

## **TELFORD INFANT SCHOOL LOVING LEARNING**

**Every child to be an inquisitive, resilient and successful learner who is eager for their next challenge.**

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# **Maths in Year 2**

## **November 2018**



# Aims of this session

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- To provide an insight into our mastery approach to mathematics.
- To give ideas for supporting maths at home and keeping it fun.



**What does it mean to master something?**



# What does it mean to master something?

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- I know how to do it.
- It becomes automatic and I don't need to think about it (like riding a bike).
- I'm really good at doing it.
- I can show someone else how to do it.

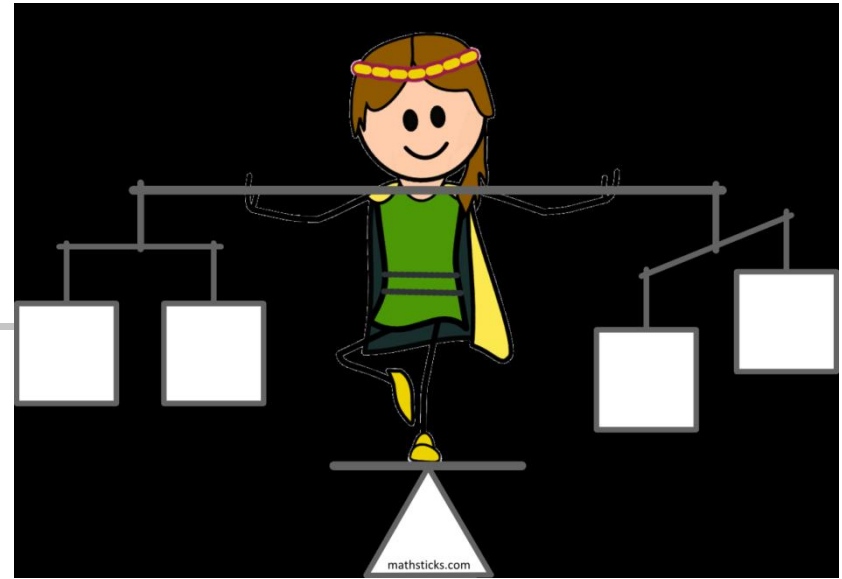


# Mastering maths also means...

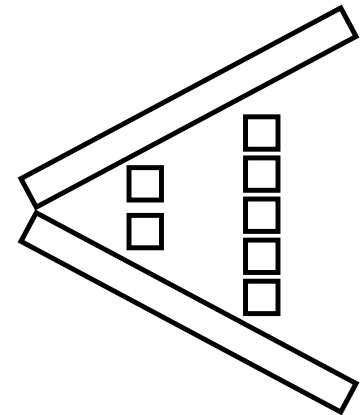
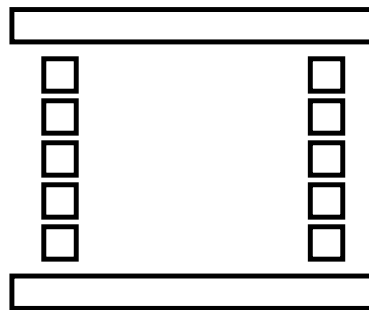
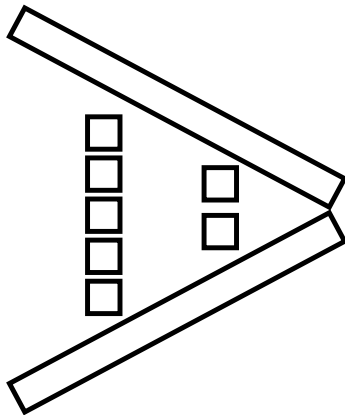
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- It is achievable for all
- Learning is deep and sustainable
- This builds a firm foundation for new learning
- Children can reason about a concept and make connections
- Children are fluent – with concepts and different methods

# Key concepts



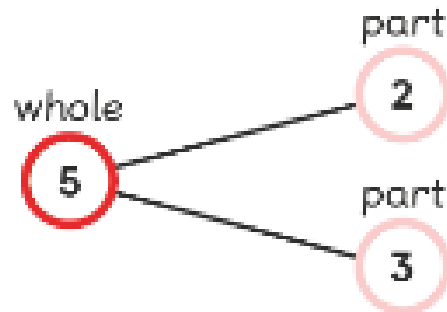
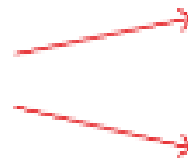
- Size and order of numbers



# Key concepts

- Structure of numbers

Put 5 cupcakes on two plates.



