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| Links to prior learning/ objectives:	Resources:	Vocabulary:
~ Children will have been exposed to halving and doubling. ~ Recognise and describe simple 2-D and 3-D shapes. ~ Have an awareness of length. ~ Counting skills ~ Division strategies to support fractions work. ~ Awareness of turns/ directional language when looking at time. ~ Awareness of clockwise and anti-clockwise.	Physical objects, bar models, clocks, 2-D shapes, 3-D shapes, fractions resources (games/ physical representations of different fractions), fraction walls, bee bots. **Mastery:** (where to find some resources) • Teaching for Mastery • White Rose **New and old documents** • Mastery maths stickers • Nrich (curriculum mapping)	Recognise, find, name, write, fractions, numerator, denominator, shapes, quantities, length, half, quarter, three-quarter, third. Simple fractions, equivalence, numerator, denominator, two quarters, half, Position, direction, movement, straight line, right angle, half turn, quarter turn, three-quarter turn, clockwise, anti-clockwise, pattern, combination, sequence, Identify, describe, properties, 2-D, sides, line of symmetry, vertical line, sides, vertices, 3-D, edges, faces, compare, sort

Objectives and Teaching		
Barriers to ARE (misconceptions) **Week 1** Children may not understand what a fraction is. Children may struggle to apply their knowledge of fractions of a range of objects/ lengths and shapes. Children may not have a secure understanding of multiplication and division.	Recognise, find, name and write fractions 1/3 , ¼, ½, and ¾ of a length, shape, set of objects or quantity • To understand that fractions must be made up of equal parts. • To know how to recognize a half. • To develop the skill of finding a half. • To know how to recognize a quarter. • To develop the skill of finding a quarter. • To know how to find a third. • To develop the skill of finding a third.	
Fluency	**Reasoning**	**Problem Solving**

Take two identical rectangular pieces of paper.
Cut or fold one of the rectangles into two equal parts, and the other into two unequal parts.
Is there more than one way to do this?

Look at the representations. Decide which show equal parts and which show unequal parts.
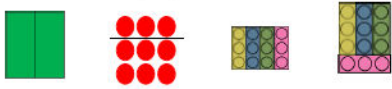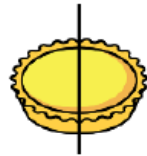
Can you split the teddies into three equal groups?
Can you split the teddies into three unequal groups?

The whole pie is split into ☐ equal parts.

Each part is worth a ☐

This is the same as ☐/☐

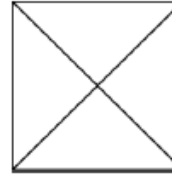Which pictures represent $\frac{1}{2}$?

Laura, Susie and Jasmine are running a race.
Laura has run further than half way. Susie has run exactly half way. Jasmine has run less than half way.
Draw on the line where each child could be between the start and the end of the race.
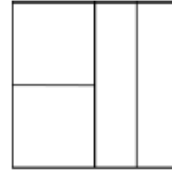
Start ——————————— End

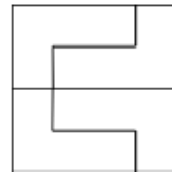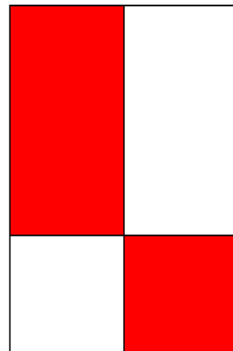Three children are splitting a square into equal parts.
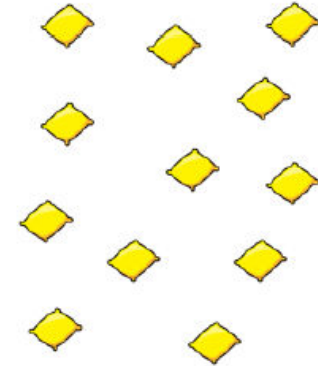
Child A

Child B

Child C

Who has split the square into equal parts? Explain why.

