Holy Rood RC High School

"Numeracy is a skill for life, learning and work."

How to help your child with Numeracy for parents, carers and guardians

Welcome!

Thank you for taking the time to read this booklet. The aim of the booklet is to show you how we teach Numeracy concepts in school so that you can help your child, or maybe even learn yourself. Numeracy is a core life skill so any support you can give your child in learning these concepts will be of huge benefit. A 'little and often' approach is best, even just talking to your child about where they are using their Numeracy skills in real life will help. There are lots of examples and opportunities highlighted through this booklet.

Remember- What you say matters to how your child feels about Maths and Numeracy.

Please don't say-

- 'I can't do Maths'
- 'I don't know how Maths is taught in school today'
- 'You've got it wrong'
- 'You got 7 of them right'
- 'I didn't like Maths at school'
- 'Oh that's really hard'

Try to build their confidence by saying things like-

- 'That's what I need to learn too!'
- 'How many different ways can we work this out?'
- 'This is a challenge- could we do it together?'
- 'You though really hard to solve those problems- good effort'
- 'I wish I learned Maths the way you are learning it now'
- 'That looks like a problem we can solve together'

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Estimating and Rounding

Talking to your child about Numeracy in real life helps them understand the importance of having good Numeracy skills. For example-

- Talking about how much things weigh when cooking (a bag of sugar is 1Kg, a block of butter is 500g), or volumes (a medicine spoon is 5ml, a bottle of juice is 2.5litres)
- Talking about lengths and heights (how tall are you (in metres and centimetres), how long is a swimming pool, football pitch)
- Talking about areas (sizes of rooms in a house in m^2, how much paint is needed to cover a wall)

Being able to estimate the answer to a problem is an important skill, encourage your child to ask 'does my answer make sense?' Remember it is fine to make mistakes!

Often we have to round answers to a 'degree of accuracy.' This can be the nearest 10 or 100 or to 2 decimal places for money problems. To round we decide where we want to 'cut off' the number. We then look at the next digit- if it's 5 or more we round up.

Here are some examples:

74 ---> 70 (to the nearest 10)

386---> 390 (to the nearest 10) or 400 (to the nearest 100)

347.5 ---> 348 (to the nearest whole number)

7.51 --> 7.5 (to 1 decimal place)

8.96 ---> 9.0 (to 1 d.p.)

3.14159 ---> 3.142 (to 3 d.p.)

3.14159 --> 3.14 (to 3 significant figures)

567 --> 570 (to 2 significant figures)

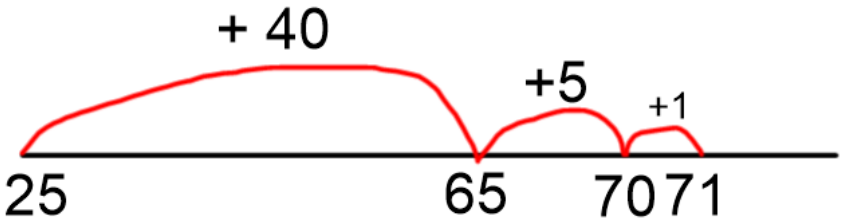
Adding

Mental Methods- for example work out 25 +46

Method 1 Add the 10's then the units, then add together- 20 + 40 = 60 5 + 6 = 11

60 + 11 = **71**

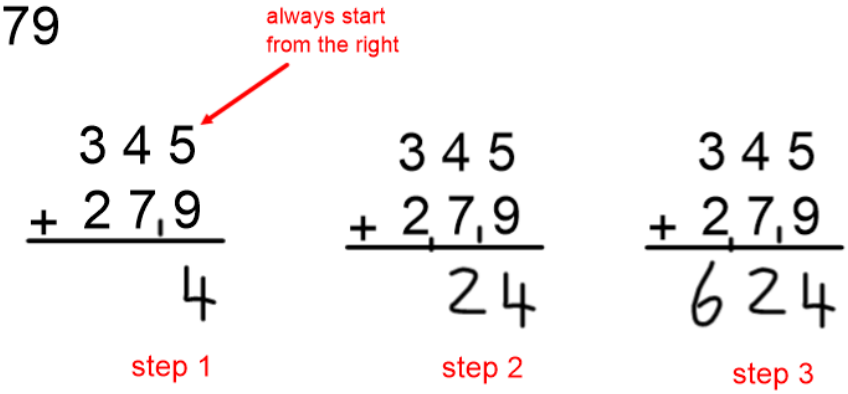
Method 2 'Jump on' from one number, imagine a number line-