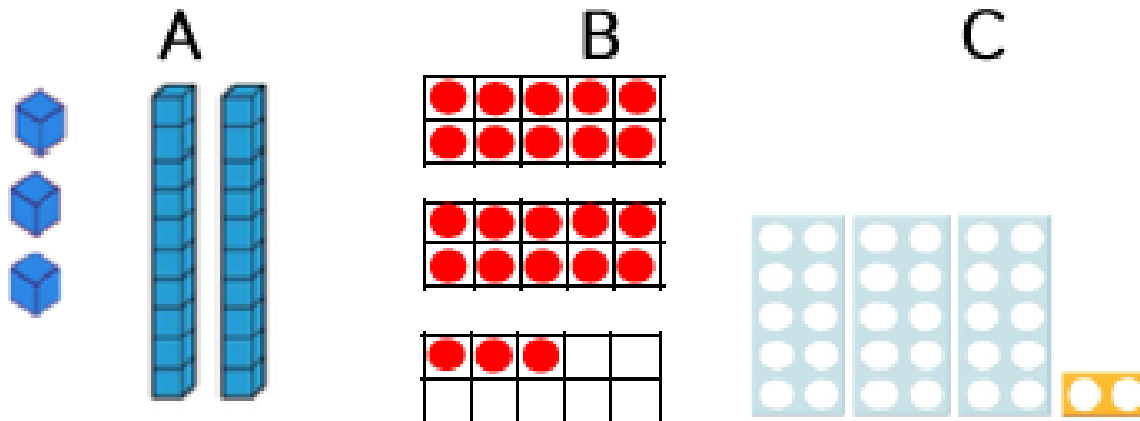
2 and 3  
make 5.

This is a number bond.

# Key concepts

- Place value

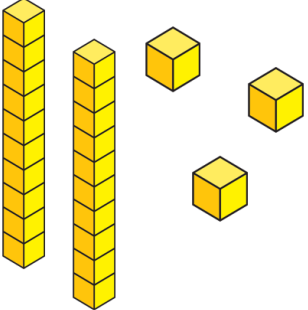
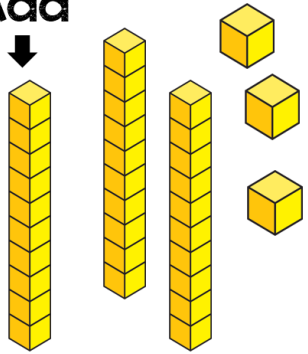
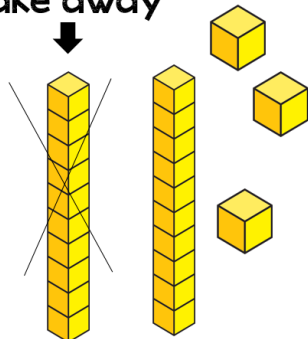
One of these images does not show 23.  
Can you explain the mistake?





# Key concepts

- Place value

<p>Make the number 23</p> 	<p>“What is 10 more than 23?”</p> <p><b>Add</b></p> 	<p>“What is 10 less than 23?”</p> <p><b>Take away</b></p> 
<p><b>23</b></p>	<p><b>23</b> 33</p>	<p>13 <b>23</b> 33</p>