Sandy says the shaded part of the shape does not show a half because there are four parts, not two equal parts.
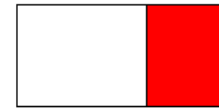
Do you agree? Explain why.

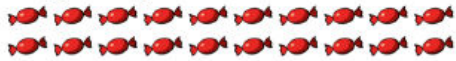How many different ways can you put these beanbags into equal groups?

Odd One Out

$\frac{1}{2}$

One half

Which is the odd one out?
Explain your answer.

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James has 20 sweets. He gives half of them to his friend. How many do they each have?

The whole is ____. Half of ____ is ____

Use counters to find half of the amounts. Complete the stem sentences for each amount.

26   30

The whole is ____. Half of ____ is ____

Fill in the blanks. Use counters to help you if needed.

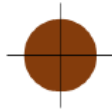$\frac{1}{2}$ of 10 = ☐ $\frac{1}{2}$ of ☐ = 10

$\frac{1}{2}$ of 12 = ☐ $\frac{1}{2}$ of ☐ = 12

$\frac{1}{2}$ of 14 = ☐ $\frac{1}{2}$ of ☐ = 14

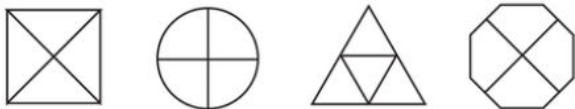What do you notice?

Four friends are sharing a cake.

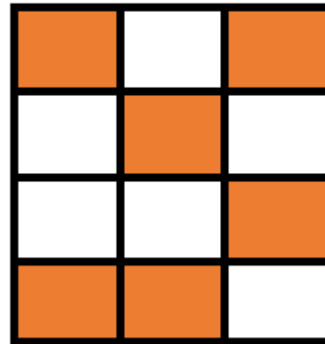The cake is split into ☐ equal parts.

Each part is worth a ☐

This is the same as $\frac{☐}{☐}$

Shade $\frac{1}{4}$ of each shape.
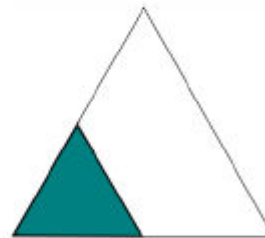
Sarah is asked to shade half of her shape.
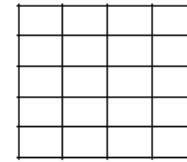This is what she shades.

Is she correct? Explain why.

True or False?

$\frac{1}{4}$ of the shape is shaded.

Explain your answer.
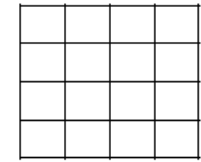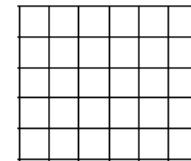
Tina is designing tiles for her kitchen. She wants half of each tile to be red and half of each tile to be blue.

Tile 1   Tile 2

Tile 3

Can you create 3 different designs for each tile?

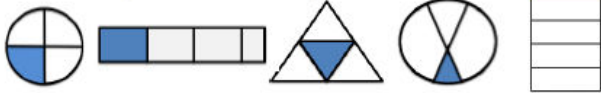Amy is folding two identical paper strips.

I think $\frac{1}{4}$ of the strip will be bigger than $\frac{1}{2}$ of the strip because 4 is bigger than 2

Use paper strips to prove Amy is incorrect.

Circle the shapes that have a quarter shaded.

Which shapes do not have a quarter shaded? How do you know?
Can you draw the shapes again and split into quarters correctly?

Complete

$\frac{1}{2}$ of 12 = ☐ $\frac{1}{2}$ of 12 = ☐

$\frac{1}{2}$ of 20 = ☐ $\frac{1}{4}$ of 20 = ☐

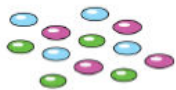$\frac{1}{2}$ of 8 = ☐ $\frac{1}{4}$ of 8 = ☐

What do you notice?

