Summer

Scheme of learning

Reception

White Rose MATHS

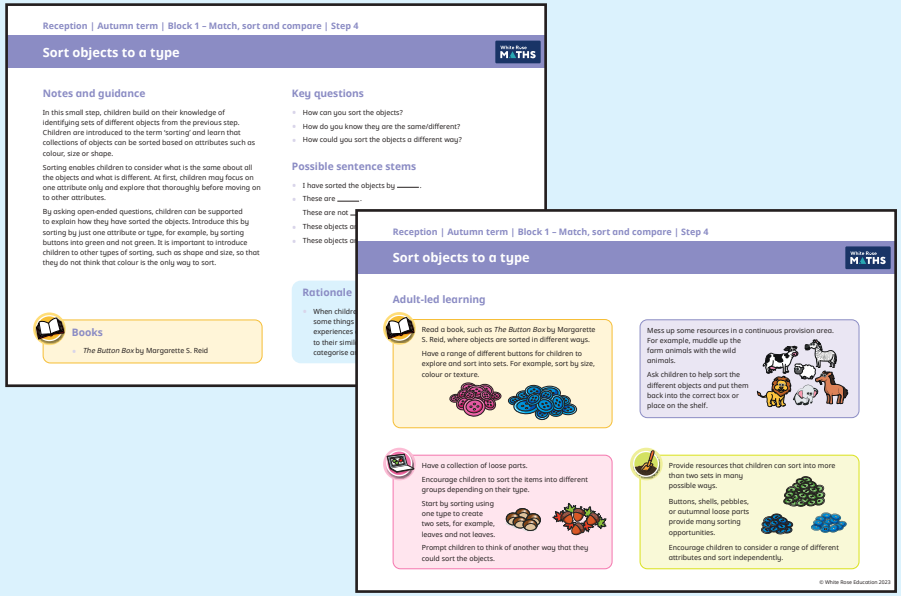
The **White Rose Maths** schemes of learning

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

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.

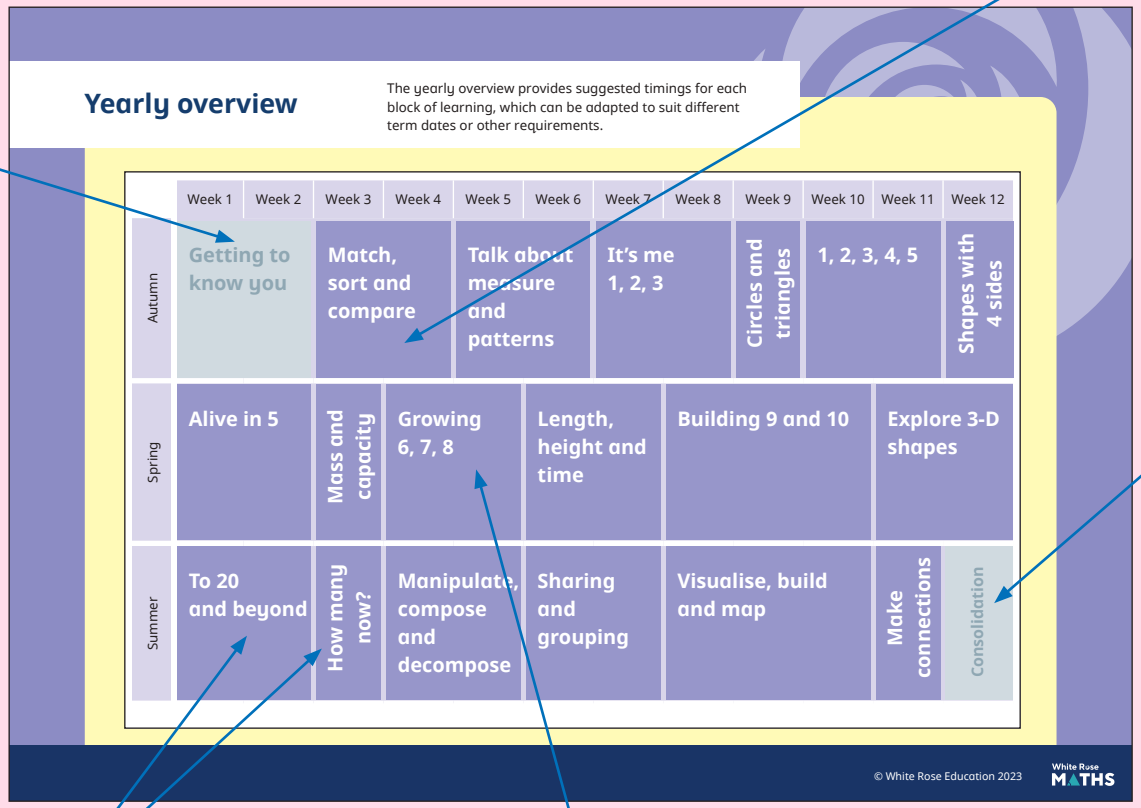
Encourage children to count objects, left to right, right to left, top to bottom and bottom to top. Once children have counted a group, move the objects and ask children how many there are. If they count them all again they have not fully grasped this principle.

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.

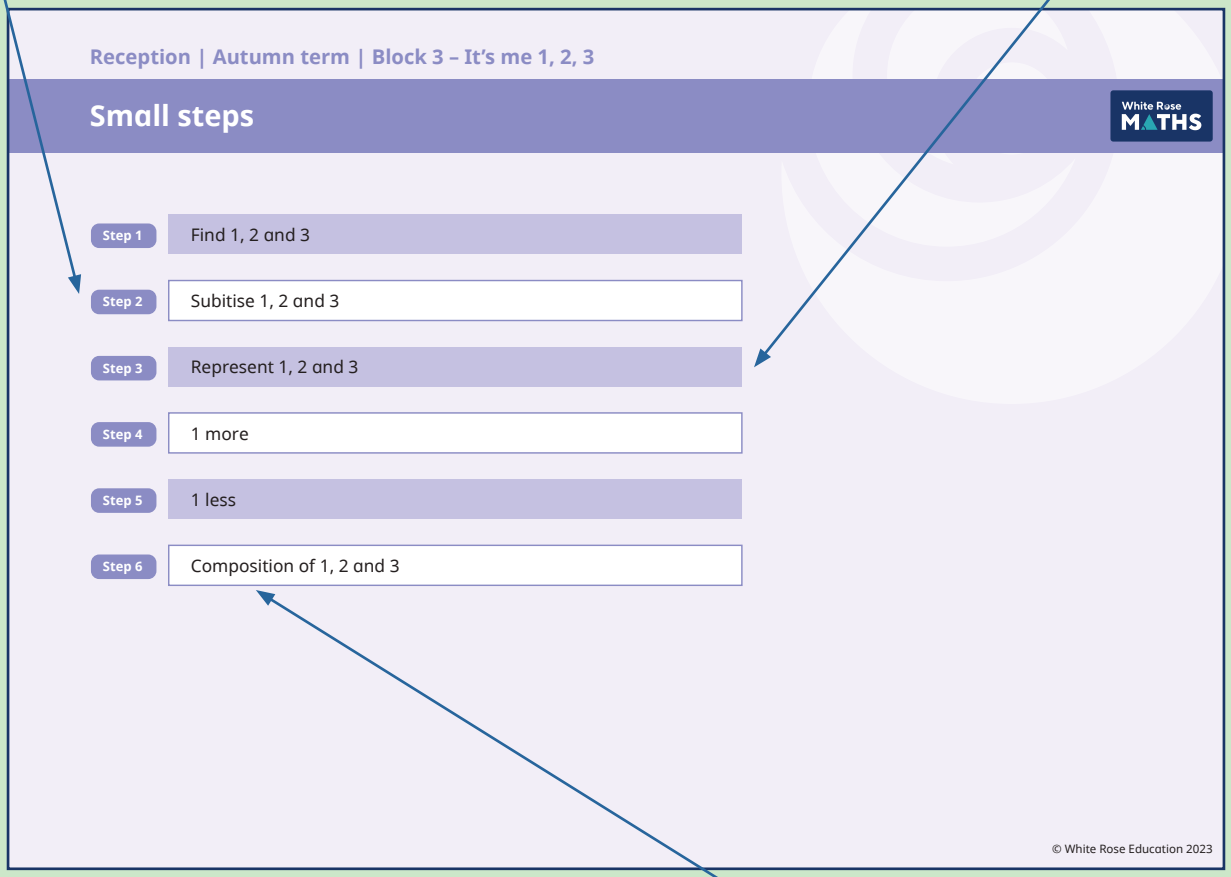
Content is consolidated so all concepts are explicitly taught before assessment for ELG.

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

White Rose MATHS

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

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.

Adult-led learning

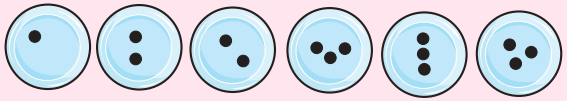
The adult-led learning section provides suggested activities that can be used when teaching this small step. These activities could be delivered to the whole class or in small groups.

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.

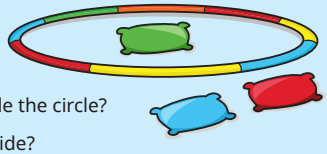
Provide them with a piece of paper and allow them to paint, draw or use collage materials to represent the numbers 1, 2 and 3

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.

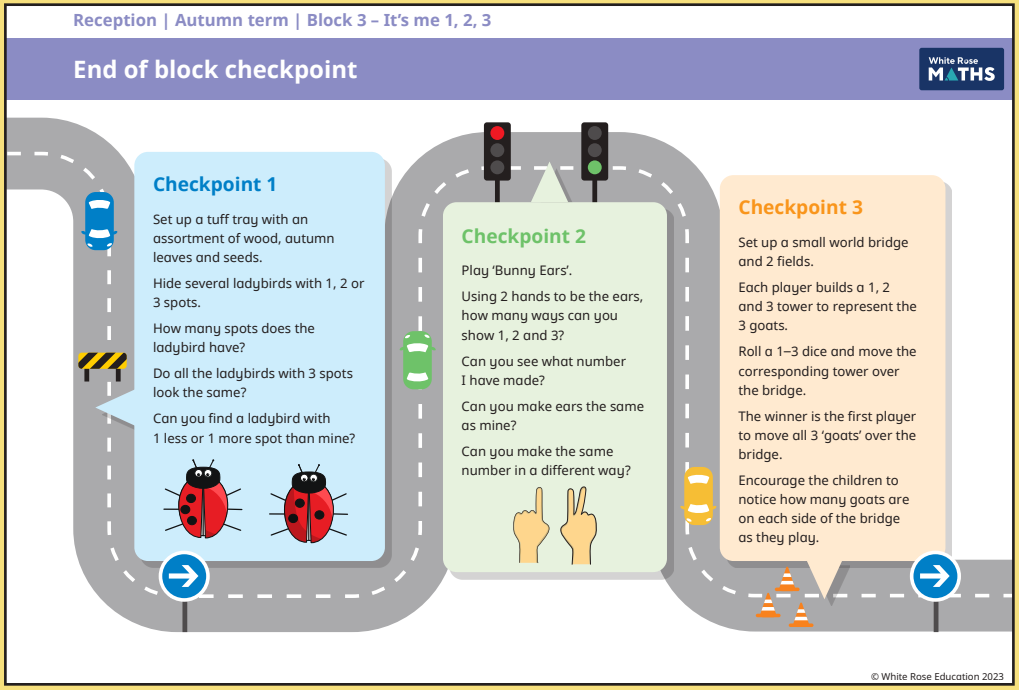
Include some unlabelled pots and encourage children to make their own labels to show how many they put inside.

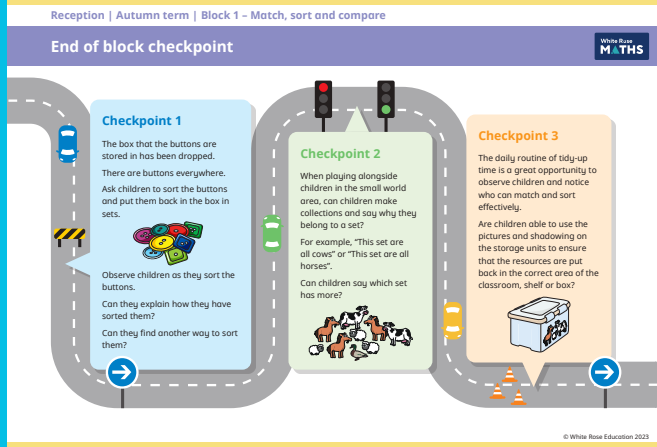
End of block checkpoint

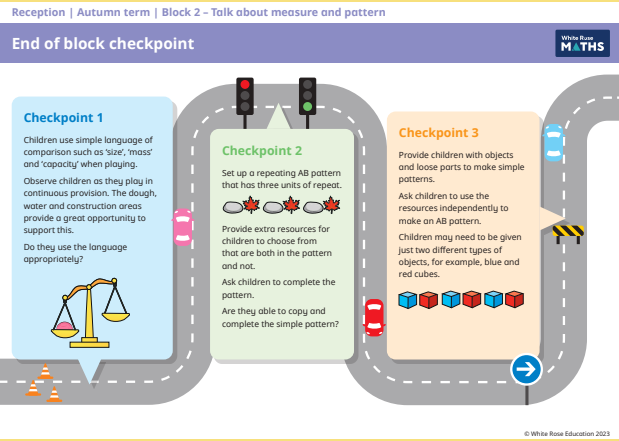
This section provides suggested activities that can be used to assess children's learning from the block.

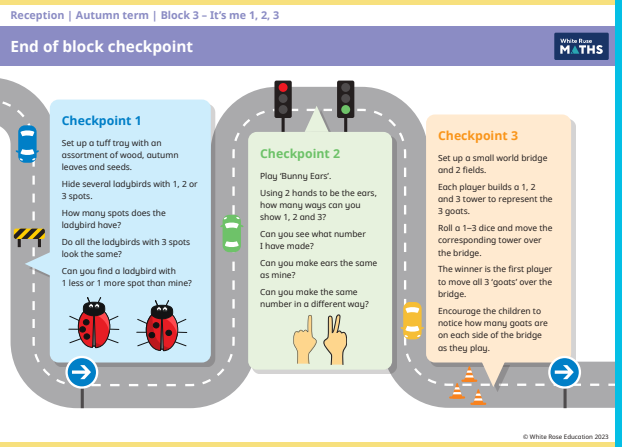
Each block has three end of block checkpoints where adults can observe children demonstrating the knowledge they have gained. These are designed to be fun games or activities to support play-based practical learning.

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







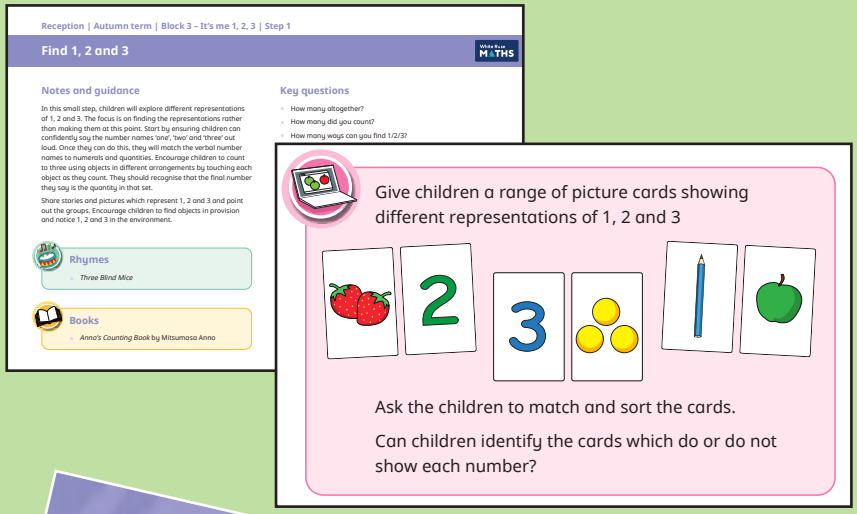


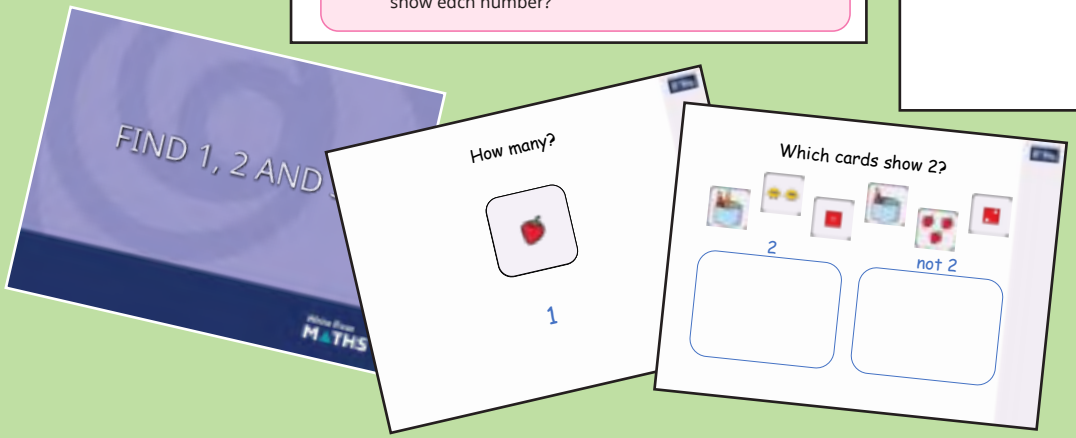
Premium supporting materials

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.

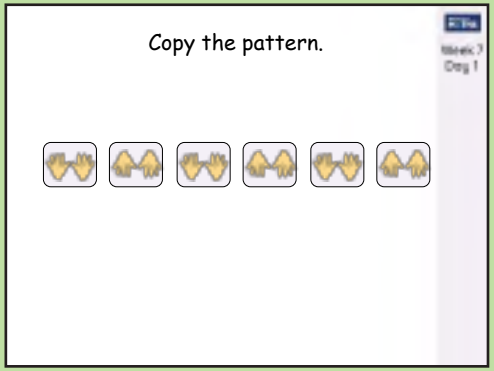
Premium resources – Teaching slides

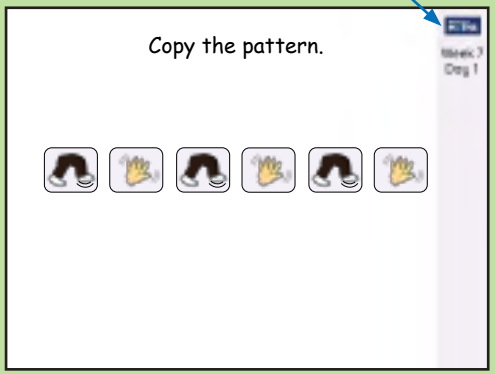




Each set of starters revisits the previous week's learning to support consolidation.

Premium resources – Starter slides





White Rose MATHS

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

Summer 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 – To 20 and beyond

- *Anno's Counting Book* by Mitsumasa Anno
- *Monster Counting Book 1 to 20* by Frances Mackay
- *13 Ways to Eat a Fly* by Sue Heavenrich
- *The Real Princess* by Brenda Williams
- *One Moose, Twenty Mice* by Claire Beaton
- *20 Big Trucks in the Middle of the Street* by Mark Lee
- *Jack the Builder* by Stuart J. Murphy
- *Monster Math* by Anne Miranda
- *1 is One* by Tasha Tudor

Block 2 – How many now?