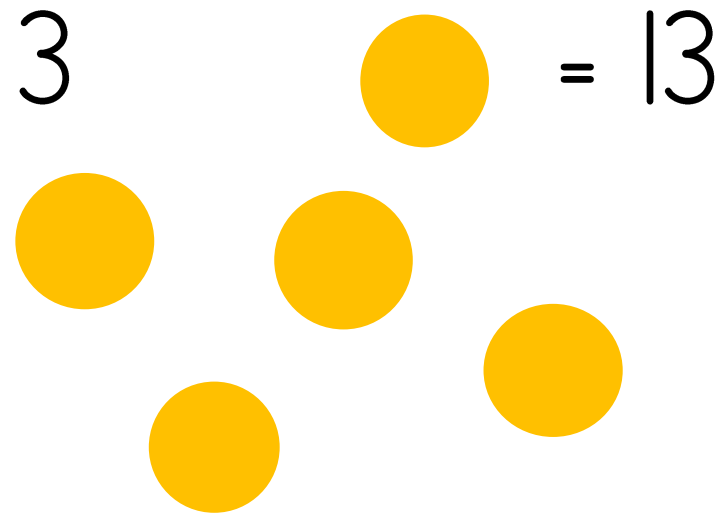
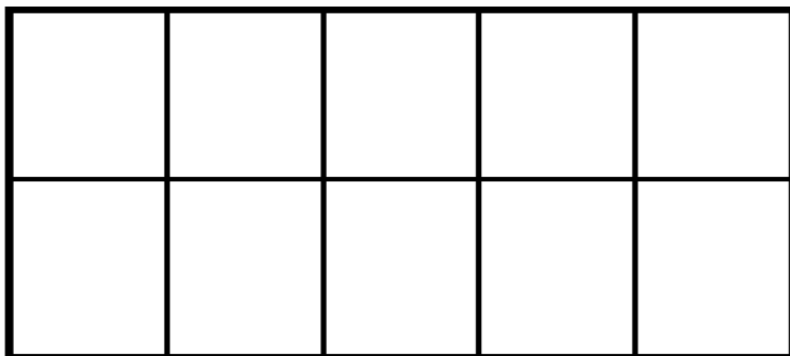
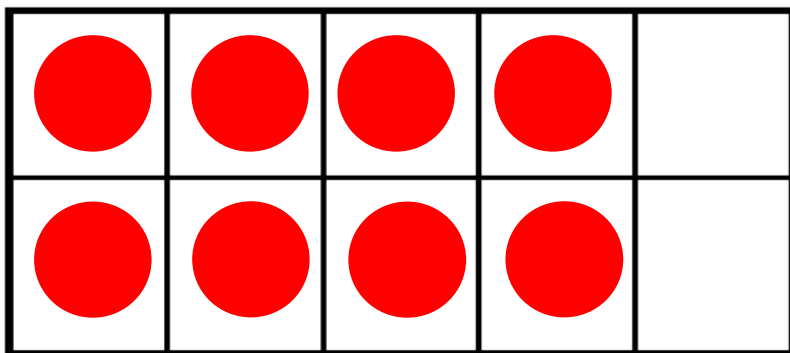


# Key concepts

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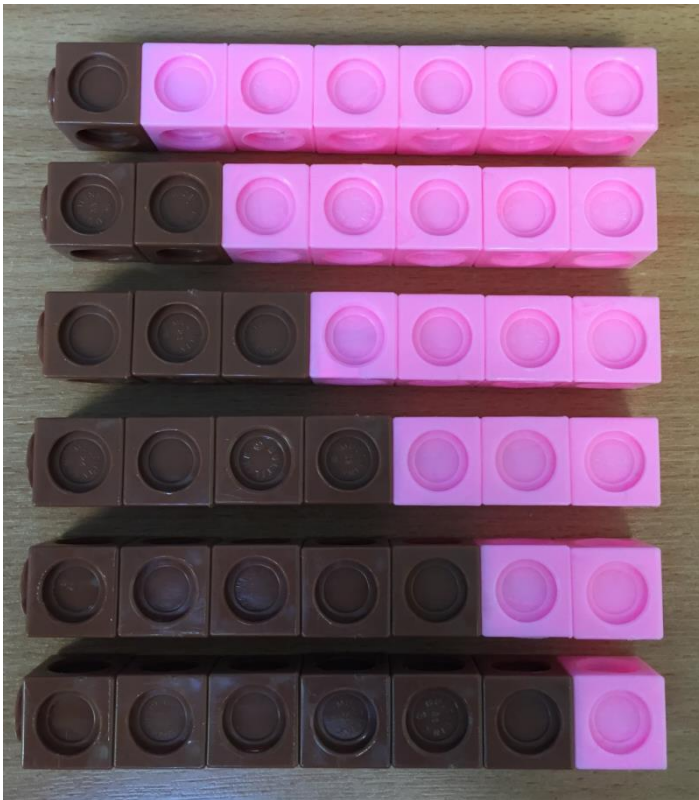
- Number structure and place value

