Get the most from this book

We all need to decide how to revise in a way that works for us, but learning each topic, testing our understanding and knowing how to answer exam questions is essential.

My Functional Skills will help you to do that in a planned way, topic by topic. Use this book in the way that works best for you: write in it, doodle, personalise your notes; and check your progress by ticking off each section as you revise.

This book is broken down into three sections:

1   Using numbers and the number system
2   Using common measures, shape and space
3   Handling information and data.

Features to help you succeed

DIAGNOSTIC QUESTIONS

Focus! Work out which topics you need to spend more time on by answering these **diagnostic questions**. You can choose to focus on areas where you're weaker and spend less time on the topics you're already really good at.

WORKED EXAMPLE

Oh, so that's how I do it! Every topic includes at least one **worked example** that guides you through the steps to answer an exam-style question.

KEY TERMS

What does that mean? On each page, all the important **key terms** are defined; and there's a handy summary of all of these in the glossary at the back of the book.

EXAM TIP

What *is* the examiner looking for? Throughout the book you'll find **hints and tips** on how to approach answering questions, as well as how you might gain the most marks in the exam.

COMMON MISTAKES

Where did I go wrong? Many of the **common mistakes** and pitfalls students have made in Functional Skills exams are highlighted, so you can avoid making them yourself.

MAKING LINKS

Where can I find out more? Some topics link closely with others. Here you'll see where you can find more information elsewhere in the revision guide that is relevant to the topic.

CHECK YOUR UNDERSTANDING

Now it's my turn! Test your understanding of each topic with these short questions. Review the answers online at hoddereducation.co.uk/xxxx to see whether you have answered correctly.

EXAM-STYLE QUESTIONS

Practice, practice, practice! Get exam-ready by answering these **exam-style questions**. Review the **answers** online at www.hoddereducation.co.uk/xxxxx to see whether you have answered correctly or if you need to try again.

Countdown to my exams

6–8 WEEKS TO GO

○ **What do I need to revise?** Familiarise yourself with the topics you need to revise. You can use the revision planner in this book to help you.

○ **What will the exam look like?** Look at the exam board specification or ask your tutor about the format of your Functional Skills exams. When and where will they take place? How long will they last? What types of questions might you see on the exam papers? The Assessment Breakdown on page 7 gives more information on this.

○ **Get organised.** Organise your notes and make sure you've covered all the topics.

○ **Make a plan.** Create a revision plan that shows the days and times you'll revise each topic. Be realistic – small, focused sessions of around 40–50 minutes will be more achievable and successful. Make sure you allow yourself breaks. Stick to your plan!

2–6 WEEKS TO GO

○ **Make a start.** Use your own revision plan to work through the topics in this book. Look at the explanations, worked examples, key terms, common mistakes and hints and tips. Highlight any important bits and make your own notes in the book if you wish. Tick off each topic when you feel confident, or come back to any topics you think you need to look at again.

○ **What do I know?** Now test your understanding by answering the Check your understanding questions. Look at the answers online at www.hoddereducation.co.uk/xxxxx. What did you get right? Which topics do you need to revisit?

○ **Where do I need help?** Speak to your tutor about any topics you're finding tricky. They may be able to go over them again with you as part of a revision class.

○ **Get exam ready!** The best way to prepare is to practise answering lots and lots of exam questions. Have a go at the exam-style questions in this book and check your answers online at www.hoddereducation.co.uk/xxxxx. Look at and attempt past Functional Skills exam papers – you will find these on your exam board's website, or your tutor will be able to share some with you.

○ **Keep track.** Use the revision planner to keep track of your progress.

1 WEEK TO GO

○ **Have I covered everything?** Check that you have revised every topic on the revision planner. Look at any you haven't already covered; and revisit any topics you still feel less confident about.

○ **Prepare for exam conditions**. Do a complete past exam paper in timed exam conditions to help you plan your time for the real exams. Compare your answers against the mark scheme or ask your tutor to mark it for you.

