Flourishing through faith, hope and love

Mathematics Workshop – Alana Rowlandson
Supporting Your Child At Home With Mathematics

Agenda

- Our method, vision and approach to teaching maths
- Homework/maths learning outside of the classroom
- Encouraging mathematical thinking in the real world

Vision

All of our pupils to have a resilient and positive attitude towards mathematics and an understanding of the importance of this learning in real world contexts. We want our pupils to have confidence in mathematical knowledge, concepts and skills in order for them to be able to reason and solve problems logically and systematically. We wish for our pupils to leave primary school equipped with the knowledge and skills they need, to prepare them for their next step in education, and be enthusiastic about what they are yet still to learn.

Pearson

At the heart of *Power Maths* is the belief that all children can achieve. It's built on an exciting growth mindset and problem-solving approach.

POWER MATHS

Key aims of *Power Maths*

Keeping the whole class progressing together

Providing rich problem solving to challenge and engage every child

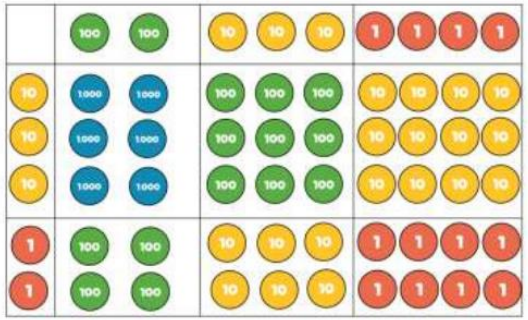
Practical assessment to reveal misconceptions and inform speedy interventions

Nurturing a growth mindset and building children's confidence in maths

Pearson

What is mastery?

“Mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject” – NCETM



Th	H	T	O
	2	3	4
×		3	2
	4	6	8
1^{7}	1^{0}	2	0
7	4	8	8

×	200	30	4
30	6,000	900	120
2	400	60	8

$234 \times 32 = 7{,}488$

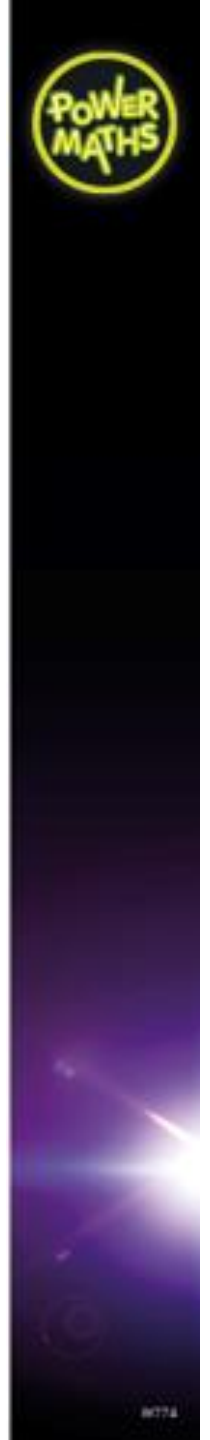
We achieve this by …

- Carefully sequenced, small step learning
- Representation that expose mathematical structures
- Developing mathematical thinking
- Building fluency

Pearson

Growth mindset

Fixed mindset	Growth mindset
“I’m not good at maths – I’ve never been good at maths”	“I’m finding maths hard now, but I can improve with time and effort”
“I give up – I can’t make this any better”	“I can improve if I keep trying”
“If I fail I am a failure”	“Most successful people fail along the way”
“I can’t do this – I keep making mistakes”	“Mistakes help me learn”



Meet the growth-mindset characters!

Flo

Flo is flexible and creative. She often with new methods to solve problems.

Dexter

Dexter is determined. When he makes a mistake he learns from it and tries again.

Pearson

Meet the growth-mindset characters!

Astrid

Astrid is brave and confident. She is not afraid to make mistakes.

I will share my ideas!

Is there a pattern?

