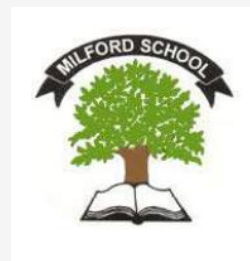


# MATHS WORKSHOP

Milford Infant School  
November 2016



Grow, Learn, Believe, Achieve

# Aims

- To signpost a range of ideas, strategies and resources to use at home with your children
- To gain an understanding of the impact mindsets have on learning
- To develop a greater understanding of year group expectations

# Making Maths Meaningful

What maths have you seen/used today?



At home  
Way to work



At work

Leisure

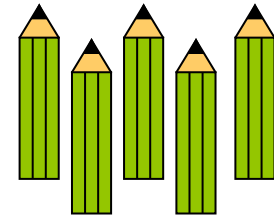
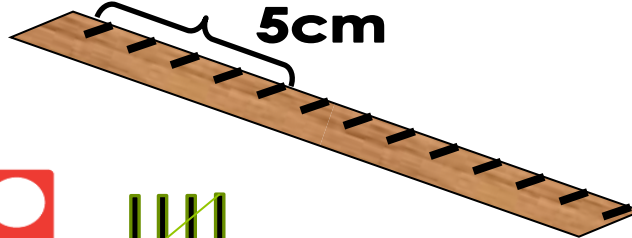


# How many different ways can you show me 5?

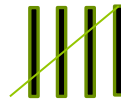


five past

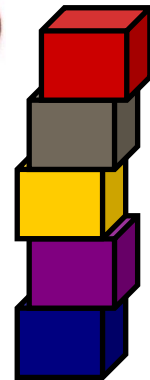
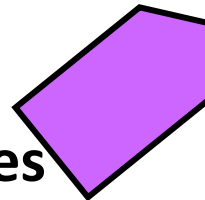
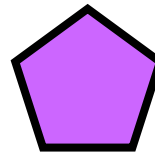
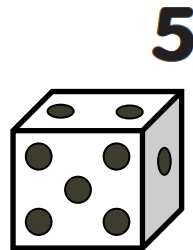
five  
minutes



5

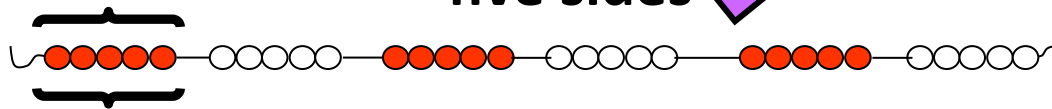


*five  
cinq*



five sides

V



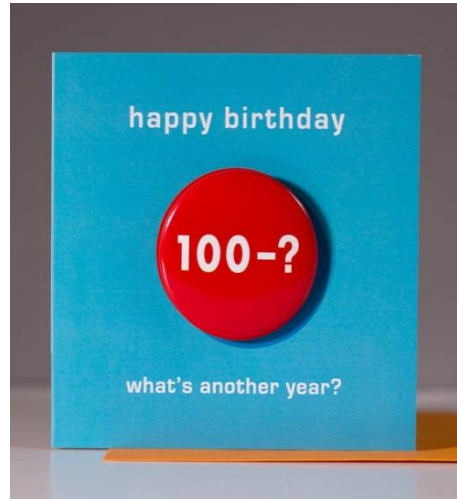
**How quickly can you place the numbers in numerical order from the lowest to the highest?**

