How to use the mixed-age SOL

In this document, you will find suggestions of how you may structure a progression in learning for a mixed-age class.

Firstly, we have created a yearly overview.

For each block of learning, we have grouped the small steps into themes that have similar content. Within these themes, we list the corresponding small steps from one or both year groups. Teachers can then use the single-age schemes to access the guidance on each small step listed within each theme.

The themes are organised into common content (above the line) and year specific content (below the line). Moving from left to right, the arrows on the line suggest the order to teach the themes.

Each term has 12 weeks of learning. We are aware that some terms are longer and shorter than others, so teachers may adapt the overview to fit their term dates.

The overview shows how the content has been matched up over the year to support teachers in teaching similar concepts to both year groups. Where this is not possible, it is clearly indicated on the overview with 2 separate blocks.
Notes and Guidance

How to use the mixed-age SOL

Here is an example of one of the themes from the Year 1/2 mixed-age guidance.

### Points to consider
- Use the mixed-age schemes to see where similar skills from both year groups can be taught together. Learning can then be differentiated through the questions on the single-age small steps so both year groups are focusing on their year group content.
- When there is year group specific content, consider teaching in split inputs to classes. This will depend on support in class and may need to be done through focus groups.
- On each of the block overview pages, we have described the key learning in each block and have given suggestions as to how the themes could be approached for each year group.
- We are fully aware that every class is different and the logistics of mixed-age classes can be tricky. We hope that our mixed-age SOL can help teachers to start to draw learning together.

### Subtraction

<table>
<thead>
<tr>
<th>Year 1 (Aut B2, Spr B1)</th>
<th>Year 2 (Aut B2, B3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many left? (1)</td>
<td>Subtract 1-digit from 2-digits</td>
</tr>
<tr>
<td>How many left? (2)</td>
<td>Subtract with 2-digits (1)</td>
</tr>
<tr>
<td>Counting back</td>
<td>Subtract with 2-digits (2)</td>
</tr>
<tr>
<td>Subtraction - not crossing 10</td>
<td>Find change - money</td>
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<tr>
<td>Subtraction - crossing 10 (1)</td>
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<tr>
<td>Subtraction - crossing 10 (2)</td>
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In order to create a more coherent journey for mixed-age classes, we have re-ordered some of the single-age steps and combined some blocks of learning e.g. Money is covered within Addition and Subtraction.

The bullet points are the names of the small steps from the single-age SOL. We have referenced where the steps are from at the top of each theme e.g. Aut B2 means Autumn term, Block 2. Teachers will need to access both of the single-age SOLs from our website together with this mixed-age guidance in order to plan their learning.
<table>
<thead>
<tr>
<th>Week 1</th>
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<th>Week 5</th>
<th>Week 6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
<th>Week 10</th>
<th>Week 11</th>
<th>Week 12</th>
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<td></td>
<td>Number: Place Value</td>
<td>Number: Addition and Subtraction</td>
<td>Number: Multiplication and Division</td>
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<td></td>
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</tr>
<tr>
<td>Number: Multiplication and Division</td>
<td>Measurement: Length, Perimeter and Area</td>
<td>Number: Fractions</td>
<td>Y3: Measurement: Mass and Capacity</td>
<td>Y4: Number: Decimals</td>
<td></td>
<td>Consolidation</td>
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<tr>
<td>Summer</td>
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</tbody>
</table>

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In this section, content from single-age blocks are matched together to show teachers where there are clear links across the year groups.

Teachers may decide to teach the lower year’s content to the whole class before moving the higher year on to their age-related expectations.

The lower year group is not expected to cover the higher year group’s content as they should focus on their own age-related expectations.

In this section, content that is discrete to one year group is outlined. Teachers may need to consider a split input with lessons or working with children in focus groups to ensure they have full coverage of their year’s curriculum. Guidance is given on each page to support the planning of each block.

The themes should be taught in order from left to right.
Length, Perimeter and Area

**Common Content**

**Equivalent Lengths**
- Year 3 (Spr B4)
  - Equivalent lengths - m & cm
  - Equivalent lengths – mm & cm
  - Compare lengths
- Year 4 (Aut B3)
  - Kilometres

**Perimeter**
- Year 3 (Spr B4)
  - Measure perimeter
  - Calculate perimeter
- Year 4 (Aut B3)
  - Perimeter on a grid
  - Perimeter of a rectangle
  - Perimeter of rectilinear shapes

There are many opportunities in this block for Year 4 children to recap their understanding whilst Year 3 visit this learning for the first time, this includes measuring lengths and equivalence between mm, cm and m.