- *Mouse Count* by Ellen Stoll Walsh
- *One Ted Falls out of Bed* by Julia Donaldson
- *My Granny Went to Market* by Stella Blackstone
- *Mr Gumpy's Outing* by John Burningham
- *Splash!* by Ann Jonas
- *Tad* by Benji Davies
- *The Shopping Basket* by John Burningham

Block 3 – Manipulate, compose and decompose

- *Big Box of Shapes* by Wiley Blevins
- *Which One Doesn't Belong?* by Christopher Danielson
- *Mr Gumpy's Motor Car* by John Burningham
- *Tangram Cat* by Maranke Rinck and Martijn van der Linden
- *Three Pigs, One Wolf, and Seven Magic Shapes* by Grace Maccarone
- *Mouse Shapes* by Ellen Stoll Walsh
- *Pezzettino* by Leo Lionni
- *Jack and the Flumflum Tree* by Julia Donaldson
- *Perfect Square* by Michael Hall
- *Grandpa's Quilt* by Betsy Franco
- *Color Zoo* by Lois Ehlert
- *Cubes, Cones, Cylinders, & Spheres* by Tana Hoban
- *Boxitects* by Kim Smith

Summer book list

Block 4 – Sharing and grouping

- *The Last Marshmallow* by Grace Lin
- *The Squirrels Who Squabbled* by Rachel Bright
- *One Hungry Cat* by Joanne Rocklin
- *The Doorbell Rang* by Pat Hutchins
- *Ness the Nurse* by Nick Sharratt
- *The Gingerbread Man*
- *Bean Thirteen* by Matthew McElligott
- *Missing Mittens* by Stuart J. Murphy
- *Alison Hubble* by Allan Ahlberg

Block 5 – Visualise, build and map

- *I See a Pattern Here* by Bruce Goldstone
- *Pattern Fish* by Trudy Harris
- *Pattern Bugs* by Trudy Harris
- *Art Forms in Nature* by Ernst Haeckel
- *Rosie's Walk* by Pat Hutchins
- *What the Ladybird Heard* by Julia Donaldson
- *Disney's The Lion King* by Justine Korman Fontes
- *We're Going on a Bear Hunt* by Michael Rosen
- *Cockatoos* by Quentin Blake
- *Martha Maps It Out* by Leigh Hodgkinson
- *In Every House, on Every Street* by Jess Hitchman
- *If I Built a House* by Chris Van Dusen
- *The Secret Path* by Nick Butterworth
- *Me on the Map* by Joan Sweeney
- *Pirates Love Underpants* by Claire Freedman
- *My Map Book* by Sara Fanelli
- *Little Red Riding Hood*
- *The Once upon a Time Map Book* by B.G. Hennessy
- *The Gruffalo* by Julia Donaldson

Block 6 – Make connections

- *Billy's Bucket* by Kes Gray
- *Mr Gumpy's Outing* by John Burningham
- *How Many Legs?* by Kes Gray
- *Ants Rule: The Long and Short of it* by Bob Barner
- *Mr Archimedes' Bath* by Pamela Allen
- *Who Sank the Boat?* by Pamela Allen
- *You Can't Take an Elephant on the Bus* by Patricia Cleveland-Peck

Summer Block 1

To 20 and beyond

White Rose MATHS

Teacher guidance

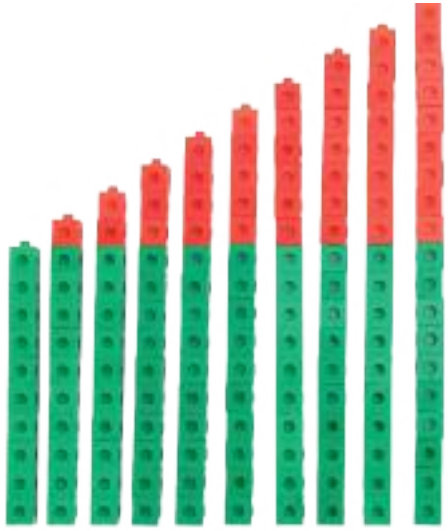
Key books

- *Anno's Counting Book* by Mitsumasa Anno
- *Monster Counting Book 1 to 20* by Frances Mackay
- *13 Ways to Eat a Fly* by Sue Heavenrich
- *The Real Princess* by Brenda Williams
- *One Moose, Twenty Mice* by Claire Beaton
- *20 Big Trucks in the Middle of the Street* by Mark Lee
- *Jack the Builder* by Stuart J. Murphy
- *Monster Math* by Anne Miranda
- *1 is One* by Tasha Tudor

Top tips

- Continue counting past 10, as the numbers just beyond can be the trickiest. Incorporate counting within your daily routine, such as counting children when lining up or the number of sleeps to a key event.
- Use a range of concrete manipulatives which vary in size, colour and position to support children when counting.
- Encourage children to notice numerals and quantities up to 20 in the classroom and outdoor environment.

Key resources



Small steps

Step 1	Build numbers beyond 10 (10–13)
Step 2	Continue patterns beyond 10 (10–13)
Step 3	Build numbers beyond 10 (14–20)
Step 4	Continue patterns beyond 10 (14–20)
Step 5	Verbal counting beyond 20
Step 6	Verbal counting patterns

Build numbers beyond 10 (10–13)

Notes and guidance

In this block, children become more familiar with numbers beyond 10 and the pattern (stable order) of numbers to 20 and beyond. Children will be familiar with larger numbers from daily routines such as counting children or the days in the month. This small step focuses on numbers beyond 10. First, ensure that children can say the numbers 11, 12 and 13 and support them to use one-to-one correspondence to count items beyond 10

Provide varied opportunities for building the numbers 10, 11, 12 and 13 to support children's understanding. Encourage children to play games that involve these numbers, and count on and back to improve children's knowledge of the stable order counting principle.

Rhymes

- *Sesame Street's Pinball Number Count*

Books

- *Anno's Counting Book* by Mitsumasa Anno
- *Monster Counting Book 1 to 20* by Frances Mackay

Key questions

- How will you build the number 10/11/12/13?
- Where can you find 10/11/12/13?
- What number have you built?
- What do you notice about that number?

Possible sentence stems

- I can see _____
- I can build _____
- 10/11/12/13 has ten and _____

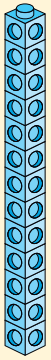
Links to the curriculum

- *Development Matters* – Reception – Count beyond ten.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - Enjoys reciting numbers from 0 to 10 (and beyond) and back from 10 to 0

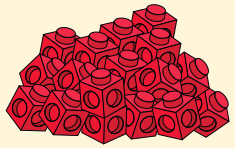
Build numbers beyond 10 (10–13)

Adult-led learning

Read stories such as *Monster Counting Book 1 to 20* by Frances Mackay, focusing on the pages up to 13

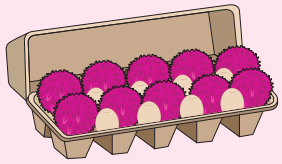


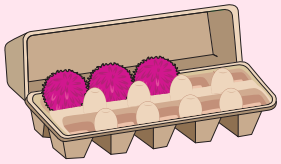
Provide children with a range of different manipulatives such as number shapes and cubes. Prompt them to build numbers up to 13



As children build the numbers, encourage them to notice and talk about the number structures.

In pairs, children take two empty, 10-hole egg boxes and fill one with loose parts. Child 1 closes their eyes while child 2 fills the other egg box with 1, 2 or 3 objects. Child 2 opens their eyes and subitises the ten and counts on how many.

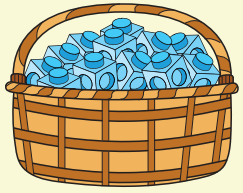


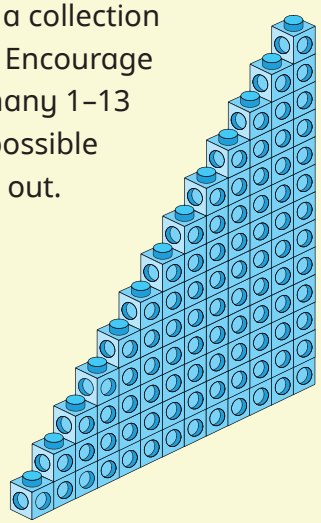


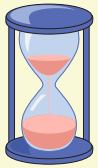
After reading the book *Anno's Counting Book* by Mitsumasa Anno with children, explore how the numbers build up across the pages, up to the number 12

Support children to then create their own page for the number 13

Provide children with a collection of cubes and a timer. Encourage children to build as many 1–13 staircase models as possible before the timer runs out.







Prompt children to count out loud and encourage them to notice the pattern of numbers.

Continue patterns beyond 10 (10–13)

Notes and guidance

In this small step, children continue to build and notice patterns with numbers beyond 10 (up to 13). Provide opportunities for children to recognise that the numbers 1 to 3 repeat after every full ten. So, they have 1 ten and 1, 1 ten and 2, 1 ten and 3. It is important to embed this skill with numbers to 13 first, before going up to 20

Encourage children to count on and back from different starting points, to say what comes before or after a given number and to place numbers in order. Challenge children to notice 11, 12 and 13 in displays and stories. Use stories linked to interests to embed the stable order. Children enjoy correcting puppets who make counting errors or say the numbers incorrectly. Daily counting routines and games provide many opportunities to regularly count beyond 10

Rhymes

- *Sesame Street's Pinball Number Count*

Books

- *13 Ways to Eat a Fly* by Sue Heavenrich

Key questions

- What number comes after _____?
- What do you notice about that number?
- What pattern can you see?

Possible sentence stems

- I can see 1 ten and _____
- _____ and _____ makes _____
- _____ comes after _____

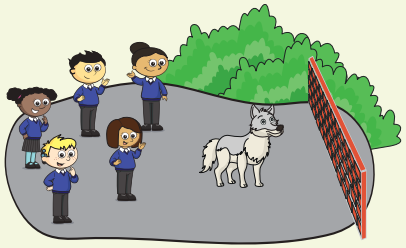
Links to the curriculum

- *Development Matters* – Reception – Count beyond ten.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - 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)

Continue patterns beyond 10 (10–13)

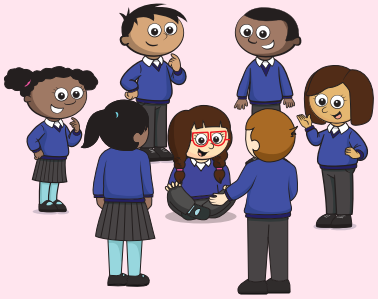
Adult-led learning

Play the game 'What's the time, Mr Wolf?' Pick one child to be the wolf and ask them to stand at one end of the outdoor area, facing the other way. All the other children stand at the other end. Children ask the wolf, "What's the time, Mr Wolf?" The wolf says a time, for example, "It is 11 o'clock."



Support children to count and take 11 steps towards the wolf. Repeat for other numbers up to 12

Encourage children to stand in a circle. Choose a child to start counting aloud around the circle from zero. Each child in turn says the next number.



The child who says the number 13 sits down in the middle of the circle.

Continue counting from 0 to 13 around the circle until one person is left standing. This person is the winner.

Provide children with crates numbered 1 to 5 and a set of balls. Prompt children to aim and throw the balls at the crates. The crate the ball lands in is the number of points they score. Support children to make marks or use a tally to record their scores.

The first to score exactly 13 is the winner.

Provide children with a number track from 1 to 13, a dice labelled 1 to 3 and counters.

1	2	3	4	5	6	7	8	9	10	11	12	13

Encourage them to take it in turns to roll the dice and count on the corresponding number of spaces on the number track.

What number do you need to roll next to get to 13?

Build numbers beyond 10 (14–20)

Notes and guidance

In this small step and the next, children build on their skills using the numbers to 13 to become more familiar with the numbers to 20

This small step focuses on building numbers to 20

Provide many opportunities for children to build these numbers, again focusing on the ten and 4, 5, 6, 7, 8, 9

Continue to encourage them to build the numbers using the sequence identified in number stories. Use manipulatives to explore the structure of numbers beyond 10

Simple matching games can support children to link the number to the quantity, using resources such as number and representation cards. Encourage children to use loose parts and objects of interest to make these larger numbers. Use ten frames to support and emphasise the structure they are building. Allow children to explore larger staircase models and patterns that show that the next number is one more than the previous number.

Books

- *The Real Princess* by Brenda Williams
- *One Moose, Twenty Mice* by Claire Beaton

Key questions

- How will you build the number _____?
- Where can you find the number _____?
- What number have you built? What do you notice?

Possible sentence stems

- I can see _____
- I can build/I have made _____
- _____ has ten and _____

Links to the curriculum

- *Development Matters* – Reception – Count beyond ten.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - 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)

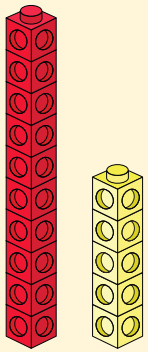
Build numbers beyond 10 (14–20)

Adult-led learning

Read stories such as *One Moose, Twenty Mice* by Claire Beaton which show different representations of numbers up to 20

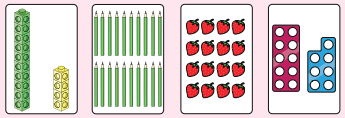
Prompt children to use manipulatives such as cubes to represent the number shown on each page.

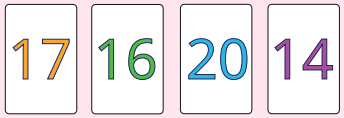
How many cubes do you have? What do notice?



Provide a set of picture cards and matching numeral cards for numbers up to 20

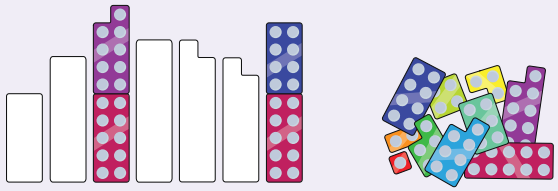
Give one card to each child and ask them to find a partner with the matching number. Prompt them to then find other children who have the same number shown in different ways.





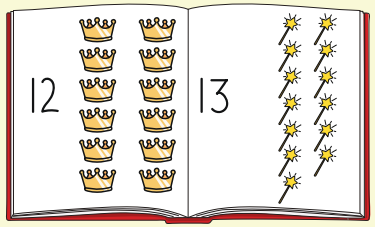
What number card do you have? How do you know?

Provide blank outlines of a cityscape for children to fill using number shapes. Prompt them to see which number has filled each tower. Is there more than one way to do this?



Challenge children to design their own cityscape for a partner to fill with number shapes.

After reading stories such as *The Real Princess* by Brenda Williams, provide children with blank, pre-folded books. Encourage children to make their own number stories. Prompt them to draw out numbers from familiar stories or numbers linked to their own interests.



Continue patterns beyond 10 (14–20)

Notes and guidance

In this small step, children develop their experiences of building the numbers from 14 to 20

They will now focus on seeing the pattern of ten and 4 more, ten and 5 more, ten and 6 more, and so on, which will then be built on further in later year groups.

Support children to recreate this pattern in provision using different resources and contexts, such as putting a given number of vehicles on a road or a given number of blocks in a tower.

Having an empty washing line and number cards available for children to sort will support children to recognise numerical patterns.

A good way to support children to see what comes next in a sequence is by having a puppet remove or reorder familiar resources, such as number shapes in an interactive display.

Books

- *20 Big Trucks in the Middle of the Street* by Mark Lee
- *Jack the Builder* by Stuart J. Murphy

Key questions

- What number comes after _____?
- What do you notice about that number?
- What pattern can you see?

Possible sentence stems

- I can see 1 ten and _____
- _____ and _____ makes _____
- _____ comes after _____

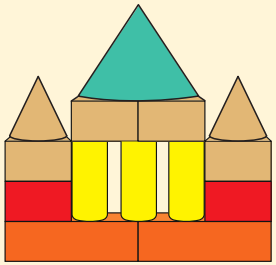
Links to the curriculum

- *Development Matters* – Reception – Count beyond ten.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - 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)

Continue patterns beyond 10 (14–20)

Adult-led learning

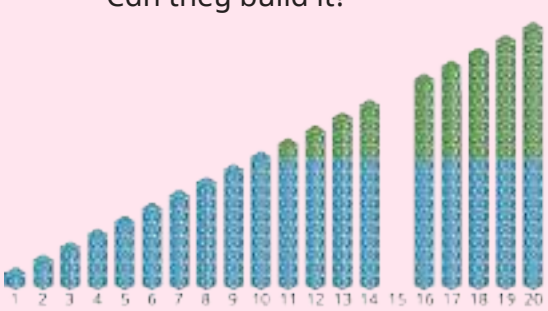
After reading stories such as *Jack the Builder* by Stuart J. Murphy, encourage children to build their own cityscapes using different numbers of blocks. Encourage children to count as they build.



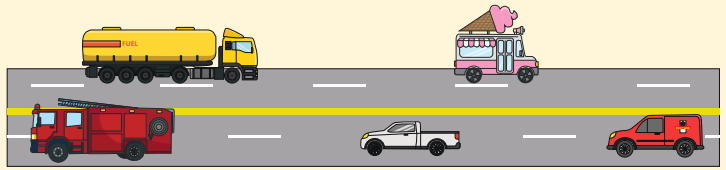
Prompt them to tell a partner what they have built and how many blocks they have used.

Provide a randomly arranged set of towers to 20 and use a class puppet to remove a tower without children seeing. Ask them to order the towers to identify which one is missing. How do they know?

Can they build it?

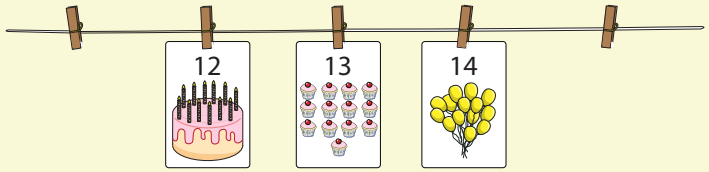


Read stories such as *20 Big Trucks in the Middle of the Street* by Mark Lee with children. Prompt them to enact the story by adding different vehicles to their street in the small world area.



Encourage children to count how many vehicles they have each time. What patterns do they notice?

Provide children with a set of birthday cards where the cardinal value is represented in pictures on the front.



Play 'Which one is missing?' with a birthday card number line. Shuffle the cards and prompt children to order them to find the missing card.

Verbal counting beyond 20

Notes and guidance

In this small step and the next, children will focus on counting verbally beyond 20

Children should already have heard the numbers beyond 20

This step provides time to focus on this skill in adult-led learning. However, this will also need to be embedded in daily routines to support children to become confident.

In this small step, children focus on the process of counting and the numerical patterns. Provide many opportunities for verbal counting beyond 20, pausing at each multiple to draw out the structure. Playing games and taking part in activities involving numbers beyond 20 can help to develop this skill, focusing on saying the numbers out loud. One example of this is playing hide and seek.

Rhymes

- *Catch, Catch, Catch a Fish*

Books

- *Monster Math* by Anne Miranda

Key questions

- What number comes after_____ ?
- What number comes before _____ ?
- What number shall we start counting from?

Possible sentence stems

- _____ comes after _____
- _____ comes before _____
- I will start counting from _____

Links to the curriculum

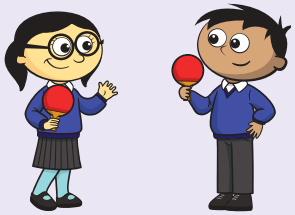
- *Development Matters* – Reception – Count beyond ten.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
  - Enjoys reciting numbers from 0 to 10 (and beyond) and back from 10 to 0
  - Increasingly confident at putting numerals in order 0 to 10 (ordinality)

Verbal counting beyond 20

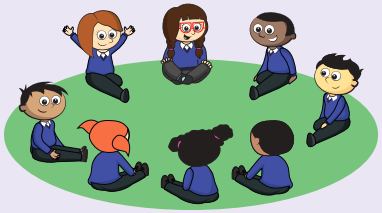
Adult-led learning

Play 'ping pong' with numbers to 20 and beyond. Say one number and then prompt children to say the next number, repeating back and forth.

Repeat with different starting numbers and practise counting on and back.

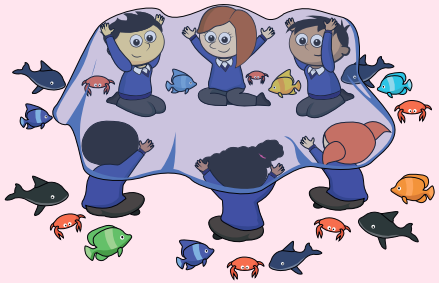


Encourage children to sit in a circle with both their legs stretched out in front of them. Pick a 'target number' below 30 and prompt children to count from zero to 30



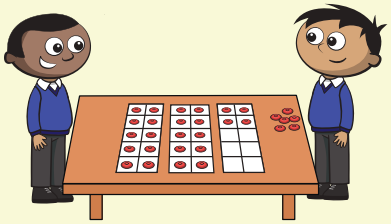
Children say one number for each leg they have in the circle and tap each leg in turn as they say each number. If a child says the target number, then they must tuck that leg away. Continue until there is just one child left in the game.

Sit the whole class in a circle with a range of different sea creatures behind their backs and sing the rhyme, "Catch, catch, catch a fish, hook it on your line. Reel it, reel it, reel it in, this one will be mine". Children with a fish behind their back place it into the middle of the circle. Count how many fish there are altogether.



Repeat the song and change the 'fish' to other sea creatures.

Fill three ten frames with 30 small-world objects and place them in the middle of two children to begin the game.



Children take it in turns to roll a dice and collect the corresponding number of objects from the frames. The child who takes away the last object wins the game. As children play, encourage them to say how many objects remain.

Verbal counting patterns

Notes and guidance

In this small step, children build on verbal counting beyond 20 by noticing the counting patterns involved.

Provide calendars, hundred squares or number tracks, both inside and out, either painted or marked out on the ground. This will support children to become familiar with 2-digit numbers beyond 20 and to start to spot the patterns within them. Children may naturally be curious about bigger numbers. Read stories such as *1 is One* by Tasha Tudor with children, paying particular attention to how each number is represented in the pictures to support counting larger numbers.

It is important that this skill should still remain fun and active, so that children are eager to count. A good way to encourage this is for one child to pick the starting number, such as the date of the month, and another to say if we will be counting on or back. Children can also pick what actions they count, such as taps, clicks or stamps, to embed this skill and make it memorable.

Books

- *1 is One* by Tasha Tudor

Key questions

- What number comes after _____ ?
- What number comes before _____ ?
- What number shall we start counting from?

Possible sentence stems

- _____ comes after _____
- _____ comes before _____
- I will start counting from _____

Links to the curriculum

- *Development Matters* – Reception – Count beyond ten.
- *Birth to 5 Matters* – Range 6
  - Uses number names and symbols when comparing numbers, showing interest in large numbers
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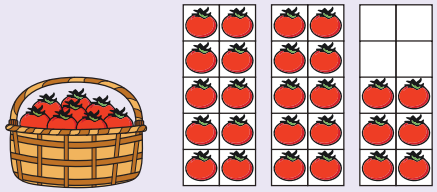
Verbal counting patterns

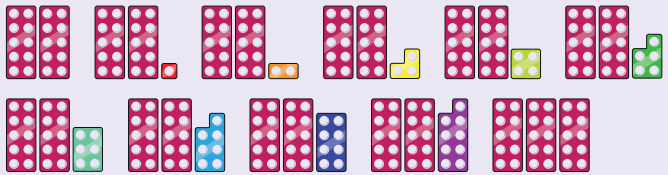
Adult-led learning

At the start of snack time, count out the fruit with children, making sure you have more than 20 pieces to count.



