

Name _____

Date _____

16.3 Choosing the right average — worksheet

Choose and explain which of the mode, median and mean is most appropriate for a given context, and recognise the effect of an outlier. · 48 questions · Show your working.

Remember

- All three of mode, median and mean are **averages**. They choose the representative value differently.
- **Mode**: use it for **categories** and for “which is most popular”. It is the only one that works for words.
- **Median**: use it when there is an **outlier** or the data is lopsided — house prices, salaries.
- **Mean**: use it when the values are close together with no extremes. It uses every value.
- An **outlier** moves the mean a long way and the median hardly at all.
- Do not silently delete an outlier. Investigate it, and say what you decided.
- Always quote a **range** alongside an average — the average alone says nothing about spread.
- A smaller range means more **consistent**.
- In an examination the **reason** earns the mark, not the name of the average.

A · Fluency — Which average fits, and all four statistics computed.

- 1 Which average is most appropriate for **favourite colour of 30 learners**?
☐ mode
☐ median
☐ mean
- 2 Which average is most appropriate for **shoe sizes sold in a shop**?
☐ mode
☐ median
☐ mean
- 3 Which average is most appropriate for **house prices on a street with one mansion**?
☐ mode
☐ median
☐ mean
- 4 Which average is most appropriate for **test scores with no extreme values**?
☐ mode
☐ median
☐ mean

- 5 Which average is most appropriate for **salaries in a company where the owner earns ten times the rest**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 6 Which average is most appropriate for **the most popular pizza topping**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 7 Which average is most appropriate for **the number of goals per game over a season**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 8 Which average is most appropriate for **times for 100 m, one runner having stopped to tie a lace**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 9 Which average is most appropriate for **the mass of 50 similar parcels**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 10 Which average is most appropriate for **the most common number of people in a car**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 11 Which average is most appropriate for **daily temperature over a month**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 12 Which average is most appropriate for **the middle income of a country**?
- ☐ mode
 - ☐ median
 - ☐ mean
- 13 These are house prices, in thousands of dollars:
180, 200, 210, 220, 240, 950
What is the mean? Give the answer to one decimal place.
-
- 14 These are house prices, in thousands of dollars:
180, 200, 210, 220, 240, 950
What is the median?
-

- 15** These are house prices, in thousands of dollars:
180, 200, 210, 220, 240, 950
What is the range?
-
- 16** These are shoe sizes:
6, 7, 7, 8, 7, 9, 6
What is the mean? Give the answer to one decimal place.
-
- 17** These are shoe sizes:
6, 7, 7, 8, 7, 9, 6
What is the median?
-
- 18** These are shoe sizes:
6, 7, 7, 8, 7, 9, 6
What is the mode?
-
- 19** These are shoe sizes:
6, 7, 7, 8, 7, 9, 6
What is the range?
-
- 20** Which value in this set is the outlier?
4, 5, 6, 5, 40
-
- 21** Which value in this set is the outlier?
12, 14, 13, 15, 90
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- 22** Which value in this set is the outlier?
21, 22, 20, 23, 2
-
- 23** Which value in this set is the outlier?
7, 8, 9, 7, 60
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B · Reasoning — Outliers, categories and why the reason earns the mark.

- 24** Which average is affected most by one extreme value?
- ☐ mode
 - ☐ median
 - ☐ mean
 - ☐ they are all affected equally
- 25** Which average can be used for data that is **words**?
- ☐ mode
 - ☐ median
 - ☐ mean
 - ☐ any of them

- 26** What is an **outlier**?
- ☐ The largest value
 - ☐ A value far away from the rest
 - ☐ The mode
 - ☐ A mistake
- 27** House prices on a street are 180, 200, 210, 220, 240 and 950 thousand. Which average describes the street better?
- ☐ the mean
 - ☐ the median
 - ☐ the mode
 - ☐ neither
- 28** A shop wants to know which size to order most of. It should use ...
- ☐ the mean
 - ☐ the median
 - ☐ the mode
 - ☐ none of them
- 29** Should you always ignore an outlier?
- ☐ Yes
 - ☐ No
- 30** Why quote a range alongside an average?
- ☐ It looks thorough
 - ☐ Because an average alone says nothing about how spread out the data is
 - ☐ It is required
 - ☐ To find the mode
- 31** Which average is best when the values are close together with no extremes?
- ☐ mode
 - ☐ median
 - ☐ mean
 - ☐ they are equally good
- 32** Can the mean, median and mode of a set all be the same?
- ☐ Yes
 - ☐ No
- 33** A question says “explain which average is most appropriate”. What must your answer include?
- ☐ The value only
 - ☐ The name of the average and a reason from the context
 - ☐ All three averages
 - ☐ A chart

C · Challenge — The effect of removing or correcting a value.

- 34** The set 4, 5, 6, 5, 40 has an outlier. What is the mean with the outlier included?
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- 35** The set 4, 5, 6, 5, 40 has an outlier. What is the mean with the outlier removed?

- 36** The set 4, 5, 6, 5, 40 has an outlier. What is the median?

- 37** A class of 30 has a mean score of 15. The teacher finds one score was recorded as 40 instead of 4. What is the corrected mean?

- 38** Two classes both have a mean score of 12. Class A has range 4 and class B has range 20. Which class number is the more consistent, A or B? Answer 1 for A and 2 for B.

- 39** Five values have a mean of 10 and a range of 4. The smallest is 8. What is the largest?

- 40** Six numbers have a mean of 20. The largest, 45, is removed. What is the mean of the remaining five?

D · Word problems — Salaries, bakeries, cricket and consistency.

- 41** In an office, nine people earn \$30 000 and the manager earns \$210 000. What is the mean salary, in dollars?

- 42** In that office, what is the median salary, in dollars?

- 43** A bakery records daily sales of 40, 42, 39, 41 and 158 loaves — the last being a festival day. What is the median?

- 44** For that bakery, what is the mean, to the nearest whole loaf?

- 45** A survey records favourite fruits: apple, banana, apple, cherry, apple, banana. How many people chose the modal fruit?

- 46** A cricketer scores 12, 15, 0, 18, 95 and 10. Which is larger, the mean or the median? Answer 1 for the mean and 2 for the median.

- 47** Two shops have mean daily sales of 50. Shop A has a range of 6 and shop B a range of 60. Which shop's sales are easier to plan for? Answer 1 for A and 2 for B.

- 48** A learner's five scores are 7, 8, 8, 9 and 8. What is the range?
