Linked or Caused

Tell an observed relationship from a cause-and-effect claim.

CCSS.Math.Content.HSS-ID.C.9 "Distinguish between correlation and causation."

NAME _____ DATE _____

CORRELATION

Two variables are related when they tend to change together. This does not prove that one variable causes the other.

Shoe size and reading skill often rise together as children get older.

CAUSATION

Causation means that a change in one variable directly produces a change in another. Controlled experiments can provide evidence of causation.

Closing a light switch causes the connected lamp to turn on.

1 SORT

8 items

Circle RELATED or CAUSES for each statement, then in PROVE IT choose two items and explain what evidence helped you sort them.

1.	Ice cream sales and sunburn reports both rise during summer months.	RELATED CAUSES
2.	In a randomized experiment, fertilizer made tomato plants grow taller than similar plants without fertilizer.	RELATED CAUSES
3.	In a controlled test, pressing a key on a working keyboard produces its matching letter on the screen.	RELATED CAUSES
4.	A survey finds that students who sleep more tend to have higher grades.	RELATED CAUSES
5.	Cities with more bike lanes also tend to have more bicycle commuters.	RELATED CAUSES
6.	In a controlled test, adding heat melts an ice cube.	RELATED CAUSES
7.	Researchers observe that umbrella sales and wet sidewalks occur together.	RELATED CAUSES
8.	In a survey, people who report more streaming time also report later bedtimes.	RELATED CAUSES

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new RELATED example and one new CAUSES example.

RELATED _____

CAUSES _____

CHALLENGE

Write a RELATED example, then name one possible third variable that could help explain why the two variables are related.

ANSWER KEY # Linked or Caused

HIGH SCHOOL · HSS-ID.C.9

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Ice cream sales and sunburn reports both rise during summer months.	**RELATED**	Both may increase because summer brings hotter, sunnier weather, so the statement shows correlation only.
2	In a randomized experiment, fertilizer made tomato plants grow taller than similar plants without fertilizer.	**CAUSES**	Random assignment and comparison groups support the conclusion that fertilizer caused the growth difference.
3	In a controlled test, pressing a key on a working keyboard produces its matching letter on the screen.	**CAUSES**	Pressing the key directly produces the displayed letter through the keyboard's mechanism.
4	A survey finds that students who sleep more tend to have higher grades.	**RELATED**	The survey shows an association, but it cannot prove that more sleep alone caused higher grades.
5	Cities with more bike lanes also tend to have more bicycle commuters.	**RELATED**	The variables are associated, but other factors could affect both bike lanes and commuting choices.
6	In a controlled test, adding heat melts an ice cube.	**CAUSES**	Adding heat directly changes the ice from solid water to liquid water.
7	Researchers observe that umbrella sales and wet sidewalks occur together.	**RELATED**	Rain can cause both umbrella sales and wet sidewalks, so the observation does not show that either variable causes the other.
8	In a survey, people who report more streaming time also report later bedtimes.	**RELATED**	The survey reports a relationship, not proof that streaming time directly causes later bedtimes.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **RELATED**: A survey finds that people who exercise more also report drinking more water.
- **CAUSES**: In a controlled test, adding food coloring to water changes the water's color.

Challenge: Ice rink attendance and hot chocolate sales may rise together. Cold weather could increase both.

Sort key: RELATED for 1, 4, 5, 7, and 8. CAUSES for 2, 3, and 6. For PROVE IT, accept explanations that identify observed association, a possible third variable, or controlled experimental evidence.