# Tracing Creek Chloride

Use data and a runoff model to explain a local water-quality pattern.

**8.3.A** "develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;"

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline the data that support a claim, circle the words that explain the runoff model, and number the proposed test and solution. These marks will help you connect evidence, scientific ideas, and actions.

### Salt on the Move

1 After winter storms, students tested water in Pine Creek beside their school. Chloride is a dissolved part of road salt. Samples collected downstream from the parking lot had more chloride than samples upstream. The class compared results from three storms. Their data are shown in the table.

**CHLORIDE MEASUREMENTS AFTER WINTER STORMS**

| Storm | Upstream chloride, mg/L | Downstream chloride, mg/L |
|---|---|---|
| 1 | 11 | 82 |
| 2 | 13 | 91 |
| 3 | 12 | 87 |

2 To explain the pattern, the class used a runoff model. When solid salt dissolves, it separates into ions in water. Melting snow can carry those ions across pavement and into a storm drain, which empties into the creek. The model predicts higher chloride below the lot after salty runoff enters the drain.

3 The evidence does not prove the parking lot is the only chloride source, so the class suggests another test. They could measure water from a nearby untreated drain after the same storms. For a solution, they propose using less salt and sweeping up extra salt before snow melts. This should reduce salt available to dissolve and enter Pine Creek.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. What claim about chloride levels can the class support with all three data rows? Include one pair of measurements as evidence.

2. Use the runoff model to explain how road salt can move from the parking lot to Pine Creek.

3. Why would measuring water from a nearby untreated drain make the class's explanation stronger?

4. How do using less salt and sweeping up extra salt fit the class's runoff model?

## 3 YOUR TURN

Your own words

Choose a school problem involving water, energy, or materials. Write exactly five sentences that state an explanation, name two kinds of data that could support it, describe a scientific model for the pattern, propose one solution, and predict the solution's effect.

ANSWER KEY

# Tracing Creek Chloride

GRADE 8 · TEKS 8.3.A

## PART 1 · READ AND MARK

Underline the data that support a claim, circle the words that explain the runoff model, and number the proposed test and solution. These marks will help you connect evidence, scientific ideas, and actions. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | What claim about chloride levels can the class support with all three data rows? Include one pair of measurements as evidence. | **Chloride levels were higher downstream than upstream after every storm. For example, after storm 2, downstream water had 91 mg/L and upstream water had 13 mg/L.** |
| 2 | Use the runoff model to explain how road salt can move from the parking lot to Pine Creek. | **Salt dissolves into ions in melting snow. The runoff carries the ions across pavement into a storm drain, and the drain empties into Pine Creek.** |
| 3 | Why would measuring water from a nearby untreated drain make the class's explanation stronger? | **It would help determine whether another drain or source also adds chloride to the creek. The comparison could test whether the parking lot is the only source.** |
| 4 | How do using less salt and sweeping up extra salt fit the class's runoff model? | **Both actions leave less salt on the pavement. Less salt can dissolve in melting snow and be carried through the drain to the creek.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

The school garden loses soil because rainwater flows quickly down its bare slope. I would compare the amount of soil collected at the bottom after storms and the amount of ground covered by plants. A runoff model shows that plant roots hold soil while leaves slow moving water. The school could plant native grasses on the slope. After the grasses grow, less soil should collect at the bottom after similar storms.

Accept varied school-based problems if the response includes all five required parts and the explanation, data, model, solution, and prediction are logically connected. The data named should be measurable, and the model and prediction should follow accepted scientific ideas.