

Fair Test Detectives

Identify what changes, what is measured, and what stays the same.

4.1.b.i “planning and carrying out investigations identify variables when planning an investigation”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the factor Jada changes, circle the result she measures, and number the factors she keeps the same to show how she plans a fair test.

A Fair Sugar Test

- ① Jada wants to find out whether water temperature changes how fast sugar dissolves. She writes a testable question: “How does the temperature of water affect the time needed for sugar to disappear?” She plans three cups of water, one cold, one room temperature, and one warm. Each cup will hold the same amount of water.
- ② For each cup, Jada will add one teaspoon of the same kind of sugar. She will start a timer as soon as the sugar touches the water. Then she will use the same number of gentle stirs in every cup. She will stop the timer when no sugar crystals can be seen. The time on the timer is the result she will measure.
- ③ Jada repeats each temperature test three times. Repeating helps her notice if one trial has an unusual time. She records all the times and compares the average time for cold, room-temperature, and warm water. In this investigation, water temperature is the factor she changes. Dissolving time is the result she measures. The water amount, sugar amount and kind, and stirring stay the same.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What factor does Jada change in her investigation?

2 What result does Jada measure for each cup?

3 Name two factors Jada keeps the same in every cup.

4 Why does Jada repeat each temperature test three times?

3 YOUR TURN _____ Your own words

Plan a fair investigation to find out how the length of a paper airplane's wings affects flight distance. Write three sentences that name the factor you will change, the result you will measure, and at least two factors you will keep the same.

PART 1 • READ AND MARK

Underline the factor Jada changes, circle the result she measures, and number the factors she keeps the same to show how she plans a fair test. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What factor does Jada change in her investigation?	She changes the temperature of the water.
2	What result does Jada measure for each cup?	She measures the time it takes for the sugar to disappear.
3	Name two factors Jada keeps the same in every cup.	Answers include the amount of water, the amount of sugar, the kind of sugar, and the number of stirs.
4	Why does Jada repeat each temperature test three times?	Repeating helps her notice if one trial has an unusual time.

PART 3 • YOUR TURN (SAMPLE ANSWER)

I will change only the wing length on paper airplanes. I will measure the distance each airplane flies. I will keep the paper type, airplane design, launcher, launch force, and indoor launch spot the same.

Accept equivalent descriptions of the changed factor, measured result, and controlled factors. For Your Turn, accept any workable fair-test plan that changes wing length, measures flight distance, and names at least two reasonable factors held constant.