Summer Scheme of Learning

Year 2

#MathsEveryoneCan

2020-21

White Rose Maths

New for 2020/21

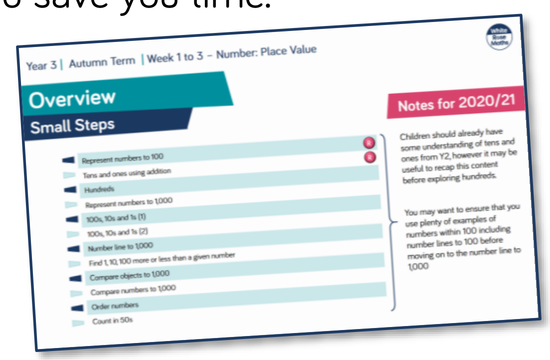
2020 will go down in history. The world has changed for all of us.

We want to do as much as we can to support children, teachers, parents and carers in these very uncertain times.

We have amended our schemes for 2020/21 to:

- ★ highlight key teaching points
- ★ recap essential content that children may have forgotten
- ★ flag any content that you might not have covered during the school closures period.

We hope these changes will add further value to the schemes and save you time.



Lesson-by-lesson overviews

We've always been reluctant to produce lesson-by-lesson overviews as every class is individual and has different needs. However, many of you have said that if blended learning becomes a key feature of school life next year, a weekly plan with linked content and videos could be really useful.

As always, we've listened! We've now produced a complete lesson-by-lesson overview for Y1 to Y9 that schools can use or adapt as they choose. Each lesson will be linked to a free-to-use home learning video, and for premium subscribers, a worksheet. This means that you can easily assign work to your class, whether they are working at home or in school.

Inevitably, this lesson-by-lesson structure won't suit everyone, but if it works for you, then please do make use of this resource as much as you wish.

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Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website:

https://www.ncetm.org.uk/resources/47230

Concrete - Pictorial - Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Need some CPD to develop this approach? Visit www.whiterosemaths.com for find a course right for you.

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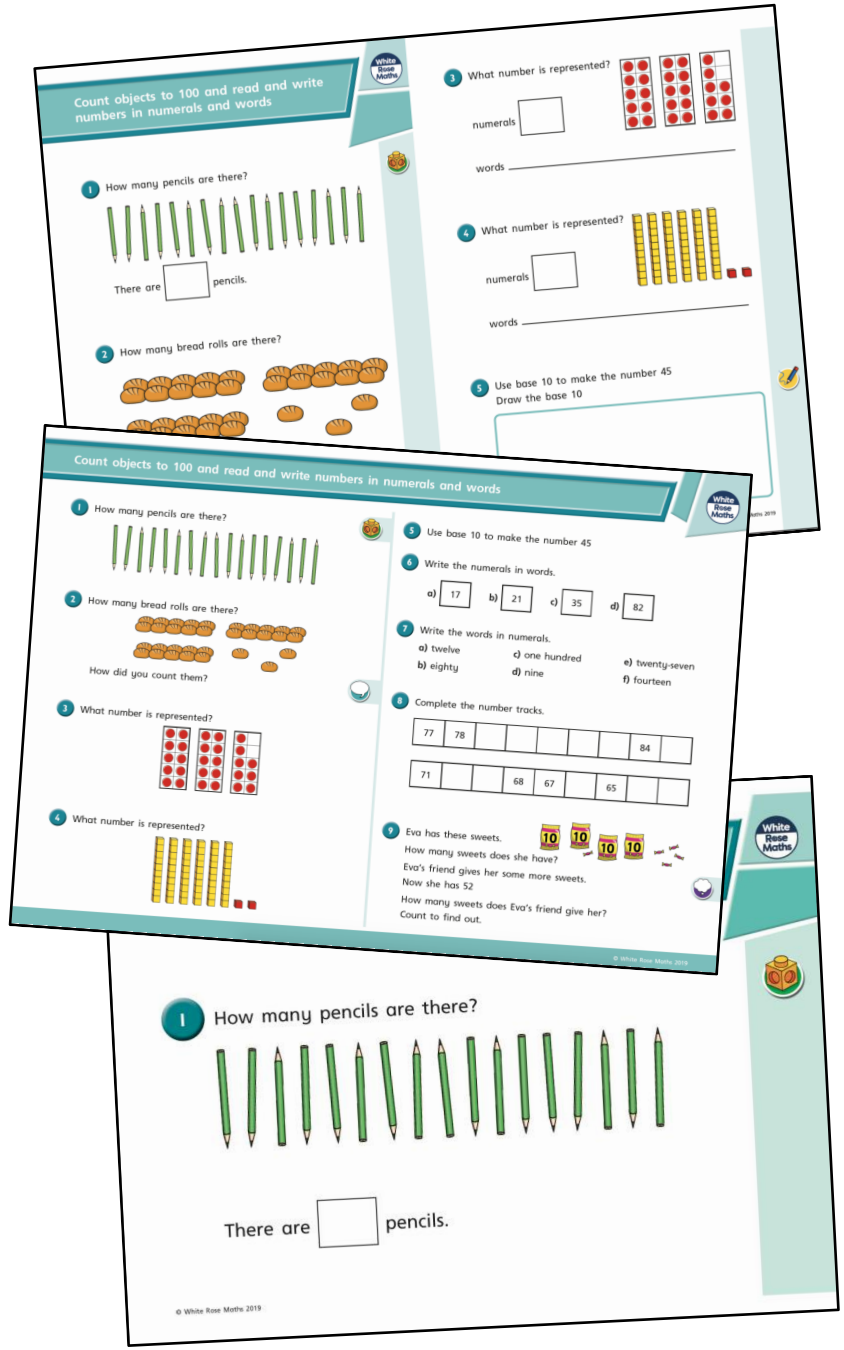
Supporting resources

NEW for 2019-20!

We have produced supporting resources for every small step from Year 1 to Year 8.

The worksheets are provided in three different formats:

- Write on worksheet – ideal for children to use the ready made models, images and stem sentences.
- Display version – great for schools who want to cut down on photocopying.
- PowerPoint version – one question per slide. Perfect for whole class teaching or mixing questions to make your own bespoke lesson.



For more information visit our online training and resources centre resources.whiterosemaths.com or email us directly at support@whiterosemaths.com

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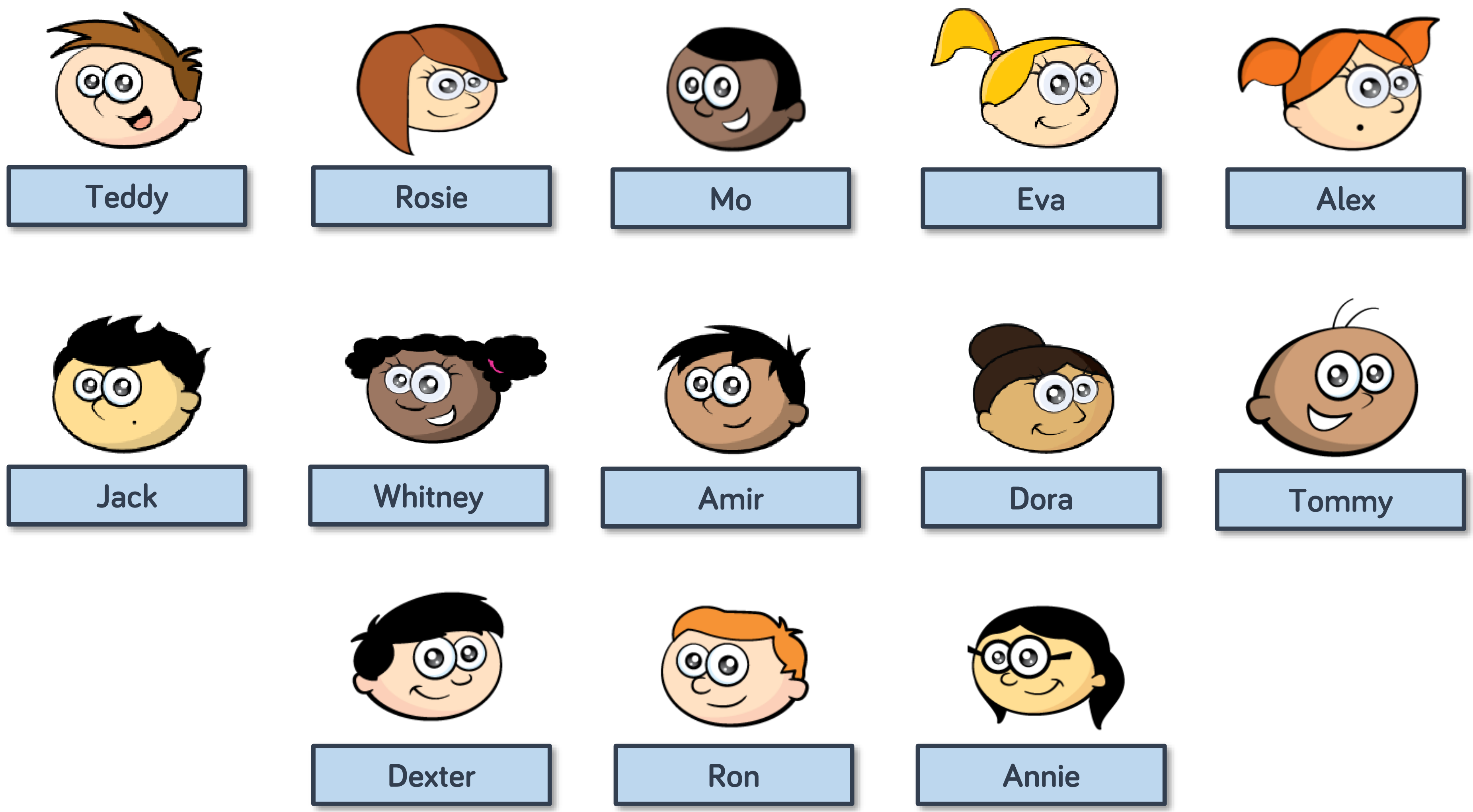
Meet the Characters

Children love to learn with characters and our team within the scheme will be sure to get them talking and reasoning about mathematical concepts and ideas. Who’s your favourite?



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Summer - Block 1

Length & Height

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Overview

Small Steps

- Compare lengths and heights R
- Measure lengths (1) R
- Measure lengths (2) R
- Measure length (cm)
- Measure length (m)
- Compare lengths
- Order lengths
- Four operations with lengths

Notes for 2020/21

It is important to spend time recapping what is meant by length and height.

Children should revisit the idea of measuring length with non-standard units such as cubes before moving on to measure length in centimetres and metres.

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Compare Lengths & Heights

Notes and Guidance

Children use and understand the language of length such as long, longer, short, shorter, tall, taller. They recognise this language will change depending on what type of length they are describing and comparing.

Children understand that height is a type of length. They should also be exposed to lengths that are equal to one another.

Mathematical Talk

Which person is taller/shorter?
Which pencil is shorter/longer?

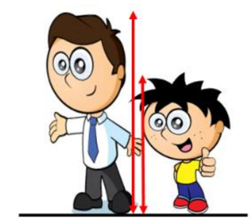
Are we measuring the height or length of something?
What is the same? What is different?

How many different sentences can you make to compare the vehicles? Say them to your partner.

Varied Fluency

R

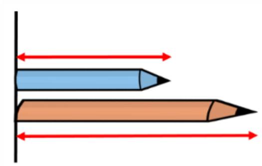
- Use the words **taller** and **shorter** in the sentence stems to compare the height of the man and the boy.



The man is ______ than the boy.

The boy is ______ than the man.

- Use the words **longer** and **shorter** in the sentence stems to compare the length of the blue pencil and the orange pencil.



The blue pencil is ______ than the orange pencil.
The orange pencil is ______ than the blue pencil.

Which pencil is the longest? Which pencil is the shortest?

- Compare the vehicles using the words to help you.

length height
longer same
taller shorter

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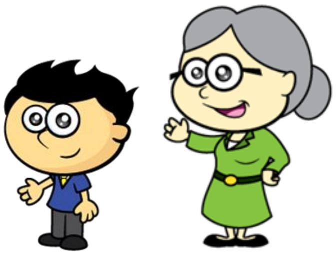
Compare Lengths & Heights

Reasoning and Problem Solving

R

Rosie, Alex and Mo are comparing the height of Mrs Rose and Jack.



Rosie

Mrs Rose is tall than Jack.

Alex

Jack is short than Mrs Rose.

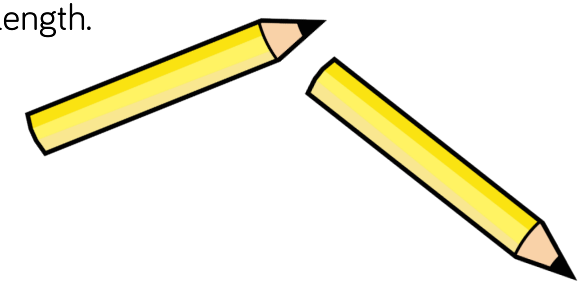
Mo

Mrs Rose is longer than Jack.

Can you improve their sentences to make them more accurate?