Written method-

When writing out a 'chimney sum' it's important to get the numbers lined up in the right columns-

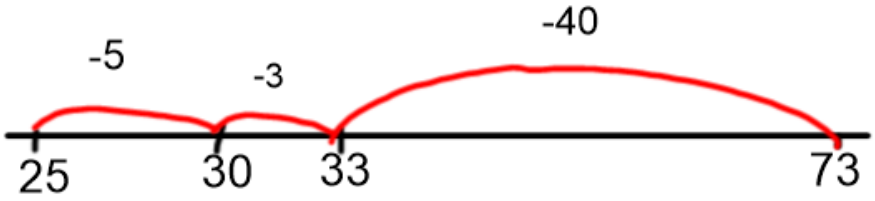
345 + 279



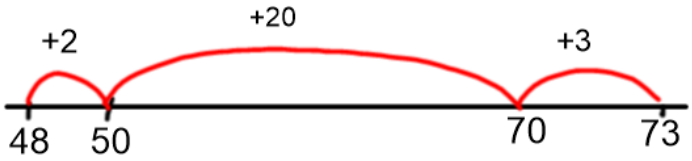
Subtraction

Mental methods, for example work out 73 – 48

Method 1: Jump back 48 from 73 (using number line mentally)

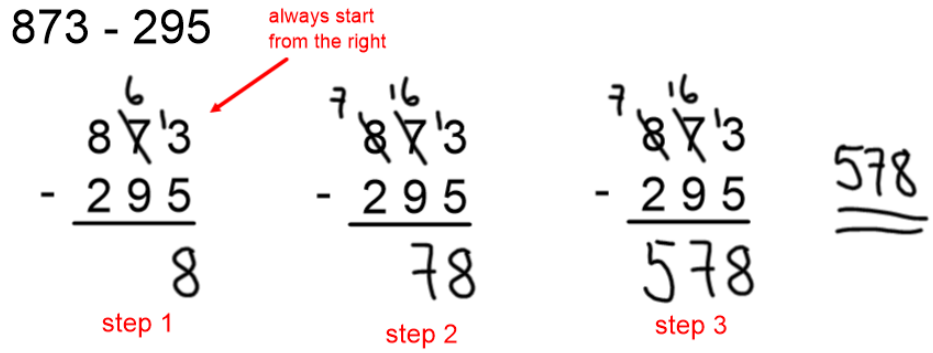


Method 2: Count on from 48 to 73 to find the difference-



(2+20+3=25)

Written Method- Make sure the numbers are lined up in the correct columns for a chimney sum:



Multiplication

The basis for all multiplication and division is being good at times tables. It can help to regularly practice times tables with your child until they are fluent. There are lots of good multiplication Apps which can help or just saying 'count up in 6's' whilst they are in the car or out for walk is great regular practice. Using ICT games like Sumdog is also great practice- your child has a login, tell them to ask their teacher if not.

