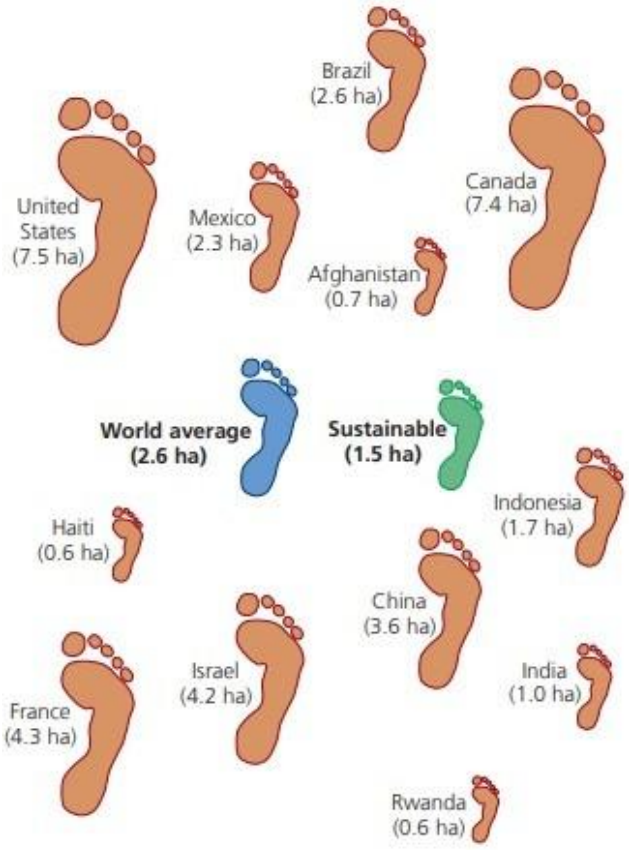
Essential Environment 7th edition Withgott Test Bank

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***Essential Environment: The Science Behind the Stories, 7e* (Withgott/Laposta)**
Chapter 1 Science and Sustainability: An Introduction to Environmental Science

1.1 Multiple Choice Questions



Use the figure above to answer the following question(s).

1) How many citizens of Mexico does it take to equal the ecological footprint of the average citizen of the United States?

A) They are essentially equal.
B) It takes just over two Mexican citizens to equal the ecological footprint of the average U.S. citizen.
C) It takes just over three Mexican citizens to equal the ecological footprint of the average U.S. citizen.
D) It takes just over eight Mexican citizens to equal the ecological footprint of the average U.S. citizen.
E) It takes about 12 Mexican citizens to equal the ecological footprint of the average U.S. citizen.
Answer: C
Diff: 1
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.4

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2) If everyone on the planet had an ecological footprint the size of the average citizen of the United States, then _____ .

A) we would have 50% more food to go around
B) we would be able to provide for everyone without much difficulty by using the 50% of the land currently not being used for agriculture
C) we would need at least two more planet Earths to feed and support everyone
D) we could support 50% more people on our planet
E) about 50% of the people would starve
Answer: C
Diff: 2
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.4

3) The U.S. average footprint is about _____ times larger than the average world footprint.

A) 2
B) 2.5
C) 3
D) 5
E) 6.7
Answer: C
Diff: 3
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.4

4) The average footprint per person has increased from 2.2 to 2.6 since 2008, and the footprints of many developing nations, such as India and China, have also increased. This means that _____ .

A) our collective lifestyle is even more unsustainable than before
B) our collective lifestyle is slightly more sustainable than before
C) the ability of the planet to sustain human beings has increased
D) some nations no longer have a measurable footprint
E) the populations of both India and China have decreased since 2008
Answer: A
Diff: 2
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.4

5) Geothermal energy, wind, and solar radiation are all examples of _____ .