Possible answer:
Rosie – Mrs Rose is **taller** than Jack.
Alex – Jack is **shorter** than Mrs Rose.
Mo – Mrs Rose is **taller** than Jack.
Taller is a better word than longer because we are comparing height.

Eva thinks the pencils are the same length.



How can Eva check if she is correct?

Eva needs line up one end of the pencils and see which is longer.

Using classroom equipment, can you find an object which is longer than your rubber but shorter than your pencil?

Can you find a friend who is shorter than you but taller than your other friend?

Children could explore other items and situations where they are asked to compare more than two objects.

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Measure Length (1)

Notes and Guidance

Children use non-standard units, such as cubes, hands and straws to measure length and height. Ensure children understand the units they use need to be of equal length. Children recognise that longer, non-standard units are more suitable for measuring the length and height of longer/taller objects. Children need to understand that non-standard units should be exactly in line with one end of the object with no gaps between them to get an accurate measurement.

Mathematical Talk

What other things could you use to measure how long a pencil is?

What could you use to measure how tall you are? Is it easier to measure someone lying down or standing up?

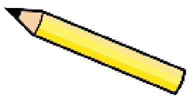
What could you use to measure the length of your classroom?

Why is it important to measure in a straight line?

Varied Fluency

R

- Use cubes to measure the length of objects around your classroom. Write a sentence for each object.



The pencil is ☐ cubes long.

The ☐ is ☐ cubes long.

- Mr White is 5 sticks tall.
Choose a suitable piece of equipment to measure how tall your friend is.

- Which is longer – your maths book or a lunch box?

The ☐ is longer than the ☐.

Choose a unit to measure the objects to check you are correct.

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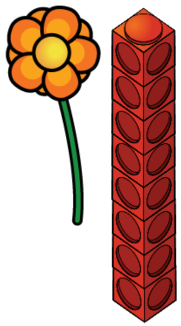
Measure Length (1)

Reasoning and Problem Solving

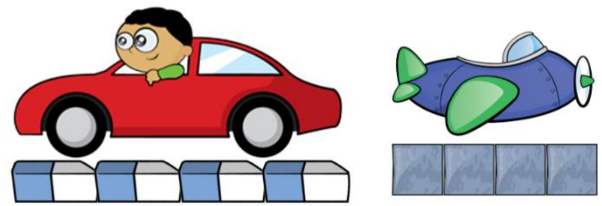
True or false?



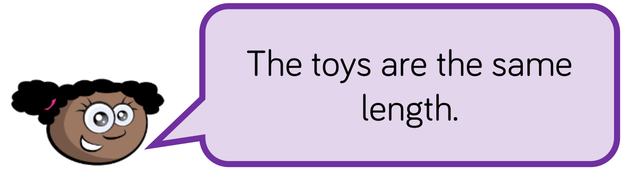
The flower is 8 cubes tall.
Explain your answer.

False because the cubes should be level with the bottom of the flower.
The flower is about 6 cubes tall.

Whitney measures the length of two toys.



She says,



Do you agree with Whitney?
Explain your answer.

Whitney is wrong. Both toys are 4 units long, but the rubber and the cubes are different lengths so the toys are not the same length.

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Measure Length (2)

Notes and Guidance

Children build on prior knowledge of measuring length and height using non-standard units and apply this to measuring using a ruler.

They should be able to understand that objects can vary in length and size, so a standard unit of measurement is required.

It is important that children know to measure from 0 cm.

Mathematical Talk

What do the numbers on the ruler mean? (1 cm etc.)

Where should we place the object to start measuring it?

Does the ruler look like anything else we have used? (number line)

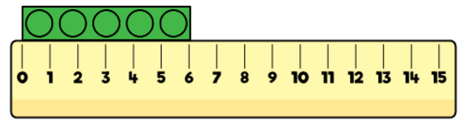
Can you count how many cm the ______ measures?

How does using a ruler help us to compare objects?

Varied Fluency

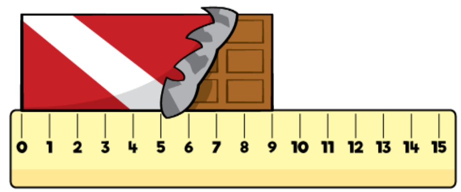
R

How long is the building block?



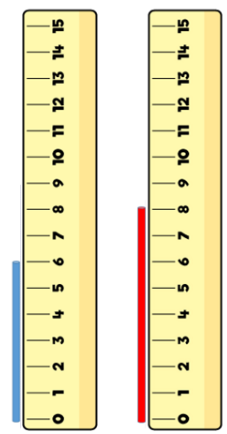
The building block is ☐ cm.

What is the length of the chocolate bar?



The chocolate bar is ☐ cm.

Which straw is the tallest?



The blue straw is ☐ cm tall.

The red straw is ☐ cm tall.

The ☐ straw is the tallest.

The ☐ straw is the shortest.

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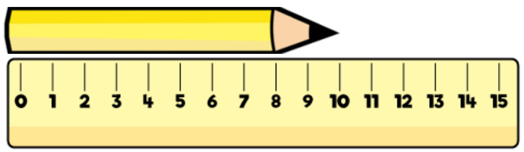
Measure Length (2)

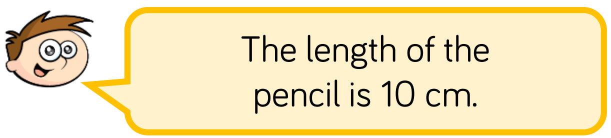
Reasoning and Problem Solving

R

Teddy measures the length of the pencil.



He says,

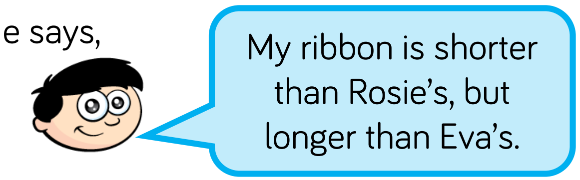


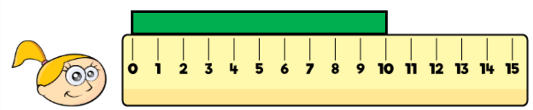
Do you agree with Teddy?
Explain why.

Teddy is wrong because he has started measuring from the end of the ruler not from 0

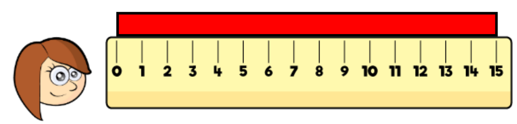
Eva, Dexter and Rosie are comparing ribbons that they have.
Unfortunately, Dexter has lost his ribbon.

He says,

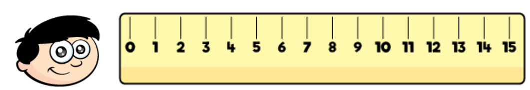




Eva



Rosie



Dexter

How long could Dexter's ribbon be?

Possible answers:

11 cm
12 cm
13 cm
14 cm

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Measure Length (cm)

Notes and Guidance

Children measure to the nearest centimetre using a ruler or tape measure.

They measure both length and height and focus on the importance of measuring from 0 rather than the end of the ruler or tape measure.

Mathematical Talk

What is the length?

How can the numbers on the ruler help us?

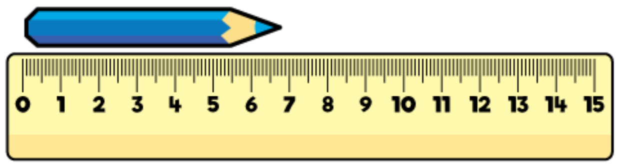
How do you know you have drawn a line that is 5cm long? How can you check?

Why is it important to start measuring from 0 on the ruler?

Varied Fluency

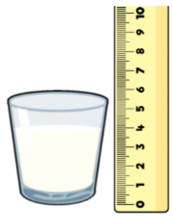
Choose a variety of objects and practice measuring them using a centimetre ruler.
Remember to line up the object to the 0 mark on the ruler.

e.g. How long is the pencil to the nearest centimetre?



How tall is the glass?

What other objects can you find to measure the height of?



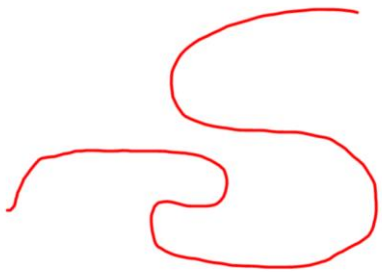
Draw a line that is:

- 5 cm long
- 8 cm long
- Longer than 4 cm but shorter than 7 cm.

Measure Length (cm)

Reasoning and Problem Solving

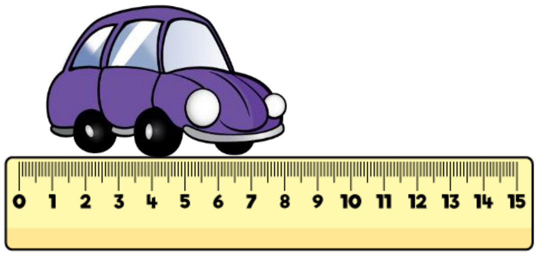
How long is this piece of string?
How could you find out?



Does the length change if you change the orientation?

The length will not change if you change the orientation so it will be easier to measure if you put it in a straight line.

Mo has used the ruler to measure the length of the car.



Mo says the car is 8 centimetres long.
Do you agree?
Explain your answer.

Mo is incorrect because he has not lined the car up with the 0 marker. If he had measured from 0 he would see that the car is 7 cm long.

Measure Length (m)

Notes and Guidance

Children begin to measure larger objects using metres. They think about whether it is better to measure items in centimetres or metres and discuss the reasons why.

Children do not yet convert from metres to centimetres; however they may see that 100 centimetres is the same as 1 metre and measurements can be written as mixed units e.g. the child is 1 metre and 25 centimetres tall.

Mathematical Talk

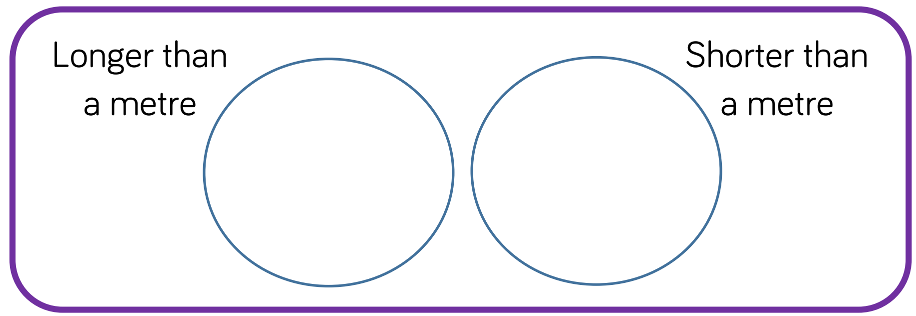
When would it be appropriate to use metres?

Why is more efficient to use metres instead of centimetres for longer objects/distances?

What equipment would you use to measure longer objects/distances?

Varied Fluency

- Use a metre stick to measure objects in your classroom and place them into the groups.



Can you find anything that is exactly one metre?

- Use a metre stick to count up in 10 cm blocks. What do you notice about 100 cm?
Possible responses: it is the same a metre, 1 m is written, it is the end of the stick.

- Measure the length of the school hall.
Record the length in metres and centimetres, e.g. 15 metres and 13 centimetres.

Measure Length (m)

Reasoning and Problem Solving

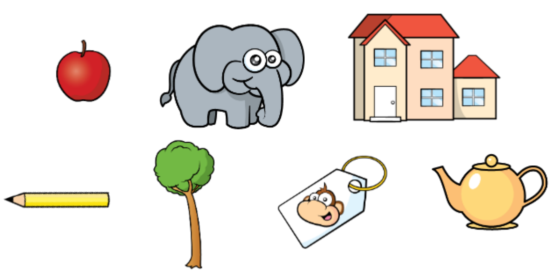
Usain Bolt can run 100 m in 9.58 seconds (just under 10 seconds).

How far do you think you can run in 10 seconds? Do you think it will be more or less than 100 m?

Measure how far you and your friends can run in 10 seconds.
Record your answers in metres and centimetres.

Children will have a variety of answers. They could measure using different equipment including metre sticks and trundle wheels.

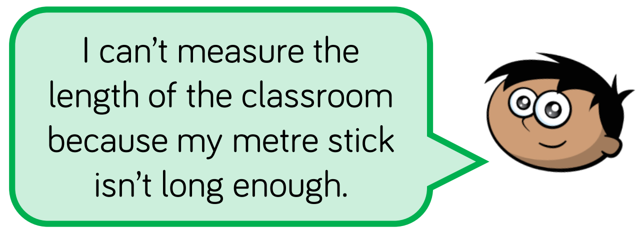
Circle the objects that you would measure in metres. Tick the objects that you would measure in centimetres.



Circle elephant, school and tree

Amir has a metre stick.

He wants to measure the length of his classroom.



Explain to Amir how he could measure the length of his classroom.

Amir can measure the length of the classroom by putting a marker at the end of the metre stick and then starting again at that point, moving his metre stick as he measures.

Compare Lengths

Notes and Guidance

Children compare lengths of objects using comparison language and symbols. They use language such as longer than, shorter than, taller than, longest, shortest and tallest.

Children only compare using the same unit of length in a question. However, the same number but different unit of measure could also be used to check that children understand metres are bigger than centimetres.

Mathematical Talk

Which is longer: 10 centimetres or 10 metres?

Which symbols can we use to compare lengths?

What is the difference between using taller than and longer than? When would we use taller than instead of longer than?

Varied Fluency

- Compare the lengths using **longer than**, **shorter than**, or **the same as**.

15 cm is		60 cm
Sixty metres is		60 m
96 m is		69 m
80 cm is		80 m

- Use < , > or = to complete the statements.

7 metres		17 metres
18 cm		18 m
32 cm		32 centimetres

- Choose 2 objects from your classroom. Estimate the length of each object. Then measure both objects and compare the lengths using <, > or =
Try this again, but this time measuring your friends' heights.

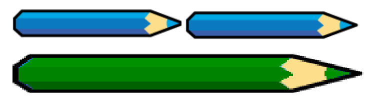
Compare Lengths

Reasoning and Problem Solving

Compare the measurements using $<$, $>$ or $=$

55 cm + 10 cm	◯	55 cm – 10 cm	$>$
42 m + 6 m	◯	42 m + 7 m	$<$
6 cm – 5 cm	◯	6 m – 5 m	$<$
80 m – 5 m	◯	70 m + 5 m	$=$

A green pencil is twice as long as a blue pencil.



Using this, complete the statements using **longer than**, **shorter than** or **equal to**.

3 green pencils are ______ 2 blue pencils

2 green pencils are ______ 5 blue pencils

4 green pencils are ______ 8 blue pencils

3 green pencils are longer than two blue pencils.
2 green pencils are shorter than 5 blue pencils.
4 green pencils are equal to 8 blue pencils.

Order Lengths

Notes and Guidance

Children order more than two lengths from shortest to longest and vice versa. This will help them recap their understanding of ordering numbers to 100

Children will order given lengths as well as ordering objects by measuring each length themselves.

They will use the language of shorter, shortest, longer and longest to describe the order.

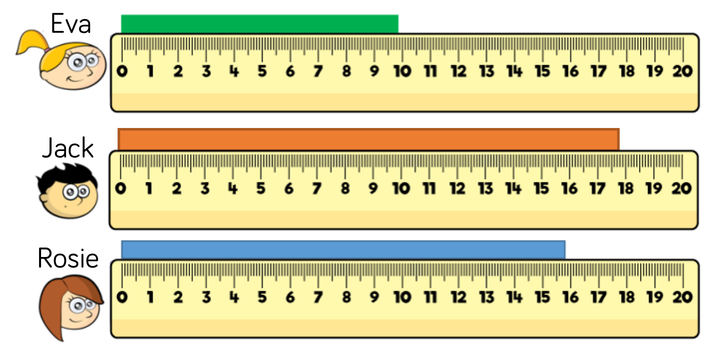
Mathematical Talk

How is ordering lengths similar to ordering numbers on a number line? Can we use a number line to help us?

Can we estimate which object is the longest before measuring?

Varied Fluency

Eva, Jack and Rosie are comparing the length of ribbons. Complete the sentences.



__________ has the longest ribbon.

__________ has the shortest ribbon.

__________ 's ribbon is shorter than _________'s.

__________'s ribbon is longer than _________'s.

Choose five objects in your classroom.
Measure them using a ruler.
Order the objects from longest to shortest.
Write at least three sentences to describe the objects using the words **longer**, **longest**, **shorter** and **shortest**.

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Order Lengths

Reasoning and Problem Solving

Four children are measuring their heights.

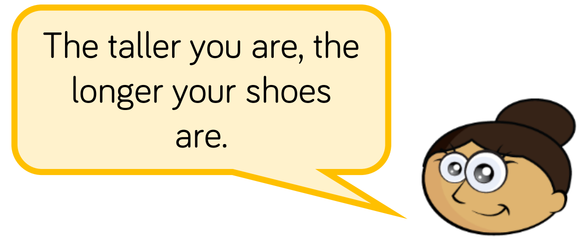
Eva is taller than Rosie, but not as tall as Mo.

Dexter is taller than Mo.

Write down their names in order of their heights, starting with the shortest.

Shortest: Rosie
Eva
Mo
Tallest: Dexter

Dora says,



Measure the height of people in your class and measure the length of their shoes.

Is Dora correct?

Children will find different results depending on their class.

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Four Operations with Lengths

Notes and Guidance

Children draw on their skills of the four operations and apply their understanding to length.

They solve one-step and two-step problems relating to length and use concrete and pictorial representations to calculate efficiently.

Mathematical Talk

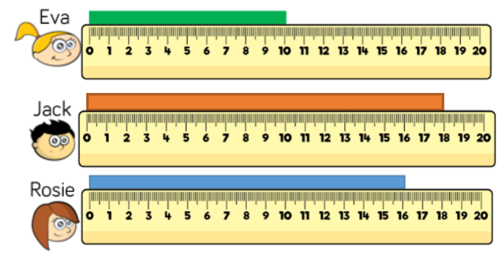
Can you draw a bar model to help to decide which operations to use?

What are the key words in the question?

Can you ask and answer any different questions using the objects and information given?

Varied Fluency

Eva, Jack and Rosie each have a piece of ribbon.



- How much longer is Jack's ribbon than Eva's?
- Jack and Rosie put their ribbons together. How long are they altogether?
- Eva cuts three more ribbons of the same length as hers. What is the total length of all four ribbons?
- Eva cuts her ribbon in half. What is the length of each piece?

Teddy has a toy train and a toy plane.
The train is 28 cm long. The plane is 16 cm longer.
How long is the plane?

The toy train is double the length of a toy car.
How long is the toy car?

Draw bar models to help you.

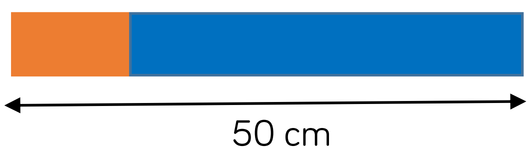
Four Operations with Lengths

Reasoning and Problem Solving

Here is a strip of orange paper.

A blue strip is four times longer than a orange strip.

The strips are joined end to end.



How long is the orange strip?

How long is the blue strip?

The orange strip is 10 cm long and a blue strip is 40 cm long.

There are 3 teddies in a box.

The brown teddy is 15 cm taller than the yellow teddy.

The yellow teddy is 3 cm shorter than the pink teddy.

The pink teddy is 42 cm tall.

How tall are the brown and yellow teddies?

How much taller is the brown teddy than the pink teddy?

The yellow teddy is 39 cm tall.

The brown teddy is 54 cm tall.

The brown teddy is 12 cm taller.

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Summer - Block 2

Position & Direction

Overview

Small Steps

- Describe position (1) R
- Describe position (2) R
- Describe movement
- Describe turns
- Describe movement and turns
- Making patterns with shapes

Notes for 2020/21

Time should be spent ensuring that children are able to confidently describe position before moving on to look at movements and turns.

The concept of position is quite difficult to grasp especially when taught remotely so children might need to spend a little longer on the basics.

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Describe Position (1)

Notes and Guidance

Children use 'left', 'right', 'forwards' and 'backwards' to describe position and direction. They will describe the position of objects and shapes from different starting positions.

You could use board games such as Snakes and Ladders and Twister to explore positional language.

Where possible, this concept should be explored practically.

Mathematical Talk

What are the different directions we can move in?

How would I get to the ……..?

How could you describe the movement?
How could we record the movement?

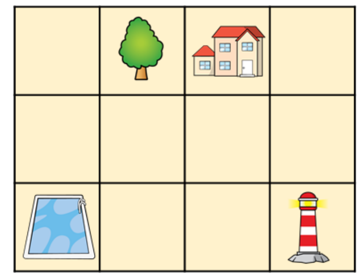
How would I get from the ……. to the ……..?

Varied Fluency

R

- Use cones to mark out a route for a partner. Describe the route your partner needs to take using the words 'left', 'right', 'forwards' and 'backwards'.

- Use a grid to move a bot to different places. Use the words 'left', 'right', 'forwards' and 'backwards' to describe the movements.



- Complete the sentences using 'left' and 'right' to describe the position of the coins.

The £1 coin is to the ______ of the 1p coin.
The 50p coin is to the _______ of the 1p coin.
The 2p coin is to the ______ of the 50p coin.

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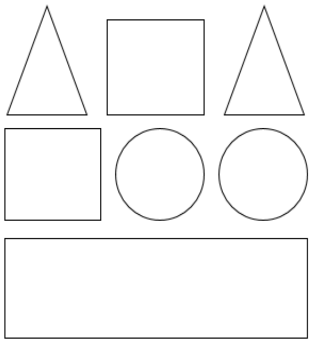
Describe Position (1)

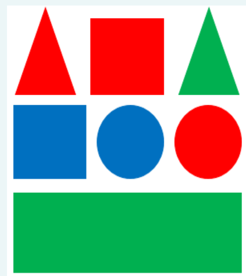
Reasoning and Problem Solving

R

Use the clues to colour the shapes.



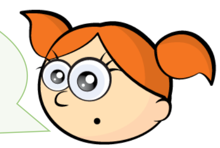
- The circle in the middle is blue.
- The circle on the right is red.
- The shape up from the right circle is green.
- The shape down from the circles is green.
- The square to the left of the green triangle is red.
- The four-sided shape up from the rectangle is blue.
- The triangle on the left is red.



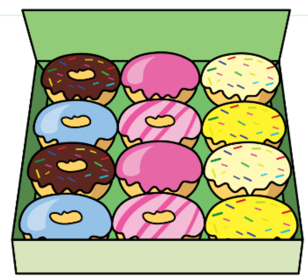
Mo

The pink doughnuts are on the left.

The pink doughnuts are on the right.



Alex



Who is correct?
Explain how you know.

Both children could be correct because they have not stated what the pink doughnuts are left or right in relation to.

The pink doughnuts are on the left of the yellow doughnuts and the pink doughnut are on the right of the blue and brown doughnuts.

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Describe Position (2)

Notes and Guidance

Children will build upon directional language 'left' and 'right' to assist with describing position. They will describe position using: 'top', 'in between', 'bottom', 'above' and 'below'. Children explore the position of objects and shapes from different starting points.

Where possible, this concept should be explored practically both in and out of the classroom.

Mathematical Talk

Where is the _____ in relation to you?

What is _______ of you?

What is _______ of this object?

How can we describe the position of _____?

Can you create your own instructions to build a tower?

Varied Fluency

R

- Think about where you are sitting in the classroom. What can you see around you? Complete the table.

In front of me	Behind me	To the left of me	To the right of me

- Use objects in your classroom or outside area to complete the sentences. Use the words: 'top', 'middle', 'bottom', 'above' and 'below' to describe the position.
  The ________ is above ________.
  The ________ is below ________.
  In between ________ and ________ is ________.
  Above ________ is ________ and ________.
  There is nothing between ________ and ________.

- Use 5 cubes to build a tower.
  - Start with a yellow cube.
  - Place a blue cube on top of the yellow cube.
  - Place a white cube below the yellow cube.
  - Place a red cube on the top of the tower.
  - Place the green cube in between the yellow and white cube.

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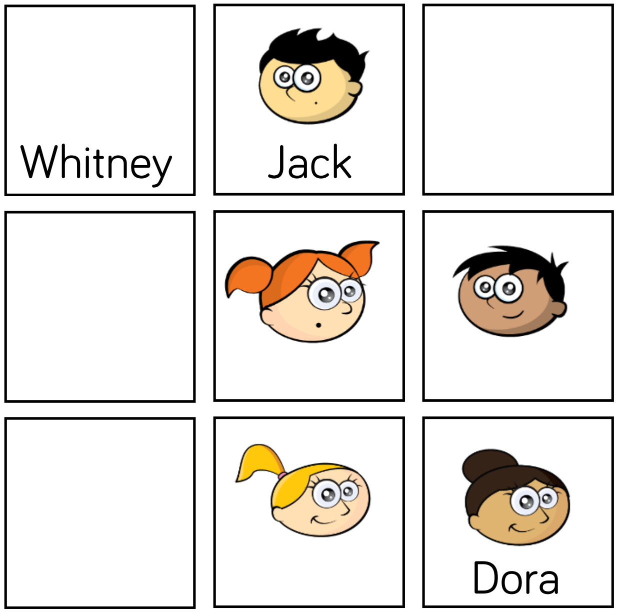
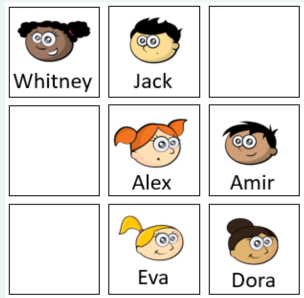
Describe Position (2)

Reasoning and Problem Solving

R



Jack is directly above Alex.
Eva is directly below Alex.
________ is to the right of Eva.
There is no-one above Amir.
What are the missing names?
Add people to complete the grid and describe where they are.



How many different ways can you describe the position of the 2p coin?

Possible answers may include:

The 2p coin is:

Below the 50p

Above the 10p

In between the £1 and 5p

To the **left** of the 5p

To the **right** of the £1

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Describing Movement

Notes and Guidance

Children use language 'forwards', 'backwards', 'up', 'down', 'left' and 'right' to describe movement in a straight line.

