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Resources	Links to prior learning/ objectives	Vocabulary:
2D and 3D shapes, number lines to 20, number cards for digits and words, numicon, tens frames,	Linking to Autumn 1 addition and subtraction to 10 Autumn 1 link counting in multiples of 2, counting on and back and writing words and numbers to 10, representing numbers to 10	Shape, 2D, 3D, rectangles, squares, circles, triangles, cuboids, cubes, pyramids, spheres, sides, corners, faces, edges, vertices Position Over, under, underneath, above, below, top, bottom, side on, in, outside, inside around, in front, behind Front, back Before, after Beside, next to, Opposite Apart Between, middle, edge, centre Corner Direction Journey Left, right, up, down, forwards, backwards, sideways Close, far, near Along, through, across To, from, towards, away from Slide, roll, turn, whole turn, half turn, quarter turn on and backwards, numerals, words, equal to, more than, less than, most, least, number bonds, add, subtract, make, total, equal, plus, minus, multiples
	Mastery: (where to find some resources) • Teaching for Mastery • White Rose **New and old documents** • Mastery maths stickers • Nrich (curriculum mapping)	

Objectives and Teaching

| Week 1

Barriers to ARE (misconceptions)
Children may struggle to remember names of 2D and 3D shapes.
Use of accurate terminology.
Struggle to see that shapes can have the same name but appear different (by size etc.).
Understanding difference between 2D and 3D. | Recognise and name common 2D and 3D shapes, including:
2D- rectangles (including squares), circles and triangles
•   To know how to recognise and name 2D shapes
•   To develop the skill of sorting 2D shapes
Recognise and name common 2D and 3D shapes, including:
3D- Cuboids, (including cubes), pyramids and spheres.
•   To know how to recognise and name 3D shapes
•   To develop the skill of sorting 3D shapes

•   To develop the skill of making patterns with shape | |

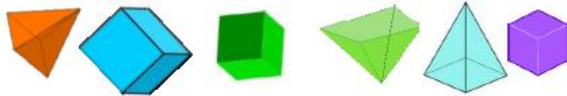| Fluency	Problem Solving	Reasoning

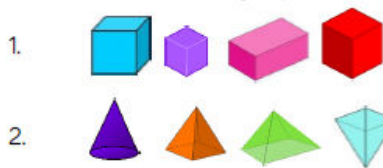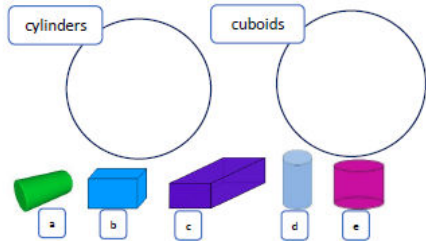Match the shape to it's name.
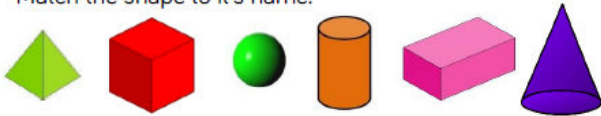
cube | cylinder | cuboid | pyramid | cone | sphere

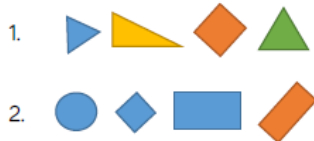Circle the cubes. Tick the pyramids.

Circle the odd on out in each group.

1.

2.

Place the shapes in the correct groups.

cylinders

cuboids

a | b | c | d | e

Choose a 3D object. Use one of the faces as a stencil to draw around. Name the shape that you have drawn. How many different 2D shapes can you draw using 3D shapes as a stencil?

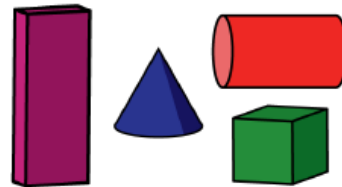Circle the odd one out in each group.

1.

2.

