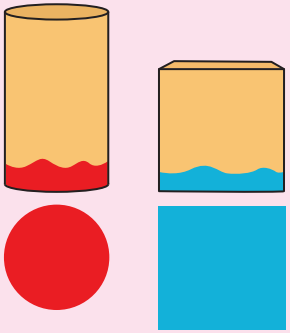
- Enjoys composing and decomposing shapes, learning which shapes combine to make other shapes
- Uses own ideas to make models of increasing complexity, selecting blocks needed, solving problems and visualising what they will build

Find 2-D shapes within 3-D shapes

Adult-led learning

Provide children with a range of 3-D shapes and real-life objects. Encourage them to explore printing with 3-D shapes using paint. What do they notice? What 2-D shape can they see?

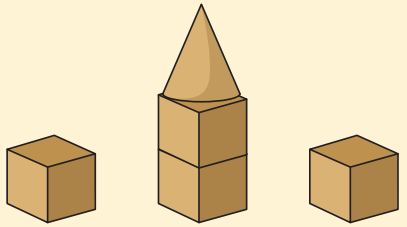
To extend this, ask children to predict what footprint a shape will make. Which shape could you use to print a triangle or a square?



Prompt children to make 3-D shapes using dough. Ask them which shapes are easier or harder to make. Why do they think that?

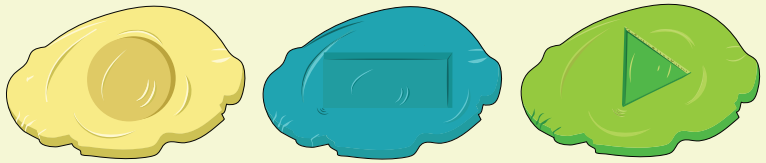
Encourage children to explore how they will make the flat faces. What will they use?

Read books such as *Changes, Changes* by Pat Hutchins and *Naughty Bus* by Jan Oke. Prompt children to notice and talk about the 2-D shapes they see on the surfaces of the building blocks in the images.



Encourage children to build their own scenes using building blocks. What do they notice?

Show children a range of footprints made by printing 3-D shapes into dough.



Prompt them to predict which 3-D shapes could have been used to make those footprints. Is there more than one possibility? Encourage children to test their predictions.

Use 3-D shapes for tasks

Notes and guidance

In this small step, children are guided to further expand their knowledge of the properties of 3-D shapes. The suggested tasks and the modelling of shape vocabulary will deepen their understanding of the properties of 3-D shapes.

Support children to determine what are the best 3-D shapes for tasks such as rolling or stacking, to develop children's understanding. They consider why this is the best shape as well as what different 3-D shapes do or do not have in common. This will help to develop spatial reasoning skills but also extend where children are on their building learning journey.

Support children by prompting them to make more complex structures. Block play can be enhanced by children bringing in further props to allow them to build for a purpose, for example, creating a rocket for an astronaut. Children may then design and make their own structures to support role-play and storytelling.

Books

- *Rapunzel*
- *Kitten Castle* by Ellen Weiss and Mel Friedman

Key questions

- Which shape have you chosen and why?
- What do you notice about your shape?
- Does your shape roll/stack?

Possible sentence stems

- I have chosen this shape because ...
- This shape has _____.
- This shape is the same/different because ...

Links to the curriculum

Development Matters – Reception

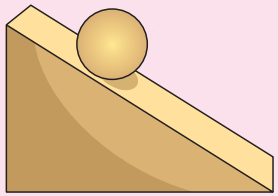
- Select, rotate and manipulate shapes to develop spatial reasoning skills.
- Compose and decompose shapes so that children recognise a shape can have other shapes *within* it, just as numbers can.

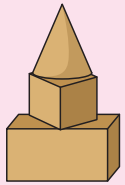
Birth to 5 Matters – Range 6 – Uses own ideas to make models of increasing complexity, selecting blocks needed, solving problems and visualising what they will build

Use 3-D shapes for tasks

Adult-led learning

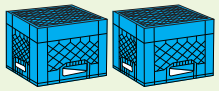
Provide children with different 3-D shapes and a ramp. Prompt them to explore which 3-D shapes roll down the ramp and which do not. What do they notice about the shapes that do roll? What is the same about them all?





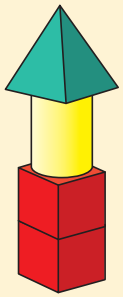
Also encourage children to explore which shapes stack and which do not. What makes a shape good for stacking?

