

# Functional Skills Maths

Pre-Intensive

Level 1 & 2

# General Information

## Course Breakdown

Welcome to the Functional Skills Maths Pre-Intensive guide book. This booklet is designed to give you an insight into the intensive course.

The course taught consists of 5 central topics, which each cover a number of maths skills to be applied in real life situations. These topics are:

- Number
- Formula
- Measure
- Shape
- Data

Each of these is covered in more detail in later sections of the booklet.

## Duration

The course is designed to be delivered over two or three days, with the final examinations to take place at the end of the second/third day.

Each day will start at 9.30, end at 16.00, and be broken into one hour sessions, with a number of small breaks and one longer lunch break.

## Exams

At 16:00 on the second/third day, you will sit two exams:

- A 25 minute non-calculator exam
- A 90 minute calculator exam

There is a small break between exams, but you will not be allowed to leave the exam room during this time.

# General Information

## Equipment

Non-Scientific Calculator

Compass

Protractor

Pencil

If for any reason you cannot bring these items, please inform the Maths & English department at the college, and we will be able to provide you with said equipment.

## Exams

Unless specified to the college prior, your exams will be sat on computer. Part of the course will include familiarising you with the interface. If you require a paper based exam, and are in any doubt as to what has been booked, please contact the Maths and English department to enquire.

## Exams Concessions

If you have previously had concessions in exams, it is your responsibility to ensure that the college is made aware. If you can evidence previous concessions, this will speed up the process of putting them in place. If you cannot evidence prior exam support, you will need to have an assessment at the college: this process takes time, and if not requested to the college directly, and **prior** to your invitation to this booking of the course, it will not be able to be put in place before this courses exam.

## Contact

If you are in any doubt as to any of the above, please get in touch with your contact point at the college (Course Leader, Apprentice Coach, Maths & English Trainer, etc.), or the Maths & English Department on:

Email – [MandEQueries@chichester.ac.uk](mailto:MandEQueries@chichester.ac.uk)

# Number

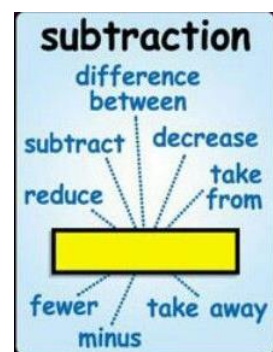
Number is the core topic which will apply to every aspect of your Functional Skills maths in some way.

It consists of:

## Mathematical Operations

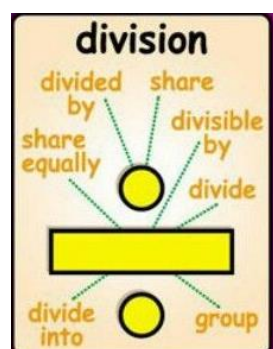
### *Addition & Subtraction*

You'll be shown how addition and subtraction can be applied to a number of situations which you may not have considered previously.



### *Multiplication & Division*

You'll be shown how multiplication and division are central to nearly all aspects of functional skills, as well as manual methods to multiply for the non-calculator exam.



### *Place Value*

You will be shown how place value works for operations, as well as how it affects the other elements of FS maths.

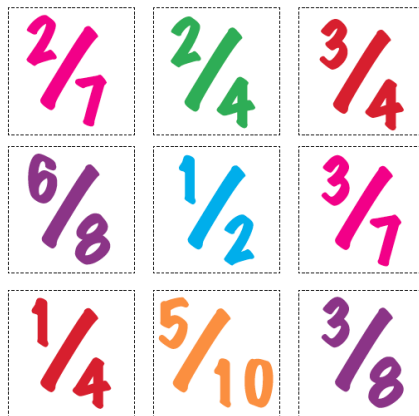
# Number

## Percentage



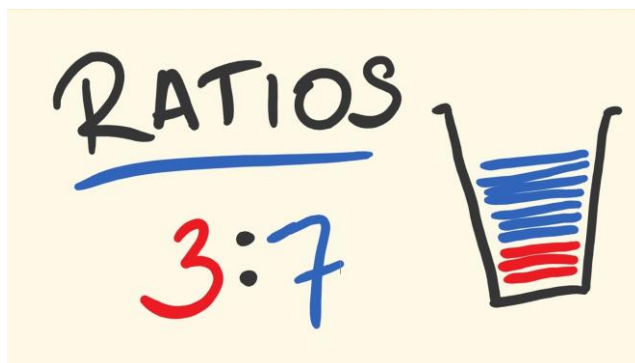
You will be shown how to calculate percentage of a total, working out 100% from a part, percentage change (increase and decrease) as well as alternative methods for percentages.

