Year 3 Maths Knowledge Organisers Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Half term	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Place value		Number facts		+ and -	X and ÷	+ and -	X and ÷		+ and -	X and ÷	4OPS		Assessment	Consolidation	

Click on a maths area

Vocabulary

- Place value
- Ones
- Tens
- Hundreds
- Thousands
- Twenty
- Thirty
- Forty
- Fifty
- Sixty seventy
- Eighty
- Ninety
- Negative numbers

Count in 50s (link with 5s)

50	250	450
100	300	500
150	350	550
200	400	600

1000 more or less

1. Identify the thousand digit (E.g. 5432 is 5 thousand)

Th H T O
5 4 3 2

2. Add 1 to 5, which means 1000 + 5000 = 6000 (1000 more than 5432 = 6432)

Th H T O
6 4 3 2

Y3 find 1, 10 or 100 more or less. They do this the same way with numbers less than 1000

Click here to return to selection page

Recognise the value of digits

What is the value of 2?

214

1. Label the HTO

   H T O

   2 1 4

2. There are 2 <u>hundreds</u> so the value is 200

3. Use resources to prove it

H	T	O
◼	│	● ● ● ●
◼		

2 hundreds

Y4 to the same but with thousands.

3. Prove with resources and drawings

Th	H	T	O
◼ ◼ ◼	◼ 🟩 ◼	‖‖	● ●

1000 more

Ordering

Order from largest to smallest

482 — 1st
428 — 2nd
824 — 3rd
284 — 4th

1. Look at the largest digit first (hundreds).

   824   Greater
   482

2. Then go to the next digit if the first digit is the same.

   4**2**8   4**2**8
   4**8**2   4**8**2   Greater

Y4 ordering process is the same but includes thousands. Children can use resources in school to prove it.

Place Value

Y3/4

Represent numbers in a variety of ways

38 = 23 + ?

? = 265 , 164

38	23
38
40 +2 61 +21

265	164

| | 265 |
| | 164 |

Tens	Ones
‖‖	::::

38 + 23 = 61

Tens	Ones

Count in 100s (link with 1s and 10s)

100	600
200	700
300	800
400	900
500	1000

Roman Numerals

I = 1 — I
V = 5 — Visited
X = 10 — X-Factor's
L = 50 — Last
C = 100 — Champion

❖ You cannot have more than 3 of the same letter in a row

e.g. III   ~~IIII~~

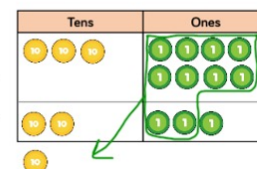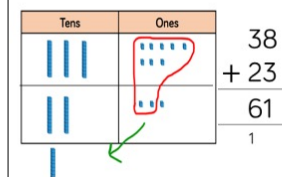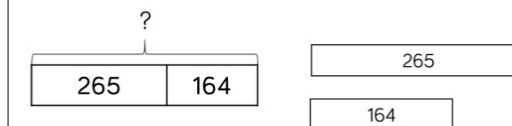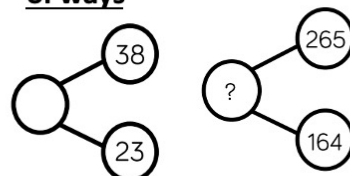V and L can only be used one time in a number.

e.g. LVIII = 58 ~~LVIII~~

Rounding to the nearest 10, 100 or 1000

Round 589 to the nearest ten.

The same process is for rounding to the nearest 100 and 1000

Identify the tens

5**8**9

Look at the digit beside the tens

Rounding rhyme – 0,1,2,3,4 stays the number before

5,6,7,8,9 rounds up on the number line

So, rounding 589 to the nearest ten will mean it will round up on the number line because of the 9 digit in the ones.

Rounded up

589 rounded to the nearest 10 = 5**9**0

584 would round down as the 4 means it is close to 580

Vocabulary

- Add
- Plus
- Total
- Sum
- Altogether
- Equals
- Digit
- Tens
- Ones
- Hundreds
- Subtract
- Minus
- Take away
- Regroup

Estimate

598 + 242

↓ Close to 600

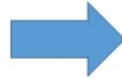600 + 242 = 842

So the answer will be close to 842.

