What's Typical? Mean, Median and Spread

Teacher		**Class**	Grade 6
Subject	Math	**Topic**	Mean and median
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn to find center and spread and describe patterns in context. They analyze reading data on paper without a calculator.

Curriculum links

- Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

Learning objectives

- Students will find mean and median to describe the center of a data set.
- Students will find MAD or IQR to describe the spread of a data set.
- Students will describe overall pattern and striking deviations in context using data sentences.

Success criteria

- I can order values and find the mean and median for center.
- I can find MAD or IQR to show how spread out data are.
- I can write context sentences about pattern and striking values in data.

What students already know

Ask: If towers are 2, 4, and 6 cubes tall, what height if leveled fairly? Listen for 4 by total 12 divided by 3.

Key words

mean	the fair-share average found by adding all values then dividing by how many [4][5]
median	the middle number after putting numbers in order smallest to largest [4]
interquartile range	the spread of the middle half of ordered data
mean absolute deviation	the average distance of values away from the average
outlier	a value far away from most of the group

Materials

- data cards with daily reading minutes, 9 per pair
- paper
- pencils
- projected Slides 2-11
- Video clip 1 (0:00-3:55) ready to play
- printed Worksheet Task A (page 1) and Task C (page 3)

Before the lesson

- Print data cards with reading minutes and Worksheet Task A and Task C for pairs
- Test Slides 2-11 and Video clip 1 (0:00-3:55) on slide 6
- Arrange desks for pairs with paper, pencils, and multiplication charts ready
- Write the 9-card reading set on the board for modeling if cards are lost

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- multiplication chart for support

Lesson outline

0–5 min **Starter** 5 min · Whole class

Activate ideas about typical values and set up the no-calculator data challenge.

YOU DO

1. Greet class and say the hook with energy to set the challenge tone.
2. Show Slide 2 and read the question: One student scores way higher than the rest. What score feels typical for the class?
3. Show Slide 3 and read: A class counted jumps in 30 seconds. Most got in the 20s, one got 62. What is typical here?
4. Take a quick show of hands for typical and ask why one high score should not decide it.

STUDENTS DO

1. Listen to the hook and look at Slides 2-3.
2. Think, then tell a partner what score feels typical and why.
3. Vote and share one reason with the class.

Say: No Chromebooks, no calculators. Just paper, pencil, and your brain against the data. Today you will find mean, median, and variability without a calculator. First, tell me what feels typical when one number is way off from the rest.

Ask: If most jumps are in the 20s and one is 62, is 62 typical? (No, most are clustered in the 20s and 62 is far away.) · Why might an average be misleading here? (One very large value can pull the average up.)

Check understanding: Use thumbs up or down for whether 62 is typical. If split, restate that most values cluster together and one is striking.

Support: Point to the cluster in the 20s and the single 62 and ask which group shows most students. **Stretch:** Ask what center would stay near the 20s even with 62 included.

Use: Slides 2-3

5–17 min **Teaching** 12 min · Whole class

Model how to find mean by fair-sharing and median by ordering.

YOU DO

1. Show Slide 4 cards and read: Mean · Add all values, then divide by how many. and Median · Middle value after ordering smallest to largest.
2. Play Video clip 1 (0:00-3:55) on Slide 6 and tell students to listen for finding mean by fair-sharing and finding median by ordering.
3. Model with jump counts 22, 24, 26, 28, 62 in order on the board.
4. Think aloud mean, median, and why mean is higher because of the outlier.

STUDENTS DO

1. Watch Video clip 1 and listen for fair-sharing and ordering.
2. Copy the ordered list, sum, division, and median circle.
3. Mark mean and median on a mini number line.

Say: Mean is the sum of all values divided by the total number of values [4]. Median is the middle value in a dataset when it is sorted in ascending or descending order [4]. Order first for median. Add then divide for mean. Then ask what the numbers tell us.

Worked example: Jumps: 22, 24, 26, 28, 62. Step 1 order: already 22, 24, 26, 28, 62. Step 2 median: middle 3rd value = 26. Step 3 mean: sum = 22+24+26+28+62 = 162. 162 divided by 5 = 32.4. Mean 32.4 is above median 26 because one very large value pulls the mean up more than the median [4].

Ask: Why must we order before finding the median? (Ordering finds the true middle; otherwise you pick the wrong middle value [4].) · Why is the mean larger than the median here? (The 62 is much higher and skews the total, like older ages skewing mean age above median [4].)

Check understanding: Hold up mini boards with median and mean. Reteach ordering and sum divided by 5 if many are off.

Support: Give pre-ordered numbers and a division table for 162 divided by 5. **Stretch:** Ask what would happen to mean and median if 62 became 82.

Use: Slides 4, 6; Video clip 1 (0:00-3:55)

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17–30 min **Guided Practice** 13 min · Whole class

Practice finding center and choosing which center is fairer with shape.

YOU DO

1. Show Slide 5 vote and read: Most jumps are 20-30, one is 62. Which best shows what is typical?
2. Show Slide 7 steps and read: Order values smallest to largest · Find mean and median for center · Find IQR or MAD for spread · Describe pattern plus any big outlier in context.
3. Work Worksheet Task A first set together on the board showing ordering for median and totals for mean.
4. Poll for Mean, Median, Report both and explain, or Neither is useful and ask for context reasons.

STUDENTS DO

1. Vote with hands for mean, median, or report both and explain.
2. Solve Worksheet Task A first set on paper showing ordering and total.
3. Share which center is fairer and one context reason.