## Fractions



You will be shown how to work with fractions of total amounts, operations with variable fractions and simplification of fractions.

## Ratio



You will be shown how to use ratios in real life contexts, find the total amount using part of a ratio, as well as

# Number

## Real World Uses

Working out how much you are saving in sales

How much interest you should be paying on purchases/charges

Comparing value for money on products

How much to tip at restaurants

Which offers are the best

Working out how much of each ingredient to use when adapting recipes

# Formula

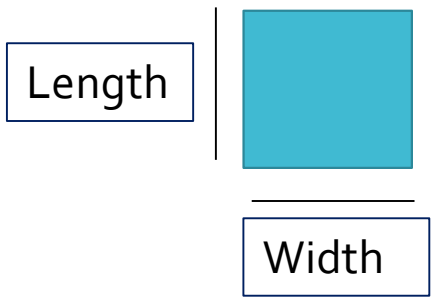
In the formula section of the course, you will be shown how to interpret formula in questions, use formula in real life situation as well as how to prove your own sums as accurate when asked.

## Key Formula

While you will be given formula to use in certain questions, you are still expected to know some from memory. The following are the key formula to remember:

### Area (<sup>2</sup>)

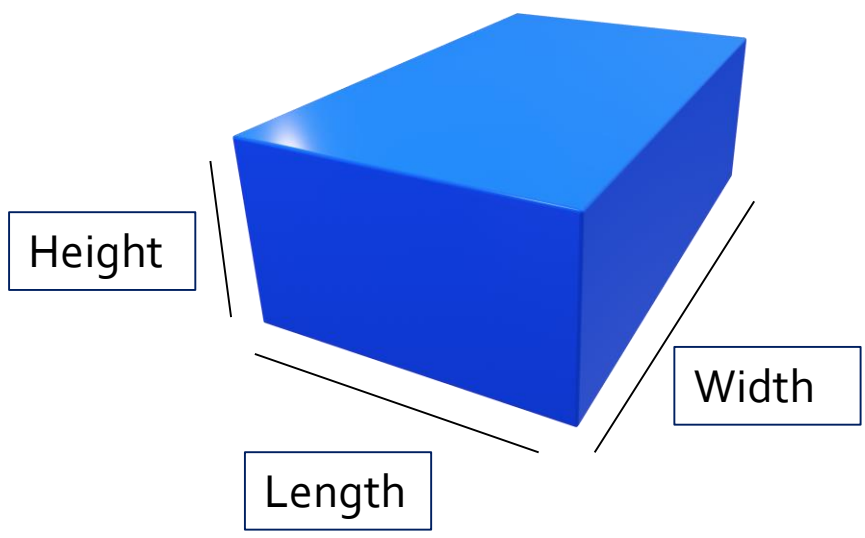
$$= \text{Length} \times \text{Width}$$



### Volume (<sup>3</sup>)

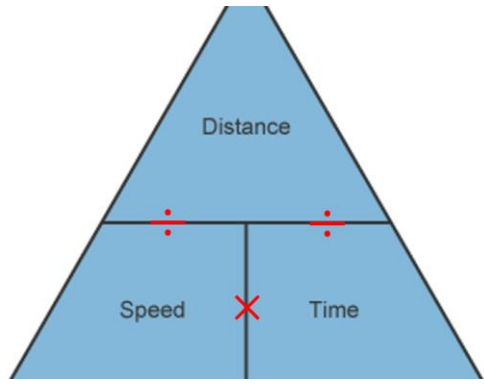
$$= \text{Length} \times \text{Width} \times \text{Height}$$

(Area)



# Formula

## Key Formula (Cont.)



$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Speed} = \text{Distance} \div \text{Time}$$

$$\text{Time} = \text{Distance} \div \text{Speed}$$

## Circumference & Area of Circles (Level 2)

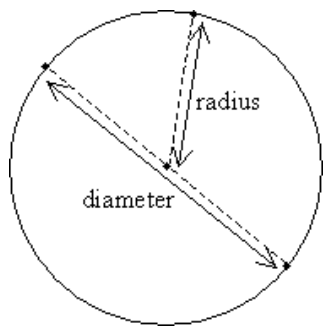
Circumference is the outside of a circle.

