

Dissolve It Fairly

Plan a controlled investigation and gather dependable evidence.

PS.1.b.i "planning and carrying out investigations independently and collaboratively plan and conduct observational and experimental investigations; identify variables, constants..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the independent and dependent variables, circle each constant and the control condition, and number each safety action. These marks show how the team planned a fair and safe investigation.

Testing Tablet Dissolving Time

- ① To investigate whether water temperature changes how fast an antacid tablet dissolves, Maya's team wrote a testable question. They predicted that a tablet in warmer water would disappear sooner. The independent variable was water temperature. The dependent variable was the number of seconds until the tablet was no longer visible. Each cup received 200 milliliters of water and one whole tablet of the same brand. They planned not to stir, because stirring could change the dissolving time.
- ② The team used three temperatures: 10°C, 22°C, and 40°C. The 22°C cup was the control condition, a comparison point representing ordinary room-temperature water. They kept the cup size, water volume, tablet brand, and no-stir method constant in every trial. One student measured temperature with a thermometer, another started a stopwatch when the tablet touched the water, and a third recorded the time. They repeated each temperature three times, then calculated an average time in seconds for each temperature.
- ③ Before starting, the team put on splash goggles and checked glass cups for cracks. They poured the 40°C water carefully and kept it away from the table edge. Nobody tasted the tablets or water. During trials, the recorder noted bubbles and whether pieces remained, but did not change the procedure. Afterward, the team compared averages, discussed any unusual trial, and cleaned spills and equipment. These observations and repeated trials helped them draw a conclusion based on evidence about temperature effects.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What was the independent variable, and what was the dependent variable?

2 Name two constants the team kept the same in every trial.

3 Which condition was the control, and what comparison did it provide?

4 How did the team make its evidence more reliable? What two observations did the recorder note during a trial?

3 YOUR TURN _____ Your own words

Plan a fair investigation of one safe physical change, such as melting, dissolving, or evaporation. Write four sentences that state a testable question and hypothesis, identify the independent and dependent variables, name two constants and a control, and include one step for safe use of equipment or materials.

PART 1 • READ AND MARK

Underline the independent and dependent variables, circle each constant and the control condition, and number each safety action. These marks show how the team planned a fair and safe investigation. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What was the independent variable, and what was the dependent variable?	Independent variable: water temperature. Dependent variable: the number of seconds until the tablet was no longer visible.
2	Name two constants the team kept the same in every trial.	Any two: cup size, water volume, tablet brand, or the no-stir method.
3	Which condition was the control, and what comparison did it provide?	The 22°C cup was the control condition. It provided a comparison point for ordinary room-temperature water.
4	How did the team make its evidence more reliable? What two observations did the recorder note during a trial?	They repeated each temperature three times and calculated an average. The recorder noted bubbles and whether pieces remained.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Does the amount of table salt change how long one ice cube takes to melt, and I predict more salt will shorten melting time. The independent variable is salt amount, and the dependent variable is seconds until the ice cube melts. I will keep ice-cube size and room temperature constant, and an ice cube with no salt is the control. I will wear goggles and wipe up melted water to prevent slipping.

Accept equivalent wording for variables, constants, and controls when the relationships are scientifically sound. For the open response, accept any safe, testable physical-change investigation that includes all required planning elements.