Add and subtract mentally

1. 3 digit and ones

Circle the ones and subtract

384 − 3 = 381
4 − 3 = 1

2. 3-digits and tens

Circle the tens and add
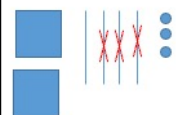
839 + 60 = 899
3 + 6 = 9

3. 3-digit and hundreds

Circle the hundreds

649 − 400 = 249
6 − 4 = 2

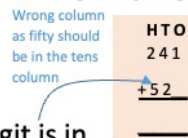Prove all with resources and drawings in school. E.g.

243 − 30 = 213

Column addition (without regrouping)

241 + 52 = 293

Wrong column as fifty should be in the tens column

H T O
2 4 1
+5 2
—

1. Write in a column
2. Make sure each digit is in the correct column

H T O
2 4 1
+ 5 2
—

❖ Start with the ones.
1+2 = 3
❖ Then go to the tens.
2 9 3

Mental addition and subtraction bridging

46 + 7 = 53
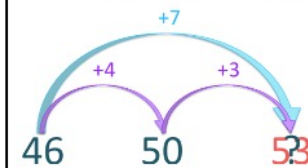
❖ Get to the next ten or hundred and then add the rest.

+7
+4   +3
46   50   53
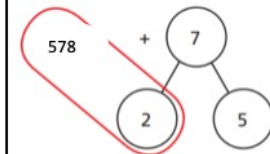
E.g. 394 − 40 =
404 + 30 = 434

578 + 7
2   5
580 + 5 = 585

Addition and subtraction Y3/4

Column addition (with regrouping)

482 + 138 = 620

1. Start with ones, 2 + 8 = 10
   So regroup by carrying
   The 1 to the tens column
2. 8 + 3 + 1 = 12
   Don't forget to add the 1
   That you regrouped!
3. 4 + 1 + 1

H T O
4 8 2
+ 1 3 8
—
6 2 0

Column subtraction (without regrouping)

875 − 254 = 621

See the steps in column addition (without regrouping)

H T O
8 7 5
- 2 5 4
—
6 2 1

Column subtraction (with regrouping)

875- 287= 589

➢ Start with ones, 5 - 7, you cannot do so regroup by taking one ten from the 7, leaving 6 tens, and put in the ones column to make 15. 15 − 6 = 9
➢ Next, the tens. 6 − 8, you cannot do so regroup by taking one of the hundreds, leaving 7 hundred, and put it in the tens column to make 16.
16 − 8 = 8
➢ Finally, 7 − 2 = 5

H T O
7 16 1
8 7 5
- 2 8 7
—
5 8 9

You cannot do 5 – 7 so go to the tens column. Take a ten to leave 6 tens and make 15 in the ones column.

Vocabulary

➢ Multiply
➢ Multiplication
➢ Lots of
➢ Times
➢ Division
➢ Grouping
➢ Sharing
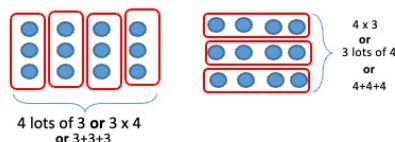➢ Arrays

What are times tables?

Times tables is when you add the same number multiple times.
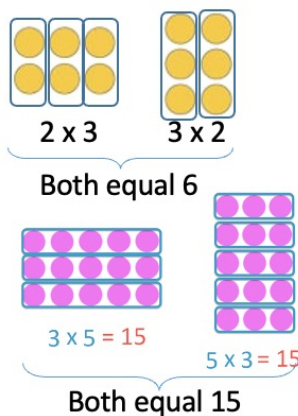
$$3 \times 4 = 12$$

Multiplier

Here we start with 3 and we have 3 four times (3+3+3+3).

You can draw and make this as shown below.

4 x 3
or
3 lots of 4
or
4+4+4

4 lots of 3 **or** 3 x 4
or 3+3+3

Commutative Law

You can multiply in any order to get the same answer. This only differs the way the number is grouped (see what are times tables).

