Air and Water Choices

Use local evidence to weigh health and resource needs.

ENV.4 "Students will demonstrate an understanding of the interdependence of human sustainability and the environment. Identify human impact and develop a solution for protection of the atmosphere, considering pollutants (e.g., acid rain…"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two sources of particle pollution, circle one effect on human health, and number two proposed actions that could protect the air without using reservoir water.

A Dry Month in Ridgeview

1. In the fictional town of Ridgeview, a dry, windy month strains the reservoir that supplies drinking water. Wind also lifts fine dust from exposed soil near a construction site. Diesel buses add more tiny particles to the air. These particles, called $PM_{2.5}$, can enter the lungs and make asthma symptoms worse.

2. The town health office tracked three weeks. Reservoir storage shows how much water remained, while each particle reading is a weekly average measured outdoors. Asthma visits count patients at one clinic, not everyone with asthma in town. The numbers move together, but this record alone cannot prove which source caused a visit.

RIDGEVIEW WEEKLY OBSERVATIONS

Week	Reservoir storage (% of capacity)	Mean outdoor $PM_{2.5}$ (µg/m³)	Asthma clinic visits
Week 1	78	9	6
Week 2	61	18	11
Week 3	48	31	19

3. Ridgeview cannot stop the wind, but it can reduce exposure and protect its limited water. The construction crew could cover bare soil instead of spraying it with reservoir water. The bus depot could limit engine idling near the clinic. Officials could monitor particle levels and warn residents when outdoor air worsens.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do a natural condition and a human activity both contribute to Ridgeview's particle pollution?

2. From Week 1 to Week 3, how did reservoir storage, mean outdoor $PM_{2.5}$, and asthma clinic visits change? Use the numbers in the table.

3. Why can't the table prove that particle pollution caused the clinic visits?

4. Which proposed construction-site action could protect both the air and the water supply? Explain how.

3 YOUR TURN

Your own words

A nearby neighborhood has frequent smoky evenings from backyard fire pits, little spare water, and residents with asthma. In three or four sentences, propose a way to reduce particle exposure without using more water, explain a health benefit, and name two measurements that could test your plan.

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PART 1 · READ AND MARK

Underline two sources of particle pollution, circle one effect on human health, and number two proposed actions that could protect the air without using reservoir water. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do a natural condition and a human activity both contribute to Ridgeview's particle pollution?	**Wind lifts dust from exposed soil, and diesel buses release particles into the air.**
2	From Week 1 to Week 3, how did reservoir storage, mean outdoor $PM_{2.5}$, and asthma clinic visits change? Use the numbers in the table.	**Reservoir storage fell from 78% to 48%, mean $PM_{2.5}$ rose from 9 to 31 µg/m³, and asthma clinic visits rose from 6 to 19.**
3	Why can't the table prove that particle pollution caused the clinic visits?	**The table shows that particle levels and visits rose together, but it does not show what caused each patient's symptoms.**
4	Which proposed construction-site action could protect both the air and the water supply? Explain how.	**Covering bare soil could keep wind from lifting dust without using reservoir water for spraying.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The neighborhood could ask residents to replace backyard fire pits with electric outdoor lights on smoky evenings. Burning less wood should reduce fine particles in the air, which may help residents with asthma avoid symptoms. The neighborhood could compare evening $PM_{2.5}$ readings and asthma-related clinic visits before and after the change, while also recording weather conditions.

Accept other feasible actions that reduce smoke without additional water. Students should treat changes in clinic visits as evidence to investigate, not proof that their action caused the change.