THE DAY BEFORE

○ **Last-minute check.** Read through your notes and flick through this book to remind yourself of any important points, common mistakes and hints and tips.

○ **When and where is it?** Check the time and place of your exam and plan your journey, allowing plenty of time to make sure you're there on time.

○ **What do I need to take?** Make sure you have everything you need for the exam including pens, highlighters and water.

○ **Relax!** Your revision is complete. Give yourself some time to relax and get an early night to make sure you're ready for the exam tomorrow.

MY FUNCTIONAL SKILLS EXAMS

Calculator paper

Date:

Time:

Location:

Non-calculator paper

Date:

Time:

Location:

3 Handling information and data

DIAGNOSTIC QUESTIONS

Non-calculator questions

1   Last year, Sarah's average (mean) score for her tests in English was 64%.

This year, her scores are:
68%   59%   63%   71%   61%   68%

Has she improved on her results from last year? Give a reason for your answer.

2   The following table shows the temperatures across seven different cities one morning in January:

Swansea	Coventry	London	Glasgow	Newcastle	Norwich	Sheffield
−1°C	0°C	2°C	−7°C	−4°C	4°C	−4°C

Calculate the temperature:

a   range   **b**   median   **c**   mode.

3   A teacher in a class creates a table to show which of his students have GCSE English. He groups them according to the age ranges 16–17 and 18+.

	16–17 year olds	18+
With GCSE English	7	12
Without GCSE English	9	5

A student is chosen at random. What is the probability of the student being a 16–17 year old with a GCSE in English?

4   A bag contains red, blue and yellow counters. If one is chosen at random, the probability of it being a red is $\frac{1}{5}$ and the probability of it being blue is 35%. Calculate the probability of the counter being yellow. Give your answer as:

a   a percentage   **b**   a decimal   **c**   a fraction.

5   The scatter diagram below shows the correlation between seven students' results for an IT test and music test:
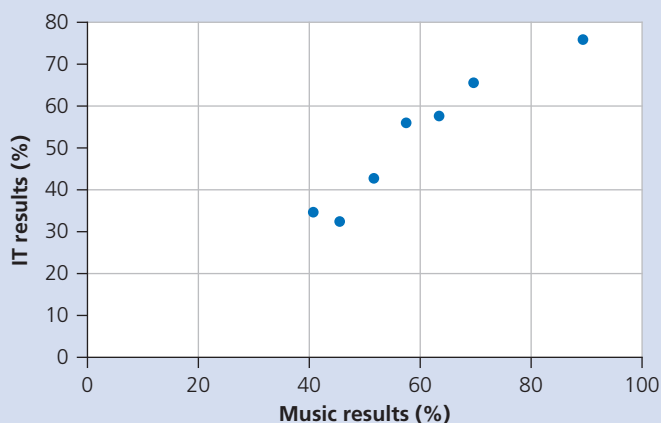
a Draw a line of best fit to show the correlation between the students' IT and music scores.

b Describe the correlation between the students' IT and music results.

c One student scored 80% in their music test, but missed the IT test. Using your line of best fit, estimate what their IT result would have been (show your working on the graph).

Calculator question

6 Debbie recorded the times, in minutes, for 20 students to complete an initial assessment. She recorded her results in the grouped frequency table below:

Time (t) mins	Frequency	
$20 \leq t < 30$	3	3 × 25 =
$30 \leq t < 40$	4	
$40 \leq t < 50$	9	
$50 \leq t < 60$	4	

Estimate the mean time to complete the initial assessment.

SAMPLE

3.1 Calculate the median and mode of a set of quantities

The median

The **median** is a type of average (do not confuse with the mean). It is the **midpoint** of a set of values when they are placed in numerical order (i.e. from lowest to highest).

The median can be a better measure of average than the mean if the data contains extreme values (either very high or very low), known as 'outliers'.

The mode

The **mode** (or modal value) of a set of quantities is the number that appears the most often.

> **MAKING LINKS**
>
> How to calculate the mean is covered in detail in Level 1, Unit 3.3.