A) nonrenewable natural resources
B) inexhaustible renewable natural resources
C) biotic environmental factors
D) exhaustible renewable natural resources
E) biodegradable materials
Answer: B
Diff: 2

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Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.2

6) Nonrenewable natural resources include all of the following EXCEPT:

A) coal.
B) crude oil.
C) minerals.
D) wind.
E) natural gas.
Answer: D
Diff: 1
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.2

7) Ecosystem services _____.

A) contribute to keeping ecosystems productive
B) are not necessary to sustainable systems
C) are economically valuable services provided by natural systems
D) are valuable to natural systems but not to human-created systems
E) are required to rebalance natural systems that we have disturbed
Answer: C
Diff: 1
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.2

8) Today (2024), there are about _____.

A) 5.35 billion people on Earth, the same as for the past 6 years
B) 9 billion people on Earth
C) 10 billion people on Earth
D) 8 billion people on Earth
E) 2% fewer people on Earth than in 2010
Answer: D
Diff: 1
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.3

9) Global population is projected to be nearly _____ in 2050.

A) 7 billion
B) 8 billion
C) 9 billion
D) 10 billion
E) 11 billion
Answer: D
Diff: 2
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.3

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10)To determine your specific impacts on the environment, you can _____.

A) measure local air pollution and its impacts on your health
B) calculate the biodiversity of your local community
C) determine your current water pollution impact
D) calculate your ecological footprint
E) measure the volume and type of all the wastes you contribute to the municipal waste stream

Answer: D
Diff: 1
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.4

11)By studying ancient civilizations, such as the Greek and Roman empires and the Angkor civilization of Southeast Asia, historians have concluded that these civilizations declined partly because of _____.

A) sustainable practices
B) overabundance of resources
C) floods
D) environmental degradation due to unsustainable use of resources
E) fires

Answer: D
Diff: 2
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.3

12)Solutions to environmental problems _____.

A) can be implemented only by scientists
B) must be designed with sustainable goals
C) must be on a local scale
D) must be short term
E) are best designed and discussed in the political arena

Answer: B
Diff: 1
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.10a

13)Imagine a scenario where a small island nation, heavily reliant on tourism for its economy, faces a dilemma. The government wants to promote economic growth by attracting more tourists, but environmentalists argue that increased tourism will exacerbate resource consumption and ecological degradation. The government must balance economic development with environmental sustainability. In the given situation, which concept could the government use to evaluate the environmental impact of increasing tourism?

A) ecological footprint
B) greenhouse gas emissions
C) biodiversity index

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D) energy efficiency rating
E) water consumption per capita
Answer: A
Diff: 1
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.9

14)What does the term "overshoot" refer to in the context of resource consumption?

A) reducing waste through recycling initiatives
B) achieving sustainable resource management practices
C) balancing economic growth with environmental conservation
D) using renewable resources faster than they are replenished
E) promoting green technologies for energy production
Answer: D
Diff: 2
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.9

15)How do the ecological footprints of residents from industrialized nations compare to those from industrializing nations?

A) Residents of industrialized nations have smaller ecological footprints.
B) Residents of industrialized nations have larger ecological footprints.
C) Ecological footprints are similar across both types of nations.
D) Residents of industrialized nations have no ecological footprints.
E) Residents of industrialized nations have more sustainable lifestyles.
Answer: B
Diff: 2
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.9

16)Which of the following best describes the practice of environmental science?

A) highly specialized and focused
B) integrative and interdisciplinary
C) abstract and theoretical
D) theoretical and controversial
E) elitist and unnecessary
Answer: B
Diff: 1
Topic/Section: 1.2 The Nature of Environmental Science
Learning Outcome: 1.1

17)Academic environmental programs that emphasize the social sciences are often called _____ programs.

A) resource studies
B) ecological science
C) environmental science

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D) environmental studies
E) wildlife management
Answer: D
Diff: 1
Topic/Section: 1.2 The Nature of Environmental Science
Learning Outcome: 1.1

18)Scientific inquiry is based on _____ .

