

Name: _____ Date: _____

Answer Key: The Infinite Battery: 10th Grade Renewable Systems Quiz

Examine how closed-loop manufacturing and geothermal heat pumps transform modern industrial footprints through low-complexity systems analysis.

1. Which of these is a key benefit of 'remanufacturing' in a circular economy, such as rebuilding heavy machinery engines in Peoria, Illinois?

Answer: B) It saves energy and prevents waste from entering landfills.

Remanufacturing captures the value already embedded in a product, using far less energy than starting from raw materials and reducing solid waste.

2. True or False: Using 'Greywater' systems—recycling water from sinks and showers for irrigation—is a form of resource conservation.

Answer: A) True

Greywater systems allow water to be used twice before leaving a property, directly reducing the demand on freshwater supplies.

3. Iceland relies heavily on _____ energy, which uses the Earth's internal heat to generate constant electricity without burning fuel.

Answer: C) Geothermal

Geothermal energy taps into volcanic heat or hot springs, providing a consistent, renewable power source that doesn't depend on weather conditions.

4. When a city in the Netherlands builds 'green roofs' (roofs covered in living plants), which environmental issue are they primarily mitigating?

Answer: A) The urban heat island effect

Plants absorb sunlight and release moisture, which cools the building and the surrounding city air compared to traditional dark asphalt roofs.

5. True or False: Economic sustainability means that a business must focus ONLY on making a profit, regardless of its impact on the community.

Answer: B) False

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Economic sustainability involves long-term viability, which requires balancing profits with social equity and environmental health to ensure the business can survive for decades.

6. The use of _____ involves planting different types of trees and crops together to improve soil nutrients and provide diverse income for farmers.

Answer: B) Agroforestry

Agroforestry mimics natural ecosystems, protecting the land from erosion while making the farm more resilient to pests and market changes.

7. Which concept best describes the practice of 'Indigenous Land Management' used by Aboriginal Australians to prevent massive wildfires?

Answer: B) Cultural burning

Cultural burning is a traditional sustainable practice that uses low-intensity fires to clear undergrowth, preventing larger, destructive wildfires.

8. A city that implements 'Bus Rapid Transit' (BRT) lanes, like Curitiba, Brazil, is primarily trying to improve _____ sustainability.

Answer: C) Social and Environmental

Efficient public transit reduces carbon emissions (environmental) and provides affordable, reliable movement for all citizens (social).

9. True or False: Sustainability is strictly about protecting nature and does not involve human rights or fair labor practices.

Answer: B) False

Social equity—ensuring fair treatment and rights for all people—is one of the three foundational pillars of sustainability.

10. Värmevärden in Sweden uses 'Waste-to-Energy' plants to provide heat to homes. This is an example of which sustainable principle?

Answer: B) Resource recovery

Resource recovery turns what would be 'trash' into a useful resource, in this case, thermal energy for heating buildings.