Ash

Ash is curious and inquisitive. He loves to explore new concepts

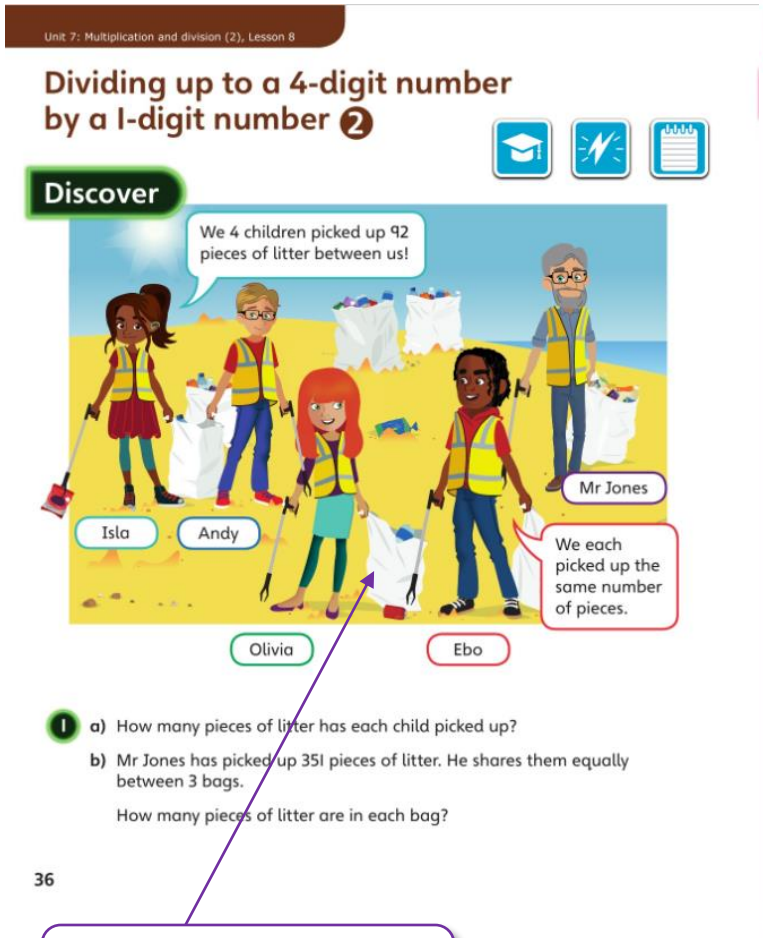
Pearson

See the lesson structure

Pearson

Discover and Share

Concrete-Pictorial-Abstract approach



Unit 7: Multiplication and division (2), Lesson 8

Dividing up to a 4-digit number by a 1-digit number 2

Discover

We 4 children picked up 92 pieces of litter between us!

Isla

Andy

Mr Jones

We each picked up the same number of pieces.

Olivia

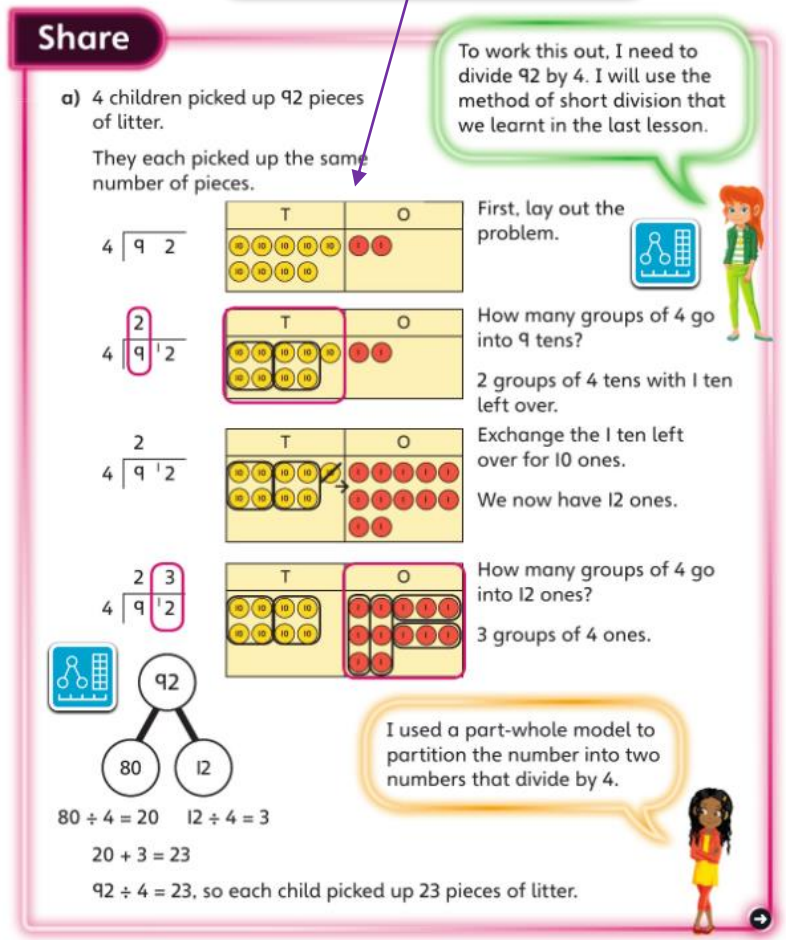
Ebo

1 a) How many pieces of litter has each child picked up?

b) Mr Jones has picked up 351 pieces of litter. He shares them equally between 3 bags.

How many pieces of litter are in each bag?

36



Share

a) 4 children picked up 92 pieces of litter.

They each picked up the same number of pieces.

To work this out, I need to divide 92 by 4. I will use the method of short division that we learnt in the last lesson.

$4 \overline{)92}$

First, lay out the problem.

T O

How many groups of 4 go into 9 tens?

$4 \overline{)9^{1}2}$ → 2

2 groups of 4 tens with 1 ten left over.

Exchange the 1 ten left over for 10 ones.

We now have 12 ones.

How many groups of 4 go into 12 ones?

3 groups of 4 ones.

92

80 12

$80 \div 4 = 20$ $12 \div 4 = 3$

$20 + 3 = 23$

$92 \div 4 = 23$, so each child picked up 23 pieces of litter.