A) an expanding knowledge based on observation, questioning, testing and discovery
B) facts that can be proven true without experimental manipulation
C) the production of technological advances
D) designing experiments that have never been done before
E) making huge leaps of knowledge with scientific insights
Answer: A
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

19)The scientific process and scientific knowledge are based on _____ .

A) observation alone
B) a systematic process of learning about and testing our understanding of the world
C) the fact that all hypotheses can be proven true
D) quantitative data alone
E) guesses based on personal feelings about the subject under inquiry
Answer: B
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

20)Sachiko and Fred are having a discussion about the scientific method. Sachiko makes the comment that every time she sees people carrying open umbrellas, she also sees several minor car accidents. This is a(n) _____ .

A) hypothesis
B) theory about umbrellas
C) theory about car accidents
D) scientific study
E) observation
Answer: E
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

21)A hypothesis is _____ .

A) a prediction about something that has not yet been observed
B) a testable proposition that explains an observed phenomenon or answers a question
C) an instrument that is used to examine environmental conditions

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D) the design of an experiment that can be used in scientific inquiry
E) a proven scientific fact
Answer: B
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

22)An experiment _____.

A) is an activity designed to test the validity of a hypothesis
B) often involves manipulating as many variables as possible
C) does not need to be repeated if well designed
D) involves only collection of quantitative data
E) is designed to generate new scientific hypothesis
Answer: A
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

23)A pharmaceutical company wishes to study a possible new headache medicine. They are doing human trials with 1000 volunteers and need to _____.

A) have 10 volunteers in the control group
B) put all women in the control group and all men in the experimental group
C) divide the groups by level of health
D) give both control and experimental groups the same amount of the new medication
E) randomly assign each person to either the treatment group or control group
Answer: E
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

24)In a controlled experiment, _____.

A) the researcher has several hypotheses, one of which will be proven correct
B) the researcher knows the outcome before beginning the experiment
C) the researcher controls for the effects of all variables except one
D) the experimental organisms have all been used before and given good results
E) you need only a single experimental organism, which is tested again and again
Answer: C
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

25)Quantitative data _____.

A) are data that are expressed as numbers and can be tested using statistics
B) fall into categories, such as male/female, school of attendance, what dorm you live in, whether you have pets, etc.
C) have variables that may not have been properly manipulated

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D) cannot be used to support or disprove hypotheses
E) cannot be replicated
Answer: A
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

26) In a manipulative experiment, _____ .

A) researchers manipulate the independent variable
B) researchers manipulate as many variables as possible
C) replication of the experiment is not necessary
D) researchers manipulate the dependent variable
E) the peer review process is bypassed
Answer: A
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

27) Ruben has a new puppy and wants to feed it the best possible food. He decides on an experiment where he will feed it the very best canned food plus a dietary supplement of vitamins recommended by a veterinarian. Which of the following best describes Ruben's project?

A) This is an example of an excellent controlled experiment as it is written.
B) Ruben needs to take careful measurements of the puppy's weight and height at least once a week for it to be a good experiment.
C) Ruben needs to control for the amount of exercise, sunshine, water, and care that the puppy gets each week, so that they are equal from week to week.
D) Ruben needs to use his mother's 6-year-old chocolate Shar-Pei to feed a standard diet so he can compare his puppy with a control dog.
E) This is not an experiment—there are no controls or replicates.
Answer: E
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

28) The process by which several researchers review another researcher's manuscript prior to publication to ensure research quality is referred to as _____ .

A) hypothesis testing
B) investigative inquiry
C) peer review
D) quality control
E) critical analysis
Answer: C
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

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29)Which of the following best embodies the qualities of a scientific theory?

A) Squirrels in central Illinois prefer to build their nests in oak trees instead of hickory trees.
B) All gases, liquids, and solids consist of atoms.
C) Prairies that have larges herds of bison show greater plant diversity than prairies without bison.
D) Dangerous wildfires in California could be avoided by better fire prevention strategies.
E) Students who study for their environmental science exams will perform better on those exams than those who do not.

