Mathematics Medium Term Planning: Autumn term Y2/3.

Week.	Mathematical aspect	Non-negotiable end points Year 2.	Non-negotiable end points Year 3	Curriculum Statements. Year 2.	Curriculum Statements. Year 3.
1.	Number and place value: counting, reading and writing numbers, place value	Knows the properties of two digit numbers. Knows that counting can be done in varying step sizes.	Knows the properties of place value for three-digit numbers.	●To count in steps of 2, 3, and 5 from 0, and count in tens from any number, forward or backward. ● To recognise the place value of each digit in a two-digit number (tens, ones). ● To identify, represent and estimate numbers using different representations, including the number line. ● To compare and order numbers from 0 up to 100; use <, > and = signs. ● To read and write numbers to at least 100 in numerals and in words. ● To use place value and number facts to solve problems.	● To recognise the place value of each digit in a three-digit number (hundreds, tens, ones). ● To compare and order numbers up to 1000. ● To read and write numbers up to 1000 in numerals and in words.
2.	Addition and subtraction: concrete, visual and number facts. Written methods 2 and 3 digit numbers, column methods.	Knows number bonds to 20. Knows efficient strategies for adding and subtracting for up to two 2-digit numbers. Knows that addition is commutative.	Knows bonds to 20 and 100. Knows how to add/subtract multiples of 10, 100 from three-digit numbers. Knows how to calculate with columnar methods.	To solve problems with addition and subtraction: ● Using concrete objects and pictorial representations, including those involving numbers, quantities and measures ● Applying their increasing knowledge of mental and written methods. ● To recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100. ● To add and subtract using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers. ● To show that addition can be done in any order (commutative) and subtraction cannot. ● To recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.	●To add and subtract numbers mentally, including: ● a three-digit number and ones ● a three-digit number and tens ● a three-digit number and hundreds. ● To solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. ● To add and subtract numbers with up to three digits, using the efficient written methods of columnar addition and subtraction.

Near doubles
13+14 =
Double 13= 26
26+1 =27
or
Double 14 =28
28-1=27

Using known facts
40 + 80 = 120 using 4 + 8 = 12
So, 400 + 800 = 1200

Remodelling strategy
243 + 198
241 + 200 = 441

25 + 25 = 50 *double*
24 + 25 = 49 *near double*
28 + 20 = 48 *+10,+10*

3 + 27 = 30, 27 + 3 = 30

25 - 20 = 5 *difference*
50 - 25 = 25 *halving*
28 - 12 = 16 *- 10, - 6*

70 – 11 = 70 – 10 - 1

Columnar addition   **Columnar subtraction**

```
   625
 +  48
   673
     1
```
Regroup the 10

```
   6 14 1
   7 5 4
 -  2 8 6
   4 6 8
```
Exchange from tens to ones, hundreds to tens

18 + 18 = 36
Because 18 + 10 = 28 then add on 2 then 6.
Is this the best way?

29 – 26 = 3
Because you just count on from 26.
Is this true?

Raj says that 32 + 6 = 38 and 32 – 6 = 28. Is he right?

Raj says 14 + 15 = 31 and 14 – 31 = 15 as they are a fact family. What is going wrong?

Which digit changes and which stay the same?

What facts will you use?
What strategies will you use?

543 + 1   543 - 1
543 + 10   543 - 10
543 + 100   543 - 100

376 + 4   695 + 8
376 + 20   695 + 30
376 + 400   695 + 600

Show how to add and subtract these numbers with 324.
675
43
900
127

Which method?
400 + 300
600 – 200
492 + 36
492 – 236

```
  5□3
+ 134
  69□
```

```
  56□
- 134
  429
```
What are the missing digits?

3.	Multiplication and division: repeated addition equal groups of. Knows and recalls table facts.	Knows the operations of multiplication (repeated addition) and division (equal groups of). Knows that multiplication is commutative.	Knows the 2, 4- and 8-times tables and the doubling patterns. Knows how to multiply using the associative law.	● To recall and use multiplication and division facts for the 2,5 and 10 multiplication tables, including recognising odd and even numbers. ● To calculate mathematical statements for multiplication and division within the multiplication tables and write them using multiplication, division and equals signs. ● To recognise and use the inverse relationship between multiplication and division in calculations. ● To show that multiplication of two numbers can be done in any order (commutative) and division for one number by another cannot. ● To solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts.	● To recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. ● To write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods.

