

*'Creating strong foundations, developing curious minds'*



# Maths and Numeracy at Magor CiW Primary School





# 4 Purposes



# Maths & Numeracy AOLE

## Numeracy proficiencies

Conceptual understanding

Strategic competence

Communication with  
symbols

Fluency

Logical reasoning

## Statement of what matters

Number

Algebra

Geometry + Measures

Statistics

Conkers?



# Fluency – What really matters

P3	6	6.1 Locate, round and explore 2-place decimals.	6.2 Fractions, decimals, <u>percentages</u> , ratio & proportion	6.3 Build on and extend knowledge to calculate	6.4 <u>Topping off</u> data	Written calculations assisted by jottings Addition & subtraction Multiplication & division	6.5	Shaping up								
	5	5.1 Locate, partition, compare and order bigger (whole) numbers	5.2 2- place decimals $\div 10 / 100$ $\times 10 / 100$	5.3 Tables, patterns and relationships	5.4 Securing and refining $+$ and $-$ $\times$ and $\div$		5.5									
	4	4.1 Tenths $\div 10 / \times 10$ ( $\times 100$ )	4.2 Locate and partition - whole /parts (tenths)	4.3 Further Fractions	4.4 Tables, patterns and sequences		4.5 Developing $+$ and $-$		4.6 Developing $\times$ and $\div$	4.7	4.8					
	3	3.1 Partition 2 and 3-digit numbers Money amounts	3.2 Add and subtract a 'near 10' and a 'near multiple of 10'	3.3 Knowing all about <u>100</u> $\pm$ extending beyond with links & patterns	3.4 Bonds of 10, 20 and 100 ( $+$ / $-$ ) Multiples of 10 ( $+$ / $-$ )		3.5 Using halving, doubling and near-doubles to calculate		3.6 Locate, compare, position and order numbers within 1000	3.7 Understand 10 times <u>bigger</u> and 10 times smaller (incl money)	3.8 Count in 1s (on/back), <u><math>\pm</math></u> in 2s, 5s & 10s, and in 10s off the decade	3.9 $\times$ and $\div$ by 3 and 4	Mental calculations assisted by jottings Addition & subtraction / multiplication & division	3.10	Under construction	
	2	2.1 Partition 2 and 3-digit numbers	2.2 Add and subtract multiples of 10 and a 'near 10'	2.3 Facts within 20	2.4 Bonds of 10 within 100		2.5 Halving and doubling within 100		2.6 Position, order and compare within 100	2.7 Addition and subtraction within 100	2.8 Counting in 1s, 2s, 5s and 10s	2.9 <del>Multipli</del> cation and division		2.10		2.11
	1	1.1 Teen numbers and tens/ones to 50	1.2 1 or 2 more or less within 20	1.3 Facts within 10	1.4 Bonds of 10		1.5 Doubles and halves to 10 and near doubles		1.6 Comparing -finding the difference	1.7 Addition and subtraction within 20	1.8 Counting in 10s (to 100)	1.9 Counting in 2s and 5s		1.10		1.11

Revise doubles of numbers up to 20 by making practically, illustrating pictorially, demonstrating with structured apparatus and using abstract notation. Use a range of games to develop quick recall of doubles.

Write the rules, patterns and links you discover.

Prove using practical resources that halving and doubling are opposites (inverses). Use numbers within 20 to explore this.

Ensure children understand how doubling as a calculation can be useful and make links to the 4 times table. Illustrate how dividing by 4 is also useful e.g. when finding  $\frac{1}{4}$  of a numerical amount.

Encourage and develop fluency in using near doubles for addition calculations within 20.

e.g.  $6 + 7 \rightarrow 12 + 1$  (and also  $14 - 1$ )

$7 + 8 \rightarrow 14 + 1$  (and also  $16 - 1$ )

$8 + 9 \rightarrow 16 + 1$  (and also  $18 - 1$ )

Also explore other close doubles, again anchoring off the known double e.g.  $5 + 7 \rightarrow 10 + 2$

$6 + 8 \rightarrow 12 + 2$

$7 + 9 \rightarrow 14 + 2$

Extend to calculations beyond 20: Formulate addition calculations where this would help (e.g.  $26 + 7 \rightarrow 20 + 13$   $35 + 27 \rightarrow 50 + 12$ ) and where other strategies would be more

Make a recipe twice as big. Or half the size of a recipe. Weigh or measure the amounts carefully. Use real food or mud kitchen / real milkshakes / coloured water etc.