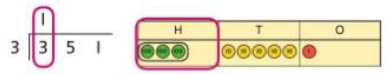
I used a part-whole model to partition the number into two numbers that divide by 4.

Engaging scenarios

Pearson

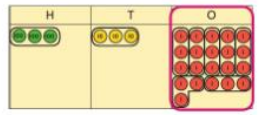
Think together

b) Mr Jones shares 351 pieces of litter equally between 3 bags.



There is 1 group of 3 hundreds.

There is 1 group of 3 tens and 2 tens left over.



Exchange the 2 tens for 20 ones. You now have 21 ones

There are 7 groups of 3 ones in 21.

351 ÷ 3 = 117

There are 117 pieces of litter in each bag.

Think together

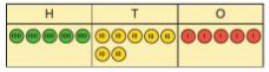
1 The children have a flask containing 575 ml of juice.

They share the juice equally among themselves and Mr Jones.

How much juice does each person get?

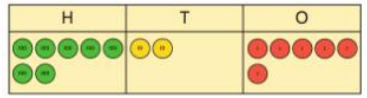
575 ÷ 5 = ☐

Each person gets ☐ ml of juice.

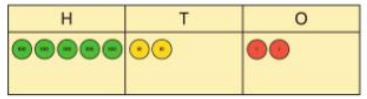


2 Complete these short divisions.

a) 726 ÷ 6 = ☐



b) 522 ÷ 3 = ☐



3 **a)** Look at these division problems.

CHALLENGE

There are 312 eggs. How many boxes of 6 eggs can be made?	Divide 1,980 by 2	485 ÷ 5

What is different about these divisions compared with the ones you have been doing so far?

I think there is something different in the first step of each division.

b) Max tries to work out the third division problem. What mistake has Max made?

5B p27

Friendly, supportive characters help children develop a growth mindset.

Pearson

Practice

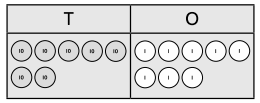
Questions are presented in a logical sequence.

→ Textbook 5B p36

Dividing up to a 4-digit number by a 1-digit number 2

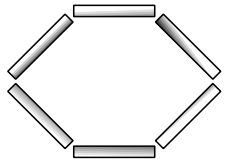
1 Mo is dividing 78 by 3. Complete his working.

$3 \overline{)\ 7\ \ 8}$



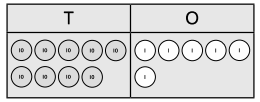
78 ÷ 3 = ☐

2 Olivia is making hexagons with straws, like this:



Olivia has 96 straws. How many hexagons can she make?

$6 \overline{)\ 9\ \ 6}$



Oliva can make ☐ hexagons.

3 Work out these divisions.

a) 642 ÷ 6 = ☐ $6 \overline{)\ 6\ 4\ 2}$

b) 725 ÷ 5 = ☐ $5 \overline{)\ 7\ 2\ 5}$

c) 5,016 ÷ 3 = ☐ $3 \overline{)\ 5\ 0\ 1\ 6}$

4 Calculate the answers to these divisions.

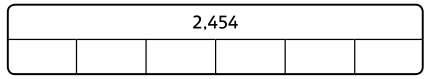
a) 7,924 ÷ 7 = ☐ $7 \overline{)\ 7\ 9\ 2\ 4}$

b) 711 ÷ 3 = ☐

c) 916 ÷ 4 = ☐

5 What division does this bar model model represent?

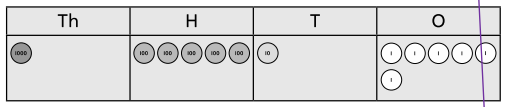
Write the calculation and then solve it.



6 Isla has made a number and then divided her number by 4 using short division.

What mistake has Isla made?

$$\begin{array}{r} 0\ 8\ 7\ 9 \\ 4 \overline{)\ 1\ {}^{3}5\ {}^{3}1\ {}^{3}6} \end{array}$$



7 Fill in the missing numbers in these short divisions.

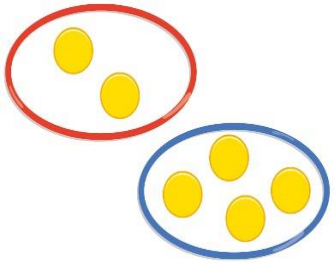
a) $\begin{array}{r} 2 \\ 4 \overline{)\ {}^{1}7\ \ 2} \end{array}$

b) $\begin{array}{r} 2\ \ 2 \\ 3 \overline{)\ \ 8\ \ 7\ \ 3} \end{array}$

c) $\begin{array}{r} \ \ \ 6 \\ 5 \overline{)\ {}^{1}\ {}^{3}0} \end{array}$

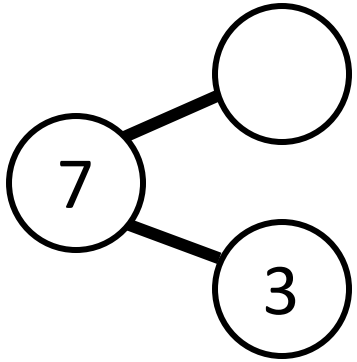
Calculations are connected so that children think about the underlying concepts.