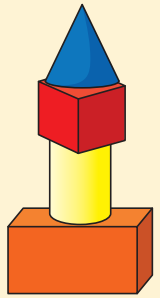
Encourage children to build an obstacle course. Prompt them to consider which objects they choose for different purposes.



Why have they chosen that object? Which shape do they need to use next?

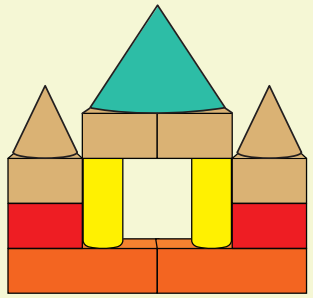
After reading traditional tales such as *Rapunzel*, children explore building towers. Which shapes do they need to use to build Rapunzel's tower? Which shapes do they need to place at the bottom of the tower? Which shapes do they need to place at the top?





Prompt them to say why they have chosen to place that shape in that position.

Read books such as *Kitten Castle* by Ellen Weiss and Mel Friedman. Encourage children to build more complex structures, such as castles.



As children select shapes to build with, prompt them to talk about its different properties and to explain why they have chosen that shape.

3-D shapes in the environment

Notes and guidance

In this small step, children build on their experiences of 2-D shapes in the environment by now looking for representations of 3-D shapes.

Children will already have some understanding of the properties of 3-D shapes and that these are solid objects. Start by referring to everyday objects in the environment using names of 3-D shapes, such as a tin of beans being a cylinder.

As with 2-D shapes, discuss with children when shapes in the environment are 3-D shapes and when they are 'almost' 3-D shapes. In this way, they will recognise that, for example, a tower on a castle is an 'almost cylinder'; however, the turret stops it being a perfect cylinder.

Provide opportunities for children to notice shapes in the environment and use the language of 2-D and 3-D shapes interchangeably to support children's fascinations. Encourage them to take photos when outside or on walks to spark discussion when sharing these in groups or as a class.

Books

- *Shapes, Shapes, Shapes* by Tana Hoban

Key questions

- What shapes can you see? How do you know?
- What can you tell me about your shape?
- Where can you see shapes within shapes?
- What is the same/different about your shapes?

Possible sentence stems

- I can see a _____ .
- This shape is the same/different because ...
- I know this shape is/is not a _____ because ...

Links to the curriculum

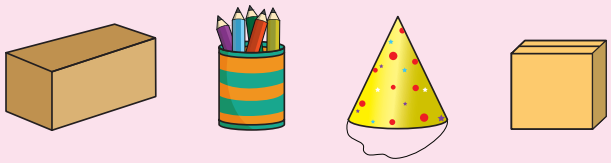
Development Matters – 3 and 4-year-olds – Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.

Birth to 5 Matters – Range 6 – Enjoys composing and decomposing shapes, learning which shapes combine to make other shapes

3-D shapes in the environment

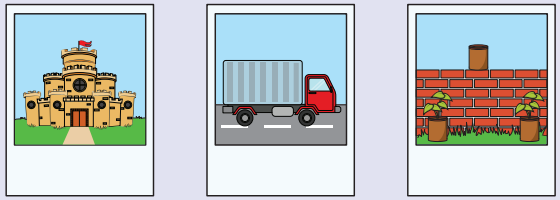
Adult-led learning

Go on a shape hunt around the classroom. Encourage children to recognise and name the 3-D shapes they find and prompt them to describe their properties.



Ask the children to find another object that is the same shape or a different shape.

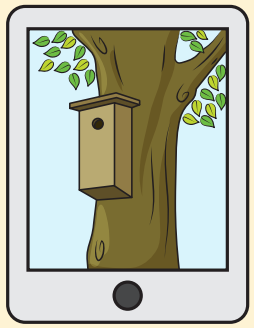
Provide a range of photographs showing a variety of real-life scenes comprising of 3-D objects. Prompt children to find all the 3-D shapes in the images. What do they notice? How can they describe the shapes they see?



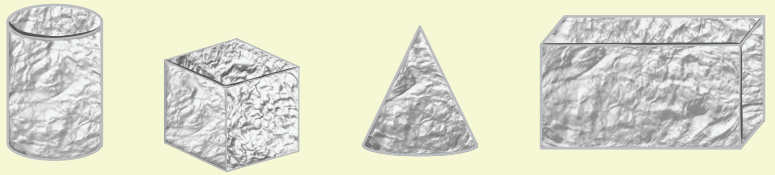
Encourage children to talk about the shapes they can see within shapes.

After reading books such as *Shapes, Shapes, Shapes* by Tana Hoban, encourage children to go on their own 3-D shape hunt around school or outside.