Multiplying mentally

For example, work out 39 x 6-

Method 1- split the number being multiplied, then add together

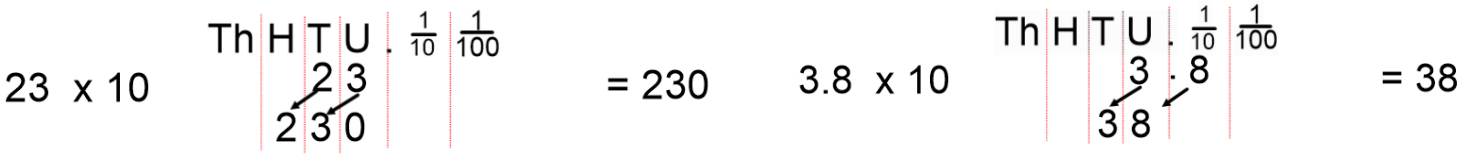
30 *x* 6 = 180 9 *x* 6 = 54 180 +54 =234

Method 2: Round the number being multiplied, then subtract the extra amount

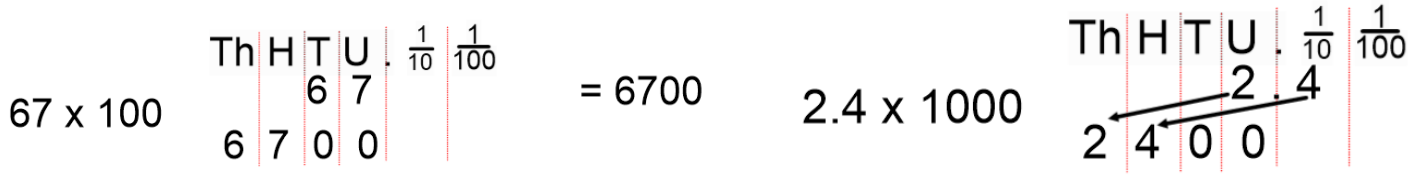
(39 is 1 less than 40) 40 *x* 6 = 240 240 – 6 = 234

Multiplying by 10,100,100

When numbers are multiplied by 10 they move columns- one place to the left.



Multiplying by 100 moves them 2 places, and 1000 moves them 3 places:



For questions like 24 *x* 30, multiply by 3 first, then multiply by 10

24 x 3 = 72, 72 x 10 = **720**

Same for decimals- 5.6 x 400

5.6 x 100 = 560, 560 x 4 = **2240**

Long Multiplication

For example work out 34 x 26

34 x 26

$$\begin{array}{r} 34 \\ \times\ 26 \\ \hline 204 \end{array}$$

step 1 - multiply by 6

$$\begin{array}{r} 34 \\ \times\ 26 \\ \hline 204 \\ 0 \end{array}$$

step 2- put a zero below

$$\begin{array}{r} 34 \\ \times\ 26 \\ \hline 204 \\ 680 \end{array}$$

step 3- multiply by 2

$$\begin{array}{r} 34 \\ \times\ 26 \\ \hline 204 \\ +680 \\ \hline 884 \end{array}$$

step 4- add your answers

Multiplying 2 decimals-

Multiply the numbers as if there are no decimal points, for example for 3.4 x 0.26, first work out 34 x 26 as above.

The answer is 884. Count how many digits are after the decimal points in the questions- 3.**4** x 0.**26**

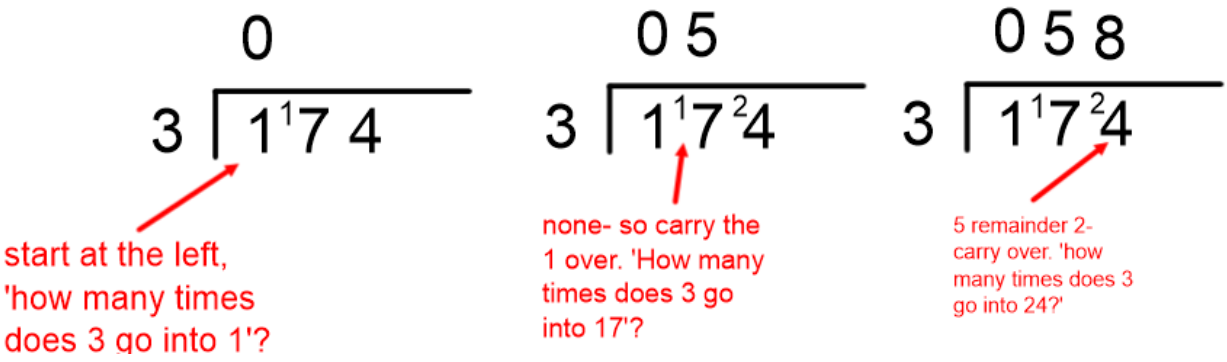
There are 3 in total. This means there must be 3 digits after the decimal point in the answer. So insert the decimal point before the 8- answer is 0.884

Division

Again times tables are important to be able to divide effectively.