Pearson



Models and representations

Part-whole models



Shows how numbers can be split into parts. Helps show the connection between addition and subtraction.

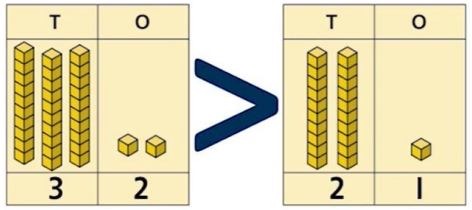
Bar models

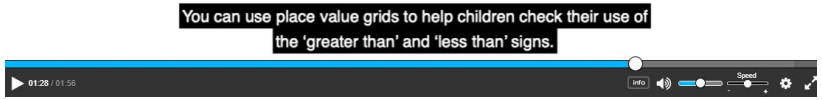
Helps show the maths problem as a picture.

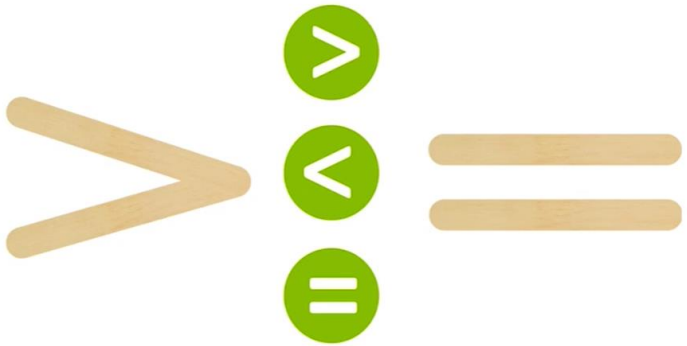
Pearson

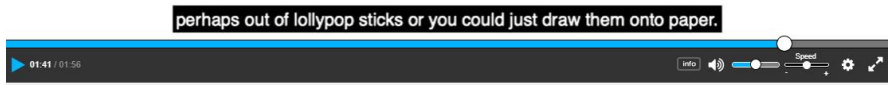
EYFS & KS1 Home Learning

Place value grid









Practical activity – Who has the highest number?

Dear parents,

This is a practical activity that should take no longer than 10 minutes.

Objective

Recognise the place value of each digit in a two-digit number (tens, ones)

Prepare

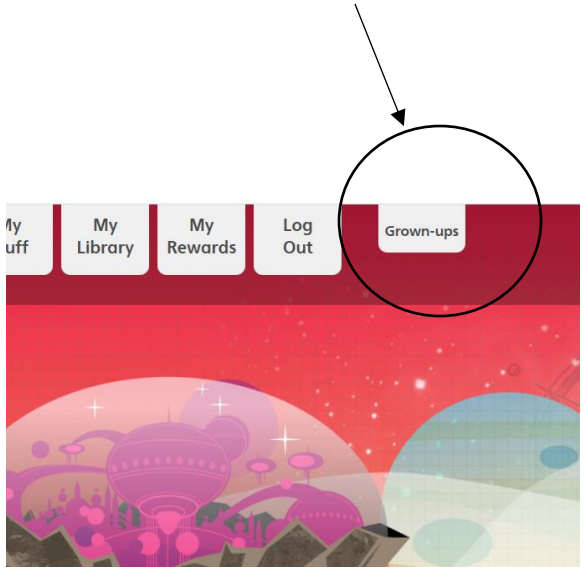
- You each need a piece of paper and a pencil. You will also need to make ten 'digit cards': write the numbers 0 to 9 on a sheet of paper and cut each number out to make ten cards.

Steps

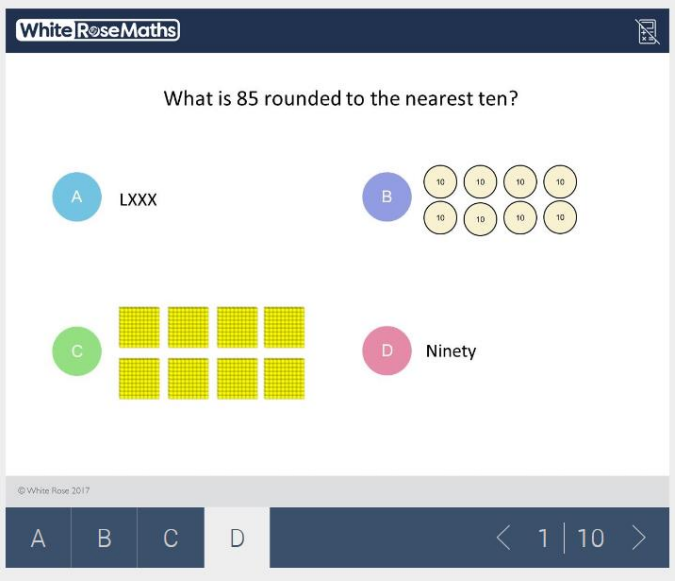
- Each player needs a place value grid. To make one, draw two columns, the first (on the left) has the heading 'Tens' (or T) and the second (on the right) has the heading 'Ones' (or O).
- Place the digit cards face down on the table.
- Take turns to choose a digit card at random. Place it in one of the columns on your place value grid. You want to make a higher number than the other player, so think carefully about whether your first digit card should be a ten or a one!
- Once each player has placed two-digit cards into their place value grid and made a two-digit number, compare them to see which is larger.