Answer: B
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

30)A paradigm _____ .

A) is a group of several hypotheses that can be tested together
B) is a dominant world view in science
C) can only come from qualitative data
D) is synonymous with the scientific method
E) is a means of evaluating scientific hypotheses

Answer: B
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

31)A study's results are deemed worthy of acceptance into the body of scientific knowledge if they are published in journals that _____ .

A) use the peer review process
B) charge a high fee for acceptance
C) are funded by corporations funding the research
D) meet guidelines advocated by environmentalists or consumer groups
E) conform to current political and religious views

Answer: A
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

32) _____ believe that the guidelines for making environmental decisions are context-specific, depending on the cultures, social issues, and other factors framing the decision.

A) Universalists
B) Conservationists
C) Followers of Leopold's land ethic
D) Relativists
E) Preservationists

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Answer: D
Diff: 1
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.7

33) _____ gives inherent value to certain living things or to the biotic (living) realm of the earth in general; both human and nonhuman lives have ethical standing.

A) Anthropocentrism
B) Biocentrism
C) Ecocentrism
D) Relativism
E) Realism
Answer: B
Diff: 2
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.7

34) A(n) _____ is best defined as one who considers the impacts on the whole ecosystem, both the living and nonliving, when considering an action.

A) biocentrist
B) ecocentrist
C) anthropocentrist
D) ethnocentrist
E) relativist
Answer: B
Diff: 2
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.7

35) The Endangered Species Act, passed by Congress nearly four decades ago, has spawned a continuous series of debates between those who feel the ethical necessity to protect species at the brink of extinction and others who feel that if we have to protect every habitat of every species at risk, then there will be a loss of jobs and a blow to an already shaky economy. This boils down to a conflict between _____ .

A) economists and environmental scientists
B) anthropocentrists and ecocentrists
C) universalists and ecofeminists
D) relativists and environmental justice advocates
E) social scientists and conservationists
Answer: B
Diff: 2
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.7

36) John Muir, a great American environmentalist, felt that _____ .

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A) resources should be exploited wherever they were found to the greatest economic benefit
B) the only true value of wilderness was its ability to provide national economic growth
C) pristine wilderness should be preserved because "Everybody needs beauty as well as bread"
D) national parks violated the principles of environmental justice
E) wilderness was essentially worthless and should not be preserved
Answer: C
Diff: 2
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.7

37) Who is credited for articulating the conservation ethic and for founding the U.S. Forest Service?

A) Theodore Roosevelt
B) John Muir
C) Robert Bullard
D) Gifford Pinchot
E) Aldo Leopold
Answer: D
Diff: 1
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.7

38) Issues of _____ are environmental issues whose dimensions include differential exposure to risk from toxic wastes and air pollution or differential access to the natural beauty of parks based on ethnicity or race.

A) environmental justice
B) ecocentrism
C) anthropocentrism
D) moral relativism
E) paradigm shifts
Answer: A
Diff: 2
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.8

39) Sustainable development _____.

A) ensures an economy that will decline over time
B) involves consuming resources without compromising future availability
C) is impossible to accomplish
D) is beyond our current technology and attitudes
E) is possible given our increased use of fertilizers and technology for agriculture
Answer: B
Diff: 1
Topic/Section: 1.5 Sustainability And Our Future

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Learning Outcome: 1.10a

40) You have read about the mistakes made on Easter Island. On Tikopia, another small island, the people acted differently. When they realized that the pigs they had imported were damaging the environment, they killed them all. They had to have permission from a chief to fish, which prevented overfishing. They practiced contraception. These all indicate that _____.

A) they believed in full resource utilization
B) they felt that everything was a nonrenewable resource
C) they felt that everything was a renewable resource
D) they were concerned with only one year at a time
E) they truly practiced sustainability
Answer: E
Diff: 1
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.10a

41) All of the following are ways that campuses could possibly become more sustainable EXCEPT:

A) install photovoltaic solar panels on the roofs of campus buildings.
B) build a parking garage and convert some parking lots into gardens.
C) close down many of the dorms and have students live off campus.
D) use more local produce in the dining halls.
E) install low-flow showers and toilets.
Answer: C
Diff: 2
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.10a

42) _____ is a basic understanding of Earth's physical and living systems and how we interact with them.

