Warm up your brain while you wait…

Order these sets of numbers from smallest to largest:

9.9	9.09	9.099	9.99
6.56×10	665	1 tenth of 6556	
-5.5	-5.05	-5.55	-5.055
0.12	13÷100	0.011	

Hide Answers

Maths Curriculum Evening

Our purpose tonight is:

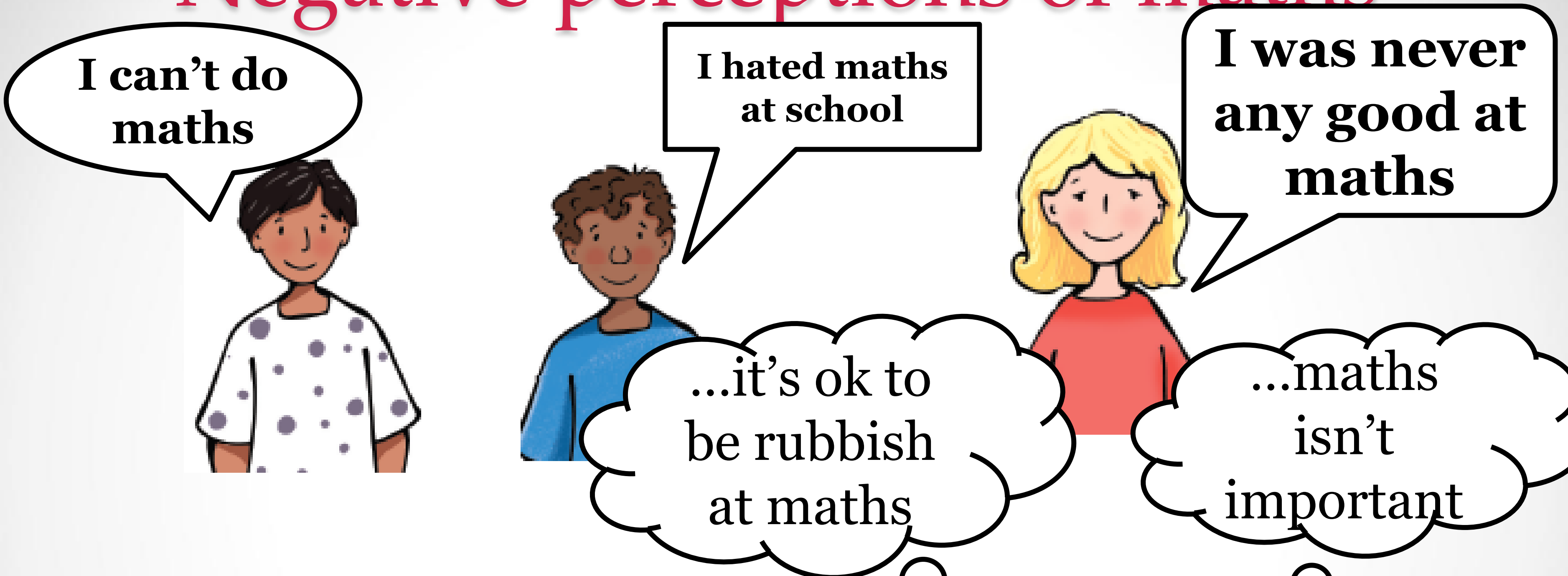
- MINDSET – success for all
- Give background to why we teach maths using a 'mastery approach'
- Explore the key ideas in our maths teaching
- Explain some of the concepts and models your children will be using
- Allow you to explore the manipulatives
- Give you the opportunity to ask questions

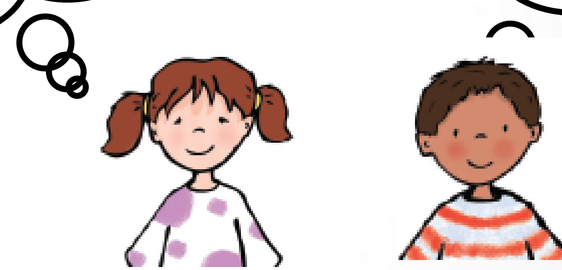
Success for all

We believe that ***everyone*** *can get better at maths…when they put in the* ***effort*** *and work at it.*

•

Negative perceptions of maths





- Self-fulfilling prophecy
- There is no maths gene
- Develop perseverance and resilience and good 'habits of mind'.

How can we overcome negative perceptions of maths?

Intelligence is fixed

I need to be viewed as able

When the going gets tough … I get found out

Ability leads to success

- Portray challenges, effort, and mistakes as highly valued <u>for all pupils</u>.

- Praise and feedback on the process.

From Dweck C., Mindsets and Math/Science achievement, Stanford University, 2008

Types of praise

I am amazed that you have finished the task already - you are such a fast worker!

I like the way you tried to work that out. Your answer is very close – try again!

Great! You persevered and did well in your subtracting equations!

Well done on your maths test, you have learnt from the feedback I gave you last week and have improved.

I am impressed by how hard you have tried to work this out.

You scored 90% on your exam which is an 'A' grade! You are excellent at Maths!

I enjoyed marking your work. You got all the questions right! You are destined to be a mathematician when you grow up!

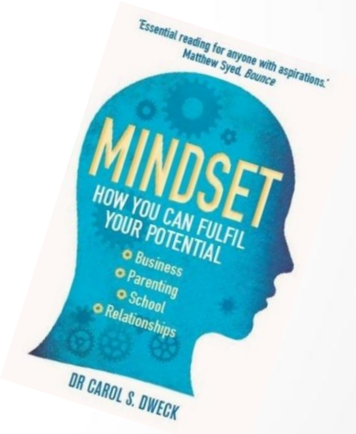
What is mindset?

Mindset is an idea developed by Dr. Carol Dweck.

A set of beliefs that determine somebody's behaviour and outlook in life.

Two types of mindset:

- A **fixed** mindset
- A **growth** mindset



Mindset: fixed vs growth

Two Beliefs about Intellectual Ability

- Innate Ability
- Effort-Based Ability

“I can’t do maths.”

A fixed mindset

- Ability and intelligence are innate and cannot be changed.
- Tend to give up easily with tasks and avoid challenges
- Feel threatened by the success of others.
- Ignore constructive criticism.

A growth mindset

- Intelligence can be developed over time through effort, dedication and hard work.
- Persevere with tasks and enjoy challenges.
- Setbacks and criticism are lessons to be learnt from.
- Inspired by and learn from the success of others.

Effort-based ability – growth mindset

Intelligence can grow

Effort leads to success

When the going gets tough … I get smarter

I only need to believe in myself

Success is the making of targets

When the going gets tough … dig in and persist

Innate ability

Intelligence is fixed

Ability leads to success

When the going gets tough … I get found out

I need to be viewed as able

Success is doing better than others

When the going gets tough … give up, it's hopeless

A Healthy Mindset is Key!

Maths, very much like sports or music, is a skill that needs practice.

Professor Brian Cox, *"I'm not a natural mathematician but few people are...you have to practice."*

Marcus du Sautoy (Professor of Maths at University of Oxford), *"Think of having a mathematical muscle in your mind that with practice gradually gets stronger." I particularly like this idea of a "mathematical muscle.*

A Healthy Mindset

A healthy mindset towards learning maths includes self-belief, confidence and the resilience to keep learning even when it gets tough.

- **Start with yourself and your partner**

Are you setting a good example?

Throw away remarks like

"I'm not good at maths," "I hated maths at school." These are picked up by children and influence their attitude to maths.

Making mistakes isn't bad, it's a necessary part of the journey for every learner. Change "I can't do it," to **"I can't do it yet."**

What do we mean by **Mastery?**

- **Deep and sustainable learning – for all**

  Depth is the key to avoiding the need to repeat teaching.
  It doesn't feel like we're starting again each term.

- **The ability to build on something that has already been sufficiently mastered**

  …for this stage of learning - Mastery is a continuum

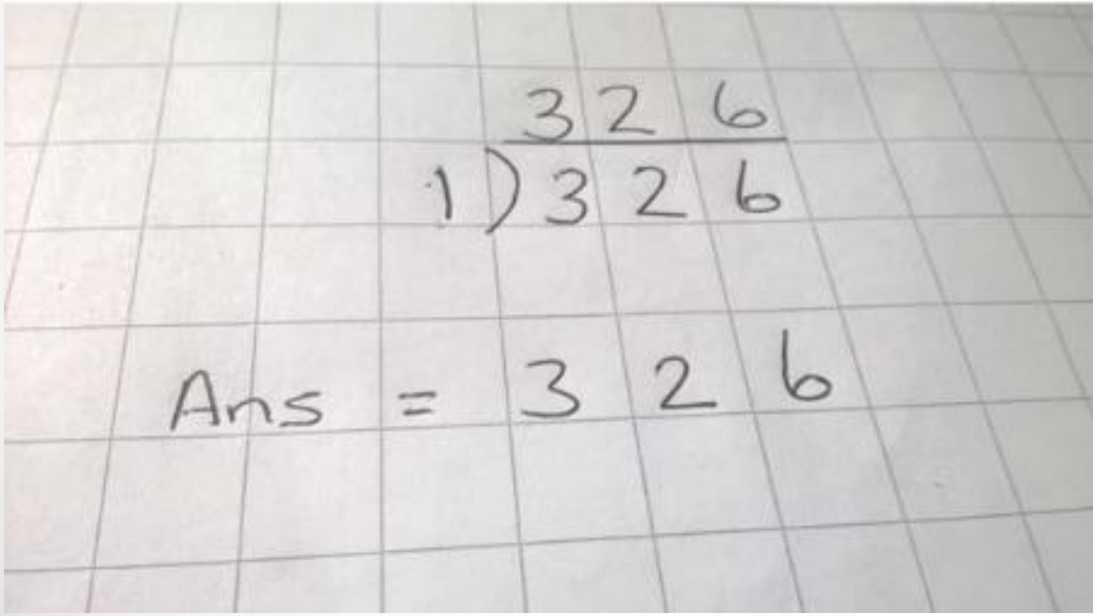
What do we mean by **Mastery?**

- **The ability to reason about a concept and make connections**
  - Cuts down on the amount I need to learn
    e.g. relating concepts of division, fractions and ratio
  - Deepens conceptual understanding

- **Conceptual and procedural fluency**
  - Move maths from one context to another. Recognise concepts in unfamiliar situations
  - Know number facts and tables, have efficient procedures

Does this show mastery?

$$326 \div 1 =$$



KS2
Arithmetic Paper

Teaching for Mastery

MathsHUBS

1. We ALL start the journey TOGETHER

2. Some children will need a little additional support along the way

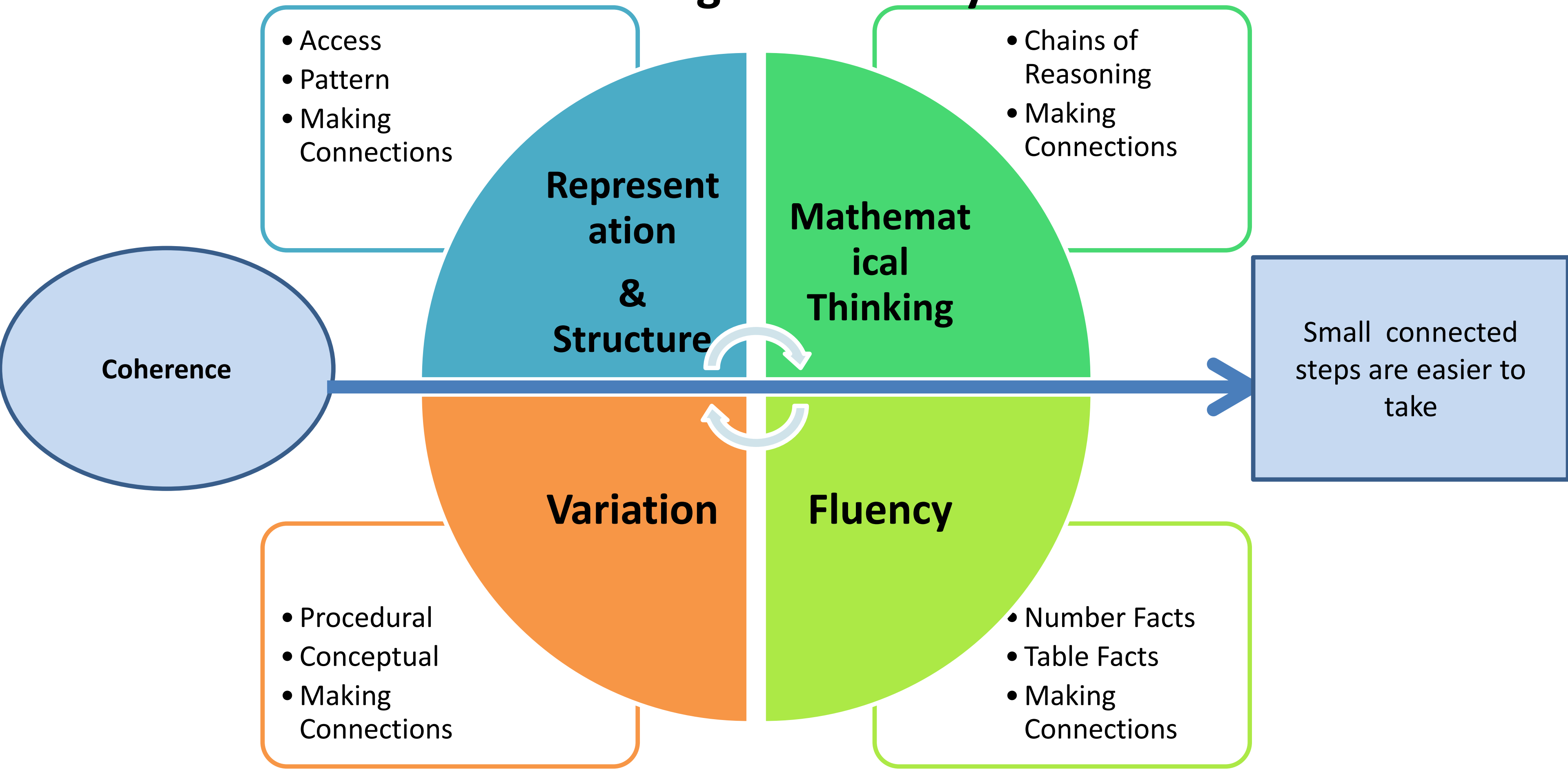
3. Some children, who feel confident, will be let loose. They'll be able to explore deeper into the woods, before returning to the group to continue on with the journey.