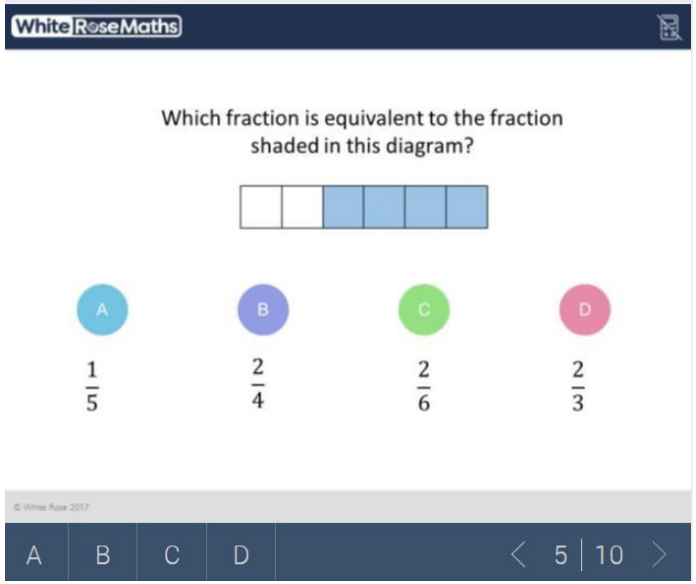
Win the game

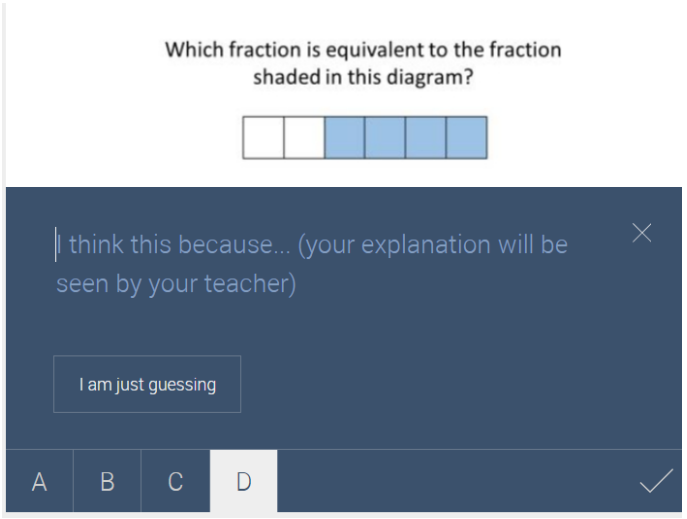
- The winner is the player with the highest number!



KS2 Home Learning







How can we assess reasoning?

STEP 1
Describing- simply what they did.

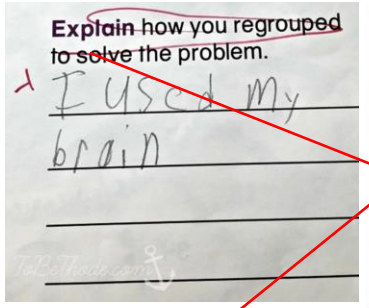
STEP 2
Explaining- offers some reasons for what they did. May/may not be a correct explanation.

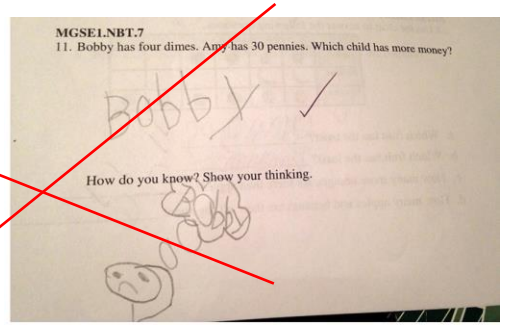
STEP 3
Convincing- more confident in explanation. Underlying mathematical argument may/may not be accurate yet but is more coherent than step 2.

STEP 4
Justifying- a correct logical argument and chain of reasoning. Words such as because, so, therefore may be used.

STEP 5
Proving- a watertight argument that is mathematically sound often based on generalisations and underlying structure.

