Environmental Science and SustainabilityÂ 1st edition Sherman Test Bank

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CHAPTER 1: Environmental Science and Sustainability: What's the Big Idea?

MULTIPLE CHOICE

1. Ecosystem services provide
   a. oxygen.
   b. food and water.
   c. energy.
   d. All of these are correct.

   ANS: D DIF: Easy
   REF: 1.1 What Is the Environment, and What Is an Ecosystem?
   OBJ: 1.A. Describe the range of ways in which humans affect the environment.
   MSC: Remembering

2. Only when all of the parts of an automobile are assembled does it become a functional vehicle. In this way, an automobile is best defined as a(n)
   a. component.
   b. interaction.
   c. system.
   d. niche.

   ANS: C DIF: Moderate
   REF: 1.1 What Is the Environment, and What Is an Ecosystem?
   OBJ: 1.A. Describe the range of ways in which humans affect the environment.
   MSC: Understanding

3. The Mississippi River delivers runoff from farms in the Midwest to the waters of the Gulf of Mexico. Excess fertilizer enters the Gulf, resulting in a Dead Zone, or water area that cannot support life. As a shrimp farmer, you are concerned about how this affects the _____ of the Gulf.
   a. ecosystem services
   b. competition among shrimp
   c. ecological footprint
   d. agricultural impact

   ANS: A DIF: Moderate
   REF: 1.1 What Is the Environment, and What Is an Ecosystem?
   OBJ: 1.A. Describe the range of ways in which humans affect the environment.
   MSC: Applying

4. The _____ refers to all of the living and nonliving things on Earth that sustain life.
   a. environment
   b. population
   c. Anthropocene
   d. community

   ANS: A DIF: Easy
   REF: 1.1 What Is the Environment, and What Is an Ecosystem?
   OBJ: 1.A. Describe the range of ways in which humans affect the environment.
   MSC: Remembering

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5. A coral reef ecosystem could include which list of components?
   a. sponges, sea anemones, and fish
   b. coral, sunlight, and water
   c. minerals, microscopic organisms, and worms
   d. All of these are correct.

   ANS: D DIF: Moderate
   REF: 1.1 What Is the Environment, and What Is an Ecosystem?
   OBJ: 1.A. Describe the range of ways in which humans affect the environment.
   MSC: Understanding

6. Some scientists have proposed the _____ as a new epoch that encompasses the period in Earth's history during which humans have had a dominant influence over the environment.
   a. Mesozoic
   b. Anthropocene
   c. Holocene
   d. Pleistocene

   ANS: B DIF: Easy
   REF: 1.1 What Is the Environment, and What Is an Ecosystem?
   OBJ: 1.A. Describe the range of ways in which humans affect the environment.
   MSC: Remembering

7. The 3 Es that serve as key considerations for sustainability efforts are
   a. environment, economy, equity.
   b. ecology, equity, energy.
   c. economy, energy, environment.
   d. ecosystem, environment, ethics.

   ANS: A DIF: Moderate REF: 1.2 What Is Sustainability?
   OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
   MSC: Remembering

8. The ability of an environment to absorb damage and recover quickly is known as ecological
   a. capacity.
   b. resilience.
   c. plasticity.
   d. strength.

   ANS: B DIF: Easy REF: 1.2 What Is Sustainability?
   OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
   MSC: Remembering

9. Fossil fuel combustion from millions of cars contributes to air pollution and climate change. Given this information, which is the best example of sustainability in transportation?
   a. driving yourself to class early in order to get a good seat
   b. carpooling with friends to a weekend camping trip
   c. taking the city bus across town to get groceries
   d. walking to work in order to avoid traffic congestion

   ANS: D DIF: Moderate REF: 1.2 What Is Sustainability?
   OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
   MSC: Applying

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10. Along the coastline of the Gulf of Mexico, salt marshes accumulate sediment that helps them recover from damaging storm surges. These salt marshes increase the _____ of the ecosystem.
    a. resilience
    b. feedback
    c. development
    d. cycling

    ANS: A DIF: Moderate REF: 1.2 What Is Sustainability?
    OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
    MSC: Applying

11. The Native peoples of the Pacific Northwest practiced sustainability by
    a. using traditional fish traps produced with local groves of oak trees.
    b. following rituals and rules that allowed a large share of salmon to reproduce.
    c. maximizing harvest yield using highly efficient large nets and traps.
    d. All of these are correct.

    ANS: B DIF: Moderate REF: 1.2 What Is Sustainability?
    OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
    MSC: Understanding

12. Sustainable development applies to which resource types(s)?
    a. populations of commercially harvested fish
    b. timber stands used for logging
    c. freshwater taken from a river for irrigating crops
    d. All of these are correct.

