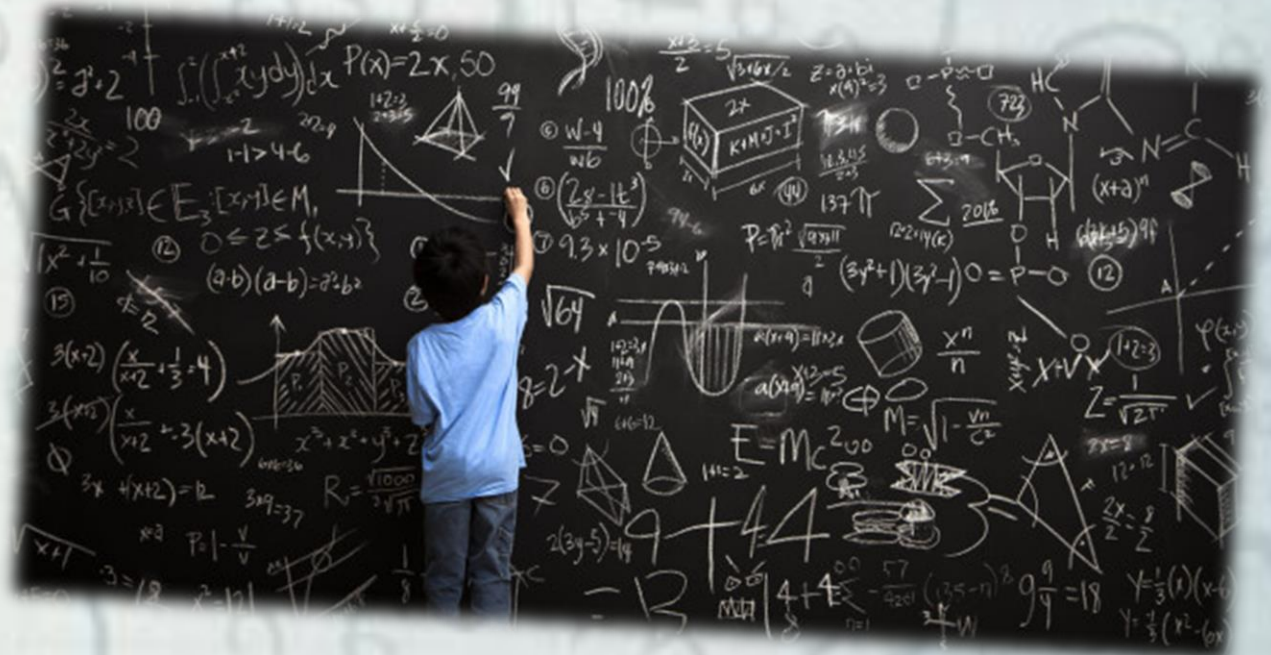


# Maths Open Classroom

# Understanding How Your Child Is Taught Maths



## *This Afternoon:*

- ❖ Gain an overview of how concepts are taught
- ❖ See the expectation at the end of the Key Stages
- ❖ Witness and take part in maths in action – open classrooms to explore



# Three Aspects Taught

FLUENCY

Conceptual Understanding

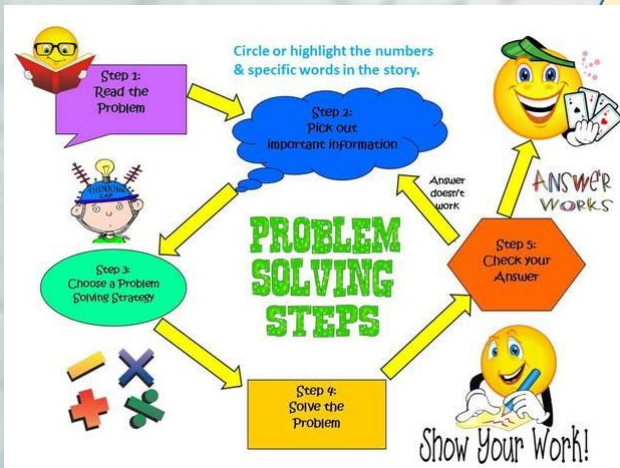
Rigor

Procedural Fluency

Application

VARIATION

REASONING &  
PROBLEM SOLVING



Use the strategies to help you work on the missing numbers:

5 + 0 = 5  
1 +  = 5  
2 +  = 5  
3 +  = 5  
4 +  = 5  
4 +  = 5

10  
4  
12  
1  
1  
12  
3  
9  
3 +  = 10

10  
4  
12  
2  
10  
12  
4  
?

