Chapter 01 Test bank: Introduction to Earth Science

*Student: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

1. In the context of science, how would you classify the following statement? Iridium is present in relatively high concentrations in 65 million year old rock layers in several different locations on Earth.

A. theory

B. hypothesis

C. observation

2. Suppose you measure the flow of water from a drinking fountain 10 times and all your measurements agree very closely to one another, but differ significantly from the accepted flow value. Which of the following statements best describes your empirical data?

A. they are accurate but not precise

B. they are precise but not accurate

C. they are not accurate nor precise

3. During orientation you learn that all classrooms on campus are air conditioned. You decide to bring a sweatshirt to class even on the hottest days. What type of reasoning did you use?

A. inductive

B. deductive

C. neither inductive nor deductive – the decision did not involve science

4. Which statement best describes science?

A. Science is a large body of factual knowledge.

B. Science is the process of discovery.

C. Science is the quest for ultimate truth.

5. Which of the following is not a characteristic of scientific explanations?

A. they are tentative

B. they are able to answer all questions

C. they are limited by technology

D. they are based on empirical observations

6. Which method of science reasoning uses specific observations to draw general conclusions?

A. inductive

B. deductive

C. logical

7. Which process of a scientifically enlightened citizen deals with being aware that other's actions on Earth affect us and we affect others?

A. know

B. care

C. act

8. Which role of earth scientists most directly relates to forecasting hurricane paths?

A. finding and sustaining earth resources

B. protecting the health of the environment

C. ensuring the future of human life

D. protecting against natural hazards

9. Scientific results are unpredictable and are mainly determined by the personal views of the scientists.

True False

10. Once a scientific explanation has been established it never needs to be changed.

True False

11. Which of the following statements does not describe some aspect of scientific investigation?

A. Observing that much of the water along the beach is no longer where it should be.

B. Reasoning that fair weather conditions do not normally result in rapid drops in ocean levels so something extraordinary is occurring.

C. Hypothesizing that the water would likely come back in as fast as it went out.

D. Concluding that this rising water process had to do with sinking land levels rather than rising water levels.

E. All of these choices are correct.

12. Consider the following statement and choose which response best applies to it.  
  
"Over the last two centuries, there has been a marked decrease in the number of pirates in the world at the same time that global temperatures are rising. Therefore, the lack of pirates must be linked to global warming."

A. This is an example of attacking the scientists doing the research, rather than the science.

B. This is an example of flawed cause and effect reasoning.

C. This is an example of poor statistics, as the population size covers only 200 years of data.

D. This is an example of arguing a point on the basis of authority.

E. All of these choices are correct.

13. If you were asked to describe some of the useful things that earth scientists might be involved in, which of the following would not be applicable?

A. Helping the public understand which areas and populations might be susceptible to earthquakes.

B. Trying to understand what causes flooding so it can be prevented.

C. Trying to predict when natural hazards might occur by using secret methods.

D. Trying to predict the weather so farmers might know when to plant crops.

E. All of these choices are correct.

14. In the context of science, how would you classify the following statement? Dinosaurs became extinct because a large asteroid collided with Earth.

A. Theory

B. Hypothesis

C. Observation

 Pluto was discovered in 1930, becoming the 9th planet in the solar system. As telescopes improved, other Sun-orbiting objects were discovered. Some of those were even larger than Pluto. By 2005, it was becoming apparent that many more objects would soon be discovered and that the number of planets in the Solar System could swell to as many as 50. After much debate, scientists in the International Astronomical Union (IAU) concluded that Pluto and the other similar celestial bodies orbiting the Sun should be classified as "dwarf" planets. Since a "planet" must clear the space surrounding its orbit, our Solar system now has 8 planets.

15. Why weren't the other Pluto-like objects discovered earlier?

A. Scientific explanations are tentative.

B. Scientific hypotheses are falsifiable.

C. Scientific explanations make predictions.

D. Science is limited by technology.

16. Pluto still exists, so how do you explain that we now officially only have 8 planets in our solar system?

A. Scientific explanations are tentative.

B. Science is based on empirical observations.

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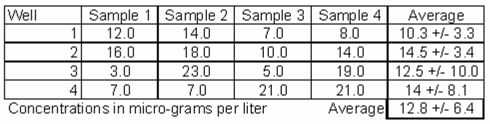
17. Why are scientists expected to publish the data they use to make discoveries?

A. Scientific explanations are tentative.

B. Science is based on empirical observations.

C. Scientific explanations make predictions.

D. Science is limited by technology.

 A group of concerned citizens was worried that their local water supply might be contaminated with naturally occurring arsenic. They decided to purchase a home arsenic monitoring kit and tested well water in their local area. After analyzing the data (shown below), the citizens wrote a letter to the editor of a local newspaper arguing that their data proved that the water supply is contaminated. They demanded immediate government action to address the problem. The local water board again tested the wells using their official water testing instruments and found average concentrations of 8.1 +/- 0.2 micrograms per liter. Assume the water board's reported measurements are the accepted value. The maximum permitted level of arsenic in water supplies is 10 micro-grams per liter.  
  