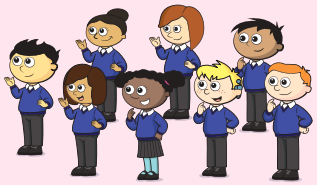
As you lift each piece of fruit out of the basket, say the number name and place it in a line or on a ten frame.

Provide children with a range of number shapes. Prompt children to make their own number line using the number shapes.



What do you notice about the pattern of these numbers?

Play 'I count, you count' with children to practise counting on from different starting points. Point to yourself and begin counting. Then point to the group and prompt them to continue the count.



This could be extended to having more than one group of children.

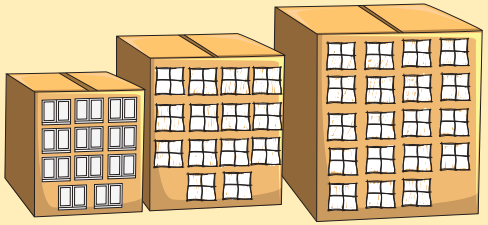
Provide children with a large hundred square chalked on the ground outside. Cover some of the numbers up and ask children to identify the missing numbers.

How do they know that number is the missing number? Can they count on from the missing number?

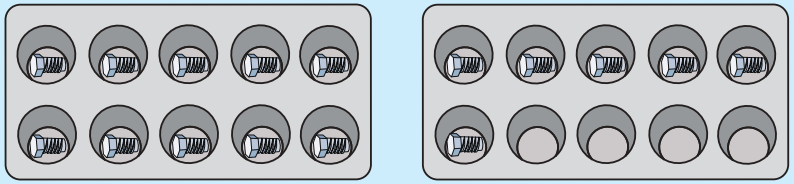
1	2	3	4	5	6	7	8	9	10
11	12	13	14		16	17	18	19	20
21	22	23	24	25	26		28	29	30
	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Continuous provision

Ensure that children have a variety of small and large recyclable box modelling resources. Encourage children to make their own 'number city' by constructing different sized buildings and representing amounts by the number of windows.

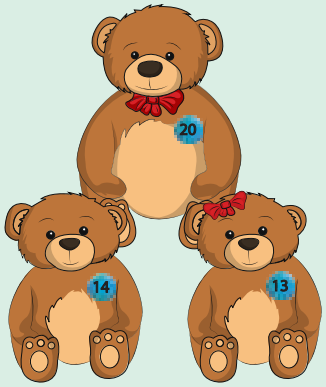


Give children up to 30 small loose parts, for example nuts and bolts. Encourage them to estimate how many there are. Then prompt them to arrange these items into bun tins with 10 spaces to help them to see how many full tens and how many of the next ten they have.



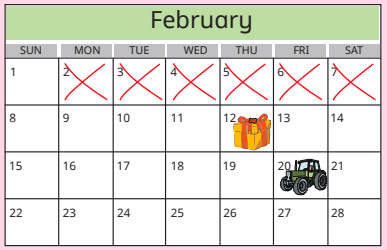
Enhance provision with teddy bears and give each a birthday badge with a number from 11 to 20

Provide children with blank folded cards and encourage them to make their own birthday cards for one of the bears. Prompt them to mark-make or draw images to represent the corresponding number.



Provide children with hundred squares and number tracks, both inside on a small scale and outside on a larger scale, painted or chalked onto the ground. Calendars displayed with key events are also a great way to encourage children to count forwards or backwards to important dates.

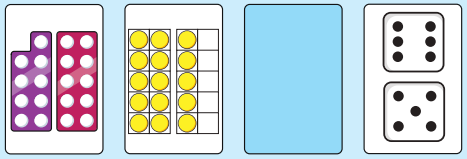
Encourage children to notice and become familiar with 2-digit numbers and start to spot the patterns within them.



End of block checkpoint

Checkpoint 1

Provide children with a selection of picture cards from 11 to 20 and ask them to select four each. Hold up numeral cards one by one. If children have the matching picture card, they can turn it over.



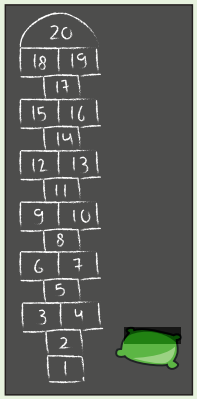
Can children recognise what number is represented on each picture card?

Checkpoint 2

Play hopscotch to 20

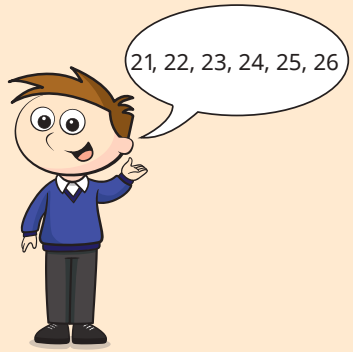
Children throw a beanbag towards the hopscotch.

Can they identify the number their beanbag landed on? Can they count on as they move up the hopscotch and then count back as they return?



Checkpoint 3

Select a number to begin counting from and ask children to choose whether to count on or back. Can children maintain the stable order when counting beyond 20?



Summer Block 2

How many now?

White Rose MATHS

Teacher guidance

Key books

- *Mouse Count* by Ellen Stoll Walsh
- *One Ted Falls out of Bed* by Julia Donaldson
- *My Granny Went to Market* by Stella Blackstone
- *Mr Gumpy's Outing* by John Burningham
- *Splash!* by Ann Jonas
- *Tad* by Benji Davies
- *The Shopping Basket* by John Burningham

Key resources

Top tips

- Using 'first, then, now' number stories helps children to find the answer to the question "How many now?" by providing meaningful contexts.
- Encourage children to represent number stories using props and manipulatives so that they can see the maths that is happening.
- Using double-sided counters on ten frames provides a visual aid so that children can see how many have been added or taken away.

Small steps

Step 1	Add more
Step 2	How many did I add?
Step 3	Take away
Step 4	How many did I take away?

Add more

Notes and guidance

In this small step, children build on their understanding as they explore the change structure of addition (augmentation) by adding more. The focus for this step is on increasing a quantity by a given amount, while continuing to work within 10

Children will use real objects to see that the quantity of a group can be changed by adding more. The 'first, then, now' structure is a very effective way to help build their understanding by creating mathematical stories in meaningful contexts. At first, children may need to re-count all the items (for example, 1, 2, 3, 4, 5, 6, 7) to see how many they have altogether. When they are ready, support them to count on instead (for example, 4, 5, 6, 7).

Encourage children to enact and represent number stories using ten frames, number tracks and their fingers.

Key questions

- How many are there?
- How many were there first?
- How many are there now?
- How many are there altogether?

Possible sentence stems

- First there were _____
- Then _____ more were added.
- Now there are _____
- There are _____ altogether.

Books

- *Mouse Count* by Ellen Stoll Walsh
- *One Ted Falls out of Bed* by Julia Donaldson
- *My Granny Went to Market* by Stella Blackstone

Links to the curriculum

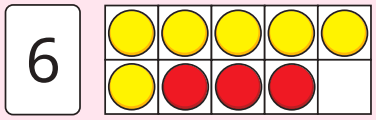
- *Development Matters* – Reception – Automatically recall number bonds for numbers 0–5 and some to 10.
- *Birth to 5 Matters* – Range 6 – In practical activities, adds one and subtracts one with numbers to 10

Add more

Adult-led learning

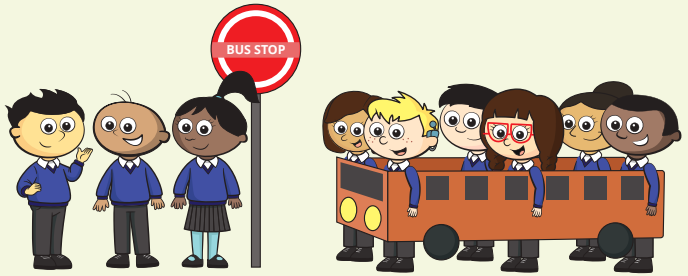
Ask children to show you 5 fingers. Now show 2 more. How many fingers are showing now? How do you know there are 7?

Extend this by showing children a numeral card and asking them to represent the number on a ten frame with double-sided counters all on the same coloured side. Prompt them to add 3 more, representing this using the other side of the double-sided counters.

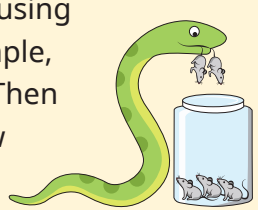


How many are there altogether? Repeat this with different numbers.

Use 'first, then, now' to tell simple number stories to practise adding more in real-life contexts. Set up a bus and bus stops and prompt children to say the story out loud to match the context. For example, "First there were 2 people on the bus. Then 2 more people got on the bus. Now there are 4 people on the bus."



Read stories such as *Mouse Count* by Ellen Stoll Walsh with children, which demonstrate adding more than one. Enact 'first, then, now' stories using props linked to the story. For example, "First there were 3 mice in the jar. Then the snake added 2 more mice. How many mice are in the jar now?"



Count out 5 cubes. Ask children to check how many there are. Cover the cubes with a cloth. Then, add a hidden number of cubes under the cloth. Show children how many cubes there are now. Challenge them to work out how many cubes were added, using their fingers or mark-making.

How many did I add?

Notes and guidance

In this small step, children continue to develop their understanding of the addition change structure by adding more. Children have already explored finding the answer to "How many are there now?" To deepen learning, provide children with 'first, then, now' number stories where the 'then' part is missing. For example, "There were 5 children on the bus, then we don't know how many more got on, but now there are 8 children on the bus."

Support children to use real objects, such as a ten frame and counters, to find the missing number that was added. For example, they represent the starting number with red counters and then they add yellow counters until they reach the total amount. The number of yellow counters represents the number that has been added.

Rhymes

- *Ten Green Bottles*

Books

- *Mr Gumpy's Outing* by John Burningham

Key questions

- How many are there?
- How many are there now?
- How many were added?

Possible sentence stems

- First there were _____
- Now there are _____
- _____ were added.
- I added _____

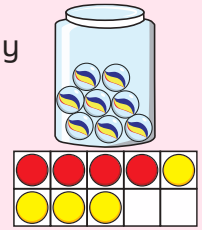
Links to the curriculum

- *Development Matters* – Reception – Automatically recall number bonds for numbers 0–5 and some to 10.
- *Birth to 5 Matters* – Range 6 – Begins to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-"

How many did I add?

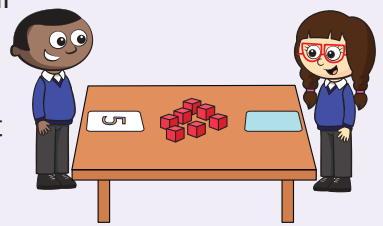
Adult-led learning

Place a number of marbles in a jar and represent this number on a ten frame with red counters. Use a class puppet to add more marbles to the jar without children seeing. Count how many marbles are in the jar now. Support children to find how many were added by placing yellow counters on the ten frame until you reach the total number.



How many yellow counters did you add? How many marbles must the puppet have added?

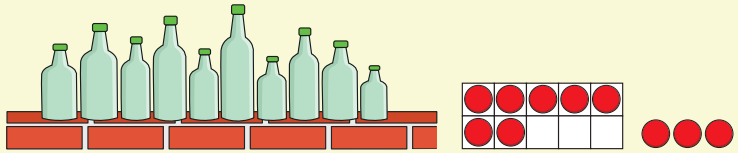
In pairs, one child selects a numeral card and collects that number of cubes. The other child selects another numeral card and, without showing their partner, they add that number of cubes to the pile.



Their partner must work out what number is on the hidden card by finding how many cubes were added.

After reading stories such as *Mr Gumpy's Outing* by John Burningham, encourage children to play the characters from the story. Have some children in the boat and ask the other children to shut their eyes. Secretly tap some of these, who join the boat without the others seeing. Then ask everyone to open their eyes. How many children are in the boat now? How many were added?

In the context of the song *Ten Green Bottles*, tell children a 'first, then, now' story where the first part is missing. For example, "We don't know how many bottles were on the wall, but then 3 more were added and now there are 10 altogether."



Encourage children to use a ten frame and counters to work out how many bottles there were at the start.

Take away

Notes and guidance

In this small step, children build on their understanding as they explore the change structure of subtraction (reduction) by taking away. Children will have experience of taking away objects in everyday life and this is built on by focusing on taking away more than 1 object. The focus is on decreasing a quantity by a given amount, while continuing to work within 10

Encourage children to use real objects to see that the quantity of a group can be changed by taking some away. Prompt them to remove the items and then count or subitise to see how many are left. The 'first, then, now' structure is an effective way to help build their understanding by creating mathematical stories in meaningful contexts, using ten frames, number tracks and their fingers.

Rhymes

- *Ten Currant Buns*

Books

- *Splash!* by Ann Jonas
- *Tad* by Benji Davies

Key questions

- How many are there?
- How many were there first?
- How many are left?
- How many are there now?

Possible sentence stems

- First there were _____
- Then _____ were taken away.
- Now there are _____
- There are _____ left.
- I have _____, how can you show me _____?

Links to the curriculum

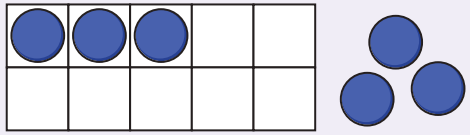
- *Development Matters* – Reception – Automatically recall number bonds for numbers 0–5 and some to 10.
- *Birth to 5 Matters* – Range 6 – In practical activities, adds one and subtracts one with numbers to 10

Take away

Adult-led learning

Ask children to show you 5 fingers and then show you 4 fingers by putting one finger or thumb down. Prompt them to notice that 1 less is the same as taking away one. Repeat this and encourage children to notice how many are left each time.

Extend this by showing children a numeral and asking them to represent that number on a ten frame with counters. Then ask them to take away 3 counters. How many are left?



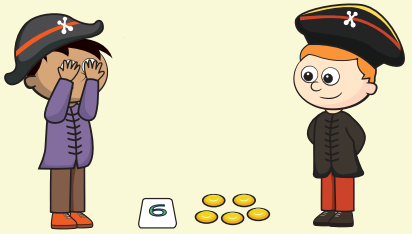
Repeat with different numbers.

After reading stories such as *Splash!* by Ann Jonas with children, set up a small-world scene with characters linked to the story. Encourage children to act out 'first, then, now' stories where characters are taken away. Following this, they could be prompted to create their own number stories. Encourage children to talk about how many characters are left each time.

Encourage children to act out rhymes such as *Ten Currant Buns* and adapt them so that more than one bun is taken away each time.

Prompt children to use props to find how many are left. They could also represent the 'first, then, now' story using cubes or counters on a ten frame.

In pairs, children play a game of 'pirate treasure'. Pick a numeral card and count out the corresponding number of gold coins or loose parts. One child covers their eyes while their partner 'steals' some of the coins and hides them.



The first child has to work out how many coins have been stolen. Children could count on or use double-sided counters to support them.

How many did I take away?

Notes and guidance

In this small step, children continue to develop their understanding of the subtraction change structure by taking away. Children have already explored finding the answer to "How many are there now?" To add challenge, provide children with 'first, then, now' number stories where the 'then' part is missing. For example, "There were 5 children on the bus, then we don't know how many got off, but now there are 2 children."

Support children to use real objects to find the missing number that was taken away. They can represent the starting number with counters on a ten frame, then remove counters until they represent the number of items there are now. Prompting children to talk about how many counters were taken away will help them understand the missing part.

Rhymes

- *Ten Little Ducks*

Books

- *The Shopping Basket* by John Burningham

Key questions

- How many are there?
- How many are there now?
- How many were taken away?

Possible sentence stems

- First there were _____
- Now there are _____
- _____ were taken away.
- I took away _____ and now there are _____

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 – Begins to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-"

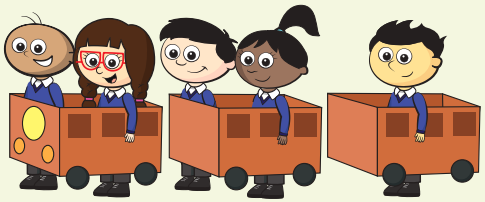
How many did I take away?

Adult-led learning

After reading stories such as *The Shopping Basket* by John Burningham with children, enact scenes from the story but adapt them so that more than one item is secretly taken away. Model using towers of cubes to work out how many were taken away. Start by building a tower to represent the starting number. Take away cubes until you represent the number of items you have left. How many cubes were taken away?

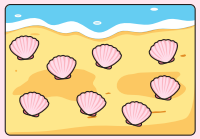
Use simple 'first, then, now' number stories to practise taking away in real-life contexts.

Act out the 'first, then, now' story by setting up a train in the outdoor area.



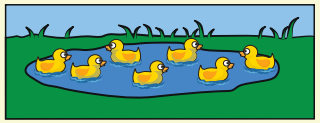
Ask some children to close their eyes and then prompt other children to get on the train. How many children are left at the station? How many have gone?

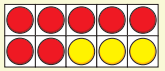
As children are playing in the small-world area, encourage them to create their own 'first, then, now' stories. In pairs, they act out these number stories using props.



Have numeral cards available for children to select as starting numbers for their number stories. Then one child takes away some of the objects while their partner closes their eyes. Their partner then works out how many were taken.

In the context of the song *Ten Little Ducks*, tell children a 'first, then, now' story where the first part is missing. For example, "We don't know how many ducks there were to start with, then 3 swam away and now there are 7 ducks left."

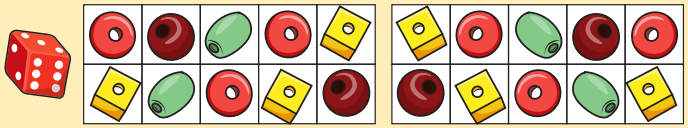




Encourage children to use a ten frame and different-coloured counters to represent how many there are now and how many were taken away.

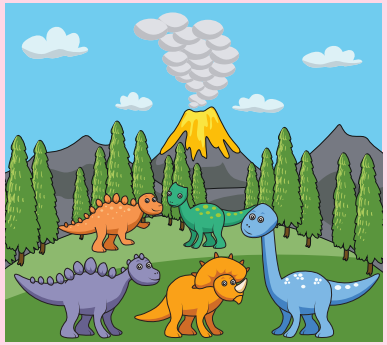
Continuous provision

Encourage children to play a game of 'race to zero'. Provide them with two ten frames each, a dice and loose parts. Each child collects 20 items to fill their two ten frames. Then they take it in turns to roll a dice and take away the corresponding number of items. Each time, children say how many they have left.



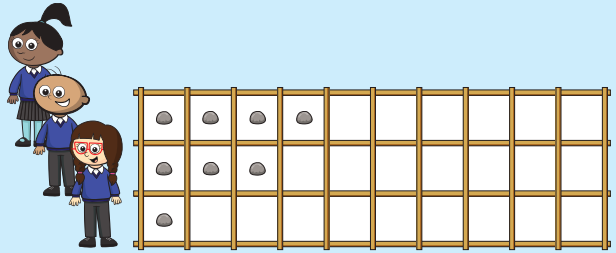
The first child to reach exactly zero wins the game.

Prompt children to create their own 'first, then, now' stories using small-world resources linked to their interests.



For example, "First there were 3 dinosaurs. Then 2 more dinosaurs came along. Now there are 5 dinosaurs altogether." Encourage children to enact their number stories with a partner.

Enhance provision outside by providing a square-holed trellis, or tape a grid onto the playground, and a range of small objects such as beanbags or pebbles. Each child has a row on the trellis. They take it in turns to roll a dice and then they fill their row with the corresponding number of objects.



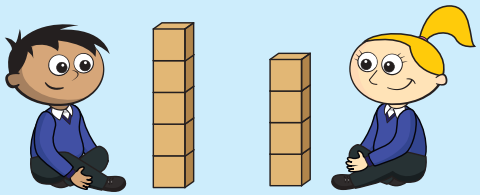
The first child to fill their row wins the game.

In pairs, prompt children to collect 10 objects. They take it in turns to choose whether to take away 1, 2 or 3 objects. The winner is the player who avoids taking the last object.

End of block checkpoint

Checkpoint 1

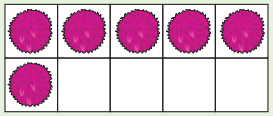
Provide children with a 1 to 3 dice and cubes. Children take it in turns to collect 1, 2 or 3 cubes to add to their tower.



Can children say how many were added? How many cubes do they have now? How tall can they build their towers before they topple over?

Checkpoint 2

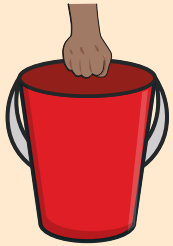
Play a game of 'pass it on' in small groups. Each child starts with 6 loose parts. They roll a 1 to 3 dice and pass the corresponding number of objects to the child on their left. The winner is the first child to give away all their objects.



Can children say how many they have taken away? How many do they have left?

Checkpoint 3

Provide children with a 5 to 10 dice, beanbags and a bucket. Encourage one child to roll the dice and place the corresponding number of beanbags into the bucket. Prompt another child to take some of the beanbags out of the bucket without the group seeing how many. Tip the remaining beanbags out of the bucket. How many are left now? Can children work out how many beanbags must have been taken?