KS2 Home Learning





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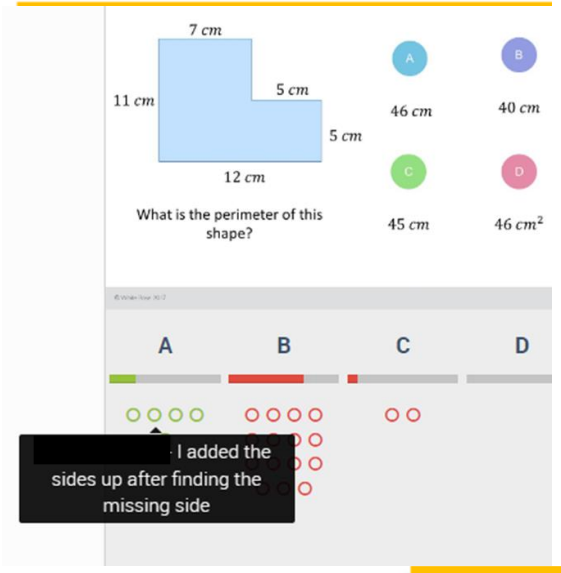

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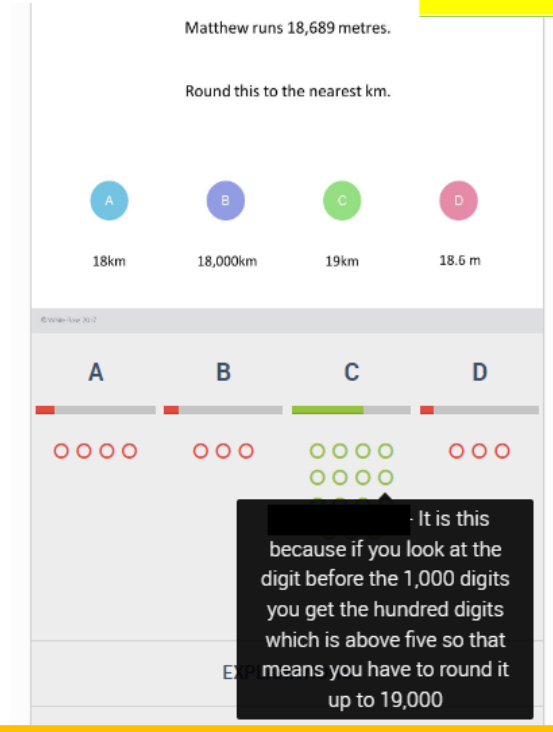
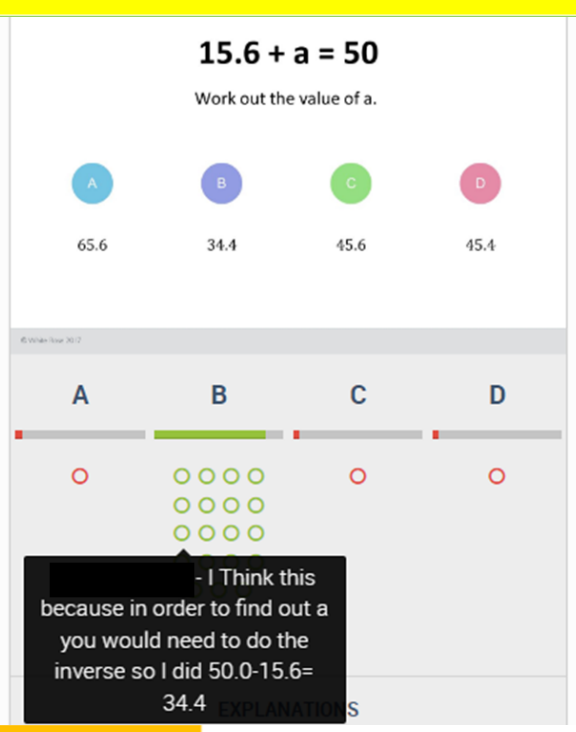
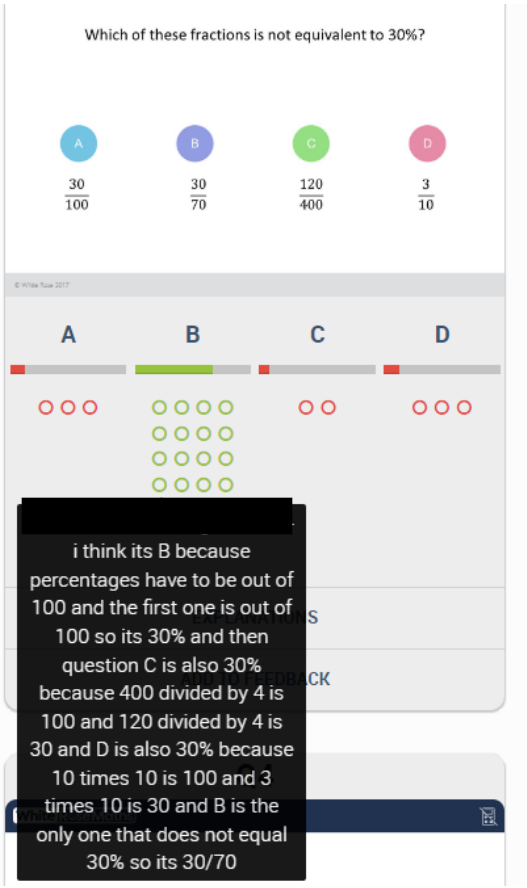