2 x 3   3 x 2

Both equal 6

3 x 5 = 15

5 x 3 = 15

Both equal 15

Apply times tables

If you know 2 x 8 = 16, then you know...

2 x 8 = 16

20 x 8 = 160

20 has a 0 so your answer will have 1 zero as it is 10x greater

2 x 80 = 160

Top tip – look at the number of zeros. This tells you if you need to write any zeros in your answer

In total, 20 and 80 have 2 zeros so the answer will have 2 zeros as it is 100x greater

20 x 80 = 1600

Important facts

- Anything x0 is always 0 as you do not have any groups.

  E.g. 20x0=0

  185x0=0

- Dividing by 1 leaves the number unchanged

  E.g. 35÷1=35

  124÷1=124

Column multiplication

324 x 13

1. Write the calculation in a column. Make sure the digits are in the correct column.

   e.g.   H T O
          3 2 4
          X 1 3   ✗

          H T O
          3 2 4
          X 1 3   ✔

2. Start with multiplying the 3 in 13 with the ones column. So, 3x4 =12. Carry the 1 in the number 12 into the tens column.
3. Move onto 3x2 (the tens column) and **add the extra 1** that you carried. 3x2=6, add 1=7
4. Then, 3x3 (in the hundreds column), which is 9
5. You have multiplied the 3 in 13, now move onto the 1 ten in 13.
6. Put a zero (0) in the ones column as we are x by 10 not 1.
7. Then follow the same process described in the previous Steps but multiplying each digit by 1 instead (1x4,1x2,1x3)
8. Finally, 972 + 3240 = 4212. Use the column method (see the addition and subtraction KO for support)

H T O
3 2 4
X 1 3
2
1

H T O
3 2 4
X 1 3
9 7 2
1

H T O
3 2 4
X 1 3
9 7 2
+ 3 2 4 0
4 2 1 2

Multiplication and division Y3/4

SJB

Times tables – click the links for the songs

3x - https://youtu.be/QYiK5a40z_8

4x – https://youtu.be/JO66NtuQ_e8

6x – https://youtu.be/aXlTg56os1o

7x – https://youtu.be/hsM4FRWJ5yl

8x – https://youtu.be/yGeJKWQ_e2Y

9x – https://youtu.be/dEogUYtuiBg

Inverse

Division is the opposite of multiplication.

So, if you understand that 5x4=20, then you know:

20 ÷ 4 = 5 and 20 ÷ 5 = 4

This is because you can divide by grouping the numbers (i.e. counting using the times tables)

20 ÷ 5 simply means: how many 5s are in 20? 5, 10, 15, 20
① ② ③ ④

20 ÷ 4 simply means: how many 4s are there in 20?   4, 8, 12, 16, 20
① ② ③ ④ ⑤

Vocabulary

➢ Fractions
➢ Denominator
➢ Numerator
➢ Equivalent
➢ Bar model
➢ Parts
➢ Equal
➢ Tenths
➢ Half
➢ Quarters
➢ Thirds
➢ Decimal place (DP)

What is a fraction?

The Numerator
The top half of the fraction. The number of parts you have.
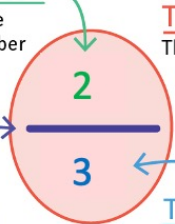
The Fraction
The whole thing!

$$\frac{2}{3}$$

The line that separates the numerator and the denominator (doesn't have a name).

The Denominator
The bottom half of the fraction. The number of parts in a whole.

Adding and subtracting fractions

You do not add or subtract the denominator as this just tells you how many parts there are.

$$\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$$

$$\frac{3}{7} - \frac{2}{7} = \frac{1}{7}$$

Round decimals to the nearest whole number

Rounding rhyme – 0,1,2,3,4 stays the number before

5,6,7,8,9 rounds up on the number line

4.73

1. Look at the first DP
2. The digit is a 7 so it must round up to 5 as it is closer to 5.

4.73 → 5
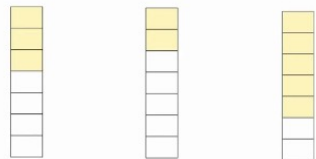
Compare decimals

Which is larger: 0.73 or 0.39?