Arrays representing the dividend

10 ÷ 2 = 5   and 10 ÷ 5 = 2
Repeated addition (to reach a given target)
+5   +5   +5   +5
0   5   10   15   20
There are 20 sweets in a bag. How many children can have 5 each?
+5   +5   +5   +5
0   5   10   15   20
Repeated subtraction (from a given quantity)
-4   -4   -4   -4

How many number sentences can you write to describe this array? Can you use addition, multiplication and division?

Explain your answers.

X	2	4	8
5			
3			
10			

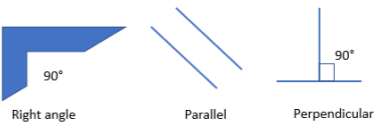| X	8	2	4
8			
6			
9			

Convince me that 3 x 5 is the same as 5 x 3.

Complete the fact family:
2 x 5 = 10
5 x 2 = 10
10 ÷ 5 = 2
10 ????
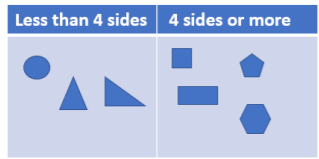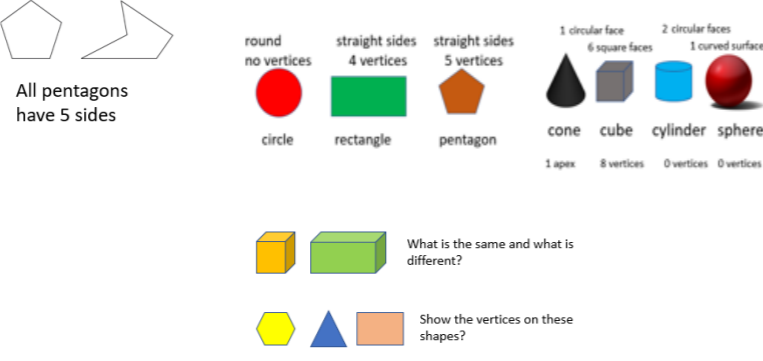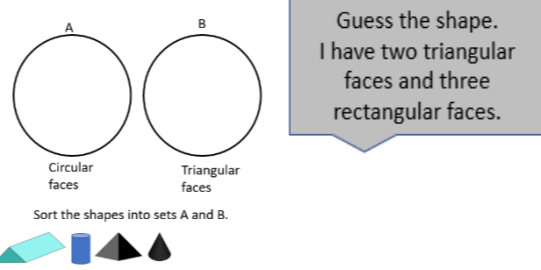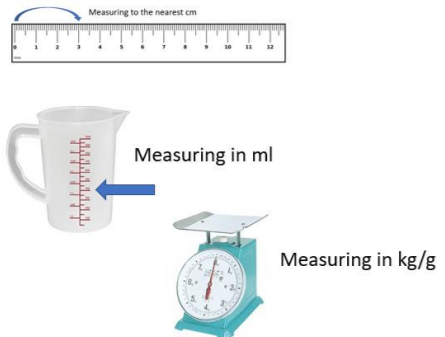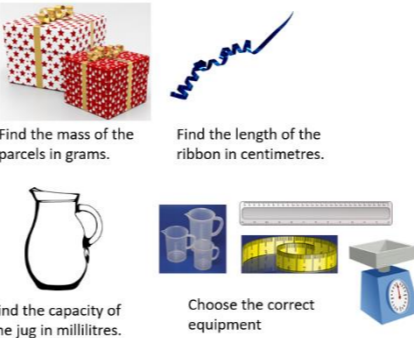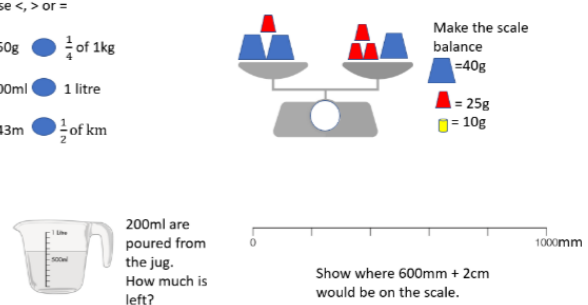
3 x 4 x 2 = 24
Jane did 3 x 4 then doubled for x2.
James did 4 x 2 = 8, then 8 x 3.
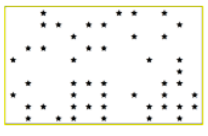
Commutative law

9	12	15	18	21
12	16	20	24	28
15	20	25	30	35
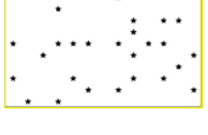
4.	Geometry: properties of shape	Know the mathematical names and properties of 2d and 3d shapes.	Know the mathematical names and properties of 2d and 3d shapes including parallel and perpendicular lines.	● To identify and describe the properties of 2D shapes, including the number of sides and symmetry in a vertical line. ● To identify and describe the properties of 3D shapes including the number of edges, vertices and faces. ● To identify 2D shapes on the surface of 3D shapes, for example circle on a cylinder and a triangle on a pyramid. ● To compare and sort common 2D and 3D shapes and everyday objects.	● To draw 2D shapes and make 3D shapes using modelling materials; recognise 3D shapes in different orientations and describe them with increasing accuracy. ● To identify horizontal, vertical, perpendicular and parallel lines in relation to other lines.