Method 1- 'Bus stop' sum

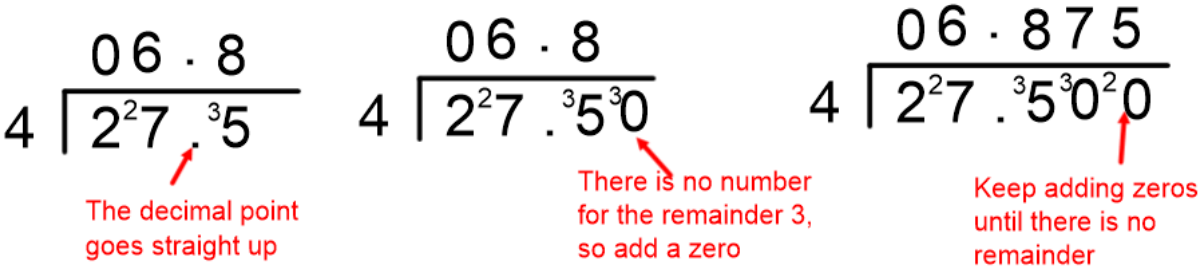
For 174÷3



Method 2: Remainders

The calculation can be carried on by adding zeros after the decimal point-

For 27.5÷4



Negative Numbers (Integers)

Talk to your child about where negative numbers are used in real life- temperature, sea level, money.

It's useful to think of a number line when adding and subtracting negative numbers-

Usually when we add, we move up the number line, and subtracting we move down.

When we add a negative number however we go down (so it's really like subtracting).