Can you notice a pattern to find the final missing number?

# Fluency



Fluency is at the centre of the updated National Curriculum for maths. In this context, “fluency” refers to knowing key mathematical facts and methods and recalling these efficiently. ... It is widely acknowledged that practice, drill and memorisation are essential if students are to become mathematically fluent.



# *Fluency:*

## **Fluency involves:**

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics
- The ability to recognise relationships and make connections in mathematics

*Number Facts*

*Times Tables*

*Making  
Connections*

- Compare these two multiplication exercises.
- Which supports the development of fluency better? Why?

$8 \times 5 =$	$8 \times 3 =$	$9 \times 4 =$	$9 \times 4 =$	$7 \times 9 =$	$1 \times 4 =$
$2 \times 8 =$	$5 \times 2 =$	$3 \times 9 =$	$6 \times 3 =$	$6 \times 8 =$	$8 \times 5 =$
$1 \times 1 =$	$3 \times 8 =$	$2 \times 5 =$	$9 \times 2 =$	$7 \times 7 =$	$4 \times 6 =$

$2 \times 3 =$

$6 \times 7 =$

$9 \times 8 =$

$2 \times 30 =$

$6 \times 70 =$

$9 \times 80 =$

$2 \times 300 =$

$6 \times 700 =$

$9 \times 800 =$

$20 \times 3 =$

$60 \times 7 =$

$90 \times 8 =$

$200 \times 3 =$

$600 \times 7 =$

$900 \times 8 =$

# *Variation:*

## Variety

- 'Pick and mix'
- Most practice exercises contain variety

## Variation

- Careful choice of WHAT to vary
- Careful choice of what the variation will draw attention to

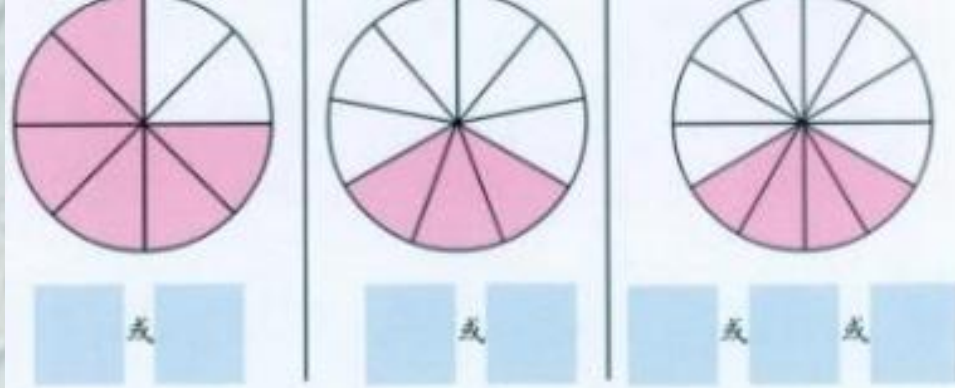
*Procedural*

*Conceptual*

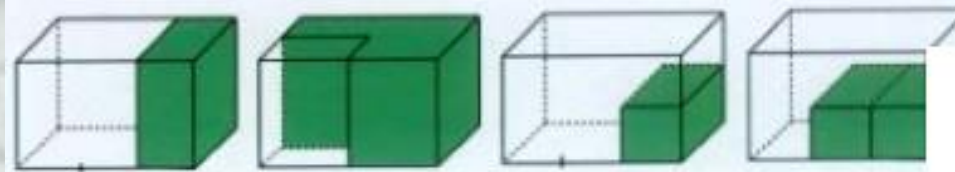
*Making  
Connections*



# What is a fraction?



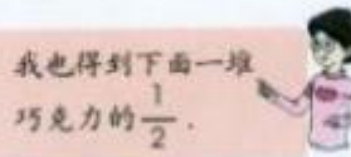
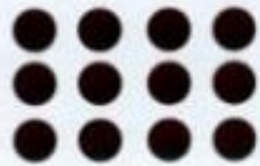
2. 绿色部分是长方体的几分之几? 用分数表示。