Both year groups measure and calculate perimeter. Year 4 are then introduced to area and apply their understanding of arrays to calculate areas more efficiently.

**Measure Length**
- Year 3 (Spr B4)
  - Measure length

**Add & Subtract Lengths**
- Year 3 (Spr B4)
  - Add lengths
  - Subtract lengths

**Area**
- Year 4 (Aut B3)
  - What is area?
  - Counting squares
  - Making shapes
  - Comparing area
Block 1 - Length, Perimeter and Area

Theme 1 - Measure length
Measure Length

Notes and Guidance

Children are introduced to millimetres for the first time and build on their understanding of centimetres and metres.

Children use different measuring equipment including rulers, tape measures, metre sticks and trundle wheels. They discuss which equipment is the most appropriate depending on the object they are measuring.

Mathematical Talk

What would be the best equipment to measure _____ with? (e.g. tape measure, ruler, metre stick)

What do we have to remember when using a ruler to measure? Which unit of measurement are we going to use to measure? Centimetres or millimetres?

What unit of measure would be best to measure _____?

Varied Fluency

- Measure the lines to the nearest centimetre. Can you measure the lines in millimetres?

- What unit of measurement would you use to measure these real life objects? Millimetres, centimetres or metres?

- What is the length of each pencil?
Whitney’s ruler is broken. How could she use it to still measure items?

Possible answer: She could start from a different number and count on.

Tommy thinks that this chocolate bar is 4 cm long. Is he correct?

He is incorrect because he has not placed the chocolate bar at 0, he has put it at the end of the ruler.

Three children measured the same toy car. Eva says that the car is 6 cm and 5 mm. Dexter says the car is 5 cm. Annie says the car is 4 cm 5 mm.

Dexter is correct. The other two children have not lined up the ruler correctly: Eva has started at 1 cm and 5 mm instead of 0 and Annie has started at the end of the ruler.

Who is correct? Who is incorrect? Explain why.
If \( a = 10 \text{ cm} \), calculate the missing measurements.

\[
\begin{align*}
b &= \underline{\phantom{0}} \text{ cm} \\
c &= \underline{\phantom{0}} \text{ cm} \\
1 \text{ metre} &= \underline{\phantom{0}} \text{ cm}
\end{align*}
\]

Can you match the equivalent measurements?

<table>
<thead>
<tr>
<th>100 cm</th>
<th>9 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 m</td>
<td>200 cm</td>
</tr>
<tr>
<td>300 cm</td>
<td>500 cm</td>
</tr>
<tr>
<td>2 m</td>
<td>1 \text{ metre}</td>
</tr>
<tr>
<td>900 \text{ centimetres}</td>
<td>3 m</td>
</tr>
</tbody>
</table>

Eva uses this diagram to convert between centimetres and metres. Use Eva’s method to convert:

- 130 cm
- 230 cm
- 235 cm
- 535 cm
- 547 cm

If there are 100 cm in 1 metre, how many centimetres are in 2 metres? How many centimetres are in 3 metres?

Do we need to partition 235 cm into hundreds, tens and ones to convert it to metres? Is it more efficient to partition it into two parts? What would the two parts be?

If 100 cm is equal to one whole metre, what fraction of a metre would 50 cm be equivalent to? Can you show me this in a bar model?
Mo and Alex each have a skipping rope.

Alex says,

I have the longest skipping rope. My skipping rope is 250 cm long which is 30 cm more than 220 cm.

Mo says,

My skipping rope is the longest because it is 220 cm and 220 is greater than 2\(\frac{1}{2}\) metres long.

Who is correct? Explain your answer.

Alex is correct because her skipping rope is 250 cm long which is 30 cm more than 220 cm.

Three children are partitioning 754 cm

Teddy says, 75 m and 4 cm

Whitney says, 7 m and 54 cm

Jack says, 54 cm and 7 m

Who is correct? Explain why.