    ANS: D DIF: Moderate REF: 1.2 What Is Sustainability?
    OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
    MSC: Understanding

13. Chronic overfishing disrupts a coral reef ecosystem, making the reef more susceptible to bleaching and resulting in die-off events rather than recovering. In this example, the result of human impact is _____ of the coral reef.
    a. biased management
    b. sustainable development
    c. reduced resilience
    d. diminished equity

    ANS: C DIF: Moderate REF: 1.2 What Is Sustainability?
    OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
    MSC: Applying

14. A student in the cafeteria states that composting food waste would significantly increase the sustainability of school operations. This statement is best described as a(n)
    a. observation.
    b. experiment.
    c. hypothesis.
    d. model.

    ANS: C DIF: Moderate REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Applying

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15. A(n) _____ is a test in which researchers intentionally manipulate some aspect of a system and compare the changed system to an unaltered one.
    a. controlled experiment
    b. natural experiment
    c. observational study
    d. modeled study

    ANS: A DIF: Easy REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Remembering

16. Models are often used to
    a. test natural phenomena that are explained by a single factor.
    b. examine a system in which multiple factors interact.
    c. compute the relationships between all aspects of a real system.
    d. validate the peer-review process prior to publication.

    ANS: B DIF: Easy REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Remembering

17. Controlled experiments are most appropriate for testing which of these hypotheses?
    a. A meteorite collision with Earth caused the extinction of the dinosaurs.
    b. Diets high in saturated fats cause cardiovascular disease in humans.
    c. Increased carbon dioxide levels in the atmosphere have caused global temperatures to rise.
    d. Introduction of water-recycling systems conserves water and reduces factory-operating costs.

    ANS: D DIF: Difficult REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Analyzing

18. Which phrase best describes the scientific method?
    a. collection of facts
    b. linear series of steps
    c. ongoing process
    d. natural experiment

    ANS: C DIF: Easy REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Remembering

19. The mass extinction event 65 million years ago in which the dinosaurs went extinct is believed to have been caused by a large asteroid striking Earth. Evidence in support of this hypothesis includes the discovery of material common to asteroids within a layer of Earth that dates to the time of the extinction. In addition, a large crater was discovered with the expected date and size of such an asteroid impact. The fossil record indicates there were four other mass extinction events. Which of the following experimental results support(s) a hypothesis that all mass extinction events were caused by asteroid strikes?
    a. Craters of various sizes are present throughout the fossil record.
    b. Deposits of volcanic ash correlate with other indicators of major climate shifts.
    c. Layers of Earth that date to the time of each mass extinction event contain the material common to asteroids.
    d. All of these are correct.

    ANS: C DIF: Difficult REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Analyzing

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20. Select the scientific hypothesis.
    a. Both the intensity and frequency of hurricanes have increased since the 1980s.
    b. Ethically, it is better to use reusable cloth bags for shopping.
    c. Most ghosts are friendly.
    d. None of these are correct.

    ANS: D DIF: Difficult REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Analyzing

21. In order to test a climate model, researchers plugged in initial conditions from a known starting point in the past. The results matched up well with what actually happened in the current time period. This exercise is known as
    a. hindcasting.
    b. pseudoscience.
    c. forecasting.
    d. a natural experiment.

    ANS: A DIF: Easy REF: 1.3 What Is Science?
    OBJ: 1.C. Summarize how the scientific method works. MSC: Remembering

22. Juanita and Robert have four daughters together and Juanita is currently pregnant with their fifth child. The couple tells a neighbor, "After four girls, we're confident this one will be a boy because we are due for a son." Which concept best explains this statement?
    a. resilience
    b. peer review
    c. fraud
    d. bias

    ANS: D DIF: Moderate REF: 1.4 What Are Challenges to Good Science?
    OBJ: 1.D. Distinguish among the various methods of observation and testing involved in scientific inquiry. MSC: Understanding

23. Prior to publication in a scientific journal, an article must undergo the process of peer review. In this process, "peer" refers to which group?
    a. independent experts in the field of study
    b. all authors of the research article
    c. subscribers to a particular journal
    d. random members of the scientific community

    ANS: A DIF: Easy REF: 1.4 What Are Challenges to Good Science?
    OBJ: 1.D. Distinguish among the various methods of observation and testing involved in scientific inquiry. MSC: Remembering

24. _____ refers to an attempt to deceive people by communicating findings that are simply false.
    a. Fraud
    b. Bias
    c. Misinformation
    d. Skepticism

    ANS: A DIF: Easy REF: 1.4 What Are Challenges to Good Science?
    OBJ: 1.D. Distinguish among the various methods of observation and testing involved in scientific inquiry. MSC: Remembering

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25. Select the phrase that best defines an aspect of pseudoscience.
    a. obtains results through hindcasting
    b. relies on observational studies
    c. oversimplifies a complex process
    d. blocks findings from scientific scrutiny

    ANS: D DIF: Easy REF: 1.4 What Are Challenges to Good Science?
    OBJ: 1.D. Distinguish among the various methods of observation and testing involved in scientific inquiry. MSC: Remembering

26. A rumor that is false but widely believed is a good example of
    a. misinformation.
    b. skepticism.
    c. peer review.
    d. bias.

