

# Level 1 Functional Maths - key information

Name \_\_\_\_\_ Date \_\_\_\_\_

## Ratio

Two or more items are separated by a colon. The amounts can be increased or decreased but must stay in the same relative amount to each other.

Increase example: Sam is making some cakes for a party. She must use 200g flour to 100g butter and 80g sugar. She has a 3kg bag of flour and wants to use it all. How much butter and sugar does she need?

**Answer**      200 : 100 : 80      3Kg = 3000g

↓x15    ↓x15    ↓x15

3000 : 1500 : 1200

As you need to multiply 200g by 15 to get 3000g, you also have to multiply the other ingredients by 15.

Decrease example: What is the ratio of ingredients in its lowest terms? This means you have to make the numbers as small as you can by dividing through by the same number.

**Answer**      200 : 100 : 80

↓÷20    ↓÷20    ↓÷20

10 : 5 : 4

Choose the biggest number that will go into each of the parts of the ratio. In this example, 10, 2, 5, and 20 are all divisors, but 20 is the biggest.

Split example: Sam needs 1200g pastry to make sausage rolls. She uses flour to fat in the ratio 2:1. How much of each does she need?

Add up how many parts then share your quantity by the number of parts to find out how much one part is

**Answer:** Flour + Fat = 1200g There are 2 lots of flour to each one lot of fat.

$$2 + 1 = 3 \text{ lots make up } 1200\text{g} \quad 1200\text{g} \div 3 = 400\text{g},$$

This means one lot is 400g,      flour =  $2 \times 400 = 800\text{g}$  and fat =  $1 \times 400\text{g}$

## Fractions

can be increased or decreased in the same way as ratios. Equivalent fractions are fractions that represent the same amount.

Choose the biggest number that will go into each of the parts of the fraction and divide through.

Example: Express the fraction  $\frac{25}{90}$  in its lowest terms.

The only number that will go into both 25 and 90 is 5

$$25 \div 5 = 5 \quad 90 \div 5 = 18 \quad \text{so our fraction becomes } \frac{5}{18}$$

You may need to make equivalent fractions if you want to compare them.

Example: Which is bigger  $\frac{2}{3}$  or  $\frac{5}{8}$ ?

a)  $3 \times 8 = 24$  so multiply 2 by 8    b)  $8 \times 3 = 24$  so multiply 5 by 3

$$2 \times 8 = 16$$

$$5 \times 3 = 15$$

$$\frac{2}{3} = \frac{16}{24} \quad \text{and}$$

$$\frac{5}{8} = \frac{15}{24}$$

So  $\frac{2}{3}$  is the bigger of the fractions.

Multiply the bottom numbers together. Turn each fraction into an equivalent by multiplying. Then you can see which is bigger.

### TIP

÷ by bottom number  
x by top number

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## Finding a fractional part:

Find  $\frac{2}{7}$  of £350       $350 \div 7 = 50$      $50 \times 2 = 100$     Answer £100

## Decimals

When **adding, subtracting or ordering** decimals, make sure you line up the decimal points so that you are adding digits with the same place value together.

Example $48.365 + 146.2$	Correct	Incorrect
	48.365	48.365
	146.2	146.2

### TIP

If ordering decimals, it may help to add zeroes to the end of the number

46.5	46.500
46.399	46.399

When multiplying decimals, treat the numbers as whole numbers and adjust for the decimal point afterwards

**Example**  $21.4 \times 2.5$

Answer

214

adjusting for decimal point

x25

21.4 has 1 decimal place (dp)

1070

2.5 has 1 decimal place

4280

Total of 2 decimal places in question so

5350

need 2 dp in answer, count from right

### TIP

Check that the answer is of the right order by multiplying the whole numbers together.  $21 \times 2 = 42$ , so answer should be over 42 and less than  $21 \times 3$  (63).

5350  $\longrightarrow$  53.50

## Division

If dividing by a whole number, just carry out the division as normal taking care to insert the decimal point of the answer immediately above the one in the sum.

		9.15
$5 \overline{) 45.75}$	$\longrightarrow$	$5 \overline{) 45.75}$

If you are dividing by a decimal number, multiply both that number and the number you are dividing into by 10, 100 or 1000 to get rid of the decimal point. Then carry out the division in the normal way. **There is no need to adjust back – this is your answer**, because you have done the same to both numbers.

### Example

$48 \div 0.3$       x both by 10,  $480 \div 3 = 160$

$48 \div 0.03$       x both by 100,  $4800 \div 3 = 1600$

### TIP

Because you are dividing by a number less than one, your answer will be bigger than the number you started with. If this seems weird, imagine you have 4 pizzas, if you divide them into halves ( $\div 0.5$ ) you have 8 pieces of pizza.

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## Rounding

Make sure you round as requested. Decide where your number will finish and look at the digit following that. If this digit is 5 or more, round the number up by adding 1 to the digit to the left, otherwise leave off all digits after where your number ends.

