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Teaching The Fundamentals: Functional Skills Level 2 Maths: Mean, Mode, Median and Range

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What Learners Need To Know | The Basics

What Learners Need To Know

The Basics

Learners need to know how to work out the mean, mode, median and range.

Mean – the total divided by how many

Mode – the most common number

Median - the middle number if they are put in numerical order lowest to highest

Range – the difference between the highest and lowest number

What Learners Need To Know

The Basics

Example assessment questions:

Here are the times, in seconds, five athletes took to finish a 100m race.

11.05 10.94 11.12 10.91 11.12

Find the median

Here are the times, in seconds, five athletes took to finish a 100m race.

11.05 10.94 11.12 10.91 11.12

Find the mode

What Learners Need To Know

Higher Tariff Questions

Obviously, higher tariff questions will be more involved than these. To solve these, learner need more understanding of the subject. This includes:

- Why we have more than one type of average.
- When to use the different types of averages.
- How the mean, mode and median can lead to different outcomes.
- What the purpose of the range is.

What Learners Need To Know

Higher Tariff Questions

Let's take a look at some questions in detail.

A team of workers deliver identical fridges.

The team will use the average time to fully load an old lorry to predict the time to fully load a new lorry.

The table shows the times it took to fully load the old lorry with 24 fridges.

Time (mins)	52	60	55	59	54	63	56

This question uses the word average, not a specific average. This give the learners free choice over which average to use.

In this instance, it could be more straightforward to use the median than the mean.

What Learners Need To Know

Higher Tariff Questions

Let's take a look at some questions in detail.

Carla is the director of a building company.
She employs builders at a site in Hull and at a site in London.

The average day rate of her builders in London is £153

In Hull the day rates she pays her builders are shown in this table.

builder	A	B	C	D	E	F	G
day rate (£)	290	75	115	84	120	89	298

The builders in Hull say their average day rate is less than £153

Carla says the average day rate is the same in Hull and in London.

Show how both these statements can be true.
You **must** show your working.

(4)

Again, this question uses the word average. It implies that the learners need to actually work with more than one average.
To successfully complete the question the learner would need to work out if the mean, mode or median do satisfy those statements.

What Learners Need To Know

Higher Tariff Questions

Let's take a look at some questions in detail.

Calvin is a train company manager.

He compares the arrival times of a morning train service for 10 days in the summer and for 10 days in the winter.

In the summer the median number of minutes late was 12.7 minutes.
The range of the number of minutes late was 11 minutes.

The results below show the number of minutes late in the winter.

8, 32, 44, 5, 17, 67, 9, 14, 10, 26

Calvin thinks that in the winter

- the median number of minutes late increases
- the train service is less consistent.

Is Calvin correct?
Show why you think this giving reasons with your answers.

(6)

This question (in part) relies on the learners understanding the purpose of the range.
The consistency element of the question is referring to the range.

What Learners Need To Know

Higher Tariff Questions

Let's take a look at some questions in detail.

Gavin is a car salesman.

The table shows the number of cars he sold in one week.

Mon	Tue	Wed	Thu	Fri	Sat
2	0	1	4	1	2

The cost of each car is £20 950

For every car Gavin sells he earns

- 1.25% of the cost of the car in commission
- a bonus of £50

Work out the median amount Gavin earned per day for this week.

(5)

The average can sometimes be part of a more complex question.
Here the learners need to work out how much is earnt from the sale of a car before they can find the median.

Teaching The Concepts

Teaching The Concepts

Learners need to understand the differences between the averages and what the benefits of choosing one over the other might be. Let's take a look at some data:

Player	Club	Weekly Wage	Annual Salary
Erling Haaland	Manchester City	£525,000	£27.3M
Mohamed Salah	Liverpool	£400,000	£20.8M
Casemiro	Manchester Utd	£350,000	£18.2M
Virgil van Dijk	Liverpool	£350,000	£18.2M
Raheem Sterling	Chelsea	£325,000	£16.9M
Jack Grealish	Everton (Loan)	£300,000	£15.6M
Bruno Fernandes	Manchester Utd	£300,000	£15.6M

These are the top 7 highest paid players in the Premier League (25/26)

The average Premier League player earns £80,000 per week or approximately £4.16m annually.

The UK's national living wage is £488.40 per week (for 40 hours) or £25,396.80 annually (as of 1 April 2025).

Teaching The Concepts

Using this data, let's look at some questions.

1. If the average professional footballer wage is £80,000 per week and there are players earning more than £300,000 per week, what does that say about what the lower earners may be earning?
2. Why might a Premier League club use the mean of all staff wages to show how well they pay their staff?
3. Why might the range make this amount not accurate?
4. In this situation what might be a better average to use?

Teaching The Concepts

Numberless Problem-Solving

You can use numberless problem-solving to check that learners understand the concepts.

1. Peter plays in goal for his local walking football team. He keeps a record of the number of shots he saves per game. How would he work out the mean number of shots he saves over a season?

6. Nelly goes for a work every day and records the distance and time. How would she work out the mode speed she walked over a year?

What Learners Need To Know | Estimating The Mean From Grouped Frequency Distribution

Estimating The Mean From Grouped Frequency Distribution

Sometimes the data presented will have been grouped. In this situation the learners would need to estimate the mean from this data.

To do so they would need to find the mid point. The grouped data should be evenly distributed so the mid point will be consistent.
In this case the midpoints are 10.5, 30.5 etc.

They would then use the mid point and multiply it by the frequency (in this case the number of offices). Finally, they would then divide this number by the sum of the frequencies to find the estimated mean.

number of workers	number of offices
1 to 20	9
21 to 40	8
41 to 60	2
61 to 80	1

Estimating The Mean From Grouped Frequency Distribution

Sometimes the question will have additional columns in the table to support the learners.

Nikos owns a restaurant.

The table shows information about the number of customers that visited the restaurant on each of the 31 nights in August.

Number of customers	Frequency		
1 – 15	2		
16 – 30	7		
31 – 45	12		
46 – 60	10		

The mean number of customers per night in July was 32

Nikos thinks the mean number of customers per night in August was more than the mean number of customers per night in July.

(a) Is Nikos correct?
Show why you think this.

(3)

Teaching The Concepts

Teaching The Concepts

Scaffolded Learning

You can use scaffold the learning to ensure that learners understand the concepts.

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The table shows information about the number of customers that visited the restaurant on each of the 31 nights in August.

Number of customers	Frequency		
1 – 15	2		
16 – 30	7		
31 – 45	12		
46 – 60	10		

The mean number of customers per night in July was 32

Nikos thinks the mean number of customers per night in August was more than the mean number of customers per night in July.

(a) Is Nikos correct?
Show why you think this.

(3)

- What are the mid-points for each row? How would you work this out?
- What are the estimated number of customers for each row?
- How would you work this out?
- How would you work out the estimated mean from this information?
- What is the estimated mean?
- Is Nikos correct and why?

Teaching The Concepts

Numberless Problem-Solving

You can use numberless problem-solving to check that learners understand the concepts.

9. Clare works at an estate agents. She employs a large number of salespeople. She broke down their sales for last month using this table.

Number of Houses Sold
1 – 5
6 – 10
11 – 15
16 – 20

How could she use this table to estimate the mean number of house sold last month by her salespeople?


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