Prompt children to take photographs of the shapes they see. These could be used to make a class shape book.



Wrap a range of objects tightly in brown paper or foil. Encourage children to explore the shapes and predict which objects might be inside.



Prompt them to talk about the properties of each shape to explain why they think it is a particular object.

Identify more complex patterns

Notes and guidance

In this small step, children build on their knowledge of simple AB patterns from the autumn term. They are introduced to more complex patterns such as ABC and ABCD, where all the elements are different. This can then progress to AABB, AAB and ABB patterns. Pattern structures are seen to be easier when all the elements repeat, so children may find AABB easier than AAB. They will then explore patterns with the same start and end point, such as ABBA, which are more complex.

Children may naturally join in with sound patterns that fit different structures, and this is all part of learning. It is important to encourage them to listen carefully to adults or music-making sound patterns and identify which structure is being used.

Sing and make up silly songs that follow different structures, such as, 'stomp, dinosaur, dinosaur, stomp' for ABBA, so that children recognise that this can be audible as well as visual. Allow children to mark-make their own notations to identify patterns and support their thinking.

Books

- *Pattern Fish* by Trudy Harris

Key questions

- What do you notice?
- What pattern can you see/hear?

Possible sentence stems

- I can see/hear a _____ pattern.
- This is a _____ pattern.

Links to the curriculum

Development Matters

- 3 and 4-year-olds – Notice and correct an error in a repeating pattern.
- Reception – Continue, copy and create repeating patterns.

Birth to 5 Matters – Range 6

- Spots patterns in the environment, beginning to identify the pattern "rule"
- Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat

Identify more complex patterns

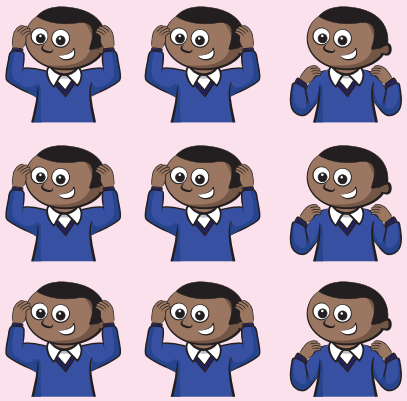
Adult-led learning

Explore pattern books such as *Pattern Fish* by Trudy Harris with children, paying particular attention to the pages with more complex patterns such as ABCD, AABB, AAB and ABB.

Encourage children to identify the patterns and talk about what they can see.

Demonstrate action patterns for children to copy:

- clap, jump, jump, clap, jump, jump, clap, jump, jump
- head, head, shoulders, head, head, shoulders, head, head, shoulders

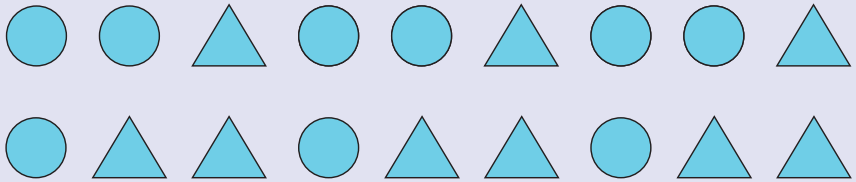


Say the pattern aloud as you act it out and encourage children to join in.

What patterns do they notice?

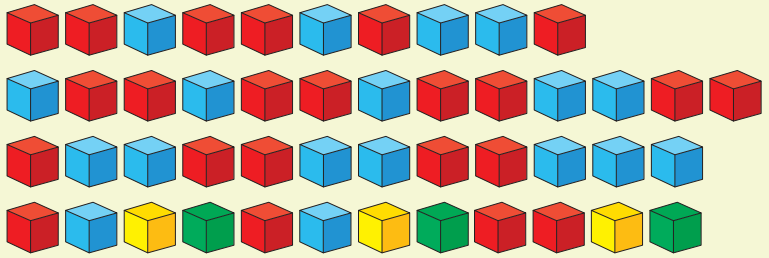
Show children an AAB and ABB pattern and ask them what they notice.

What patterns can they see?



What is the same? What is different?

Show children an AAB, ABB, ABBA or ABCD pattern with a deliberate mistake, such as an extra item added.



Can they identify the mistake and correct it?

Copy and continue patterns

Notes and guidance

In this small step, children move on from exploring the features of more complex patterns to being able to competently copy and continue them.

Support children to copy ABC, ABCD, AABB, AAB and ABB patterns. Patterns may be easier when all the elements repeat, so children may find AABB easier than AAB. Children may then move on to ABBA patterns. When showing and modelling patterns, remember to show three full units of repeat for them to be able to copy and continue it.