1	2	3	4	5	6	7	8	9	10
yī	èr	sān	sì	wǔ	liù	qī	bā	jiǔ	shí
一	二	三	四	五	六	七	八	九	十

***Children need to understand the value of numerals and their relationship to each other***

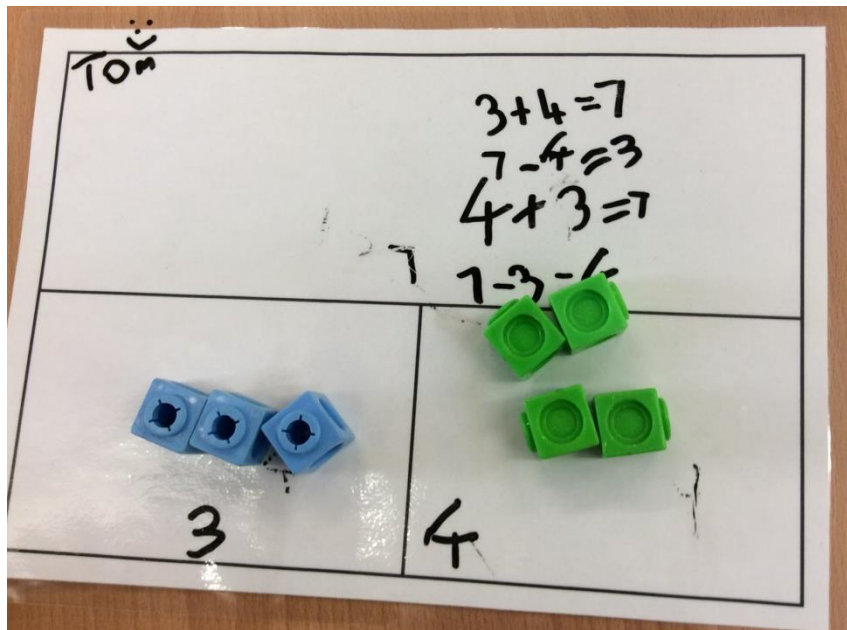


# Numbers are abstract ideas



*“How we represent an idea in mathematics is a key part of the process by which we develop understanding and give meaning to that idea.”*

Barmby et al, 1999.



# Our teaching approach

Concrete



Includes manipulatives, measuring tools, or other objects that children can handle



Pictorial



Includes drawings, diagrams, charts or graphs that children can relate back to the concrete objects

Abstract

$$2 + 1 = 3$$

Symbolic representations such as numerals, letters, number sentences





# CONCRETE

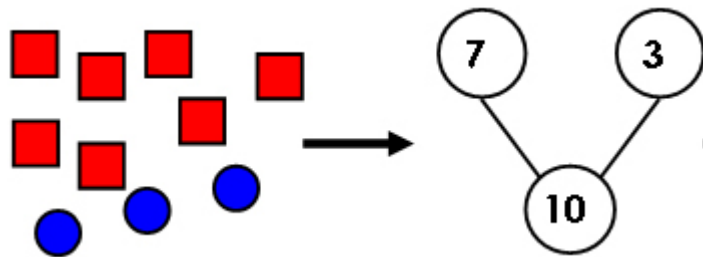
Counting  
resources



Numicon



# PICTORAL



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

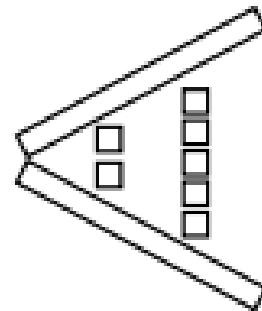
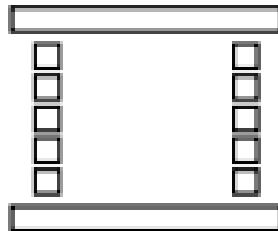
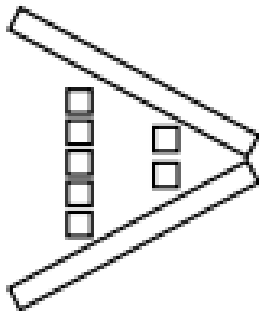
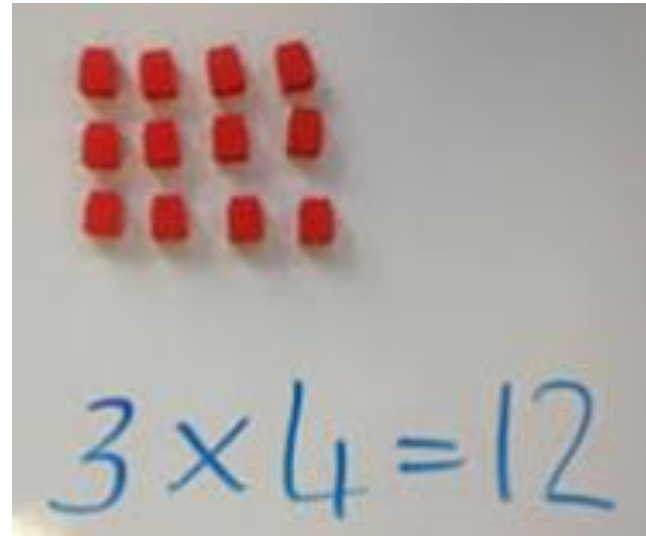
# ABSTRACT