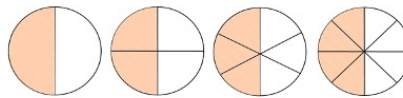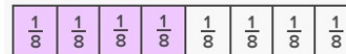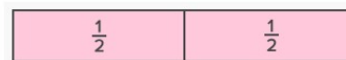Look at the first DP. Which is larger?

0.73   0.39   0.73 is larger as 7 is greater than 3

Equivalent fractions

Fractions that have the same value.

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$$

$\frac{1}{2}$	$\frac{1}{2}$

$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$

$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

Fractions and decimals Y3/4

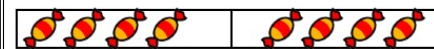**Fractions of an amount**

Rule – Divide by the bottom, times by the top.
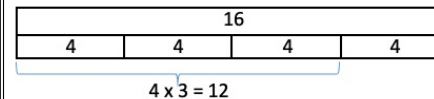
Find $\frac{1}{2}$ of 8.

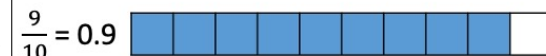Divide by 2 (count in twos to help)

4 and then times by the top

4 x 1 = 4

Find $\frac{3}{4}$ of 16.

1. Divide by the bottom. 16 ÷ 4 = 4
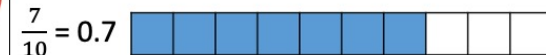
16			
4	4	4	4

4 x 3 = 12

Count in tenths

Tenths means dividing by 10.

$\frac{1}{10}$ = 0.1

$\frac{2}{10}$ = 0.2

$\frac{3}{10}$ = 0.3

$\frac{4}{10}$ = 0.4

$\frac{5}{10}$ = 0.5

$\frac{6}{10}$ = 0.6

$\frac{7}{10}$ = 0.7

$\frac{8}{10}$ = 0.8

$\frac{9}{10}$ = 0.9
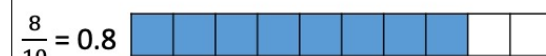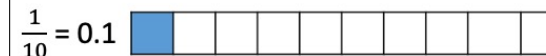
Counting in hundredths

Hundredths means dividing by 100.

$$\frac{1}{100} \quad \frac{2}{100} \quad \frac{3}{100} \quad \frac{4}{100} \quad \frac{5}{100} \quad \frac{6}{100}$$

$$\frac{7}{100}$$

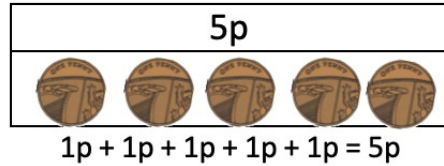$$\frac{1}{100} = 0.01 \qquad \frac{2}{100} = 0.02$$

Vocabulary

➤ Money
➤ Pence/penny
➤ Pound (£)
➤ Value
➤ Time
➤ Seconds
➤ Minutes
➤ Hours
➤ Day
➤ Week
➤ Month
➤ Year
➤ January
➤ February
➤ March
➤ April
➤ May
➤ June July August
➤ September
➤ October
➤ November
➤ December

Value of coins

1p	2p	5p	10p	20p	50p	£1	£2
one penny coin	two pence coin	five pence coin	ten pence coin	twenty pence coin	fifty pence coin	one pound coin	two pound coin

Adding coins

5p

1p + 1p + 1p + 1p + 1p = 5p

Children physically use coins to add.

= + + + +

£20

= +

Measurement Y1-3/4

Value of notes

£5	£10
5 pound	10 pound

£20	£50
20 pound	50 pound

Finding change

26p

95p

What is the change if I pay with £1.98

1. Draw bar model

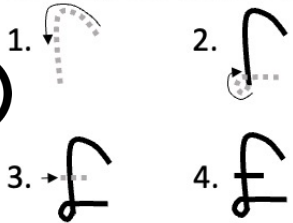| £1.98		
95p	26p	Change

2. Add prices
   95 + 26 =121

3. Subtract 198p
   198 – 121 = 77p

Writing the pound sign £

1.   2.