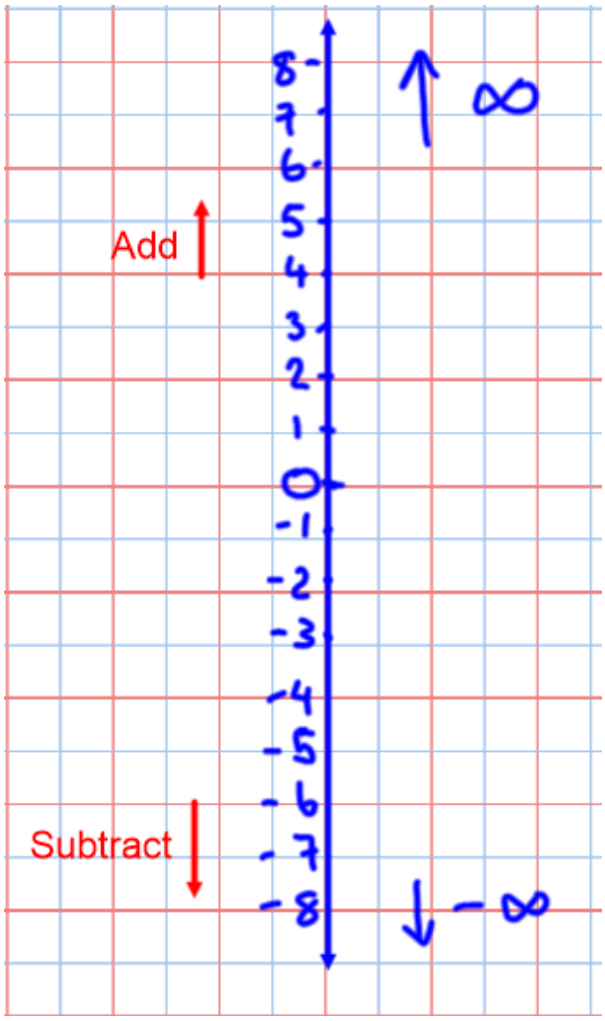
6 + (-5) = 1

-2 + (-7) = -9

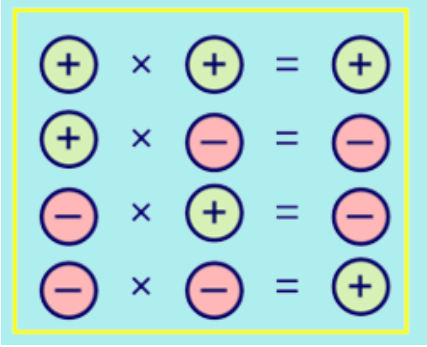
When we subtracting a negative number, we move up the number line (like adding).

2 – (-6) = 8

(-3) – (-8) = 5



The rules for multiplying negative numbers are-



'If signs are the same, the answer is positive, if the signs are different the answer is negative.'

Rules for dividing are the same. Here are some examples-

(-9) x 6 = -54 (-7) x (-6) = 42 8 x (-2) = -16

(-20) ÷ (-4) = 5 (-56) ÷ 8 = -7 $\frac{18}{(-3)} = -6$

BODMAS (Rules for order of operations)

We use the acronym BODMAS to decide what order to work things out in a calculation. It stands for-

Brackets

Of (a fraction of, the square of, square root of, power of)