$$\pi = \text{Pi}$$

**Pi is 3.14**

To work out the Circumference, you need to multiply:

$$\pi \times \text{Diameter}$$



To work out the area of a circle, you need to multiply:

$$\pi \times \text{Radius} \times \text{Radius}$$



# Formula

## Inverting Operations (to prove your sums)

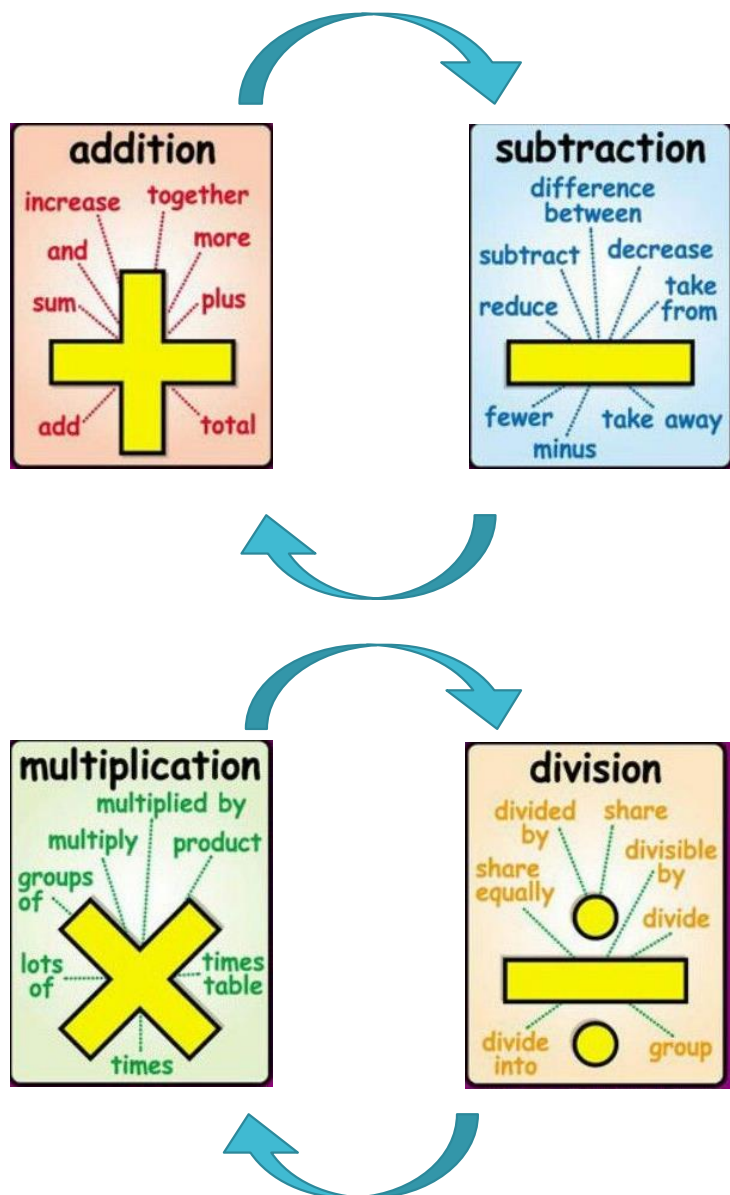
While not a formula, it's useful for you to remember the inverse, or **opposite** operations:

**Addition** is the *inverse* of **Subtraction**

**Subtraction** is the *inverse* of **Addition**

**Multiplication** is the *inverse* of **Division**

**Division** is the *inverse* of **Multiplication**



## Formula

## Real World Uses

Knowing how much carpet/how many tiles to buy when doing up the house

Checking you're not being wrongly charged by different businesses/organisations

Make sure you haven't paid too much/too little for something

# Measure

In the measure section of the course, we will look at how to convert between different units of measurement (including currencies), how to use conversion factors, how to apply the formula for Perimeter, Area and Volume, as well as how to work with time conversion.

## Units of Measurement

You are not expected to remember how to convert all the possible units you will have to work with in the exam. Quite often, you will be given the information needed to convert and work with the information you are dealing with.

You **ARE** expected to remember the Metric Units for the exam.

