Test It Another Way

Choose methods that test the same hypothesis.

FSL.3C.3 "Select and describe an alternate method for testing a hypothesis."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the first test, circle each alternate method, and number two conditions that must stay equal for a fair comparison.

Which Plate Warms Faster?

1. On a sunny afternoon, students wonder whether a dark surface heats faster than a light surface. Their hypothesis is that black-painted metal will gain more temperature than white-painted metal during ten minutes of equal light. For their first test, they paint two metal plates of the same size and thickness, attach identical contact thermometers, and place both outdoors side by side. They record each plate's starting temperature and its temperature ten minutes later. They compare each plate's change in temperature, not simply which plate feels warmer at the end. A cloud shading one plate could distort the result.

2. Other equipment could test the same idea without relying on a clear day. A single lamp can shine on both plates indoors if each plate is the same distance from the bulb. Calibrated temperature strips could replace contact thermometers; each strip displays a reading that changes as its plate warms. Students would still record a starting and ending reading for each plate. They might also paint two identical metal cans, fill them with equal amounts of water at the same starting temperature, and compare the water's temperature changes under equal light. That version measures how much warmth reaches the water.

3. Every method has limits. A lamp may heat the nearby air as well as the plates, so both plates must have the same exposure. Temperature strips must cover the expected temperature range, or a reading might fall off the scale. Water inside cans can warm more slowly than metal surfaces, so a ten-minute trial may show little change. Students could also run several plate pairs at once and switch the positions of the plates in each pair halfway through the trial. This would reduce the effect of a warm spot on the table. Changing only the surface color makes the comparison meaningful.

2 ANSWER WITH EVIDENCE

Use the passage

1. A week of rain prevents the outdoor test. Which alternate method would you choose, and how would you keep the light exposure equal?

2. The contact thermometers break. Which alternate method could measure warming, and what readings would you compare?

3. A class wants to test whether dark surfaces help warm a liquid. Which alternate method fits that goal, and what would the class compare?

4. One side of the outdoor table is warmer. Which alternate procedure could reduce this problem, and how would it help?

3 YOUR TURN

Your own words

Students think seeds sprout sooner in warm soil than in cool soil. Their first plan is to plant one seed in each of two pots and record which sprouts first. In 3 or 4 sentences, describe an alternate way to test the hypothesis, what you would measure, and what you would keep the same.

ANSWER KEY

Test It Another Way

HIGH SCHOOL · FSL.3C.3

PART 1 · READ AND MARK

Underline the first test, circle each alternate method, and number two conditions that must stay equal for a fair comparison. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	A week of rain prevents the outdoor test. Which alternate method would you choose, and how would you keep the light exposure equal?	**Use one lamp indoors to shine on both plates. Place the plates the same distance from the bulb.**
2	The contact thermometers break. Which alternate method could measure warming, and what readings would you compare?	**Use calibrated temperature strips that cover the expected range. Compare the starting and ending readings for each plate to find its temperature change.**
3	A class wants to test whether dark surfaces help warm a liquid. Which alternate method fits that goal, and what would the class compare?	**Use identical black-painted and white-painted cans with equal amounts of water at the same starting temperature. Compare the water's temperature change in each can.**
4	One side of the outdoor table is warmer. Which alternate procedure could reduce this problem, and how would it help?	**Test several plate pairs and switch the plates' positions within each pair halfway through. Each plate would spend equal time in the warmer spot.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would plant 20 seeds of the same kind in each of several warm pots and several cool pots. I would count how many seeds sprout in each pot every day and compare when half the seeds in each group have sprouted. I would keep the soil type, water, light, and planting depth the same in all pots.

Accept methods that test the stated hypothesis with a different procedure and a clear comparison. For Part 3, accept other measurable outcomes if soil temperature is the intended difference and relevant growing conditions are controlled.