4. Children will not be racing off ahead on a different journey.

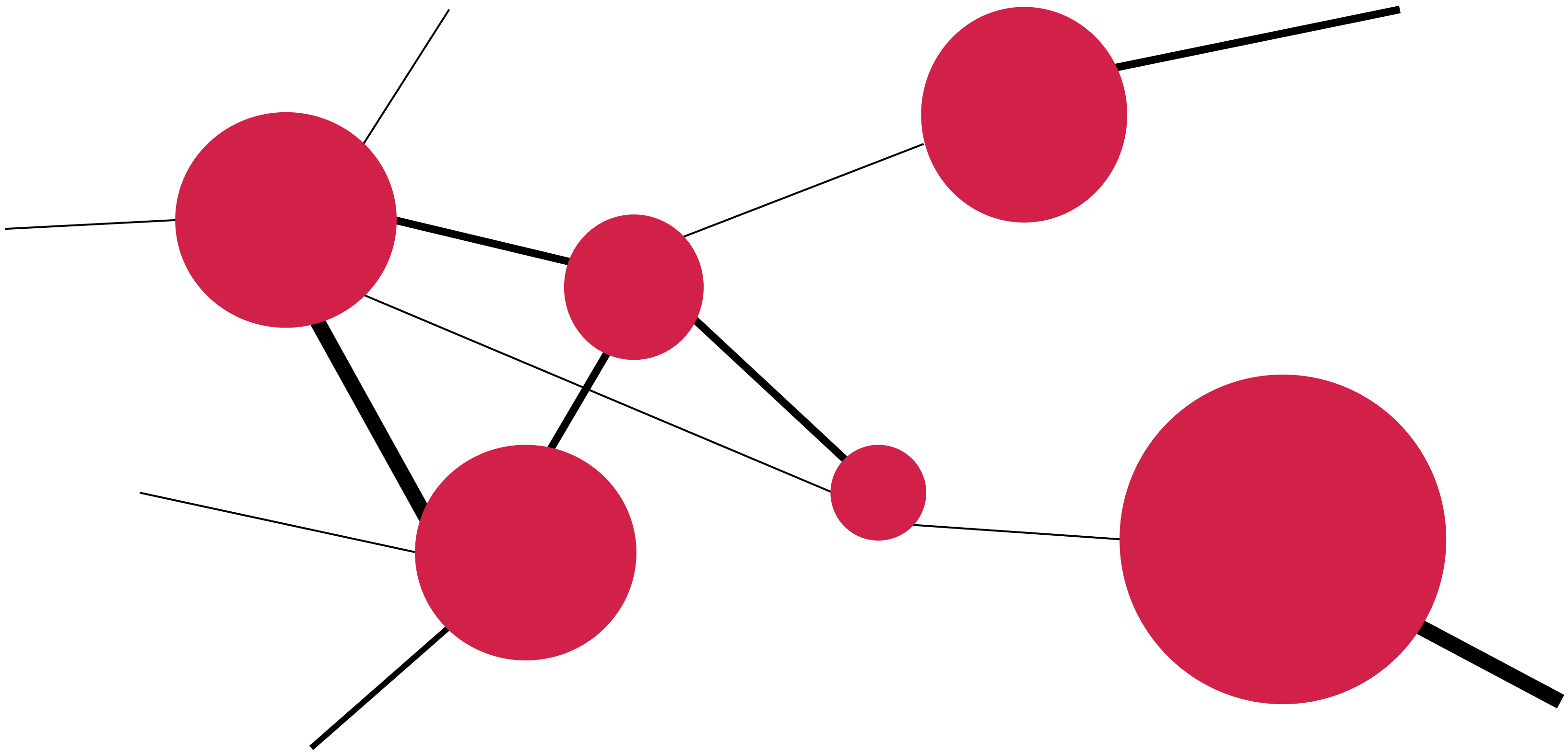
5. Children will not be left behind alone and isolated.

We're Going on a Maths Hunt

Teaching for Mastery

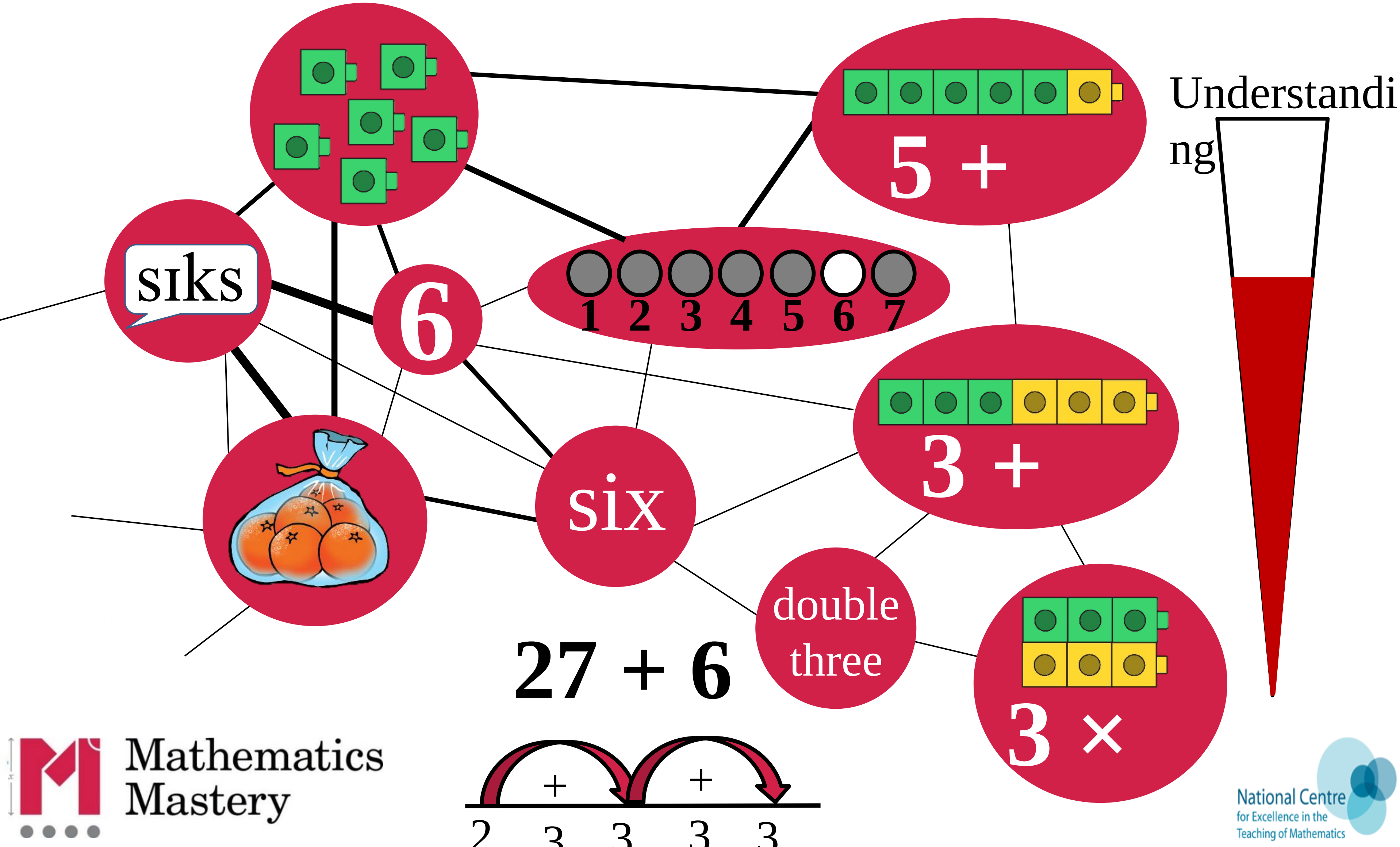


Number Sense & Making Connections – a model for understanding



Barmby et al. 1999

A representational-reasoning model of understanding



Mathematics Mastery

National Centre for Excellence in the Teaching of Mathematics

Number Sense and Fluency

What is Number Sense?

https://www.youcubed.org/resources/what-is-number-sense/

A few years ago a British politician, Stephen Byers, made a harmless error in an interview.

He was asked to give the answer to 7 x 8 and he gave the answer of 54, instead of the correct 56.

His error prompted widespread ridicule in the national media, accompanied by calls for a stronger emphasis on ‘times table’ memorisation in schools.

So, the Conservative education minister for England insisted that all students in England memorise all their times tables up to 12 x 12 by the age of 9. This requirement has now been placed into the UK’s mathematics curriculum.

Unfortunately misinterpretations of the meaning of the word ‘fluency’ are commonplace and publishers continue to emphasise rote memorisation, encouraging the persistence of damaging practices across the country.

So as teachers and parents, what must we do?

Mathematics facts are important but the memorisation of maths facts through times table repetition, practice and timed tests cannot be the only way to learn them as this method alone is damaging.

The English minister's mistake when he was asked 7 x 8 prompted calls for more memorisation. This was ironic as his mistake revealed the **limitations of memorisation without 'number sense'.**

People with number sense are those who can use numbers flexibly

When asked to solve 7 x 8 someone with number sense may have memorized 56 but they would also be able to work out that 7 x 7 is 49 and then add 7 to make 56, or they may work out ten 7's and subtract two 7's (70-14).

They would not have to rely on a distant memory. Math facts, themselves, are a small part of mathematics and they are best learned through the use of numbers in different ways and situations.

It is useful to hold some maths facts in memory.

I don’t stop and think about the answer to 8 plus 4, because I know that maths fact. But I learned maths facts through using them in **different mathematical situations**, not by practicing them and being tested on them.

Number sense is something that is much more important for students to learn, and that includes **learning of maths facts along with deep understanding of numbers and the ways they relate to each other**.

A sledgehammer to crack a nut!

1000
\- 7
993

16
\- 9
7

97
x 100
00
000
9700
9700

08
7) 56

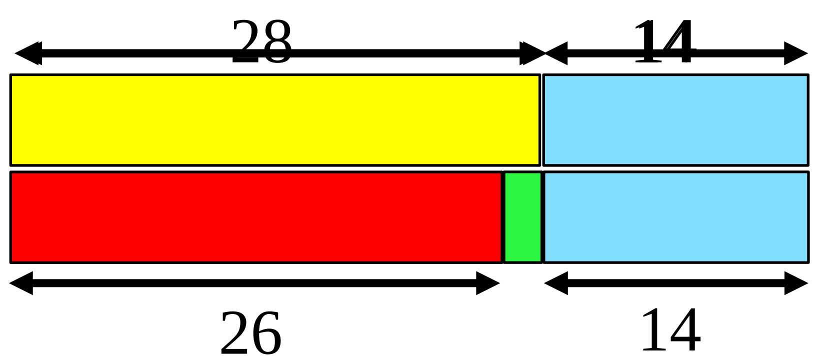
What does poor number sense look like?

- Children with poor number sense are **<u>procedure focused</u>** and will tend to **<u>rely on methods that they feel secure with</u>**. They apply inefficient and immature strategies to calculations and **<u>fail to spot links and connections</u>** that could get them to the answer more quickly.