Circle one quarter of the cars.

One quarter of ____ is ____

____ is $\frac{1}{4}$ of ____

Share the smarties equally between 4 people.

The cake is split into ☐ equal parts.

Each part is worth a ☐

This is the same as $\frac{☐}{☐}$

Three friends are sharing a cake.

The cake is split into ☐ equal parts.

Each part is worth a ☐

This is the same as $\frac{☐}{☐}$

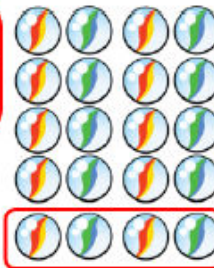Who has more? Explain why.

Amy

I have $\frac{1}{4}$ of £8

I have $\frac{1}{2}$ of £6

Zara

Do you agree? Explain your answer.

I have $\frac{1}{4}$ because I have 4 marbles.

Becky says,

I have one third of a pizza because I have one slice and there are three slices left.

Do you agree? Explain your reasoning.

Sam and Faye each have a piece of ribbon that they have cut into quarters.

Sam

5 cm

Faye

4 cm
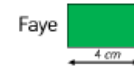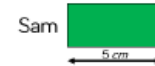
How long was Sam's whole piece of ribbon?

How long was Faye's whole piece of ribbon?

Whose whole piece of ribbon was the longest?

Shania, Leo and Alby each have a piece of ribbon.

Shania has $\frac{1}{2}$

Leo has $\frac{1}{4}$

Alby has $\frac{1}{3}$

Who will have the longest piece?

Who will have the shortest piece?

Explain why.

Shade $\frac{1}{3}$ of each shape.

What is the same? What is different?

Which represent one third?

Explain why the other circles do not represent one third.
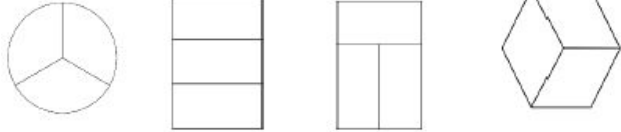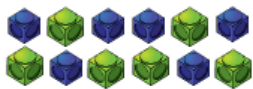
Use the cubes to make three equal groups.

There are ☐ cubes altogether.
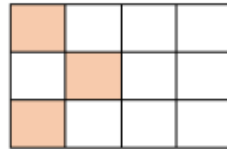
One third of ☐ is ☐

$\frac{1}{3}$ of ☐ is ☐

Christina is organising her teddy bears.
She donates $\frac{1}{3}$ of them to charity.
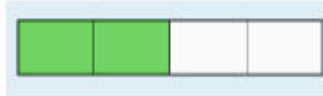How many bears does she have left?

Complete

True or False?

This shows $\frac{1}{4}$

Can you shade the same shape to show $\frac{1}{3}$?

Kira says,

I have shaded $\frac{2}{2}$ of the shape.
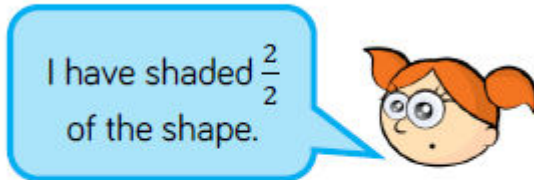
Explain her mistake.

Taylor is using beanbags and hoops to find three quarters of 20

Can you spot his mistake?
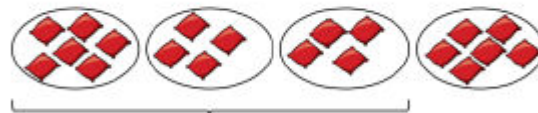
$\frac{3}{4}$ of 20 = 14

Hannah has a piece of string.

She cuts it into three equal parts.

One third of the ribbon is 5 cm long.