If you are asked to round to the nearest whole number, you will not have any decimal part.

43.743 → 44

Number to finish before arrow, 7 is greater than 5, so add 1 onto the 3 .

If you are asked to round to two decimal places, you will have 2 digits after the decimal point.

43.743 → 43.74

Number to finish before arrow, 3 is less than 5, so leave it off.

## Percentages

To find a given percentage, you multiply the amount by the percentage and then divide by 100.

So 18% of £350 =  $18 \times 350 \div 100 = \text{£}63$

**Tip: Remember, percentages are like fractions but the bottom number is always 100**     $18\% = 18/100$

However, it is often easier to find percentages like this:

$50\% = \frac{50}{100}$  which is half, so divide the amount by 2:     $50\% \text{ of } \text{£}350 = \text{£}350 \div 2 = \text{£}175$

$10\% = \frac{10}{100} = \frac{1}{10}$ , so divide the amount by 10:     $10\% \text{ of } \text{£}350 = \text{£}350 \div 10 = \text{£}35$

**Using these two percentages, you can work out all others by simple maths, like this:**

25% is half of 50%, so find 50% and divide by 2 again     $50\% \text{ of } \text{£}350 = \text{£}350 \div 2 = \text{£}175 \div 2 = \text{£}87.50$

5% is half of 10%, so find 10% and divide by 2     $10\% \text{ of } \text{£}350 = \text{£}350 \div 10 = \text{£}35 \div 2 = \text{£}17.50$

1% is one tenth of 10% so find 10% and divide by 10 again     $10\% \text{ of } \text{£}350 = \text{£}350 \div 10 = \text{£}35 \div 10 = \text{£}3.50$

18% can be made by adding 10+5+1+1+1. So add 10%, 5%, 1%, 1% & 1% =  $35 + 17.50 + 3.50 + 3.50 + 3.50 = \text{£}63$

**Some questions may ask you to find a percentage increase (or decrease). Simply find the percentage and add it (take it from) to the amount you started with.**

**Example If you earn £100 and get a 5% pay rise: 5% of £100 = £5, so your new pay will be £105 NOT £5**

## Equivalences between fractions, decimals and percentages

The important ones to remember are:

0.5	$\frac{1}{2}$	50%		0.2	$\frac{1}{5}$	20%
0.25	$\frac{1}{4}$	25%		0.333	$\frac{1}{3}$	33.3%
0.1	$\frac{1}{10}$	10%		0.667	$\frac{2}{3}$	66.7%

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## Measurement

If you can remember the following prefixes, it will help with converting measurements.

**Milli** means thousandths, so

1 millimetre is **one thousandth** of a metre and you need **one thousand** of them to make a metre

1 millilitre is **one thousandth** of a litre and you need **one thousand** of them to make a litre

1 milligram is **one thousandth** of a gram and you need **one thousand** of them to make a gram

**Centi** means hundredths, so

1 centimetre is **one hundredth** of a metre and you need **one hundred** of them to make a metre

**Kilo** means one thousand of, so

1 kilometre is **one thousand** metres and you need **one thousand** metres to make a kilometre

1 kilogram is **one thousand** grams and you need **one thousand** grams to make a kilogram

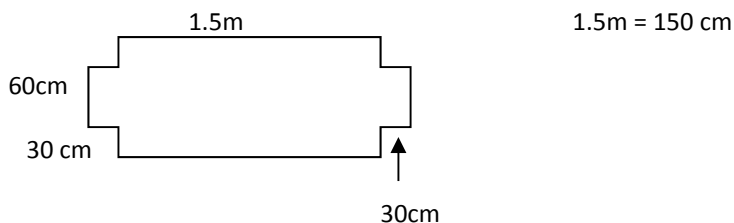
## Perimeter, Area and Volume

Perimeter is the area around a shape – add up all the sides, making sure that the units are the same.

The area of a rectangle is given by length x width. If the shape you get is not a rectangle, split it to make rectangles, then add up all the bits.

Volume of a cuboid is length x width x height, again, you may have to split a shape into cuboids

### Example



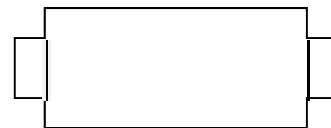
$$\text{Perimeter} = 150 + 150 + 60 + 60 + 30 + 30 + 30 + 30 + 30 + 30 + 30 + 30 = 660\text{cm}$$

Area To find the area of the above shape, make it into 3 rectangles

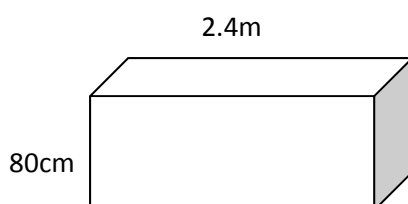
$$\text{Area large rectangle} = 150 \times 120 = 1800 \text{ cm}^2$$

$$\text{Area of each small rectangle} = 60 \times 30 = 180 \text{ cm}^2$$

$$\text{Total area} = 180 + 180 + 1800 = 2160 \text{ cm}^2$$



Volume of a cuboid = length x width x height. For the *square ended* cuboid below:



**height = depth**

$$\text{Volume} = 80 \times 80 \times 240 = 15360 \text{ cm}^3$$

**The standard units of measure are:**  
metre for length  
gram for weight  
litre for capacity  
°C for temperature

### TIP

Area is 2-D so units are squared –  $\text{cm}^2$  or  $\text{m}^2$

Volume is 3-D so units are cubed –  $\text{cm}^3$  or  $\text{m}^3$

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## Mean and Range

The mean is the most commonly used average. Add up all values and divide by the number of values.

### Example

Find the average temperature measured at midday over a week: 16°C, 18°C, 17°C, 12°C, 15°C, 13°C, 15°C

Answer:  $16 + 18 + 17 + 12 + 15 + 13 + 15 = 106$   $106 \div 7 = 15.1^\circ\text{C}$

The range is the difference between the highest and lowest values and gives a measure of the spread of data. Using the figures above – highest value is 18°C and lowest is 12°C,

Range =  $18 - 12 = 6^\circ\text{C}$

### GENERAL HINTS

**Make sure you:** read the question carefully, check you have copied numbers down correctly, put units on wherever applicable, answer the question they have asked and show all your working – **remember a lot of the marks are awarded for working-out so you need to show the examiner how you have solved a problem, even if you can do it in your head.**

**If you are using a calculator, check your answer – it is too easy to push the wrong button!**

If you are stuck, write down the information given in the question and think how you can use it to solve the problem.

What information have they given you?

What are you trying to find out?

How do you get the answer from the information you have been given?

Above all: KEEP CALM AND PACE YOURSELF

# Level 1 Functional Maths - key information

## Teaching notes and curriculum mapping

Name \_\_\_\_\_ Date \_\_\_\_\_



This resource contains the basic information with examples for learners preparing to sit level 1 Functional Maths. It is by no means comprehensive but does cover the areas that most learners find problematic, such as ratio, fractions, decimals, percentages and perimeter, area and volume.

### FUNCTIONAL MATHEMATICS Coverage and Range statements (indicative only)

Coverage and range statements provide an indication of the type of mathematical content candidates are expected to apply in functional contexts. Relevant content can also be drawn from equivalent National Curriculum levels and the Adult Numeracy standards.

✓ indicates the main coverage and range skills covered in this resource, although these will vary with the student group and how the resource is used by the teacher.

#### Level 1

- |   |  |
|---|--|
| a) Understand and use whole numbers and understand negative nos. in practical contexts  | g) Solve problems requiring calculation, with common measures, including money, time, length, weight, capacity and temperature ✓ |
| b) Add, subtract, multiply and divide whole numbers using a range of strategies ✓       | h) Convert units of measure in the same system ✓   |
| c) Understand and use equivalences between common fractions, decimals and percentages ✓ | i) Work out areas and perimeters in practical situations ✓   |
| d) Add and subtract decimals up to 2 decimal places ✓                                   | j) Construct geometric diagrams, models and shapes   |
| e) Solve simple problems involving ratio, where one number is a multiple of the other ✓ | k) Extract and interpret information from tables, diagrams, charts and graphs  |
| f) Use simple formulae expressed in words for one- or two-step operations               | l) Collect and record discrete data and organise and represent information in different ways                                     |
|   | m) Find mean and range ✓   |
|   | n) Use data to assess the likelihood of an outcome   |

#### Level 2

- |   |  |
|---|--|
| a) understand and use positive and negative numbers of any size in practical contexts                           | g) find area, perimeter and volume of common shapes ✓  |
| b) carry out calculations with numbers of any size in practical contexts, to a given number of decimal places ✓ | h) use, convert and calculate using metric and, where appropriate, imperial measures   |
| c) understand, use and calculate ratio and proportion, including problems involving scale                       | i) collect and represent discrete and continuous data, using information and communication technology (ICT) where appropriate  |
| d) understand and use equivalences between fractions, decimals and percentages                                  | j) use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate. |
| e) understand and use simple formulae and equations involving one or two operations                             | k) use statistical methods to investigate situations   |
| f) recognise and use 2D representations of 3D objects   | l) use probability to assess the likelihood of an outcome  |

## References

Ofqual (2009), *Functional Skills criteria for Mathematics: Entry 1, Entry 2, Entry 3, level 1 and level 2.*

<http://www.ofqual.gov.uk/>

This resource also covers many **adult numeracy curriculum** elements.

<http://www.excellencegateway.org.uk/sflcurriculum> including

For related resources and further curriculum links please visit the download page for this resource at

[www.skillsworkshop.org](http://www.skillsworkshop.org)