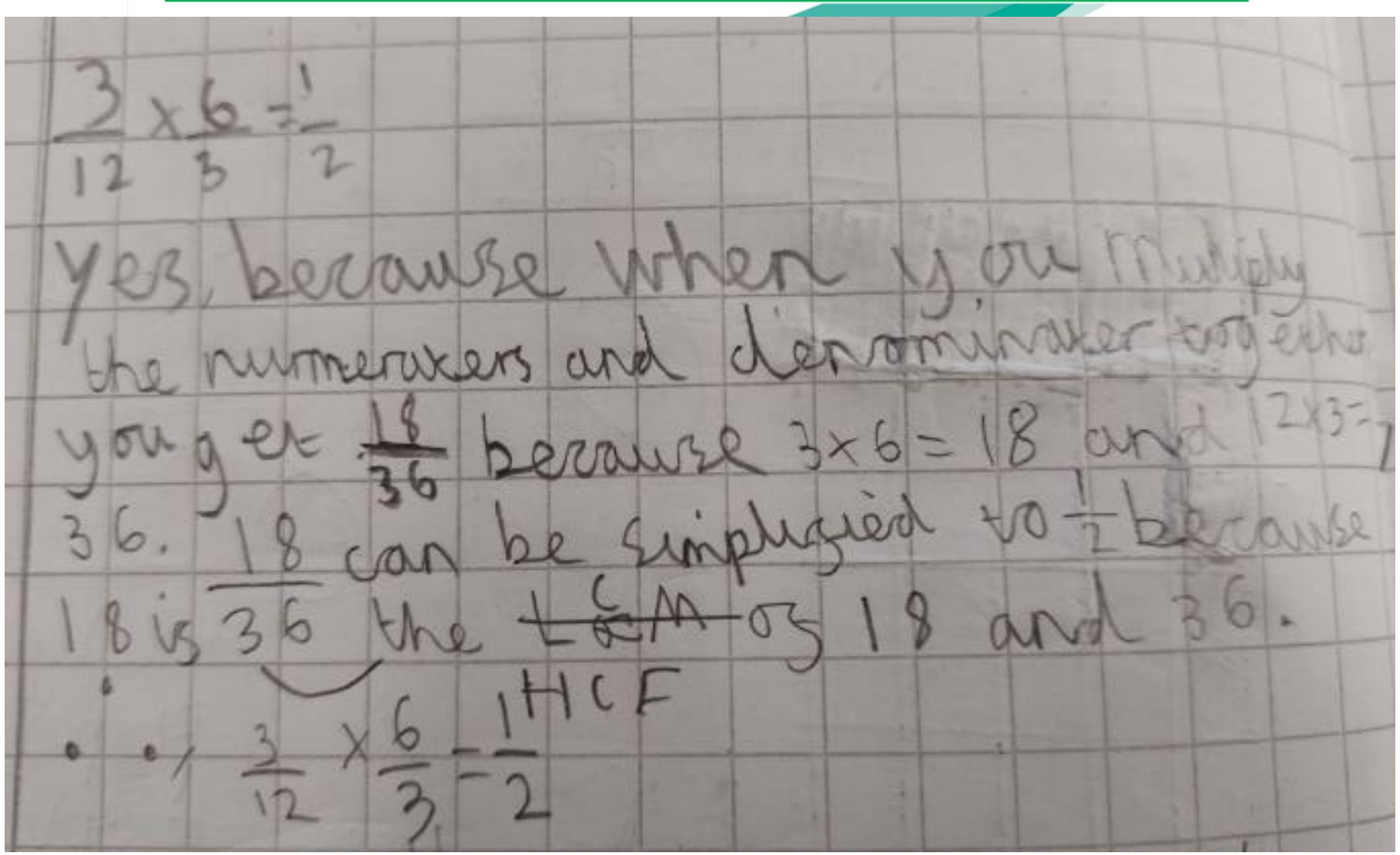


STEP 4
Justifying- a correct logical argument and chain of reasoning. Words such as because, so, therefore may be used.



KS2 Home Learning

STEP 5
Proving- a watertight argument that is mathematically sound often based on generalisations and underlying structure.



Times Table Rock Stars

Supporting your Child at Home

1

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.

2

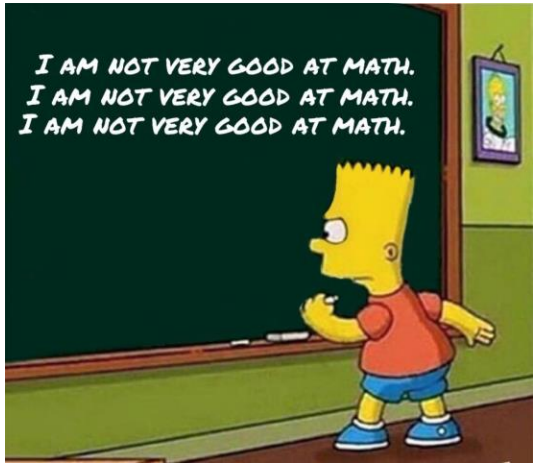
Point out the maths in everyday life. Include your child in activities involving numbers and measuring, such as shopping, cooking and travelling.