How long is the whole piece of string?

I am thinking of a number.

One third of my number is greater than 8 but smaller than 15

My number is even.

My number has an odd amount of tens.

What could my number be?

I am thinking of a number.

$\frac{1}{4}$ of my number is 3 less than $\frac{1}{3}$ of my number.

$\frac{1}{3}$ of my number is 12

What is $\frac{1}{2}$ of my number?

Look at 20 toy cars. Is it possible to find $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ of the cars without breaking any of them?

Complete

$\frac{1}{3}$ of 9 = ☐ $\frac{1}{3}$ of 15 = ☐

$\frac{1}{3}$ of 12 = ☐ $\frac{1}{3}$ of 18 = ☐

Complete the missing information.

Fraction	Bar Model	Words
$\frac{1}{2}$		
		One quarter

Take 12 counters. Find:

$\frac{1}{2}$ of them $\frac{1}{3}$ of them $\frac{1}{4}$ of them

Repeat for 24 counters
What is the same? What is different?
Write down the fraction of objects circled.
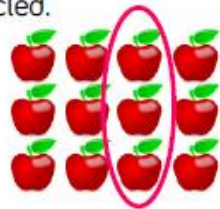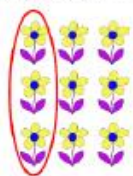
Sort the fractions into the table.

	Fractions equal to one whole	Fractions less than one whole
Unit fractions		
Non-unit fractions		

$\frac{3}{4}$ $\frac{2}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{2}{3}$ $\frac{4}{4}$ $\frac{3}{3}$ $\frac{1}{2}$

Are there any boxes in the table empty? Why?

There are 24 hours in one day.

A panda slept for $\frac{3}{4}$ of a day.

How many hours was the panda asleep for?

How many hours was the panda awake for?

Complete the table.

Fraction	Bar Model	Words
$\frac{1}{4}$		One quarter
$\frac{3}{4}$		
		One whole

Shade in the whole of each circle. What fraction is represented in each case?

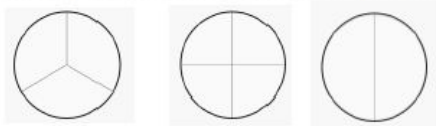Shade $\frac{3}{4}$ of each shape.
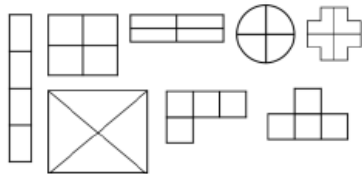
Taylor shares 12 beanbags into 4 equal groups. Fill in the blanks.

$\frac{1}{4}$ of 12 = ___

$\frac{2}{4}$ of 12 = ___

$\frac{3}{4}$ of 12 = ___

$\frac{4}{4}$ of 12 = ___
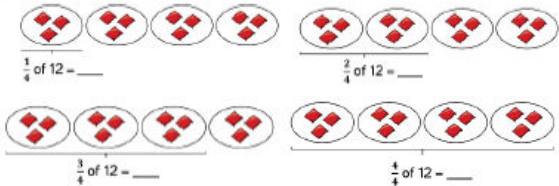
Ahmed uses counters to create a bar model when finding $\frac{3}{4}$ of 8

$\frac{3}{4}$ of 8 = 6

8

6
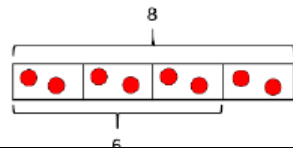
Week 2	Write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and ½
Children may not understand what a fraction is. Children may not recognise what the equivalence means and that two fractions can be the same.	• To understand what a unit fraction is. • To understand what a non-unit fraction is.

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Children may not have a secure understanding of multiplication and division.	• To understand that ½ and 2/4 are equivalent. • To know how to find ¾ of a quantity. • To know how to count in fractions.

