When Environments Change

Trace environmental changes to health risks and solutions

ENV.4.3 "Enrichment: Research and analyze case studies to determine the impact of human-related and natural environmental changes on human health and communicate possible solutions to reduce/resolve the dilemma."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the natural event and two human-caused changes, circle health effects, and draw arrows through the passage to show how each change can lead to exposure.

Two Communities, Two Health Risks

1 In 2014, Flint, Michigan, changed its drinking-water source to the Flint River. The city did not use adequate corrosion control, so the water damaged protective coatings inside some pipes and released lead into tap water. This human decision changed the water people used every day. Lead can harm the developing brain and nervous system, especially in children, even when the water looks clear. Families who relied on tap water could be exposed while drinking or cooking. Flint later returned to another water source, but damaged pipes still needed replacement to reduce the risk.

2 In 2017, Hurricane Harvey brought extreme rain to the Houston area of Texas. Floodwater entered homes and left walls and carpets wet. When damp materials stayed in place, mold could grow, which can worsen asthma and other breathing problems. Floodwater in some places also mixed with sewage, creating a risk of illness if people swallowed it or it entered a cut. The storm was a natural event, but paved land gave some rainwater fewer places to soak into the ground, adding to runoff. Residents with limited money or transportation could have more trouble leaving or repairing a flooded home.

3 These cases show why identifying a hazard is only the first step. In Flint, testing tap water and replacing lead service lines address exposure; corrosion control helps prevent lead from entering water in the first place. In Houston, warnings about floodwater, prompt removal of wet materials, and help with safe cleanup can reduce immediate health risks. Keeping more ground able to absorb rain and improving drainage may reduce flooding in future storms, but cannot stop heavy rain. In both places, solutions work better when residents receive clear information and people who cannot afford repairs receive support.

2 ANSWER WITH EVIDENCE

Use the passage

1. Trace the steps from Flint's water-source change to a possible health effect in children.

2. How did a natural event and a human-caused change combine to increase health risks in Houston?

3. How did people's routes of exposure differ in Flint and Houston, and what health effect could follow each route?

4. Choose one prevention measure from each case. Explain how each could interrupt the path from environmental change to a health risk.

3 YOUR TURN

Your own words

Imagine a town where a summer heat wave follows the removal of shade trees for a parking lot. In four to five sentences, explain how both changes could affect health, identify who may be at higher risk, and propose one immediate and one long-term response. Explain how each response reduces risk.

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PART 1 · READ AND MARK

Underline the natural event and two human-caused changes, circle health effects, and draw arrows through the passage to show how each change can lead to exposure. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Trace the steps from Flint's water-source change to a possible health effect in children.	**Without adequate corrosion control, the new water source caused lead to enter tap water from pipes. Children could ingest the lead while drinking the water, which can harm their developing brains and nervous systems.**
2	How did a natural event and a human-caused change combine to increase health risks in Houston?	**Harvey brought extreme rain. Paved land reduced how much rain could soak into the ground, adding to runoff and flooding. Flooded homes could develop mold, and some floodwater mixed with sewage.**
3	How did people's routes of exposure differ in Flint and Houston, and what health effect could follow each route?	**In Flint, people could ingest lead in tap water, risking harm to the brain and nervous system. In Houston, mold in damp homes could worsen asthma or other breathing problems.**
4	Choose one prevention measure from each case. Explain how each could interrupt the path from environmental change to a health risk.	**Corrosion control in Flint could prevent lead from entering tap water. In Houston, ground that absorbs more rain could reduce runoff and flooding, leaving fewer homes with damp materials where mold can grow.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A heat wave raises temperatures, and replacing shade trees with pavement can make nearby streets even hotter. Older adults and outdoor workers may face a greater risk of heat illness, especially if they cannot cool down. Opening a free cooling center right away would give residents a place to lower their body temperature. Over time, the town could plant shade trees near sidewalks and buildings. That change would reduce sun exposure and help cool places where people spend time.

Accept other passage-supported exposure routes and prevention measures. For Your Turn, look for a plausible link between both changes and a health risk, plus distinct immediate and long-term responses with explanations.