### Distance



### *Metres*

$10 \text{ mm} = 1 \text{ cm}$   
 $100 \text{ cm} = 1 \text{ m}$   
 $1000 \text{ m} = 1 \text{ km}$

### Weight



### *Grams*

$10 \text{ mg} = 1 \text{ cg}$   
 $100 \text{ cg} = 1 \text{ g}$   
 $1000 \text{ g} = 1 \text{ kg}$

### Capacity



### *Litres*

$10 \text{ ml} = 1 \text{ cl}$   
 $100 \text{ cl} = 1 \text{ l}$

## Measure

Correctly weighing up ingredients for meals

Accurately working out how much of each material you may need while working on your house

## Real World Uses

Working out how much of individual materials you need via conversion

Understanding quantity and dosage strength in relation to medications

Knowing how much to buy of something so you don't end up with too little or too much

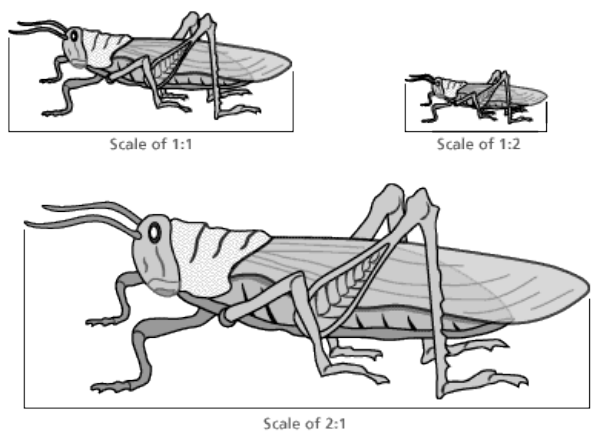
# Shape

In the shape section of the course, we will look at how to work with scale, symmetry and angles, as well as looking at different shapes, nets, plans and other scale drawing.

## Scale

Scale is how we can represent bigger things from real life into things like floor plans, models, etc.

You will be shown how to use scale factors for drawing and how to interpret scale drawings for construction.



## Floor Plans

Floor plans are one of the many ways we use scale. What sort of professions use scale drawings like this? Why might you use scale drawings in your life?



# Shape

## Elevations

Elevations are drawings taken from one side of a 3D object/area.

You can have front, back and side elevations.



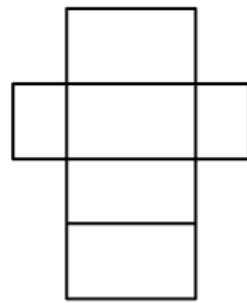
## Nets

Nets are 2D drawings of a 3D shape, unfolded. You might be asked to make a scale net of something like a jewellery box in the exam.