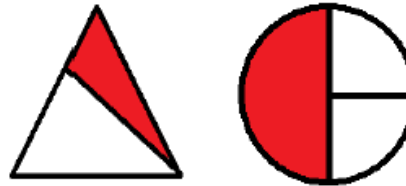| **Fluency**	**Reasoning**	**Problem Solving**
Using two identical strips of paper, explore what happens when you fold the strips into two equal pieces and four equal pieces. Compare on of the two equal pieces with two of the four equal pieces. Give children an amount of counters or concrete objects, can you find one half of them? Can you find two quarters of them? What do you notice? Shade in one half and two quarters of each shape.	Tick the shapes below that show either $\frac{1}{2}$ or $\frac{2}{4}$ Explain how you know.	George has a jar of 12 cookies. He gives half of them to Sam, and $\frac{2}{4}$ of them to Ben. Cookies Who gets the most cookies? Using red and blue cubes, build two towers to convince me that $\frac{1}{2}$ and $\frac{2}{4}$ are equal.
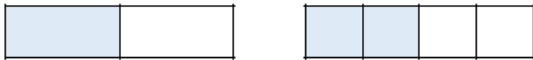
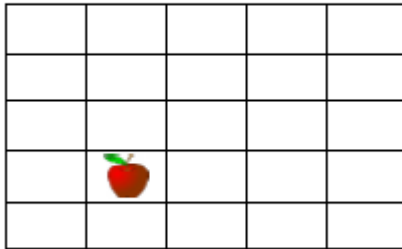| **Week 3**	Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).
Children may not recognise a half turn. Children may not be able to apply their knowledge of quarters to physical turns. Children may not be able to visualise an object/ picture turning. Children may mistake clockwise and anti-clockwise. Children may struggle to recognise a pattern with shapes.	. • To know how to describe a movement in a straight line. • To know how to describe a turn. • To develop the skill of describing movements and turns.

Children may struggle to recognise a pattern with numbers- identifying what each number is increasing by.

Order and arrange combinations of mathematical objects in patterns and sequences.

- To know how to make patterns with shapes.
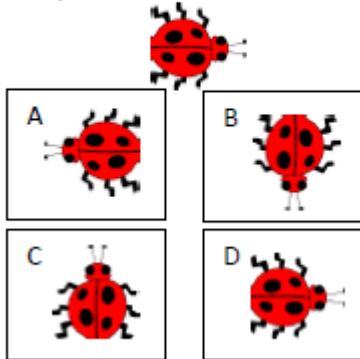- To develop the skill of making patterns with shapes.

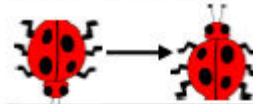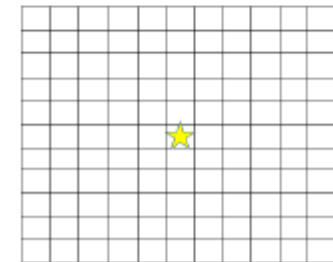| Fluency	Reasoning	Problem Solving
• In the grid below, the apple is moved two squares up and three squares to the right. Draw where the apple will be now. • Tick the image that is showing the bug has made a three quarter turn anti clockwise A B C D	This bug has rotated. The bug has made 2 turns clockwise The bug has made 2 turns anti-clockwise. Who is right? Why? What's the same and what's different about moving on a hundred square grid and a snakes and ladders game board?	On the grid below (11 x 11), both players start with their counter on the star. Roll two dice. The first dice decides the direction in which you move: 1 = up, 2 = down, 3 = left and 4 = right The second dice tells you how many spaces you move. The first person to reach an edge wins. Write a set of instructions for a friend. Watch you friend put these into a Bee-Bot and check if it is correct.