Summer Block 3

Manipulate, compose and decompose

White Rose MATHS

Teacher guidance

Key books

- *Big Box of Shapes* by Wiley Blevins
- *Which One Doesn't Belong?* by Christopher Danielson
- *Mr Gumpy's Motor Car* by John Burningham
- *Tangram Cat* by Maranke Rinck and Martijn van der Linden
- *Three Pigs, One Wolf, and Seven Magic Shapes* by Grace Maccarone
- *Mouse Shapes* by Ellen Stoll Walsh
- *Pezzettino* by Leo Lionni
- *Jack and the Flumflum Tree* by Julia Donaldson
- *Perfect Square* by Michael Hall
- *Grandpa's Quilt* by Betsy Franco
- *Color Zoo* by Lois Ehlert
- *Cubes, Cones, Cylinders, & Spheres* by Tana Hoban
- *Boxitects* by Kim Smith

Key resources

Small steps

Step 1	Select shapes for a purpose
Step 2	Rotate shapes
Step 3	Manipulate shapes
Step 4	Explain shape arrangements
Step 5	Compose shapes
Step 6	Decompose shapes
Step 7	Copy 2-D shape pictures
Step 8	Find 2-D shapes within 3-D shapes

Select shapes for a purpose

Notes and guidance

Children have already had experience of selecting shapes for a purpose when using 3-D shapes for tasks. In this small step, this learning is extended to further exploring the properties of shapes and spatial relations.

Provide opportunities for children to explore the attributes of shapes and to select shapes for a particular purpose. Encourage them to explain why they chose a particular shape and why other shapes would not be suitable.

Prompt children to explore using pattern block shapes and encourage them to fill templates or make their own pictures. Children could also explore selecting shapes for a purpose outside by using large-scale construction to build large models such as vehicles or dens.

Books

- *Big Box of Shapes* by Wiley Blevins
- *Which One Doesn't Belong?* by Christopher Danielson
- *Mr Gumpy's Motor Car* by John Burningham

Key questions

- Which shapes will you need?
- Why have you chosen a _____?

Possible sentence stems

- I have chosen a _____ because _____.
- This one doesn't belong because _____.
- I need a _____ to complete my picture.

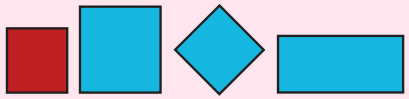
Links to the curriculum

- *Development Matters* – Reception – Select, rotate and manipulate shapes to develop spatial reasoning skills.
- *Birth to 5 Matters* – Range 5
  - Chooses items based on their shape which are appropriate for the child's purpose
  - Responds to both informal language and common shape names
  - Shows awareness of shape similarities and differences between objects

Select shapes for a purpose

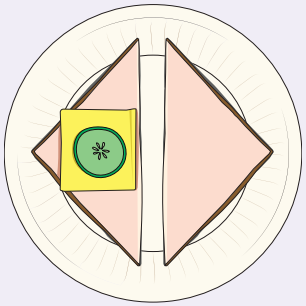
Adult-led learning

After reading books such as *Which One Doesn't Belong?* by Christopher Danielson with children, provide them with a range of shapes that could be used in a similar way to those in the book. Select the shapes so that there is a reason why each one of them doesn't belong.



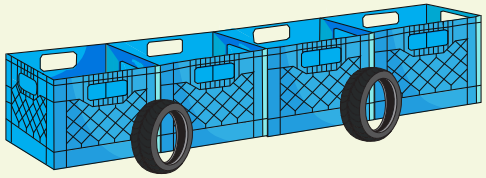
Ask children which one doesn't belong and encourage them to explain their reason why.

Provide children with real food or pre-cut paper shapes to represent sandwich ingredients, such as brown triangles for bread, yellow squares for cheese slices, green circles for cucumber slices and red circles for tomato slices.



Prompt children to design and make their own sandwich, explaining why they have chosen each of the shapes and placed them in that order.

After reading books such as *Mr Gumpy's Motor Car* by John Burningham, encourage children to make arrangements outside, such as a car, using a variety of resources.

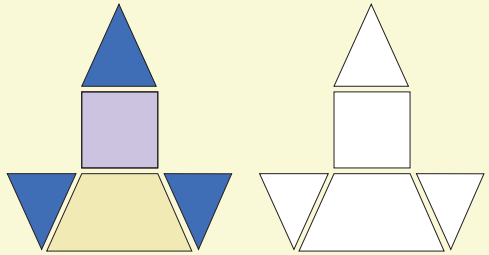


Prompt them to talk about which shapes to select and where to place them in relation to the other shapes.

Provide children with pattern blocks and encourage them to design their own picture.

Prompt them to create a template to help them to remember their design.

They could then ask a partner to use the template to recreate their picture.



Rotate shapes

Notes and guidance

In this small step, children will explore how shapes will appear when rotated. A key thing to look out for is that children may not recognise a shape when its orientation changes. For example, children often do not recognise triangles and squares when they have been rotated.

Rotating shapes is an important step, as it will help to support children to visualise how shapes and objects will fit together in later steps.

Provide opportunities for children to select and rotate shapes to fill a given space. Using jigsaws, number shape baseboards and pattern block templates can help to support this.

Prompt children to notice that some jigsaw pieces are corner pieces and that some have straight edges. They may also notice that the pieces have 'sticky-out bits' or holes. Encourage children to notice how the pieces fit together or why certain pieces will not fit together.

Books

- *Which One Doesn't Belong?* by Christopher Danielson

Key questions

- Which shape will match?
- What shapes have you used to make your picture?
- How did you make the shape fit?
- How did you manipulate the shape to make it fit?

Possible sentence stems

- This shape is a _____.
- I need to _____ the shape to make it fit.
- I need a _____ to complete my picture.
- This will not fit because _____.

Links to the curriculum

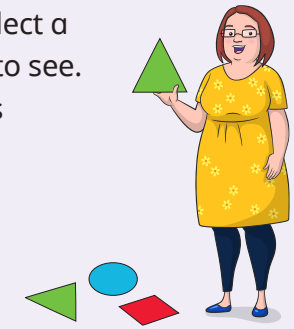
- *Development Matters* – Reception – Select, rotate and manipulate shapes to develop spatial reasoning skills.
- *Birth to 5 Matters* – Range 6 – Investigates turning and flipping objects in order to make shapes fit and create models; predicting and visualising how they will look (spatial reasoning)

Rotate shapes

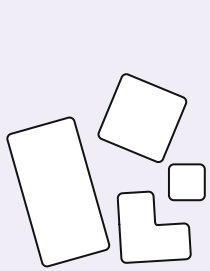
Adult-led learning

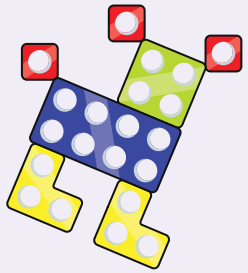
Provide children with a set of shapes. Select a shape and hold it up for all the children to see. Ask them to find the shape that matches yours.

This can be adapted by making the shapes more similar and changing the orientations.



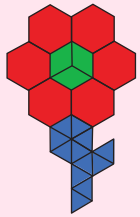
Provide children with number shapes and outlines of the number shapes in different orientations. Ask them to select shapes to match each outline.

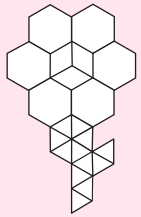




Provide baseboard overlays or number shape outlines and encourage children to use positional language as they build.

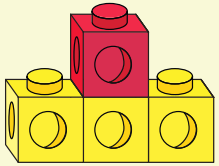
Provide children with pattern blocks or similar shapes, along with coloured picture templates for them to match. The children can progress from matching shapes with coloured pictures to pictures with outlines only.

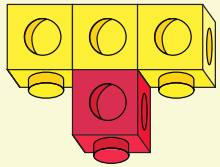


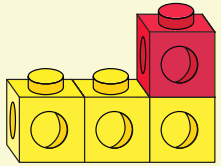


Encourage children to look carefully and select the correct shapes. These may need to be rotated to fit in the outline.

Give children instructions to visualise a 3-D model without using equipment. For example, "Join three yellow cubes together in a line, place a red cube on top of the middle yellow cube. Then flip your model upside down." Show children three possible models and ask them which matches the model they visualised.







Manipulate shapes

Notes and guidance

In this small step, children build on the learning from previous steps by now manipulating shapes. Children will explore moving, turning, rotating and flipping shapes to fit into the spaces provided. Continuing to enhance provision with pattern block templates and number shape baseboards will support children to manipulate shapes.

As with rotating shapes, provide opportunities for children to see shapes in a variety of orientations and positions, so they learn that the same shape can look different. Shape sorters can support with this, as they encourage children to turn, rotate and flip shapes.

In this small step, tangram pieces are introduced for the first time. Allow some time for children to explore the tangram shapes in open-ended activities before moving on to using these in adult-led tasks.

Books

- *Tangram Cat* by Maranke Rinck and Martijn van der Linden
- *Three Pigs, One Wolf, and Seven Magic Shapes* by Grace Maccarone

Key questions

- Which shapes will you need to use?
- How have you moved the shape/shapes?
- How have you made your picture?
- How would you describe your picture?

Possible sentence stems

- I have chosen a _____ because _____.
- I need a _____ to complete my picture.
- I need to _____ my shape to make it fit.

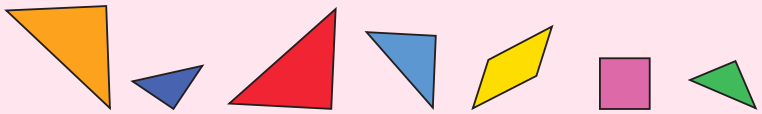
Links to the curriculum

- *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)

Manipulate shapes

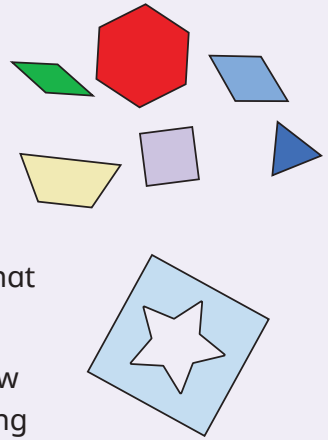
Adult-led learning

After reading stories such as *Tangram Cat* by Maranke Rinck and Martijn van der Linden, provide children with tangram pieces and encourage them to explore the different shapes.



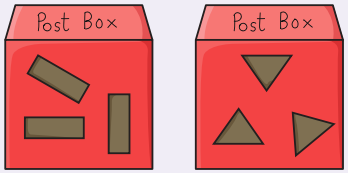
Once children are familiar with them, provide templates with the outlines of different pictures. Prompt them to manipulate the shapes to complete the picture.

Provide children with a set of pattern blocks or similar shapes. Cut out a star template. Encourage children to find different ways to build a star. How many different shapes have they used? Prompt them to talk about the shapes they choose and what they notice.



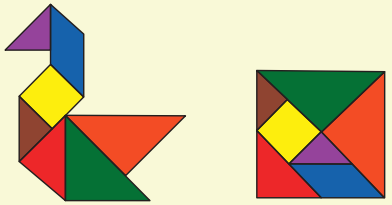
Encourage children to investigate how many ways they can build a star using the same shape.

Use junk modelling boxes to make a range of postboxes with different-shaped openings, ensuring that there are three different orientations on each box.



Provide children with a range of shapes which will fit inside the openings of the box. Prompt them to manipulate the shapes to fit inside the postbox.

Provide children with a set of tangrams and prompt them to rotate and manipulate the shapes to make their own arrangements and pictures.



Can a partner guess what they have created? Encourage them to challenge their partner to recreate what they have made using their own pattern blocks.

Explain shape arrangements

Notes and guidance

In this small step, children use their previous knowledge of positional language and now progress to explaining more complex shape arrangements. Provide opportunities for children to match arrangements of shapes, prompting them to use positional language to describe where the shapes are in relation to one another.

In play, prompt children to describe the position of shapes, building blocks or small-world characters. This could also be done on a large scale outside when building and following obstacle courses.

Encourage children to play barrier games where two children sit opposite each other with a barrier in between them. A piece of cardboard or a book make good barriers. When playing the game, one child gives instructions to their partner for them to make the same arrangement as them. First, begin without a barrier, then progress to using a barrier but give quick peeks. Finally, extend to leaving the barrier in place so that children must rely on verbal instructions to copy the shape arrangements.

Books

- *Mouse Shapes* by Ellen Stoll Walsh

Key questions

- How are the shapes arranged?
- Which shapes have you used?
- How can you explain your model?

Possible sentence stems

- The _____ is next to the _____.
- The _____ is in front of the _____.
- The _____ is behind the _____.
- Move around the _____.
- Move under/over the _____.

Links to the curriculum

- *Development Matters* – Reception – Select, rotate and manipulate shapes to develop spatial reasoning skills.
- *Birth to 5 Matters* – Range 6 – Uses informal language and analogies, (e.g. *heart-shaped and hand-shaped leaves*), as well as mathematical terms to describe shapes

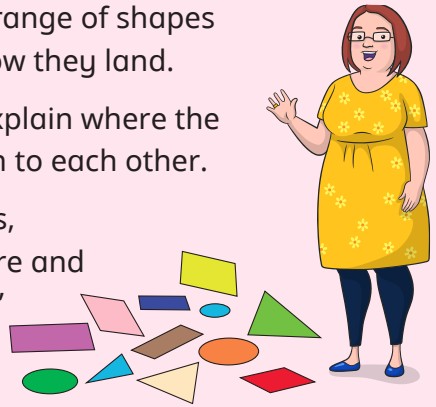
Explain shape arrangements

Adult-led learning

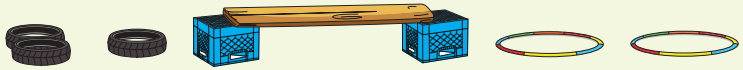
'Accidentally' drop a range of shapes onto the floor. See how they land.

Prompt children to explain where the shapes are in relation to each other.

Ask questions such as, "Can you find a square and describe its position?"



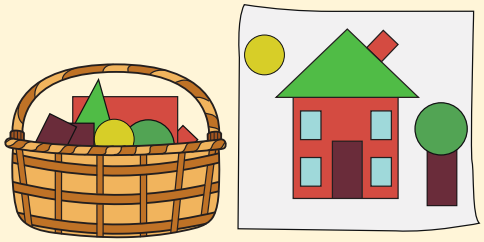
Provide children with a range of large outdoor construction equipment. Discuss how these could be used to develop an obstacle course for their peers.



Ask children to construct an obstacle course. As they create it, encourage them to explain to a partner how the obstacles are arranged and talk to them about how to move around the course.

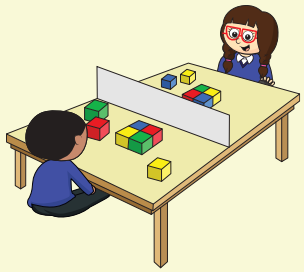
Read stories such as *Mouse Shapes* by Ellen Stoll Walsh with children. Provide a range of gummed paper or pre-cut felt shapes and prompt children to create arrangements.

Talk to children about where the different shapes are positioned in relation to each other.



Play a barrier game with children in an area of provision such as the construction area. Ensure that you and the child have identical objects before placing a barrier between you both. Arrange the objects and describe the arrangement to the child. Prompt them to create an identical arrangement.

This could be developed by encouraging children to describe arrangements to each other.



Compose shapes

Notes and guidance

In this small step, children understand that shapes can be combined to make new shapes. Provide opportunities for children to fit shapes together using resources such as pre-cut gummed shapes, pattern blocks and number rods. Encourage children to investigate how many different ways a given shape can be made using smaller shapes.

At first, support children by providing them with certain shapes to use, for example, only the correct shapes that they will need. Then progress to providing them with a larger selection of shapes so that children must decide which to use. Also, they can explore combining a given set of shapes in a variety of ways to make different shapes.

Exploring illustrations of how shapes have been combined to make new shapes in books can support children's understanding in this step and provide meaningful contexts for composing shapes.

Books

- *Pezzettino* by Leo Lionni
- *Jack and the Flumflum Tree* by Julia Donaldson

Key questions

- How are the shapes arranged?
- Which shapes have you used?
- What shape have you made?
- How many shapes did you use?
- Can you make a shape in a different way?

Possible sentence stems

- I used _____ shapes to make a _____.
- To make the smallest/largest _____, I used _____ pieces.

Links to the curriculum

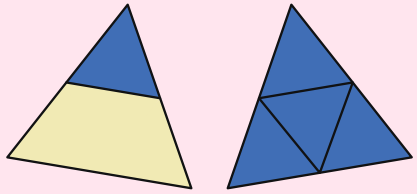
- *Development Matters* – Reception – Compose and decompose shapes so that children recognise a shape can have other shapes *within* it, just as numbers can.
- *Birth to 5 Matters* – Range 6 – Enjoys composing and decomposing shapes, learning which shapes combine to make other shapes

Compose shapes

Adult-led learning

After reading books such as *Pezzettino* by Leo Lionni, leave the books out for children to look at independently. Provide a range of squares and triangles and encourage children to use them to make new shapes. Ask questions such as, "Which shapes have you used? How many squares did you need? How many triangles did you need?"

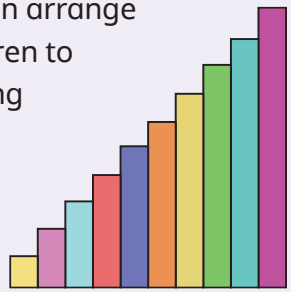
Provide a set of pattern blocks or similar shapes and challenge children to build as many different triangles as they can.
Who can build the largest triangle? Who can build a triangle with two, three or four pieces?



Prompt children to explore and discuss the different ways they can find to build the same-sized triangle. To support with this activity, provide templates or give children the correct number of pieces needed to make a triangle.

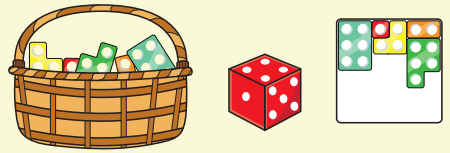
Provide children with a set of number rods. Encourage them to see how many different ways they can arrange the rods to build a square. Prompt children to make another square the same size using different rods.

How do they know they are square? What do they notice about the rods as they build?



Give children a set of number shapes and an outline of a 6 by 6 square. Each side of the square should be the same length as two number 6 pieces placed together end-to-end.

Working in pairs or small groups, prompt children to take turns to roll a dice, select the corresponding number shape and place this on their square. The winner is the first player to fill their square exactly.



Decompose shapes

Notes and guidance

In this small step, children explore identifying shapes within shapes.

Children understand that shapes can be separated to make new shapes. Provide children with paper or gummed shapes and encourage them to fold or cut them; for example, by folding a rectangle to make two squares or cutting a square to make two triangles.

Exploring how shapes are decomposed in books can provide meaningful contexts for identifying shapes within shapes. After reading these books together, encourage children to decompose shapes in similar ways in provision.

Once children have explored decomposing shapes in open-ended activities, ask them to predict what new shapes they can make by folding or cutting. Prompt children to talk about which shapes they will see or predict what will happen if they fold the shape in half.

Books

- *Perfect Square* by Michael Hall
- *Grandpa's Quilt* by Betsy Franco

Key questions

- How are the shapes arranged?
- Which shapes did you need to rotate?
- Which shapes did you separate?
- What is your new shape?
- What are your new shapes?
- What happens when you fold your shape?

Possible sentence stems

- I can make a _____ using ...
- I used a _____ to make ...

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

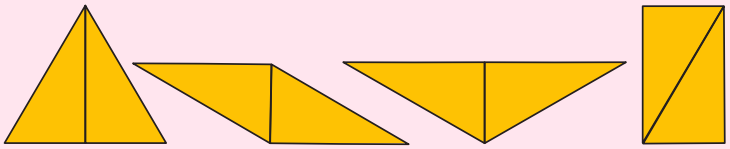
Decompose shapes

Adult-led learning

After reading books such as *Perfect Square* by Michael Hall, provide children with a square-shaped piece of paper. Ask them what they could make from a square. Encourage children to rip or cut the square and use it to create something new.

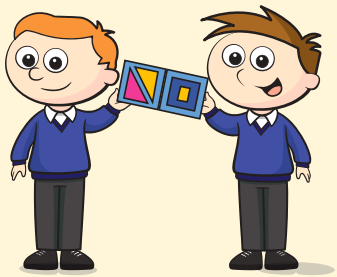
Show children two identical right-angled triangles which have been made by cutting a rectangle in half diagonally. How many new shapes can they make by fitting the triangles together? Can they make shapes with three sides or with four sides?

Encourage children to return the two triangles back into a rectangular shape before investigating further.



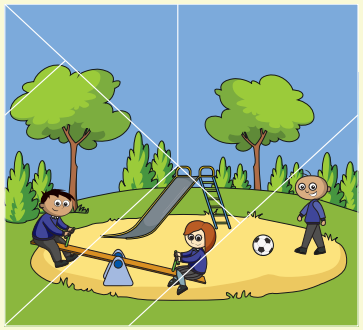
To develop this activity, provide children with four identical right-angled triangles.

Read books such as *Grandpa's Quilt* by Betsy Franco. Prompt children to design one square for their own class quilt. Put all the individual squares together and discuss the designs children have made.



Encourage children to arrange the squares to make a long, thin rectangle or a short, fat rectangle.

Provide children with a photocopy of their favourite picture or book cover. Prompt children to cut up the picture or book cover and give it to a partner to put back together.