他们得到的巧克力一样多吗?



我得到下面一堆巧克力的  $\frac{1}{2}$ 。



我也得到下面一堆巧克力的  $\frac{1}{2}$ 。



A. Use fractions to express the coloured parts.



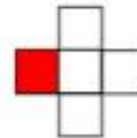
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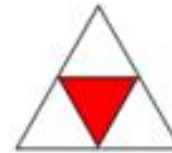
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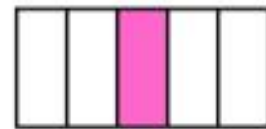
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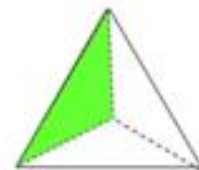
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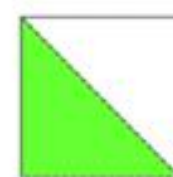
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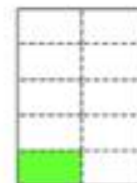
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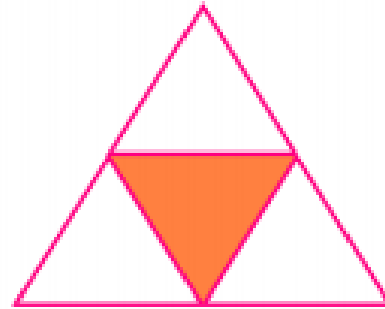
True or false?



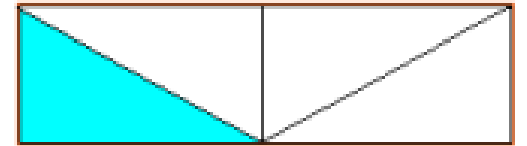
$$\frac{1}{4}$$



$$\frac{1}{5}$$



$$\frac{1}{3}$$



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

## Developing Variation:

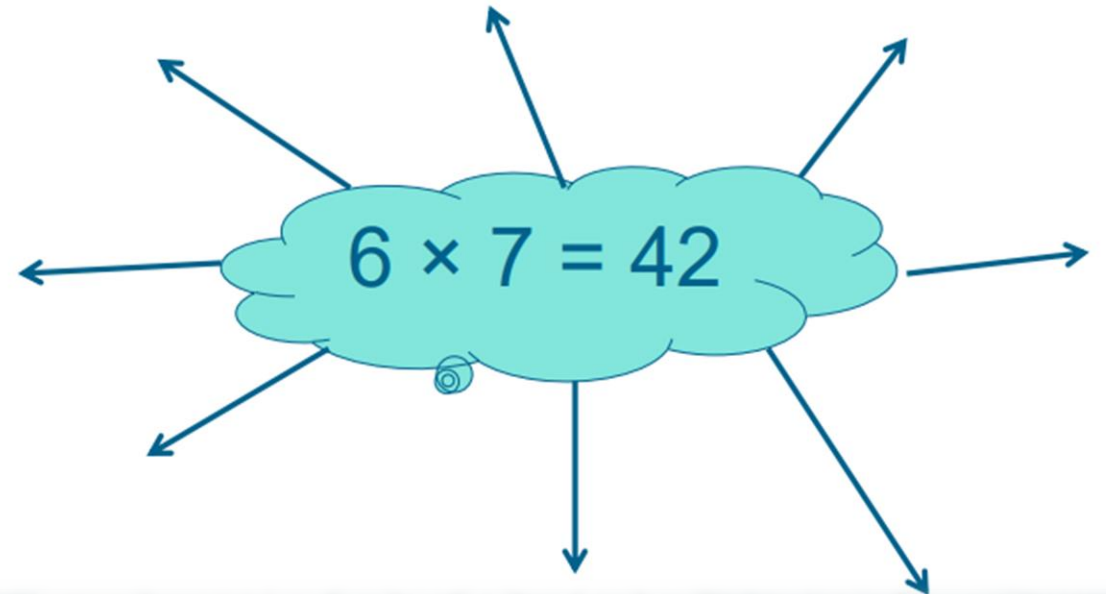
In how many different ways?