Division

Multiplication

Addition

Subtraction

Examples-

Work out-

$30 - 4 \times 2$

$= 30 - 8$

$= 22$

$\frac{(9+3)}{6}$

$= \frac{12}{6}$

$= 2$

3×4^2

$= 3 \times 16$

$= 48$

$(3 \times 4)^2$

$= 12^2$

$= 144$

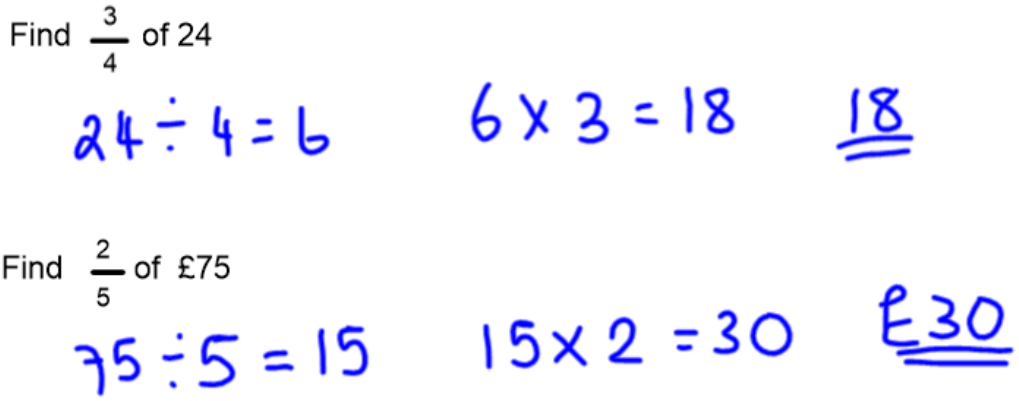
$(7 \times 6) - \sqrt{25}$

$= 42 - 5$

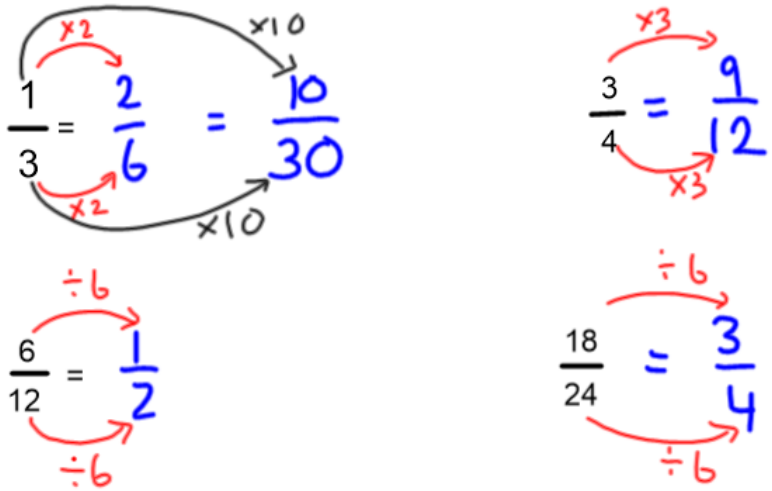
$= 37$

Fractions

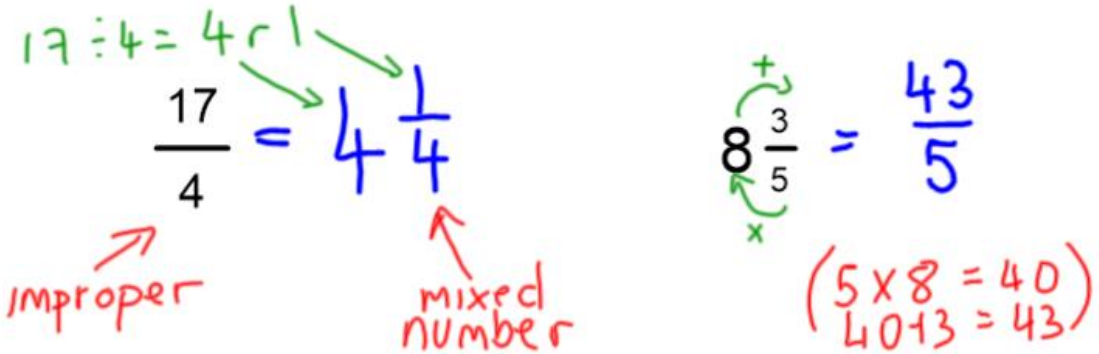
To find a **fraction of a quantity**, we divide by the denominator (bottom number), then multiply the answer by the numerator (top number).



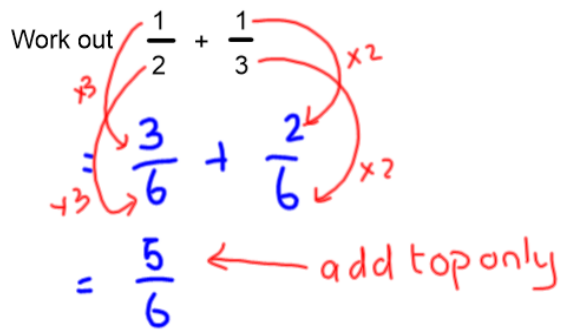
An **equivalent fraction** is when a fraction is multiplied top and bottom, by another number. Fractions can also be **simplified** by dividing top and bottom by the same number.

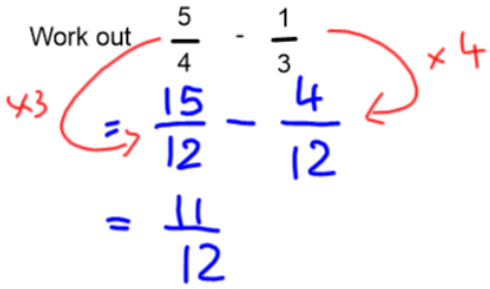


Improper fractions (or top-heavy fractions) are when the top is bigger than the bottom. They can be changed to mixed numbers, and vice versa-



Fractions can only be **added or subtracted** if they have the same denominator. If the denominators are different we use equivalent fractions to get the same, or 'common denominator'. Once the denominators are the same, we add or subtract the top numbers only, the denominator stays the same.





To **multiply fractions** we multiply the two top numbers, then multiply the two denominators.

To divide fractions, we flip the second fraction, then multiply them.

We call this the 'stick, switch flip'.