> **Median**: the midpoint value in a data set or list of numbers.
>
> **Mode**: the number that appears most often in a data sample.

WORKED EXAMPLE

The ages of a group of adults in a class are recorded below.

24, 19, 34, 28, 30, 36, 26, 23, 41, 34

- **a** Find the median.
- **b** Find the mode
- **c** Another adult, aged 32, joins the class. Calculate the new median.

ANSWER

- **a** Place the numbers in numerical order: 19, 23, 24, 26, **28**,|**30**, 34, 34, 36, 41.
  Count the number of values. There is an **even** number of ages (10), so we can put a line between the two middle numbers (28 and 30). The median value is midway between those two numbers, so it is **29**.
  Alternatively, you could add the two middle numbers (28 + 30 = 58) and divide by 2 (**29**) to find the median.
- **b** The mode of the above set of quantities is the number which occurs the most: **34**.
- **c** Now there are 11 numbers (odd). The median value is then the number in the middle, **30**, which has the same amount of numbers (5) on either side of it.
  19, 23, 24, 26, 28, **30**, 32, 34, 34, 36, 41

> **EXAM TIP**
>
> Make sure, when rearranging the numbers in ascending order, that all numbers from the data set are included and that the position of the median is indicated clearly.

COMMON MISTAKE

A common mistake here is to calculate the median from the set of numbers before putting them in order. In this case, it would be 33, which is between 30 and 36.

1   Work out the mode and the median of the following weights:
    65.3 kg, 84 kg, 54.0 kg, 82.4 kg, 91 kg, 84.2 kg, 84.0 kg, 76.7 kg,
    88.5 kg

2   The following table shows the temperatures in 10 cities across the
    UK on a January morning:

City	Temperature (°C)	City	Temperature (°C)
Edinburgh	−3	Liverpool	−1
Bristol	5	Norwich	4
London	3	Belfast	−3
Cardiff	6	Aberdeen	−5
Birmingham	0	Sunderland	−2

    a   What is the modal temperature?
    b   Calculate the median temperature.

3   A student measures the lengths of six pieces of wood. She
    calculates that the median value is 2 m. However, when she
    records her results, she leaves out one of the measurements.
    Calculate the missing measurement.
    1.4 m, 2.3 m, 0.9 m, 3.2 m, 1.8 m, ?

3.2 Estimate the mean of a grouped frequency distribution from discrete data

The mean

The **mean** of a data set is the total sum of all the numbers in that data set, divided by the number of values in the set.

A grouped frequency distribution is where **discrete data** is grouped together in **intervals** and placed in a table, called a frequency table.

The frequency column in a table is the number of things in each interval. In a grouped frequency distribution, the following symbols are used:

- < means less than
- ≤ means less than or equal to
- > means greater than
- ≥ means greater than or equal to

> **Mean**: a type of average; the values are added and the total divided by the amount of values.
>
> **Discrete data**: data with specific values, e.g. shoe size or the number of students in a class.

WORKED EXAMPLE

A teacher has 30 adults in her class. She records their ages in a grouped frequency table:

Age (a) of adults in class	Frequency
$18 \leq a < 24$	5
$24 \leq a < 30$	10
$30 \leq a < 36$	8
$36 \leq a < 42$	3
$42 \leq a < 48$	4

Estimate the mean age of the adult students in her class.

> **EXAM TIP**
>
> The mid-point of each interval is taken as the best estimate for the ages of the adults in that interval.

ANSWER

The first line in the table shows that five adults have an age greater than or equal to 18 ($18 \leq a$), but less than 24 ($a < 24$).

For each group interval (e.g. $18 \leq a < 24$), take the mid-point of that interval (here, 21) and multiply it by the number of adults ($21 \times 5 = 105$).