3

Praise your child for effort rather than for being "clever". This shows them that by working hard, they can always improve.

~~"I was never very good at maths at school."~~

~~"You must get your 'maths brain' from your mum/dad."~~



Supporting your Child at Home

- Encourage number sense. What separates high and low achievers is number sense – having an idea of the size of numbers and being able to separate and combine numbers flexibly. For example, when working out 29 + 56, if you take one from the 56 and make it 30 + 55, it is much easier to work out. The flexibility to work with numbers in this way is what is called number sense and is very important.

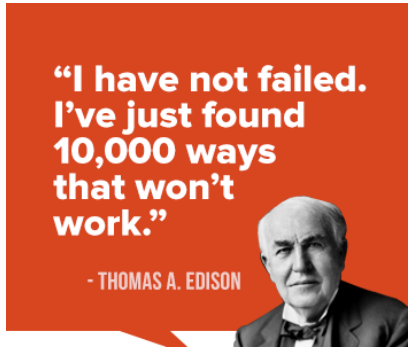
- Please don't worry about supporting your child 'the wrong way'. Maths is all about learning a variety of methods and your support alone is enough to promote positive learning behaviours towards maths. If your child becomes frustrated or says: "My teacher does it a different way," explain that there are lots of different ways to reach an answer and perhaps they could show you the way they have learnt. Use this as an opportunity to teach each other something new.

Supporting your Child at Home

- Always be encouraging and try to avoid telling your child that they are wrong when they are working on maths problems. Instead find the logic in their thinking – there is always some logic to what they say. For example if your child multiplies 3 by 4 and gets 7, say – “Oh I see what you are thinking, you are using what you know about addition to add 3 and 4. When we multiply we have 4 groups of 3…”

- Never associate maths with speed. It is not important to work quickly, and we now know that forcing children to work quickly on maths is the best way to start maths anxiety for children, especially girls.

Supporting your Child at Home



Perhaps most important of all – encourage a "growth mindset". Let your child know that they have unlimited maths potential and that being good at maths is all about working hard. When children have a growth mindset, they do well with challenges and do better in school overall.

When children have a fixed mindset and they encounter difficult work, they often conclude that they are not "a maths person". Telling children they are "smart" or "human calculators" when they do something well is encouraging a fixed mindset.

That seems like a nice thing to do, but it sets children up for difficulties later, as when they fail at something they will inevitably conclude that they aren't smart after all.

Instead use growth praise such as: "It is great that you have learned that." Or "I really like your thinking about that." When they tell you something is hard for them, or they have made a mistake, tell them: "That's wonderful; your brain is growing!"

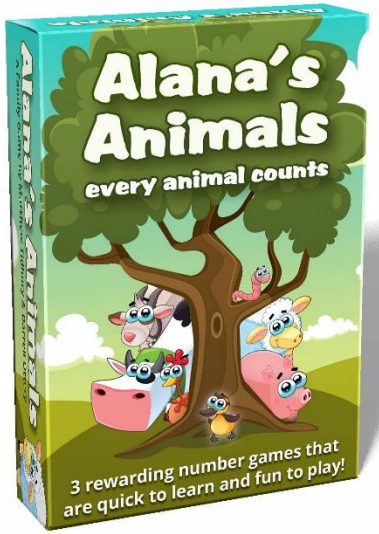
Supporting your Child at Home

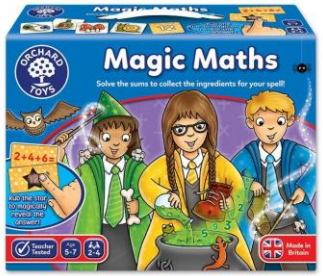
Real life contexts – use maths at any given opportunity!

- Counting up the stairs/counting fruit in a supermarket
- Matching pairs of socks
- Sorting and classifying toys at tidy-up time
- Comparing weights and measures when helping to put shopping away: "Oh this one feels heavy!"
- Measuring and weighing out ingredients
- Paying for and checking change in shops
- Prices in the supermarket – which deal is better?
- Correcting mathematical language e.g. confusion over yesterday/tomorrow etc.
- Time – encouraging your child to wear a watch
- Estimation of time – setting Alexa/phone timer for '10 minutes screen time'
- Subitising: "How many do you think there are?"
- Calculators at home to play with
- Pointing out 'real world' maths e.g. hairdresser using angles to cut hair

Supporting your Child at Home

- Encourage children to play maths puzzles and games. Award winning mathematician, Sarah Flannery reported that her maths achievement and enthusiasm came not from school but from the puzzles she was given to solve at home. Puzzles and games will help them enjoy maths, improve critical thinking skills and develop number sense, which is critically important.





Apps, Websites & Useful Games

- Currently in the process of putting together an age-related list for recommended apps, games and websites.
- Minecraft and Osmo Tangram are great for exercising spatial and visual problem solving skills
- Please do get in touch if there is something your child has used that you would recommend