

Evidence Changes Choices

How research can reshape scientific ideas and public decisions

8.4.A "relate the impact of past and current research on scientific thought and society, including the process of science, cost-benefit analysis, and contributions of diverse scientists as related to the content;"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline details that show how scientists gathered or checked evidence, circle effects that research had on society, and number one cost and two benefits of preventing lead exposure.

Researching Lead, Protecting Health

- ① In the early 1900s, physician Alice Hamilton investigated why workers in lead industries became ill. She visited factories, interviewed workers, and collected medical records. Hamilton compared patterns of illness among people with different jobs and reported that lead dust could harm the body. Her evidence added to scientific understanding of workplace health, even though some business leaders resisted regulations. Research like hers helped society see that a product's usefulness does not erase its health risks.
- ② More than a century later, pediatrician Mona Hanna-Attisha studied children's blood-lead levels in Flint, Michigan. In 2015, she and her team compared records from before and after the city changed its water source. They also examined results from different neighborhoods. The pattern showed an increase in elevated blood-lead levels after the change. Other testing and investigations supported concern about the water system. The findings helped prompt public warnings, expanded testing, and efforts to reduce exposure.
- ③ Communities now use cost-benefit analysis when deciding how to prevent lead exposure. Replacing lead service lines can cost millions of dollars, and leaders must plan how to pay fairly. Benefits include fewer children exposed to lead, lower future medical and educational costs, and greater trust in public systems. Scientists continue to test water, improve sampling methods, and share results for review. Past and current research can change scientific ideas and public choices when new evidence is carefully examined.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What was one way Alice Hamilton gathered or analyzed evidence, and what did her evidence help society understand?

2 What pattern did Hanna-Attisha’s team find in Flint, and name one action the findings helped prompt.

3 How did the Flint researchers use comparisons to investigate the problem? Give two comparisons from the passage.

4 Give one cost and two benefits of replacing lead service lines. Why is this a cost-benefit analysis?

3 YOUR TURN _____ Your own words

Choose a school health issue other than lead, such as air quality, noise, or heat. In 4 to 6 sentences, describe a research plan with a comparison, explain how a scientist with community knowledge could contribute, and weigh one cost against two benefits before making a recommendation.

PART 1 • READ AND MARK

Underline details that show how scientists gathered or checked evidence, circle effects that research had on society, and number one cost and two benefits of preventing lead exposure. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What was one way Alice Hamilton gathered or analyzed evidence, and what did her evidence help society understand?	She visited factories, interviewed workers, collected medical records, or compared illness patterns. Her evidence showed that lead dust could harm workers and that useful products can still have health risks.
2	What pattern did Hanna-Attisha's team find in Flint, and name one action the findings helped prompt.	The team found an increase in elevated blood-lead levels after the water-source change. The findings helped prompt public warnings, expanded testing, or efforts to reduce exposure.
3	How did the Flint researchers use comparisons to investigate the problem? Give two comparisons from the passage.	They compared blood-lead records from before and after the water-source change and examined results from different neighborhoods.
4	Give one cost and two benefits of replacing lead service lines. Why is this a cost-benefit analysis?	A cost is that replacement can cost millions of dollars. Benefits include fewer children exposed to lead, lower future medical and educational costs, and greater trust in public systems. It weighs a cost against expected benefits.

PART 3 • YOUR TURN (SAMPLE ANSWER)

To study classroom air quality, a team could measure carbon dioxide levels in rooms with open and closed windows during the same class period. A public-health scientist who knows the school community could help choose rooms used by students with asthma and explain results clearly to families. Installing improved ventilation would cost the district money, but it could reduce breathing problems and improve students' ability to focus. I recommend testing first, then upgrading rooms where repeated measurements show poor air quality.

Accept equivalent evidence-gathering methods, societal impacts, costs, and benefits stated in the passage. For the open task, accept varied school issues if the response includes a comparison, a meaningful scientist contribution, one cost, two benefits, and a supported recommendation.