... can you show that:

$$6 \times 7 = 42$$

If you know this what else do you know?

*MathsHUBS*





**Describing**

**Explaining**

**Justifying**

**Proving**



**What is Reasoning?**

**I already know  
that ...so...**

**This is different  
because...**

**I noticed that...**

**I used the fact  
that...**

**This is true here  
because...**

**It can't be ...  
because...**



### True or False

Explain your answers! ☺

$$12 \div 4 = 9 \div 3 \text{ true}$$

$$14 \div 7 = 10 \div 2 \text{ false}$$

$$10 \div 10 = 6 \div 2 \text{ false}$$

### Odd One Out

Which of these number sentences is the odd one out? Explain your reasoning.

$$15 \div 3 =$$

$$20 \div 4 =$$

$$18 \div 2 =$$

Two friends would like to buy some sweets from the shop but want to share them equally with none left over.

Which bag of sweets should they buy? How do you know?

15



16



9



# ARITHMETIC EXPECTATIONS KS1:

## Fluency:

$36 + 24 =$

$98 - 84 =$

$28 +$

$= 35$

$12 \times 5 =$

$22 \div 2 =$

$3 \times 4 =$



# REASONING EXPECTATIONS KS1:

Write a digit in each box to make the sum correct.

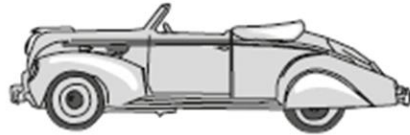
$$\begin{array}{|c|} \hline 7 \\ \hline \end{array} \begin{array}{|c|} \hline \\ \hline \end{array} + \begin{array}{|c|} \hline \\ \hline \end{array} = \begin{array}{|c|c|} \hline 8 & 3 \\ \hline \end{array}$$

Abdul has some toy cars.

He gives half of them to Ben.

He has four toy cars left.

How many toy cars did Abdul start with?



toy cars

Look at the numbers in this addition.

$$\begin{array}{|c|} \hline 9 \\ \hline \end{array} + \begin{array}{|c|} \hline 5 \\ \hline \end{array} = \begin{array}{|c|} \hline 14 \\ \hline \end{array}$$

Use the **same numbers** to make these correct.

$$\begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline \\ \hline \end{array} = \begin{array}{|c|} \hline 9 \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline \\ \hline \end{array} - \begin{array}{|c|} \hline 9 \\ \hline \end{array} = \begin{array}{|c|} \hline \\ \hline \end{array}$$

Write the missing number in the box.

$$\begin{array}{|c|} \hline \\ \hline \end{array} \div 2 = 7$$

# ARITHMETIC EXPECTATIONS KS2:

## Fluency

$$15.98 + 26.314 =$$

$$37.8 - 14.671 =$$

$$\begin{array}{r} 6574 \\ \times \quad 31 \\ \hline \end{array}$$

$$59 \overline{) 2242}$$



# REASONING EXPECTATIONS KS2:

Nadia is working with **whole** numbers.