3.   4.

Top tip! Think of a walking stick for the start of the symbol.

Vocabulary

- ➢ 2D shapes
- ➢ 3D shapes
- ➢ Square ▮
- ➢ Rectangle ▭
- ➢ Rhombus ▱
- ➢ Quadrilateral (4 sides)
- ➢ Triangle (3 sides) ▲
- ➢ Pentagon (5 sides) ⬠
- ➢ Hexagon (6 sides) ⬡
- ➢ Heptagon (7 sides) ⬢
- ➢ Octagon (8 sides) ⯃
- ➢ Angle
- ➢ Sides
- ➢ Corners
- ➢ Edges
- ➢ Vertices
- ➢ Face/surface
- ➢ Sphere ⬤
- ➢ Cylinder ▯
- ➢ Cube ⬛
- ➢ Cuboid ▱
- ➢ Pyramid ◢
- ➢ Tetrahedron ◭
- ➢ Cone ◭

Symmetry
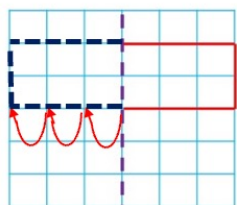
Count across from the line of symmetry and count the same on the other side.

Repeat with the rest of the shape.

Making 2D shapes

Popstick Play

Each stick is a side. Each shape has the same number.

Children can also draw them the shapes.

Side

Corner

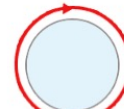### Angles and turning (children practice turning each of these angles)

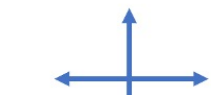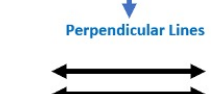| 1 right angle quarter turn **90°** | 2 right angles 2 quarter turns or half turn **180°** | 3 right angles 3 quarter turns **270°** | 4 right angles 4 quarter turns or full turn **360°** |

Types of lines

https://youtu.be/0Q_JJNXXDzE

Horizontal

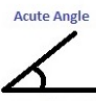**Vertical**

Perpendicular Lines

Parallel Lines

Geometry

Y3/4

Types of angles
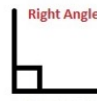
| Acute Angle | Right Angle | Obtuse Angle |
| Less than 90° | Exactly 90° | Greather than 90° but less than 180° |

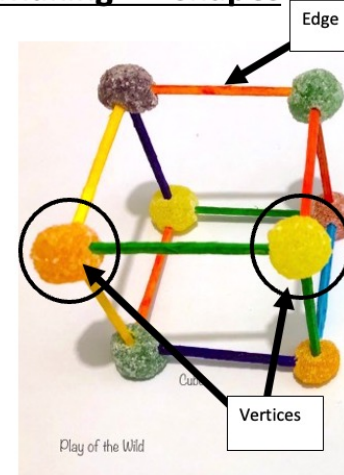| Straight Angle | Reflex Angle | Full Rotation |
| Exactly 180° | Greater than 180° | Exactly 360° |

The children would use right angle measurers to help them at first. Then they strive to identify them without thinking.

This angle is less than 90 degrees so it is an acute angle.

Making 2D shapes

Edge

Edges and vertices make a face. This faec/surface is a triangle

Square-based pyramid

Vertices

Play of the Wild

Cube

Triangular-based pyramid

Children must become familiar with 3D shapes by making and exploring them to understand their properties (what makes them that shape). They then can go onto recognising them in different orientations (see below).
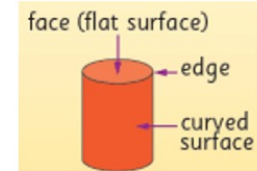
3D shapes in different orientations
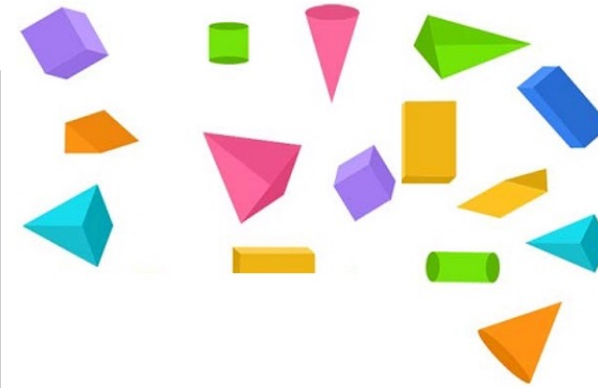
Once children know the properties, they can justify how they know what each shape is.