$$8 + 5 = 8 + 2 + 3$$



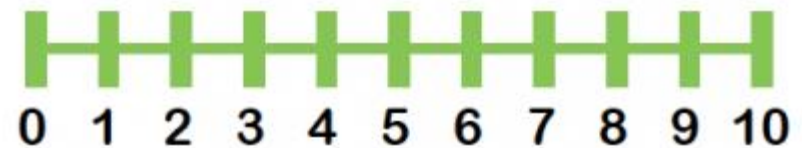
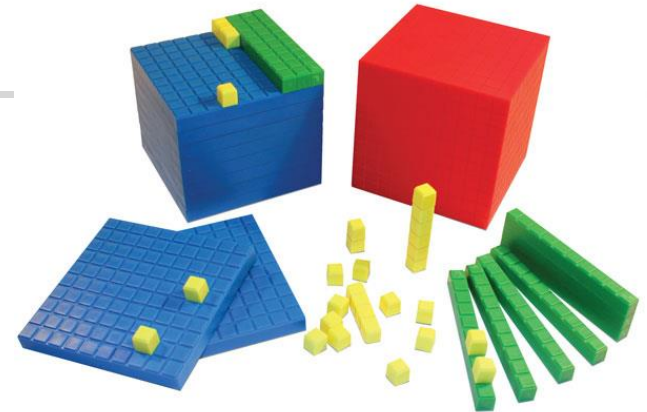
$$= 13$$

# Representations

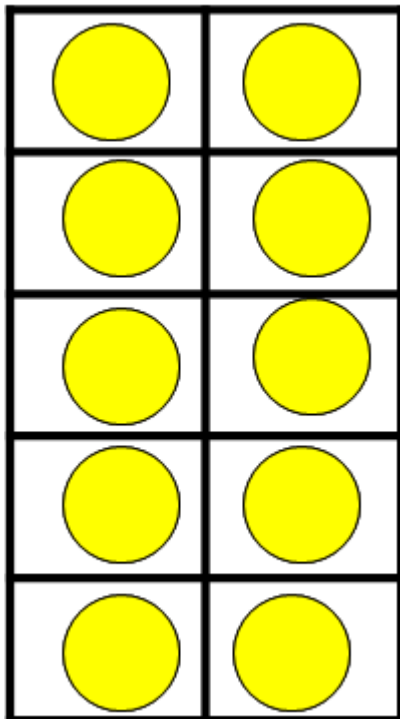


# Representations

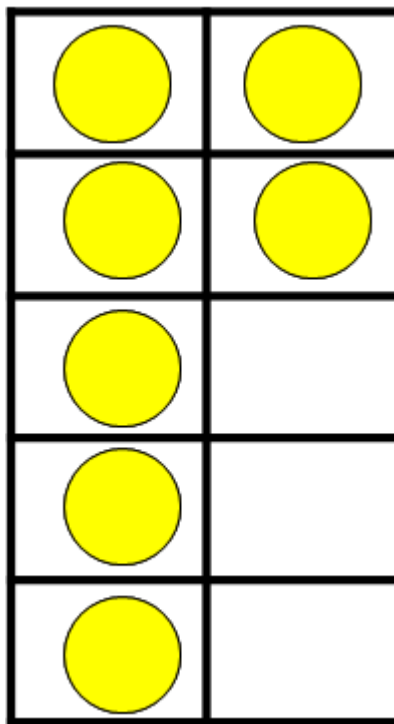
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