    ANS: A DIF: Moderate REF: 1.4 What Are Challenges to Good Science?
    OBJ: 1.D. Distinguish among the various methods of observation and testing involved in scientific inquiry. MSC: Understanding

27. Select the process that prevents the publication of pseudoscience in a scientific journal.
    a. fraud analysis
    b. peer review
    c. bias valuation
    d. misinformation index

    ANS: B DIF: Easy REF: 1.4 What Are Challenges to Good Science?
    OBJ: 1.D. Distinguish among the various methods of observation and testing involved in scientific inquiry. MSC: Understanding

28. Sam decides to bike instead of drive across campus to class because she cares about reducing her environmental impact. This desire for how she wants things to be reflects her
    a. values.
    b. bias.
    c. misinformation.
    d. trade-offs.

    ANS: A DIF: Easy
    REF: 1.5 What Shapes Our Decisions on the Environment?
    OBJ: 1.E. Identify ways in which values influence our individual and collective responses to environmental issues. MSC: Understanding

29. Ten states have “bottle-bill” laws that require a deposit for products sold in recyclable containers, which you can then get back if you bring the container to a recycling location. This is an example of a(n)
    a. footprint strategy.
    b. trade-off.
    c. incentive.
    d. value bias.

    ANS: C DIF: Easy
    REF: 1.5 What Shapes Our Decisions on the Environment?
    OBJ: 1.E. Identify ways in which values influence our individual and collective responses to environmental issues. MSC: Applying

30. The process of science is best described as a
    a. method for making ethical judgments.
    b. mechanism for refining our values.
    c. collection of facts.
    d. tool for understanding the natural world.

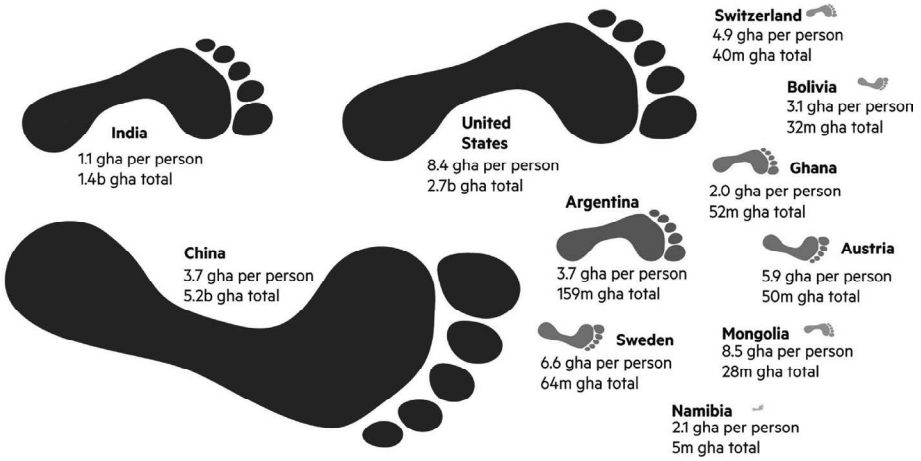
    ANS: D DIF: Easy
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31. Ecological footprint analysis is a method used to understand the
    a. fossil record for evidence of mass extinctions.
    b. impact of choices on the environment.
    c. range of ecosystem services generated by species.
    d. rigor of scientific studies.

    ANS: B DIF: Easy
    REF: 1.5 What Shapes Our Decisions on the Environment?
    OBJ: 1.E. Identify ways in which values influence our individual and collective responses to environmental issues. MSC: Remembering

32. The three countries with the largest ecological footprints are the United States, China, and India.



    Given that the populations of these countries are 320 million (United States), 1.4 billion (China), and 1.3 billion (India), which of the statements is correct?
    a. The average footprint for an individual is smaller in the United States than in China or India.
    b. Countries with larger populations use more resources than countries with smaller populations.
    c. The average footprint for an individual is larger in the United States than in China or India.
    d. None of these is correct.

    ANS: C DIF: Moderate
    REF: 1.5 What Shapes Our Decisions on the Environment?
    OBJ: 1.E. Identify ways in which values influence our individual and collective responses to environmental issues. MSC: Understanding

33. Denecha lowers the temperature on her water heater in order to use less natural gas and save money. After making this change, she discovers that the water needs to run longer in order to warm up enough to shower. Weighing the pros of using less energy against the cons of using more water is an example of
    a. modeling.
    b. resilience.
    c. bias analysis.
    d. trade-offs.

