Salt After Snow

Use focused questions to trace evidence about road salt.

9.6.R.1 "Students will find and comprehend information about a topic, using their own viable research questions."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline facts that could help answer where road salt goes, and circle details researchers could measure to investigate its effects. Use your marks to connect research questions with evidence.

Where Does Road Salt Go?

1. After a snowstorm, crews may spread rock salt on roads and sidewalks. Rock salt is mostly sodium chloride. When snow melts, runoff can carry dissolved chloride into storm drains and nearby streams. Salt can also soak into soil and reach groundwater, which may feed a stream long after the pavement is dry. Chloride does not disappear when water evaporates; it stays behind until water moves it elsewhere. This path raises a researchable question: How can a winter road treatment affect a stream in spring? Following the water from pavement to stream gives a starting answer.

2. Freshwater plants and animals are adapted to particular ranges of water conditions. Too much chloride can make it harder for some freshwater organisms to survive or reproduce. The effect depends on the species and the amount of chloride in the water. Testing a stream once, on a single afternoon, would not show whether its chloride level changes after storms or remains high into summer. Researchers can collect water samples on different dates and measure chloride concentration. They can also compare sites upstream and downstream of salted roads, while remembering that other sources of chloride may exist.

3. Cities cannot simply stop dealing with ice, since slippery pavement poses a danger. One approach is to remove snow before it freezes onto the pavement, which can reduce the amount of salt needed. Another is to use spreaders calibrated to release a planned amount rather than an uneven excess. Neither approach guarantees that a stream will have safe chloride levels. A useful local investigation would record how much salt is applied and test nearby water over time. Those records could help answer whether a change in road treatment is followed by a change in chloride levels, without proving cause on their own.

2 ANSWER WITH EVIDENCE

Use the passage

1. Write a focused question about how road salt reaches a stream. Give two steps in a route described in the passage.

2. Write a question about whether a stream's chloride level stays high after winter. What evidence does the passage suggest collecting to answer it?

3. Write a question about chloride and stream life that this passage can partly answer. State one finding and one limit of the information given.

4. Write a question comparing two ways cities could reduce salt use. Use the passage to explain how each way could help.

3 YOUR TURN

Your own words

Imagine a stream near a salted road in your community. Write a focused research question about that stream that the passage cannot answer, then name a realistic source or method and two kinds of information you would need.

ANSWER KEY

Salt After Snow

GRADE 9 · 9.6.R.1

PART 1 · READ AND MARK

Underline facts that could help answer where road salt goes, and circle details researchers could measure to investigate its effects. Use your marks to connect research questions with evidence. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Write a focused question about how road salt reaches a stream. Give two steps in a route described in the passage.	**Question: How can chloride from a salted road reach a stream? Melting snow carries it in runoff to a storm drain, and the runoff reaches a nearby stream.**
2	Write a question about whether a stream's chloride level stays high after winter. What evidence does the passage suggest collecting to answer it?	**Question: Does a stream's chloride level remain high into summer? Researchers would measure chloride in water samples collected on different dates, including after winter.**
3	Write a question about chloride and stream life that this passage can partly answer. State one finding and one limit of the information given.	**Question: How might chloride affect freshwater organisms? Too much chloride can make survival or reproduction harder for some organisms, but the passage does not identify which species would be affected in a particular stream.**
4	Write a question comparing two ways cities could reduce salt use. Use the passage to explain how each way could help.	**Question: How could snow removal and calibrated spreaders reduce salt use? Removing snow before it freezes can reduce the salt needed, while calibrated spreaders can avoid releasing an uneven excess.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

At Mill Creek, do chloride levels rise after winter storms compared with days before the storms? I would collect water samples at the same site before and after several storms and ask the local public works office when the nearby road was salted. I would need chloride measurements from the samples and dates of salt application.

Accept other focused, passage-supported questions in Part 2 when the cited information answers them. For Part 3, the question should require new evidence, and the proposed source or method should be able to provide the information named.