# More Than Once

Choose new trials that strengthen an investigation.

**FSL.3C.5** "Determine which additional trials could be performed in an investigation to enhance the results of an experimental design."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline three details that could make Maya's first result uncertain. Number two places where a new trial could help her test a possible cause.

### The Warm Side of the Sidewalk

1. At the school bus stop, Maya noticed that dark pavement felt warmer than a nearby pale sidewalk. She asked whether surface color affects heating under a lamp. To model the surfaces, she wrapped two identical ceramic tiles in black and white paper. She placed them side by side under one lamp, turned it on for ten minutes, and measured each tile's surface temperature with the same thermometer. The black tile reached 36°C and the white tile reached 32°C. One pair of readings suggests a difference, but Maya needs more trials before trusting that color caused it.

2. During that first run, Maya put the black tile closer to the center of the lamp's beam. The beam is brightest near its center, so position might explain part of the difference. She also noticed that a ceiling vent blew across the table at unpredictable times. She did not record either tile's temperature before the lamp was switched on. A new trial is most useful when Maya can explain what doubt it addresses. She needs to keep other conditions steady so she can tell whether a change in the results came from the factor she meant to test.

3. Maya also wonders whether the effect would appear in a dimmer setting, not just beneath the lamp at its current height. She can move the lamp or use a sturdy box to block its light, and she can work at a table away from the vent. Her lab period allows four more ten-minute runs. She must decide which new trials are worth those limited runs. For each, she needs to say which doubt the trial addresses and what she would keep constant. She will record every reading, even when it conflicts with her original prediction.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. What additional runs would help Maya find out whether the temperature difference happens consistently? Name two conditions she should keep the same.

2. What additional trial could Maya perform to check whether tile position helped cause the first result?

3. What additional trial could check whether the tiles warm differently without direct lamp light?

4. What additional trial could test whether the color difference also occurs when the lamp is farther away? How should Maya place the tiles?

## 3 YOUR TURN

Your own words

A class compares how long paper helicopters with short or long blades take to fall. They drop only one of each, and the short-bladed helicopter starts from a higher step while a fan turns on and off. Propose two additional trials. For each, explain what it checks and what you would keep the same.

ANSWER KEY

# More Than Once

HIGH SCHOOL · FSL.3C.5

## PART 1 · READ AND MARK

Underline three details that could make Maya's first result uncertain. Number two places where a new trial could help her test a possible cause. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | What additional runs would help Maya find out whether the temperature difference happens consistently? Name two conditions she should keep the same. | **Repeat the comparison several times with both tiles equally exposed to the lamp. Keep the heating time and measurement method the same.** |
| 2 | What additional trial could Maya perform to check whether tile position helped cause the first result? | **Switch the tiles' positions and run the lamp for another ten minutes, keeping the other conditions the same.** |
| 3 | What additional trial could check whether the tiles warm differently without direct lamp light? | **Measure both tiles over the same time period with the lamp's light blocked from both by the box, starting them at the same temperature.** |
| 4 | What additional trial could test whether the color difference also occurs when the lamp is farther away? How should Maya place the tiles? | **Move the lamp farther away and test both colors again, placing the tiles equally far from the lamp.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

First, drop both blade designs several times from the same marked height with the fan off. This checks whether one design consistently falls longer when height and airflow are controlled. Second, repeat several drops of each design from a different marked height, releasing both designs from that height with the fan off. This checks whether the pattern holds at another height while keeping the paper type and timing method the same.

Accept other feasible trials if each addresses a specific uncertainty and controls conditions needed for a fair comparison. Repeating a run without addressing the unequal tile positions does not, by itself, isolate the effect of color.