



# Warm Up

Grade 7  
Feb. 12, 2024



Here are the marks out of 100 on an English test for students in a Grade 7 class:

21, 23, 24, 24, 27, 29, 29, 29, 32, 37, 37, 38, 39, 40, 50, 50, 51, 54, 56, 57, 58, 59, 61, 71, 80, 99

1. How many students were in the class? How do you know?

26, Counted test marks

2. What is the outlier? Explain your choice.

99, b/c it has a difference of 19 from nearest mark

3. Calculate the mean, median, and mode.

4. Calculate the mean, median, and mode without the outlier. What do you notice?

5. Should the outlier be used when reporting the average mark? Explain.

$$2) \text{ mean} = \frac{1175}{26} = 45.19$$

$$3) \text{ mean} = \frac{1076}{25} = 43.04$$

$$\text{median} = 39$$

$$\text{mode} = 29$$

$$\text{Median} = \frac{39+40}{2} = \frac{79}{2} = \boxed{39.5}$$

$$\text{mode} = 29$$



3.  
4, 28, 32, 32, 32, 34, 36, 36, 36, 36, 38, 40,  
42, 44, 46

mode - 36

median - 36

(8th  
number)

$$\text{mean} - \frac{516}{15} = 34.4$$

b) outlier - 4

mode - 36

median - 36

$$\text{mean} \quad \frac{512}{14} = 36.6$$

Mode and median stayed the same  
mean increased

d)

4.  
0, 64, 65, 66, 68, 68, 72, 78, 82, 90, 93

mode 65 and 68

median - 68

$$\text{mean} - \frac{811}{12} = 67.6$$

b) Outlier 0

mode 65 and 68

median 68

$$\text{mean increase } \frac{811}{11} = 73.7$$

5. a) If you wanted to show an average that closely represents the data, you would not include the outliers.

b) If you wanted the averages to "appear" better, then you would include the outliers. (This may not represent the data accurately or fairly)

6. a) 23 raisins per cup  
 $\times$  20 cups of cereal  
 460 raisin in each box

b) 400, 413, 419, 428, 437, 441, 453,  
 465, 467, 473, 477, 485, 489, 499  
 476

mode - no mode

median - 465  
 (8th number)

mean  $\frac{6817}{15} = 454$

c) Outliers 400 and 499

mode - no mode

median - 465 - didn't change

mean  $\frac{5918}{13} = 455$

The **mean** is usually the best average when no numbers in the data set are significantly different from the other numbers.

The **median** is usually the best average when there are numbers in the data set that are significantly different.

The **mode** is usually the best average when the data represent measures, such as shoe sizes or clothing sizes.  
A store needs to restock the sizes that sell most often.

Which of mean, median, or mode would be most helpful to know in each situation? Justify your choice.



1. You are ordering bowling shoes for a bowling party. *Mode* → most popular
2. You want to know if you read more or fewer books per month than most people in your class.
3. You want to know the "average" amount spent per week on junk food in your class.

Book

1  
0  
0  
0  
0  
0  
3  
4

00000 1 3 4



W9	B5
W6	B8.5
W3	B9
W7	B9
W6	B9

$$3, 5, 6, 6, 7, 8.5, 9, 9, 9$$
$$\text{mean} \Rightarrow \frac{62.5}{9} \approx 6.9$$

$$\text{mode} = 9$$

$$\text{median} = 7$$

A clothing store sold jeans in these sizes in one day:

28 30 28 26 30 32 28 32 26 28 34 38 36 30 34 32 30

Calculate the mean, median, and mode.

Which average is most useful to the storeowner? Explain.

$$\text{mean} = \frac{522}{17} = 30.7$$

$$\text{median} = 30$$

$$\text{mode} = 28, 30$$

\$	# Book
8.99	3
9.99	5
13.99	5
32.99	1
37.99	1

8.99, 8.99, 8.99, 9.99, 9.99, 9.99, 9.99, 9.99, 9.99  
 13.99, 13.99, 13.99, 13.99, 13.99, 32.99, 32.99

mode  $\Rightarrow$  9.99, 13.99

Median  $\Rightarrow$  9.99

mean = 14.52

# Class/Homework

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#1, #2(a), ~~#3(a,b), #4(a,b), #6(a,b,c), #7(a,b,c)~~

