Tablet Temperature Test

Use data to support a scientific conclusion.

SC.7.N.1.1 "Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the testable problem, circle the independent and dependent variables, and star two average values in the table that support the conclusion.

Dissolving at Different Temperatures

1. During a unit on physical changes, Maya's class noticed that an antacid tablet seemed to disappear faster in warm water than in cool water. They defined a testable problem: How does water temperature affect the time an antacid tablet takes to dissolve? Before planning, they used their science textbook and a reliable science website to learn that temperature changes motion.

2. The class used 200 milliliters of water in identical cups at four temperatures. They placed one tablet in each cup and timed its dissolving. Water volume, tablet brand, cup size, and stirring stayed the same. Temperature was the independent variable, and dissolving time was the dependent variable. Three trials at each temperature reduced the effect of unusual results.

ANTACID TABLET DISSOLVING TIMES

Water temperature	Trial 1, seconds	Trial 2, seconds	Trial 3, seconds	Average, seconds
10 °C	192	188	190	190
20 °C	124	120	122	122
30 °C	78	82	80	80
40 °C	53	55	54	54

3. After averaging the times, students made a line graph with temperature on the horizontal axis and average dissolving time on the vertical axis. The pattern showed shorter times as temperature rose. They concluded that warmer water made the tablets dissolve faster in this investigation. The data supported their prediction, but the conclusion applies only to tested conditions.

2 ANSWER WITH EVIDENCE

Use the passage

1. What testable problem did Maya's class investigate?

2. Name the independent variable, the dependent variable, and two variables the class controlled.

3. At which water temperature did the tablet dissolve fastest? Use the average time to explain your answer.

4. Give two average times from the table that support the conclusion that warmer water made the tablet dissolve faster.

3 YOUR TURN

Your own words

Choose a testable problem about how one factor affects bean seed germination. In five or six sentences, state your question and prediction, identify the independent and dependent variables, name two controls, and explain how you will collect data.

ANSWER KEY

Tablet Temperature Test

GRADE 7 · SC.7.N.1.1

PART 1 · READ AND MARK

Underline the testable problem, circle the independent and dependent variables, and star two average values in the table that support the conclusion. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What testable problem did Maya's class investigate?	**How does water temperature affect the time an antacid tablet takes to dissolve?**
2	Name the independent variable, the dependent variable, and two variables the class controlled.	**Independent variable: water temperature. Dependent variable: dissolving time. Controls include water volume, tablet brand, cup size, and stirring.**
3	At which water temperature did the tablet dissolve fastest? Use the average time to explain your answer.	**At 40 °C. Its average dissolving time was 54 seconds, the shortest average in the table.**
4	Give two average times from the table that support the conclusion that warmer water made the tablet dissolve faster.	**Answers may include 190 seconds at 10 °C and 54 seconds at 40 °C. The average time decreased as temperature increased.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Does the amount of water given to bean seeds affect how many seeds germinate in seven days? I predict that seeds given 5 mL of water each day will germinate more often than seeds given 1 mL each day. The independent variable is the daily water amount. The dependent variable is the number of seeds that germinate. I will keep the seed type, soil amount, cup size, light, and temperature the same. I will use three cups of five seeds for each water amount and record the number germinated each day in a table.

Accept equivalent wording for the problem, variables, and controls when it matches the passage. For the open response, accept reasonable predictions and plans that identify one changed factor, one measured result, at least two controls, and a clear data-collection method.