Explore halves of given angles, understanding angle as a measure of turn. Use a  $90^\circ$  angle turn to illustrate that angle is about measurement. Measure. Link the  $90^\circ$  quarter turn to the  $180^\circ$  half turn and illustrate with pictures / diagrams.

Halve regular and irregular 2D geometric shapes practically and introduce the terms 'symmetrical' and 'line of symmetry'.

Sort 2D geometric shapes according to symmetry property and use Venn and Carroll diagram to classify using two criteria e.g. symmetrical / not symmetrical, regular / irregular, 1 more right-angles / no right-angles

## Using halving, doubling and near-doubles to calculate

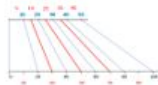
3:5

Focus on halving odd numbers and show practically the need to halve / split one item. Identify these numbers.

Look at the process for halving 30, 50, 70 and 90.

One ten must be split in half. Do this practically to discover halves of these numbers. Now we know the doubles of what numbers quickly?

Children draw a halving diagram to locate these halves and doubles.



Derive the 4x table by doubling the 2x table and practise covering and revealing boxes to gain fluency with doubling /halving and carrying out mental calculations. Support using doubling / halving diamonds, where needed.

	1	2	3	4	5	6	7	8	9	10
2x	2	4		8	10	12	14	16	18	
4x	4	8	12	16				32	36	40



Buy two of a range of objects. How much will that be? Double a portion of a till receipt. Make identical shopping lists for two households.

Extend use of doubling diamonds to money, making use of place value where helpful.

Shop in a half-price sale. Illustrate that this is the same as a '50%' sale.

Look at right angle triangles. Compare them to rectangles that are double the area. Calculate areas of triangles and rectangles using this relationship.

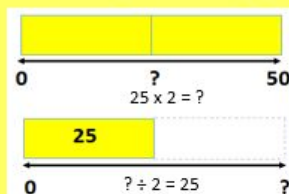
Compare data in charts and graphs making reference to statistics/bars that are double/half other information, or nearly (roughly) double/half.

Use sums with holes to develop understanding of 'inverse' and explore links and patterns e.g.

$$25 \times 2 = ? \quad ? \div 2 = 25$$

$$? \div 2 = 45 \quad 45 \times 2 = ?$$

Solve with practical, pictorial and abstract methods, including bar-modelling e.g.



## Games

### Outside

Two footed and triple jump style jumps on number lines marked in 200 mm. Where did you land? What's your next target? Can you jump to a specific number without wobbling?

<https://nrich.maths.org/public/topic.php?code=-842&c1=2&cldcmid=6342> Round the dice decimals

A range of blank number lines on tables with target areas, start and end points given. Slide coins or poker chips to try to get in target area. Justify where it has landed and if all agree mark on line. Don't score for anything already marked. Add 110 or 1.1 etc. to score if hit target.

4:2

Locate and partition  
- whole and parts  
(tenths)



## Maths Talk

- Location practise Y4
- Folding strips into 10 equal parts. Best ways and worst ways
- Partition mistakes why are these wrong?
- P.V. boards order and make numbers e.g. a number with 15 tens and less than 5 units.

## AOLE links

**Expressive Arts** **Health & Wellbeing** **Humanities** **LLC** **Sc & Tech**

Look at how numbers are used in different contexts to measure things to tell us about our world measure decibels with app, time with stopwatch, capacity from pipettes to litres, thermometers and digital scales. Order these numbers as you practise measuring

Look at famous sporting races around the world. How far are they in metres and kilometres. Are they. Order them in distance on a number line with a landmark associated with each race.