If children need additional support, first encourage them to copy small sections of patterns before combining them to make the full pattern, then they can attempt to continue it. You may notice that some children find different types of patterns harder than others. To support this, ensure that there are different resources that link to children's interests and fascinations so they can be encouraged to copy and continue more complex patterns.

Books

- *Pattern Bugs* by Trudy Harris

Key questions

- Copy my pattern – what do you hear/see?
- How does the pattern continue?

Possible sentence stems

- The _____ comes next in the pattern.
- The pattern is _____, _____, _____ (, _____).

Links to the curriculum

Development Matters

- 3 and 4-year-olds – Notice and correct an error in a repeating pattern.
- Reception – Continue, copy and create repeating patterns.

Birth to 5 Matters – Range 6

- Spots patterns in the environment, beginning to identify the pattern "rule"
- Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat

Copy and continue patterns

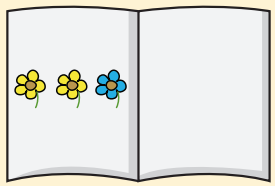
Adult-led learning

Go outside and model making large-scale patterns with more complex pattern structures such as ABCD, AAB, ABB and ABBA. Use a range of large outdoor resources such as crates, tyres and sticks.

Support children to copy and continue the patterns. What comes next in the pattern?

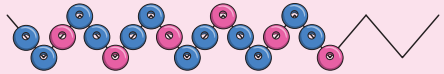
Explore books such as *Pattern Bugs* by Trudy Harris, focusing on pages with more complex pattern structures. What patterns do they see?

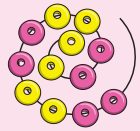
Encourage children to make their own page by copying and continuing one of the patterns. What will come next in the pattern?



Provide children with a range of loose parts, such as buttons, beads, pebbles, shells or seeds. Encourage them to use these to make, copy and continue different patterns.

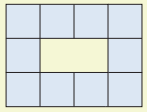
To extend this, provide children with wavy lines, spirals or zigzag lines for them to build their patterns along.

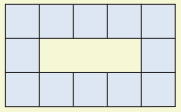


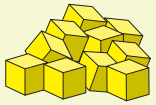


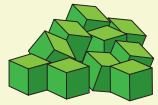
Provide frames with a set number of spaces and a range of loose parts.

Ask children to build patterns around the frame by putting one item in each space.









Prompt them to investigate whether AB, ABC, ABB, AAB, AABB and ABBA patterns will fit around the frame. Which patterns will fit exactly, and which will not?

Patterns in the environment

Notes and guidance

In this small step, children build on what they have learned about more complex patterns by applying their skills to patterns in the environment. This might start with spotting patterns in the classroom then extend to looking at patterns when out on walks and when visiting places that are full of pattern experiences.

Immerse children in different types of patterns by pointing out patterns and bringing in a selection of wallpapers and fabrics. Allow them to notice pattern styles by reading stories that show different cultural styles of pattern, for example, where certain forms of shape are used or how fabric is weaved.

Model noticing patterns all around us, so that it becomes a key talking point. Praise children for making links between the different elements of pattern and shape.

Books

- *Busy, Busy, Busy* by Haneul Ddang
- *The Leopard's Drum* by Jessica Souhami
- *Jamil's Clever Cat* by Fiona French with Dick Newby

Key questions

- What pattern can you see?
- What do you notice about your pattern?
- Where else might we see this pattern?
- What will come next?

Possible sentence stems

- This is a _____ pattern.
- _____ will come next in the pattern.

Links to the curriculum

Development Matters – Reception – Continue, copy and create repeating patterns.

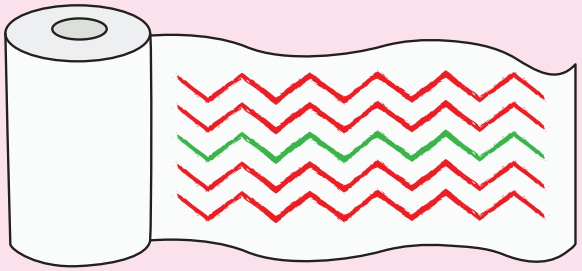
Birth to 5 Matters – Range 6

- Spots patterns in the environment, beginning to identify the pattern "rule"
- Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat

Patterns in the environment

Adult-led learning

Show children a selection of patterned wrapping paper. What patterns can they see?