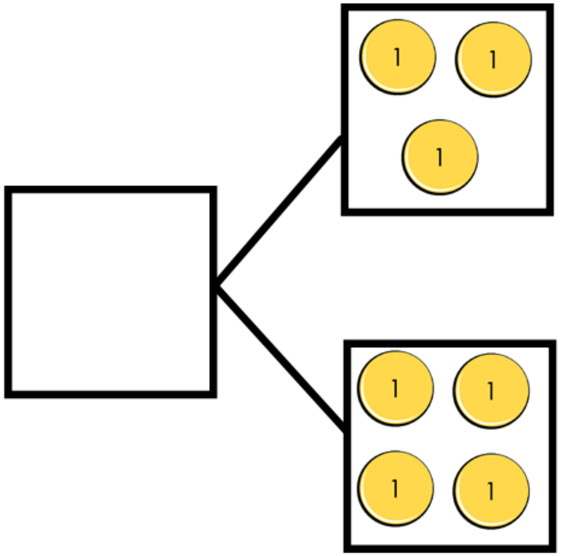
- They **<u>prefer to use pen and paper</u>** rather than work things out in their heads. They are **<u>reluctant to estimate</u>** an answer before working it out and will generally accept whatever answer they get, without considering whether it is reasonable or not.

How would you do...?

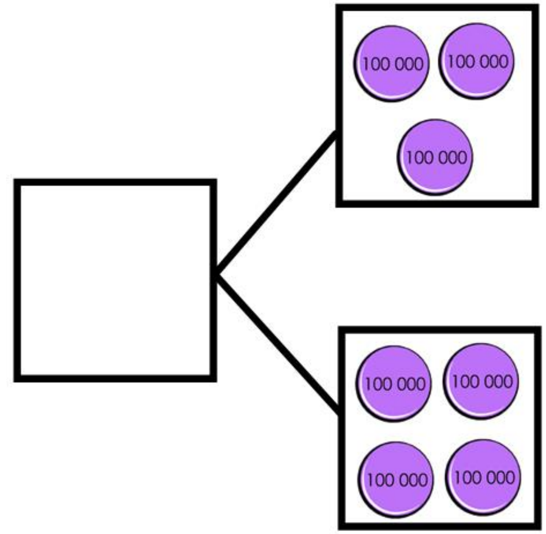
$$14 + 28 = 26 + \_\_\_\_$$

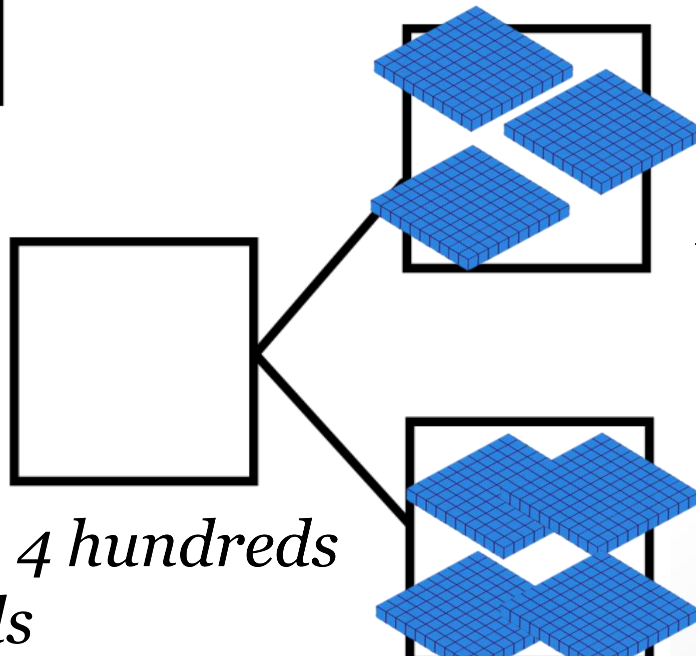


Deriving from known facts



I know 3 + 4 is equal to 7





I know 3 hundred thousands add 4 hundred thousands is equal to 7 hundred thousands

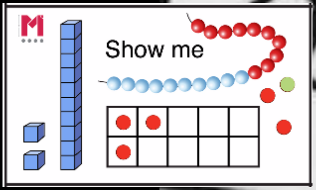
I know 3 hundreds + 4 hundreds is equal to 7 hundreds

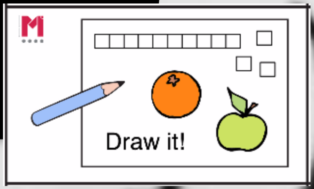
Number talk

Mentally evaluate 173 + 29

Explain your method

Did anybody do it in a different way?





From the KS2 paper 2016

18	122,456 – 11,999 =	1 mark

From the KS2 paper 2016

16	$15.98 + 26.314 =$	1 mark

Ideas for Activities

- Addition Facts: Snap it!
- Multiplication Facts: How close to 100 - *let's play!*
- Maths Cards – alternative to flash cards

Take a pack and play these games at home with your child. These games are just a few to get you started in exploring the underlying Maths involved.

Deep conceptual understanding = flexible and fluent!

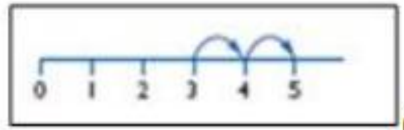
Activity – Take your finger for a walk!

0·01	0·02	0·03	0·04	0·05	0·06	0·07	0·08	0·09
0·1	0·2	0·3	0·4	0·5	0·6	0·7	0·8	0·9
1	2	3	4	5	6	7	8	9
10	20	30	40	50	60	70	80	90
100	200	300	400	500	600	700	800	900
1000	2000	3000	4000	5000	6000	7000	8000	9000
10000	20000	30000	40000	50000	60000	70000	80000	90000

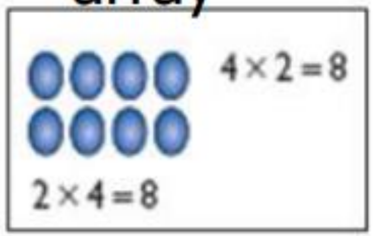
Resources to help build concepts

Numicon

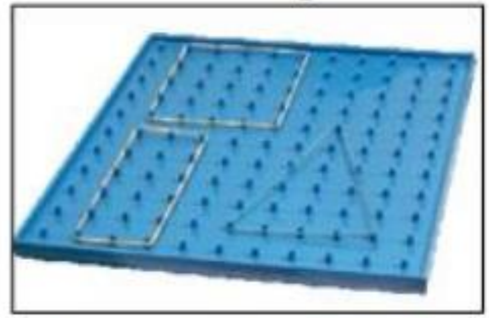
number line



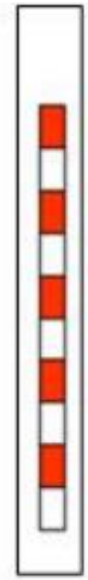
array



geoboard

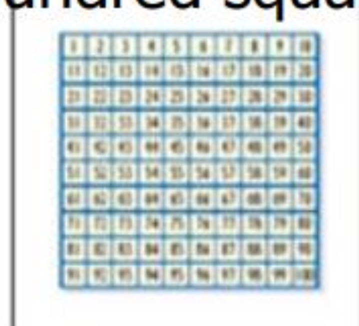


counting stick or metre rule

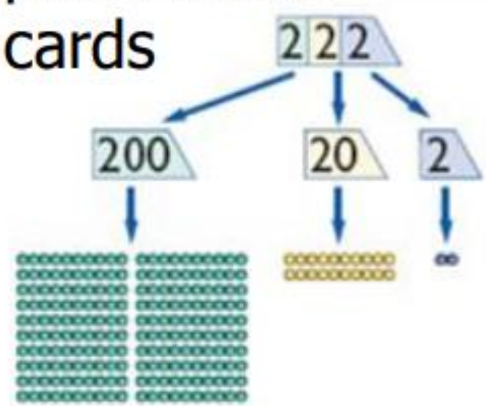


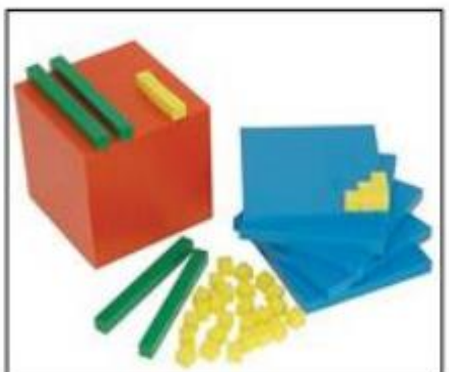
empty number line

hundred square



place value cards



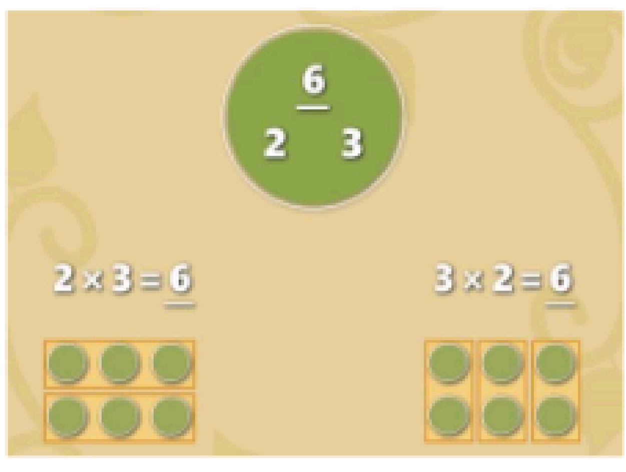


Dienes blocks
base-ten blocks

bead string

Fact Families

- A technique used to learn key facts and help spot patterns and relationships.



Addition Strategies

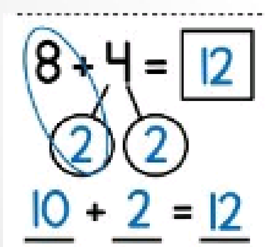
- **Doubles**

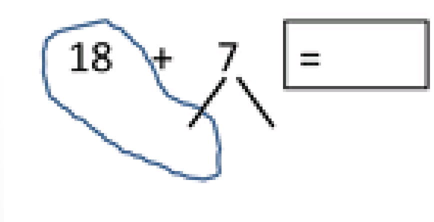
15 + 15 = 30

- **Near doubles**

15 + 16, 8 + 7, 25 + 24

- **Bridging 10**

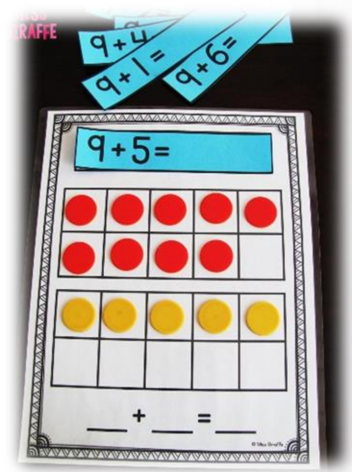




- **Fast Nines**

9 + 5 = 10 + 5 – 1 = 14

59 + 34 = 60 + 34 – 1 = 93



How would you solve these?

- 25 + 42
- 25 + 27
- 25 + 49
- 78 + 199
- 145 +127

Subtraction Strategies

- Add up to find the difference

$84 - 37 = ?$

$37 + \underline{3} = 40$

$40 + \underline{40} = 80$

$80 + \underline{4} = 84$

I added 3, 40, and 4 or a total of 47.
$84 - 37 = 47$.

- Near Multiples

74 − 39 = ?

First subtract $74 - 40 = 34$, since 40 is close to 39 and an easy number to subtract.
But, you subtracted <u>one too many</u>.
Therefore, add 1 to the answer: $34 + 1 = 35$.

81 − 57 = ?

First subtract $81 - 60 = 21$, since 60 is close to 57 and an easy number to subtract.
But, you subtracted <u>three too many.</u>
Therefore, add 3 to the answer: $21 + 3 = 24$.

Subtraction Strategies

- Number split

53 − 8
= 53 − 3 − 5
= 50 − 5 = 45

Subtract 8 in two parts: first 3, then 5.

220 - 50 =

330 - 60 =

- Fast Nines

179 – 30 = 180 – 30 + 1 = 151

- Thinking Addition

- counting on

71 – 67 = ??

Think: 67 + ____ = 71

How would you solve these?