### 3D Shape

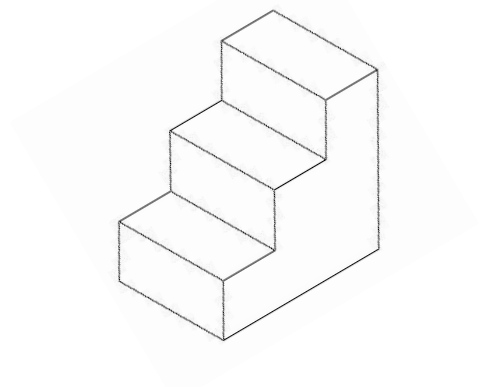


### Net



## Isometric Drawing

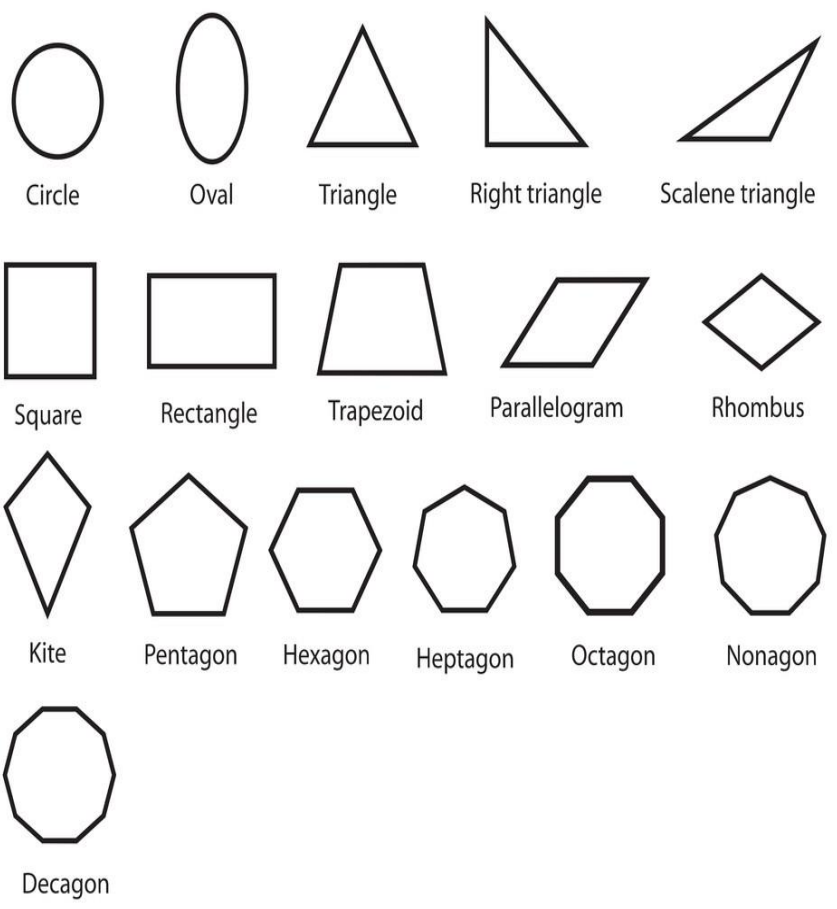
Isometric drawing is 2.5D; a 3D object represented in 2D. You may be asked to replicate an isometric drawing in your exam.



# Shape

## Symmetry, Shapes & Angles

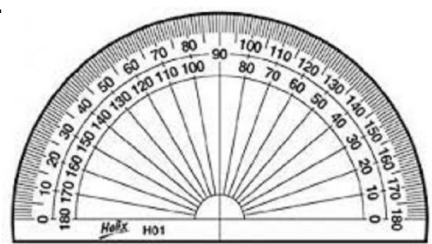
You may be asked to work with certain shapes in different situations for, so it is important to be able to identify key shapes. Below are the sorts of shape you *MAY* encounter in the exam.



You Might be asked to identify lines of symmetry (a line that you could place a mirror on and reflect the shape so that it still looks the same)

## Working with Angles

You may be asked to work with angles in the exam. This could be measuring them, this could be working out missing angles in a shape, or it could be drawing a shape using them.



# Shape

Planning construction in advance

Being able to work out how many materials you may need for a project in advance

# Real World Uses

Making sure things are symmetrical (so that they match)

Knowing how much carpet you may need (for shapes of rooms not square) to re-carpet a room



# Data

In the Data section of the course, we will look at how to interpret data via averages (mean, median and mode), range, graphs, probability and collection sheets, as well as how to compare said data and how to comment on your use of data.

## Averages & Range

You will be shown how to use the **three types of average** to produce analysis of data, as well as how to find data from an average. You will also learn how to use the **range of data** – this is not an average, but is linked.

**Mean** = Add up all data, and  $\div$  the result by the number of data

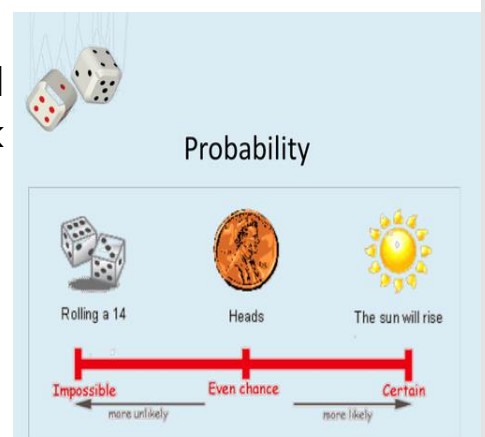
**Median** = the middle value of the data in order or smallest to largest

**Mode** = the most repeating data value (often there won't be a mode)

**Range** = smallest data value subtracted from the largest

## Probability

Probability is how likely something is to happen or not. You will be taught how to work out the probability of an event, as well as how to express probability through comments, percentage and fractions.