$$8 + 2 = 10$$

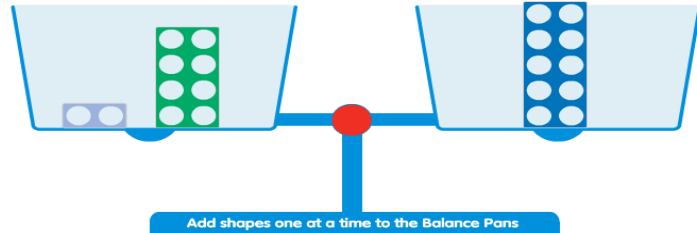
$$2 = 8 = 10$$

$$10 = 8 + 2$$

$$10 = 2 + 8$$



# The equals sign



$$8 + 2 = 10$$

$$10 = 8 + 2$$

equals

total

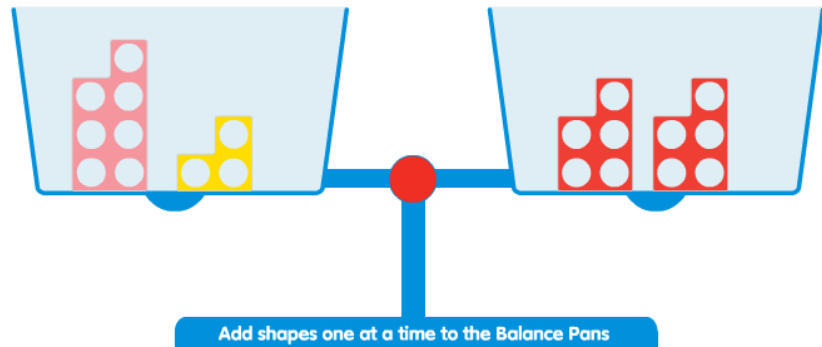
the same as

is equal to

altogether

$$7 + 3 = 5 + 5$$

$$5 + 5 = 3 + 7$$





# The National Curriculum for mathematics aims to ensure that all pupils:

become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems

**reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

# The importance of mathematical reasoning and problem solving

- Mathematical reasoning, even more so than children's knowledge of arithmetic, is important for children's later achievement in mathematics
- "Children's ability to reason about mathematical relations was easily the most powerful predictor of children's mathematical achievement, out of all the relevant cognitive measures...It strongly predicted their mathematics achievement in Key Stage 2 and 3 assessments"

Nunes, T. (2009) Development of maths capabilities and confidence in primary school, Research Report DCSF-RR118 (PDF)

# Conjecture, explain, convince

- If you add 0 to a number the number stays the same



TRUE OR FALSE

$$4 + 6 + 8 > 3 + 7 + 9$$

# Solving problems

- 2 Put the numbers 6, 7, 8, 9, 10 and 11 into the boxes.

Use each number only once.

$$23 + 10 + \square > 23 + 10 + \square$$

$$32 + \square + 5 < 32 + \square + 5$$

$$50 + 30 + \square = 49 + 29 + \square$$

- 1 These items are sold in a shop.



Ray buys three items.

Two of them were the same item.

He spent £23

Which items does he buy?



# The importance of a growth mindset

Research, conducted by Accenture, found that 60% of girls aged 12 surveyed in the UK and Ireland felt that mathematics and science were “too difficult” to learn and better suited to **boys** because of their brains, hobbies and personalities.



# Negative portrayal in the media



“Age is just a number  
and maths was never  
my thing.”

L'Oréal Paris advert changed 2015

Product withdrawn  
by EE January 2016  
after many  
complaints



DAVID & GOLIATH  
BLONDE PHONE  
SOCK - IM TOO  
PRETTY TO DO  
MATHS

£4.00

ADD TO BASKET

# Damaging maths mindset holding pupils back

30% wrongly believe that maths is a skill you are born with, rather than a skill that can be learnt.

“The cultural acceptability of saying 'I can't do maths'”

An international study (OECD) ranked the UK 26th out of 65 countries for maths ability.

Children in the UK the equivalent of 3 years behind peers in Shanghai.

# Mind set beliefs

- If you have a fixed mind set you believe that your abilities are fixed and that you can either do mathematics or you can't
- If you have a growth mind set you believe that you can learn and become better at mathematics
- Children who have a fixed mind set are at a significant disadvantage compared to children who have a growth mind set



# Ways to help children to develop/ maintain a growth mind set

- Believe all children can learn maths to a high level
- Show your child that you believe in their ability to learn by what you say and do – Carol Dweck talks about the power of saying “yet”
- Praise effort and strategies
- We will ensure at school that we provide challenging learning opportunities and opportunities for children to make mistakes - MARVELLOUS MISTAKES
- Celebrate mistakes, new learning and each child's progress

# Talking about our mathematics

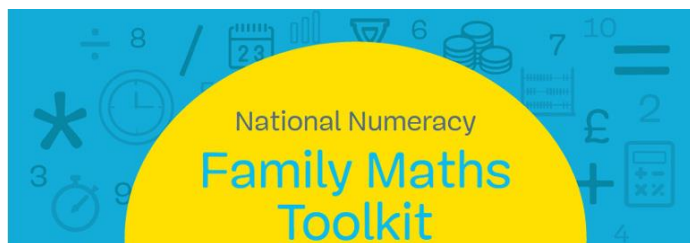
- Why do you think that ...?
- Can you explain why that is right?
- How did you reach that conclusion?
- How is that possible?
- Can you show me ...?
- Is there another way ...?
- What explanation do you think is best ...?
- Have you tried all the possible cases?



Once pupils' thinking is secure, then 'What if ...?' questions can be used to promote new ideas and to extend the scope or context of the problem.

# What can I do?

- Be positive about maths. Try not to say things like "I can't do maths" or "I hated maths at school" - your child may start to think like that themselves.
- Point out the maths in everyday life. Include your child in activities involving numbers and measuring, such as shopping, cooking and travelling.
- Praise your child for effort rather than for being "clever". This shows them that by working hard they



A website full of ideas, resources and activities that can help children up to 13 years old explore maths in everyday life.

# Try to make it fun

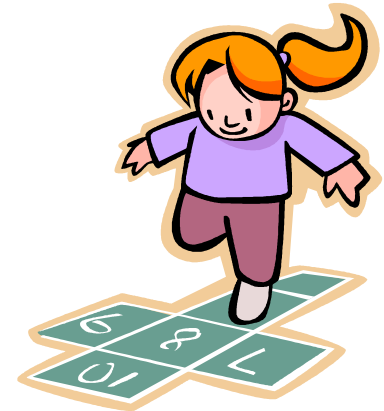


Try to make it real

Encourage children to ask questions  
and guide them in finding solutions

Engage in conversation

Encourage curiosity and a love of  
learning





## Parents

### Curriculum Guidance for Parents

How we have responded to suggestions

Christmas Performance Materials!!!

Parent Forms and Documents

School Clubs

Surrey Schools Term Dates

Parent view

School lunch menu

What our school stickers mean

Letters to Parents

## Curriculum Guidance for Parents

 [Parents little guide to reading](#)

 [Parent Flyer\\_Book talk.pdf](#)


 [Termly expectations for English and Maths.pdf](#)

### **Maths Guidance for Parents**

Please find below maths support for Years R-2, but please note that the guidance covers the whole primary curriculum ie Years R-6.


This guidance is produced by Oxford Owls.

 [Addition guidance](#)

 [Counting guidance](#)

 [Division guidance](#)


 [Multiplication guidance](#)

 [Subtraction guidance](#)

 [BABCOCK\\_New\\_Progression\\_In\\_Calculation-\\_Primary](#)

### **English Guidance for Parents**

Please find below English support for Years R-2, but please note the guidance covers the whole curriculum ie Years R-6.

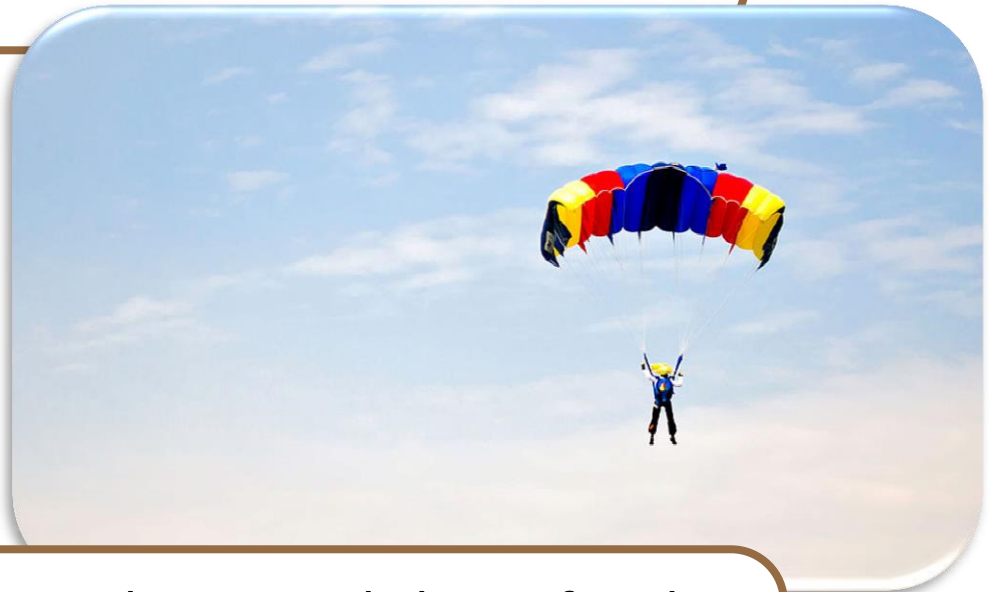
 [English Grammar Jargon Buster](#)

**Any questions ?**



“Minds are like parachutes, they only function when they are open.”

James Dewar (inventor of the vacuum flask)



If you have any suggestions about workshops for the future or any other questions please email me  
[amorgan@milford.surrey.sch.uk](mailto:amorgan@milford.surrey.sch.uk)