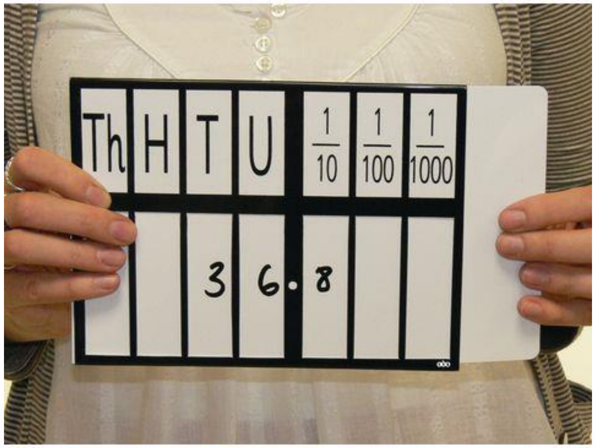
- 67 - 45
- 67 - 59
- 178 - 99
- 3241 - 2167

Multiplication Strategies

- Basic facts (powers of 10)

7 x 6 = 42 to calculate 70 x 6 = 420

4 x 6 = 24 to calculate 400 x 6 = 2400



Multiplication Strategies

- Partition and recombine

46 X 8

A student might think:

40 x 8 + 6 x 8

and recombine as

320 + 48 = 368

25 X 28

A student might think:

25 x (4 x 7)

25 x 4 = 100

7 x 100 = 700

15 X 24

A student might think:

(3 x 5) x (4 x 6)

and rearrange as

12 x 30 = 360

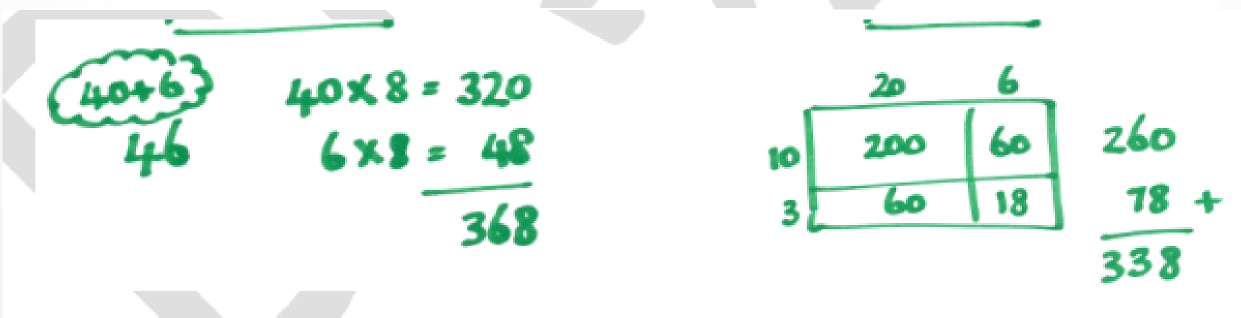
36 X 23

A student might think:

(30 x 20) + (30 x 3) +
(6 x 20) + (6 x 3)

adding the parts as

600+90+120+18



Multiplication Strategies

Doubling & Halving

- Working with multiples of 2, 4 or 8

27 X 8

A student might think:

Double 27 is 54,

double again is 108

double again is 216

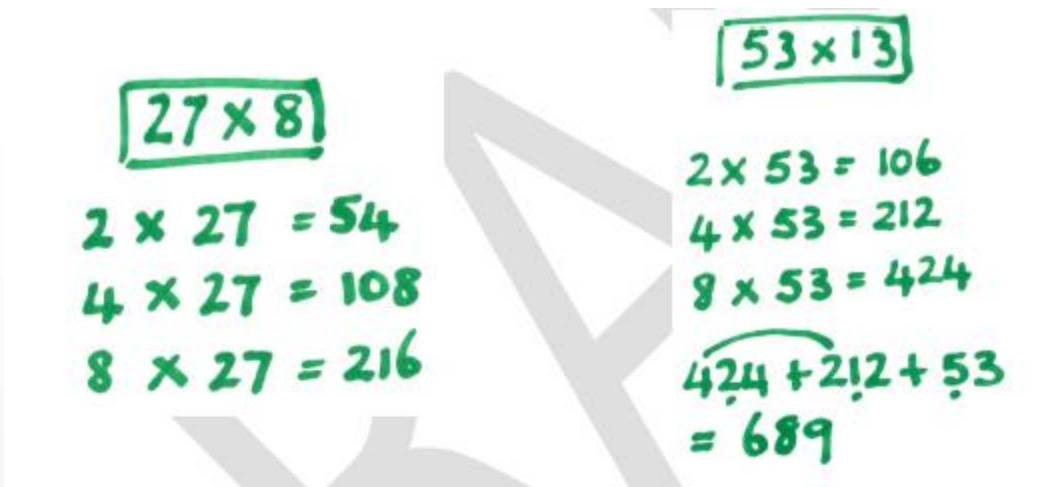
53 X 13

A student might think:

4 x 53 is 212 (double double)

8 x 53 is 424 (double again)

424 + 212 + 53 = 689



How would you solve these?

- 24×50
- 24×4
- 24×15
- 136×9

Division Strategies

- Partition and Recombine

$84 \div 4$

A student might think:

$(80 \div 4) + (4 \div 4)$

and recombine as

$20 + 1 = 21$

$720 \div 6$

A student might think:

$(600 \div 6) + (120 \div 6)$

and recombine as

$100 + 20 = 120$

Division Strategies

Doubling & Halving

- Working with multiples of 2, 4 or 8

128 ÷ 4

A student might think:

Half of 128 (64), half of 64 (32)

500 ÷ 8

A student might think:

Half of 500 (250), half of 250 (125), half of 125 (62.5)

Division Strategies

Compensate

- Adjust one number

96 ÷ 4

A student might think:

25 fours in 100

Less one. So, 24 fours in 96.

419 ÷ 7

A student might think:

420 ÷ 7 = 60

So 419÷7 will be 59 rem. 6

419÷7

7×60=420

So 7×59=413

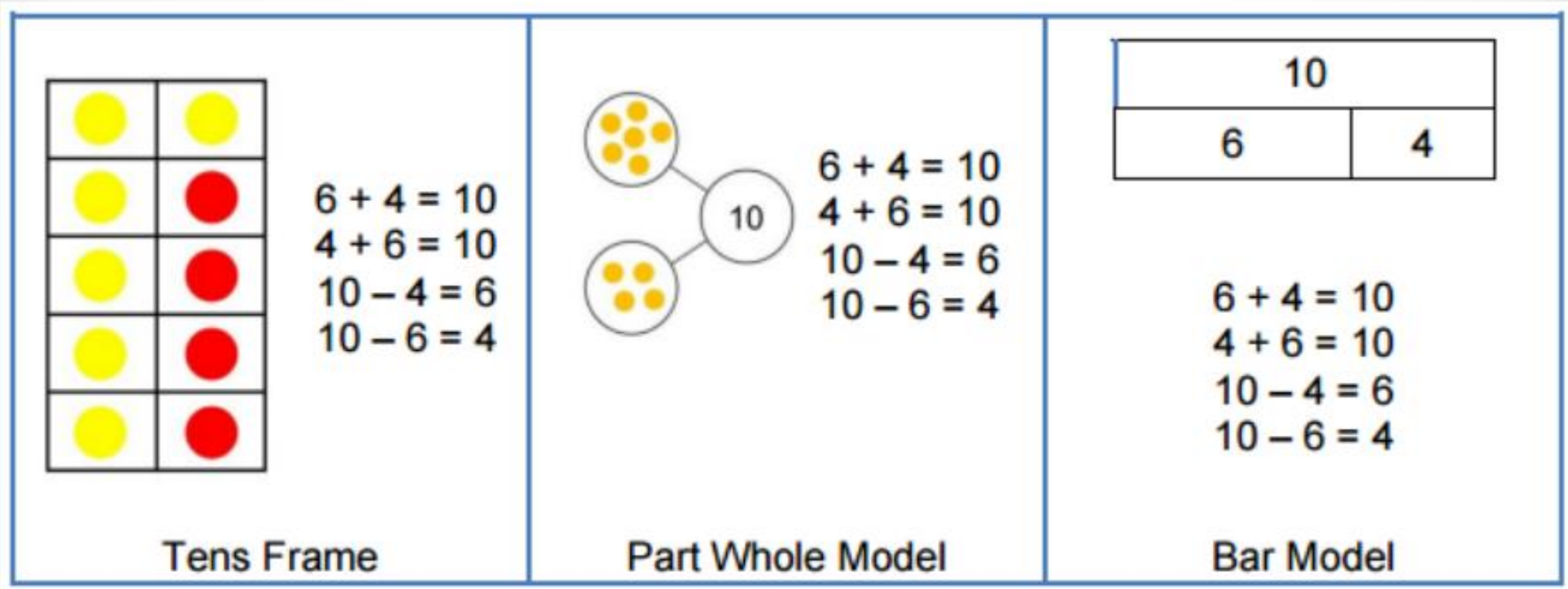
419÷7=59 rem6

Representation & Structure

Three key images:

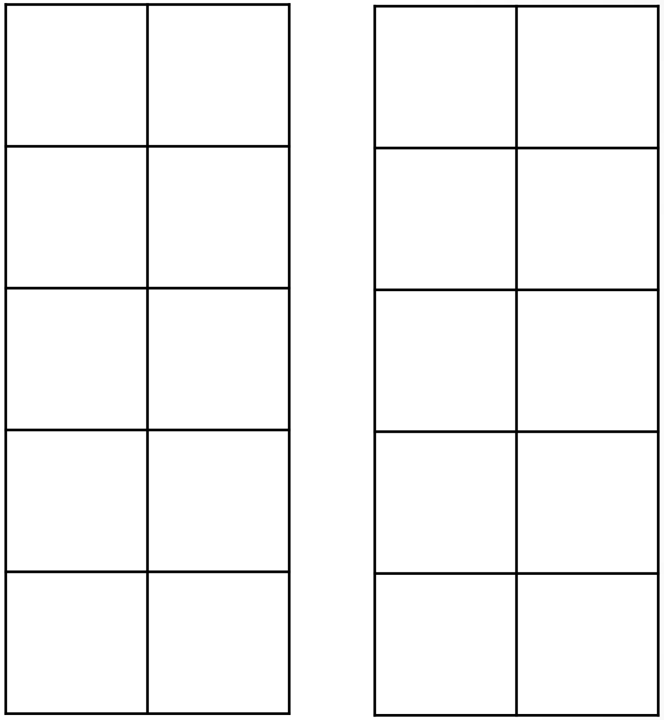
- Part-whole model
- Bar model
- Tens frame

Representation & Structure

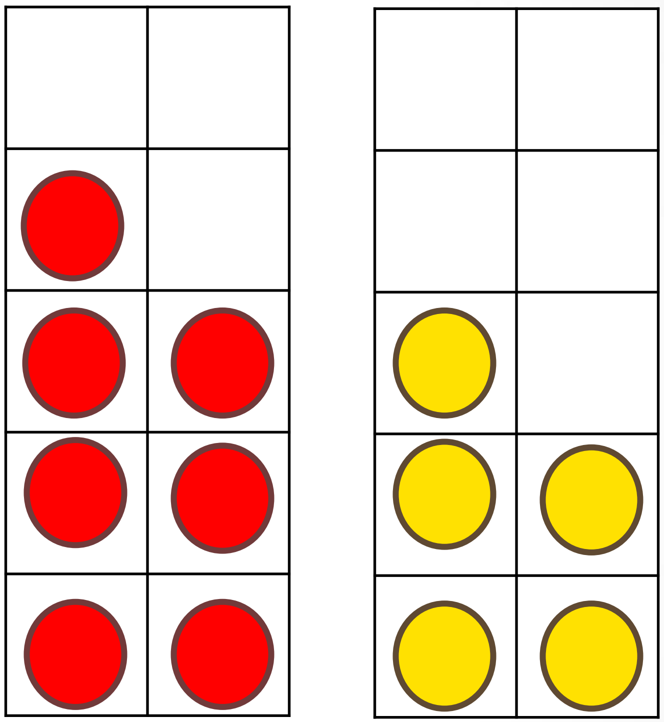


Connections between these models are made so that children understand the **same mathematics is represented in different ways**. Asking the question, '<u>What's the same, what's different</u>?' gives children the opportunity to make connections.