    ANS: D DIF: Moderate
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34. In the hallway outside your classroom, a water-bottle refill station encourages the use of reusable containers rather than single-use plastic water bottles. The digital display quantifies the number of water bottles saved from the landfill as a result of using the refill station. This example of a _____ increases awareness of the costs and benefits of an everyday decision.
    a. trade-off
    b. communication strategy
    c. footprint analysis
    d. value inquiry

    ANS: B DIF: Easy
    REF: 1.5 What Shapes Our Decisions on the Environment?
    OBJ: 1.E. Identify ways in which values influence our individual and collective responses to environmental issues. MSC: Understanding

35. The ecological footprint of the average U.S. citizen is significantly larger than the global average. What would happen if all humans on Earth each had an ecological footprint that matched that of a typical American?
    a. The need for ecological services would decrease.
    b. The global usage of resources would become much less sustainable.
    c. The balance of the 3 Es would shift more to economy.
    d. All of these are correct.

    ANS: B DIF: Moderate
    REF: 1.5 What Shapes Our Decisions on the Environment?
    OBJ: 1.E. Identify ways in which values influence our individual and collective responses to environmental issues. MSC: Applying

SHORT ANSWER

1. Define an ecosystem and describe the specific components of an ecosystem that is located where you live.

    ANS:
    An ecosystem is a community of life and the physical environment with which it interacts. Descriptions of local ecosystems will vary, but they should include both the living and nonliving components. For example, a forest will include populations of plants and animals as well as the soil, water, and local climate.

    DIF: Moderate REF: 1.1 What Is the Environment, and What Is an Ecosystem?
    OBJ: 1.A. Describe the range of ways in which humans affect the environment.
    MSC: Understanding | Applying

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2. Define sustainable development.

   ANS:
   Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. Examples of sustainability efforts at a college campus may include power generation from renewable sources, new building construction to LEED standards, recycling, water conservation, busing, energy efficient lighting, composting of food scraps, and local sourcing of cafeteria foods.

   DIF: Easy REF: 1.2 What Is Sustainability?
   OBJ: 1.B. Explain the meaning of sustainability and ways it relates to human development.
   MSC: Understanding

3. In the process of coral bleaching, coral weakens and turns white. Potential causes include the warming and increased acidity of the ocean. A study proposes to test the role of pH level by increasing the acidity of water in an isolated portion of a coral reef for one month and then evaluating the response of the coral. Is this a controlled experiment? Explain.

   ANS:
   This is not a controlled experiment. The study fails to account for the role of other factors, such as temperature, on the health of the coral. A more controlled experiment would divide an isolated area of reef into a test group, with exposure to increased acidity, and a control group, with conditions identical to the test group except that the water has a normal pH level.

   DIF: Difficult REF: 1.3 What Is Science?
   OBJ: 1.C. Summarize how the scientific method works. MSC: Analyzing

4. Julie and Mark have a one-year old son, Kliff. Based on an advertisement, they purchase a subscription to online streaming of "Baby Smart: Guaranteed!" The advertisement claims the product will speed up intellectual development, but fails to describe or reference any supporting studies. How would a friend identify the issue with the product claim and explain how this violates the scientific process?

   ANS:
   The advertisement claim is based in pseudoscience, not the result of scientific inquiry. By failing to describe or reference any studies, the process is not open to scientific scrutiny. In a scientific study, the methodology, such as how intellectual development is measured, must be described in sufficient detail for other researchers to replicate the findings. In addition, a proper study would include controls, such as a control group of children who were not exposed to the product, but whose intellectual development was measured the same way.

   DIF: Moderate REF: 1.4 What Are Challenges to Good Science?
   OBJ: 1.D. Distinguish among the various methods of observation and testing involved in scientific inquiry. MSC: Analyzing

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5. The production and disposal of material goods affects the environment. Therefore, decisions regarding the consumption of goods impacts our personal ecological footprint. Consider all your purchases over the last week. Which of these items were not necessary to purchase? Could any of these items be reused, recycled, or composted?

   ANS:
   Answers will vary, but typical consumption items may include groceries, cosmetics, fast food or junk food, apparel, soft drinks, bottled water, electronics, and toys. Items such as outgrown clothes can be donated and reused by others. Aluminum cans, plastic containers, and paper products can be recycled. Food scraps can be composted.

   DIF: Moderate
   REF: 1.5 What Shapes Our Decisions on the Environment? | 1.6 What Can I Do?
   OBJ: 1.E. Identify ways in which values influence our individual and collective responses to environmental issues. MSC: Applying| Evaluating

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