Grade 6 Math · Lesson 5 — The Honest Headline

Mean, median, MAD and box plots · ages 10 to 13 · 45 minutes · the workbook, one screen, this page, a pencil and paper

At a Glance

- **The book:** 6th Grade Math Workbook: Real-World Problem Solving, Chapter 5 (The Data Journalist), by Dr. Gene A Constant.
- **Free tool:** Statistics Skeptic (how numbers can mislead, as a game), free, no login, plays in the browser: globalsovereignuniversity.org/statistics-skeptic.
- **Ages and time:** Grade 6 · ages 10 to 13 · 45 minutes.
- **Prep (5 min):** read the Teaching Creed and have the workbook open to Chapter 5. Write the heights of everyone at home, in inches, on a slip of paper, or collect any seven numbers from your week.

Why this lesson

Averages sell houses, set wages and win elections. One very large number can drag the mean far from where most of the data sits. A child who knows when the median tells the truer story, and how to measure spread, cannot be fooled by a headline.

What the learner will be able to do

- Find the mean, median, mode and range.
- Choose the measure of center that best describes the data.
- Find the mean absolute deviation.
- Build a five-number summary and find the IQR.

The 45-Minute Climb

How to read this: the gold box in each step is your lesson, word for word. Run it as written. The notes beneath are optional support. "The group" means your family; "host" means you.

1 · The Hook (5 min)

"Five houses on a street sell for $250,000, $275,000, $280,000, $310,000 and $975,000. A newspaper says the average house costs $418,000. Is that honest?"

Say it like this: Let your child argue both ways. The math is true, but four of the five houses cost far less. That gap is today's lesson.

2 · Work It Together (15 min)

Open the workbook to Test Scores and read it aloud: mean 85, median 85, mode 85, range 23. Then read Finding a MAD: the distances from 6 are 4, 2, 0, 2, 4, so the MAD is 12 ÷ 5 = 2.4. Finish with A Five-Number Summary: 12, 16.5, 25, 32.5, 40.

Use your family's heights: put them in order, find the median and the mean, and see whether anyone pulls the mean. Then play one round of Statistics Skeptic.

3 · The Talk (8 min)

1. Why does the $975,000 house change the mean so much but the median hardly at all? 2. Two stores both average $500 a day. Why would you want to know the MAD? 3. What does the box in a box plot show?

You are not fishing for one right answer. You are listening for understanding:

- Q1: The mean uses every value's size. The median only cares about the middle position.
- Q2: It tells you whether sales are steady or swing wildly, which matters for planning.
- Q3: The middle half of the data, from Q1 to Q3.

4 · Solo Climb (12 min)

Five problems on your own, with your work shown.
1. Data: 12, 15, 18, 15, 22, 15, 20. Find the mean, median and mode.
2. Find the MAD: 10, 20, 30, 40, 50.
3. Find the five-number summary: 5, 8, 12, 15, 18, 20, 25.
4. Find the IQR: 3, 5, 7, 9, 11, 13, 15.
5. Home prices in thousands: 250, 275, 280, 310, 975. Which measure of center would be misleading, and why?

Why solo: a test, a job and real life ask you to work alone. Five problems rehearse exactly that. The answers are at the end of this plan.

Keep It Fresh (5 min, the next day)

Two review problems from earlier chapters.
1. Find: ⅔ ÷ ½
2. Find the surface area of a cube with 7 cm sides.

Ready to move on? Four of the five Solo Climb problems right, with work shown, means this skill is solid. If not, reread the worked examples together and try two more problems from the chapter before the next lesson. Short review of old skills keeps them from fading.

5 · The Takeaway (5 min)

“Check for an outlier before you trust an average. Report the center and the spread together.” · Homework: Find one average in a news story, ad or sports report. Write one question you would ask before believing it.

The badge moment: finishing all five steps earns the Bronze ring of this lesson’s badge, The Fact Checker. Mark it on the Climber’s Passport now; the homework is how Silver and Gold are earned during the week.

Common Mistakes to Watch For

- Finding the median without putting the data in order first.
- Including the median in both halves when finding Q1 and Q3 for an odd count.
- Using negative distances when finding the MAD.

The Teaching Creed

You are not the expert; the book and the method are. Your job is to ask “how do you know?” one more time than feels natural, and to celebrate wrong answers out loud. In here, a wrong answer is where the lesson lives.

GENO, GSU’s free tutor, can explain any step a second way, any hour, in 83 languages, with no login: globalsovereignuniversity.org/free-tutor. A prompt for the host: Ask GENO: “My child says the median of 8, 3, 12, 7, 15 is 12. Help them see why without giving the answer.”

Adapt It and Measure It

Differentiation

- Struggling: start with five numbers and only the mean and median.
- Ahead: build a data set with mean 10 and median 8.
- Large co-op: survey the group on one question and present a box plot.
- Reluctant: use sports scores from the child’s favorite team.

Evidence of learning (no exam)

Look for three things. **Tried**: finished all five Solo Climb problems with work shown. **Noticed**: can name the mistake in Common Mistakes that they almost made. **Changed**: the next day, solves one new problem from the same chapter without help. Those three words are the whole rubric, and they match the badge tiers below.

Gamify It — The Campus Climb

Every GSU lesson is one badge on the Climber’s Passport, earned at four depths: Bronze, Silver, Gold and Platinum.

LESSON 5 BADGE — The Fact Checker · Bronze — The Climb: finished the 45-minute lesson, all five steps. · Silver — The Try: did the homework and explained it to the host. · Gold — The Proof: completed the chapter's Action Report in the workbook with every answer checked against the Answer Key. · Platinum — The Teacher: ran this lesson as host for someone else. The harvest of a teacher is teachers.

Answers for the Host

1. Mean 16.71 (117 ÷ 7, rounded), median 15, mode 15
2. 12
3. 5, 8, 15, 20, 25
4. 8 (Q1 = 5, Q3 = 13)
5. The mean (418). The one $975,000 home pulls it far above what most homes cost. The median (280) is typical.

Keep It Fresh: 1. 1⅓ · 2. 294 sq cm

Every answer above comes from the workbook's own Answer Key. The book behind this lesson: 6th Grade Math Workbook: Real-World Problem Solving, Chapter 5 (The Data Journalist).

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