How have you cut up your picture? How many pieces do you have? Is it easier to complete a jigsaw with more or fewer pieces?

Copy 2-D shape pictures

Notes and guidance

Children will already have had some experience of making shape pictures in previous blocks. In this small step, children will build on this prior learning and will progress to copying more complex 2-D shape pictures. They will use learning from earlier steps in this block, such as rotating, manipulating and composing shapes to help them when copying shape pictures.

Prompt children to talk about the properties of the 2-D shapes they use as they make their pictures and encourage them to use shape vocabulary to explain why they have used the shapes in that way.

Encourage children to explore shape pictures in books and prompt them to copy the pictures using pre-cut gummed shapes. Focus on more complex shape pictures that include more shapes and also include shapes in different orientations.

Books

- *Color Zoo* by Lois Ehlert
- *Mouse Shapes* by Ellen Stoll Walsh

Key questions

- How are the shapes arranged?
- Which shapes can you see?
- Which shapes can you see inside other shapes?
- Why have you used those shapes?
- How have you moved your shape to match the picture?
- How is the shape positioned?

Possible sentence stems

- I can see _____.
- I have made a _____ using ...

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)

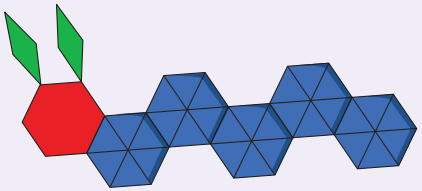
Copy 2-D shape pictures

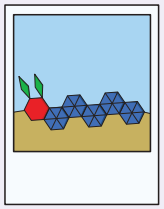
Adult-led learning

After reading books such as *Mouse Shapes* by Ellen Stoll Walsh with children, revisit the later pages of the book where there are examples of more complex shape pictures. Provide children with pre-cut gummed or felt shapes and encourage them to copy pictures such as a robot or car.

Ask children to describe their pictures, focusing on the shapes used and their position.

Provide children with resources, such as pattern blocks, to make their own shape pictures. Either photograph or photocopy the pictures they make and then give them to other children for them to replicate.



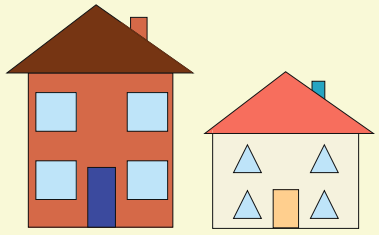


Ask children to talk about the shapes they used. Does it look the same as the picture? Encourage children to give reasons as to why it is the same or different.

Provide a variety of complex shape pictures, such as a street scene or farm scene. Prompt children to talk about the shapes they can see and the positions they are in.

Encourage children to copy the pictures with their own shapes.

Show children two shape pictures where some of the features are the same and some are different. Encourage children to reason and explain what the similarities and differences are.



To extend this, prompt them to design their own pictures in a similar way. Children can then discuss the similarities and differences with a partner.

Find 2-D shapes within 3-D shapes

Notes and guidance

Children will have experience of finding 2-D shapes within 3-D shapes from earlier blocks. In this small step, this learning is built on and children are encouraged to notice 2-D shapes within 3-D shapes in a range of contexts. Encourage children to make a range of constructions, using skills from the previous steps in this block to rotate, manipulate and explain shape arrangements.

When building, prompt children to talk about why they have chosen each shape or object, particularly focusing on the 2-D shapes within the 3-D shapes and why this makes it suitable for their construction.

As a class, explore books that use 3-D shapes and encourage children to notice where they can see 2-D shapes on the faces of the 3-D objects. Children can then build structures in a similar way to the books. Encourage them to talk about the shape properties as they build.

Books

- *Cubes, Cones, Cylinders, & Spheres* by Tana Hoban
- *Boxitects* by Kim Smith

Key questions

- What shapes can you see?
- Where can you see a _____?
- Why have you chosen that shape?
- Is that the best 3-D shape to use?

Possible sentence stems

- I can see a _____ within a _____.
- I can see a _____ in the _____.
- I know it is a _____ because it has a _____.
- I can feel that this shape is a _____ because...

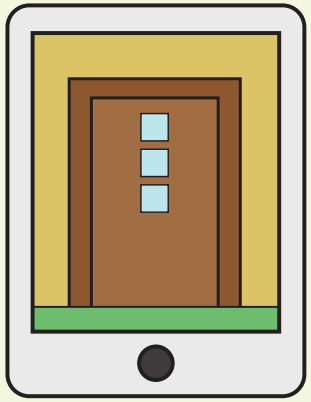
Links to the curriculum

- *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

Find 2-D shapes within 3-D shapes

Adult-led learning

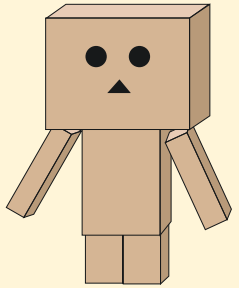
Read books such as *Cubes, Cones, Cylinders, & Spheres* by Tana Hoban and encourage children to notice 2-D shapes on the faces of 3-D shapes.



Go on a shape hunt to look for and identify 2-D shapes within 3-D objects.

Take pictures of the shapes children find and collate them into a class book.

After reading stories such as *Boxitects* by Kim Smith, place the books in the construction area for children to refer back to. Encourage them to construct their own 3-D models and discuss where they can see 2-D shapes.



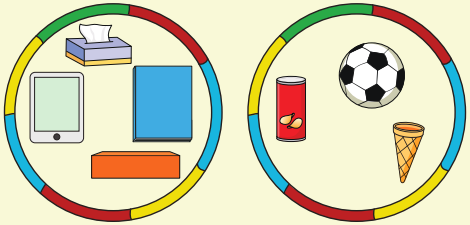
To extend this, children could ask a partner to identify where they see 2-D shapes on the faces of their model.

Create a feely box or bag with a variety of 3-D shapes inside.

Encourage children to feel inside the box or bag and identify the shapes they can feel.

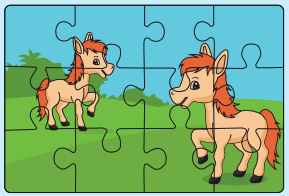
Prompt children to say out loud what they can feel by using the language relating to 2-D shapes.

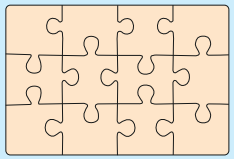
Sit children in a circle around two hoops and provide a range of 3-D shapes, including real-life objects. Pick a child to create a rule and then sort the shapes using this rule. For example, the rule could be all the shapes that have a rectangular face go in one hoop and those that don't go in the other.

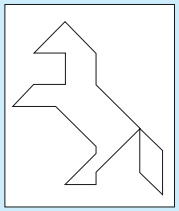


Continuous provision

Enhance provision with a range of jigsaws as well as pattern block and tangram templates. Encourage children to talk about how they are turning, rotating and flipping each piece as they complete the jigsaws and templates.

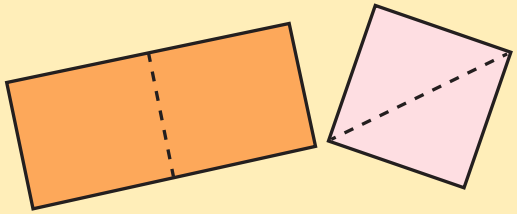






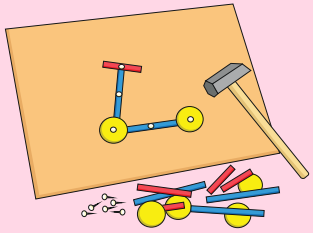
Children could begin by completing templates where all the individual pieces are clearly shown and then they can progress on to templates that just show the outline.

Provide pre-cut paper rectangles, squares and triangles. Encourage children to explore what new shapes they can make by folding or cutting the paper. Prompt them to predict what the new shapes will be and then ask them to investigate to check.



Children could then make 2-D shape pictures with the new shapes they have made.

Provide children with hammer and nail shape boards. Encourage them to use these to copy shape pictures, or they could create their own pictures for a partner to copy.

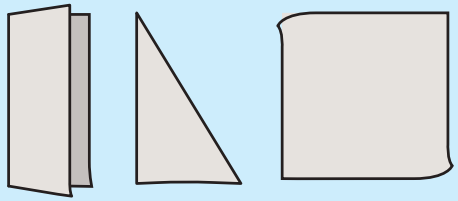


Enhance the construction area with real-life 3-D objects, such as crisp tubes and cereal boxes. Encourage children to talk about the 2-D shapes they can see within the 3-D shapes as they build.

End of block checkpoint

Checkpoint 1

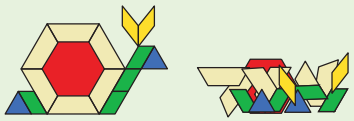
Provide children with pre-cut paper shapes that they can fold to make new shapes. In pairs, one child folds a shape and their partner has to predict what the new shape will be after folding.



Can children correctly predict what new shapes will be made once the paper is folded?

Checkpoint 2

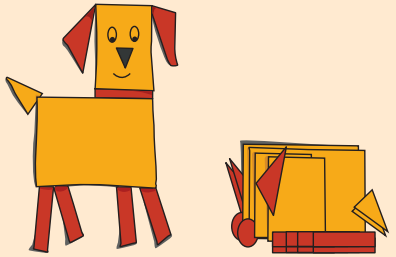
Encourage children to complete pattern block templates. These templates could be coloured, or to extend this further, provide children with black and white templates where they can see only the outlines of the shapes.



Can they select the correct shapes and rotate them to fit on the template?

Checkpoint 3

Provide children with a range of pre-cut gummed shapes or felt shapes to make their own shape pictures with. Can they talk about why they are choosing each shape and what it is going to represent on their shape picture?



Summer Block 4

Sharing and grouping

White Rose MATHS

Teacher guidance

Key books

- *The Last Marshmallow* by Grace Lin
- *The Squirrels Who Squabbled* by Rachel Bright
- *One Hungry Cat* by Joanne Rocklin
- *The Doorbell Rang* by Pat Hutchins
- *Ness the Nurse* by Nick Sharratt
- *The Gingerbread Man*
- *Bean Thirteen* by Matthew McElligott
- *Missing Mittens* by Stuart J. Murphy
- *Alison Hubble* by Allan Ahlberg

Key resources

Top tips

- Draw upon children's past experiences when discussing the idea of fair and equal groups. Children are more likely to notice when things are fair when it involves items that are of importance to them, such as food and toys. Try to use other non-food resources to prove 'fair' and 'not fair'.

Small steps

Step 1	Explore sharing
Step 2	Sharing
Step 3	Explore grouping
Step 4	Grouping
Step 5	Even and odd sharing
Step 6	Play with and build doubles

Explore sharing

Notes and guidance

In this small step, children will begin to develop an understanding of sharing. They will investigate what sharing is and describe equal sharing as fair and unequal sharing as unfair.

Within this block, we explore sharing and grouping, which are both different methods of division. Sharing (see small steps 1 and 2) involves dividing a set equally between a certain number of groups. Grouping (see small steps 3 and 4) involves dividing a set by placing a certain number of items in each group.

Activities such as sharing snacks or playing group games are great opportunities for children to notice when it is fair. These practical activities help children see whether items have been shared equally and whether everyone has the same. Children may remember from previous steps the concepts of even and odd numbers relating to this, which will be focused on in later steps.

Exposing children to this concept of sharing into groups and beginning to identify when these groups are equal will ensure that children are ready to move on to the next step.

Books

- *The Last Marshmallow* by Grace Lin
- *The Squirrels Who Squabbled* by Rachel Bright

Key questions

- Is it fair? How do you know?
- Are the groups equal?
- Do all the groups have the same amount?

Possible sentence stems

- It is fair because...
- It is not fair because...
- The _____ have/have not been shared equally.

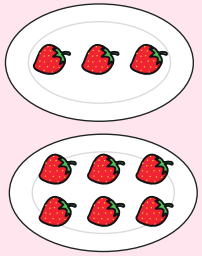
Links to the curriculum

- *Development Matters* – Reception
  - Compare numbers.
  - Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6
  - Estimates of numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Explore sharing

Adult-led learning

Show children a bowl of strawberries and two plates. Explain that you are going to share the strawberries so that each plate has the same number. Put a handful straight onto each plate without counting, making sure that one plate clearly has more strawberries than the other.



Ask children whether it is fair. Prompt them to show you how to share the strawberries fairly. What if there are three plates?

In the dough area, start off with all the dough in one ball. Break the dough and give each child a noticeably different amount of dough. Ask, "Is it fair? Does everyone have the same amount?"

How can we make it fair so that all children have the same amount of dough?

Provide opportunities for children to see items shared equally and unequally. Give each child a noticeably different handful of cards – is it fair?

Do all the children have an equal number of cards?

Read stories such as *The Squirrels Who Squabbled* by Rachel Bright. Outside, set up two tyres with one character in each. Provide children with a collection of natural materials, such as acorns, conkers or pinecones. Encourage them to explore whether these items can be shared equally between the two characters.

Prompt children to explain their reasoning.

Sharing

Notes and guidance

In this small step, children will build upon their knowledge of sharing from the previous small step and refine these skills further. Children will share practically for a purpose by having a number of objects to share between various people or groups.

Children will learn that to share we need to take one object at a time and give it to one child before taking the next object and giving it to the next child, repeating this process until all the objects are gone or each child has an equal amount.

This small step will also address what happens if an amount cannot be shared equally by the number of children that we have; they will identify that, at times, there will be leftover objects that cannot be shared fairly. Children may have ideas on what should be done with leftover objects.

Story books that relate to sharing can expose children to a range of scenarios and provide meaningful contexts. Encourage children to discuss their experience of sharing and how they know whether it is fair.

Books

- *One Hungry Cat* by Joanne Rocklin
- *The Doorbell Rang* by Pat Hutchins

Key questions

- How will you share the _____ equally?
- How do we make sure everyone has the same amount?
- Are there any left over?

Possible sentence stems

- The _____ have/have not been shared equally.
- There are _____ altogether.
- They are shared equally between _____ groups.

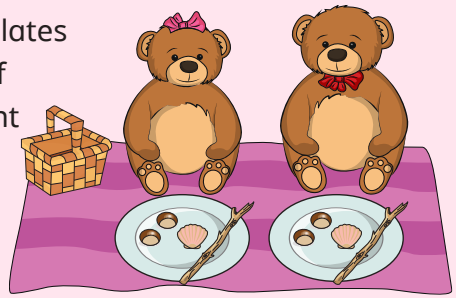
Links to the curriculum

- *Development Matters* – Reception
  - Compare numbers.
  - Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6
  - Estimates of numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Sharing

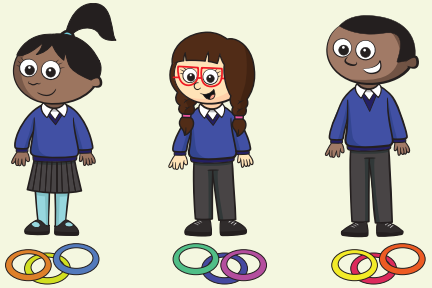
Adult-led learning

Provide teddy bears, plates and small quantities of loose parts to represent different food items. Ask children to share out the loose parts fairly so that each teddy gets the same amount.



Are there any items left over? What will happen if another teddy joins the picnic?

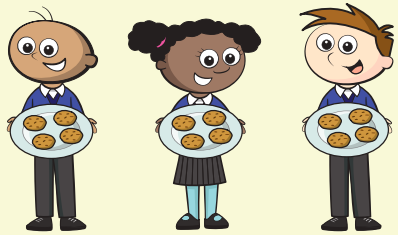
In pairs, play a throwing game using quoits. Give children a bucket of quoits and tell them that each player needs to start the game with the same number. How will we share the quoits equally? How can we make it fair? Repeat with different numbers of quoits and different numbers of players.



After reading stories such as *One Hungry Cat* by Joanne Rocklin, support children to bake cookies or make them in the dough area. Once they have made the cookies, encourage them to share them equally with a partner.

How many cookies does each child have? Have they shared the cookies equally?

After reading books such as *The Doorbell Rang* by Pat Hutchins, give children 12 cookies. Act out the story and encourage them to share the cookies between 2, then 3, then 4 people.



What will happen if one more person arrives?

Explore grouping

Notes and guidance

In the previous small steps, children have explored the method of sharing and will now move on to the method of grouping. When exploring grouping in this small step, children will use their knowledge of equal and unequal groups to support them.

Remember that grouping involves dividing a set by placing a certain number of items in each group, whereas sharing (see small steps 1 and 2) involves dividing a set equally between a certain number of groups.

When grouping, children divide a set by placing a given number of objects in each group and investigate how many groups they will require. Provide varied opportunities for children to recognise and make equal groups. The use of stories can provide meaningful contexts for grouping.

To maximise children's opportunities to independently develop their grouping skills, ensure that classroom provision is enhanced with some labelled groups, for example, by labelling how many pencils belong in each pot. Tidy up time will then provide a relevant purpose for grouping.

Books

- *Ness the Nurse* by Nick Sharratt

Key questions

- How many do you have?
- How many are there in each group?
- Are the groups equal? How do you know?

Possible sentence stems

- The groups are equal/not equal because...
- There are _____ groups of _____
- There are _____ altogether.

Links to the curriculum

- *Development Matters* – Reception
  - Compare numbers.
  - Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6
  - Estimates of numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Explore grouping

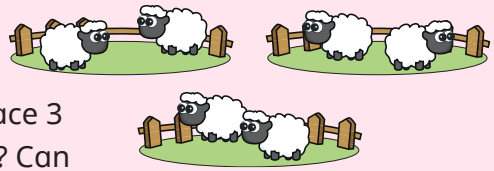
Adult-led learning

After reading stories such as *Ness the Nurse* by Nick Sharratt, enact a similar scenario with children. Show them how many objects you have, such as 10 stickers. Give 1 sticker each to 7 children, then give the remaining 3 stickers to another child. Ask children, "Have I grouped the stickers equally?"

If we have 10 stickers and we give 1 to each child, how many children can we give stickers to?

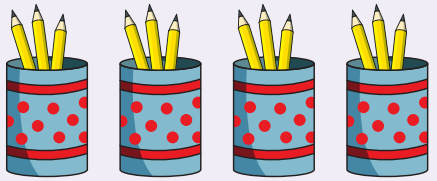
Ask children to make groups using the small-world animals. If they have 6 sheep and 2 sheep need to go in each field, how many fields will they need?

What happens if they make groups of 3 and place 3 sheep in each field? Can they make more groups of 2 or more groups of 3?



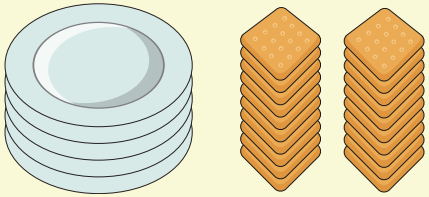
Repeat this in different contexts.

Challenge children to help you reorganise the mark-making provision. Tell children that you would like to put 3 pencils in each pot. How many pots will you need?



Repeat this and reorganise different areas of provision, such as paintbrushes in jars or books in baskets.

Encourage children to sit in small groups for a picnic outside and provide different quantities of food.



Prompt children to give out the food in different ways to encourage grouping. For example, if each child needs 3 cream crackers, how many children can eat at the picnic with us? How can we find out?

Grouping

Notes and guidance

In this small step, children build upon their knowledge of grouping from the previous step and refine these skills further. Children will group for a purpose and divide a set of objects by placing a certain number of them in each group. They will investigate how many groups they need in order to give out all their objects.

When making groups, encourage children to place their objects into pots, bowls or other containers to support them to make distinct groups and to see whether the groups are equal. Children could also explore grouping on a larger scale outside by placing objects into hoops or buckets. Further to this, they could be encouraged to play team games that require them to get into teams of certain numbers.

Provide a range of opportunities for children to explore grouping, initially prompting them to divide a number of objects that can be grouped equally. To further develop children's understanding, progress to exposing them to numbers of objects that cannot be grouped equally and so items are left over. Encourage them to come up with their own suggestions for how to resolve this.

Books

- *The Gingerbread Man*

Key questions

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

Possible sentence stems

- There are _____ altogether.
- The _____ can be put into equal groups of _____
- There are _____ groups of _____

Links to the curriculum

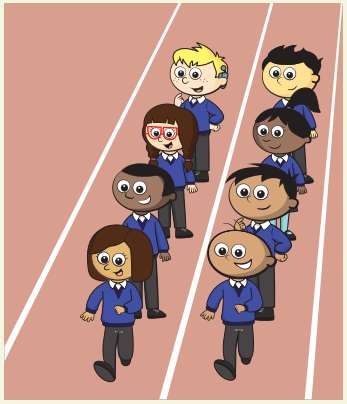
- *Development Matters* – Reception
  - Compare numbers.
  - Explore the composition of numbers to 10.
- *Birth to 5 Matters* – Range 6
  - Estimates of numbers of things, showing understanding of relative size
  - Counts out up to 10 objects from a larger group

Grouping

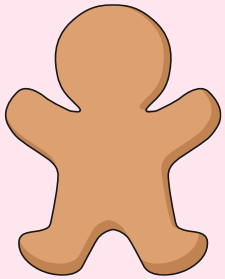
Adult-led learning

Play relay races in small groups, explaining that we need teams of 4 children to play the game. How many teams can we make?

Repeat with different numbers of children needed in each group. How many teams can we make this time?