$7 + 5$

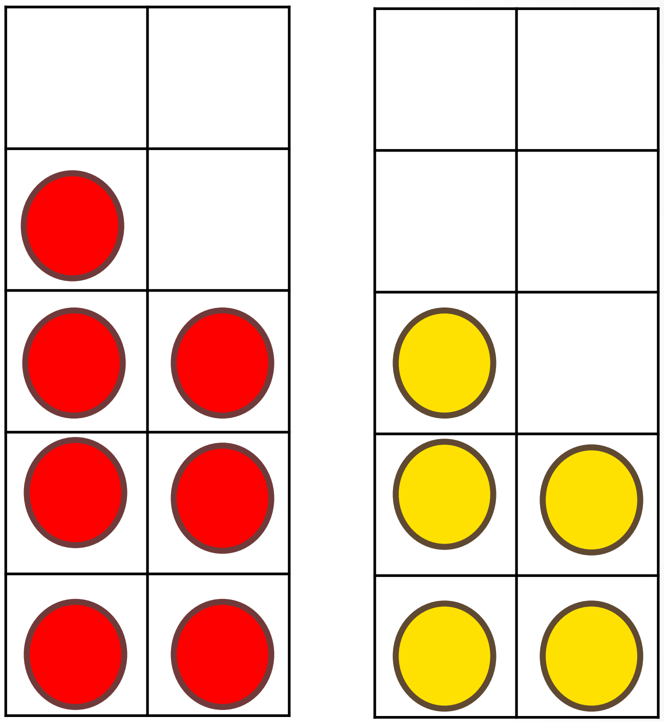


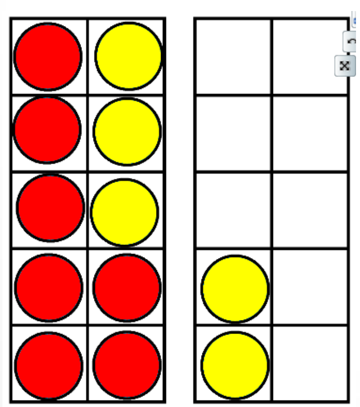
$7 + 5$



$7 + 5$

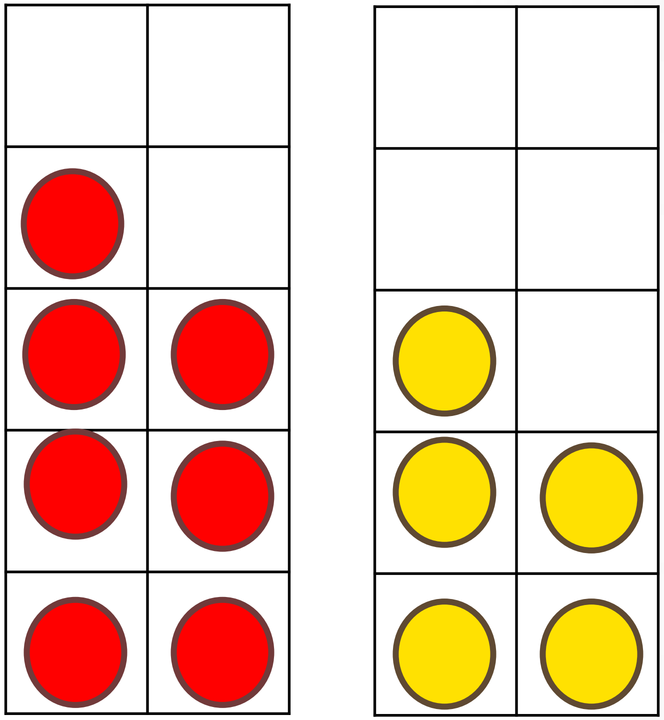
3 2



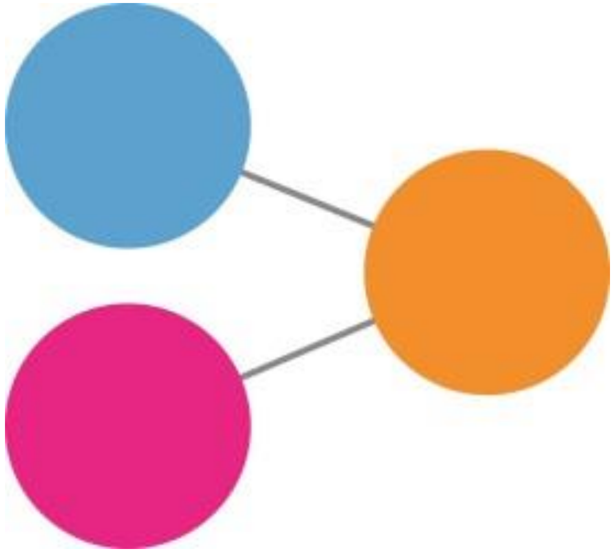


$7 + 5$

$2 \quad 5$

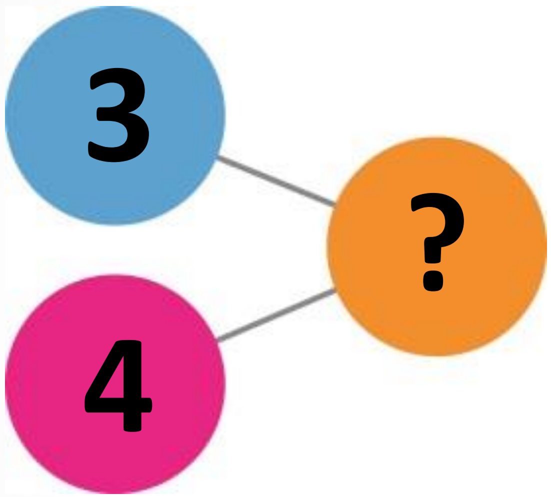


The Part-Whole Model



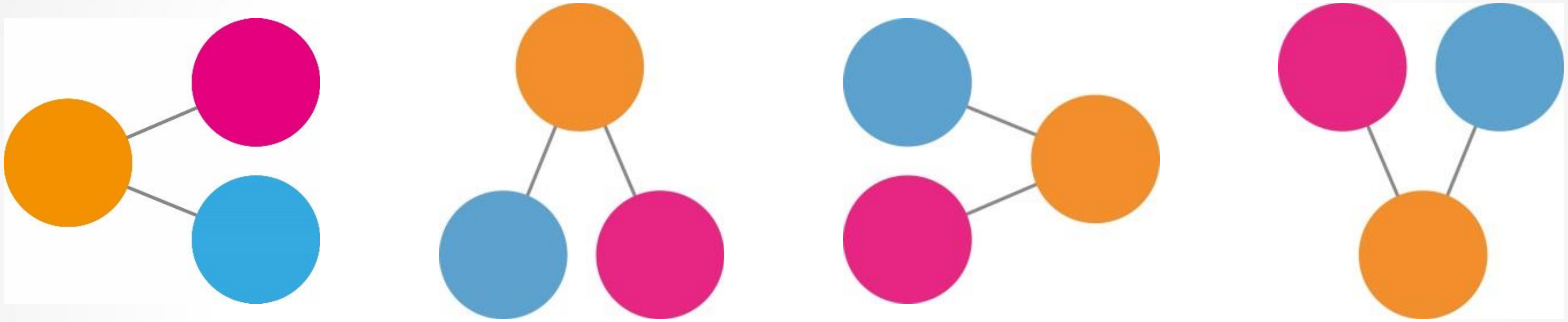
This model works on the principle that if you know two values out of three in a calculation, you can calculate the missing value using addition or subtraction.

The Part-Whole Model



The two parts (3 and 4) combine to make the whole (7).

The Part-Whole Model



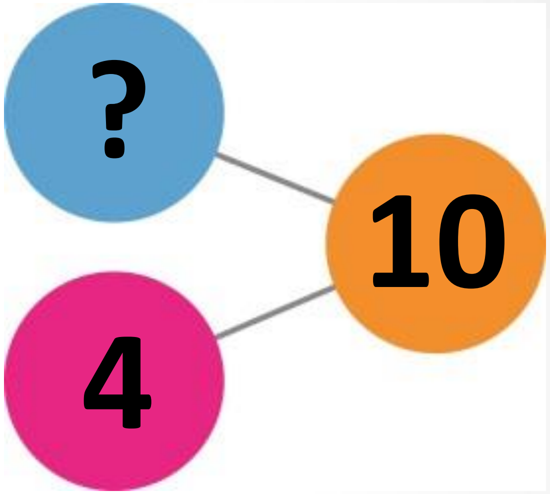
The part-whole model can be orientated differently, and is used for addition and subtraction problems

The Part-Whole Model

An unknown number and 4 makes 10.
This leads to a missing box calculation:

+ 4 = 10

In other words, algebra.



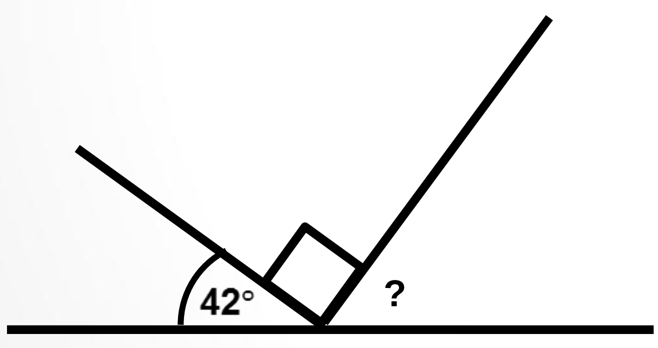
The National Curriculum requires that children know their number families for all the operations, for example:

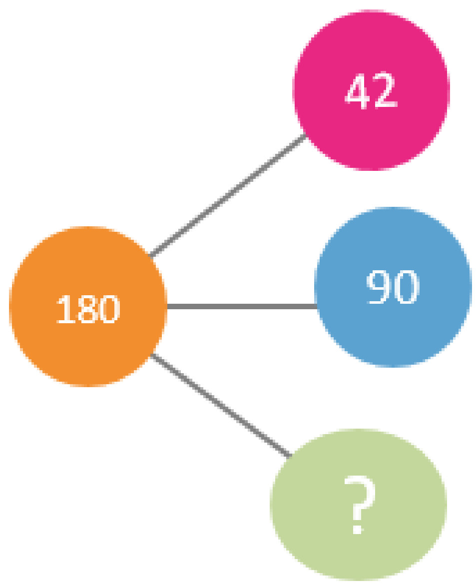
6 + 4 = 10	3 × 7 = 21
4 + 6 = 10	7 × 3 = 21
10 – 6 = 4	21 ÷ 7 = 3
10 – 4 = 6	21 ÷ 3 = 7

The Part-Whole Model

The part-whole model can involve more than two parts.

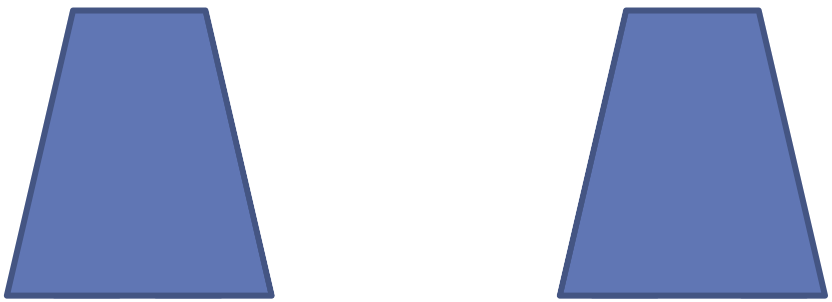
Here is an example from a Year 6 geometry lesson:



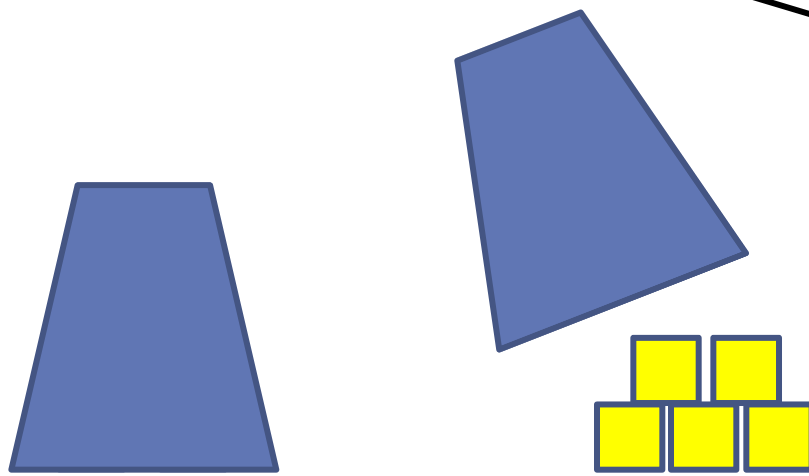


Activities and games

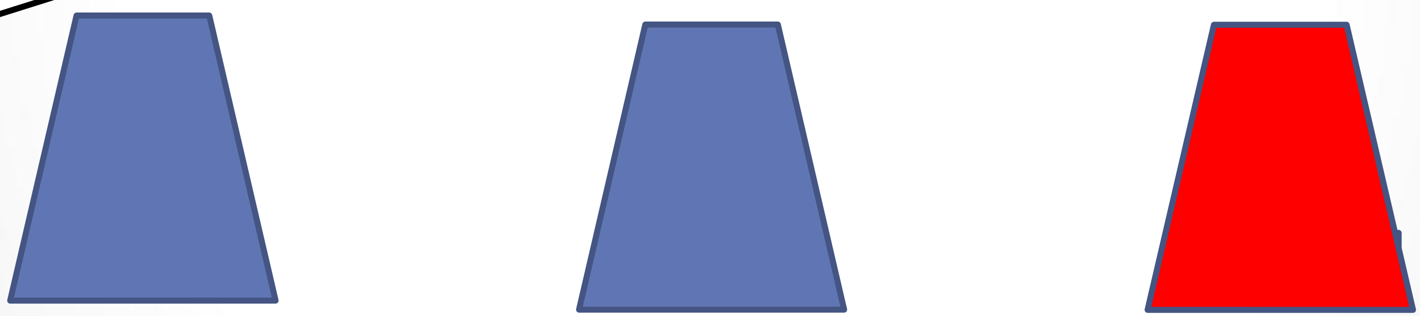
There are 7 cubes under the cups. You can only lift one cup up. Can you work out how many cubes are under the second cup?