Less than 4 sides | 4 sides or more

All pentagons have 5 sides

round no vertices — circle
straight sides 4 vertices — rectangle
straight sides 5 vertices — pentagon

1 circular face 6 square faces — cone — 1 apex
2 circular faces 1 curved surface — cube — 8 vertices
cylinder — 0 vertices
sphere — 0 vertices

What is the same and what is different?

Show the vertices on these shapes?

A   B
Circular faces   Triangular faces
Sort the shapes into sets A and B.

Guess the shape. I have two triangular faces and three rectangular faces.

90° Right angle
Parallel
90° Perpendicular

Shape	Number of sides	Number of right angles	Pairs of parallel lines
Square	4	4	2
Rectangle	4	4	2
Triangle	3	1	0
Pentagon	5	0	0
Hexagon	6	0	0

5.	Measurement: length, mass, capacity	Knows the standard units of measure for length, mass and capacity.	Knows the relationships between the units of measure for each aspect.	To choose and use appropriate standard units to estimate and measure length/ height in any direction; mass; temperature; volume and capacity to the nearest appropriate unit using rulers, scales, thermometers and measuring vessels. ● To compare and order lengths, mass, volume/capacity and record the results using >, < and =.	● To measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

Measuring to the nearest cm

Measuring in ml

Measuring in kg/g

1km	1000 m
1m	100 cm
1cm	10 mm
1 kg	1000g
1 l	1000ml

Find the mass of the parcels in grams.
Find the length of the ribbon in centimetres.
Find the capacity of the jug in millilitres.
Choose the correct equipment

Use <, > or =
250g ● $\frac{1}{4}$ of 1kg
600ml ● 1 litre
743m ● $\frac{1}{2}$ of km

Make the scale balance =40g
= 25g
= 10g

200ml are poured from the jug. How much is left?

Show where 600mm + 2cm would be on the scale.
0   1000mm

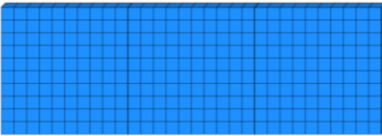| 6.	Number and place value: comparing, ordering two-digit numbers and knowing their place value	Knows the symbols of comparing numbers. Uses the skill of estimation.	Knows the relative position of numbers. Knows zero as a place holder in three-digit numbers. Knows the rules of rounding.	●To identify, represent and estimate numbers using different representations, including the number line. ● To compare and order numbers from 0 up to 100; use <, > and = signs. ● To read and write numbers to at least 100 in numerals and in words. ● To use place value and number facts to solve problems.	• Knows how to compare and order numbers up to 1000. • Knows how to identify, represent and estimate numbers using different representations. • Knows that zero can hold a place in a three-digit number. • Knows the rules of rounding to the nearest 10, 100.

This is 48 stars

Is this more or less than 48 stars?

This is 48 stars

306
3 hundreds
30 tens
6 ones

Round to the nearest 10, look at the unit digit

0 – 4 down
5 – 9 up

13**4** rounds to 130

27**6** rounds to 280

Round to the nearest 100, look at the tens digit

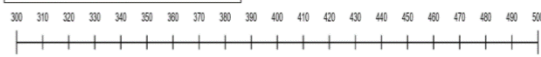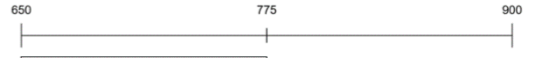2**7**6 rounds to 300

27 < 72   46 =

53 > 28

About 20 stars

Find 48.
Write statements using < and > and 48.

Place 376, 307, 458, 409 on the number line
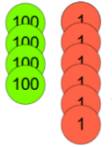
Estimate where 800, 675 and 890 would be on this number line.

Round these numbers to the nearest 10 and 100.
678
342
704

Jim says this number is 4006. Is he correct?