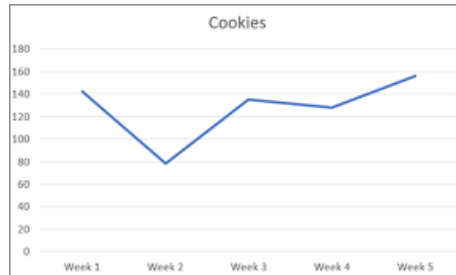


# Data

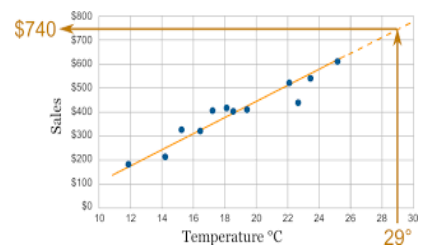
## Graphs & Charts

Graphs & Charts are a key tool to displaying data for analysis. You will be shown the use and application of multiple types of graph and chart to draw information, as well as how to generate your own to display data.

### Types of Graph

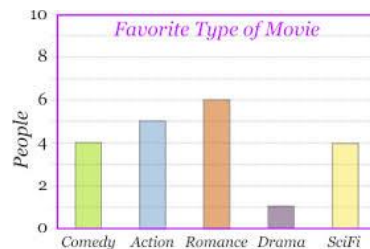


Line Graphs

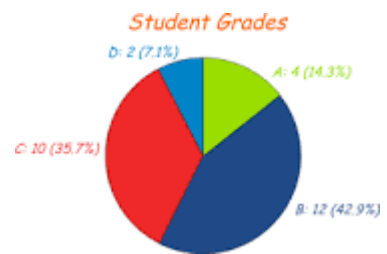


Scatter Graph/Line of Best Fit

### Types of Chart



Bar Chart



Pie Chart

At Level 1 you will be expected to be able to work with all of the above, with the exception of line of best fit/scatter graph!

At Level 2 you will be expected to be able to work with scatter graphs, lines of best fit, and comparative charts and graphs!

# Data

## Data Collection

Data Collection includes some of the methods above (Tally Charts for example), but also includes specific data collection sheets; forms designed to produce data and correlation (a connection). There is a key difference between Level 1 and Level 2.

### *Level 1 Data Collection Sheet*

At Level 1, you will need to correlate **two** pieces of data into a form. This could be *Gender* and *Age* of customers online.

	Male	Female
16 – 24 years old		
25+ years old		

### *Level 2 Data Collection Sheet*

At Level 2, you will need to correlate **three** pieces of data into a form. This could be *Gender*, *Age* and *Time Spent* by customers online.

	Male		Female	
	16 – 24 years old	25+ years old	16 – 24 years old	25+ years old
1 – 2 hours				
3 – 4 hours				

# Data

Budgeting for the month/year

Keeping a track of expenses

# Real World Uses

Keeping a track of trends in business, behaviour, etc

Representing data to others

Making connections between causation and correlation

Being able to work out the probability of something

# How to prepare for this course

It may have been a long time since you last studied maths, and this may look like a lot to go over. You might want to look at some topics in advance; that's fine! There are many online resources for you to look at on maths, but don't delve too deep...

The key to maths (and every skill) is repetition; practice makes perfect. Reading something once won't make you an expert; but reading something 100 times, 1000 times, or more... you're well on your way to memorising it!

The next page will give you some basic maths ideas to try and apply to every day life in the lead up to this course. The following page will give you some ideas on how to use them, but feel free to come up with your own as well!!

# How to prepare for this course

Percentage = Total Number  $\div$  100 to find 1%, and then multiply by the percentage you are looking for.

Mean Average = add up all the data you have, and divide by how many pieces of data added (i.e. add up the temperature each day for a week, and divide by the number of days).

Range = subtract the smallest piece of data from the biggest.

Proportion increase = increasing something as a whole, rather than individual measurements. (i.e. taking the amount of sugar consumed in a day and multiplying by 7, rather than measuring all sugar intake for 7 days)

# How to prepare for this course

Below are some everyday things you could do to practice maths in a small way. Every little helps!!

- Why not total how much money you spend in an entire week, and then work out the average amount you spent each day?
- Why not measure some items around the house using a tape measure, and try converting from cm to meters ( $\div 100$ )?
- Why not practice your times tables (again, repetition is the key to memory)?
- Why not work out how much it would cost to re-carpet the house? (Area of each room,  $\times$  by the cost of carpet per  $m^2$ )
- Why not work out how much more you would need of each ingredient in a meal you make for your family if you were making it for 12 people?
- Why not work out how much sugar you take in a cup of coffee, and then work out your total sugar for the week (from coffee)?

## Times Tables

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

## Reverse Methods (Checking sums)