$\frac{4}{7} \times \frac{2}{3}$

$= \frac{4 \times 2}{7 \times 3}$

$= \frac{8}{21}$

$\frac{3}{7} \times \frac{2}{3}$

$= \frac{3 \times 2}{7 \times 3}$

$= \frac{6}{21}$ Simplify by ÷3

$= \frac{2}{7}$

'Stick' (stays same) 'Switch' change to x

$\frac{5}{7} \div \frac{2}{3}$

$= \frac{5}{7} \times \frac{3}{2}$ ← 'Flip' turn upside down

$= \frac{15}{14}$ ← 5x3, 7x2

$= 1\frac{1}{14}$ (Write as a mixed number)

Percentages

Percent means 'out of 100'. To change a percentage to a fraction, we put 100 on the bottom, then simplify-

$50\% = \frac{50}{100} = \frac{1}{2}$

$70\% = \frac{70}{100} = \frac{7}{10}$

$12.5\% = \frac{12.5}{100} = \frac{25}{200} = \frac{1}{8}$

(×2 to get rid of decimal; ÷25)

To change a percentage to a decimal we divide by 100-

$37\% = 37 \div 100 = 0.37$

$80\% = 80 \div 100 = 0.8$

$5\% = 5 \div 100 = 0.05$

We can also change a fraction to a decimal or percentage- $\frac{18}{40} = 18 \div 40 = 0.45 = 45\%$ (×100)

To find a percentage of an amount mentally we find 10% (by dividing by 10) or 1% (by dividing by 100), then multiply the answer to get the percentage we want.

Find 70% of £90-

10% of £90 = 9

9 x 7 = £63

(70% = 10% x 7)

Find 15% of £67-

10% of 67 = 6.70

5% of 67 = 3.35 (5% is half of 10%)

15% of 67 = 10.05 £10.05

(15% is 10% + 5%)

To find a percentage of an amount with a calculator, we write the percentage as a decimal, then multiply-

Find 8% of £34

8% = 0.08 (8 ÷ 100 = 0.08)

0.08 x 34 = £2.72

There are other methods for working with percentages, if you or your child prefer to use a different method it's fine, as long as it works!

Ratio

When two quantities are measured in comparison to each other they can be written a s a ratio. For example when hairdressers make colour, they might add two parts bleach to 3 parts colour, or to make purple paint you add two parts red to three parts blue. Ratios are also used a lot in recipes. The skill in understand ratio is therefore used a lot in real life, often when we don't realise.

Ratios are written with a colon- 6:7 (we say '6 to 7')

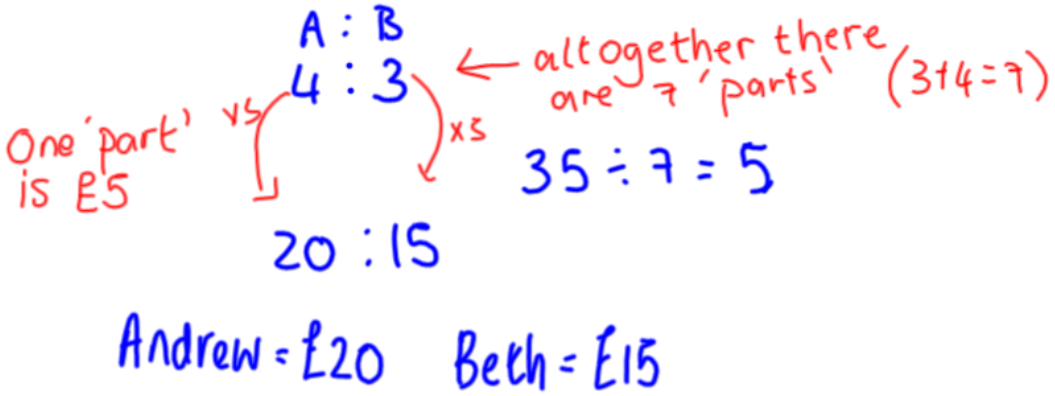
Ratios can be simplified like fractions- 8:2 is the same as 4:1

Ratio problems-

To make playdoh, we mix flour:water:oil in the ratio 6:4:1

If we have 180g of flour, how much oil do we need?