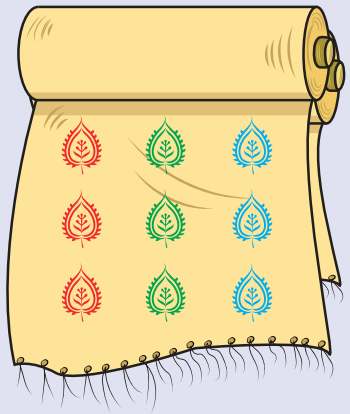
Provide large sheets of paper and some items for printing and designing.

Encourage children to use repeating patterns to design and create their own wrapping paper.

Explore artwork from artists such as Andy Goldsworthy and James Brunt and discuss the patterns they can see. Prompt children to hunt for natural objects to make patterns with outside.

Show examples of patterned fabric from different cultures or traditions.

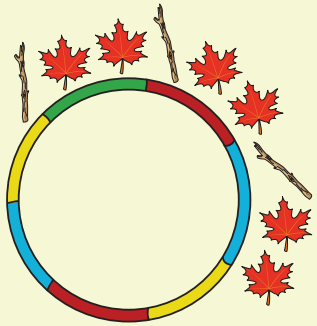
Prompt children to discuss and recreate the patterns they see. Encourage them to design their own patterns in a similar style.



Ask children to arrange patterns around a circle, such as a hoop or a paper plate.

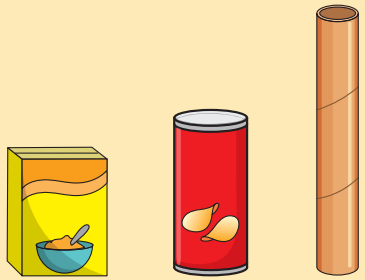
Prompt them to consider how they will continue the pattern all the way round. Does their pattern fit?

Encourage children to view other patterns in the environment and replicate them.



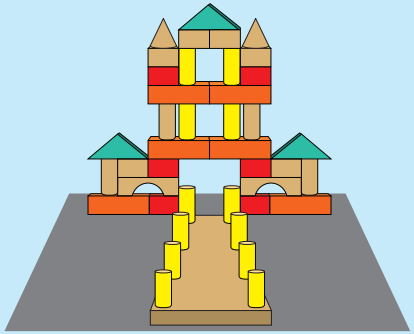
Continuous provision

Provide a variety of empty boxes, tubes and lids. Ask children to make a model for a particular purpose, for example, to build a bridge for the three billy goats or a new chair for Baby Bear. Encourage them to tell you about their model.



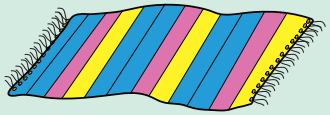
Which shapes were easy to build with? Which shapes were difficult to fasten together?

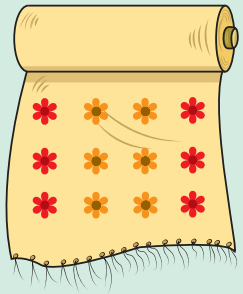
Provide pictures of buildings such as castles, palaces, mosques and city skyscrapers. Ask children to discuss the shapes they can see in the buildings.



Encourage children to design their own models and to extend these by adding arches, bridges, spires and moats.

Enhance the provision with a range of fabrics and saris that show more complex patterns. As the children explore the fabrics and dress up, prompt them to talk about the patterns they see.





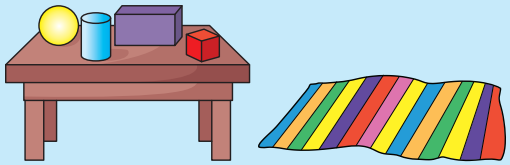
Use 3-D shapes to press patterns into the dough. Prompt children to ask a partner which shapes they used and encourage them to copy the pattern.

Children can make patterns such as AAB, ABB, ABBA and ABCD in the dough using loose parts such as shells, stones, beads or buttons.

End of block checkpoint

Checkpoint 1

Show children a range of 3-D shapes of various sizes and colours. Cover the shapes with a piece of material, ask children to close their eyes and remove one of the shapes.



Lift off the material and encourage children to identify which shape has been removed. Ask them to explain how they know by referring to the properties of the shapes.

Checkpoint 2

Show children a pattern that uses a more complex structure, such as ABCD, AAB, ABB or ABBA. Can they identify the pattern?

Can they copy and then continue your pattern?

Provide children with the resources, such as pattern blocks, for them to use to copy and continue the patterns.

Checkpoint 3

Provide children with objects and loose parts to make more complex patterns.

Ask children to use the resources independently to make an ABCD, AABB, AAB, ABB or ABBA pattern. Encourage them to talk about the pattern and its structure.