Use a selection of triangles, rectangles, squares and circles.
Put your shapes into groups.
Ask a friend to label the groups.

Place a 3D shape in a feely bag.
What shape could it be?

Explain how you know.
How many ways can you sort the shapes into groups?

Here is part of a shape.

How many different ways can you complete the shape using one or more straight lines?

Compare yours with a partner.

What is the same and what is different?

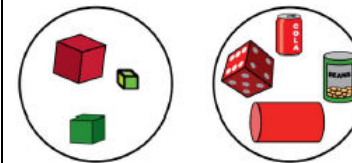The shapes below are shadows of a 3D shape.

What could the 3D shape be?

The bottom of a 3D shape is hidden.

What shape could it be?
Explain how you know.
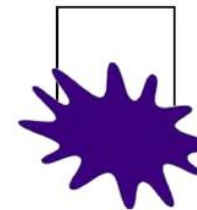
Some 3D shapes have been sorted.

Have the shapes been sorted correctly?

Explain how you know.

How else could the shapes be sorted?

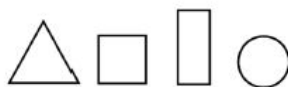Part of a shape is hidden.

What shape could it be?

Is there more than one possibility?

Explain your thinking.

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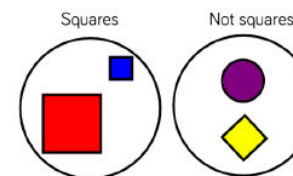
Use a selection of triangles, rectangles, squares and circles.

Put your shapes into groups.

Ask a partner to label your groups.

How many groups can you create?

Simon has sorted some shapes.

Squares   Not squares

Has he sorted them correctly?

Explain how you know.

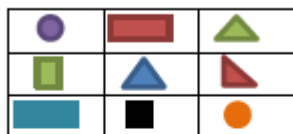| Week 2 **Barriers to ARE (misconceptions)** Language – incorrect use of left, right, up, down. Difficulty in describing turns, making connections to fractions – half, full, quarter. Difficulty visualizing shapes after turns/movements.	Describe position, direction and movement, including quarter, half, three quarters and whole turns. • To know how to describe a turn • To know how to describe the position of an object or shape. Count to 20, forwards and backwards, beginning from 0 or 1, or from any given number. • To develop the skill of counting forwards and backwards to 20 • To develop the skill of counting forwards and backwards from any number

Fluency	**Problem Solving**	**Reasoning**
• Identify the position of each item. Top, Middle or Bottom? Above or Below? The blue square is in the ___ row. The purple circle is _____ the green square. The black square is in the _____ row _____ the blue triangle.	• Use these clues to colour the four squares. Blue is above green. Red is below yellow. Yellow is to the left of blue. Bill built a tower using four different coloured cubes. The red cube was below the green cube. The blue cube was above the yellow cube which was above the green cube. Which cube is on top?	• Sarah chooses a shape from the grid. You can ask her 4 questions to work out which shape she is thinking of. She can only answer 'Yes' or 'No'. Which 4 questions would you ask? Can you explain why? Could you ask a different set of questions?

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Read the following stories and look out for positional language. Can we act out the stories? 1. We are going on a bear hunt by Michael Rosen 2. Rosie's Walk by Pat Hutchins 3. Naughty Bus by Janette Oke 4. Dinosaur's Day Out by Nick Sharatt	Five blocks have been labelled A, B, C, D and E. A is immediately to the right of B. C is to the right of D. B is in between E and D. E is immediately to the left of B. Where is D?	Decide whether the statements are true or false. Explain your answers.