# Representations



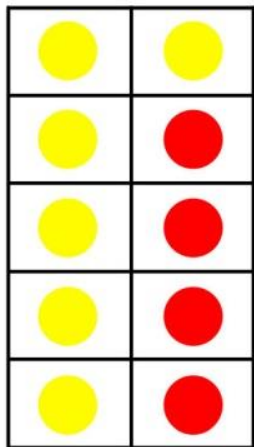
Ten frame



*Seeing pattern and structure is important in a mastery curriculum*

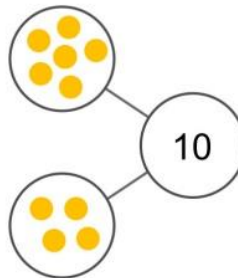
$$\begin{array}{l} 6 + 1 = 7 \\ 5 + 2 = 7 \\ 4 + 3 = 7 \\ 3 + 4 = 7 \\ 2 + 5 = 7 \\ 1 + 6 = 7 \\ 0 + 7 = 7 \end{array}$$

# Representations



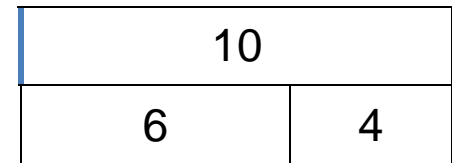
$$\begin{aligned}6 + 4 &= 10 \\4 + 6 &= 10 \\10 - 4 &= 6 \\10 - 6 &= 4\end{aligned}$$

Tens Frame



$$\begin{aligned}6 + 4 &= 10 \\4 + 6 &= 10 \\10 - 4 &= 6 \\10 - 6 &= 4\end{aligned}$$

Part Whole Model



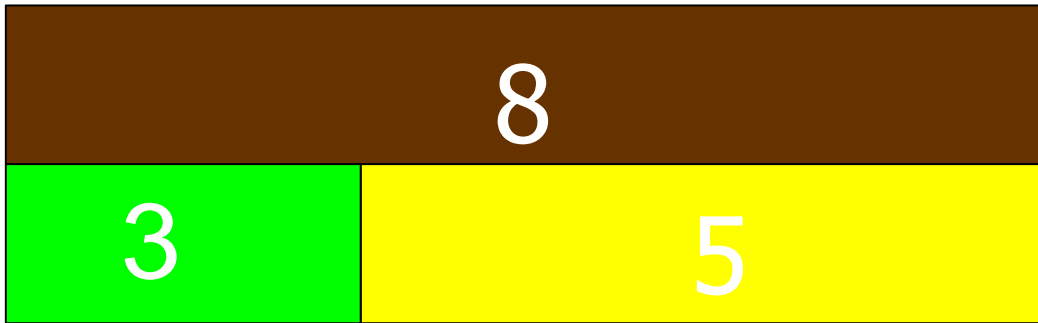
$$\begin{aligned}6 + 4 &= 10 \\4 + 6 &= 10 \\10 - 4 &= 6 \\10 - 6 &= 4\end{aligned}$$

Bar Model



# Representations

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$$\square + \square = \square$$

$$\square + \square = \square$$

$$\square - \square = \square$$

$$\square - \square = \square$$

*Identification of relationships and making connections supports deep and sustainable learning and paves the way for later learning.*



# Paving the way for later learning

10	
6	4

$$6 + 4 = 10$$

$$4 + 6 = 10$$

$$10 - 6 = 4$$

$$10 - 4 = 6$$

62	
34	28

$$34 + 28 = 62$$

$$28 + 34 = 62$$

$$62 - 34 = 28$$

$$62 - 28 = 34$$

6.2	
3.4	2.8

$$3.4 + 2.8 = 6.2$$

$$2.8 + 3.4 = 6.2$$

$$6.2 - 3.4 = 2.8$$

$$6.2 - 2.8 = 3.4$$



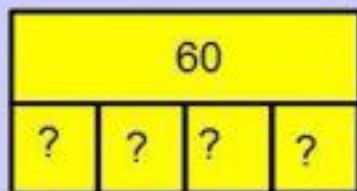
# A versatile way of representing problems

Whole unknown...



