

Salt's Hidden Trail

Trace evidence from a stream investigation to explain connected effects.

7.5.B “identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each cause and circle its effect. Number the linked steps in the chain that begins when snow melts, so you can trace how one change leads to another.

Why Mayflies Disappeared

- ① In late winter, scientists noticed that fewer mayfly nymphs lived in Clearbrook Stream near a busy highway. The water looked clear, but tests showed higher salt levels after snowstorms. Road crews spread salt to melt ice. When snow melted, runoff carried dissolved salt from pavement into storm drains and then into the stream. Because salt stays dissolved, it could affect aquatic organisms even when the water did not look polluted to people at first glance.
- ② To investigate the pattern, the team placed equal numbers of mayfly nymphs in three tanks of stream water. One tank received no added salt, one received a low salt amount, and one received a higher amount. All tanks had the same temperature, food, light, and water flow. After seven days, the scientists counted living nymphs. Fewer nymphs survived as salt concentration increased. Keeping the other conditions the same helped the team connect the survival change to salt rather than to another tank condition.
- ③ The results did not prove that salt caused every loss of mayflies in Clearbrook Stream. In the stream, temperature, flowing water, and other pollutants can also change. Still, the tank results gave evidence that salt can reduce mayfly survival. If fewer mayflies live, fish that eat them may have less food. The town could reduce this risk by using less salt, applying it only where needed, and sweeping up extra salt before melting snow carries it away.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What observations led scientists to investigate whether road salt affected mayflies?

2 How did the tank investigation help the team test whether salt affected mayfly survival?

3 Explain the cause-and-effect relationship that could leave fish with less food.

4 Why could the scientists not conclude that salt caused every mayfly loss in Clearbrook Stream?

3 YOUR TURN _____ Your own words

Choose a different scientific phenomenon that could have a cause and effect, such as plants changing near a sidewalk or an animal population changing in a pond. In 4 to 5 sentences, explain a three-step cause-and-effect chain and describe an investigation that tests one cause while keeping at least two conditions the same.

PART 1 • READ AND MARK

Underline each cause and circle its effect. Number the linked steps in the chain that begins when snow melts, so you can trace how one change leads to another. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What observations led scientists to investigate whether road salt affected mayflies?	They found fewer mayfly nymphs near the highway and measured higher salt levels after snowstorms.
2	How did the tank investigation help the team test whether salt affected mayfly survival?	The team changed the salt amount but kept the number of nymphs, temperature, food, light, and water flow the same. This made salt the likely cause of survival differences.
3	Explain the cause-and-effect relationship that could leave fish with less food.	Higher salt can reduce mayfly survival. With fewer mayflies, fish that eat mayflies have less food.
4	Why could the scientists not conclude that salt caused every mayfly loss in Clearbrook Stream?	Conditions in the stream, including temperature, water flow, and other pollutants, can also change and affect mayflies.

PART 3 • YOUR TURN (SAMPLE ANSWER)

After winter, grass beside a sidewalk may turn brown because salty meltwater enters the soil. Salt in the soil makes it harder for grass roots to take in water, causing the grass to dry out. I would grow equal grass seedlings in soil with no salt, low salt, and higher salt. I would keep light, soil amount, water volume, and temperature the same, then compare leaf color and height after two weeks.

Accept accurate cause-and-effect chains supported by a reasonable scientific explanation. For the investigation, accept a test with one stated variable changed, at least two controlled conditions, and a measurable result.