

Trial Data Detectives

Use repeated trials and means to make evidence-based conclusions.

GRADE 6 • TEKS 6.1

6.1 "Scientific and engineering practices. The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions..."

NAME _____

DATE _____

FIND THE MEAN

When you repeat a measurement, add the trial values and divide by the number of trials. The mean gives one value that represents the repeated data, and it keeps the same SI unit as the measurements.

WORKED EXAMPLE

A student measures 10 mL, 14 mL, 18 mL, and 22 mL of water in four trials. What is the mean volume?

1. Add the measurements: $10 + 14 + 18 + 22 = 64$.
2. Count the trials: 4.
3. Divide the total by the number of trials: $64 / 4 = 16$.

Answer: 16 mL

PRACTICE 6 problems

- 1** A graduated cylinder holds 21 mL, 23 mL, and 25 mL of water in repeated trials. What is the mean volume?

ANSWER _____

- 2** A plant stem grows 6.1 cm, 6.3 cm, and 6.2 cm in three repeated measurements. What is the mean growth?

ANSWER _____

- 3** A temperature probe records 27°C, 29°C, and 28°C for a cup of water. What is the mean temperature?

ANSWER _____

- 4** A balance measures a rock as 41 g, 43 g, and 42 g. What is the mean mass?

ANSWER _____

- 5** A toy car travels a track in 7 s, 8 s, 9 s, and 8 s. What is the mean travel time?

ANSWER _____

- 6** Group Blue measures bean plant heights of 31 cm, 33 cm, and 32 cm. Group Green measures heights of 35 cm, 29 cm, and 32 cm. Find each mean. Do the groups have the same mean height?

ANSWER _____

APPLY IT Show your work

- 1** A makers club tests two shade materials for an outdoor device station. The table shows the temperature inside the station after the same amount of time. Find the mean temperature for each material. Which material kept the station cooler?

STATION TEMPERATURE TRIALS

Trial	Material A (°C)	Material B (°C)
1	28	24
2	30	25
3	29	26

CALCULATE BOTH MEANS

ANSWER _____

- 2** A school garden team designs two rainwater funnels for watering seedlings. Their goal is to collect 128 mL of water. Find the mean amount collected by each design. Which design is closer to the goal?

RAINWATER FUNNEL TRIALS

Trial	Design A (mL)	Design B (mL)
1	126	120
2	130	124
3	128	122

CALCULATE BOTH MEANS

ANSWER _____

CHALLENGE

One step up

A student says the mean mass of four soil samples is 26.5 g. Three masses are 24 g, 29 g, and 27 g. What was the fourth mass? Explain how you know.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A graduated cylinder holds 21 mL, 23 mL, and 25 mL of water in repeated trials. What is the mean volume?	23 mL
2	A plant stem grows 6.1 cm, 6.3 cm, and 6.2 cm in three repeated measurements. What is the mean growth?	6.2 cm
3	A temperature probe records 27°C, 29°C, and 28°C for a cup of water. What is the mean temperature?	28°C
4	A balance measures a rock as 41 g, 43 g, and 42 g. What is the mean mass?	42 g
5	A toy car travels a track in 7 s, 8 s, 9 s, and 8 s. What is the mean travel time?	8 s
6	Group Blue measures bean plant heights of 31 cm, 33 cm, and 32 cm. Group Green measures heights of 35 cm, 29 cm, and 32 cm. Find each mean. Do the groups have the same mean height?	Blue: 32 cm. Green: 32 cm. Yes, the means are the same.

PART 2 • APPLY IT

- Material A mean: 29°C. Material B mean: 25°C. Material B kept the station cooler.** Add each material's three temperatures and divide by three. Compare the two means, and choose the lower temperature.
- Design A mean: 128 mL. Design B mean: 122 mL. Design A is closer to the goal.** Find each mean by adding the three trial amounts and dividing by three. Compare each mean to 128 mL.

CHALLENGE

26 g. A mean of 26.5 g for four samples means the total mass is 106 g. The three known masses total 80 g, so the fourth mass is $106\text{ g} - 80\text{ g} = 26\text{ g}$.

Accept equivalent calculation work and correctly labeled units. For the challenge, accept a clear explanation that finds the total from the mean before subtracting the known masses.