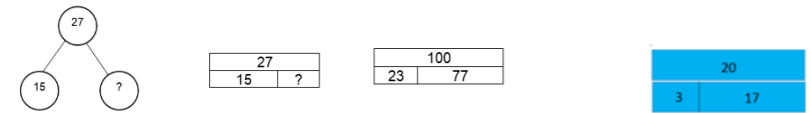| 7.	Addition and subtraction: using recall of addition and subtraction facts and mental calculation strategies Subtraction as take away & difference (counting on and back)	Knows efficient methods using number sense, place value, bridging, near doubles and adjustment strategies.	Knows how to calculate with columnar methods including money.	To solve problems with addition and subtraction: ● Using concrete objects and pictorial representations, including those involving numbers, quantities and measures ● Applying their increasing knowledge of mental and written methods. ● To add and subtract using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers. ● To show that addition can be done in any order (commutative) and subtraction cannot. ● To recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.	● To add and subtract numbers with up to three digits, using the efficient written methods of columnar addition and subtraction. ● To estimate the answer to a calculation and use inverse operations to check answers. ● To solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Whole-part model

Adjustment strategy

$5 + 9 =$
$5 + 10 - 1 = 14$

$77 - 9 =$
$77-10 +1 =67+ 1$
$=68$

Re-arranging
$18+4 =$
Tell me what you know about 4, e.g. 3+1, 2+2
$18+4=$ Rearrange the 4 into 2+2 $18+2+2= 20+2 =22$
(Round and adjust)
What is the nearest 10?
$55 - 27 =$
$55 - 30 +3 =25 + 3$
$= 28$
$91 - 48 =$
$91-50 +2=41 +2$
$=43$

20
3   17

$9 = 9$
$9 = 8 + 1$
$9 = 7 + 2$
$8 + 1 = 7 + 2$

$20 = 3 + 17$
$20 = 17 + 3$
$20 = 3 - 17$
$20 - 17 = 3$

$10 = 10$
$10 = 8 + 2$
$10 = 6 + 4$
$8 + 2 = 6 + 4$

Using £ notation and the decimal point

Lining up the place value.

£ 678.00
- £ 126.00
    752.00

£ 345.00
+ £₁62.98
   407.98

Add	Subtract
$25 + 10$	$65 - 10$
$25 + 15$	$65 - 15$
$25 + 17$	$65 - 55$
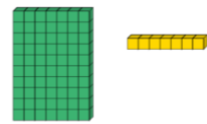
Better, best
$25 + 29 = 54$
$25 + 30 = 55$, then subtract 1
$25 + 25 = 50$, then add 4

Spot the mistake
$75 + 25 = 100$
$76 + 34 = 100$
$100 - 24 = 76$

Show me how to do $76 - 43$ using the Dienes.

Jason has been asked to calculate $67 - 19$
Jason draws this picture and says that $67 - 19 = 46$
Do you agree? Explain why.

Kevin says that
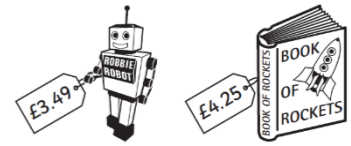**The difference between 72 and 68 is 16**
Can you explain what Kevin has done wrong?

Which is the correct notation?

£567.54p
£567.54

Dan buys two presents.

How much change does he get from £10?
Show your working.

