

Name: _____ Date: _____

Sustaining Systems: Senior Science Solutions for a Stable State

Twelfth graders identify core pillars of resilience across 10 problems focused on cradle-to-cradle design and the circular economy.

1. Which concept describes an industrial system that is restorative or regenerative by intention and design, replacing the 'end-of-life' concept with restoration?

- A. Linear Economy
- B. Planned Obsolescence
- C. Circular Economy
- D. Resource Extraction

2. The Triple Bottom Line framework evaluates a company's performance based on three specific dimensions: Profit, People, and Planet.

- A. True
- B. False

3. When a product like a smartphone is designed to become outdated or non-functional after a short period, it is known as _____.

- A. Cradle-to-Grave
- B. Planned Obsolescence
- C. Life Cycle Assessment
- D. Downcycling

4. Which of these is a 'Biomimicry' example where engineers solve human challenges by emulating nature's time-tested patterns and strategies?

- A. Building a shopping mall with air conditioning
- B. Designing a high-speed train nose after a Kingfisher's beak
- C. Using chemical fertilizers to increase crop yield
- D. Clearing land for a new hydroelectric dam

5. Intergenerational equity suggests that the current generation has a moral obligation to leave a healthy planet for those born in the future.

- A. True
- B. False

6. The measurement of the environmental impact of a person or community, expressed as the amount of land required to sustain their use of natural resources, is the ecological _____.

- A. Handprint
- B. Threshold
- C. Carrying Capacity

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D. Footprint

7. Which of the following is considered 'Downcycling' rather than true recycling?

- A. Turning an aluminum can back into a new aluminum can
- B. Turning high-grade office paper into lower-quality cardboard
- C. Composting vegetable scraps into nutrient-rich soil
- D. Glass bottles being melted down to create new glass bottles

8. A 'Carbon Sink' is any process, activity, or mechanism that removes a greenhouse gas from the atmosphere.

- A. True
- B. False

9. In sustainability, the 'Precautionary Principle' suggests that if an action has a suspected risk of causing harm to the public or environment, in the absence of scientific consensus, the burden of proof falls on ____.

- A. The general public
- B. The government
- C. Those proposing the action
- D. Future generations

10. Which term refers to the maximum population size of a species that an environment can sustain indefinitely without degrading the resource base?

- A. Exponential Growth
- B. Carrying Capacity
- C. Limiting Factor
- D. Tipping Point