Andrew and Beth share £35 in the ratio 4:3. How much do they each get?



Proportion

Two quantities are said to be in direct proportion if they both go up at the same rate.

For example- If 5 bananas cost 80p, what would 3 bananas cost?

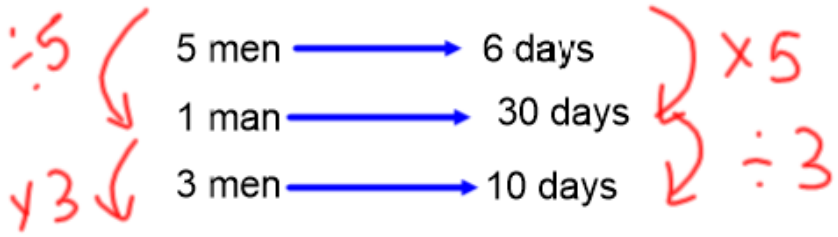
Work out the price of 1→ 80p ÷ 5 = 16p

Find the cost of 5→ 16p x 3 = 48p

Shops provided great opportunities to practice this skill- next time you see a '3 for 2' offer ask your child what the price of 1 would be? Or what is a good deal when items are on offer.

Indirect proportion is when one quantity goes up as another goes down.

For example- If a wall is built by 5 men in 6 days, how long would it take 3 men?



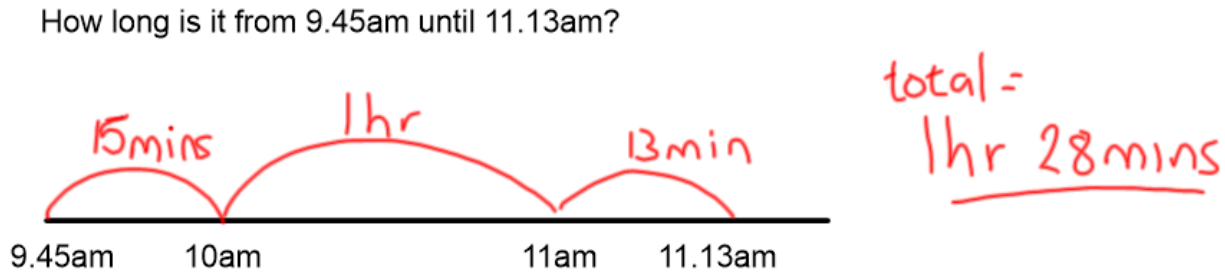
Time

Learning time is a skill parents can really help their child with at home. Talk to your child about how many seconds are in a minute, minutes in an hour, hours in a day etc. Talk about leap years having 366 days instead of 365 and how they can tell when it's a leap year (multiple of 4). Children also often forget there are 52 weeks in a year as well.

Children need to know how to convert between 12hour and 24hour clock as well. Keeping a clock in the house in 24hour format can be a useful way of practicing this and asking them to tell you the time from it.

Similarly keeping an analogue clock and asking them to tell you time without looking at their phone enhances their time skills.

Children also need to know how to calculate a time interval-



We also teach how to change time from minutes to hours for time calculations:

For example change 27 minutes into hours: 27 ÷ 60 = 0.45 hours

Talk to your child about bus timetables as well- ask them to work out how long it will take to get somewhere.

Measurement

It is useful to know the conversions between units-

Length

10mm = 1cm

100cm = 1m

1000m = 1km

Weight

1000g = 1Kg

1000Kg = 1 tonne

Volume

$1cm^3$ = 1ml

1000ml = 1 litre

Look for lengths, volumes and weight on products in your home or at the shops and point them out to your child. It is also good to talk about imperial measurements with your child (miles, inches, feet, pounds etc.) as often they will still have to use these in real life.

Remember practising Numeracy skills doesn't have to be obvious- playing card games, board games or dominoes all help with logic and problem solving skills for example.

Thank you for taking the time to read this booklet- keep it handy in case you need to refer to it, or your child asks for help with homework. If you need any further support or more ideas please let us know!

Here are some websites that might be useful also-