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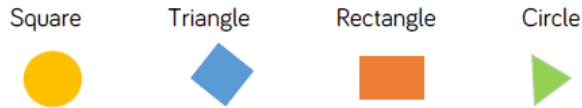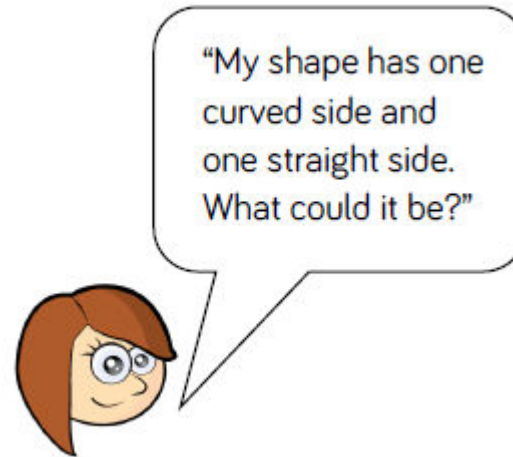| **Week 4**	Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
Children may struggle to remember the names of 2-D and 3-D shapes. Children may not use the accurate terminology. Children may mix up the terminology for 2-D and 3-D shapes. Children may struggle to identify a shape when it is in a different orientations.	- To know how to recognize 2D shapes. - To know how to count sides on 2D shapes. - To know how to count vertices on 2D shapes. - To know how to draw 2D shapes. - To know how to find lines of symmetry in shapes.

| **Fluency**	**Reasoning**	**Problem Solving**
Match the names of the shapes to the pictures. Square Triangle Rectangle Circle Put a combination of 3D shapes in a feely bag. Can you find the cube, the cone, the cylinder? etc.	Beth says: "My shape has one curved side and one straight side. What could it be?"	Here are 18 lollipop sticks. How many octagons can you make? Put these shapes into order based upon the number of sides that they have. Which shape has more vertices? <table><tr><td></td><td>Number of vertices</td></tr><tr><td>2 squares</td><td></td></tr><tr><td>4 triangles</td><td></td></tr><tr><td>2 pentagons</td><td></td></tr></table>

Match the shapes to the number of sides.

One   Four   Three

Colour the four-sided shapes in red.
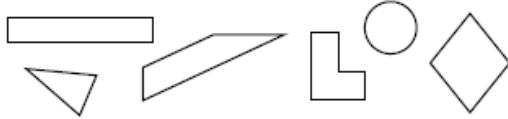
Complete the table.

Name	Shape	Number of sides
Pentagon		
Circle		
Square		
Triangle		
Hexagon		

Match the shape to the correct number of vertices.

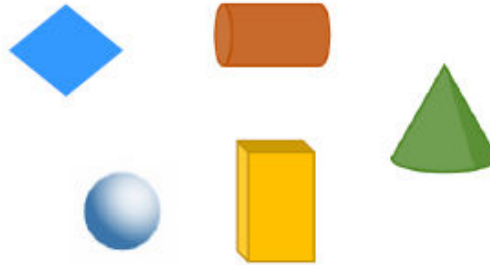3 Vertices   5 Vertices   4 Vertices
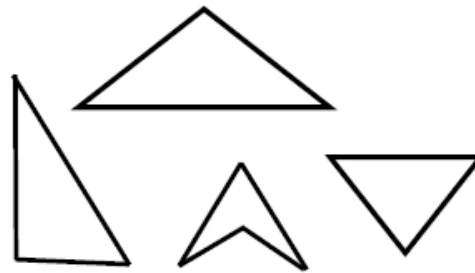
Chris says:

My shape has 3 vertices.
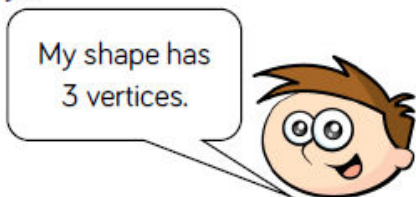
What shape could he have?

Which is the odd one out?

Which is the odd one out? Explain your reasoning.

Bob says:

All squares have 5 vertices.