## Pupil practise

<https://www.iseemaths.com/wp-content/uploads/2021/03/1-See-Reasoning-Y4-Division-Sample.pdf> Read the pictures

Teacher questions pupil questions devise 1 easy one middle one hard Scheme with page ref

## Glorious anything (other rich tasks and great activities)

<https://www.stem.org.uk/elibrary/resource/29243#&gid=undefined&pid=2>

Queen Esmerelda coins

<https://www.atm.org.uk/Shop/Primary-Education/Primary-Education-Books/Books--Hardcopy/We-Can-Work-It-Out-1/act054> Mirror Maze



## Themes / Topics Marvellous Machines

Make a junk robot and get it to perform a choreographed dance by positioning it on programmable machine. Can you and your partner make them dance in time and same rotations, distance etc. What about dance the opposite? What music will you chose for it to dance to, why? GA

Look at Rube Goldberg machines, can you make one that measures only 20 cm in length on your table? What about 1 meter high using boxes? How long does each machine take? Order them.



# Weekly structure of lessons



3 part warm up focusing on a 'What matters a day'.



Children actively engaged in hands on practical tasks.



Independent or collaborative work based on conkers.



Reasoning opportunities in plenary.



# MENTAL MATHS DAILY WARM UPS!

<b>Monday</b> <b>Number</b>	Topmarks - use 100 square to hide numbers...what comes next, before, after, 2 more, 10 more <a href="https://www.topmarks.co.uk/learning-to-count/paint-the-squares">https://www.topmarks.co.uk/learning-to-count/paint-the-squares</a> Number line with velcro - count forwards and backwards from a given number .... <u>how</u> do you know? Count in 2's, 5's10's Teen number songs <a href="https://www.youtube.com/watch?v=psSWYxlnob4">https://www.youtube.com/watch?v=psSWYxlnob4</a> Magic hat go round - song- when music stops - choose number, ask child fact about number Counting in welsh and french
<b>Tuesday</b> <b>Algebra</b>	Copy the clapping pattern..... Continue the shape pattern.....square, triangle,circle, square, triangle, circle. Make paper symbol cards - children as conductor, copy or follow the symbols More and Less song - interactive <a href="https://www.youtube.com/watch?v=M6Efu2slal">https://www.youtube.com/watch?v=M6Efu2slal</a> What is the missing number ? Games
<b>Wednesday</b> <b>Data</b>	Year 1 house pack - How can you sort the houses into groups eg window shape, doors, flowers/not flowers data handling - How we are the same/ different - eye/ hair colour Favourite fruit snack/ story - use hwb to represent Pattern sorting - socks/ mittens
<b>Thursday</b> <b>Shape/Measure</b>	Measuring time - activities you can do in 1 minute/ 2 minutes etc. Sand timer and bomb timer. countdown <a href="https://www.youtube.com/watch?v=CH50zuS8DD0">https://www.youtube.com/watch?v=CH50zuS8DD0</a> All make an o'clock with your mini clock Measure length - comparisons of height / shoe size. Find me something AS LONG AS 5 multilink / AS LONG AS <u>10cm's</u> . Weight- ? Shape <a href="https://www.youtube.com/watch?v=WTeqUejf3D0">https://www.youtube.com/watch?v=WTeqUejf3D0</a> Find a triangle, pentagon in the environment, in a story book. Play estimation games Symmetry games - <a href="https://www.topmarks.co.uk/symmetry/symmetry-matching">https://www.topmarks.co.uk/symmetry/symmetry-matching</a> rotation - put your object in front, to the right etc, jump forwards , to the right etc - HWB drop the pen games
<b>Friday-Reasoning</b>	Verbal questions .... if everyone needs a pencil for <u>sounds</u> group, how many will you <u>need</u> . 3 people are away today, how many are in school What comes next on the dice .... 1 spot, 2 spots Spot the difference games Kim's game

10 times smaller

### What Matters a Day

### Place Value

Y6

What are the missing numbers?