Whitney and Jack are both correct. Teddy has incorrectly converted from cm to m when partitioning.
Children recognise that 10 mm is equivalent to 1 cm. They use this knowledge to convert other multiples of 10 mm into centimetres and vice versa.

When looking at lengths that are not multiples of 10, they partition the measurement and convert into centimetres and millimetres. At this stage, children do not use decimals. This is introduced in Year 4.

**Mathematical Talk**

What items might we measure using millimetres rather than centimetres?

If there are 10 mm in 1 cm, how many mm would there be in 2 cm?

How many millimetres are in \(\frac{1}{2}\) cm?

How many different ways can you partition 54 cm?
Rosie is measuring a sunflower using a 30 cm ruler. Rosie says, "The sunflower is 150 cm tall."

Rosie is incorrect. Explain what mistake she might have made. How tall is the sunflower?

Rosie is incorrect. She has used the wrong unit on the ruler. The sunflower is 15 cm tall or 150 mm tall.

Ron is thinking of a measurement. Use his clues to work out which measurement he is thinking of.

- In mm, my measurement is a multiple of 2
- It has 8 cm and some mm
- It's less than 85 mm
- In mm, the digit sum is 12

Ron is thinking of 84 mm (8 cm and 4 mm)
**Compare Lengths**

**Notes and Guidance**

Children compare and order lengths based on measurements in mm, cm and m.

They use their knowledge of converting between units of measurement to help them compare and order. Encourage children to convert all the measurements to the same unit of length before comparing.

**Mathematical Talk**

Is descending order, shortest to tallest or tallest to shortest?
Can you order the children's heights in ascending order?
Why does converting to the same unit of length, make it easier to compare lengths?
Estimate which child's tower you think will be the tallest. Explain why.

**Varied Fluency**

Complete the sentences.

<table>
<thead>
<tr>
<th>Child</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosie</td>
<td>109 cm</td>
</tr>
<tr>
<td>Amir</td>
<td>1 m 5 cm</td>
</tr>
<tr>
<td>Jack</td>
<td>135 cm</td>
</tr>
<tr>
<td>Dora</td>
<td>1 m 45 mm</td>
</tr>
</tbody>
</table>

Rosie is _______ than Jack.
Jack is _______ than Dora.
Amir is _______ than Rosie.
Dora is _______ than Amir.

Four friends are building towers.
Eva's tower is 22 cm and 7 mm tall.
Teddy's tower is 22 cm tall.
Annie's tower is 215 mm tall.
Dexter's tower is 260 mm tall.
Order the children's towers in descending order.

Using a ruler, measure the width of 5 different books to the nearest mm. Record your results in a table, then compare and order them.
### Compare Lengths

#### Reasoning and Problem Solving

#### Always, Sometimes, Never?

mm lengths are smaller than cm lengths.

Possible answer:
Sometimes. E.g. 1 mm is smaller than 1 cm but 70 mm is larger than 3 cm.

#### Sort the lengths into the table.

<table>
<thead>
<tr>
<th>Longer than a metre</th>
<th>Shorter than a metre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 m 65 cm</td>
<td>165 mm</td>
</tr>
<tr>
<td>165 cm</td>
<td>16 cm 5 mm</td>
</tr>
<tr>
<td>1 cm 65 mm</td>
<td>165 m</td>
</tr>
</tbody>
</table>

Are any of the lengths equivalent?

1 m 65 cm, 165 cm and 165 m are longer than a metre.
165 mm, 16 cm 5 mm and 1 cm 65 mm are shorter than a metre.

1 m 65 cm is equivalent to 165 cm.
165 mm is equivalent to 16 cm 5 mm.
Children multiply and divide by 1,000 to convert between kilometres and metres.
They apply their understanding of adding and subtracting with four-digit numbers to find two lengths that add up to a whole number of kilometres.
Children find fractions of kilometres, using their Year 3 knowledge of finding fractions of amounts. Encourage children to use bar models to support their understanding.

Complete the statements.

3,000 m = ___ km
8 km = _______ m
5 km = ___ m
3 km + 6 km = _______ m
500 m = ___ km
250 m = ______ km
9,500 m = ___ km
4,500 m – 2,000 m = _____ km

Complete the bar models.

3 kilometres
1,800 metres
2,870 m
___ km
4,130 m

Use <, > or = to make the statements correct.