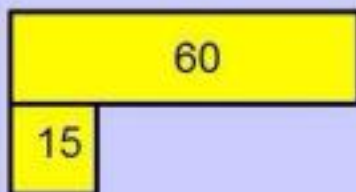
4 children go to the cinema. They each pay £15. How much do they spend altogether?

Size of groups unknown...



4 children go to the cinema. They each pay £60 altogether. How much do they spend each?

Number of groups unknown...



Tickets to the cinema are £15. Some children buy tickets that cost £60. How many children bought tickets?



# Written methods for calculation

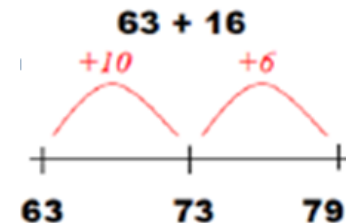
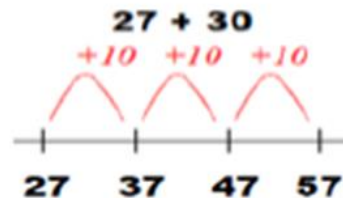
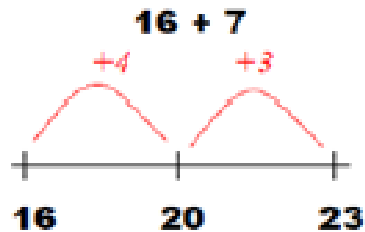
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- These build on and relate to the concrete methods the children use first.
- They help the children to see the underlying maths.

# Written methods for calculation

## ■ Blank numberline

- for addition and subtraction, eg:



## ■ Arrays

- for multiplication



$$5 \times 3 = 15$$

$$3 \times 5 = 15$$

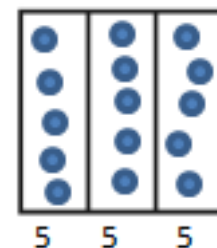
$$5 \times 3 = 3 + 3 + 3 + 3 + 3 = 15$$

$$3 \times 5 = 5 + 5 + 5 = 15$$

## ■ "Fraction boxes"

- to find  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  and  $\frac{1}{3}$

I need a fraction box with 3 parts because I am finding thirds.



I carefully share 15 dots and write the number in each section.



# Teaching for mastery

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- High expectations for every child.
- Fewer topics covered in greater depth.
- Number sense and place value come first.
- Problem solving is central.
- Challenge is provided through deep and rich problems, rather than accelerating on to new content or higher numbers.



# How we challenge

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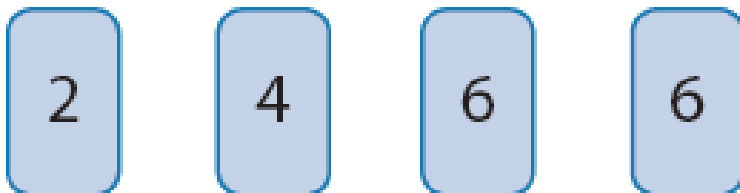
All children will be able to...

Put a circle around the larger number.

- 1) 50 48    2) 77 81    3) 78 87

Some children will explore the concept in greater depth...

Write all the 2-digit numbers greater than 40 using these digits.



How do you know you have them all? Prove it.



# How we challenge

---

All children will be able to...

Katie has 12 marbles.

Jim has 13 marbles more than Katie.

How many marbles does Jim have?

Some children will explore the concept in greater depth...

What digits could go in the boxes?

$$\square 2 + \square 5 = 87$$



## How we challenge

---

All children will be able to...

What is  $5 \times 4$ ? (5 times table)

What is  $10 \times 6$ ? (10 times table)

Some children will explore the concept in greater depth...

Which has the most biscuits:

4 packets of biscuits with 5 in each packet, or

3 packets of biscuits with 10 in each packet?

Explain your reasoning.