There are 5 cubes under this cup. There are 7 cubes altogether. 7 – 5 = 2. I know that there are 2 cubes under the other cup.

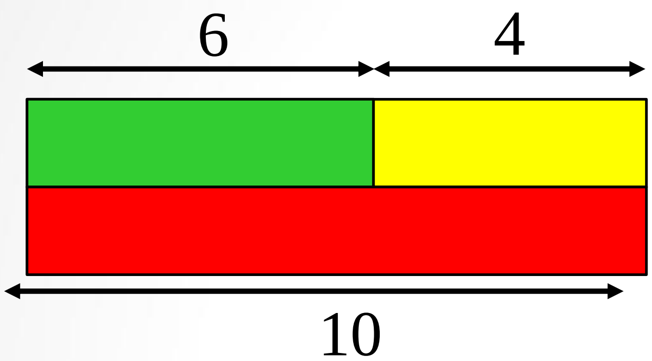


I have 3 cups and 10 cubes. I’ve hidden the same number of cubes under both blue cups and a different number under the red cup. You can only lift one cup. Can you work out what is hiding under the other 2 cups without lifting them?



Making links

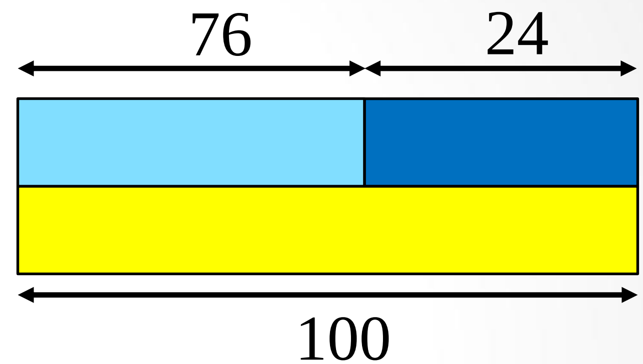
Bar models are useful to show the relationships between numbers



What facts does the bar model represent?

X

Answer



Write down the facts for this bar model

X

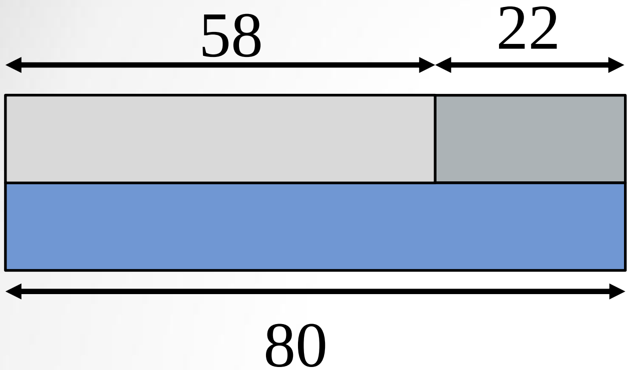
Answer

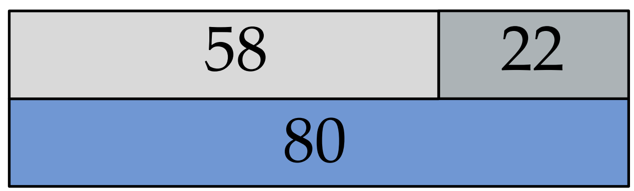
Clear understanding of part-whole relationship will avoid:

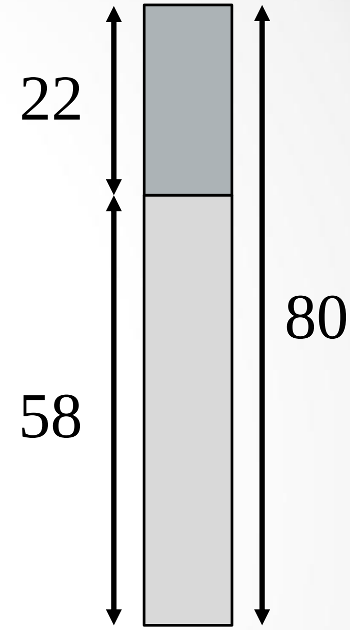
$6 - 10 = 4$

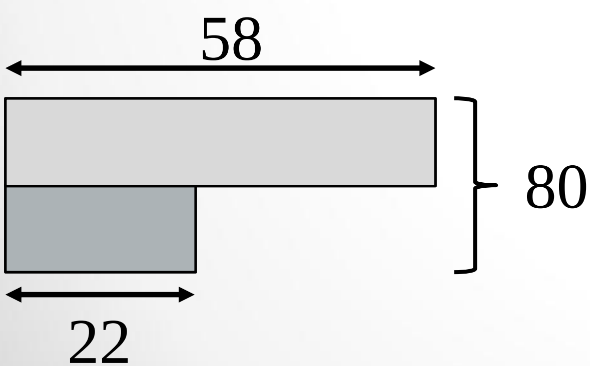
$4 - 10 = 6$

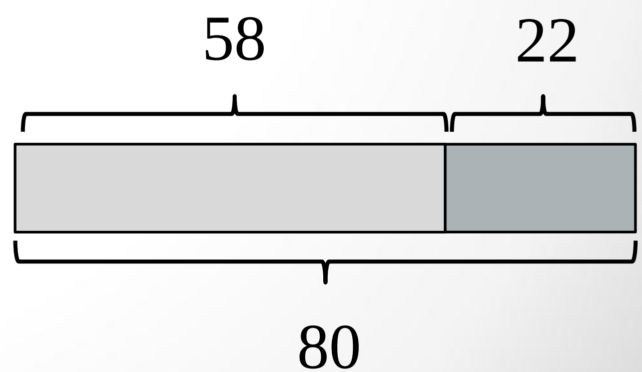
Same or different?





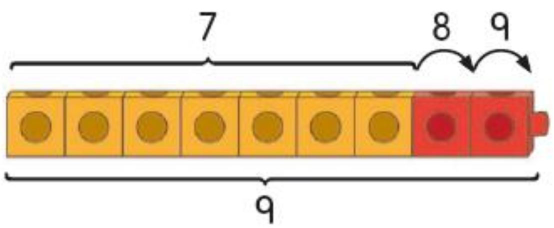






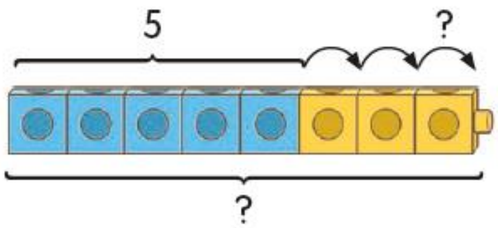
Introducing the bar model

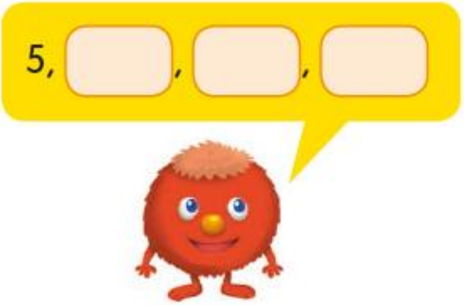
4 What is 2 more than 7?



2 more than 7 is 9.

5 What is 3 more than 5?

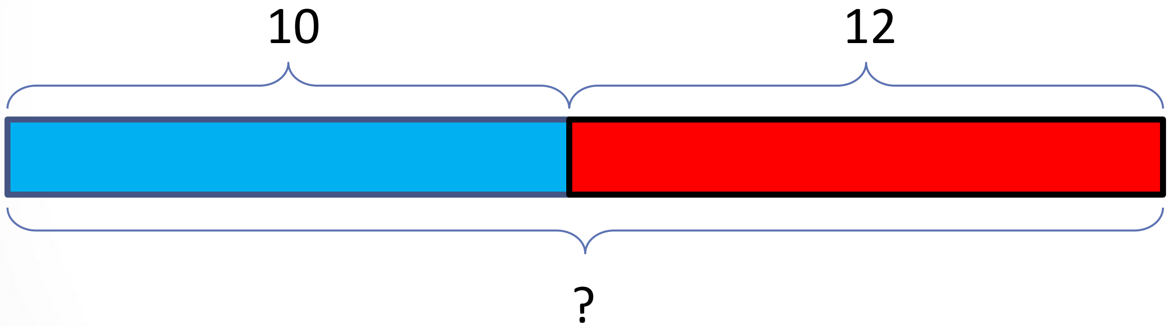




3 more than 5 is ☐.

Introducing the bar model

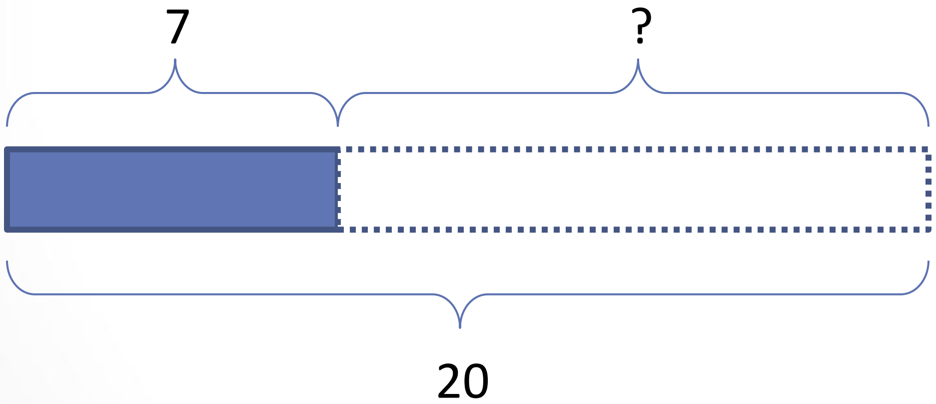
Omar bakes 10 biscuits.
Ruby bakes 12 biscuits.
How many biscuits do they bake altogether?



They bake 22 biscuits altogether.

Introducing the bar model

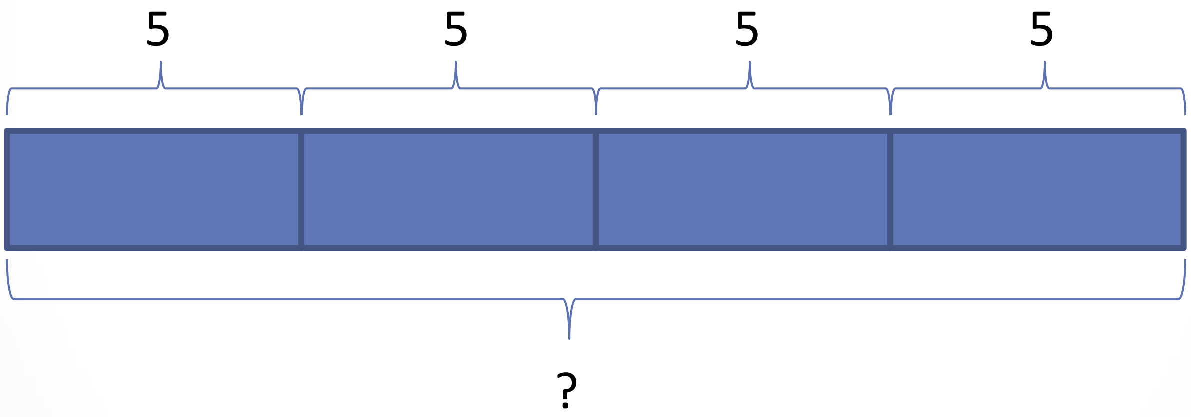
Hardeep buys large eggs and small eggs.
Altogether he buys 20 eggs
There are 7 small eggs.
How many large eggs are there?