A) Sustainability
B) Environmental economics
C) Environmental ethics
D) Environmental literacy
E) An ecological footprint
Answer: D
Diff: 1
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.10a

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Read the following scenario and answer the question(s) below.

Pablo and Johanna have to do a yearlong study for their biology course. After some discussion, they decide to try comparing their dogs and the diet that they feed them to test their hypothesis that the local veterinarian's special dog food mix will enhance growth and development. Each student adopts a puppy from the local pound. Pablo plans to feed his Goldendoodle the special diet, while Johanna plans to use generic dry kibble from the supermarket for her bulldog.

43)The independent variable in this study will be _____ .

A) the age of the dogs
B) the sex of the dogs
C) the type of food the dogs receive
D) how much the dogs grow
E) the breed of the dogs
Answer: C
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

44)One dependent variable in this study will be _____ .

A) the age of the dogs
B) the sex of the dogs
C) the type of food the dogs receive
D) how much the dogs grow
E) the breed of the dogs
Answer: D
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

45)When they write up their initial proposal, the instructor will probably _____ .

A) give them an A for thoroughness and allow them to proceed with the experiment
B) tell them that they need at least 100 dogs to do the study
C) tell them that the proposal is impossible and that such a study cannot be done at all
D) give them an F and tell them to start over–it would take many years to do such a study
E) tell them they have some serious problems with the proposal, but it is fixable if they are willing to use more dogs in their study
Answer: E
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

46)Pablo and Johanna have too many _____ .

A) variables that they didn't control and not enough replicates

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B) replicates and not enough variables
C) controlled variables and not enough uncontrolled variables
D) dependent variables and not enough independent variables
E) independent variables and not enough dependent variables
Answer: A
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

47) Pablo and Johanna appear not to have given consideration to the importance of controlling for _____.

A) the age of the dogs
B) the food that the dogs are being fed
C) possible differences resulting from using two different breeds of dog
D) the possibility that one dog food is healthier than the other dog food
E) the source of the dog food
Answer: C
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

48) After meeting with their instructor, Pablo and Johanna know that they need to change their experimental design. They contact a local puppy farm and arrange to do their study with 3-month-old litters of pups from four Irish setters, for a total of 24 puppies consisting of 12 females and 12 males. In order to have two groups of puppies (control and experimental), Pablo and Johanna should _____.

A) put the 12 females in one group and the 12 males in the other group
B) flip a coin for each dog to see which group it will be in
C) randomly choose one dog for the control group and use the other 23 in the experimental group
D) put six males and six females in each group, with some from each litter in each group
E) put all the puppies from two of the litters in one group and all of the puppies from the other two litters in the other group
Answer: D
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

49) Imagine you are a student researching the effects of climate change on marine ecosystems. You come across two articles discussing the topic. Article A is published in a renowned scientific journal and is authored by marine biologists who conducted field research on coral reefs affected by rising sea temperatures. Article B is a blog post written by an activist who claims to have insider information about climate change but provides no evidence or credentials to support their claims.

Which of the following statements accurately compares the reliability of the two sources

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mentioned in the above situation?

A) Article A is less reliable than Article B because it is written by multiple authors, while Article B is authored by a single individual.
B) Article A is more reliable than Article B because it is published in a scientific journal and authored by experts who conducted field research.
C) Article A is equally reliable as Article B because both sources provide insights into the effects of climate change on marine ecosystems.
D) The reliability of Article A or B will depend on how appealingly the content is written.
E) The reliability of Article A or B will depend on whose author is more famous or has more followers on social media.