Test Wednesday

Unit 7 Data Analysis (Part 1) Test  
will be Feb. 14

Topics: Mean, Median, Mode, Range, Outliers

8 Multiple Choice

3 Short Response

(VERY similar To wamp ups)

- 1.** The daily high temperatures for one week at Clearwater Harbour were:  $27^{\circ}\text{C}$ ,  $31^{\circ}\text{C}$ ,  $23^{\circ}\text{C}$ ,  $25^{\circ}\text{C}$ ,  $28^{\circ}\text{C}$ ,  $23^{\circ}\text{C}$ ,  $28^{\circ}\text{C}$
- Find the mean, median, and mode for these data.
  - Which average do you think best describes the daily high temperature at Clearwater Harbour that week? Explain.
  - The weather channel reported the average temperature for Clearwater Harbour that week was  $23^{\circ}\text{C}$ . Is this correct? Explain.



- 2.** Caitlin received these test marks in each subject.
- Find the mean, median, and mode mark for each subject.
  - Explain what information each average gives.
  - Which subject do you think Caitlin is best at? Worst at? Explain your reasoning.

Caitlin's Marks							
Math	85	69	92	55	68	75	78
Music	72	81	50	69	81	96	92
French	68	74	82	80	76	67	74

- 3.** The table shows the tips earned by five waiters and waitresses during two weeks in December.
- Calculate the mean, median, and mode tips for each week.
  - Calculate the mean, median, and mode tips for the two-week period.
  - Compare your answers in parts a and b. Which are the same? Which are different? Explain why.
  - Explain which average best represents the tips earned during the two weeks.

Weekly Tips Earned (\$)		
Waiter	Week 1	Week 2
James	1150	600
Kyrra	700	725
Tamara	800	775
Jacob	875	860
George	600	1165

- 4.** A small engineering company has an owner and 5 employees. This table shows their salaries.
- Calculate the mean, median, and mode annual salaries.
  - What is the range of the annual salaries?
  - Which measure would you use to describe the average annual salary in each case? Explain.
    - You want to attract a new employee.
    - You want to suggest the company does not pay its employees well.

Company Salaries	
Position	Annual Salary (\$)
Owner	130 000
Manager	90 000
2 Engineers	50 000
Receptionist	28 000
Secretary	28 000

- 5.** Is each conclusion correct? Explain your reasoning.
- The mean cost of a medium pizza is \$10.  
So, the prices of three medium pizzas could be \$9, \$10, and \$11.
  - The number of raisins in each of 30 cookies was counted.  
The mean number of raisins was 15.  
So, in 10 cookies, there would be a total of 150 raisins.

- 6. Assessment Focus** In each case, which average do you think is most useful: the mean, median, or mode? Justify your answer.
- A storeowner wants to know which sweater sizes she should order.  
Last week she sold 5 small, 15 medium, 6 large, and 2 X-large sweaters.
  - Five of Robbie's friends said their weekly allowances are: \$10, \$13, \$15, \$11, and \$10.  
Robbie wants to convince his parents to increase his allowance.
  - Tina wants to know if her math mark was in the top half or bottom half of the class.

- 7.** A quality control inspector randomly selects boxes of crackers from the production line. She measures their masses.
- On one day she selects 15 boxes, and records these data:
- 6 boxes: 405 g each
  - 2 boxes: 395 g each
  - 4 boxes: 390 g each
  - 2 boxes: 385 g each
  - 1 box: 380 g
- a) Calculate the mean, median, and mode masses.
  - b) What is the range of the masses?
  - c) For the shipment of crackers to be acceptable, the average mass must be at least 398 g. Which average would you use to describe this shipment to make it acceptable? Explain.



- 8. Take It Further** Andrew has these marks:  
English 82%, French 75%, Art 78%, Science 80%
- a) What mark will Andrew need in math if he wants his mean mark in these 5 subjects to be each percent?
    - i) 80%
    - ii) 81%
    - iii) 82%
  - b) Is it possible for Andrew to get a mean mark of 84% or higher? Justify your answer.
- 9. Take It Further** Celia received a mean mark of 80% in her first three exams. She then had 94% on her next exam. Celia stated that her overall mean mark was 87% because the mean of 80 and 94 is 87. Is Celia's reasoning correct? Explain.



**Reflect**