

Cool Cup Data

Use repeated trials and means to organize an insulation investigation.

7.1.F “construct appropriate tables, graphs, maps, and charts using repeated trials and means to organize data;”

NAME _____

DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the details that make the trials a fair comparison. Circle the words that tell how the results can be organized into a table or graph.

Testing Cup Sleeves

- ① To compare how well different materials insulate a cup, a science class tested three sleeve types. They poured the same amount of warm water into identical cups and waited ten minutes. For each sleeve, they repeated the test three times. Repeated trials reduce the effect of a small mistake or an unusual result.
- ② After each trial, students measured how many degrees Celsius the water cooled. They wrote every result in a table instead of relying on memory. Each sleeve has its own row, and each trial has its own column. The class can later compare patterns without mixing measurements from different conditions.

WATER TEMPERATURE DROP AFTER 10 MINUTES

Sleeve type	Trial 1, °C	Trial 2, °C	Trial 3, °C
Felt	6	7	5
Foil	10	9	11
No sleeve	16	15	17

- ③ To find a mean, add the three measurements for one sleeve and divide by three. The mean gives a single value that represents the repeated trials. A bar graph could show one bar for each sleeve, with bar heights based on the means. Clear labels should identify the sleeve types and temperature drop in degrees Celsius.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Name two conditions the class kept the same in every trial.

2 Calculate the mean temperature drop for the foil sleeve. Show the mean with units.

3 If you make a bar graph from these results, what should the horizontal axis show, and what should the vertical axis show?

4 How do three repeated trials make the class results more reliable?

3 YOUR TURN _____ Your own words

Test which of three surfaces lets the same toy car travel farthest. Roll the car from the same starting line three times on each surface, record each distance in centimeters, and calculate each mean.

SURFACE	TRIAL 1 DISTANCE, CM	TRIAL 2 DISTANCE, CM	TRIAL 3 DISTANCE, CM	MEAN DISTANCE, CM

PART 1 • READ AND MARK

Underline the details that make the trials a fair comparison. Circle the words that tell how the results can be organized into a table or graph. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Name two conditions the class kept the same in every trial.	The class used the same amount of warm water and identical cups.
2	Calculate the mean temperature drop for the foil sleeve. Show the mean with units.	10 °C
3	If you make a bar graph from these results, what should the horizontal axis show, and what should the vertical axis show?	The horizontal axis should show sleeve types. The vertical axis should show mean temperature drop in degrees Celsius.
4	How do three repeated trials make the class results more reliable?	They reduce the effect of a small mistake or an unusual result.

PART 3 • YOUR TURN (SAMPLE ANSWER)

SURFACE	TRIAL 1 DISTANCE, CM	TRIAL 2 DISTANCE, CM	TRIAL 3 DISTANCE, CM	MEAN DISTANCE, CM
Tile	84	82	83	83
Carpet	41	43	42	42
Cardboard	68	70	67	68.3

Accept equivalent wording for controlled conditions and graph axes. For the open task, accept any three surfaces, three repeated measurements per surface, and correctly calculated means with units.