Do you agree? Convince me.

Which 2d shape has half the amount vertices as a hexagon?

What 2d shape has twice as many vertices as a square?

Using geoboards, how many different rectangles can you make?

What's the same about the rectangles? What's different?

Has your friend made any different rectangles?

Can you draw more than one four-sided shape that has a vertical line of symmetry?

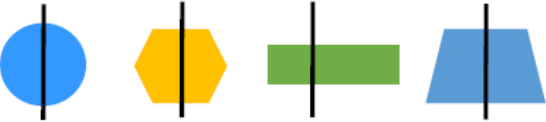Caroline has placed a mirror on the vertical line of symmetry. This is what she sees:
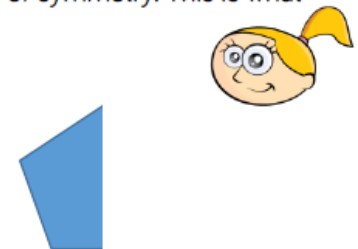
Can you complete the other half of the shape?

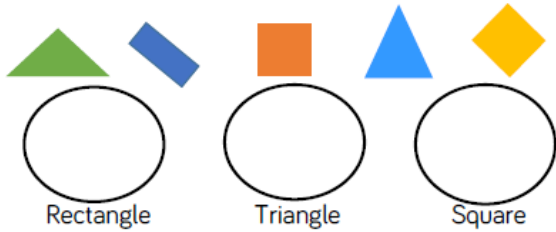Which 2D shapes can be made when a vertical line of symmetry is drawn on a square?

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Put these shapes in order based upon the number of vertices they have.

Can you fold these shapes to find a vertical line of symmetry? Rotate the shape, can you find a Horizontal line of symmetry?

Draw the vertical lines of symmetry on these shapes.

Draw a large rectangle on squared paper. Draw a square inside the rectangle. Draw a triangle underneath the rectangle. Draw a pentagon that is bigger than the square.

Can you give instructions to your partner to help them draw different shapes?

Circle the shape with an incorrect line of symmetry. Explain why.

Week 5	Compare and sort common 2-D and 3-D shapes and everyday objects.
Same as week 4	• To know how to sort 2D shapes according to their properties. • To know how to make patterns with 2D shapes. Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • To know how to count faces of 3D shapes. • To know how to count edges on 3D shapes. • To know how to count vertices on 3D shapes. • To know how to sort 3D shapes according to their properties. • To know how to make patterns with 3D shapes.
Fluency	**Reasoning**	**Problem Solving**

Sort these 2D shapes into the correct group:

Rectangle   Triangle   Square

Give children prepared groups of 2D shapes and labels. Match the labels to the groups and justify how they have been sorted. How are the shapes sorted?

Sophie sorted the shapes by the number of vertices. What shapes belong to each group?

4 vertices	More than 4 vertices

Look at these 3D shapes:

Which 2D shapes can you see on each one?
How many 2D shapes can you see on each one?

Complete the table:

| Shape	Name	Flat Faces	Curved Surfaces

I am a 3D shape with 2 square faces and 4 rectangular faces. What am I?

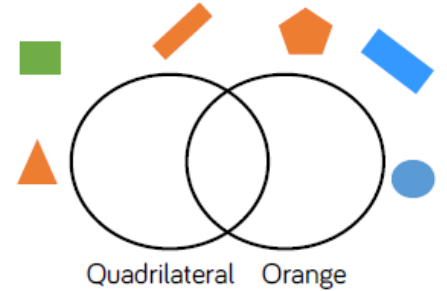Ben sorted the shapes in order of the number of sides. Has he ordered them correctly?

Samir says my 3D shape has 6 faces. Jolene says he must have a cube.
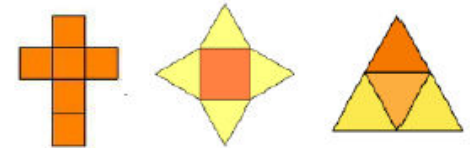Is Jolene correct?
Explain your answer.