500 m
7 km
5 km

500 m
800 m
500 m

Can you research different athletic running races? What different distances are the races? Can you convert the distances from metres into kilometres? Which other sports have races over distances measured in metres or kilometres?
If 10 children ran 100 metres each, how far would they run altogether? Can we go outside and do this? How long do you think it will take to run 1 kilometre?
How can we calculate half a kilometre? Can you find other fractions of a kilometre?
Dexter and Rosie walk 15 kilometres altogether for charity. Rosie walks double the distance that Dexter walks. How far does Dexter walk?

Dexter and Rosie each raise £1 for every 500 metres they walk. How much money do they each make?

Rosie walks 10 km. Dexter walks 5 km.


Complete the missing measurements so that each line of three gives a total distance of 2 km.
Block 1 - Length, Perimeter and Area

Theme 3 - Add & Subtract Lengths
Add Lengths

Notes and Guidance

Children add lengths given in different units of measurement. They convert measurements to the same unit of length to add more efficiently. Children should be encouraged to look for the most efficient way to calculate and develop their mental addition strategies.

This step helps prepare children for adding lengths when they calculate the perimeter.

Mathematical Talk

How did you calculate the height of the tower?

Estimate which route is the shortest from Tommy's house to his friend's house.

Which route is the longest?

Why does converting the measurements to the same unit of length make it easier to add them?

Varied Fluency

Ron builds a tower that is 14 cm tall. Jack builds a tower than is 27 cm tall. Ron puts his tower on top of Jack's tower. How tall is the tower altogether?

Tommy needs to travel to his friend's house. He wants to take the shortest possible route. Which way should Tommy go?

Miss Nicholson measured the height of four children in her class. What is their total height?

95 cm  1 m and 11 cm  1 m and 50 mm  89 cm
Add Lengths

Reasoning and Problem Solving

Eva is building a tower using these blocks.

100 mm 80 mm 50 mm

How many different ways can she build a tower measuring 56 cm? Can you write your calculations in mm and cm?

Possible answer:

Four 100 mm blocks and two 80 mm blocks.

There are many other solutions.

Eva and her brother Jack measured the height of their family.

Eva thinks their total height is 4 m and 55 cm
Jack thinks their total height is 5 m and 89 cm

Who is correct? Prove it.

Jack is correct. Eva has not included her own height.
Find the difference in length between the chew bar and the pencil.

The chew bar is ___ cm long.
The pencil is ___ cm long.
The chew bar is ___ cm longer than the pencil.

Alex has 5 m of rope. She uses 1 m and 54 cm to make a skipping rope. She works out how much rope she has left using two different models.

\[
\begin{align*}
5 \text{ m} & - 1 \text{ m} = 4 \text{ m} \\
4 \text{ m} & - 54 \text{ cm} = 3 \text{ m 46 cm}
\end{align*}
\]

\[
\begin{align*}
200 \text{ cm} & - 154 \text{ cm} = 46 \text{ cm} \\
3 \text{ m} + 46 \text{ cm} & = 3 \text{ m 46 cm}
\end{align*}
\]

Use the models to solve:
• Mrs Brook’s ball of wool is 10 m long. She uses 4 m and 28 cm to knit a scarf. How much does she have left?
• A roll of tape is 3 m long. If I use 68 cm of it wrapping presents, how much will I have left?
A bike race is 950 m long. Teddy cycles 243 m and stops for a break. He cycles another 459 m and stops for another break. How much further does he need to cycle to complete the race?

A train is 20 metres long. A car is 15 metres shorter than the train. A bike is 350 cm shorter than the car. Calculate the length of the car. Calculate the length of the bike. How much longer is the train than the bike?

Teddy needs to cycle 248 metres further.

Annie has a 3 m roll of ribbon.

She is cutting it up into 10 cm lengths. How many lengths can she cut?

Annie gives 240 cm of ribbon to Rosie. How much ribbon does she have left? How many 10 cm lengths does she have left?

Annie can cut it into 30 lengths.

Annie has 60 cm left. She has 6 lengths left.

Annie has 3 m of ribbon.

She is cutting it up into 10 cm lengths. How many lengths can she cut?

Annie gives 240 cm of ribbon to Rosie. How much ribbon does she have left? How many 10 cm lengths does she have left?

Annie can cut it into 30 lengths.