Week 3 **Barriers to ARE (misconceptions)** Understanding of numbers to 10, key language, making links from numbers to 10 to numbers to 20	Count, read and write numbers 1 to 20 in numerals and words. • To develop the skill of counting objects to 20 • To develop the skill of reading numbers to 20 in numerals • To develop the skill of reading numbers to 20 in words • To develop the skill of writing numbers to 20 in numerals • To develop the skill of writing numbers to 20 in words Identify and represent numbers using objects and pictorial representations including the number line, and use the language of equal to, more than, less than (fewer), most, least. • To know how to identify and show a number using objects and pictures • To know how to show a number using a number line • To know how to compare numbers using the correct language

Fluency	Problem Solving	Reasoning

- Match the numbers to the words.

seventeen	15
twenty	12
fifteen	17
twelve	20

- Write the number shown on the ten frame in numerals and words.
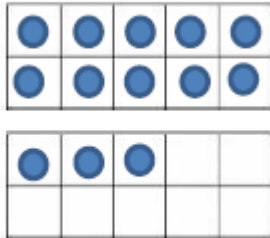
Using your own ten frame show me:

Fourteen, 18, nine, 16,

Using two ten frames, show me a number:
a) More than 12
b) Less than 20
c) Equal to 10 + 10

- Complete the sentences.

A number is more than 13 but less than 17. The number could be ___.

A number is less than 19 but more than 15. The number could be ___.

- How many numbers can you find in the word search?

s	e	v	e	n	t	e	e	n
t	h	r	e	e	w	l	e	i
f	o	u	r	t	e	e	n	n
e	i	g	h	t	n	v	o	e
e	n	s	i	x	t	e	e	n
t	h	i	r	t	y	n	t	o

- Match each number to a sentence that describes it.

A number bigger than 10.
An even number.
A number smaller than 15.

16	17	fourteen

Use two sets of cards. One set with numerals 1 – 20, one set with words 1 – 20.
Play in groups of three, take turns to pick a numeral card and word card. If they match you win the pair, if they don't match put the cards back down.

- Sarah has three bags of sweets.

A = 12   B = ?   C = 17
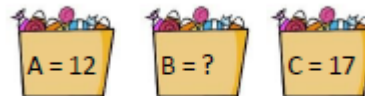
She says 'Bag A has the least sweets and Bag C has the most.'
How many sweets might be in bag B?

- **True or False?**
The car is eleven cubes long.

Dan says;

I can make all the numbers from eleven to twenty using the numbers 1-9

Do you agree?
Explain your reasoning.

Circle the odd one out and explain what has gone wrong.

11, 12, 13, 14, 51, 16, 17

- Fill the gaps:

☐ is more than 15 but less than 20.

☐ is less than eighteen but more than twelve.

What numbers could go in the boxes?
Explain your answer.

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Put a number line from 1-20 on the IWB.
One child chooses a number.
Other children then have 5 guesses to work out what their number is by asking, Is it greater than... is it less than.... Is it more than...etc.

- There are three buckets, a red, blue and purple one.
20 balls are shared between the three buckets. There are 3 more balls in the red than the blue. There is one less in the purple than the red. All the buckets have more than 4 balls in them? How many balls are in each bucket? Use cubes to help you solve the problem.

Look at the cubes, are there more of one colour than another?
Which colour has the most?
If I added two more red cubes which would have the most?
Has it changed?
Why?

Tim says '13 is more than twelve but less than eleven'.
Is he correct?
Prove it.

| Week 4	Represent and use number bonds and related subtraction facts within 20.
Barriers to ARE (misconceptions) Understanding of numbers to 10, key language, making links from numbers to 10 to numbers to 20 Understanding and misapplication of commutativity in addition and subtraction.	• To know my number bonds to 20. • To understand that subtraction facts match addition facts • To know how to show number bonds • To know how to use number bonds to find subtraction facts

Fluency

Fill in the missing numbers:

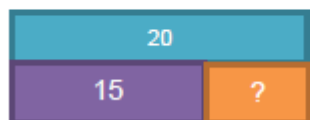$\square$ + 11 = 20

18 + $\square$ = 20

20 - $\square$ = 12

- Fill in the missing bonds:

20 — 8, $\bigcirc$
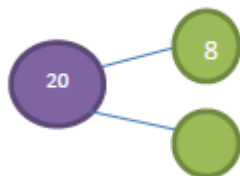
Can you make a diagram linking 17 and 20? What would the missing bond be?

- Use the bar model to write 4 number sentences. 2 additions and 2 subtractions.

| 20 | |
| 15 | ? |

Problem Solving

- I have 20p to spend, choose 2 toys that you can buy for exactly 20p. How many pairs can you find?

19p 9p 11p 1p 1p 16p 4p

Reasoning

- Fill in the missing numbers.

11 + $\square$ = 20

20 - $\square$ = 11

Can you make two more number sentences using the same three numbers?

- Continue the pattern

10 + 5=15

9 + 6 =15

Can you make a similar pattern for 20?

- The see-saw must balance. One has been done for you.

6

10   4
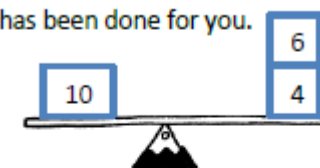
How many ways can you complete the see-saw?

20
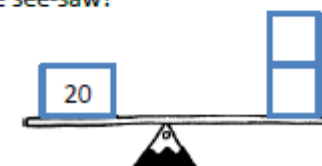
Week 5

Barriers to ARE (misconceptions)

Understanding of numbers to 10, key language, making links from numbers to 10 to numbers to 20

Add and subtract one digit and two digit numbers to 20, including zero.

Read, write and interpret mathematical statements involving addition (+), subtractions (-) and equals (=) signs.

- To develop the skill of adding 2 one digit numbers to 20.

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Understanding and misapplication of commutativity in addition and subtraction.	• To develop the skill of adding one and two digit numbers to 20
	• To develop the skill of subtracting one and two digit numbers to 20
	• To know how to read and understand number sentences
	• To know how to write number sentences

Fluency

- Use two ten frames to add numbers crossing 10.
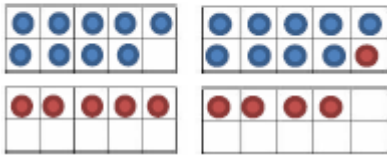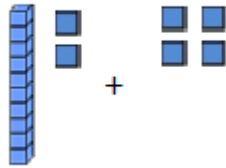
$9 + 5 = 14$

Complete the addition

+

There are 18 people on the bus, 7 get off at the bus stop. How many people are still on the bus?

Here is a ladybird.
If the ladybird lost 5 spots how many would it have left?
Write a number sentence to show your working.

Problem Solving

Fill in the blanks so each row and column adds up to 15. Can you use 4 different numbers? How many ways can you do it?
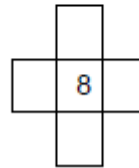
8

Add the centre number to all the numbers surrounding it to complete the outer ring.

7
2 5
4 +5 1
6 3
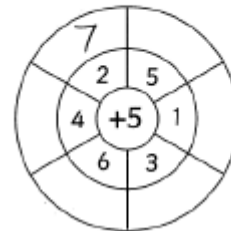
Reasoning

- Complete the diagram. Can you extend it?

17 — 7

What do you notice?
$20 - 12 = 8$
$20 - 8 = 12$

I'm thinking of a number, I have subtracted 5 and the answer is 8. What number was I thinking of? Explain how you know.

I'm thinking of a number. I have added 11 and the answer is 17. What was my number? Show me how you worked it out.

Can you make four number sentences using 14, 5 and 19?

- $13 + 5 = 18$

Can you make three other number sentences using the same three numbers?

Together, Sam and Matt have 15 sweets.
Sam has 8 sweets.
How many does Matt have? Write a number sentence to show your working.
Use a ten frame to help you.

Write a number story to describe the number sentence

6 + 8 = 14

Here is an example.

Jane has 6 balloons. Tom has 8 balloons.
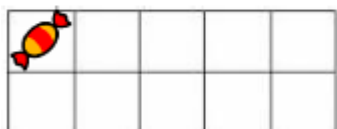Jane and Tom put their balloons together and have 14 balloons altogether.