Answer: B
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.6

50) In evaluating the reliability of information sources, which of the following criteria is NOT typically considered?

A) the presenter's experience, background, and qualifications
B) the financial support behind the presentation of the information
C) whether the presenter's motivations are clear
D) the popularity of the source on social media platforms
E) whether the information is based on factual evidence

Answer: D
Diff: 1
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.6

51) Which of the following statements accurately describes the role of primary and secondary sources in research?

A) Primary sources are often easier to understand than secondary sources.
B) Secondary sources present novel information and stand on their own.
C) Primary sources include articles or broadcasts produced by others about the contents of original research.
D) Secondary sources are typically written by experts in the field and published in peer-reviewed journals.
E) Primary sources provide firsthand information and are essential for obtaining the most accurate understanding of a scientific question.

Answer: E
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.6

52) Which group of people faced environmental justice issues related to uranium mining in the 1950s and 1960s?

A) Appalachian residents
B) Latino farm workers

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C) Navajo nation
D) residents of Warren County, North Carolina
E) Indigenous people in North America
Answer: C
Diff: 1
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.8

53) What was the primary motivation behind the protest launched by residents of Warren County, North Carolina?

A) discriminatory siting of waste disposal facilities
B) unfair labor practices in the agricultural sector
C) health issues caused by industrial farming practices
D) displacement due to mountaintop coal-mining practices
E) lack of access to information about environmental hazards
Answer: A
Diff: 2
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.8

54) Which of the following statements best summarizes the primary goal of the environmental justice movement?

A) to address inequalities of wealth and privilege in society
B) to advocate for fair treatment of all people with respect to environmental policy and practice
C) to promote sustainable development and conservation practices
D) to combat racial discrimination in the workplace
E) to provide economic opportunities for marginalized communities
Answer: B
Diff: 1
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.8

1.2 Essay Questions

1) Name two transformative events of the past 10,000 years that caused human population size to increase. Describe each, briefly explaining the contributions that each made to human population growth. Include the benefits and problems associated with each event.

   Answer: The agricultural revolution included transition from the hunter-gatherer lifestyle to an agricultural lifestyle. Then, during the industrial revolution, there were shifts from rural life, animal-powered agriculture, and manufacture by craftspeople to an urban society powered by fossil fuels such as coal and oil. Students should describe the benefits and problems associated with each transformative event.
   Diff: 2
   Topic/Section: 1.1 Our Island, Earth
   Learning Outcome: 1.3

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2) Why is it important to understand our interactions with the environment? What will studying environmental science enable you to do?

Answer: We depend on the environment for air, water, food, shelter, and everything else. We are capable of modifying the environment whether we intend to or not. Understanding our interactions with the environment is the essential first step toward devising positive, sustainable solutions. Studying environmental science will give us the tools we need to evaluate information on environmental change and to think critically and creatively about possible actions to take in response.
Diff: 2
Topic/Section: 1.1 Our Island, Earth
Learning Outcome: 1.1

3) Compare and contrast the types of knowledge gained and the research methods of natural and social sciences when considering environmental problems. Why do both types of disciplines need to be a part of environmental science?

Answer: The natural sciences are made up of disciplines that study the physical and biological facets of the natural world and their interactions with each other. These disciplines rely on all types of studies that generate mainly quantitative data, allowing scientists to acquire and interpret information about the natural world. The social sciences are made up of disciplines that study human attitudes, behaviors, and interactions. The scientists in these disciplines mainly collect qualitative data using a variety of research techniques that are similar to natural scientists. Studies that examine how cultures perceive an environmental concept may be used to implement environmental policy. Because environmental problems involve accurate assessment of the scope of the problem by which policy that affects humans is devised, both types of sciences are needed to be a part of environmental science.
Diff: 2
Topic/Section: 1.2 The Nature of Environmental Science
Learning Outcome: 1.5

4) Differentiate between environmental science and environmentalism. Define each term and explain how they are similar and how they differ.