Say: We order, then find center, then spread, then pattern in context. For jumps at 3:30 p.m., most cluster 20 to 30 with one at 62. Vote, then defend your pick with what most students did.

Worked example: Set 20, 22, 24, 26, 62. Ordered: 20, 22, 24, 26, 62. Median = 24. Sum = 154. Mean = 154 divided by 5 = 30.8. Range = 42. Median 24 better shows typical because most cluster 20 to 26 and 62 is striking.

Ask: Which center best shows typical jumps here and why? (Median, because most are 20-30 and 62 pulls the mean up.) · When would you report both and explain? (When the difference shows skew and you need to explain the outlier in context.)

Check understanding: Check Task A ordering and calculations on mini boards. Re-model ordering if median is wrong.

Support: Provide a recording sheet with boxes for sorted order, sum, and divide. **Stretch:** Ask teams to predict what outlier would make the mean exactly 2 more than the median.

Use: Slides 5, 7; Worksheet Task A

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30–50 min **Main Activity** 20 min · Pairs

Pairs find mean, median, and variability without a calculator and explain pattern.

YOU DO

1. Hand out 9 data cards with daily reading minutes: 15, 15, 20, 20, 25, 25, 30, 30, 84.
2. Show Slide 9 and read: Find mean and median. Find MAD or IQR. · Decide overall pattern and striking value. · Write 2 sentences using context to explain.
3. Remind pairs no calculators, show ordering for median and totals for mean as in Worksheet Task C.
4. Circulate, prompt for sorted list, sum, division, MAD distances, and context sentences about cluster and high value.

STUDENTS DO

1. Sort 9 cards smallest to largest and find median and mean on paper.
2. Find MAD or IQR and note range and middle-half spread with units of minutes.
3. Write 2 context sentences about the cluster from 15 to 30 minutes and the striking high value.

Say: You will find mean, median, and variability without a calculator. Sort to find the median, which is the middle sorted value [4]. Add and divide to find the mean. Then find spread and write what the cluster and the striking value mean for reading.

Ask: What are the median and mean for this reading set? (Median 25 minutes, mean about 29.3 minutes because sum 264 divided by 9.) · What does MAD about 12 minutes tell us? (Times vary a lot around the mean; the high value adds spread.)

Check understanding: Collect organized solutions with sorted list, sum, mean, median, and context sentences. Check one pair aloud before independent finish.

Support: Limit to 7 cards with small multiples of 5 and include a multiplication chart. **Stretch:** Ask for mean absolute deviation and whether mean or median better describes typical reading.

Use: Slide 9; Worksheet Task C

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50–60 min **Plenary** 10 min · Whole class

Agree how to report center, spread, and surprises like a statistician.

YOU DO

1. Show Slide 10 and read the model: Median 25, mean about 29.3 show typical reading. and MAD about 12 shows times vary a lot.
2. Show Slide 11 and vote true or false on: You must order data before finding the median. and One very large value pulls the mean up more than the median.
3. Connect to income: U.S. real median household income was $87,460 in 2025 [3] because the median is the midpoint where half have higher and half have lower income [3].
4. Set exit ticket and preview homework.

STUDENTS DO

1. Compare own reading results to Slide 10 model sentences.
2. Vote true or false and explain ordering and outlier effect.
3. Complete exit ticket on paper.

Say: Good reports give center, spread, and pattern in context. Median 25 and mean about 29.3 show typical reading but the mean is pulled up. MAD about 12 shows times vary a lot because most cluster from 15 to 30 minutes with one striking high value.

Ask: Why do researchers often use median for typical income? (A few very high incomes pull the mean up, median stays in the middle.) · What must your 2-sentence report include? (Center and spread numbers plus what pattern and striking value mean in context.)

Check understanding: Use true-false paddles for Slide 11. Reteach ordering or outlier effect if votes are split.

Support: Provide sentence starters: Most cluster ___. The striking value ___ might mean ___. **Stretch:** Ask what would happen to mean and median if two more very high incomes were added.

Use: Slides 10-11

Common mistakes

Mistake	How to spot it	How to fix it
Finding median without ordering data first	Median picked as middle of unsorted list	Rewrite smallest to largest first, then circle the middle value [4]
Dividing mean by wrong count or forgetting the outlier in total	Sum is right but division uses 8 instead of 9	Count cards, show total, then divide by that count [5]
Saying mean is always best for typical	Chooses mean even with strong skew	Compare mean and median; note a very large value pulls mean up more [4]

Support

- Limit to 7 cards with small multiples of 5 and include a multiplication chart
- Give pre-sorted slips and boxes for sorted order, sum, and divide

Stretch

- Ask for mean absolute deviation and whether mean or median better describes typical reading
- Ask teams to remove the outlier, recalculate, and note which center changed most

For the LSE or teaching assistant

Sit with pairs needing ordering help; prompt to sort cards, count to middle, and use chart for divide step.

Check for understanding

Question	Answer
Reading minutes: 15, 15, 20, 20, 25, 25, 30, 30, 84. What is the median?	25 minutes, the 5th value in order.
What is the mean and what does MAD about 12 minutes mean?	Mean about 29.3 minutes; times vary a lot around the mean.
Write one context sentence about pattern and striking value.	Most cluster from 15 to 30 minutes and the high 84 may be a weekend catch-up, pulling the mean above the median.

Homework

List tonight's reading minutes for 7 days, find median and mean, and note any striking value.

Sources

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