Read the story *The Gingerbread Man*. Give children a number of gingerbread biscuits and some raisins to use as buttons and prompt them to place 3 buttons on each gingerbread biscuit.

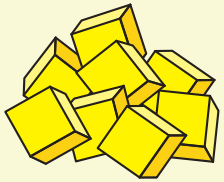


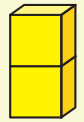
How many gingerbread biscuits can have buttons? Repeat this with different numbers of buttons – how many biscuits can have buttons this time?

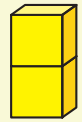
Provide children with plant pots, soil and seeds for planting. Explain to children that we need to put 3 seeds in each pot. How many pots can be filled?

This could be repeated, by giving children a different number of seeds to be put in each pot. Does the number of pots change?

Give children 12 cubes. If they put 2 cubes in each tower, how many towers will they make?







Ask them to investigate different ways of grouping their cubes into towers. Which numbers make equal groups? Which numbers don't?

Even and odd sharing

Notes and guidance

In previous small steps, children have explored sharing and experienced fair and unfair sharing by identifying whether objects are left over.

Children will now use these skills in this small step to identify whether a number is odd or even by sharing into two groups. Using language such as 'odd', 'even', 'equal' and 'unequal' will prompt children to make the links to the number of objects they are sharing.

Children are encouraged to talk through the sharing process, explaining what they notice and how they know whether an amount is odd or even. To do this, ensure that children are provided with a range of hands-on experiences that use varied resources and different numbers of objects.

Encourage children to model their thinking by asking questions such as, "Can you show me what you did?" and "How do you know?"

Books

- *Bean Thirteen* by Matthew McElligott
- *Missing Mittens* by Stuart J. Murphy

Key questions

- How many are there altogether?
- Do you have an odd or even number? How do you know?
- How many equal groups do you have? Do you have any left over?

Possible sentence stems

- There are _____ altogether.
- I have an odd/even number of _____. I know because...

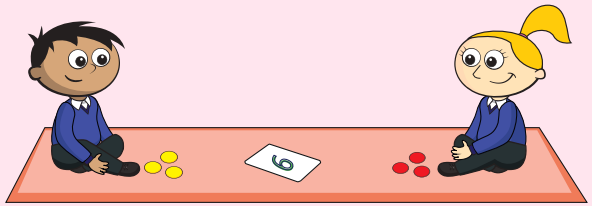
Links to the curriculum

- *Development Matters* – Reception
  - Compare numbers.
  - 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
  - Counts out up to 10 objects from a larger group

Even and odd sharing

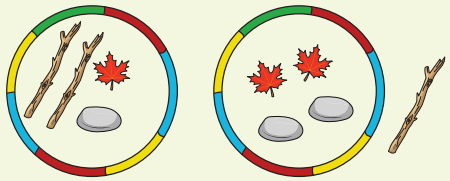
Adult-led learning

In pairs, children select a numeral card and count out the corresponding number of counters. Is this an even or odd number? Encourage them to share the counters between the two of them. Do they have two equal groups or is there one counter left over?

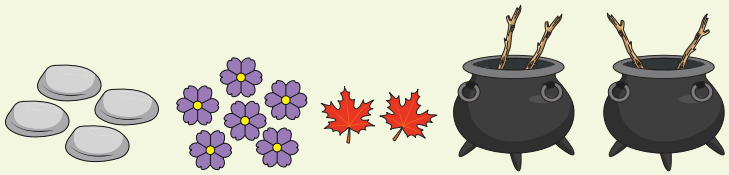


Children then bring their numeral card to the front and sort it into an odd or even hoop.

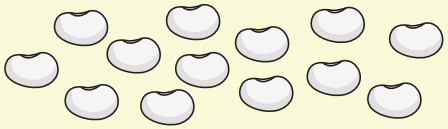
Provide pairs of children with a 30-second timer. Outside, ask them to collect as many loose objects as they can. Have they collected an even number or an odd number? How do they know? Prompt children to share their objects into two groups to find out.



Encourage children to make an odd or even potion by collecting natural objects such as sticks, pebbles, leaves and petals. How many of each object do you have? Prompt children to try sharing the objects equally between two cauldrons or pots to check whether they have an odd or even potion.



After reading stories such as *Bean Thirteen* by Matthew McElligott, give children a number of beans. Do they have an odd number or an even number? How do they know?



Prompt them to share the beans equally between two groups to investigate.

Play with and build doubles

Notes and guidance

In this small step, children consolidate their learning of finding and making doubles. Continue to prompt them to explore, investigate and build doubles in a range of different contexts.

Encourage children to double numbers but also progress this to showing children a double and asking them to say what number has been doubled, by finding the inverse. Prompt children to use sentence stems to support their mathematical talk.

In games and activities, promote and model the automatic recall of double facts, rather than always relying on building the doubles each time. Resources such as towers of cubes, counters on ten frames and dominoes will continue to support children who are not yet secure with recalling all double facts.

Drawing on knowledge of even and odd sharing from the previous small step, children may recall that all doubles are even numbers, as they are made up of two equal groups.

Books

- *Alison Hubble* by Allan Ahlberg

Key questions

- What is a double?
- What is double _____?
- How can you show me double _____?

Possible sentence stems

- Double _____ is _____
- I can see _____ and _____
- I can see _____ altogether.
- This is double _____

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

Play with and build doubles

Adult-led learning

Play a game of double bingo. Provide children with some counters and a numbered grid with numbers up to 5 on it. Show them a numeral card such as 8 and ask them which number is doubled to make 8

They then place their counter on the corresponding number, such as number 4

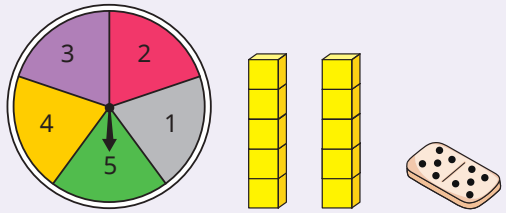
To support children, give them cubes to use to work out the double.

B	I	N	G	O
4		3		
1		5		

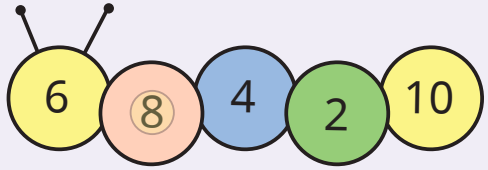
8

Ask children to spin a 1 to 5 spinner. Double the number the spinner lands on by building towers or drawing spots on blank dominoes.

What number did you land on? What is the double?



Play caterpillar doubles. Provide children with a number track shaped as a caterpillar with the numbers 2, 4, 6, 8 and 10 displayed on it in a random order. Prompt children to roll a 1 to 5 dice, double the number and put a transparent counter on the double.



Show children a 'doubles town' in the small-world area. Explain that everything in the 'doubles town' shows a double. For example, there are 6 houses, which shows double 3

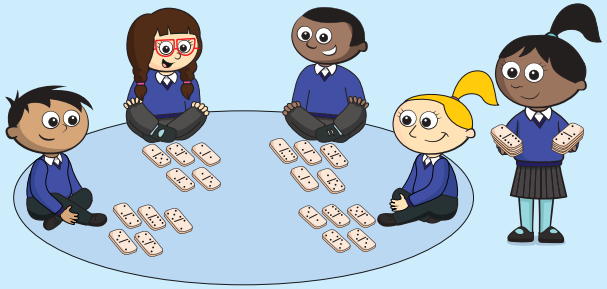
Ask children to reason why each object is part of the 'doubles town'. Do we have all the doubles to 10 in our town?

Can children make their own 'doubles town'?

Continuous provision

Enhance provision with games such as dominoes, where children need to share out all the resources equally before they play.

Does everyone have the same number of objects? Are the groups equal? Which group has an odd number of objects?

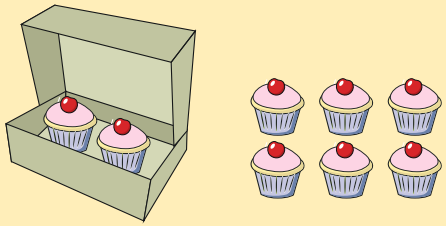


Reorganise resources in the outdoor provision by grouping. Tell children that we need to place the tyres in piles of 3. How many piles can we make? Repeat this for other resources, such as piles of crates, balls in buckets and towers of bricks.

Children could then make their own signs to label the groups.

Set up a cake shop in provision with cupcake cases and boxes. Give children orders for certain numbers of cupcakes. If we put 2 cupcakes in each box, how many boxes will we need?

Repeat this with different numbers of cupcakes and boxes. Do we have an odd or even number? How do we know?



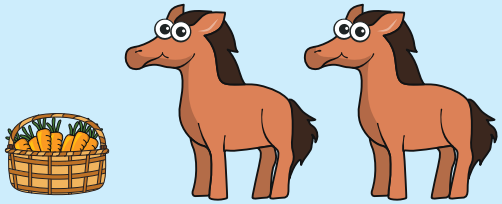
Lock two of the same number shapes together in a padlock. Write the double on the tag of the corresponding key. Repeat this for doubles to 10 and then prompt children to find the correct key to unlock the padlocks.

Once they have unlocked all the padlocks, children can lock the number shapes in the padlocks again for a partner to unlock.

End of block checkpoint

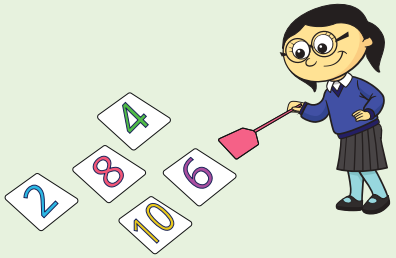
Checkpoint 1

In the small-world area, encourage children to share objects equally between two or more groups. For example, can they share the carrots between 2 horses? Can they share the sheep between 3 fields? How many are there in each group? Are the groups equal? Do they have an odd number?



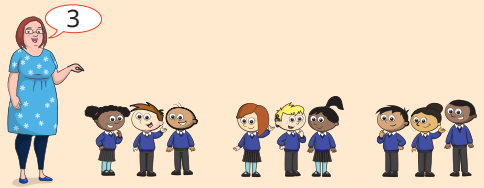
Checkpoint 2

Spread out numeral cards 2, 4, 6, 8 and 10 on the floor or around the classroom. Shout out a number and prompt children to double that number. Encourage them to race to swat the correct numeral with a swatter.



Checkpoint 3

Shout out a number and prompt children to get into groups of that number.



How many groups have we made? Are the groups equal? Is anyone not in a group?

Repeat this with different numbers of children and different numbers in each group. Is your group odd or even?

Summer Block 5

Visualise, build and map

White Rose MATHS

Teacher guidance

Key books

- *I See a Pattern Here* by Bruce Goldstone
- *Pattern Fish* and *Pattern Bugs* by Trudy Harris
- *Art Forms in Nature* by Ernst Haeckel
- *Rosie's Walk* by Pat Hutchins
- *What the Ladybird Heard* and *The Gruffalo* by Julia Donaldson
- *Disney's The Lion King* by Justine Korman Fontes
- *We're Going on a Bear Hunt* by Michael Rosen
- *Cockatoos* by Quentin Blake
- *Martha Maps It Out* by Leigh Hodgkinson
- *In Every House, on Every Street* by Jess Hitchman
- *If I Built a House* by Chris Van Dusen
- *The Secret Path* by Nick Butterworth
- *Me on the Map* by Joan Sweeney
- *Pirates Love Underpants* by Claire Freedman
- *My Map Book* by Sara Fanelli
- *Little Red Riding Hood*
- *The Once upon a Time Map Book* by B.G. Hennessy

Key resources

Small steps

Step 1	Identify units of repeating patterns
Step 2	Create own pattern rules
Step 3	Explore own pattern rules
Step 4	Replicate and build scenes and constructions
Step 5	Visualise from different positions
Step 6	Describe positions
Step 7	Give instructions to build
Step 8	Explore mapping

Small steps

Step 9	Represent maps with models
Step 10	Create own maps from familiar places
Step 11	Create own maps and plans from story situations

Identify units of repeating patterns

Notes and guidance

This block begins by returning to the concept of repeating patterns. Children will deepen their understanding of different patterns, and will begin to develop a secure knowledge of pattern rules and the ability to verbalise their thinking and explain it to others.

In this small step, the focus is supporting children to draw out the unit of repeat. First, this can be done physically, by supporting children to pull out the unit from a pattern, for example, from a line of cubes. Encourage children to move the cubes down from the pattern and see each section of the pattern as a unit. This will build on skills from earlier blocks where children identified sets.

Encourage children to identify units of repeat in images and books and prompt them to replicate them with manipulatives or drawings. Encourage children to hear the units of repeat in songs, such as beating in time to a rhythm. This is also linked to musical notation and how the beats in a bar are grouped.

Books

- *I See a Pattern Here* by Bruce Goldstone
- *Pattern Fish* by Trudy Harris
- *Pattern Bugs* by Trudy Harris

Key questions

- What pattern can you see?
- How does the pattern continue?
- What is the repeat?

Possible sentence stems

- This is a _____ pattern.
- The _____ comes next in the pattern.
- The repeat is _____.

Links to the curriculum

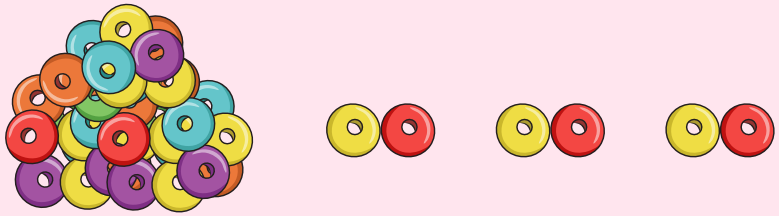
- *Development Matters* – Reception – Continue, copy and create repeating patterns.
- *Birth to 5 Matters* – Range 6
  - Spots patterns in the environment, beginning to identify the pattern "rule"
  - Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat

Identify units of repeating patterns

Adult-led learning

Provide children with a range of resources, such as loose parts, cubes and beads. Prompt them to make patterns with at least three units of repeat.

Encourage children to pull out each unit to see the pattern's structure and how it repeats.



Read books such as *I See a Pattern Here* by Bruce Goldstone and explore the relevant pages in books that show repeating patterns.

Provide children with loose parts or resources from the classroom.

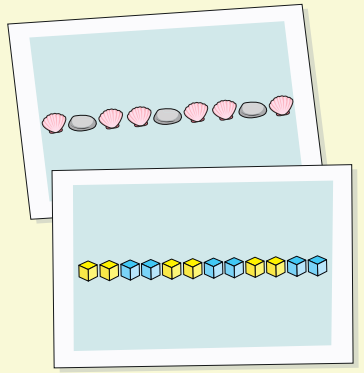
Encourage them to copy the patterns they see and then identify the units of repeat.

In an open space outside, enact large movement patterns and prompt children to say what the unit of repeat is.

Encourage children to copy and continue these patterns.

Set up a pattern station with photos of complex patterns, such as patterns that start mid-unit of repeat, or patterns where the unit of repeat starts and ends with the same item.

Encourage children to identify the unit of repeat as well as copy and continue the pattern.



Create own pattern rules

Notes and guidance

In this small step, children expand on drawing out the rule in a given pattern and progress to creating their own repeating pattern rules. Children will need to have had lots of experience in identifying a rule in the previous small step. Support children by modelling your own rules and verbalising them as they are made. For example, when sorting buttons into patterns in a tray, explain why you have picked each button.

Using a puppet to model sorting rules is a good way to take the onus off the child to create their own pattern rules. Puppets can also get things wrong and can be corrected! To help children gain confidence and think more deeply, model patterns that start mid-unit of repeat. Encourage children to show their patterns and verbalise their own rules. Provide lots of exciting resources that spark children's interests to encourage them to invent and describe their patterns.

Books

- *I See a Pattern Here* by Bruce Goldstone
- *Pattern Fish* by Trudy Harris
- *Pattern Bugs* by Trudy Harris

Key questions

- What pattern have you made?
- What is the unit of repeat?
- What is your pattern rule?

Possible sentence stems

- The _____ comes next in the pattern.
- I have made a _____ pattern.
- I need _____ to finish my pattern.

Links to the curriculum

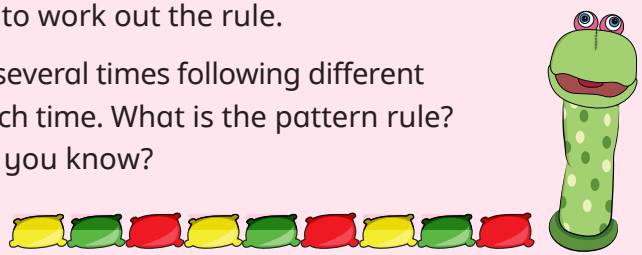
- *Development Matters* – Reception – Continue, copy and create repeating patterns.
- *Birth to 5 Matters* – Range 6
  - Spots patterns in the environment, beginning to identify the pattern "rule"
  - Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat

Create own pattern rules

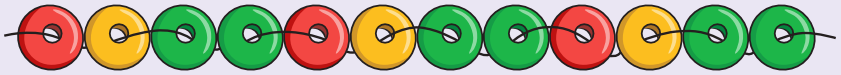
Adult-led learning

Introduce children to a class puppet and explain that the puppet is going to create a pattern using their own rule. Encourage children to look carefully at the pattern to work out the rule.

Repeat several times following different rules each time. What is the pattern rule? How do you know?

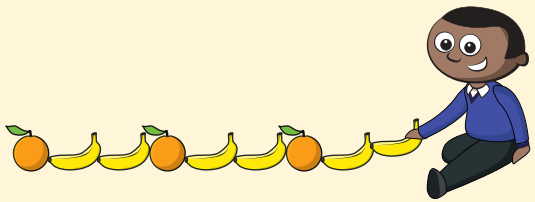


Set up a jewellery workshop with different lengths of string, beads and cotton reels. Encourage children to create their own bracelets and necklaces using their own pattern rules. Prompt children to describe the rule they followed.



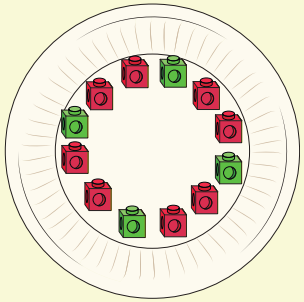
To extend this, children could be the customer and request a bracelet or necklace with a given rule. For example, they could ask for an AAB necklace.

After reading books such as *Pattern Fish* or *Pattern Bugs* by Trudy Harris, provide children with a range of resources to make patterns. In pairs, one child makes a pattern following their own rule. Their partner must guess what the rule is. Prompt the partners to then swap roles.



Show children patterns around a circle where there is more than one possible rule or unit of repeat.

Prompt children to identify the units of repeat and encourage them to make their own pattern, creating their own rules around a circle. Provide children with paper plates or circular templates and cubes to support them to do this.



Explore own pattern rules

Notes and guidance

This small step focuses on children being able to verbalise and describe their own patterns as well as other children's patterns.

Prompt children to comment on each other's patterns as a group and to describe how they have used different resources. Encourage them to ask questions about each other's patterns, such as, "Why did you put that there?" or make comments such as, "I like the way your ABBA pattern works!"

Providing tablets or cameras for children to take pictures of patterns is a good way of referencing each other's work. They could also be used during group times or number talk sessions, where patterns can be discussed and described. Deepen children's observational skills on pattern by providing resources that have patterns on them, such as shells or sea creatures.

Having a place to perform in the classroom will facilitate and encourage children to act out their patterns (for example, touch head, shoulders, shoulders, head), and to comment on each other's work.

Books

- *I See a Pattern Here* by Bruce Goldstone
- *Art Forms in Nature* by Ernst Haeckel

Key questions

- What is the unit of repeat?
- How many units of repeat do I need?
- What is your pattern rule?
- Can you guess the rule? How do you know?

Possible sentence stems

- My pattern is a _____ pattern. I know this because...
- The rule is _____.

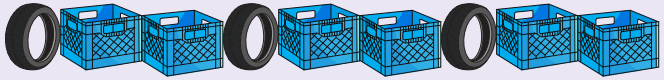
Links to the curriculum

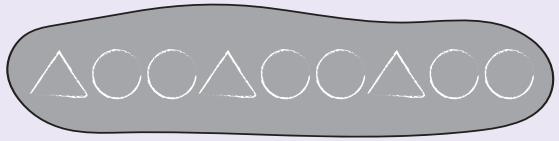
- *Development Matters* – Reception – Continue, copy and create repeating patterns.
- *Birth to 5 Matters* – Range 6
  - Spots patterns in the environment, beginning to identify the pattern "rule"
  - Chooses familiar objects to create and recreate repeating patterns beyond AB patterns and begins to identify the unit of repeat

Explore own pattern rules

Adult-led learning

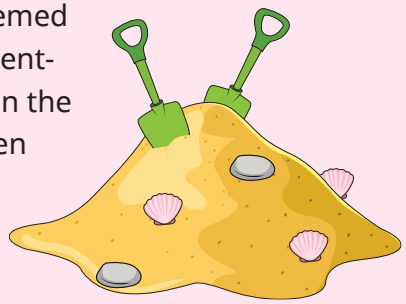
Provide children with a range of items for them to make patterns with. Ask them to identify their rule.



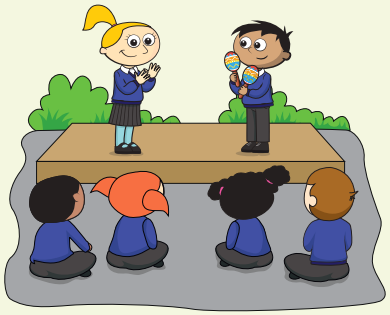


Prompt them to change the context of their pattern by using different items to show the same rule.