Annie has 60 cm left. She has 6 lengths left.
Block 1 – Length, Perimeter and Area

Theme 4 - Perimeter
Measure Perimeter

Notes and Guidance

Children are introduced to perimeter for the first time. They explore what perimeter is and what it isn’t.

Children measure the perimeter of simple 2-D shapes. They may compare different 2-D shapes which have the same perimeter.

Children make connections between the properties of 2-D shapes and measuring the perimeter.

Mathematical Talk

What is perimeter?
Which shape do you predict will have the longest perimeter?
Does it matter where you start when you measure the length of the perimeter? Can you mark the place where you start and finish measuring?
Do you need to measure all the sides of a rectangle to find the perimeter? Explain why.

Varied Fluency

- Using your finger, show me the perimeter of your table, your book, your whiteboard etc.

- Tick the images where you can find the perimeter.

- Explain why you can’t find the perimeter of some of the images.

- Use a ruler to measure the perimeter of the shapes.
Amir is measuring the shape below. He thinks the perimeter is 7 cm.

Can you spot his mistake?

Amir has only included two of the sides. To find the perimeter he needs all 4 sides. It should be 14 cm.

Whitney is measuring the perimeter of a square. She says she only needs to measure one side of the square.

Do you agree? Explain your answer.

Whitney is correct because all four sides of a square are equal in length so if she measures one side she can multiply it by 4.

Here is a shape made from centimetre squares.

Find the perimeter of the shape.

Can you use 8 centimetre squares to make different shapes?

Find the perimeter of each one.

The perimeter is 14 cm.

There are various different answers depending on the shape made.
Calculate Perimeter

Notes and Guidance

Children use their understanding of the properties of shape to calculate the perimeter of simple 2-D shapes.

It is important to note they will not explore the formula to find the perimeter of a rectangle at this point.

They explore different methods for calculating the perimeter of a shape. For example, they may use repeated addition or they may make connections to multiplication.

Mathematical Talk

How can we calculate the perimeter of each shape?

Can we calculate the perimeter using a different method?

What is the same about the two methods? What is different?

How can we work out the length of the missing side? What other information do we know about the rectangle? Can we write on the lengths of all the sides?

Varied Fluency

Calculate the perimeter of the shapes.

Can you find more than one way to calculate the perimeter?

Use two different methods to calculate the perimeter of the squares.

What is the length of the missing side?

What other information do we know about the rectangle? Can we write on the lengths of all the sides?

Perimeter = 16 cm
Calculate Perimeter

Reasoning and Problem Solving

Teddy says,

You only need to know the length of one side for the square and the pentagon as all the sides are the same. However, Teddy is wrong because for the rectangle you need to know two lengths and for the triangle you need to know all of them.

Do you agree with Teddy? Explain your answer.

Each side of this shape is of equal length. The perimeter is 60 cm. How long is each side?

How many different rectangles can you draw with a perimeter of 20 cm?

The shape has 10 sides so the length of each side is 6 cm

There are 5 different rectangles.

1 cm by 9 cm
2 cm by 8 cm
3 cm by 7 cm
4 cm by 6 cm
5 cm by 5 cm

You only need to know the length of one side of these 2-D shapes to work out the perimeter.
Children calculate the perimeter of rectilinear shapes by counting squares on a grid. Rectilinear shapes are shapes where all the sides meet at right angles.

Encourage children to label the length of each side and to mark off each side as they add the lengths together. Ensure that children are given centimetre squared paper to draw the shapes on to support their calculation of the perimeter.

What is perimeter? How can we find the perimeter of a shape?

What do you think rectilinear means? Which part of the word sounds familiar?

If a rectangle has a perimeter of 16 cm, could one of the sides measure 14 cm? 8 cm? 7 cm?
Which of these shapes has the longest perimeter?

E has a greater perimeter, it is 18 compared to 16 for T.
Open ended.
Letters which could be drawn include:
B  C  D  F  I  J  L  O  P
Letters with diagonal lines would be omitted.
If heights of letters are kept the same, I or L could be the shortest.

You have 10 paving stones to design a patio. The stones are one metre square.

The stones must be joined to each other so that at least one edge is joined corner to corner.

Use squared paper to show which design would give the longest perimeter and which would give the shortest.

The shortest perimeter would be 14 m in a 2 × 5 arrangement or 3 × 3 square with one added on.