£3.49

£4.25
BOOK OF ROCKETS

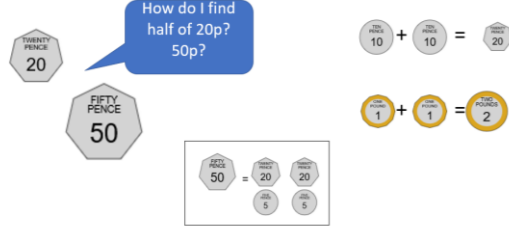| 8.	Multiplication and division: grouping and using times tables facts. Written methods partitioning and rearranging the dividend	Knows the 2s, 5s and 10s times tables. Uses arrays to represent multiplication and division facts.	Knows how to partition numbers when multiplying. Knows how to rearrange dividends into multiples of the divisor.	● To recall and use multiplication and division facts for the 2,5 and 10 multiplication tables, including recognising odd and even numbers. ● To calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. ● To recognise and use the inverse relationship between multiplication and division in calculations. ● To show that multiplication of two numbers can be done in any order (commutative) and division for one number by another cannot. ● To solve one-step problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts.	● To recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Explain the effect of multiplying by 10 and multiples of 10 ● To write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. ● To solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which *n* objects are connected to *m* objects.
	Building tables Build tables using counting stick- forwards and backwards and with missing jumps				**Using known facts** If 3 x 2 = 6, then 30 x 2 = 60, 60 ÷3 = 20 and 30 = 60 ÷ 2. **Partitioning** Informal recording of partitioned numbers 15 x 5 = 75 10 x 5 = 50 5 x 5 = 25 Solve these equations Solve these equations 75 x 5 = 95 ÷ 5 = 36 x 4 = 56 ÷ 4 = 22 x 8 = 84 ÷ 2 =
9.	Fractions: finding fractions of quantities, shapes and sets of objects finding hundredths and families of common equivalents representing, comparing and ordering of unit fractions of shapes and numbers.	Knows that fractions are relative to the whole. Knows that fractions are equal parts to the whole	Knows that fractions are relative to the whole and can be represented in different ways	● To recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4. ● To write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of two quarters and one half.	● To recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. ● To recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. ● To compare and order unit fractions, and fractions with the same denominators. ● To solve problems that involve all of the above.
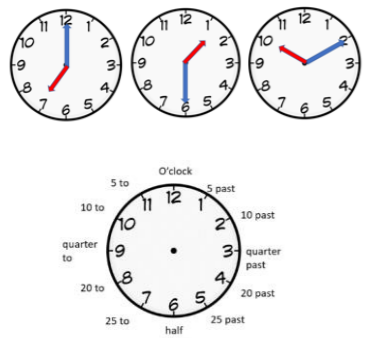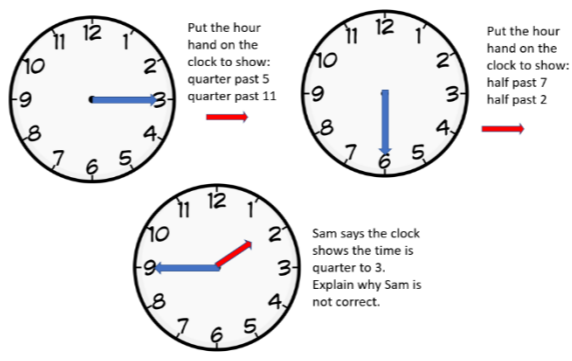
In the "Building tables" area:

Grid method
23 x 8 =
20 x 8 =160
3 x 8 = 24
23 x 8= 184

x	20	3
8		

Rearranging the dividend to find multiples of the divisor.
48 ÷ 3 =
"What do I know about the 3 x tables?"
"I know 3 x 10 = 30 and 3 x 6 = 18."
48 ÷ 3 = 16

10.	Geometry: position, movement and motion	Knows how to describe position and movement using the correct terms.	*Knows how to describe position and movement using right angles for quarter turns.*	● To order and arrange combinations of mathematical objects in patterns. ● To 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.	• To describe position and movement using clockwise, anti-clockwise, left and right. (Y2) • To describe position and movement using the correct terms.
11 & 12.	Measurement: time and money. 12-hour clock am/pm	Knows how to read the time to the nearest 15 minutes. Knows how to find totals and equivalent amounts in money using notes and coins.	Knows how to read the time to the nearest minute. Knows that the 12-hour clock can represent am or pm. Knows the passing of time can be calculated as time durations.	To compare and sequence intervals of time. ● To tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. ● To recognise and use the symbols for pounds and pence; combine amounts to make a particular value ● To find different combinations of coins that equal the same amounts of money ● To solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	● To tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks. ● To estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as am/pm, morning, afternoon, noon and midnight. ● To know the number of seconds in a minute and the number of days in each month, year and leap year. ● To compare durations of events, for example to calculate the time taken by particular events or tasks

One minute interval.
Am and pm, morning ,
afternoon, noon, midnight

7 o'clock
7:00 pm
19:00

Half past 1
1:30 am
01:30

Ten past 2
10:10 pm
22:10

Put the hour hand on the clock to show:
quarter past 5
quarter past 11

Put the hour hand on the clock to show:
half past 7
half past 2

Sam says the clock shows the time is quarter to 3.
Explain why Sam is not correct.

Draw these times on a clock face
26 minutes past one
14 minutes to seven
12 minutes past 9

Put these times on order starting at midnight

5 past two, am
7 minutes to 6, pm
Quarter to 9, am
Half past 11, pm
25 to 8, pm

How do I find half of 20p?
50p?

Paul buys two strawberry cup cakes and a chocolate cup cake.
The chocolate cake cost 25p more than the strawberry ones.
He spent £3.70. What is the cost of each cake?

Design a question with another step.

Design a question with another step and more challenge.

Which is more?

Odd one out?

Would you like these 3 coins or the other 3 coins?

Jenny's lunch costs £4.50.

She pays with a £10 note.

Find three different ways in which she could receive her change.

Bill wants to buy a comic costing £1.50.

He saves 30p one week and 65p the next week.

How much more money does he need to buy the comic?