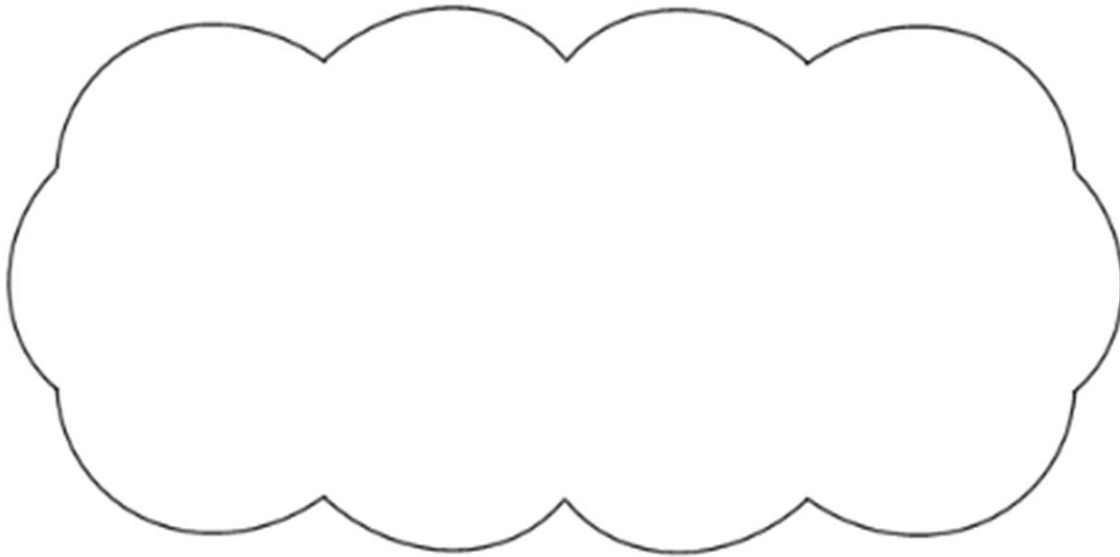
She says,

*'If you add a two-digit number to a two digit number you cannot get a four-digit number.'*

Is she correct? Circle Yes or No.

**Yes / No**

Explain why.



A box contains 2.6 kg of washing powder.



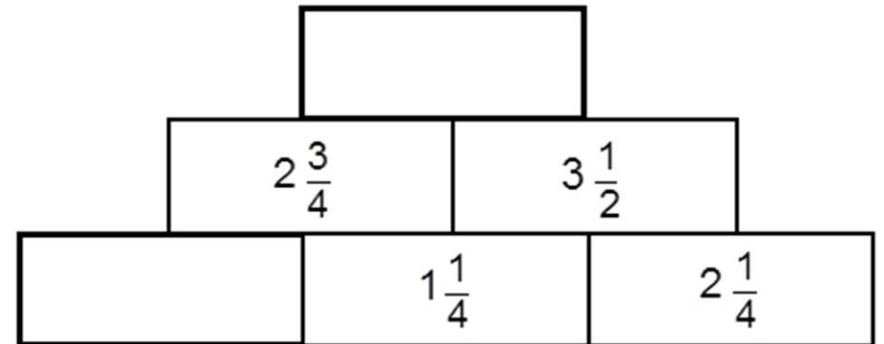
Jack uses 65 grams of powder for each wash.

He uses all the powder.

How many washes did Jack do?

In this diagram, the number in each box is the **sum** of the two numbers below it.

Write the missing numbers.



# TIMES TABLES:

## Timetable Challenge x2



If you know that  $2 \times 3 = 6$ , you know that  $2 \times 6 =$



If you know that  $14 = 7 \times 2$ , you know that   $= 14 \times 2$



If you know that  $10 = 5 \times 2$ , you know that   $= 10 \times 2$



If you know that  $11 \times 2$  is equal to 22,  
what is  $22 \times 2$  equal to?

$2 \times 3 = 6$	$2 \times 6 =$	$2 \times 12 =$	$2 \times 24 =$
$16 \times 2 = 32$	$8 \times 2 =$	$4 \times 2 =$	$2 \times 2 =$

$$2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 2 \times \text{$$

How many 2s are  
there in 18?

$$2 + 2 + 2 + 2 + 2 + 2 = 2 \times \text{$$

How many 2s are  
there in 24?

Mike says,

***'Every multiple of 2 ends in 2'***

Is Mike correct? YES/NO **Explain** how you know:



