YEAR 2
Mathematics
Exemplification Materials

National Centre
for Excellence in the
Teaching of Mathematics

PLACE VALUE Exemplification

- Use their knowledge of counting on from or back to zero in steps of 2, 3, 5 and 10 to answer multiplication and division questions such as 7 × 2 and 40 ÷ 5. They understand that one way to work out 40 ÷ 5, for example, is to find out how many fives make 40. They know that this can be done by counting forwards in fives from zero or backwards in fives from 40.
- Write the missing numbers in each of these patterns.

count
in steps of **2**

39

count in steps of **5** → | 38 | 43 | | 53 |

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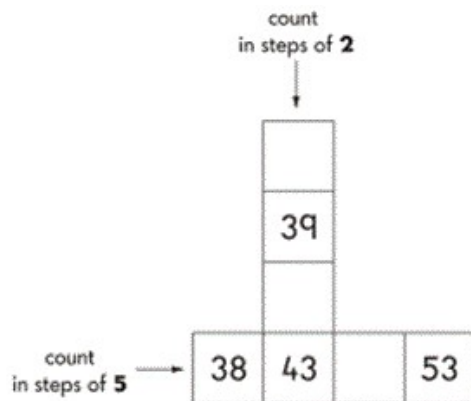
Look at these numbers.**371245607227**Which of these numbers is the largest?

- What is the value of … ? (point to digits in the list above)

PLACE VALUE Exemplification

- Children should be able to represent numbers using equipment such as bundles of ten and single art-straws, 10p and 1p coins and number lines.
- Look at the squares of chocolate

-
- There are 16 squares
- Tick(☐) the sum that matches the picture
- 5+2+9=16
- 5+6+5=16
- 6+6+4=16
- 6+2+8=16
- 8+3+5=16

Here are two signs

Use these signs to make these correct

52 ☐ 17   18 ☐ 91   50 ☐ 34

- Children should be able to order a set of two-digit numbers, such as 52, 25, 5, 22, 2, 55. They explain their decisions. They understand and use the < and > symbols; for example, they write a two-digit number to make the statement 56 > ☐ true.

Children should be able to answer questions, such as:

- What numbers can you make using two of these digits: 3, 6, 0?
- Write down each number you make. Read those numbers to me. Can you write the largest of the numbers in words?

Addition and Subtraction Exemplification

- Use partitioning, counting strategies and knowledge of number bonds to add or subtract a one-digit number or a multiple of 10 to any two-digit number. To work out 86 – 50, for example, they might partition and calculate:
- 86 – 50 = 80 + 6 – 50 = 80 – 50 + 6 = 30 + 6 = 36

- Similarly, to find the total number of people on a bus with 14 people on the top deck and 8 below, they might use:
- 14 + 8 = 14 + 6 + 2 = 20 + 2 = 22

- Children add or subtract two-digit numbers using practical and informal methods and their knowledge of the relationships between operations. For example, they count back along a number line to find 64 – 25 or count up from 67 to find the answer to 94 – 67. They represent such calculations as number sentences. They calculate the value of an unknown in a number sentence such as □ ÷ 2 = 6 or 85 – □ = 29. They recognise, for example, that to answer 85 – □ = 29 they could use the related addition 29 + □ = 85

- Extend their knowledge and use of number facts, and use partitioning and number bonds to add and subtract numbers mentally to answer questions such as 60 – □ = 52 or 35 = 20 + □. They make jottings where appropriate to support their thinking.
  - Answer problems such as:
- Look at this number sentence: □ + □ = 20. What could the two missing numbers be? What else?
- Can you tell me all the pairs of numbers that make 20?

Addition and Subtraction Exemplification

Understand that addition can be done in any order and use this to solve an addition by rearranging the numbers to simplify the operation. They need to understand that two numbers can be taken away from each other but that the answers will not be the same.

- Check their addition and subtraction with a calculation that uses the inverse operation.
    - Answer questions, such as:
    - Look at this number sentence: 74 – 13 = 61
    - Write three more number sentences using these numbers. How do you know, without calculating, that they are correct?
-
    - What addition facts can you use to help you calculate these?
    - 12 – 5, 19 – 8
    - Explain how the addition facts helped you.

Multiplication and Division Exemplification

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recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
</div>

The children should be able to:

Recognise a multiple of 2, 5 or 10 and use their knowledge of multiplication facts to find corresponding division facts. They can say which numbers are odd and which are even.

e.g. 2 x 5 = 10, show me three more number facts using these numbers.

Is 34 an odd number? How do you know?

<div style="border:1px solid orange; background:#fce9d8; padding:8px;">
calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and
</div>

Children should be able to:

Find missing numbers or symbols in a calculation:

4 x __ = 20, __ ÷ 10 = 3

Anna has 3 boxes of cakes. Each box contains 5 cakes. How many cakes does she have altogether? Show how you worked this out.

<div style="border:1px solid orange; background:#fce9d8; padding:8px;">
show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
</div>

Children should be able to:

Use their knowledge of triangles of numbers to show related number facts.

e.g. If 6 x 2 = 12 then 2 x 6 = 12 and 12 ÷ 6 = 2.

<div style="border:1px solid orange; background:#fce9d8; padding:8px;">
solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, includ-
</div>

Children should be able to:

Use various methods and apparatus to help them solve word problems such as:

There are 10 lollies in a bag. Charlie needs 30 lollies for his party. How many bags does he need to buy? Show how you worked this out

Fractions Exemplification

recognise, find, name and write fractions ⅓,¼ ,⅔ and ¾ of a length, shape, set of objects or quantity

Using bar models to represent and unpick a fraction word problem

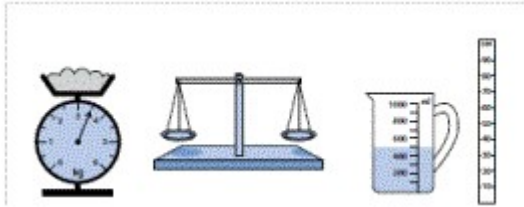| Sam's Age	Sam's Age	2

12 years
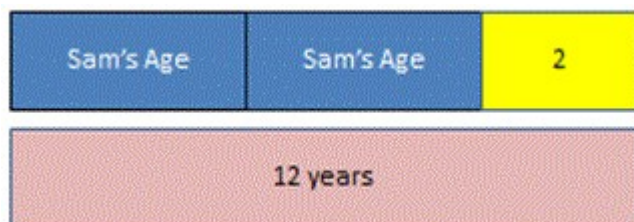
Harrison and sam were talking and Harrison said that if he doubled Sam's age and added 2 he would get 12

write simple fractions for example,½ of 6 = 3 and recognise the equivalence of ¾ and ½

Measures Exemplification

- Suggest sensible units you might use to measure: the height of your table; how much water is in a cup; the weight of my reading book; how long it takes me to wash my hands.
- Choose a piece of equipment to help you measure: the weight of your shoe; how long the classroom is; how long this lesson lasts; how much water a cup holds.
    - How long is this line? Now draw a line 2 cm longer than this one.
    - How much water is in this measuring jug?

-
    - Find an object in the classroom that you think is about 10 cm long.
    - About how heavy do you think your pencil case is?

-
- If I programme my floor turtle to go forward three metres is there enough room in the classroom? How could you measure to find out?

- Megan and Jack are growing beans. Megan's plant is 25 cm tall. Jack's is 38 cm tall. Whose plant is the taller? By how much? Can you compare them using > or < ?
-

Measures Exemplification

- Holly has these coins.
- Harry has the same amount of money but has six coins. What are they? Is there only one possible answer?

-

- Jess has saved 62p. She spends 15p. How much money does she have left? She pays with a 50p piece. How much change does she get?

- What time does this clock show?
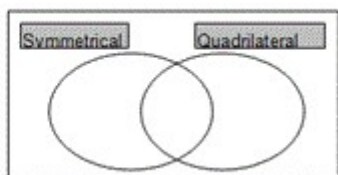- Draw a clock showing the time five minutes later.
- Show your school day on clock faces: when do you leave home, have breaks, go back home, etc.?

Shape - Geometry Exemplification

identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line

I can sort shapes describing how I have classified them	Place the shapes below in the correct place in the Venn diagram.
I can identify whether shapes are symmetrical	Make one shape of your own to add to each section of the diagram.

identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
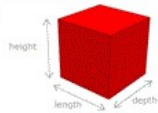
Write the missing numbers in the 2 empty boxes.

	number of square faces	number of triangular faces	number of circular faces
cylinder	0	0	
cube		0	0
pyramid	1	4	0

identify 2-D shapes on the surface of 3-D shapes, for example a circle on a cylinder and a triangle on a pyramid

What is a 3-D shape?

3-D means the shape has 3 dimensions: length, width and depth.

1-Dimension   2-Dimensions   3-Dimensions

3. This is a cube

height

length   depth

It has **3 dimensions** - length, height and depth.
All 3-D shapes are solids.

compare and sort common 2-D and 3-D shapes and everyday objects.

Children can sort two sets of 2D and 3D shapes in 2 or more different ways using different criteria each time. For example, they might choose 'dimensions' or 'right angled'
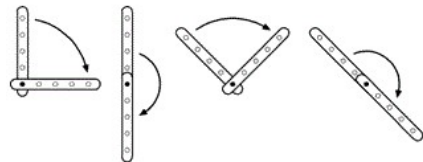
Shape - Geometry - position & direction Exemplification

Describe the patterns in sequences and predict what comes next in the sequence and continue the pattern.

Recognise whole, half and quarter turns. They describe turns and give and follow instructions to turn. For example, they give instructions to a friend to follow a route around the playground. They make and draw half and quarter turns from the same starting point using, for example, two geostrips.

Use the grid to help you complete this table.

trees	B2
slide	
seesaw	
	A3

Watch me as I rotate (turn) this picture of a clown.

Shape - Geometry - position & direction Exemplification

use mathematical vocabulary to describe position, direction and movement including distinguishing between rotation as a turn and in terms of right angles for quarter, half and three- quarter turns (clockwise and anti-clockwise), and movement in a straight line
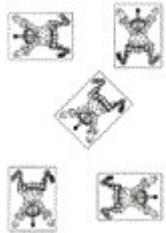
Watch me as I rotate (turn) this picture of a clown.

(Rotate the clown smoothly and continuously through a full turn, keeping it facing the children a t all times.)

Which of the pictures shows what the clown will look like if I rotate (turn) my picture a half turn?
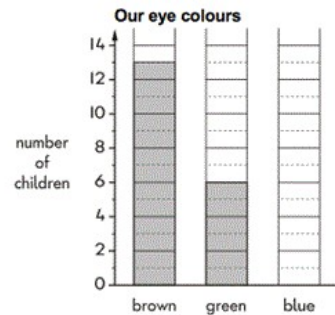
Tick the picture

(Do not rotate your picture this time)
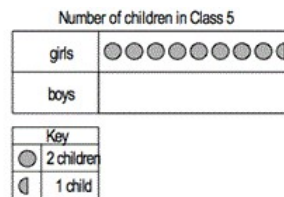
Statistics Exemplification

Our eye colours

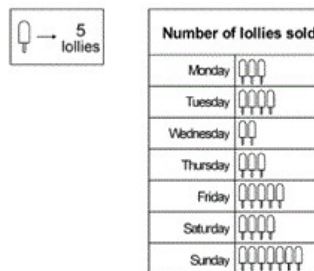- Class 2 make a graph
- 5 children have blue eyes. Show this on a graph. More children have brown eyes than green eyes.
- How many more?

Number of children in Class 5

girls	⊙⊙⊙⊙⊙⊙⊙⊙⊙(
boys	

Key	
⊙	2 children
(	1 child

- Look at this pictogram   There are 12 boys in class 5. Show this on a pictogram.

Number of lollies sold

Monday	🍭🍭🍭
Tuesday	🍭🍭🍭🍭
Wednesday	🍭🍭
Thursday	🍭🍭🍭
Friday	🍭🍭🍭🍭🍭
Saturday	🍭🍭🍭🍭
Sunday	🍭🍭🍭🍭🍭🍭🍭

Key: 🍭 → 5 lollies

- A shop sold 10 ice lollies on Wednesday.
- How many lollies were sold on Monday?
- How many more lollies were sold on Tuesday than on Wednesday?

Statistics Exemplification

ask and answer questions about totalling and comparing categorical data

How far the cars rolled
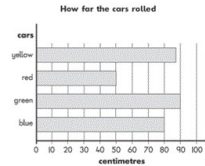
- Some children rolled toy cars down a slope
- How far did the blue car roll?
- How much further did the green car roll than the red car?
- additional questions:
- Which car rolled the furthest?
- Make up a question about the red car and the yellow car.

Birds I saw
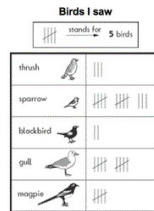
- Jane made a tally chart
- How many more gulls than blackbirds did she see?
- Additional questions:
- Make up a question comparing the numbers of sparrows and blackbirds that Jane saw?
  - How many fewer thrushes than magpies did she see:-
- 12   2   10   or 3

	Girls	Boys
zebra	9	3
lion	4	9
giraffe	7	4
monkey	8	7
elephant	6	5

- Some children were asked to choose their favourite animal in the zoo. This table shows the results.
- How many more girls than boys chose the giraffes?
- How many more boys chose lions than elephants?
- Which animal was chosen by the greatest number of children?