Hannah has sorted these 3D shapes.
Can you spot her mistake?
Can you add another shape to one of the circles?
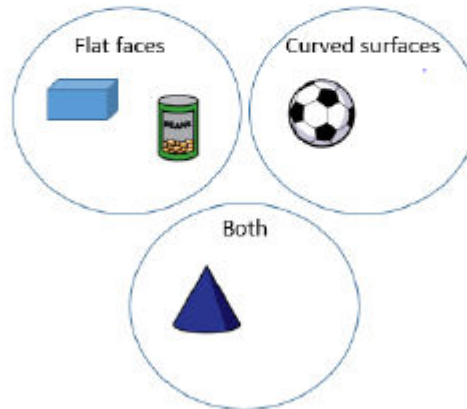
Where should these shapes go in the Venn diagram?
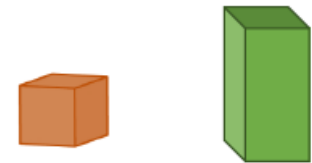

Quadrilateral   Orange

Abigail is folding paper to make a 3D shape.

Work out the shapes she has made by looking at her folded papers.
How many faces and edges has each one got?

What is the same about these 2 shapes?

What is different about these 2 shapes? Talk about faces, edges and vertices in your answer.

Look at these 3D shapes:

How many edges can you see on each one?

Sort your shapes depending on the number of edges and/ or faces.

Look at these 3D shapes:

How many Vertices can you see on each one?

Complete the table:

Shape	Name	Faces	Edges	Vertices

Alex has a shape with 8 vertices. What 3D shape could it be?

Group the following real life objects by their 3D shape name.

Sam is drawing all the 2D shapes she finds on 3D shapes. She draws 8 squares for a cube. Is she right?

Prove it!

Josh has sorted these shapes according to the number of edges.
Which shape is in the wrong place?
Explain why.

1 edge   More than 1 edge

Anna says my 3D shape has 12 edges.

Lilly says she could have a cube, cuboid or square based pyramid.

Is Lilly correct?
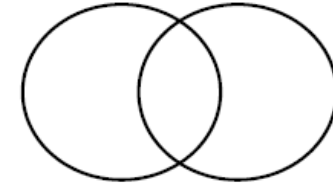Explain your answer.

Jack says:

All 3D shapes have at least one vertex.

Is this true or false?
Explain why

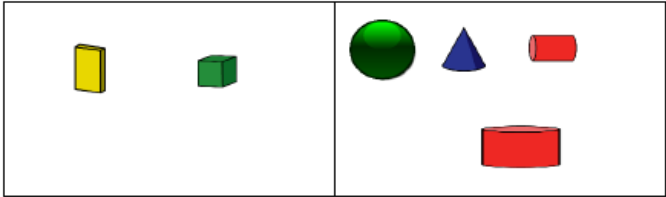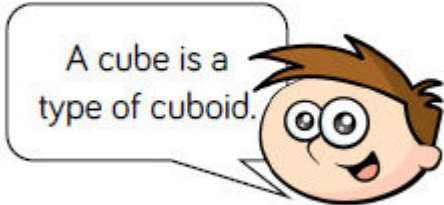Can you arrange the shapes in your table into a Venn Diagram?

What titles could you give it?

Hamza has sorted some 3D shapes. He has placed a cube and a cuboid in the same group.

How could he have sorted his shapes?

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How are these shapes grouped? Tell your partner. Has your partner grouped them in a different way? Sort the 3D shapes on your table. How have you grouped them? Label the groups.	Hamish is sorting 3D shapes. He puts a cube in the cuboid pile. A cube is a type of cuboid. Do you agree? Why?	
Week 6	SATs.	
Fluency	**Reasoning**	**Problem Solving**