The longest would be 22 m.
Children calculate the perimeter of rectangles (including squares) that are not on a squared grid. When given the length and width, children explore different approaches of finding the perimeter: adding all the sides together, and adding the length and width together then multiplying by 2.

Children use their understanding of perimeter to calculate missing lengths and to investigate the possible perimeters of squares and rectangles.

If I know the length and width of a rectangle, how can I calculate the perimeter? Can you tell me 2 different ways? Which way do you find the most efficient?

If I know the perimeter of a shape and the length of one of the sides, how can I calculate the length of the missing side?

Can a rectangle where the length and width are integers, ever have an odd perimeter? Why?
The width of a rectangle is 2 metres less than the length.
The perimeter of the rectangle is between 20 m and 30 m.
What could the dimensions of the rectangle be? Draw all the rectangles that fit these rules. Use 1 cm = 1 m.

If the perimeter is:  
- 20 m  
  Length = 6 m  
  Width = 4 m  
- 24 m  
  Length = 7 m  
  Width = 5 m  
- 28 m  
  Length = 8 m  
  Width = 6 m

Always, Sometimes, Never
When all the sides of a rectangle are odd numbers, the perimeter is even. Prove it.

Here is a square. Each of the sides is a whole number of metres.

Which of these lengths could be the perimeter of the shape?  
24 m, 34 m, 44 m, 54 m, 64 m, 74 m

Why could the other values not be the perimeter?

Always because when adding an odd and an odd they always equal an even number.

24 cm  
Sides = 6 cm  
44 cm  
Sides = 11 cm  
64 cm  
Sides = 16 cm  
They are not divisible by 4
Children will begin to calculate perimeter of rectilinear shapes without using squared paper. They use addition and subtraction to calculate the missing sides. Teachers may use part-whole models to support the understanding of how to calculate missing sides.

Encourage children to continue to label each side of the shape and to mark off each side as they calculate the whole perimeter.

**Mathematical Talk**

Why are opposite sides important when calculating the perimeter of rectilinear shapes?

If one side is 10 cm long, and the opposite side is made up of two lengths, one of which is 3 cm, how do you know what the missing length is? Can you show this on a part-whole model?

If a rectilinear shape has a perimeter of 24 cm, what is the greatest number of sides it could have? What is the least number of sides it could have?

**Varied Fluency**

Find the perimeter of the shapes.

The shape is made from 3 identical rectangles. Calculate the perimeter of the shape.

How many different rectilinear shapes can you draw with a perimeter of 24 cm? How many sides do they each have? What is the longest side? What is the shortest side?
Here is a rectilinear shape. All the sides are the same length and are a whole number of centimetres. Which of these lengths could be the perimeter of the shape?

48 cm, 36 cm, 80 cm, 120 cm, 66 cm

Can you think of any other answers which could be correct?

48 cm, 36 cm or 120 cm as there are 12 sides and these numbers are all multiples of 12

Any other answers suggested are correct if they are a multiple of 12

Amir has some rectangles all the same size.

He makes this shape using his rectangles. What is the perimeter?

54 cm

He makes another shape using the same rectangles. Calculate the perimeter of this shape.

54 cm
Block 1 – Length, Perimeter and Area

Theme 5 - Area
Children are introduced to area for the first time. They understand that area is the amount space is taken up by a 2D shape or surface. Children investigate different shapes that can be made with sets of sticky notes. They should be encouraged to see that the same number of sticky notes can make different shapes but they cover the same amount of surface. We call this the area of a shape.

Use square sticky notes to find areas of different items in the classroom, which items have the largest surface area? Would we want to find the area of the playground using sticky notes? What else could we use? Why are shapes with perpendicular sides more effective to find the area of rectilinear shapes?

Which of the two shapes covers most surface? How do you know?
This is a square sticky note.
Estimate how many sticky notes you need to make these shapes?
Now make the shapes using sticky notes. Which ones cover the largest amount of surface? Which ones cover the least amount of surface?
Teddy and Eva are measuring the area of the same rectangle.

Teddy uses circles to find the area.

Eva uses squares to find the area.

Whose method do you think is more reliable? Explain why.

Possible answer:
Eva’s method is more reliable than Teddy’s because her squares cover the whole surface of the rectangle whereas the circles leave some of the surface uncovered.