Hide a range of beach-themed loose parts, such as different-sized shells and pebbles, in the sand tray. In pairs, children dig up the items and one child uses them to make a pattern. Their partner can copy the pattern and identify the rule. Prompt the partners to then swap roles.



Set up a performance area or stage outside. Provide children with a range of musical instruments and encourage them to make different sound patterns with them.

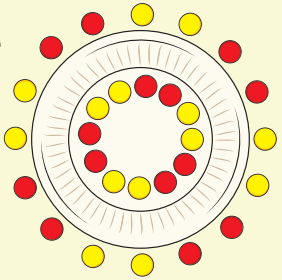


Ask the audience to describe what the rule is.

Provide children with a paper plate and items to make a pattern. Prompt the first child to make a pattern on the inside of the plate.

Invite a second child to then repeat the same pattern around the outside of the plate.

As the distance around the outside of the plate is greater, the second child will need to extend the pattern to fill the space. Ensure that they add in the extra unit of repeat.



Replicate and build scenes and constructions

Notes and guidance

The second part of this block focuses on spatial reasoning.

Replicating scenes in the small-world and construction areas develops children's thinking as to where objects are in relation to each other. This is the beginning of mapping.

Children's motor skills should already have developed in their building journey progression to allow them to manipulate objects with greater skill. Children will have gained skills in identifying which shapes are 2-D and which are 3-D as well as in composing and decomposing shapes. With these skills, children can be supported to manipulate and discuss pre-made scenes and models or ones of their own design.

When replicating scenes or constructions, children will gain an idea of scaling to size and where to place and manipulate objects. By developing these skills, children will get a clear image in their mind's eye of how simple scenes are laid out and this will support them with further visualisations.

Books

- *Rosie's Walk* by Pat Hutchins
- *What the Ladybird Heard* by Julia Donaldson

Key questions

- What will you use to build?
- How will you build/make it?
- Why have you built it like that?
- How will you recreate the scene?

Possible sentence stems

- The scene of the _____ is the same because...
- The scene of the _____ is different because...
- I used _____ to build _____.
- _____ is here because...

Links to the curriculum

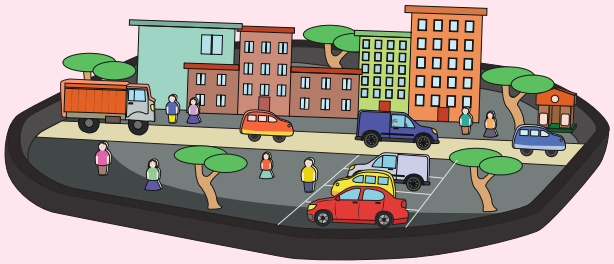
- *Development Matters* – 3 and 4-year-olds
  - Discuss routes and locations, using words like 'in front of' and 'behind'.
- *Birth to 5 Matters* – Range 6 – Uses own ideas to make models of increasing complexity, selecting blocks needed, solving problems and visualising what they will build

Replicate and build scenes and constructions

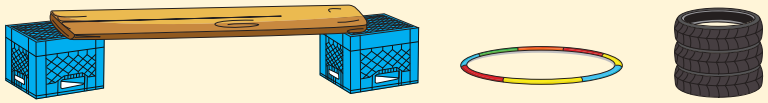
Adult-led learning

Encourage children to access the small-world area. Using the resources available, prompt children to create a scene and then invite a partner to copy it.

What is the same? What is different?



After reading stories such as *Rosie's Walk* by Pat Hutchins and *What the Ladybird Heard* by Julia Donaldson, discuss the scenes that are in the stories. Encourage children to describe what they can see. Prompt children to access the outdoor area and use large-scale resources to recreate scenes similar to those in the books.

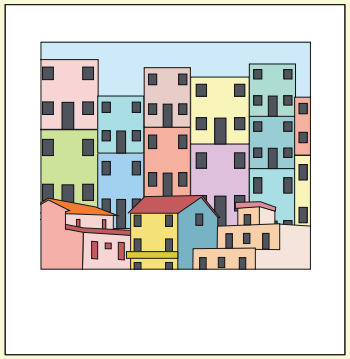


Create a scene or environment following children's interests, for example, a fairy town. Talk through where you have placed objects and why. Prompt children to then replicate and build their own scene.

Encourage children to explain the reasons why they have placed objects where they have.

Using large construction, deconstructed role-play or junk modelling, show children a scene of different-sized houses.

Encourage children to access the resources and recreate a similar scene.



Visualise from different positions

Notes and guidance

In this small step, children are encouraged to look at the world, structures and their own creations from different perspectives. This may be a new concept to children, so it is important to take time to explore different positions and perspectives through play, the outside environment and provision.

This small step allows children to gain knowledge of how things can look from different viewpoints, developing their spatial awareness. Children will also gain confidence if activities are made fun, for example, using characters from stories in the small-world area. They can explore what each character might see or where a character could hide if we were looking from one direction. What would happen if we moved to look from another viewing point? Would the character still be hidden?

Rhymes

- *The Bear Went over the Mountain*

Books

- *Disney's The Lion King* by Justine Korman Fontes

Key questions

- What can you see?
- If you move to a different position, what can you see now?

Possible sentence stems

- I can see _____. If I move, now I can see _____.
- The _____ is next to/above/below the _____.

Links to the curriculum

- *Development Matters* – 3 and 4-year-olds
  - Describe a familiar route.
  - Discuss routes and locations, using words like 'in front of' and 'behind'.
- *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
  - Uses spatial language, including following and giving directions, using relative terms and describing what they see from different viewpoints

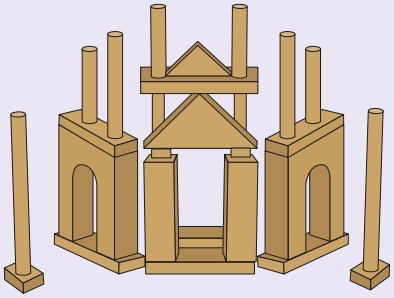
Visualise from different positions

Adult-led learning

Set up a small-world scene and ask children to describe where objects are positioned and where they are in relation to other things. Encourage them to move around and look at the scene from a different viewpoint.

What do you notice? Does the scene still look the same?

Ensure the construction area is well resourced with ample blocks and bricks of varying shapes and sizes. Encourage children to build more complex structures such as castles.

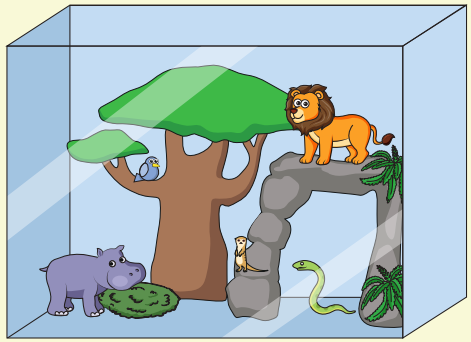


Prompt them to look at their constructions from different positions.

Take photographs of the outdoor area from unusual viewpoints. For example, from high up, low down or from under a tree. Encourage children to identify where the photographer was standing when they took the picture.

Prompt them to take their own photographs from different viewpoints.

After reading stories such as *Disney's The Lion King* by Justine Korman Fontes, set up a similar scene in the small-world area or in a curiosity cube.



Encourage children to explore and talk about what the characters will be able to see from different positions and viewpoints.

Describe positions

Notes and guidance

In this small step, children build on their knowledge of visualising from different perspectives and will now verbalise this by describing scenes using positional language.

Simple positional language will have been used in earlier steps and this is built on by using more complex scenarios. As children will have looked at scenes from different perspectives, this gives them the skills to describe scenarios such as journeys of a small-world character in more depth. Children describe their route-finding spatial awareness in more detail.

Support children to describe position by using more complex images in stories and rhymes. Encourage children to make up their own.

Books

- *We're Going on a Bear Hunt* by Michael Rosen
- *Cockatoos* by Quentin Blake
- *Martha Maps It Out* by Leigh Hodgkinson
- *In Every House, on Every Street* by Jess Hitchman

Key questions

- Where is the _____ positioned?
- Is the _____ in front of or behind the _____?

Possible sentence stems

- I have put the _____ next to the _____.
- The _____ is positioned...

Links to the curriculum

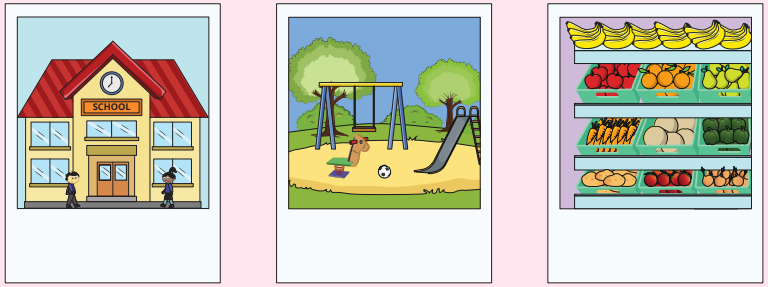
- *Development Matters* – 3 and 4-year-olds
  - Understand position through words alone – for example, "The bag is under the table," – with no pointing.
  - Describe a familiar route.
  - Discuss routes and locations, using words like 'in front of' and 'behind'.
- *Birth to 5 Matters* – Range 6 – Uses spatial language, including following and giving directions, using relative terms and describing what they see from different viewpoints

Describe positions

Adult-led learning

Show children photographs of familiar places.

Prompt them to describe where things are in relation to one another using positional language.



To develop this, encourage children to bring in photographs of places that are special to them and describe what the picture shows.

After reading books such as *We're Going on a Bear Hunt* by Michael Rosen, set up a small-world scene to enact the story.

Prompt children to describe where they are moving the characters as they act out the story.

Show children illustrations from stories such as *Cockatoos* by Quentin Blake. Initially, encourage children to say what they can see, before moving on to describing the position of key characters from the stories.

After reading books such as *Martha Maps It Out* by Leigh Hodgkinson or *In Every House, on Every Street* by Jess Hitchman, look at more complex images in books.

Encourage children to describe the positions of objects and people in the illustrations.

Give instructions to build

Notes and guidance

In this small step, children use the spatial awareness skills they gained in previous small steps to give and follow instructions to build new models and scenarios. Practical activities are still encouraged, although children might naturally mark-make to explain their thinking or to emphasise a direction.

By giving instructions on how they have built their model, children will display a clear knowledge of construction and what fits where spatially. The child will be able to visualise and mentally map the position of the objects. Encourage children to give adults instructions and follow these exactly. Deliberately take the instructions literally, for example, put the sheep on the bottom, so they become aware of the importance of giving clear, unambiguous instructions for building a model.

Rhymes

- *Gonna Build a House*

Books

- *If I Built a House* by Chris Van Dusen

Key questions

- How will you make the models the same?
- What instructions do you need to give?
- What do you need to do next?

Possible sentence stems

- I have put the _____ behind/in front of/next to the _____.
- Next, you need to _____.

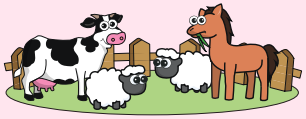
Links to the curriculum

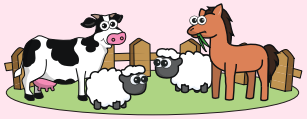
- *Development Matters* – 3 and 4-year-olds – Understand position through words alone – for example, "The bag is under the table," – with no pointing.
- *Birth to 5 Matters* – Range 6
  - Uses own ideas to make models of increasing complexity, selecting blocks needed, solving problems and visualising what they will build
  - Uses spatial language, including following and giving directions, using relative terms and describing what they see from different viewpoints

Give instructions to build

Adult-led learning

Provide each child with a set of items the same as yours, such as small-world animals. Give verbal instructions as you arrange your items. Prompt children to arrange their set in exactly the same way as yours.

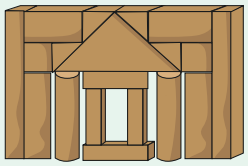




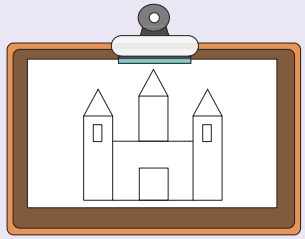
Repeat with different children taking on the role of the leader.

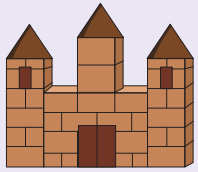
Sing songs such as *Gonna Build a House* with children. In pairs, one child makes their own model of a house and then gives their partner instructions for how to replicate the building. The partner builds a matching model, using the original model to help them.

Encourage children to discuss how they made their models and to look for what is the same and what is different.



Provide children with a plan of a model. Prompt them to use the plan to make a group model.



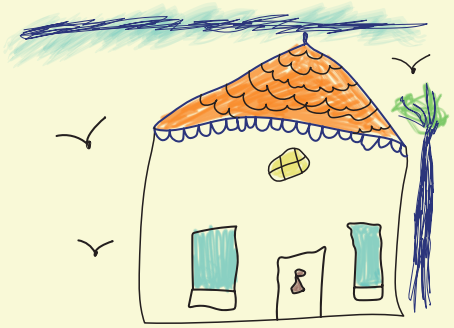


Encourage children to take it in turns to place one brick at a time onto the model.

Children will need to refer to the plan and guide each other as to where to place the next block in order to make the best construction.

After reading stories such as *If I Built a House* by Chris Van Dusen, encourage children to talk about how they could build their own fantasy house.

Encourage them to mark-make instructions to show how they will make it.



Explore mapping

Notes and guidance

Previous small steps on visualising from different perspectives will help support children to see how an aerial view can be depicted or drawn on a map. This small step focuses on exploring different maps, so children will be exposed to these in many different ways, but will not draw them at this stage.

Plan time to explore maps in paper form as well as in stories and online. Explain to children how maps were originally made and how digital maps are now created using technology. Show children how maps can be physical maps, nautical maps, thematic maps and road maps. Some maps are aerial maps (taken from above) and some maps are represented in 3-D so we can visualise how we would actually walk through an area.

Use language that models describing what can be seen, for example, "I can see the school is there and the post box is next to the house. The road goes past all the houses then stops at the park."

Books

- *What the Ladybird Heard* by Julia Donaldson
- *The Secret Path* by Nick Butterworth
- *Me on the Map* by Joan Sweeney

Key questions

- What can you see on the map?
- Where is _____?
- What do you notice?
- Can you follow my map to _____?

Possible sentence stems

- I can see _____.
- I have drawn _____ on my map because...

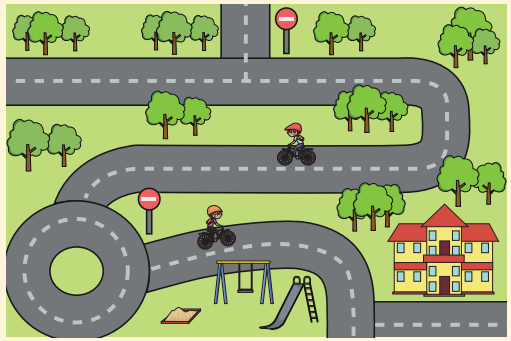
Links to the curriculum

- *Development Matters* – 3 and 4-year-olds
  - Understand position through words alone – for example, "The bag is under the table," – with no pointing.
  - Describe a familiar route.
  - Discuss routes and locations, using words like 'in front of' and 'behind'.

Explore mapping

Adult-led learning

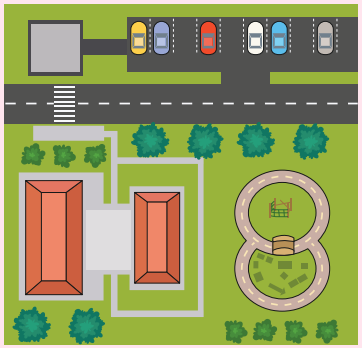
When reading stories such as *What the Ladybird Heard* by Julia Donaldson and *Me on the Map* by Joan Sweeney, encourage children to explore the maps. What do the maps show? What can they see? Explain that maps should be easy to read and follow, and should include key details such as landmarks.



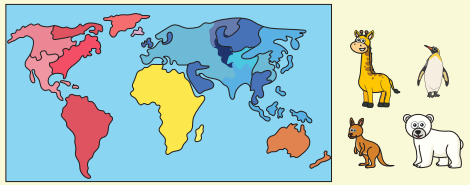
After reading stories such as *The Secret Path* by Nick Butterworth with children, explore different kinds of maps such as maps of mazes. Discuss how you could follow the map to move around the maze. Encourage children to make their own mazes (but not to draw them at this stage).

Provide children with a range of aerial maps to explore.

Ensure that children can clearly see areas from their local environment. Prompt them to try and identify key landmarks, such as their school.



Show children a map of the world. Take animals from the small-world area, such as penguins, lions, polar bears and giraffes. Encourage children to talk about where these animals might live.



What do they need to survive? Do they live in a cold or hot environment, in a forest or a desert? Support children to identify the areas on the map where each animal lives and place the animal there.

Represent maps with models

Notes and guidance

In this small step, children draw out information from a map by using models as representations.

Previous experiences of making and replicating models of scenes and constructions will have provided children with the foundational knowledge needed for this step.

Encourage children to interpret maps and, as a precursor to drawing their own, use objects to represent the space they see. Encourage children to do this using maps of familiar places or small-world setups.

Children may use a mixture of media to support them to recreate maps and they may start to mark-make. Ensure that children use a range of resources to represent their maps, for example, creating a street in box modelling.

Support children by initially mark-making basic maps for them to position key landmarks on, using bricks, blocks or small-world items.

Books

- *The Secret Path* by Nick Butterworth
- *In Every House, on Every Street* by Jess Hitchman

Key questions

- What can you see on the map?
- What will you build?
- What will you use to make a _____?

Possible sentence stems

- I have made a _____.
- The _____ is positioned next to the _____.

Links to the curriculum

- *Development Matters* – 3 and 4-year-olds
  - Understand position through words alone – for example, "The bag is under the table," – with no pointing.
  - Describe a familiar route.
  - Discuss routes and locations, using words like 'in front of' and 'behind'.
- *Birth to 5 Matters* – Range 6 – May enjoy making simple maps of familiar and imaginative environments, with landmarks

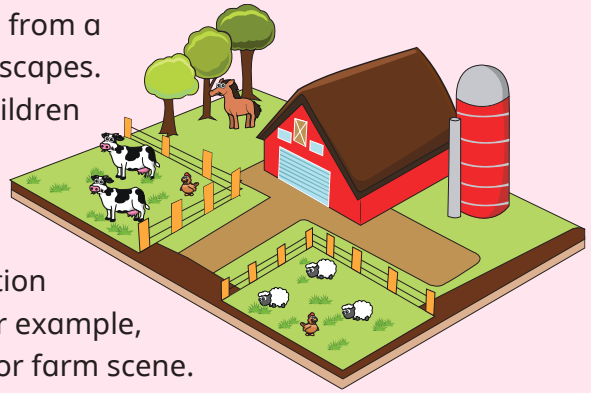
Represent maps with models

Adult-led learning

Show children maps of the school and the local area. Pick out key landmarks that they recognise and together make a map of the area around the school using small construction. Use mark-making on large paper to support this.

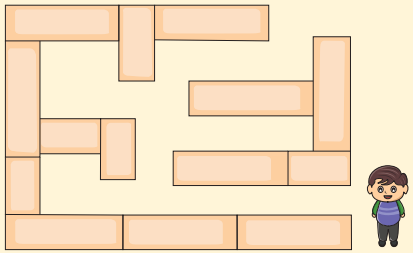
What can you recognise on the map? Where have you positioned the school?

Explore maps from a range of landscapes. Encourage children to recreate scenes using small-world and construction resources. For example, make a park or farm scene.



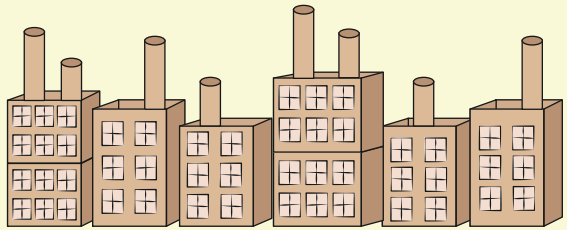
After reading stories such as *The Secret Path* by Nick Butterworth, provide children with pictures of different mazes for them to explore. Initially, encourage them to trace their finger through the maze. Then prompt children to use construction blocks to build their own mazes.

Children can ask a partner to use a small-world character or animal to try to find the way out of the maze.



After reading books such as *In Every House, on Every Street* by Jess Hitchman, provide children with recycled boxes and tubes. Encourage them to build and represent street scenes.

Prompt them to make a map of their street. What key landmarks are on your street? What does your house look like?



Create own maps from familiar places

Notes and guidance

As children continue to develop their spatial awareness along with their motor skills, they begin to gain the confidence to draw out their own thinking, showing this in their mark-making.

This small step focuses on supporting children to make simple maps of familiar places. It is crucial that children can actually see the environment that they are mapping out. Encourage this by using routes and places that children frequently travel along or visit. Children will need opportunities to discuss their routes and plans to visualise these before they can record them.

Children can also use adventure scenarios or stories to enhance their map making, such as pirates looking for treasure. They will be more successful in doing this if they have had opportunities to design and record plans of familiar routes first. Teachers can support the development of adventure scenarios by hiding or burying treasure for the pirates to find – X marks the spot!

Books

- *Pirates Love Underpants* by Claire Freedman
- *My Map Book* by Sara Fanelli

Key questions

- Where does the _____ go?
- Where did you find the treasure?

Possible sentence stems

- First, I need to...
- Go straight until you get to the _____.
- The _____ is next to the _____.

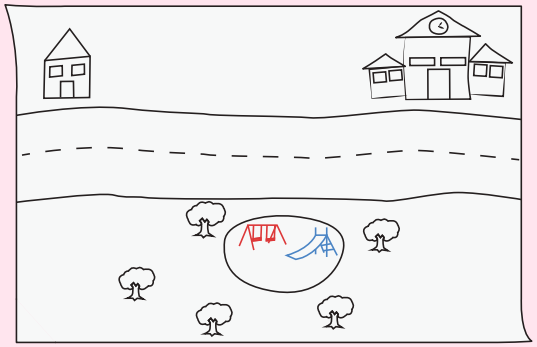
Links to the curriculum

- *Development Matters* – 3 and 4-year-olds
  - Describe a familiar route.
  - Discuss routes and locations, using words like 'in front of' and 'behind'.
  - Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'
- *Birth to 5 Matters* – Range 6 – May enjoy making simple maps of familiar and imaginative environments, with landmarks

Create own maps from familiar places

Adult-led learning

Begin by explaining your route to school from the car park or the school gates. Ask children what they pass on their way to school. Encourage children to draw a simple, linear map to show their home, their street, the school and some landmarks they pass on the way.



What do they pass first, next and last?

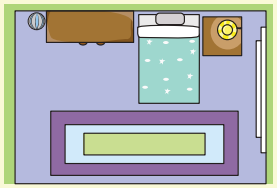
On the carpet, provide a large piece of paper in the shape of the classroom with the doors and windows already marked on the paper. Show children a range of photographs that show the different areas of the classroom. Explain that we are going to make a map of our classroom using the large piece of paper and the photographs. Encourage children to identify the areas on each of the pictures and discuss where they think they need to be positioned on the paper map.

Read stories with children, such as *Pirates Love Underpants* by Claire Freedman, that show illustrations of treasure maps. Discuss what a treasure map needs to include for others to be able to use it to find the treasure.

Hide treasure in the outdoor area and create a treasure map for children. Encourage them to discuss which area each part of the map is showing and then follow the map to find 'X marks the spot'.

Encourage children to make their own treasure maps for other children to follow.

Display pictures of different rooms in a house, discussing that everyone's houses and rooms look different. Encourage children to draw a map of one room in their own house and then talk about the different parts of the map.



Create own maps and plans from story situations

Notes and guidance

In the previous small step, children experienced creating maps to represent well-known routes and places.

In this small step, children move on from these real-life scenarios and focus more on interpreting story situations.

To support children's imaginative thinking and develop their ability to adapt scenarios depending on their interests, create scenarios and ask questions about them such as, "What if Red Riding Hood didn't go straight to Grandma's house?"

Provide materials for children to make up their own role-play stories using a variety of items. They can then develop maps and enact their adventures using the mathematical language of map making, position, direction and spatial reasoning.

Books

- *Little Red Riding Hood*
- *The Once upon a Time Map Book* by B.G. Hennessy
- *What the Ladybird Heard* by Julia Donaldson
- *The Gruffalo* by Julia Donaldson
- *My Map Book* by Sara Fanelli

Key questions

- Where does your map take you?
- What is on your map? Describe the route.

Possible sentence stems

- I have followed the map and it has led me to _____.
- Next to the _____ is _____.

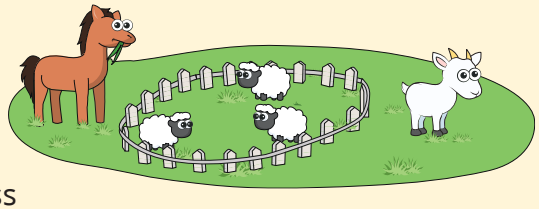
Links to the curriculum

- *Development Matters* – 3 and 4-year-olds
  - Describe a familiar route.
  - Discuss routes and locations, using words like 'in front of' and 'behind'.
  - Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then…'
- *Birth to 5 Matters* – Range 6 – May enjoy making simple maps of familiar and imaginative environments, with landmarks

Create own maps and plans from story situations

Adult-led learning

Read stories such as *What the Ladybird Heard* by Julia Donaldson. Access the small-world area with children and make the farm resources available.



Encourage children to design a similar scene to that in the story and make their own map of a farmyard, showing the journey that the characters make.

When reading stories such as *Little Red Riding Hood*, change the ending so that Red Riding Hood didn't go to Grandma's house. Talk to the children about how the events of the story have changed. Encourage them to create their own map or plan of where Red Riding Hood went instead of going to Grandma's house.

Display a map that relates to the story of *The Gruffalo* by Julia Donaldson. Ask children to identify which story it may be representing. How do they know?

Read the story while keeping the map visible and prompt children to look at and follow the journey as you read.

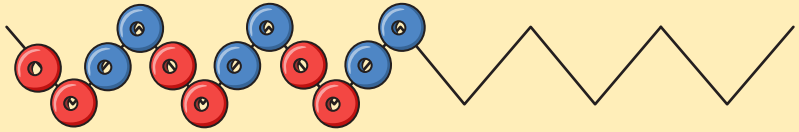
Encourage children to draw their own maps to show the journey that the mouse makes and the characters passed along the way.

Read stories such as *My Map Book* by Sara Fanelli or *The Once upon a Time Map Book* by B.G. Hennessy to explore more complex maps. Encourage children to create their own maps in the same style as the maps in the books.

Can children explain their stories in their maps? Have they used any specific landmarks or characters?

Continuous provision

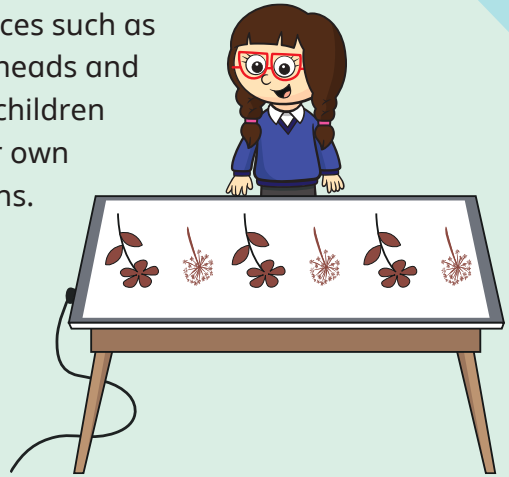
Set up a pattern area and provide children with a range of loose parts and images of patterns. Prompt children to pick a pattern and recreate it. Allow them to take a photo to display their pattern in that area for other children to recreate. Can they see the repeat?



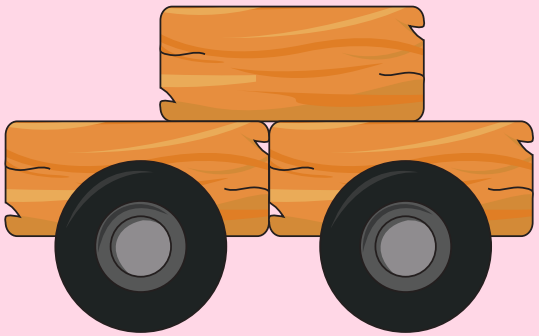
Provide children with pattern detective kits which include a magnifying glass, notepad, pencil and camera. Encourage children to hunt around the indoor and outdoor areas to identify different patterns.

Provide varied resources such as shells, pebbles, seed heads and pressed flowers that children can use to make their own more complex patterns.

Encourage children to identify patterns within those individual objects too.

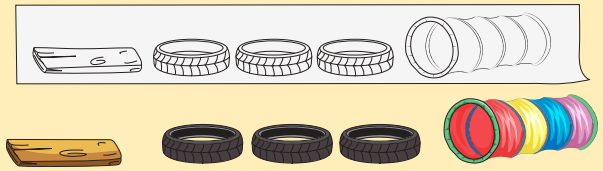


Support children to use large-scale loose parts and outdoor resources to recreate real places they have visited or places in familiar stories. Prompt them to consider the scale needed for their constructions, for example, how wide do we need to build a car so that we can all fit inside?



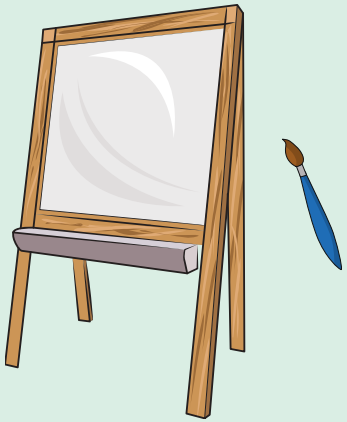
Continuous provision

Provide a simple map of an obstacle course. Encourage children to use the map to build the obstacle course, checking where things need to be in relation to others.

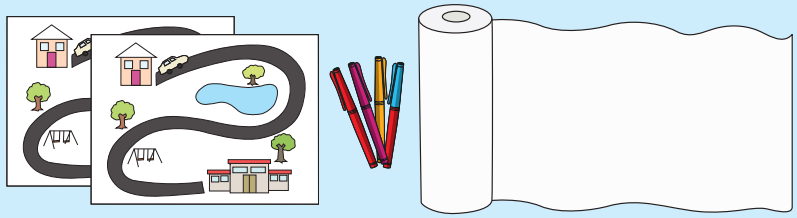


They might also like to design their own obstacle course and draw a map to help them to remember the design.

Display books such as *The Gruffalo* by Julia Donaldson or *Pirates Love Underpants* by Claire Freedman to inspire children to recreate journeys or maps from the stories. Ask children to draw or paint maps of familiar journeys or places in stories.

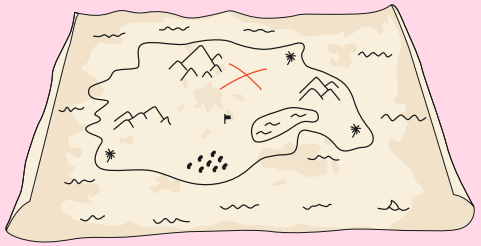


Provide children with a range of maps and large rolls of paper in provision. Encourage them to draw their own maps in the same style as the examples.



Children could bring construction and small-world resources to their map to enhance it and bring it to life.

Enhance the indoor and outdoor provision with tea-stained paper and clipboards to encourage children to create their own treasure maps.



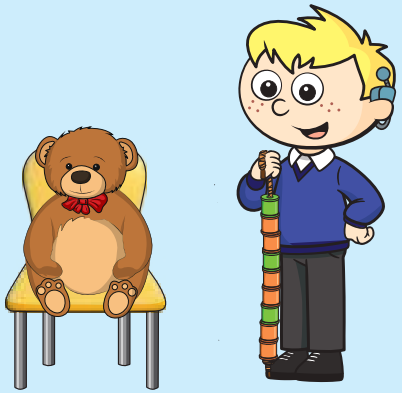
Provide tea bags and support children to make their own tea-stained paper to produce maps.

End of block checkpoint

Checkpoint 1

Place a bear or a puppet on a chair in a focal point of the classroom.

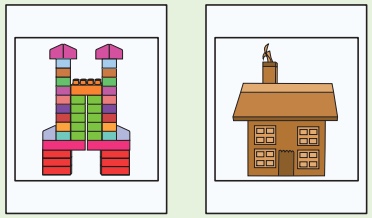
Prompt children to create their own pattern and go to tell the bear on the chair about their pattern and what the rule is.



Checkpoint 2

Encourage children to build models and then draw and explain what they have built. Photographs of these can be taken and placed in the construction area for other children to see, discuss and recreate.

Can children build, visualise and map out their thinking?



Checkpoint 3

Create maps of places that children are familiar with on tuff trays. Prompt children to add different objects, such as cars, people and buildings. Can they describe a journey through the map?

Summer Block 6

Make connections

White Rose MATHS

Teacher guidance

Key books

- *Billy's Bucket* by Kes Gray
- *Mr Gumpy's Outing* by John Burningham
- *How Many Legs?* by Kes Gray
- *Ants Rule: The Long and Short of it* by Bob Barner
- *Mr Archimedes' Bath* by Pamela Allen
- *Who Sank the Boat?* by Pamela Allen
- *You Can't Take an Elephant on the Bus* by Patricia Cleveland-Peck

Any previous books from past blocks can be re-explored and used to deepen concepts or to just enjoy!

Top tips

- Before using apparatus for problem-solving activities, ensure that children have had plenty of opportunities to explore resources and their possibilities.
- At this stage of the year, it is important to provide opportunities where adults can observe children showing their skills in maths through play in an independent fashion. Assessments should be mindful of children's independent confidence in maths and how skills can be used and applied.

Key resources

Small steps

Step 1	Deepen understanding
Step 2	Patterns and relationships

Deepen understanding

Notes and guidance

In this block, the focus is on making connections between all the aspects of maths that have been covered through the year. In this small step, we look at deepening this understanding through developing children's reasoning and problem-solving strategies.

Give children plenty of opportunities to engage in extended problem solving and develop their critical thinking skills. These problems can be linked to familiar stories, children's interests or real problems that arise as they play. Children may need support to carry out their plans and make adaptations. Ask children open-ended questions to explore their thinking. Afterwards, encourage children to review and discuss their strategies.

Rhymes

- *There's a Hole in My Bucket*

Books

- *Billy's Bucket* and *How Many Legs?* by Kes Gray
- *Mr Gumpy's Outing* by John Burningham
- *Who Sank the Boat?* by Pamela Allen

Key questions

- What can you see? Explain how you see it.
- What number story can you make?
- How many _____ do you have?
- What strategy did you use? Did it work?
- Why do you think that happened?
- How can we try again?

Possible sentence stems

- There are _____ altogether.
- I can see _____ here and _____ there.
- The _____ worked because...
- I used _____ because...

Links to the curriculum

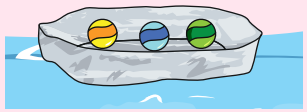
- Educational Programme for Maths – statutory framework

Deepen understanding

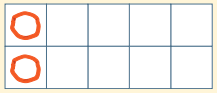
Adult-led learning

Provide children with materials such as tin foil or modelling clay to make boats. How many marbles will their boat hold while staying afloat?

Whose boat will hold the most marbles? Encourage children to adapt their design so that their boat holds more marbles.



After reading stories such as *Mr Gumpy's Outing* by John Burningham, provide children with a range of small-world animals and a container to use as a boat. Prompt children to take turns to close their eyes and collect an animal. How many legs does the animal have? Children represent the legs of the animal they have picked by drawing on a ten frame.



The first child to fill their ten frame is the winner. Encourage children to discuss what animal they need to win.

This can be extended by having to fill two ten frames.

Read stories such as *Billy's Bucket* by Kes Gray to use as a starting point for looking at comparison and number stories. Set up a small-world scene in a tuff tray and ask children to talk about what they can see.

What number stories can they make using different combinations? Prompt children to create their own scene and make up their own number stories.

Read stories such as *How Many Legs?* by Kes Gray which provide starting points for exploring counting problems. Ask children to work out how many legs there are in the different scenarios described in the story. The children will need to consider a wide variety of animals, including those with no legs.

Encourage the children to create their own nonsense scenarios in the style of the story and calculate how many legs there would be. These could be collated and made into a class *How Many?* book.

Patterns and relationships

Notes and guidance

In the second small step of this block on making connections, children should be given opportunities to explore and investigate relationships between numbers, shapes and patterns to further deepen their understanding and explore possibilities. Classroom resources such as number rods, pattern blocks and unit construction blocks are particularly good for exploring these patterns and relationships.

In addition to this, ensure that children are given the opportunity to extend these connections beyond mathematical apparatus and apply them to large-scale activities outside. Support children to enact scenarios where they have to think of more than just one answer, for example, if we all make slime, what do we need to do in order to take it home safely?

Allowing children to make decisions about what they would like to do and planning it out loud with supported scribing helps their planning and independence skills. Allow children time to discuss their plans and decisions and to think of all the possibilities.

Key questions

- How do you know?
- What do we need?
- How can we check?
- What can you see?
- Is there another answer?

Possible sentence stems

- I know my idea has worked because...
- To make a _____ I need _____.
- My plan is...
- I decided this because...

Books

- *Ants Rule: The Long and Short of it* by Bob Barner

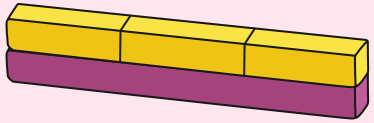
Links to the curriculum

- Educational programme for Maths – Statutory Framework

Patterns and relationships

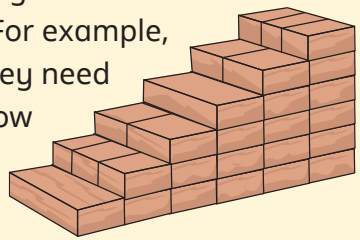
Adult-led learning

Show children a set of number rods. Ask children questions such as, "How many yellow blocks measure the same as one purple block?" What other relationships can they find? Can they find a block which is double the length of another block? How could they check?

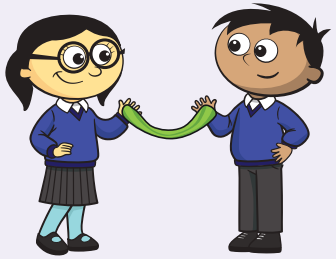


Encourage children to challenge a partner to work out the length of a given rod by experimenting with the remaining rods.

After reading stories such as *Ants Rule: The Long and Short of it* by Bob Barner, encourage children to access the construction area. Ask children to explore the different relationships they can find between various construction blocks. For example, how many short blocks do they need to match four long blocks? How could they use the blocks to make a set of stairs?

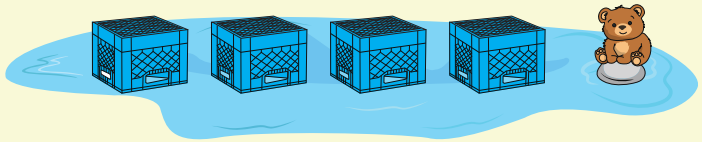


Allow children to plan (with adult support if needed) the last day of school. Encourage children to think about fun activities that they enjoy or something that they would like to do, for example, making slime.



Once children have made a plan, ask "What resources do you need to do these tasks? How long will each task take? Do we all need to work together or in small groups?"

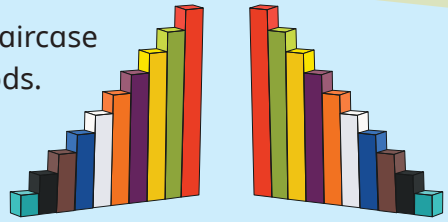
In the outdoor area, challenge children to solve problems on a large scale. For example, say "The playground is a crocodile-infested swamp! How can we rescue teddy without putting our feet on the ground?"



Other ideas could be building a shelter to keep everyone dry, choosing a vessel to fill with water, or keeping water in a vessel with holes in it.

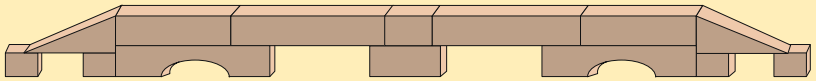
Continuous provision

Ask children to build a staircase pattern using number rods. Can they build it so that it goes up and then down? Can they build it so that it goes down and then up?



Encourage children to compare the different staircase patterns. What do they notice? They could also explore building staircase patterns that go up or down in two or three steps.

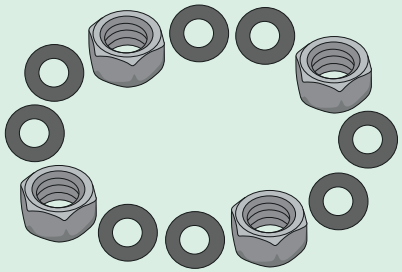
Show children photographs of bridges and prompt them to talk about what they notice. Encourage children to work together to build the longest bridge they can. How will they measure it? What is the strongest bridge they can build? How could they measure the strength of the bridge?



Encourage children to make their own cityscapes. Provide large rolls of paper with different-sized sponges and paint, or outdoor chalkboards and different-coloured chalk.

Prompt them to talk about their pictures, for example, discussing who has drawn short buildings or who has drawn tall buildings. Which house has the most windows?

Provide a range of natural materials and loose parts for children to create repeating patterns with. Encourage them to make different patterns which all have the same structure. Can they build a repeating pattern which continues around a circle?



Is there more than one way to describe this pattern? Where is the starting point?

End of block checkpoint

Checkpoint 1

After reading stories such as *You Can't Take an Elephant on the Bus* by Patricia Cleveland-Peck, encourage children to make their own vehicles for toy or small-world animals by planning out what they will need and using simple, non-standard units of measure.

Encourage children to test their vehicles and explain their designs. Why have they worked or not worked?

Checkpoint 2

Provide floor spots with numerals 0 to 10 displayed on them and a 6-sided dice with the words 'double', 'one more', 'one less', 'even', 'equal', and 'odd'.

Children stand on a number and roll the dice. Can children move to a floor spot that matches the instruction on the dice?

Checkpoint 3

In pairs, child 1 covers their eyes while child 2 selects two numeral cards and collects the corresponding number of cubes for each card.

Child 2 then combines all the cubes and turns over one of the numeral cards. Child 1 opens their eyes. Can they work out what numeral is on the hidden card using the cubes to help them? Children then swap roles.

Observe children as they play. Can they find the hidden number without counting out all the cubes?