# Questioning

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- \_\_\_\_\_ thinks that, \_\_\_\_\_. Do you agree? Explain your answer.
- Is it always true, sometimes true or never true that \_\_\_\_\_?
- Can you spot the mistake? Explain why they are wrong.
- What is the same and what is different?

*Children answer in full sentences and use stem sentences to develop their understanding.*



# Maths talk

- \* Full sentences instead of one-word answers.
- \* I say, you say, you say, you say, we all say.
- \* Sentence stems:

There are 12 stars.  $\frac{1}{3}$  of the stars is equal to 4 stars



Children use the same sentence stem to express other relationships. For example:

There are 12 stars.  $\frac{1}{4}$  of the stars is equal to 3 stars

There are 12 stars.  $\frac{1}{2}$  of the stars is equal to 6 stars



# How you can support at home

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- **See the maths leaflet on the website.**








## Supporting your child's learning: Maths in Reception, Year 1 and Year 2

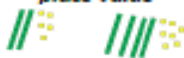
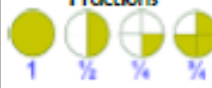
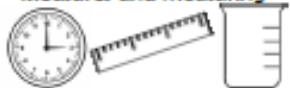


At Telford Infant School our aim is to make maths exciting, practical and relevant, to ensure that all our pupils develop as confident and independent mathematicians. We aim to develop:

Fluency	Reasoning	Problem-solving
Remembering and recalling number facts quickly. These include number bonds (pairs of numbers that make a given total), times tables, doubles and halves.	Seeing patterns, choosing appropriate strategies and being able to explain why.	Understanding when and how to use maths to tackle everyday problems and puzzles.

The aspects we focus on in Reception are:

Counting, ordering and recognising numbers 	Counting on and counting back $+1$ $-1$	Doubling, halving and sharing 
Shape 	Space 	Measures and measuring 

The aspects we focus on in Year 1 and Year 2 are:

Number and place value 	Addition and subtraction $+$ $-$	Multiplication and division $\times$ $\div$	Fractions 
Measures and measuring 	Geometry 	Statistics 	



Serious Learning, Serious Play, Serious Fun

Children become confident mathematicians by regularly talking about, playing with and experiencing numbers, counting, shapes and measurements in their everyday lives. Here are some ways that you can support your child with this at home.

1. Count anything and everything:



climbing stairs



walk for 20, skip for 20



counting small objects

Can you put 6 carrots in the bag?

help with the shopping

2. Sort things into groups:



cutlery



socks



cars

Which colour do you have most of?

3. Look for numbers, patterns and shapes when you are out and about:



door numbering

Which number will be next?  
Is it odd or even?



shapes all around

4. Sing songs:

*"Ten green bottles"*

*"Five fat sausages"*

*"Five little speckled frogs"*

*"Ten in the bed..."*

Find the biggest coin.  
Is it worth the most?

5. Handle coins, look for prices and pay for things:



Serious Learning, Serious Play, Serious Fun

If I give you 50p, how much change will I get?

6. Talk about time:



units of time

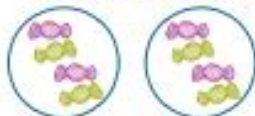


using a digital clock to read minutes



reading hours on a clockface

7. Group and share objects:



share between 2 people



how many groups of 3?

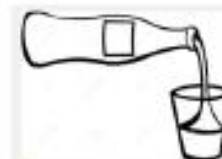
There are 5 of us here. If we have 2 biscuits each, how many will we eat altogether?

8. Using halves and quarters:

Is there a different way you could cut the sandwich into quarters?



cutting food



filling things half-way

9. Measure things:



weight



height



capacity

10. Play games:



Serious Learning, Serious Play, Serious Fun



# How you can support at home

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Maths is all around us. Look for maths problems you can solve together, making connections between what your child has been learning at school and the world around them.

- **Find numbers in the environment**
- **Follow a recipe**
- **Talk about the weather forecast**
- **Go shopping**
- **Plan an outing**
- **Use *Education City*!**



# Education City

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- Everyone has an individual log in.
- Lots of activities in all curriculum areas.