Two children have measured the top of their desk. They used different sized squares.

Dora needed fewer squares to cover the space, so her squares must have been the larger ones. If the squares are smaller, you need more of them.
Once children understand that area is measured in squares, they use the strategy of counting the number of squares in a shape to measure and compare the areas of rectilinear shapes. They explore the most efficient method of counting squares and link this to their understanding of squares and rectangles.

**Mathematical Talk**

What strategy can you use to ensure you don’t count a square twice?

Which colour covers the largest area of the quilt? Which colour covers the smallest area of the quilt?

Will Jack’s method work for every rectilinear shape?

**Varied Fluency**

Complete the sentences for each shape.

![Shape](image)

The area of the shape is ____ squares.

Here is a patchwork quilt. It is made from different coloured squares. Find the area of each colour.

- Purple = ___ squares
- Green = ___ squares
- Yellow = ___ squares
- Orange = ___ squares

Jack uses his times-tables to count the squares more efficiently.

- There are 4 squares in 1 row.
- There are 3 rows altogether.
- 3 rows of 4 squares = 12 squares

Use Jack's method to find the area of this rectangle.
Dexter has taken a bite of the chocolate bar.

The chocolate bar was a rectangle. Can you work out how many squares of chocolate there were to start with?

There were 20 squares. You know this because two sides of the rectangle are shown.

This rectangle has been ripped.

What is the smallest possible area of the original rectangle?

What is the largest possible area if the length of the rectangle is less than 10 squares?

Smallest area – 15 squares.
Largest area – 30 squares.
Children make rectilinear shapes using a given number of squares.

It is important that children understand that the rectilinear shapes they make need to touch at the sides not just at the corners. They can work systematically to find all the different rectilinear shapes by moving one square at a time.

Ron has 4 squares.
He systematically makes rectilinear shapes.

Use 5 squares to make rectilinear shapes.
Can you work systematically?

Use squared paper to draw 4 different rectilinear shapes with an area of 12 squares.
Compare your shapes to a partner.
Are they the same?
Are they different?

Mo is building a patio made of 20 square slabs.
What could the patio look like?
Mo is using 6 black square slabs in his design.
None of them are touching each other.
Where could they be in the designs you have made?

If you turn Ron’s shapes upside down, do they stay the same or are they different?

Should you overlap the squares when counting area? Explain your answer.

How many different rectilinear shapes can you make with 8 squares? Will the area always be the same? Why?
Here is a rectilinear shape.

Using 7 more squares, can you make a rectangle? Can you find more than one way?

Possible answers include:

Can you make some capital letters on squared paper using less than 20 squares?

Make a word from some and count the total area of the letters. Which letters have a line of symmetry? What is the area of half of each letter?

Most letters can be made. They could be drawn on large squared paper or made with square tiles.
Comparing Area

Notes and Guidance

Children compare the area of rectilinear shapes where the same size square has been used.

Children will be able to use < and > with the value of the area to compare shapes.

They will also put shapes in order of size by comparing their areas.

Mathematical Talk

How much larger/smaller is the area of the shape?

How can we order the shapes?

Can we draw a shape that would have the same area as ___?

What is different about the number of squares covered by shape A?

Varied Fluency

Use the words ‘greater than’ and ‘less than’ to compare the rectilinear shapes.

Complete the sentence stems using < and >

Put the shapes in order from largest to smallest area.

Here is a shape.

Draw a shape that has a smaller area than this shape but an area greater than 7 squares.

Draw a shape that has an area equal to the first shape, but looks different.
Comparing Area

Reasoning and Problem Solving

Look at the shapes. Can you spot the pattern and explain how the area is changing each time?

The area increases by 2 each time.

The next shape will have an area of 9.

The 6th shape will have an area of 13.

The answers are all odd numbers and increase by 2 each time.

Shape C has been deleted.

Area C > Area B
Area C < Area D

Can you draw what shape C could look like?

B

D

Shape A is missing too.
• It has the smallest area.
• It is symmetrical.

Can you draw what it could look like?

Shape B has an area of 18 squares.

Shape D has an area of 21 squares.

So Shape C can be any shape that has an area between 18 and 21 squares.

Shape A must have area less than 18 squares, but can be any symmetrical design e.g. a 4 by 4 square.