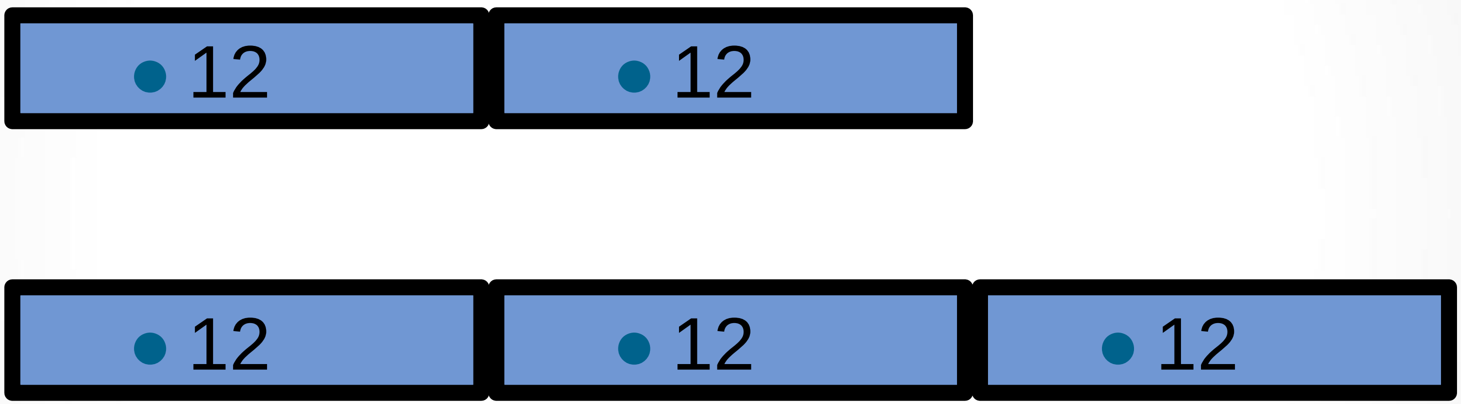
There are 13 large eggs.

Extending the bar model to multiplication

Peter puts 5 bread rolls into each packet.
He has 4 packets.
How many bread rolls does he put into the 4 packets altogether?



There are 20 bread rolls altogether.



Tim and Sally share marbles in the ratio of 2:3
If Sally has 36 marbles, how many are there altogether?

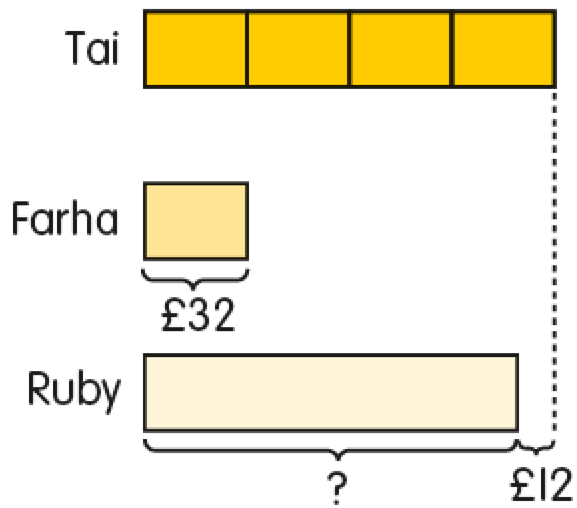
Back to the start.....

Tai saves 4 times as much money as Farha.
Ruby saves £12 less than Tai.
Farha saves £32.
How much money does Ruby save?

1 unit → £ 32

4 units → £ 32 × 4 = £ 128

Tai saves £ 128.



£ 128 – £ 12 = £ 116

Ruby saves £ 116.

One to Challenge You!

Sam had 5 times as many marbles as
Tom.

If Sam gives 26 marbles to Tom, the
two friends will have exactly the same amount.

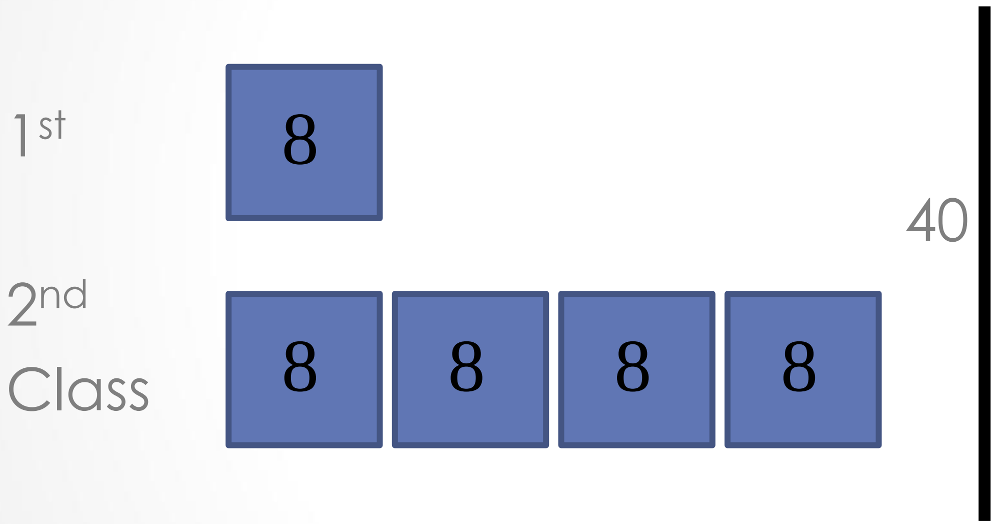
How many marbles do they have altogether?

Ralph posts 40 letters, some of which are first class, and some are second.

He posts four times as many second class letters as first.

How many of each class of letter does he post?

- He posts four times as many second class letters as first.
- How many of each class of letter does he post?



$40 \div 5 = 8$

$8 \times 4 = 32$

2nd Class 32 letters

1st Class 8 letters

GCSE higher paper 2012!

Ralph posts 40 letters, some of which are first class, and some are second.

He posts four times as many second class letters as first.

How many of each class of letter does he post?

How can I help my child?

You can help your child by finding and talking about maths in everyday situations. For example, a shopping trip is rich in mathematical opportunities, such as:

- spending money, calculating change and working out which offers give the best value for money.
- empty packaging can provide your child will immediate access to 3D shapes and nets.
- using packets and tins as a source of mathematical information to discuss, such as mass and volume.
- using items often sold in pairs, fours and sixes (such as drinks or yogurts) to talk about multiples or times tables.

How can I help my child?

You can also help your child in a number of other ways:

- Encourage a *secure knowledge of number*, by asking questions which help them explain what comes before or after a given number, or how the number is made, for example tens and ones.
- Encourage them to *draw pictures and models* such as part-whole and bar models to answer questions.
- Support them with home activities, and encourage them to answer questions in full sentences.

If you are unsure about any concepts, please ask your child's teacher to explain how it is taught and how you can support your child.

Challenge through depth

Year 3 – Place value of 3 digit numbers – how it may have looked previously

Red

1) 34
2) 85
3) 92
4) 63
5) 43

Ext:

345

Orange

1) 234
2) 854
3) 492
4) 643
5) 342

Ext:

7548

Green

1) 2534
2) 8544
3) 4922
4) 6455
5) 3455

Ext:

75485

674 is made of 6 hundreds, 7 tens and 4 ones.

674 is also made of 67 tens and 4 ones.

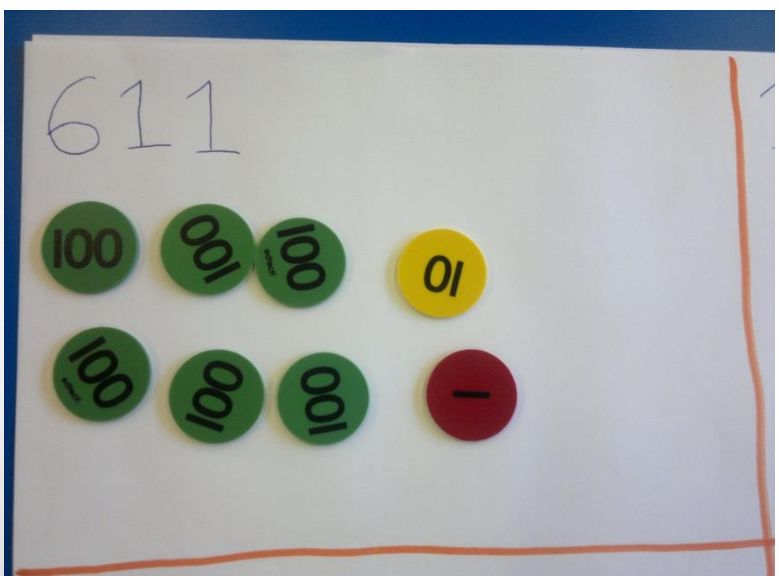
674 is also made of 6 hundreds and 74 ones.

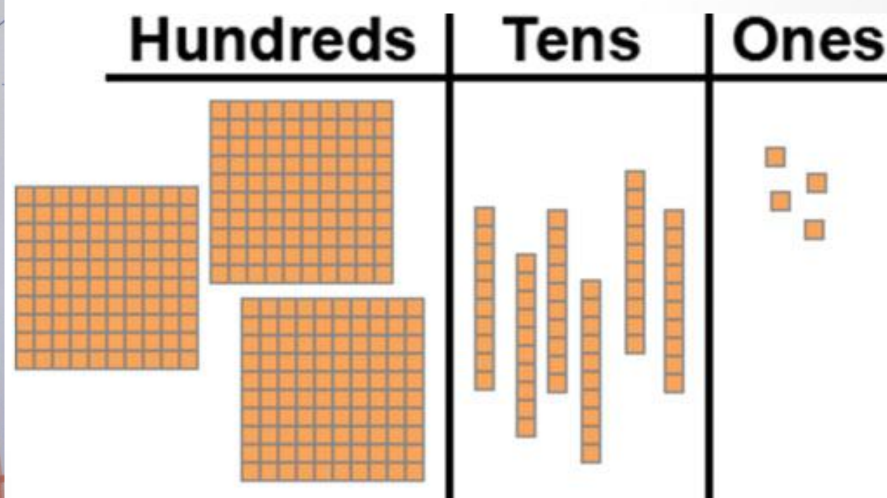
Find different ways of expressing:

- 630
- 704
- 867

And now…

1) 234
2) 854
3) 492
4) 643
5) 342





Multiply by 10,100 and 1000

Red
4 x 10
5 x 100

Orange
32 x 100
45 x 10

Green
4.3 x 10
100 x 5.65

How it may have looked previously

Multiply by 10,100 and 1000

Multiply by 10,100 and 1000 – this year

"The digits stay the same but the place value changes."

Task 1: Answer

1) 4.5 x 100

2) 10 x 87

Task 2: fill in the blanks

1) □.8□x 1000 = 3850

2) 100 x 2.□ = □50

Task 3 (what's gone wrong? Please explain)

1) 1.47 x 1000 = 147

2) 3.4 x 10 = 340

Mastery challenge

0.25 x 1000 = _____ x 25

Can you explain how you solved this?

Can you write your own similar problem?

Practice makes perfect?

Compare these two multiplication exercises.

Which supports the development of fluency better? Why?

8 x 5 =	8 x 3 =	9 x 4 =	9 x 4 =	7 x 9 =	1 x 4 =
2 x 8 =	5 x 2 =	3 x 9 =	6 x 3 =	6 x 8 =	8 x 5 =
1 x 1 =	3 x 8 =	2 x 5 =	9 x 2 =	7 x 7 =	4 x 6 =

$2 \times 3 =$	$6 \times 7 =$	$9 \times 8 =$
$2 \times 30 =$	$6 \times 70 =$	$9 \times 80 =$
$2 \times 300 =$	$6 \times 700 =$	$9 \times 800 =$
$20 \times 3 =$	$60 \times 7 =$	$90 \times 8 =$
$200 \times 3 =$	$600 \times 7 =$	$900 \times 8 =$

Partitioning

Notes and Guidance

This small step builds on basic partitioning. Children will explore how numbers can be broken apart in more than one way.

This step is particularly important later on, when children begin to exchange. Understanding that 5000 + 300 + 20 + 9 is equal to 4000 + 1300 + 10 + 19 is crucial, and this small step enables children to explore this explicitly.

Mathematical Talk

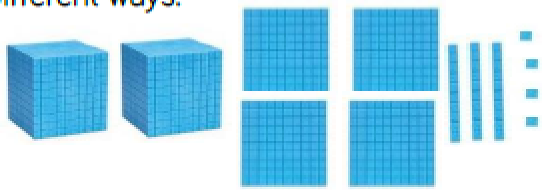
What number is being shown?

f we have 10 hundreds can we exchange them for something?

f you know ten 100s are equal to 1000 and ten 10s are equal to 100, how can you use this to make different exchanges?

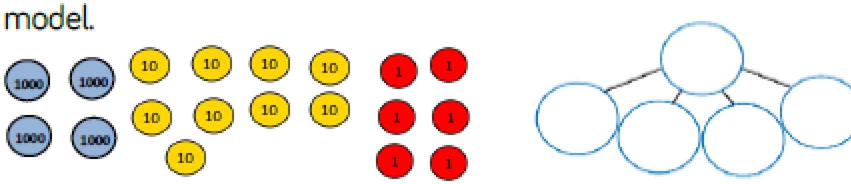
Varied Fluency

1. Move the Base 10 around and make exchanges to represent the number in different ways.



2000 + 400 + ☐ + 4
1000 + ☐ + ☐ + 14
1000 + 1300 + ☐ + ☐

2. Represent the number in two different ways in a part whole model.



3. Lily describes a number. She says,

"My number has 4 thousands and 301 ones"

What is Lily's number?
Can you describe it in a different way?