Flat and curved faces/surfaces

A curved surface wraps around

An edge as there is no vertex.

face (flat surface)

edge

curved surface

Vocabulary

➢ Bar charts
➢ Pictograms
➢ Tables
➢ Line graphs
➢ Scale
➢ X-axis
➢ Y-axis
➢ Data

Any graph, chart or table displays data (information)

Tables and tally charts

Method of Travel	Tally	Frequency
Walk	ЖЖ IIII	9
Bike	III	3
Car	ЖЖ I	6
Bus	ЖЖ ЖЖ II	12
TOTAL		30

Tally charts are used to organise a value in the table. E.g. IIIIIIIIIIII This takes a while to recognise the value; whereas ЖЖ ЖЖ III is 13.
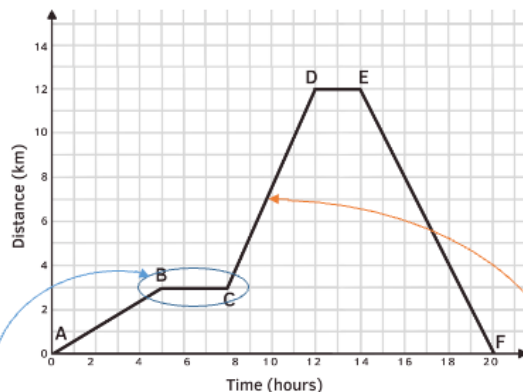
Bar chart

Most popular forms of transport
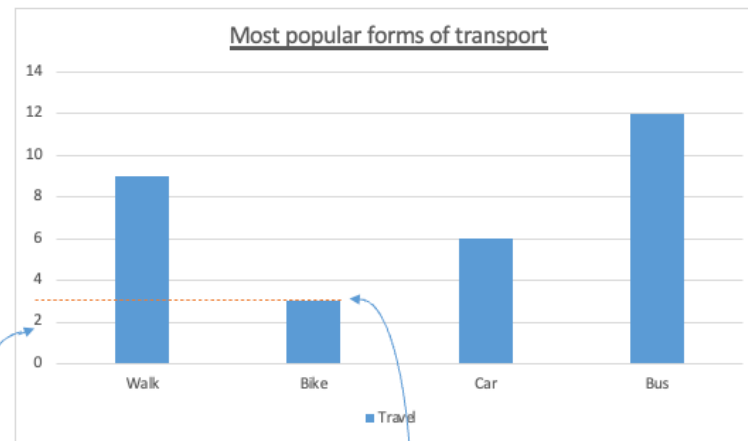
Scale (counting in 2s)

- To interpret a bar chart, children must draw a line to check the value of a bar.
- To draw a bar chart, the children must decide on a suitable scale, make sure the bars are an equal distance apart and the same thickness.

Statistics Y3/4

Time graph

- A straight horizontal line means that time is passing but the distance remains the same (no movement).
- A rapid jump up means there is lots of movement as very little time passes but lots of distance is covered.
- Children must understand the more something moves to the right, it impacts the x-axis; the more something rises or falls, the more the y-axis is impacted.

Tables and tally charts

6 x 5 = 30

Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday

= 6 cupcakes

- Children must decide on a suitable scale (in this case, it is 6)
- Splitting a picture in half means it is half the value (e.g. = 3)
- Questions may ask which day was most cupcakes sold. The pictogram shows Saturday was the most.
- Use times tables to calculate the total (e.g. Saturday = 10 x 6 = 60)
- Alternatively, a question may ask for the difference between Saturday and Tuesday. Saturday = 60 Tuesday = 6x2 then + 3 = 15
- 60 – 15 = 45 cupcakes