Age (a) of adults in class	Frequency	Mid-point × frequency	Estimated totals
$18 \leq a < 24$	5	21×5	105
$24 \leq a < 30$	10	27×10	270
$30 \leq a < 36$	8	33×8	264
$36 \leq a < 42$	3	39×3	117
$42 \leq a < 48$	4	45×4	180
	30		**936**

To get the total (estimated) age of the 30 adults, add up the estimated totals for each group interval (the numbers in the right-hand column): 936

To find an estimate for the mean age, divide the total (estimated) age by the number of adults:

$$\text{estimated mean age} = \frac{\text{total (estimated) age}}{\text{number of adults}} = \frac{936}{30}$$

$$= 30\overline{)93^36.^60}\ \ ^{3\ 1.\ 2}$$

estimated mean age = **31.2 years**

CHECK YOUR UNDERSTANDING

1 A student recorded the mass (in kg) of 12 different dogs and placed their results in a grouped frequency table.
Calculate an estimate for the mean mass of the dogs.

Mass (m) in kg	Frequency
$0 < m \le 10$	2
$10 < m \le 20$	3
$20 < m \le 30$	4
$30 < m \le 40$	2
$40 < m \le 50$	1

2 A teacher asks their students how long they spend on their phones every day during their holiday. The frequency table shows the results:

Time spent (t) in hours	Frequency
$0 \le t < 1$	4
$1 \le t < 2$	6
$2 \le t < 3$	7
$3 \le t < 4$	6
$4 \le t < 5$	4

Estimate the mean time (in hours) that the students spend on their phones every day during their holiday.

3 A member of a scrabble club records the scores of the members after a game. The following data represents the results:

Score (s)	Frequency
$140 \le s < 150$	2
$150 \le s < 160$	4
$160 \le s < 170$	4
$170 \le s < 180$	3
$180 \le s < 190$	2

Estimate the mean score of the members of the scrabble club.
Give your answer to 1 decimal place.

3.3 Use the mean, median, mode and range to compare two sets of data

REVISED ●

Mean, median, mode and range

The mean, median, mode and **range** can be used to compare two sets of data. Questions comparing two sets of data involve calculating a value in one set of data (e.g. mean or median), and comparing it with the same value in the other set of data.

> **Range**: the difference between the largest and smallest values in a data set.

MAKING LINKS

How to calculate the mean and range is covered in Level 1, Section 3.4. How to calculate the median and mode is in Section 3.1, page 84.

WORKED EXAMPLE

Paulo records the heights of a group of eight students in his class (group A):

    1.64 m, 1.64 m, 1.70 m, 1.76 m, 1.82 m, 1.83 m, 1.72 m, 1.84 m

He then records the heights of another eight students in his class (group B). The median height is 1.77 m. Write a statement comparing the two median values.

> **ANSWER**
>
> Calculate the median of the eight students in group A. Place the values in numerical order:
>
>   1.64 m, 1.64 m, 1.70 m, <u>1.72 m</u> | <u>1.76 m</u>, 1.82 m, 1.83 m, 1.84 m
>
> The median is midway between the two middle numbers (1.72 m and 1.76 m) = **1.74 m**
>
> Write a statement making the comparison.
>
> **The median height for group B (1.77 m) is higher than the median height for group A (1.74 m).**

COMMON MISTAKE

A common mistake here would be to forget to place the numbers in numerical order so calculating the median as 1.76 m | 1.82 m = **1.79 m** in error.

EXAM TIP

When writing a statement to compare values keep it short and clear. It's often just saying that one value is higher (or lower) than another.

WORKED EXAMPLE

A student wants to know if it takes him longer to cycle to college or walk to college.

He records the time it takes over five journeys by cycle and five journeys by foot in the table below.

Time to cycle to college (mins)	24	22	24	26	28
Time to walk to college (mins)	25	26	23	23	24

  a Write a statement comparing the mean times it takes him over the five journeys.

  b Which of the times were most consistent, cycling to college or walking to college? Give a reason for your answer.

EXAM TIP

When comparing two sets of data to find the most consistent, the examiner is looking for the two ranges to be compared. The set of data with the lower range will be the more consistent (its values will vary less).