

Nonrenewable Resources

Quarry Run with Earthling

Learning target

Explain why some resources do not replenish on a human timescale.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Minerals; metals; fossil fuels; long formation times; extraction

Open Quarry Run - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Nonrenewable Resources - key ideas

1. The first clues

Minerals, metals and fossil fuels form through natural processes, often over very long times. We cannot replace their deposits as quickly as people use them.

2. How the clues connect

Mining and other extraction methods obtain these resources. Processing turns raw materials into useful products, and can have environmental effects.

3. Our evidence record

Our quarry record links a metal object to ore from rock. Reusing or recycling the metal can reduce demand for newly extracted material, though it does not make the original deposit renewable.

Keep the science accurate

Renewable does not mean unlimited or impact-free. Use evidence and tradeoffs, not a universally best energy source.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/4-ess3-earth-and-human-activity>

Talk through the evidence

1. Which resource is nonrenewable on human timescales?

Expected answer: A metal ore deposit

Reasoning: Minerals, metals and fossil fuels form through natural processes, often over very long times. We cannot replace their deposits as quickly as people use them.

2. Where can metal raw material come from?

Expected answer: Ore in rock

Reasoning: Our quarry record links a metal object to ore from rock. Reusing or recycling the metal can reduce demand for newly extracted material, though it does not make the original deposit renewable.

3. What can recycling help reduce?

Expected answer: Demand for newly extracted material

Reasoning: Our quarry record links a metal object to ore from rock. Reusing or recycling the metal can reduce demand for newly extracted material, though it does not make the original deposit renewable.

4. Does recycling instantly regrow an ore deposit?

Expected answer: No

Reasoning: Our quarry record links a metal object to ore from rock. Reusing or recycling the metal can reduce demand for newly extracted material, though it does not make the original deposit renewable.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.