

Fair Test Detectives

Track the choices that make an investigation fair, safe, and useful.

6.1.b.i “planning and carrying out investigations independently and collaboratively plan and conduct observational and experimental investigations; identify variables, constants, and controls where appropriate...”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the variable, circle each constant, and number the safety steps in the passage to trace how Jada planned a fair and safe investigation.

Testing Sugar and Water

- ① Jada noticed that sugar seemed to disappear faster in hot tea than in cold lemonade. First, she planned an observational investigation. She watched two family members stir sugar into their drinks and recorded what she saw, without changing their drinks. Her notes suggested that temperature might matter, but the drinks also had different amounts of liquid and different stirring. To test one possible cause fairly, Jada and her partner planned an experiment using water instead of drinks.
- ② They chose water temperature as the variable they would change. In three clear cups, they placed 100 milliliters of water at 10°C, 25°C, or 40°C. Each cup received one level teaspoon of sugar. They started the timer as they added the sugar, stirred each cup with the same spoon for ten seconds, and stopped timing when the last sugar crystals disappeared. Amount of water, amount of sugar, cup type, stirring time, and stirring method were constants. The 25°C cup was their control, or comparison condition. They planned three trials at each temperature and would calculate an average time.
- ③ Before beginning, Jada read the safety steps aloud with her partner. They wore safety goggles, tied back long hair, and kept the cups away from the table edge. They used warm water, not boiling water, and carried it carefully. Sugar and water are safe classroom materials, but no one tasted the samples or put used materials back into the supply container. After measuring, they wiped spills and washed their hands. Jada recorded the times in a shared chart, while her partner watched the timer. Then they switched jobs for the next trial.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What variable did Jada and her partner change? Name three constants they kept the same.

2 What was the control in this experiment, and why did the partners use it?

3 How was Jada's first investigation observational, and how was the second investigation experimental?

4 Name two safety actions from the passage. Then describe one way Jada and her partner shared the work.

3 YOUR TURN

Your own words

Write the original salt-and-ice plan: variable, measure, three constants, no-salt control, two safety steps and partner jobs. Obtain teacher approval. Individually observe an untreated cube briefly and record what you see. Then with a partner actually test equal cubes with 0 g, 5 g and 10 g salt twice each, keeping plate, location and timing method the same. On extra paper record Amount (g) / Trial / Actual Melt Time (min) / Observation. Switch jobs. If ice remains at the teacher-set stopping time, record that fact and time instead of inventing a melt time. Compare actual results and give a limitation.

PART 1 • READ AND MARK

Underline the variable, circle each constant, and number the safety steps in the passage to trace how Jada 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 variable did Jada and her partner change? Name three constants they kept the same.	They changed water temperature. Constants included the amount of water, amount of sugar, cup type, stirring time, and stirring method.
2	What was the control in this experiment, and why did the partners use it?	The 25°C cup was the control. It gave them a comparison condition for the other water temperatures.
3	How was Jada's first investigation observational, and how was the second investigation experimental?	In the first investigation, Jada watched family members' drinks without changing them. In the experiment, she and her partner changed water temperature while keeping other conditions the same.
4	Name two safety actions from the passage. Then describe one way Jada and her partner shared the work.	Answers include wearing goggles, tying back hair, keeping cups away from the edge, using warm rather than boiling water, not tasting samples, wiping spills, or washing hands. Jada recorded times while her partner watched the timer, and they switched jobs for the next trial.

PART 3 • YOUR TURN (SAMPLE ANSWER)

My question is, How does salt amount affect the melting time of an ice cube? I will test 0 g, 5 g, and 10 g of salt and measure minutes until each equal-sized ice cube melts. The 0 g sample is the control. Ice-cube size, plate type, room location, and timing method will stay the same. We will wear goggles, keep salt away from eyes, and wipe spills. I will add salt, and my partner will time and record results.

Accept any correctly identified constants and safety actions from the passage. For the open task, accept reasonable procedures that change only salt amount, include a no-salt control, and name appropriate constants, safety steps, and shared jobs. Teacher setup: supply six equal-sized ice cubes, matching plates, salt, balance, timer, goggles and towels. Approve the plan and set an observation window before starting. Keep materials away from eyes, do not taste, wipe spills and wash hands. Observe individual notes and shared test work; require all six real trial records, including unfinished melts where applicable. Accept any supported pattern, ties or inconclusive evidence; no particular salt effect is required. Future-tense sample text models the plan only, not completed results.