Can you draw a picture for your number story?

Write the missing symbols in the following number sentences.

17 ☐ 3 ☐ 20

20 ☐ 5 ☐ 15

16 ☐ 20 ☐ 4

| Week 6 **Barriers to ARE (misconceptions)** Understanding of numbers to 10, key language, making links from numbers to 10 to numbers to 20	Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? - 9. • To develop the skill of solving addition problems using resources • To develop the skill of solving subtraction problems using resources • To know how to solve missing number problem

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Understanding and misapplication of commutativity in addition and subtraction.		
Fluency	**Problem Solving**	**Reasoning**

Fluency

- Complete the missing number.

$+$ $=$
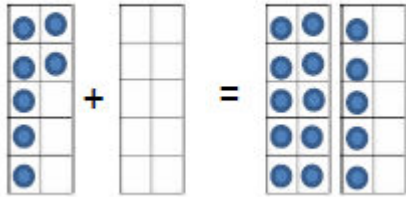
- Dan has 12 cubes.
  He gives 6 to Amy.
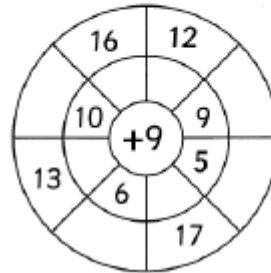 How many cubes does he have left?

Lila has 8 stickers.
Jack has 6 stickers.

How many stickers do they have altogether?

Problem Solving

Add the centre number to all the numbers surrounding it to complete the outer ring.

Outer ring: 16, 12, 10, 9, 13, +9, 5, 6, 17

In the triangle, the number above two numbers is the difference between the numbers.
Eg 3 above 7 and 4
Find the missing numbers. Can you do it in more than one way?

Triangle: 2 / 5 / 11, 13
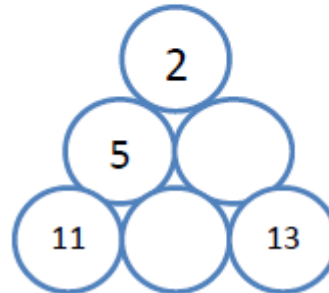
Reasoning

- Complete the number sentence. Use cubes to help you solve the problem.

$$5 + 8 = 9 + \boxed{}$$

- How many different ways can you complete the empty boxes?

$$5 + \boxed{} = 12 - \boxed{}$$

Sam has some biscuits. He gives 3 to his dad. Now Sam has 13 biscuits.
How many did he have to start with?

Draw a picture to explain how you know.

Week 7	Count in multiples of twos and fives.
	• To develop the skill of counting in twos

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- To develop the skill of counting in fives.

Fluency	Problem Solving	Reasoning

Fluency

- Continue the pattern:
  Use cubes to build each number.

2, 4, 6, 8, __, __, __, __

- Find the missing numbers:

6	8		12		16

30	25			10	

How many gloves are there? How many fingers are there?

Problem Solving

Jenny has made 2 biscuits. She has 20 jelly tots and 8 chocolate buttons to decorate them. She says 'I want to use jelly tots in multiples of 5 and chocolate buttons in multiples of 2.' How many ways could she decorate her biscuits?

Zig and Zag are aliens. Zig eats multiples of 2. Zag eats multiples of 5. Which numbers would they eat? Are there any numbers they would both eat?

2, 5, 8, 10, 15, 20

Gringlygoos are monsters who have eyes that are multiples of 2 and fingers that are multiples of 5. Which monster below is a Gringlygoo?

Reasoning

True or False?

I count in fives from 10.
I say the number 45.

Explain your answer.

Ben says 'If I count in 2's from 7 I will say the number 18.'

Do you agree?

Explain your answer.

- What is wrong with this sequence of numbers?

20	18	16	13	12	10

Explain your answer.