Filter, Test, Change

Use test results to improve a cleanup design

5.15 "Design, test, and revise solutions to clean a polluted environment."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the first filter design, circle each test result, and write 1 beside the revision so you can track how evidence changed the solution.

The Muddy Rain Barrel

1. After a storm, brown water pooled beside the school garden. Soil from a bare path had washed into a rain barrel used to water plants. The class wanted to remove the floating leaves and muddy bits without adding chemicals. They placed a clean cloth over a bucket, then spread a layer of gravel on the cloth. Their design aimed to catch large pieces as water passed through.

2. To test the filter, the class poured one cup of mixed barrel water through it. They saved one cup of the same mixed water in a clear jar for comparison. Both cups came from the barrel after it was stirred, so each began equally cloudy. The filtered water had no leaves, but it was still brown. Tiny soil bits had slipped between the gravel pieces.

3. The class revised the design by putting a layer of fine sand between the gravel and cloth. They stirred the barrel again and repeated the test with one cup of water, saving another cup for comparison. This time, the filtered water looked clearer than the unfiltered sample. The sand trapped more tiny soil bits. Clearer water was not proof that the water was safe to drink. Dissolved pollution could remain and would need a different test.

2 ANSWER WITH EVIDENCE

Use the passage

1. What problem did the first filter solve, and what problem remained?

2. How did the class make its first test a fair comparison?

3. What change did the class make, and what result showed that it helped?

4. Why could the class not say the revised filter made the water safe to drink? What would they need to test next?

3 YOUR TURN

Your own words

Plastic bits are stuck in a school garden's mulch. In four or five sentences, describe a safe cleanup design, how you would test it, a possible result, and how you would change your design based on that result.

ANSWER KEY

Filter, Test, Change

GRADE 5 · 5.15

PART 1 · READ AND MARK

Underline the first filter design, circle each test result, and write 1 beside the revision so you can track how evidence changed the solution. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What problem did the first filter solve, and what problem remained?	**It removed the leaves, but tiny soil bits passed through, leaving the water brown.**
2	How did the class make its first test a fair comparison?	**They stirred the barrel, then took two one-cup samples from the same mixed water. They filtered one and kept the other unfiltered.**
3	What change did the class make, and what result showed that it helped?	**They added fine sand between the gravel and cloth. In the new test, the filtered water looked clearer than the unfiltered sample.**
4	Why could the class not say the revised filter made the water safe to drink? What would they need to test next?	**Dissolved pollution could remain even when water looks clear. They would need a different test for dissolved pollution.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would use tongs to pick plastic bits from a one-foot square of mulch and put them in a trash bag. I would count the bits before and after cleanup to test how many I removed. I would try the same plan in another one-foot square with about the same starting number of bits. If tiny bits remained, I would gently move the top mulch with a small hand rake, then pick up the bits with tongs. I would count again to see whether the change removed more bits.

Accept other safe cleanup designs if the test measures a result and the revision responds to that result. For question 3, the clearer water supports improvement, not proof that all pollution was removed.