Answer: Environmental science is the pursuit of knowledge about the workings of the environment and our interactions with it. Environmentalism is a social concern focused on protecting the natural environment and, by extension, humans, from undesirable changes brought about by certain human choices. Environmental scientists and environmentalists study the same issues, but environmental scientists use an objective scientific approach to understanding environmental problems. Environmentalists, on the other hand, may use dramatic and often emotional approaches to alter the political and social understanding or to educate the public about environmental problems.
Diff: 2
Topic/Section: 1.2 The Nature of Environmental Science
Learning Outcome: 1.1

5) Discuss the differences between a manipulative and a natural experiment.

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Answer: In a manipulative experiment, the researcher chooses and manipulates the independent variable, but in a natural experiment, the researcher records differences in variables as they are expressed in the natural environment, such as the mean weight of tomatoes grown in dry versus wet climates.
Diff: 2
Topic/Section: 1.3 The Nature of Science
Learning Outcome: 1.5

6) Compare and contrast the philosophies of John Muir and Gifford Pinchot.

Answer: Both men were active in the early 1900s and both aimed to protect the North American wilderness by opposing rapid deforestation and unregulated land development. Muir was a preservationist and a true ecocentrist and preservationist who believed that nature should be protected for its own inherent value and who maintained that the experience of natural beauty was as important to us as the physical necessities of food and materials. He believed from his personal experience that nature provided spiritual renewal and met recreational needs. Pinchot was a conservationist who favored sustainable use of resources for the benefit of present and future generations. He was a utilitarian, meaning that he believed humans should use resources in a way that provides the greatest good for the greatest number of people for the longest time. He leaned closer to anthropocentrism than Muir.
Diff: 2
Topic/Section: 1.4 Environmental Ethics
Learning Outcome: 1.7

7) What qualities would be present in a sustainable enterprise?

Answer: A sustainable enterprise is one which allows future generations to carry it on at the same level of productivity that we do at present. Whatever natural capital is required will remain equally available in the future as it is now. The environmental effects of the enterprise will not damage, degrade, or deplete the systems with which it interfaces. Materials and energy will be used efficiently, wastes will be minimal and nontoxic, and the ecological footprint of the enterprise will remain unchanged, or may diminish as better technology becomes available.
Diff: 2
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.10a

8) Use the assessment tool at http://www.footprintcalculator.org to calculate your ecological footprint. Once you determine the factors that evaluate your use of water, energy, waste disposal, transportation, and food consumption, use the results of your specific ecological footprint to determine three specific actions that you can take to reduce the size of your ecological footprint. Make sure that your specific actions each fit into a different category (water, energy, waste, transportation, and food). Summarize your assessment.

Answer: The answers will vary based on results of individual student lifestyle. Students can reflect on their results and can then consider making lifestyle

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adjustments that support a greater environmental sustainability.
Diff: 2
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.4

9) There is a heated debate on a certain college campus as to whether closing down one of the dorms would make the campus more sustainable. Present one possible argument why closing the dorm might be wise for sustainability, and one possible argument why such action might NOT make the campus more sustainable.

Answer: Answers will vary. Possible reasons why closing the dorm would make the campus more sustainable include the following:

(1) the dorm is old and the costs of materials to bring it up to code and make it more energy efficient are not worth keeping the dorm open;

(2) students may be able to use the land for a sustainability project such as a campus garden; and

(3) the other dorms on campus have room for the students who would otherwise be living in this dorm, so you can house just as many students without having to heat and furnish the extra building.

Reasons why the move may not be a step toward sustainability include the following:

(1) the closing of the dorm may force more students to live off campus and they would have to commute to campus using automobiles, so even if they use public transportation, fossil fuels would be needed;

(2) if the dorm is not demolished, it may just sit there unused and end up blighting the landscape; and

(3) much of the material from the closed dorm might end up taking up space in a landfill.

Diff: 3
Topic/Section: 1.5 Sustainability And Our Future
Learning Outcome: 1.10a

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