	2000	3000	4000			7000		9000
100	200		400		600	700		900
10		30	40		60		80	90
1	2	3	4		6	7	8	9

What would be the next row?

10 times bigger

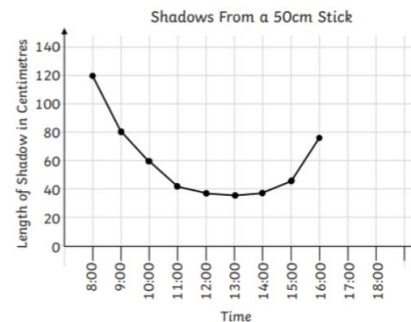
### What Matters a Day

### Data

Y6

3. This graph shows the length of a shadow at each hour:

- When was the shadow shortest?
- What was the difference between the shortest and longest shadow?
- By how much did the shadow change between 8:00am and 10:00am?
- What time would you expect the shadow to be 120cm again?



### What Matters a Day

### Algebra

Y6

## Emergency Plumber

- 1) An emergency plumber charges £15 for a call out and £8 per hour for any work. Which formula below can be used to calculate how much the plumber charges?



15h + 8

8h - 15

8h + 15

15h - 8

(h is the number of hours the plumber works)

If you finish:

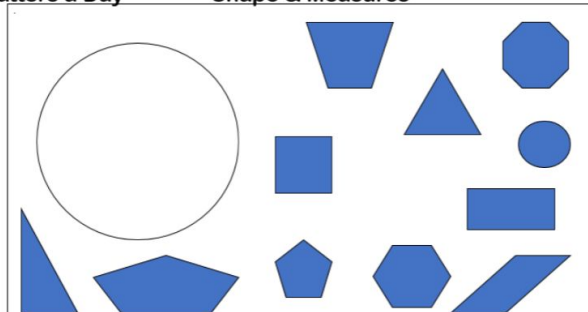
💡 Write some similar problems for your partner.

Show Answers

### What Matters a Day

### Shape & Measures

Y6



I am thinking of a rule.

If a shape meets the rule it can go into the circle.

# Maths resources

Base 10



Bead bars



Place value  
cards/boards

100	10	1
200	20	2
300	30	3
400	40	4
500	50	5
600	60	6
700	70	7
800	80	8
900	90	9
853		



Numicon



# Tips for using **Numicon**



# Assessment

- Diagnostic interviews
- Welsh government national tests
- Pupil reviews
- Pupil learner progress



# Maths talk activities

## Broken Calculators

Can you make the number 33 ?

Broken keys are numbers 3, 2, 1

Operators +

Can you make the number 107 ?

Broken keys are numbers 7, 0, 1

Operators +

Can you make the number 8 ?

Broken keys: numbers 7, 0, 1, 8

Operators + - x

Can you make the number 11 ?

Broken keys: numbers 2, 0, 1, 3

Operators + - ÷

In which column would each one go? Give a quick reason why without giving the answer?

Higher or Lower

Lower than 1

= 1

Higher than 1

$0.7+1$

$0.05+0.5$

$0.7+0.4$

$0.07+0.3$

$0.5+3$

$0.8+0.1+0.2$

$1.08+0.1$

$0.5+0.1$

$0.7+0.2+0.1$

$0.7+1+0.1$

$0.6+0.16$

$0.8+0.3$

$0.07+0.03+0.9$

$0.2+0.5$

$0.6+0.3$

$0.8+0.2$

$0.5+0.7$

$0.08+0.04$

$0.05+0.95$

$0.5+0.1+4$

$0.9+0.02+0.07$

$0.09+0.01$

$0.4+0.06 \times 10$

$0.4+0.4$

$8+1+1 \div 10$

$0.6+0.6 \div 10$

$9+0.2+1+1$

$0.6+0.08+0.2$

$0.8+0.1+0.1 \div 10$

# Online home resources



↑  
Topmarks  
games and  
visual aids.

↓  
Engaging times  
tables videos.



↑  
j2 blast

↑  
Engaging maths  
related videos.