Partitioning

Reasoning and Problem Solving

Which is the odd one out?

3,500	3,500 ones
2 thousands and 15 hundreds	35 tens

35 tens is the odd one out because it does not make 3500, it make 350

Jeff says:

My number has five thousands, three hundreds and 64 ones

John says:

My number has fifty three hundreds, 6 tens and 4 ones

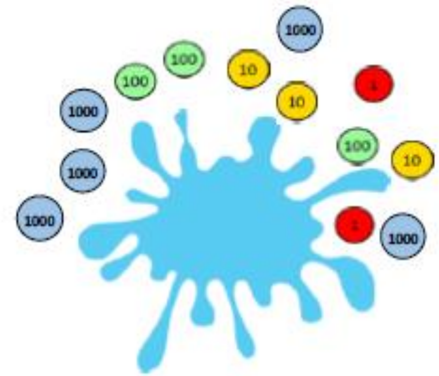
Who has the largest number? Explain.

They both have the same number because 53 hundreds is equal to 5 thousand and 3 hundred. Jeff and John both have 5364

Some place value counters are hidden. The total is six thousand, four hundred and thirty two.

Which place value counters could be hidden?

Think of at least three solutions.



Could be one 1,000 counter and one 100 counter.
Could be ten 100 counters and ten 10 counters.
Could be eleven 100 counters.

dd more than 4-digits

otes and Guidance

hildren will build upon previous learning of column addition. ey will now look at numbers with more than four digits and e their place value knowledge to line the numbers up curately.

hildren will learn that when there are more than ten ousands in the thousands column these can be exchanged for n thousands.

lathematical Talk

ill you have to exchange? How do you know which columns ll be affected?

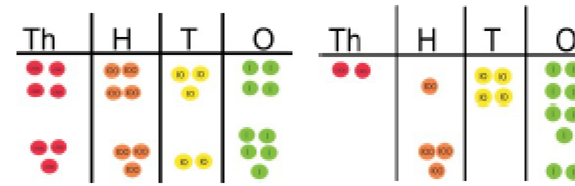
es it matter that the two numbers don't have the same nount of digits?

hich number goes on top in the calculation? Does it affect the swer?

Varied Fluency

1. Solve:

    4,434
    +3,325



_____ + _____ = _____   _____ + _____ = _____

Can you give the other 3 fact family questions that relat this question? (Inverse operation link)

2. Answer:

    32 461   48 276
    + 4 352   + 5 613

Can you think of a sensible story to represent this question?

3. Using the column method, answer:

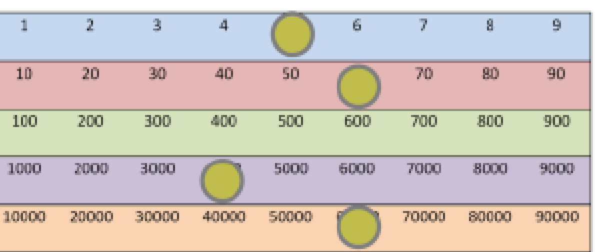
54,311 + 425 + 3,501
35,622 + 24,316 + 7,43
3,942 + 14,356 + 88

dd more than 4-digits

easoning and Problem Solving

am is discovering numbers on a
attegno board.

e makes this number:



am moves one counter three spaces on
horizontal line to create a new number.

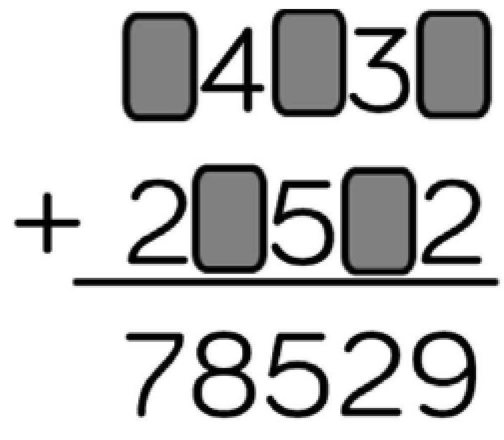
hen he adds this to his original number
e gets 131,130

hich counter did he move?

He moved the counter from 4,000 to 7,000

64,065 + 67,065 = 131,130

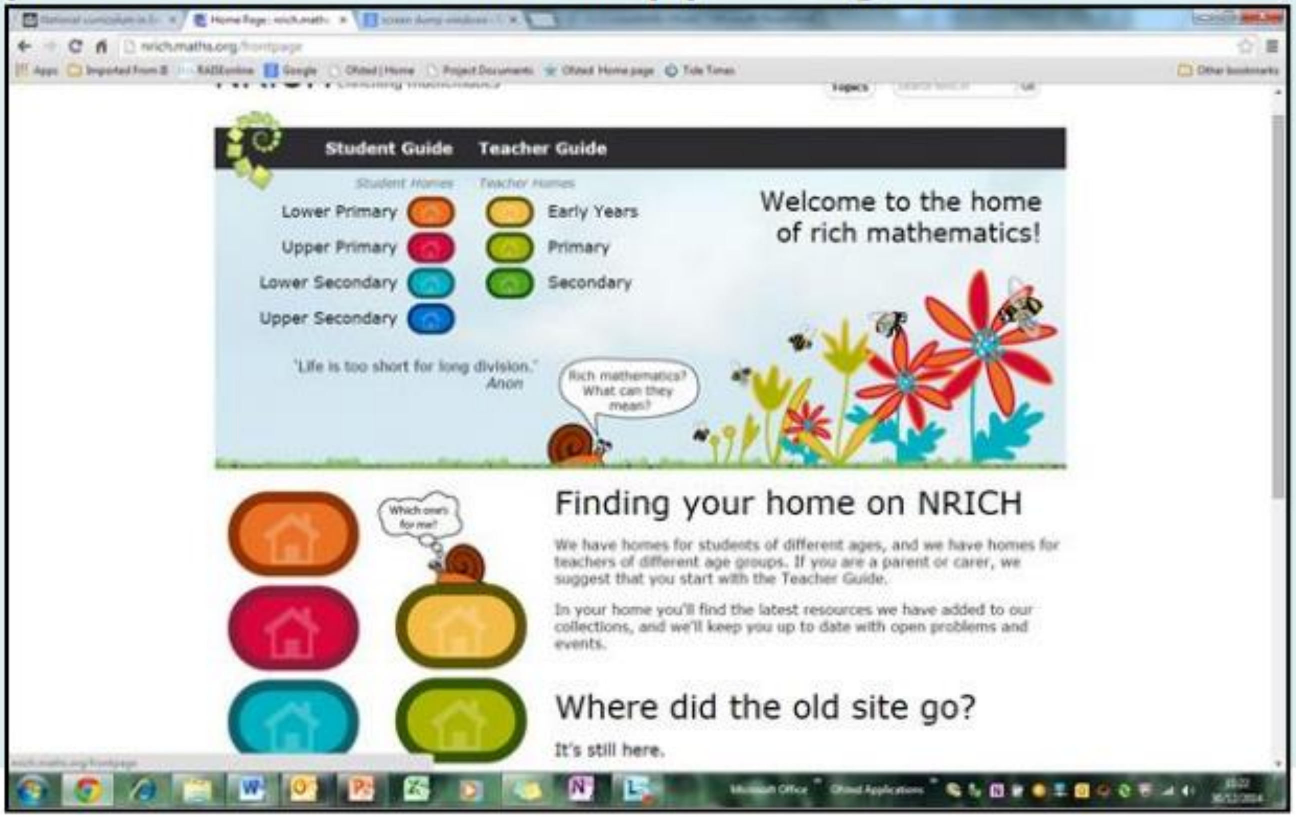
Work out the missing numbers.



54,937 + 23,59
78,529

Problem solving: nrich.maths.org

- The nrich website is a good source for problems.
- It includes printable resources, notes for teachers and solutions written by pupils.
- Each problem has been mapped against the new NC.



What other strategies are we using this year to develop fluency and confidence in Maths?

Maths Meetings

Why do we do them?

- Identify the day of the week, month of the year and how many *days of school* there have been
- Consolidate key ideas in mathematics
- Practise mental arithmetic
- Learn and consolidate ‘general knowledge maths’
- Rhymes and chants

Maths Meetings

*The key purpose is to develop **fluency** and confidence with the skills and understanding for the year group.*

The emphasis should be on **a small selection of routines** that are **used for 10- 15 minutes everyday** so that they are:

- building over time to develop fluency and mastery
- based on oral work and conversation
- pacey, engaging and motivating, linking maths to real life
- providing variety in the practise of skills

Improving Progress

'Keep up, Not Catch up'

One of the core aims of the National Curriculum is that all pupils progress through the curriculum at broadly the same pace; however, some pupils will require additional practice in order to keep up with their peers.

To support this, Orleans use same day interventions (SDI) and also provide 'closing the gap' materials for those pupils with more significant gaps in their understanding of number.

Same Day Interventions - SDI

For pupils who have not fully understood a concept within a lesson, the use of **same day interventions** is required which give those pupils the chance to keep up with their peers by reinforcing the learning from that day's lesson and addressing any misconceptions.

These interventions respond to specific pupils' needs and will involve different pupils each day.

- Interventions will be carried out on a daily basis for approximately 15 minutes

Pre-Teaching

Why Is This Strategy Useful?

One factor that affects a child's mathematical performance is the utilization of prior knowledge.

Pre teaching is the teaching of skills prior to the activity that utilizes them.

Research shows that when the skills of mathematical procedures are pretaught, children learn to solve math problems much faster than when the components and the procedure were learned at the same time.

Preteaching components of a skill is efficient because integrating recently mastered components is easier than simultaneously mastering the components and integrating them to form a more complex skill.

8.40 - 9am - Pre-teaching for specified children.
Sessions will be led by the teaching assistant.

Times Tables

By the end of Year 4, it is expected that children recall and use multiplication and division facts all tables to 12x12.

Our Times Table programme works brilliantly to motivate and focus children to learn their times tables. It is organised in a way that helps develop children's understanding of number and their ability to make links and spot patterns.

Stages are as follows:

- Stage 1: x2, x5 & x10
- Stage 2: x3, x6
- Stage 3: x4, x8
- Stage 4: x7, x9
- Stage 5: x11, x12
- Ultimate Challenge: All mixed up to 12x12

www.theschoolrun.com/times-tables-the-best-ways-to-learn

As you will notice, numbers with links have been **paired together**. The 6x tables is double that of the 3x table and the 8x tables is double that of the 4x table.

By learning times tables in this order, children will **make links and spot patterns** more easily, helping them to **speed up the process of learning** and recalling facts. Halving and doubling play a key part, for example, 4 x 3 = 12 so 4 x 6 = 24; 8 x 10 = 80 so 8 x 5 = 40.

Other patterns will also be spotted as the children learn their tables such as in the 6x table, every other number is a multiple of 3.

The requirement for Bronze, Silver and Gold provide differing levels of challenge

Bronze: Recite a complete multiplication table without error or long pauses (pupil may self-correct).

Silver: Answer random order multiplication sums without error or long pauses (pupil may self-correct) e.g. 2 x 4? 2 x 8?

Gold: Give the multiplication fact for any given answer/product e.g. 36 – 6x6

The GOLD challenge and its link with division is key. Children find division much more challenging and so making that link with multiplication all the way through, rather than just in the *Ultimate Challenge*, will be hugely beneficial.

The more adept children are at knowing their times tables and related division facts, the easier subsequent learning in multiplication and division will be.

九九乘法口诀表
乖宝宝
1
1×1=1
1×2=2
1×3=3
1×4=4
1×5=5
1×6=6
1×7=7
1×8=8
1×9=9
2
2×2= 4
2×3= 6
2×4= 8
2×5=10
2×6=12
2×7=14
2×8=16
2×9=18
3
3×3= 9
3×4=12
3×5=15
3×6=18
3×7=21
3×8=24
3×9=27
4
4×4=16
4×5=20
4×6=24
4×7=28
4×8=32
4×9=36
5
5×5=25
5×6=30
5×7=35
5×8=40
5×9=45
6
6×6=36
6×7=42
6×8=48
6×9=54
7
7×7=49
7×8=56
7×9=63
8
8×8=64
8×9=72
9
9×9=81
“九九”——乘法口诀表

Handouts

- Times Table Guidance
- Fluency Games
- Advice from Jo Boaler - youcubed
- Use website list

www.theschoolrun.com

www.youcubed.org

whiterosemaths.com/schemes-of-learning/**barvember**/