Children will practically follow and give directions with a partner before writing directions for routes and recording routes on 2-D grids. Teachers need to discuss the direction objects are facing, in order to correctly complete left and right movements.

Mathematical Talk

How far have you/has your partner moved?
In what direction have you/has your partner moved?

What direction are we facing in at the start? Why is this important?

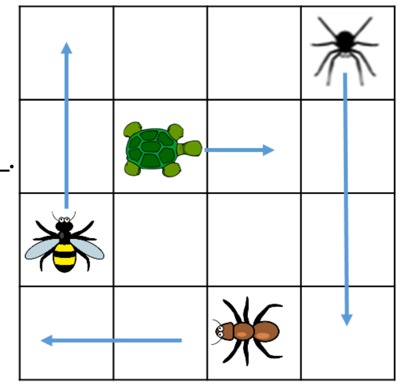
Can you describe the movements made by ____?

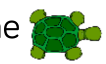
How could we record these movements?

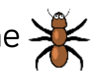
Varied Fluency

- Using the words forwards, backwards, left and right, give your partner some instructions to follow when moving around the classroom/playground.

- Complete the stem sentences to describe the movements made.

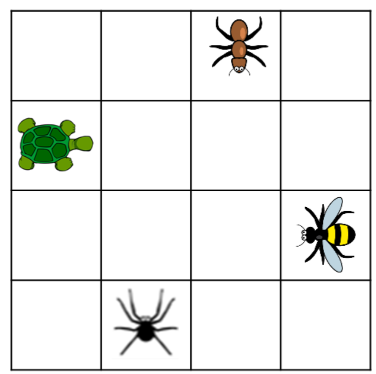


The  has moved 1 square ________.

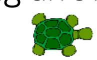
The  has moved ___ squares _______.

The _____ has moved 2 squares up.

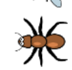
The ____ has moved ___ squares down.

- 

Record these movements on the grid using arrows.

The  moves 1 square right.

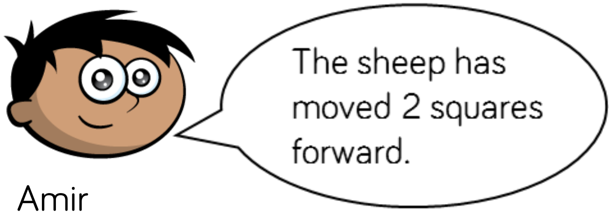
The  moves 3 squares forward.

The  moves 1 square down.

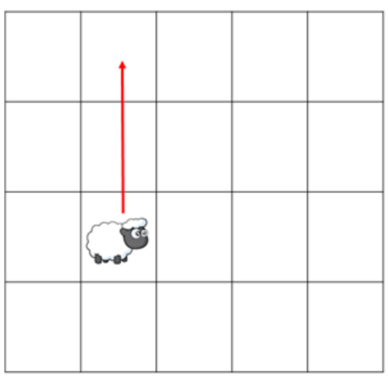
The  moves 1 square up.

Describing Movement

Reasoning and Problem Solving



Amir

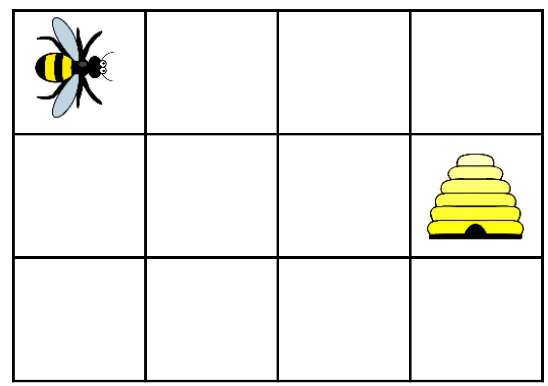


Is Amir correct?
Explain your reasoning.

Amir is incorrect. The sheep has moved 2 squares to the left because of the way it was facing to begin with.

How many different routes can you write for the bee to get to the hive?

Use the words forwards, backwards, left and right.



Possible answers:
Forward 3, Right 1.

Right 1, Forward 3.

Right 2, Forward 3, Left 1.

Right 1, Forward 3.

Right 2, Forward 2, Left 1, Forward 1.

There are more routes for the children to find.

Describing Turns

Notes and Guidance

Children describe turns using the language ‘full turn’, ‘half turn’, ‘quarter turn’, ‘three-quarter turn’, ‘clockwise’ and ‘anticlockwise’.

It is important to encourage the children to take into consideration which direction the object/person is facing to begin with.

Mathematical Talk

What direction was the turn?

Describe the turn that the number shapes have made?

Could there be more than one answer? Why?

Varied Fluency

- Turn a figure.

  Ask your partner to describe the turn using the language, ‘full turn’, ‘half turn’, ‘quarter turn’, ‘three-quarter turn’, ‘clockwise’ and ‘anticlockwise.

- Match the turn to the description.

A full turn.

A quarter turn clockwise.

A half turn anticlockwise.

- Describe how the triangle has turned each time.

The triangle has made a _____turn _______.

The triangle has made a _____ turn _______.

The triangle has made a ______ turn _______.

Describing Turns

Reasoning and Problem Solving

Look at the number shape below:

How could the number shape have turned?

Describe all possibilities.

Possible answers:
No turn
Quarter/half/three-quarter or full turn clockwise.

Quarter/half/three-quarter or full turn anticlockwise.

Always, Sometimes, Never

If two objects turn in different directions they will not be facing the same way.

Sometimes.
It depends on how far the objects are turned – quarter, half, three quarters or full.

Describing Movement & Turns

Notes and Guidance

Children use their knowledge of movement and turns to describe and record directions.

They need to be aware of the direction the object is facing before it is turned.

Children may explore movement and turns further using ICT or during P.E.

Mathematical Talk

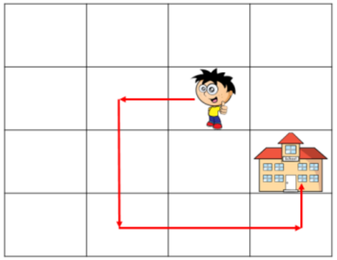
Which direction is ____ facing to begin with? Why is this important?
Is ____ moving or just changing direction? How do you know?

How can we record the directions given?

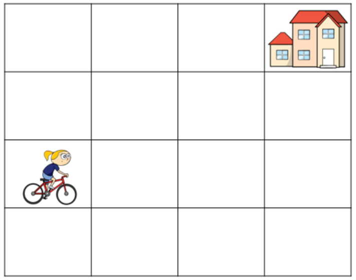
Are there any other routes that could be taken?

Varied Fluency

- Describe the route Dennis takes to school.

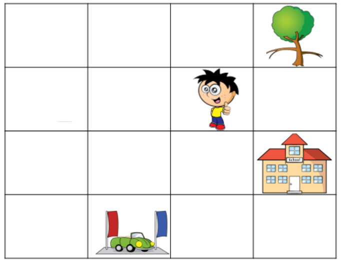


- Draw the route to show these directions.



Forward 1 square. Turn left.
Forward 1 square, quarter turn anti-clockwise.
Forward 1 square. Make a quarter turn clockwise.
Forward 1 square. Make a three quarter turn anti-clockwise. Forward 3

- Write directions for Dennis to get to each place on the map.

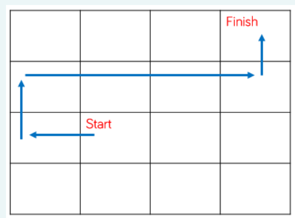


Describing Movement & Turns

Reasoning and Problem Solving

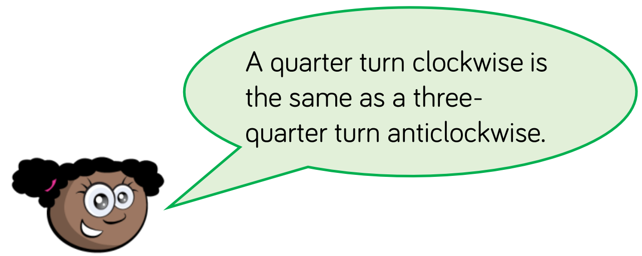
How many different routes can you find to get from start to finish.
Use the words 'forwards', 'backwards', 'clockwise', 'anti-clockwise' and 'quarter turn'.

Children will find a range of routes.
For example:



Turn a quarter anticlockwise.
Forward 1
Turn a quarter clockwise.
Forward 1
Turn a quarter clockwise.
Forward 3
Turn a quarter anticlockwise.
Forward 1

Is Whitney correct?



Convince me.

Possible answer:
Whitney is correct.

A quarter turn clockwise is the same as a three-quarter turn anticlockwise.

Children may use objects/small people to show their reasoning.

Making Patterns with Shapes

Notes and Guidance

Children build on previous knowledge of patterns and repeating patterns from Year 1

They now describe and create patterns that involve direction and turns.

Children use the language ‘clockwise’, ‘anti-clockwise’, ‘quarter’, ‘half’ and ‘three quarters’ to describe patterns.

Mathematical Talk

What is happening in the pattern?

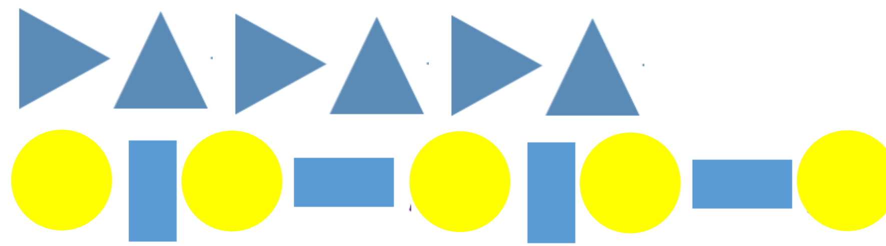
What would the next shape look like?

How would you describe its position?

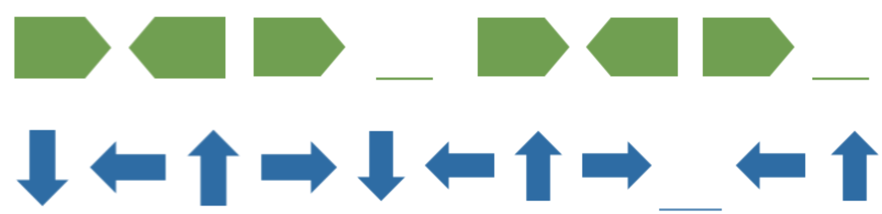
How can we work out the missing shape?

Varied Fluency

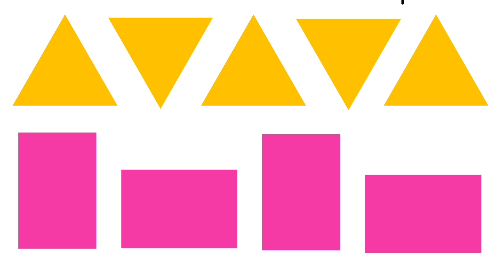
- Continue these patterns by adding the next 3 shapes.



- Fill in the missing shapes to complete the patterns.



- Describe the turn for each pattern.

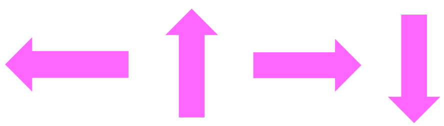


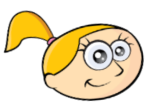
Making Patterns with Shapes

Reasoning and Problem Solving

How many different patterns can you create using this shape?

Possible answers:





Eva

The rule is turn the shape a quarter turn.

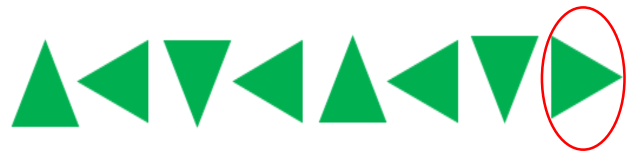
The rule is turn the shape three quarters.

Rosie

Who is correct?

Eva and Rosie could both be correct as no direction is given. Eva may be turning clockwise and Rosie anticlockwise.

Spot the mistake in each pattern. Explain why they are incorrect.



The 4th shape should be pointing right.

Or the 8th shape should be pointing left.

The 5th shape has not made half a turn.

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Summer - Block 3

Time

Overview

Small Steps

- Telling time to the hour (R)
- Telling time to the half hour (R)
- O'clock and half past
- Quarter past and quarter to
- Telling time to 5 minutes
- Writing time (R)
- Hours and days
- Find durations of time
- Compare durations of time

Notes for 2020/21

Children may have missed the time block in Year 1 making this their first formal experience of telling the time.

Children should revisit the basics specifically focusing on telling the time to the hour and half hour before looking at the two combined.

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Time to the Hour

Notes and Guidance

Children are introduced to telling the time to the hour using an analogue clock. They learn the language of o'clock and understand the hour hand is the shorter hand and the minute hand is the longer hand.
Children read the time to the hour and know when the minute hand is pointing upwards to the number 12 it is an o'clock time, and understand that they need to look at the hour hand to see which hour it is.

Mathematical Talk

There are two hands on the clock.
What is the same about each hand? What is different about each hand compared to the other?

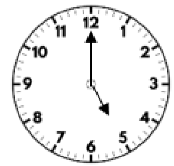
Looking at all three clock faces, what is the same about the hands? What is different about them?

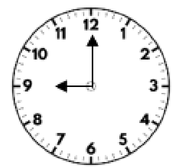
Where will the hour hand be at ____?
Where will the minute hand be at ____?
Can you show me _______?

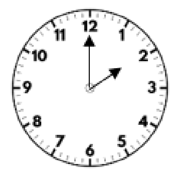
Varied Fluency

R

Match the times to the clocks.





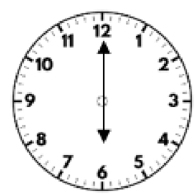


9 o'clock

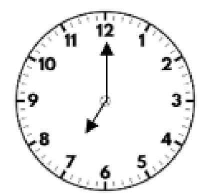
Two o'clock

5 o'clock

Complete the times.



The time is ___ o'clock



The time is ___ o'clock

Draw the hour hand and minute hand on clock faces to show the times:

Eight o'clock   1 o'clock   Twelve o'clock

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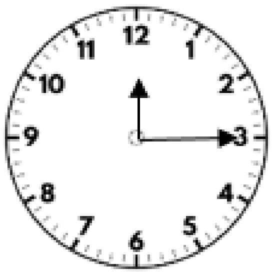
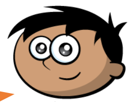
Time to the Hour

Reasoning and Problem Solving



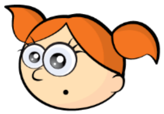
The time is 3 o'clock.



Can you spot Amir's mistake?

Amir has read the hour hand and the minute hand the wrong way round. At three o'clock the longer minute hand should be pointing at 12 and the shorter hour hand should be pointing at 3

When it is 11 o'clock both hands point at 11



Is Alex correct?
Explain your reasoning.

Alex is incorrect. If the time is eleven o'clock, the hour hand should be pointing at 11 and the minute hand should be pointing at 12

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Time to the Half Hour

Notes and Guidance

Children are introduced to telling the time to the half hour. They learn the language half past.

They understand that, at half past the hour, the minute hand has travelled half way around the clock from the twelve and is pointing at the six and the hour hand is half way between the hours e.g. half way between one and two or half way between nine and ten.

Mathematical Talk

Which is the hour hand? Which is the minute hand? How do you know?

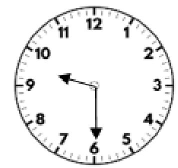
Where does the minute hand point to at half past? Can you see that the minute hand has travelled halfway around the clock? Could you show this to your partner?

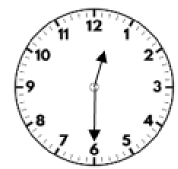
Can you show me ______?

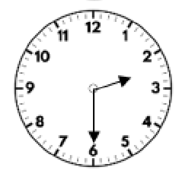
Varied Fluency

R

Match the times to the clocks.





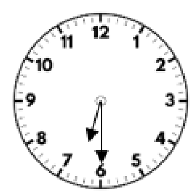


Half past twelve

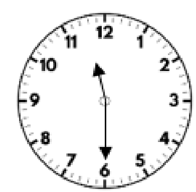
Half past 2

Half past nine

Complete the times.



The time is half past ___



The time is half past ___

Draw the hour hand and the minute hand on clock faces to show these times:

Half past 1 Half past four Half past 8

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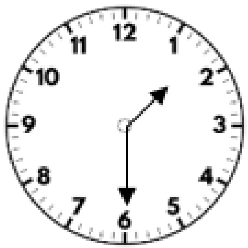
Time to the Half Hour

Reasoning and Problem Solving

R



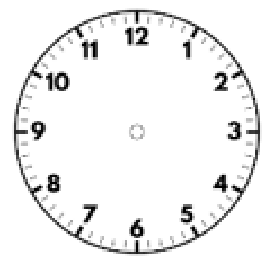
Tommy

Can you spot Tommy's mistake?

Tommy has read the minute hand as showing the number of minutes past the hour, rather than understanding that the minute hand pointing to 6 means half past. The time is half past one.

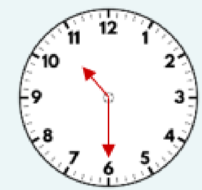
Read the instructions and draw the hands on the clock.

- The minute hand is pointing at the six.
- The hour hand is half way between 10 and 11



What time is it?

The time is half past 10



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O'clock and Half Past

Notes and Guidance

Children recap the Year one objective of telling the time to the hour and half past the hour.

Children should be given the opportunity to create times using individual clocks with moveable hands.

Children read and write times from clocks.

Mathematical Talk

What do the numbers represent on the clock face?
Which is the hour hand? Which is the minute hand?

Where will the hour hand be at ____ ?
Where will the minute hand be at ____?
What do you notice about the minute hand at half past?

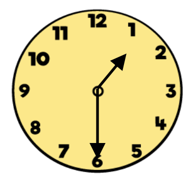
Can you show me _______?

Varied Fluency

Match the events to the approximate times they happen.
Can you show the time on your clock?

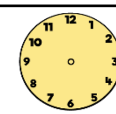
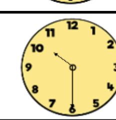
9 o'clock	Lunchtime
Half past 10	Go to school
12 o'clock	Home time
Half past 3	Playtime

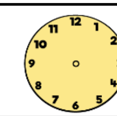
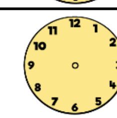
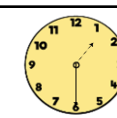
What time is it?



It is ______ past ______

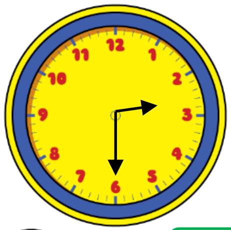
Complete the tables.

5 o'clock	
	

Half past 4	
1 o'clock	
	

O'clock and Half Past

Reasoning and Problem Solving

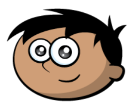


Who is telling the time correctly?

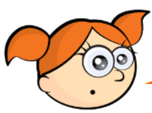
The time is half past 6

Dora

The time is half past 3



Amir



The time is half past 2

Alex

Can you spot the mistakes they've made?

Alex is correct.
Dora has confused the minute hand with the hour hand.
Amir has not noticed that the hour hand has not gone past 3 yet.

It is half past 11 so the hour hand should be on the 11

Is Alex correct?
Explain your reasoning.

Alex is incorrect. If the time is half past 11 the hour hand should be half way between the 11 and 12

Oh no! The minute hand has fallen off the classroom clock!

Lunchtime is at 12:00

Have the children missed their lunchtime?

Unfortunately, the children have missed their lunch. The hour hand is halfway between 12 and 1 so the time is 12:30

Quarter Past & Quarter To

Notes and Guidance

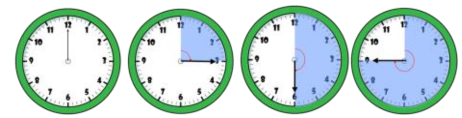
Children read and draw the times 'quarter to' and 'quarter past'. They use their knowledge of fractions and turns to identify quarter past and quarter to.
Children should recognise that the hour hand moves along with the minute hand. Therefore when the time is quarter past the hour, the hour hand will be just past the hour and when the time is quarter to, the hour hand will be just before the hour.

Mathematical Talk

Where are the hands pointing to?
Can we divide the clock face into four equal parts? Can we link this to fractions?
If the minute hand is pointing at 3, how many minutes have passed the hour?
If the minute hand is pointing at 9, how many minutes until the next hour?
Show me quarter past/to….

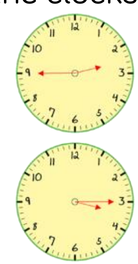
Varied Fluency

- Look at the clocks.

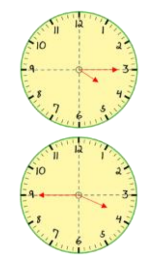


Discuss how the minute hand has travelled. Identify when the time is quarter past the hour and quarter to the hour. Give the children individual clocks with moveable hands and ask them to make quarter to/past times.

- Match the clocks to the correct time.



Quarter to four
Quarter past four
Quarter to three
Quarter past three

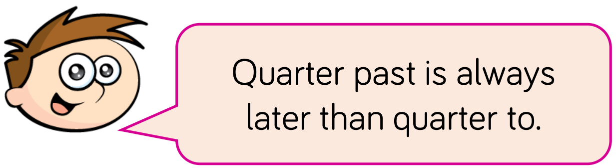


- Complete the table.

The minute hand is pointing to ____ The hour hand is just after ____ The time is *quarter ____ seven*		The minute hand is pointing to three. The hour hand is just after six. The time is *quarter past six.*	
The minute hand is pointing to ____ The hour hand is just before ____. The time is *quarter ____ two.*		The minute hand is pointing to nine. The hour hand is just ____ twelve. The time is *quarter to twelve.*	

Quarter Past & Quarter To

Reasoning and Problem Solving



Do you agree with Teddy?
Explain why.

It depends on the hour of the times given. For example: quarter to 12 is later than quarter past 11
If the hour remains the same than Teddy is correct.

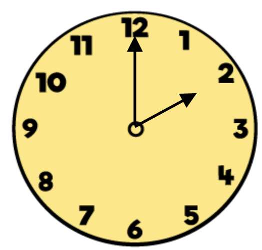
How many quarters of an hour are between 7 o'clock and 9 o'clock.

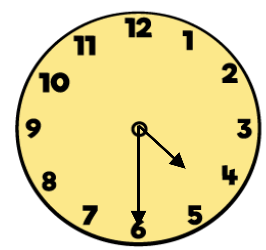
Explain how you found the answer.

There are 8 quarters of an hour between 7 o'clock and 9 o'clock.

The train to Blackpool leaves at quarter past and quarter to every hour.

Make a list of the times of the trains Oliver can catch if he gets to the train station between 2 o'clock and half past 4





Oliver could catch the following trains:
Quarter past 2
Quarter to 3
Quarter past 3
Quarter to 4
Quarter past 4

Telling Time to 5 Minutes

Notes and Guidance

Children read and show analogue time to 5-minute intervals. Children should be confident at counting from 0 to 60 in steps of 5 so they can then apply this to counting around the clock in fives and use this method to work out what time is shown.

Children need to recognise that once the minute hand gets past 6 the time is described as 'to' the next hour, rather than 'past' the hour.

Mathematical Talk

How many minutes are there between each pair of numbers on a clock?
How many different ways can you count round the clock?
Where will the minute hand be at _____? Where will the hour hand be at ______?
How do we know whether it is a 'past' or a 'to' time?
Can you show ______ past/to ______?

Varied Fluency

- Using a demonstration clock, ask the children to count round in minutes. When the minute-hand is pointing to a number, record how many minutes have passed the hour in a table. What do they notice? Will this pattern continue?

Minute hand pointing to	Minutes past the hour
1	5
2	10
3	15

- Show the children times to 5-minute intervals on a large clock. Ask the children to identify what time is being shown. Give the children individual clocks with moveable hands. Ask the children to make times to 5 minute intervals.

- Match the times to the correct clock.

20 past 6		5 to 9	
10 to 2		20 to 11	
25 to 3		10 past 1	

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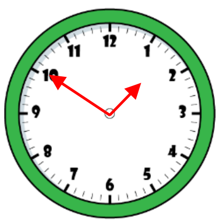
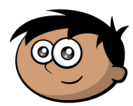
Telling Time to 5 Minutes

Reasoning and Problem Solving



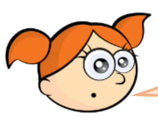
It is ten to one.

Dora



It is ten past ten.

Amir

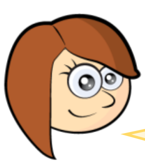


It is ten to two.

Alex

Who is correct? Explain your answer.

Alex is correct.
Dora has said the hour before not the next hour.
Amir has confused his minute and hour hands.

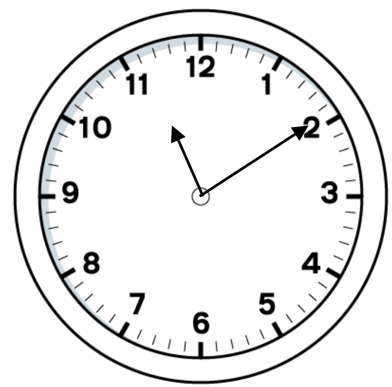


Four lots of 5 minutes is the same as quarter of an hour.

Do you agree with Rosie? Explain why.

Rosie is incorrect.
Four 5 minutes are the same as 20 minutes.

Sophia starts her Maths questions at 10 past 11



Each question takes her 5 minutes to complete.
She completes 7 questions.

What time does Sophia finish her Maths questions?
Explain how you found the answer.

Sophia finishes her Maths questions at quarter to 12

Children may use a clock to count round seven lots of 5 minutes.

Children may do $5 \times 7 = 35$ and count 35 minutes round the clock.

Writing Time

Notes and Guidance

Children explore the difference between seconds, minutes and hours. They decide which activities would be measured in each unit of time.
Children explore suitable equipment e.g. stopwatches or sand timers to measure durations of time. They carry out activities and use suitable equipment to measure how long each activity takes e.g. timing how long it takes to run around the playground using a stopwatch.

Mathematical Talk

Would you measure the activity in hours, minutes or seconds?

How many star jumps do you think you can do in 10 seconds?

Let's count to 20 seconds in our heads, stand up when you think we reach 20 seconds. How close were you?

Varied Fluency

R

Using a stopwatch, record how many times you can do these activities in 20 seconds.

- Star jumps
- Write your name
- Hops on the spot

Can you think of any activity which takes 20 seconds?

Would you measure the duration of the activities in seconds, minutes or hours? Sort the activities into three groups: seconds, minutes and hours.

Brushing teeth	Reading a book	Saying the alphabet
Holiday flight	Playing outside	Sleeping at night

Complete the sentences using seconds, minutes or hours.

- Playtime is about 20 ________ long.
- The school day is about 6 ______ long.

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Writing Time

Reasoning and Problem Solving

R

Are the units of time chosen sensible for these activities?

- A football match measured in seconds.
- A lap around the school playground measured in minutes.
- A birthday party measured in hours.

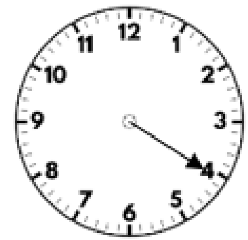
Explain your answers.

Not sensible- a football match is measured in minutes because to use seconds would involve very large numbers.

Dependent on the school playground, could be sensible, or it could be more sensible to measure in seconds.

Sensible - parties can last at least 2 hours.

Dora has a clock without an hour hand.



She says,

> I can measure how long it takes someone to run around the playground 10 times using my clock.

Do you agree with Dora?
Explain your answer.

I agree, Dora can still measure time in minutes using her clock.
The minute hand moving the distance from one increment to another shows one minute has passed.
The minute hand moving one complete turn shows that one hour has passed.

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Hours and Days

Notes and Guidance

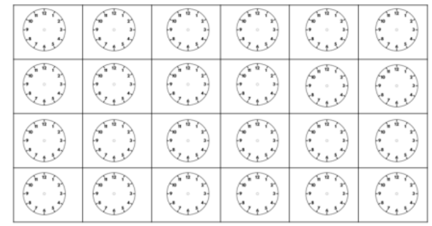
Children learn that there are 24 hours in a day and 60 minutes in an hour.
Children use clocks to convert minutes to hours and minutes.
Children should be encouraged to use their knowledge of counting in fives to help them convert.

Mathematical Talk

How many hours are there in a full day?
How many minutes are in an hour and a half? How could we calculate this?
Could we count in half an hours? How many half an hours are in one hour?
How many half an hours will there be in two hours?

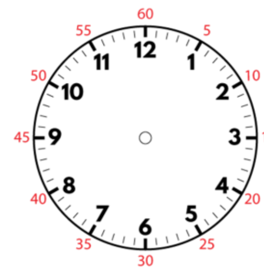
Varied Fluency

- Starting from midnight show every hour on the clocks for a full day.

  There are ☐ hours in a day.

- Using the clock, show how many minutes there are in 1 hour.

  1 hour = ______ minutes
  How many minutes would there be in 2 hours?

- Match the bars to the times.

60 minutes		

60 minutes	60 minutes

60 minutes		

60 minutes	10	

90 minutes

70 minutes

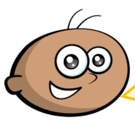
120 minutes

2 hours

1 hour

Hours and Days

Reasoning and Problem Solving

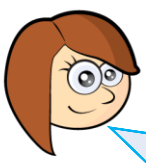


Tommy

There must be 12 hours in a day because we start from midnight and go up to 12 o'clock then start again from 1

Do you agree with Tommy? Explain why.

I disagree because there are 12 hours am and 12 hours pm therefore equaling 24 hours in a day.

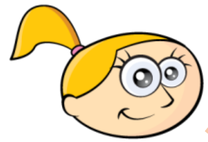


Rosie

If you add three hours onto the current time, the amount of minutes to/past the hour do not change.

Do you agree with Rosie? Prove it.

I agree. The hour hand will change but the minutes will stay the same.



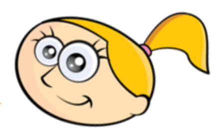
Eva

The day starts at 12 o'clock and ends at 12 o'clock.

Here are Eva's calculations for working out how many hours there are in a day.

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

I counted them up, and there are 25 hours in a day.



What mistake has Eva made?

Eva has counted 12 o'clock three times.

The final twelve on her list is the start of the next day.

Find Durations of Time

Notes and Guidance

Children identify the start and end time of an event. They use these times to work out how long an event lasted. Children should understand this is the duration of an event. Children use individual clocks and number lines to help them work out the duration of an event. They can count in steps of 5 minutes to help them.

Mathematical Talk

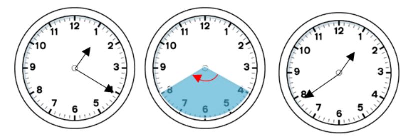
What is the start time? What is the end time?
How can we show this on the clock?
How long did the event last?

How did you work out the duration?
Are there any other methods for working out duration?

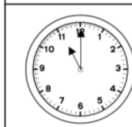
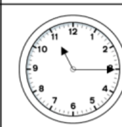
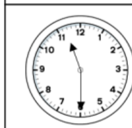
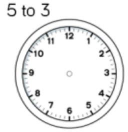
Varied Fluency

How much time has passed from the start to end time?

Start Duration End



Complete the table.

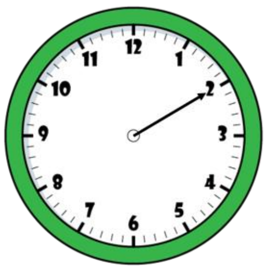
Start	End	Time passed	Duration
			____ minutes
			____ minutes
5 past 2 	5 to 3 		____ minutes

Jack leaves school at quarter past 3
He arrives home at five to 4
How long was Iqbal's journey?

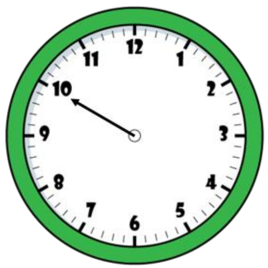
Find Durations of Time

Reasoning and Problem Solving

Oh no! The hour hand has fallen off the class clock!



Start



End

The clock shows the start and end time of a film.

How long do you think the film lasted?

The film could have lasted 40 minutes, but children may reason that most films last more than an hour, so it is more likely to be an hour and 40 minutes or two hours and 40 minutes.

Aimee is planning her birthday. She wants to plan something to do from 9am to 5pm.

Here are the things she wants to do:

- Visit the zoo (3 hours)
- Go to Pizza Palace (1 hour and a half)
- Have breakfast (half an hour)
- Play party games (1 hour)
- Watch a film (2 hours)

Create a timetable for Aimee's day. Compare it to your friends – is it the same?

There are 8 hours in Aimee's day so children could create different combinations for Aimee's day.

Compare Durations of Time

Notes and Guidance

Children compare times using 'longer' and 'shorter'. They order times from longest to shortest and vice versa.
Children then compare durations of time taken by particular events.
They could explore ways to work out durations of time most efficiently, including using empty number lines and using their knowledge that there are 60 minutes in an hour.

Mathematical Talk

Which is longer 2 minutes or 1 hour?
How can you order the times?
How many minutes does each TV show last?
How can we count the minutes efficiently?
How much longer is ………. than ……………?
How can we efficiently work out the length of time each person works?

Varied Fluency

Circle the longest time.

1 hour	40 minutes	Half an hour
55 minutes	Three quarters of an hour	35 minutes

Can you order the times from longest to shortest?

Use the table to complete the sentences.

TV Show	Starts	Ends
Pop World	3 o' clock	Twenty to 4
Animal Patrol	Half past 6	Five to 7
Super Cars	Quarter past 8	Five past 9

______________ is the shortest TV show.

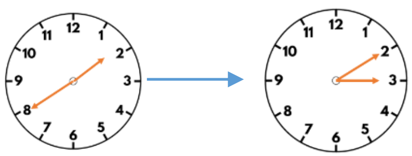
___________ is longer than __________ and ____________

Joe works from half past 10 until 3 o' clock.
Emma works from 9 o' clock until half past 12
Who works the longest amount of time?

Compare Durations of Time

Reasoning and Problem Solving

The clocks show the start and end time of the film Super Dog.



The film Crazy Cat starts at quarter past 1 and ends at quarter to 3

Teddy says,

Super Dog must be the longest film, because it ends the latest.

Do you agree with Teddy?
Explain why.

I do not agree with Teddy, because both films last exactly the same length of time – 1 hour and 30 minutes.

Rosie has an hour for her lunch break. If she takes 10 minutes to eat her lunch, does she have enough time to complete all of the playground activities?

Activity	Duration
Skipping	7 minutes
Ball skills	10 minutes
Treasure hunt	21 minutes
Trim trail	19 minutes

How do you know?

Rosie doesn't have time to complete all of the activities. Completing all of the activities would take 57 minutes. If she spends 10 minutes eating her lunch, she would only have 50 minutes left.

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Summer - Block 4

Mass, Capacity & Temperature

Overview

Small Steps

- Introduce weight and mass (R)
- Measure mass (R)
- Compare mass
- Measure mass in grams
- Measure mass in kilograms
- Introduce capacity and volume (R)
- Measure capacity (R)
- Compare volume
- Millilitres
- Litres
- Temperature

Notes for 2020/21

Children should revisit the idea of mass and capacity initially focusing on non-standard units such as cubes and jugs respectively. They will then look more formally at measuring using standard units.

Practical activities are encouraged to support understanding.

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Introduce Weight & Mass

Notes and Guidance

Children are introduced to weight and mass for the first time. They may already have some understanding of heavy and light from their own experience of carrying objects.
Children should begin by holding objects and describing them using vocabulary such as heavy, light, heavier than, lighter than before using the scales to check.
The children may believe that larger objects are always heavier and this misconception should be explored.

Mathematical Talk

Hold two objects, which is heavier/lighter? How do you know? How can we prove this?

Are larger objects always heavier than smaller objects?

If the balance scale is down, what does that tell us?

If the balance scale is up, what does that tell us?

If the balance is level, what does that tell us?

Which of these objects is heavier? How do you know? How will this be shown on the weighing scale?

Varied Fluency

R

- Choose two objects. Which is heavier? Which is lighter?
Can you be a human weighing scale?
Now use the weighing scale to check.

Which object is heavier? Which object is lighter?
The _______ is heavier/lighter than the ________ .

- Fill in the missing gaps to make the sentences correct.

The _______ is heavier than the _______.
The _______ is lighter than the _______.
The _______ is equal to the _______.

- Collect different objects from around your classroom. Use a balance scale to find the heaviest object.
Can you find 2 objects that are equal in mass?

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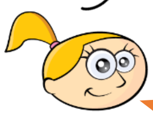
Introduce Weight & Mass

Reasoning and Problem Solving

R

The class are seeing whether the balloon or apple will weigh more.



Eva

The balloon will be heavier because it is bigger than the apple.

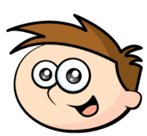
The balance will be level because they are both red.

Whitney

Mo

The apple will go down because it is lighter.

The balloon will go up because it is lighter.



Teddy

Teddy is correct. However his explanation needs to be clearer. Children should practice using vocabulary such as heavier than and lighter than when comparing objects alongside talking about the movement of the scale.

Children should be encouraged to explain why the others are incorrect.

I'm thinking of an object. It is heavier than a pencil, but lighter than a dictionary.

What object could Jack be thinking of?
Prove it.
How many objects can you think of?

Children will use a balance scale to find objects that are heavier than a pencil, then check that their chosen objects are lighter than the dictionary.

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Measure Mass

Notes and Guidance

Children begin by using a variety of non-standard units (e.g. cubes, bricks) to measure the mass of an object.
They see that when the scale is balanced, the number of non-standard units can be used to determine the mass.
E.g. One apple weighs ____ bricks.
Children may find that it is difficult to balance objects exactly using non-standard units. For example an object may be heavier than 3 bricks, but lighter than 4 bricks.

Mathematical Talk

When the scales are balanced, what does this mean?
How many ______ weigh the same as one ________?

If I add one more cube to this side, what will happen? How do you know? What if I take a cube away?

Which classroom objects are the best units to measure with? Why?

Varied Fluency

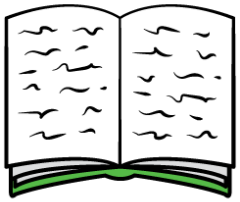
R

- Use the non-standard units to measure each item on your table.

The _______ weighs the same as _______ cubes.

- Weigh an object using cubes and then weigh the same object using different non-standard units.
Record your findings.
What do you notice?
Which non-standard unit was the best to use? Why
Which non-standard unit was not good to use? Why?

- Which non-standard units would be the best to measure the mass of a heavy book?



Counters
Wooden blocks
Pencils

Why?

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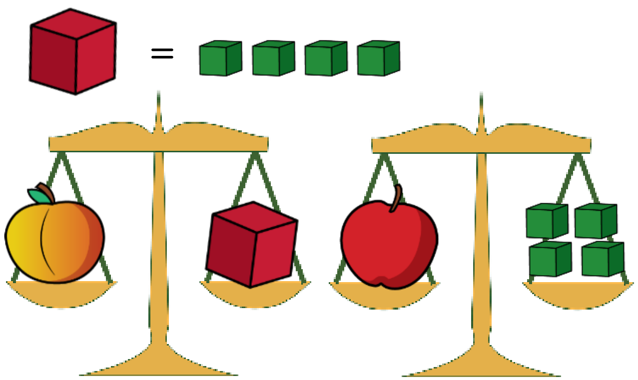
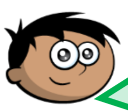
Measure Mass

Reasoning and Problem Solving

R

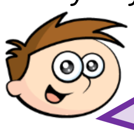


Amir says,



The apple is heavier than the peach, because it weighs 4 cubes.

Teddy says,



The apple and the peach weigh the same.

Who do you agree with?
Explain why.

Possible answer:
I agree with Teddy, because 1 brick weighs the same as 4 cubes so the apple and the peach weigh the same.

How many cubes does the teddy bear weigh?
Explain how you know.

The teddy bear weighs 5 cubes. I can take 1 cube off of each side of the scale and it will still balance.

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Compare Mass

Notes and Guidance

Children recap on Year 1 learning by comparing the mass of different objects. They will initially use balance scales to compare the mass of two or more objects.

Children compare mass using < and > and order objects based on their masses.

Mathematical Talk

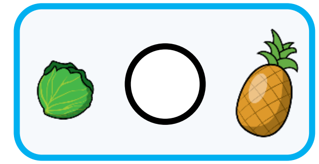
Look at the scale, which side is lower?
What does this tell us about the objects?

Which object is heavier? Which object is lighter?

Can you hold the objects and predict which is heavier?
Is a largest object always the heaviest?

Varied Fluency

- Using the words 'more' and 'less' and the > or < symbols, describe the mass.



The lettuce weighs _____ than the pineapple.

- Choose three objects. Use the balance scales to order them from heaviest to lightest?

The ______ is heavier than the ______ but lighter than the _____.
The ______ is lighter than the ______ but heavier than the _____.

- Complete the sentences:

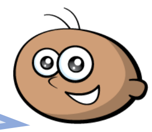
4 bananas weigh the same as ___ doughnuts.
2 bananas weigh the same as ___ doughnuts

Can you write sentences using 'more' or 'less' using the image?

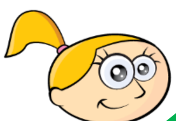
Compare Mass

Reasoning and Problem Solving

Apples weigh more than bananas.



Tommy

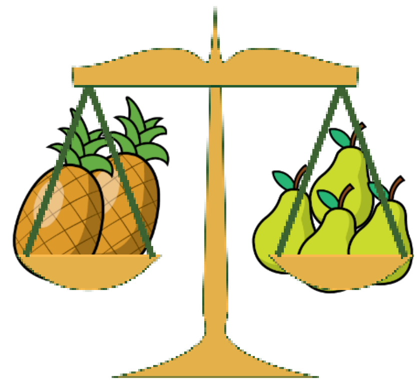


Eva

Two doughnuts weigh the same as two bananas.

Do you agree?
Explain why.

3 bananas weigh the same as two apples, so Tommy is correct - an apple must weigh more than a banana.
1 banana weighs the same as 2 doughnuts so Eva is incorrect.



One pear weighs 10 cubes.
How many cubes will balance one pineapple?
Explain how you know.

1 pineapple weighs 20 cubes.

Always, sometimes or never true?

The larger the box, the heavier it is.

Sometimes.
Children can explore this using different sized boxes.

Measure Mass (g)

Notes and Guidance

In Year 2, the children use standard units of mass (grams) for the first time. They continue to use balance scales before moving on to use standard weighing scales.
Children apply their counting in 2s, 5s and 10s skills to reading scales accurately. They should see a variety of scales with different intervals. Give children the opportunity to feel the mass of gram weights so they can use this for estimation.

Mathematical Talk

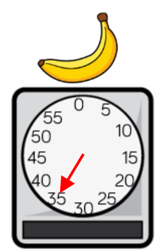
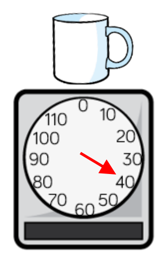
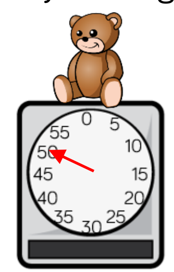
When the balance scales are level, what does this tell us?
What symbol could we use? (=)
What is the mass of the _____?
What would two ______weigh?
How could you tell is something was lighter or heavier than 10g?
How much heavier is the _____ than the _____? How could you work it out?

Varied Fluency

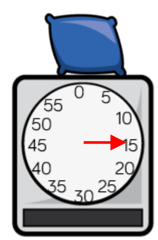
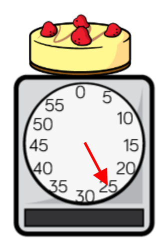
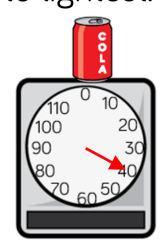
- Use gram weights to measure the mass of objects using a balance scale.

  The _____ weighs _______ grams.

- Use scales to record the mass of objects in grams.

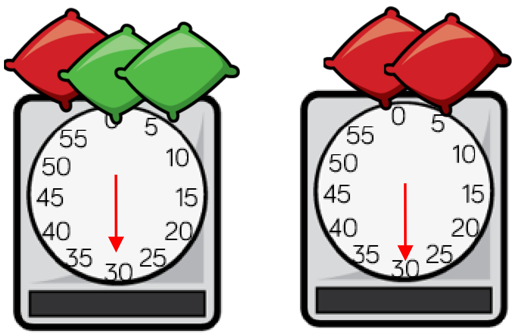




- Order the items from heaviest to lightest.

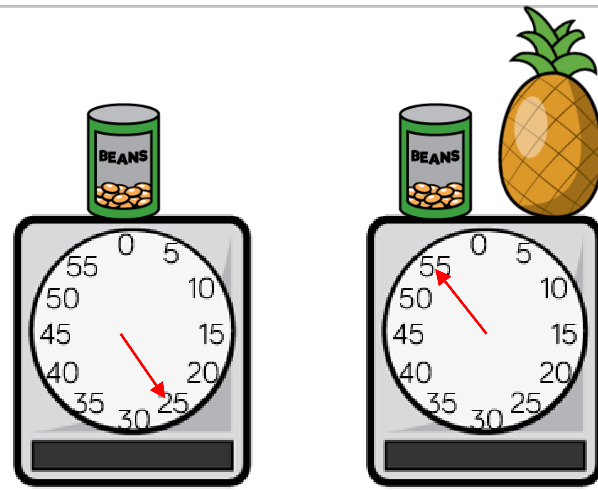
Measure Mass (g)

Reasoning and Problem Solving

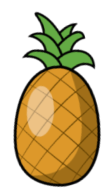


Which is heavier, the red or the green beanbag?
Explain why.

The red beanbag weighs more because it weighs the same as **two** green beanbags.



The  weighs ☐ g.

The  weighs ☐ g.

The tin of beans weighs 25 g and the pineapple weighs 30 g

Measure Mass (kg)

Notes and Guidance

Children use their knowledge of measuring mass in grams to start to measure mass in kilograms.
They apply counting in 2s, 5s and 10s to measure on different scales.
Give children the opportunity to feel the mass of kilogram weights and real life objects that weigh 1 kg so they can use this to estimate.

Mathematical Talk

Which is heavier, one gram or one kilogram?
What else do you think we might measure in kilograms?

How much do you think that you weigh? Would you measure this in grams or kilograms? Shall we estimate and then weigh ourselves?

Can you make up some different questions about the suitcases? What words can you use to compare?

Varied Fluency

- Find the mass of the sweets and the beans.

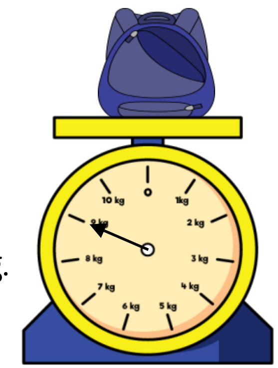
The sweets weigh ____kg

The beans weigh ____g.

- Read the scales to find the mass of each.

The bag weighs ____ kg.

The person weighs ____ kg.



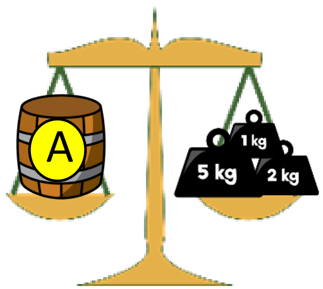
- Sophie's family are going on holiday. Compare the mass of their suitcases.

Sophie's suitcase is ______ than Dad's suitcase
Mum's suitcase weighs ____ kg more than Dad's suitcase.

Measure Mass (kg)

Reasoning and Problem Solving

What is the mass of each barrel?



Double the mass of A

Half the mass of A

What is the difference between the mass of B and C?

Barrel A weighs 8 kg

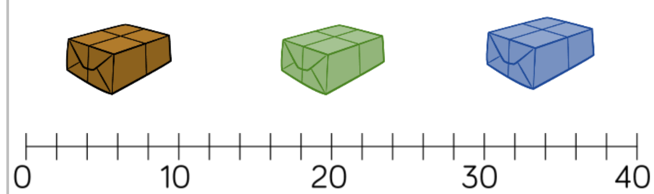
Barrel B weighs 16 kg

Barrel C weighs 4 kg

B is 12 kg heavier than C

The brown parcel weighs twice as much as the blue parcel.
The green parcel weighs 2 kg more than 30 kg
The blue parcel weighs 12 kg less than the green parcel.

Draw an arrow to show where each parcel would be on the scale.



The green parcel weighs 32 kg

The blue parcel weighs 20 kg

The brown parcel weighs 40 kg

Introduce Capacity and Volume

Notes and Guidance

Children are introduced to volume and capacity for the first time.

They explore the concept in a practical way, using a variety of containers.

They compare the volume in a container by describing whether it is full, nearly full, empty or nearly empty.

Mathematical Talk

Look at my bottle, is it full? Is it empty?

Compare my two bottles, which has more liquid in? Which has less?

How can we show the container is nearly full or nearly empty?

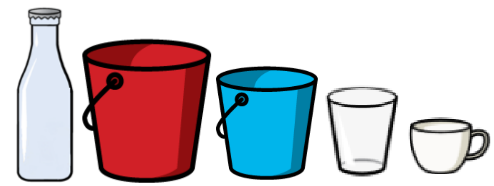
How can we measure the capacity of this container?

Varied Fluency

R

- Provide a range of different containers for children to explore practically using water or sand.

  Show me full containers.
  Show me empty containers.
  Show me almost full.
  Show me almost empty.



- Use the words 'more' or 'less' to compare the containers.

A B

A has ________ than B.

A has ________ than B.

A B

- Put these in order from empty to full.

A B C D

empty full

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Introduce Capacity and Volume

Reasoning and Problem Solving

Always, Sometimes, Never?

The tallest container holds the most liquid.

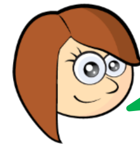
Identical containers can have a different capacity.

Show me.

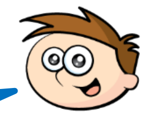
Sometimes.

Never - If the containers are identical they will have the same capacity but they can have different volumes of liquid in.

Rosie, Teddy and Amir are describing their glasses of water.



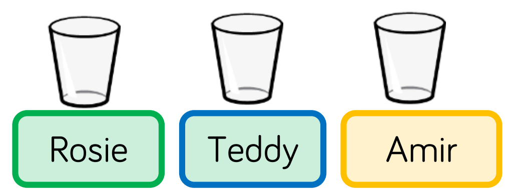
Rosie: My glass has more water than Teddy's.



Teddy: My glass is nearly full.

Amir: My glass has less water than Rosie's.

Can you fill in how much water could be in each of the children's glasses?



Various representations for Rosie's and Amir's as long as they show that Amir's is less than Rosie's and Rosie's is more than nearly full.

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Measure Capacity

Notes and Guidance

Children measure the capacity of different containers using non-standard units of measure. They understand that the unit of measure must stay the same, for example the same cup, the same spoon etc.

They understand to measure accurately, they must make each container or non-standard measure full.

Mathematical Talk

How can we measure how much liquid will fill my container?

What could I use?

How many bowls of liquid fill the bottle?

How many cups of liquid fill the bottle?

How is this different? How is this the same?

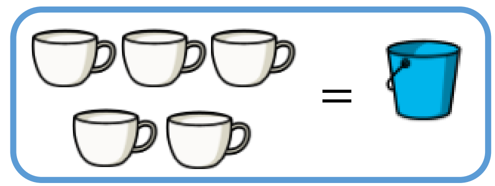
Varied Fluency

R

- Work practically using a variety of containers.
  Investigate how many small containers it takes to fill the larger containers.

  The capacity of the _______ is _______ pots.

- It takes 5  to fill 1 

  How many  will it take to fill 2 buckets?

  What about three buckets?

  Four buckets?

  What do you notice?
  Can you continue the pattern?

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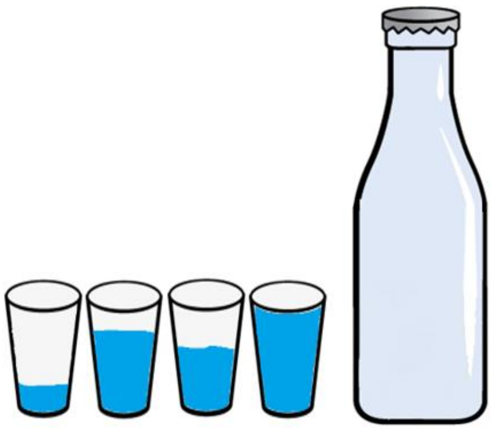
Measure Capacity

Reasoning and Problem Solving

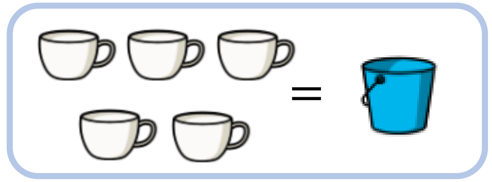
Whitney pours her cups into the bottle and they fill it exactly.

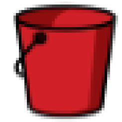


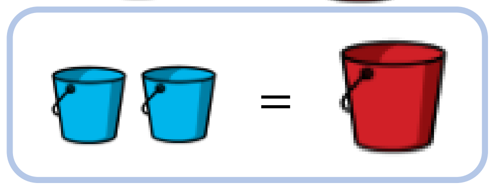
She says the bottle has a capacity of four cups. Do you agree?

Whitney is wrong. She has not filled the cups to the top so her measuring is inaccurate.

It takes 5  to fill 1 



It takes 2  to fill 1 



How many  will fill one  ?

What else can you find out?

10 cups will fill one red bucket.

The children may also find that it will take 20 cups to fill 2 red buckets etc.

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Compare Volume

Notes and Guidance

Children compare the volume of containers using < , > and = They build on their understanding of the difference between capacity and volume from Year 1. Capacity is the amount a container can hold. Volume is the amount it is actually holding.

Children use the language ‘quarter’, ‘half’ and ‘three-quarters full’ to describe and compare volume. Make sure children have the opportunity to practically investigate volume and capacity.

Mathematical Talk

Which container has the largest/smallest capacity? How do you know? Can we order them from largest to smallest?

Which container has the most or least liquid in?

How many <u>mugs</u> does it take to fill the <u>bottle?</u>
Is this more or less than the <u>pot</u>? Can we find the difference?
Does the tallest container always hold the most?

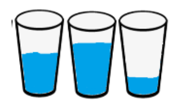
Varied Fluency

- Show three different containers. Which container has the largest capacity? Using water or rice, make each container:
one quarter full, half full, three-quarters full.

- Complete the sentences using the words ‘less’, ‘more’ or equal’.

A B

Container A has ________ than container B.



A B C

Container C has ________ than container B.

Container A has ________ than container C

but ______ than container B.

- Complete the sentences:

The bottle can fill _____ mugs.

The pot can fill _____ mugs.

Use other containers to investigate how many mugs of rice they take to fill.

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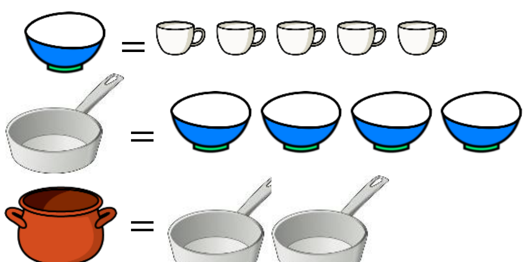
Compare Volume

Reasoning and Problem Solving

Whitney had two full bottles of juice.
She poured some juice into two glasses.

Which glass has the most juice in?
Which has the least juice in?
Explain how you know.

Glass A has the least juice in and Glass B has more juice in. Bottle A has more juice left over which means it has less juice poured out.



How many  does the  hold?

The pot holds 40 cups of water.

Choose a selection of different sized containers.
Decide how you will measure how much liquid each container can hold.
Order your containers from smallest to largest.
Compare the containers using <, > or =

Millilitres

Notes and Guidance

Children are introduced to standard units of millilitres (ml) for the first time.

They should be provided with a selection of different measuring cylinders and jugs in order to practice measuring in millilitres. They should be encouraged to estimate how many ml unlabeled containers will hold and then use measuring cylinders or jugs to check.

Mathematical Talk

Which container has the largest/smallest capacity? Can we order them from largest to smallest?

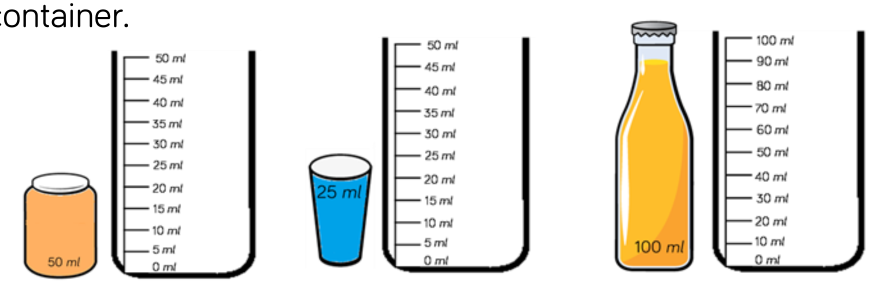
Look at the scale on my cylinder, what do you notice? Is this the same for this cylinder?

If we pour the liquid from this jar/glass into the cylinder, how much does each container hold?

Varied Fluency

- Use a variety of different containers with ml clearly labelled e.g. measuring spoon, water bottle, liquid soap, vinegar etc. Introduce that liquid can be measured in millilitres. Discuss whether 5 ml is a large or small amount. Show 5 ml using a medicine spoon. Look at the containers estimate then identify how many ml each container holds.

- Draw the level on the scale to show the capacity of each container.



The container's capacity is ___ *ml*	The container's capacity is ___ *ml*	The container's capacity is ___ *ml*

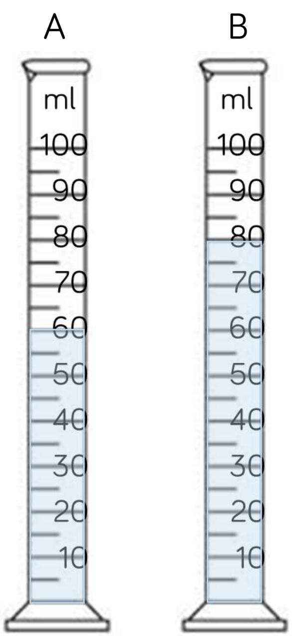
- Use different containers e.g. mug, bowl, pan, tea cup. Fill them with water or rice. Pour them into a measuring cylinder and measure the amount of liquid or rice in the measuring cylinder.

Millilitres

Reasoning and Problem Solving

A  holds 5 ml of liquid.

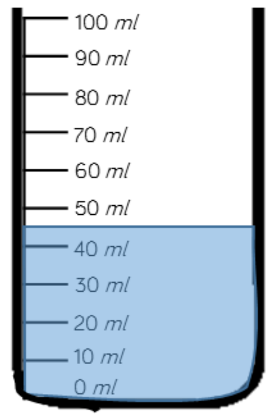
How many  of liquid are there in each container?



Container A holds 12 teaspoons.

Container B holds 16 teaspoons.

Estimate the amount of water in the container.



Explain why you have given your answer.

The water is between 40 ml and 50 ml
It is approximately 45 ml

Litres

Notes and Guidance

Children are introduced to litres (l) as a standard unit for the first time.

Children recognise the difference between measuring in millilitres and litres and when it is more efficient to use litres to measure liquid rather than millilitres. They should be encouraged to estimate volumes and then check by measuring.

Mathematical Talk

Which is larger, 1 mililitre or 1 litre? How do you know?

Would you measure ________ in litres or millilitres? Why?

How many litres of water do you drink a day?

Show the children a litre container. How many litres of water do you think it would take to fill ________?

Varied Fluency

- Provide a variety of different containers with litres clearly labelled e.g. cola bottle, paint bottle, milk etc.

  Introduce litres and discuss how these are the same but different to millilitres. Identify how many litres fill each container.

- Show how much liquid is in each cylinder after you:
  - Pour 3 litres of water into the cylinder.
  - Leave 1 litre of cola in the bottle.
  - Pour half of the juice into the cylinder.

- Use different containers e.g. bucket, large pan etc. Estimate and then measure the capacity of each one.

Litres

Reasoning and Problem Solving

Mo puts 4 litres of water in bucket A. He then pours 3 litres from bucket A into bucket B.

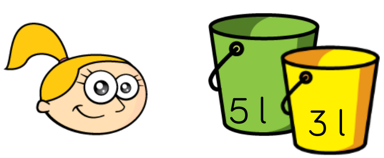
Which sentence is correct? A B

- There is more in bucket A.
- There is less in bucket A.
- There are equal amounts in each bucket.

Explain why.

There is less in bucket A because there will be 1 litre in A and 3 litres in B.

Eva wants to measure 2 litres of water into a tub. She only has a 5 litre and a 3 litre container.



How can she use both containers to measure 2 litres?

Eva could fill her 5 litre container and then empty 3 litres into the 3l container. She will be left with 2 litres.

5l – 3l = 2l

3 bowls each have more than 20 l of water in but less than 50 l

The green bowl has 5 l more than the red bowl.

The blue bowl has 10 l more than the green bowl.

How much could each bowl have in?

The red bowl could have between 20 l and 35 l

The green bowl could have between 25 l and 40 l

The blue bowl could have between 35 l and 50 l

Temperature

Notes and Guidance

Children are introduced to temperature, thermometers and the units ‘degrees Centigrade’, written °C for the first time. They learn that the temperature is higher when it is warmer.

They apply their counting in 2s, 5s and 10s skills when reading different scales on thermometers.

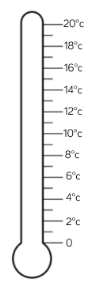
Mathematical Talk

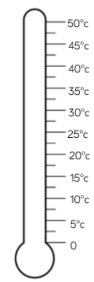
What unit can we use to measure temperature?
What is the scale going up in? How do you know?
If the temperature increases what happens to the number on the scale?
If the temperature decreases what happens to the number on the scale?
Can we compare temperatures using vocabulary such as increased, decreased, warmer, colder and difference?

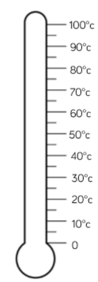
Varied Fluency

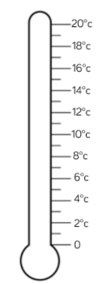
- Take temperatures around the school and complete the following stem sentences:
  The temperature in the classroom is ________.
  The classroom is _________ than the playground.
  The difference in temperature between the __________ and the _________ is __ degrees Celsius.

- Complete the thermometers to show the temperatures.

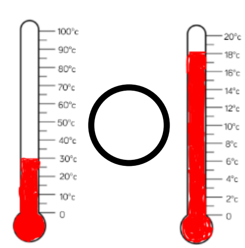

16 °C

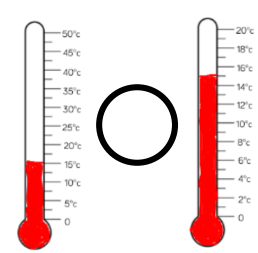

35 °C

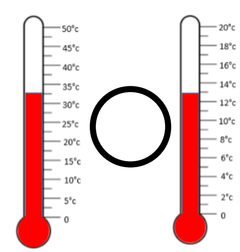

70 °C


9 °C

- Compare the temperatures using <, > or =







Temperature

Reasoning and Problem Solving

Mollie took the temperature at 12 p.m. and again at 5 p.m.

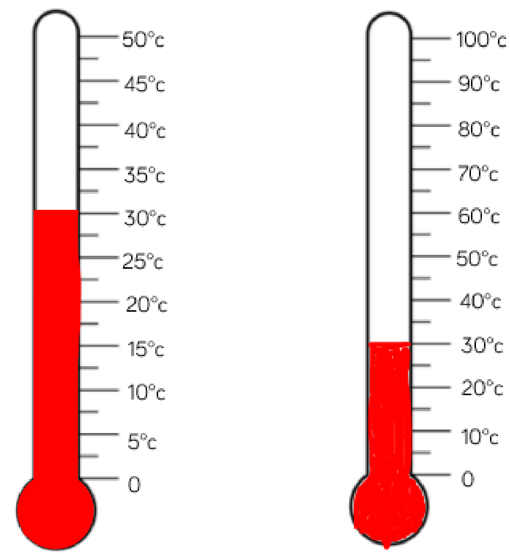
There was a difference of 7°C

What could the temperatures be?

Children may give any temperatures that have a difference of 7

Some children may realise that it is usually cooler in the evening and therefore make sure there 12pm temperature is always warmer than the 5pm temperature.

What is the same and what is different about the thermometers/temperatures?



Both thermometers are showing 30°C

The scale on the first thermometer counts up in 5°c. The scale on the second thermometer counts up in 10°C

The second thermometer will be able to record higher temperatures.