 

18. Which of the earth-system scientist's roles is best illustrated by this paragraph?

A. Alerting the public of natural hazards

B. Use of earth resources

C. Health of the environment

D. Informing society

19. Which earth system interaction is illustrated in this passage?

A. Hydrosphere to atmosphere

B. Hydrosphere to biosphere

C. Geosphere to hydrosphere

D. Geosphere to atmosphere

20. What is the most reasonable action for local government to officials to take in this situation?

A. Ignore the data collected by the concerned citizens.

B. Test the water samples using both testing methods.

C. Require the water board to test a third set of well samples.

D. Require the water board to create a plan to reduce arsenic levels in the well water.

21. It is later revealed that several of the citizens' samples from Well 2 were likely contaminated prior to testing, but the citizens decided to include these samples in their final data set anyway. Which characteristic of bad science does this illustrate?

A. Attacking the scientists, not the science.

B. Confusing cause and effect.

C. Making use of bad statistics.

D. Creating an argument based upon authority.

 Emission testing is required by federal law in areas that have had problems meeting health-based air quality standards. Such areas typically include industrialized urban areas and large cities. Supporters of this practice argue that all citizens benefit because vehicles with malfunctioning pollution control systems are identified. They also cite government data showing average failure rates of 10%. Critics of the testing argue that, of those vehicles that fail, 90% are vehicles 5 or more years old. A law has been placed on the ballot to save citizens money by no longer requiring vehicles less than 5 years old be tested unless they are obviously malfunctioning.

22. Suppose the law passed. What is likely to happen to air quality in those areas where testing is required?

A. Air quality should improve a lot.

B. Air quality should decline a lot.

C. There should be little change to air quality.

23. Complete the following sentence: The new emissions testing law is based on \_\_\_\_\_\_ reasoning.

A. deductive

B. inductive

 The U.S. government Strategic Plan for the Climate Change Science Program (CCSP) has five major goals related to the role of earth scientists in society. 1) Improve knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed variability and change. 2) Improve quantification of the forces bringing about changes in the Earth's climate and related systems. 3) Reduce uncertainty in projections of how the Earth's climate and related systems may change in the future. 4) Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes. 5) Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change.

24. What hypothesis underlies these goals?

A. Climate has changed in the past.

B. Climate will change in the future.

C. Climate will stay about the same.

25. How are these goals consistent with the characteristics of good science?

A. They rely on scientific opinions.

B. They rely on accepted theories.

C. They rely on empirical evidence.

26. Which of the earth-system scientist's roles is best illustrated by goal number 3?

A. Alerting public of natural hazards

B. Use of earth resources

C. Ensuring the future of human life

D. Informing society

 Suppose an electric-generating power plant is about to be built near your house. The local government has not decided whether to allow coal, nuclear, or oil as fuel for the plant (natural gas is not an option). Some groups argue coal is the best choice because there is a 200-year supply and using coal reduces our dependence on foreign oil. Critics argue that burning coal produces three times more global-warming gasses than oil. Coal also produces more dust and expels more acid-rain-causing gases than oil. Others argue that nuclear-generated power produces no greenhouse gases and no other atmospheric pollution. Critics argue that there is presently no long-term location to store the radioactive waste that will be generated and question the safety of nuclear power. Over the life of the plant, nuclear is the least expensive option, followed by coal and then oil.

27. Place the fuel options from this paragraph in order from highest impact on global warming to least impact.

A. Nuclear, oil, coal

B. Oil, coal, nuclear

C. Coal, nuclear, oil

D. Coal, oil, nuclear

28. Which earth system interaction is illustrated by this passage?

A. Geosphere to atmosphere

B. Atmosphere to geosphere

C. Geosphere to hydrosphere

D. Hydrosphere to geosphere

29. Which of the earth-system scientist's roles is best illustrated by this paragraph?

A. Alerting public of natural hazards

B. Use of earth resources

C. Ensuring the future of human life

D. Informing society

Many people think that water draining from a sink rotates in a particular direction due to something called the Coriolis effect, which is generated by the rotation of the earth. Furthermore, such people frequently argue that the direction of water flow is reversed in the opposite hemisphere. In reality, the Coriolis effect in that situation is too small to affect the direction water drains from a sink or toilet. The drainage direction is instead related to the shape of the sink bowl or the direction water flushes into a toilet.

30. Which characteristic of "bad science" related to draining water is most prevalent in this passage? Which characteristic of "bad science" related to draining water is most prevalent in this passage?

A. Attack on the scientist, not the science.

B. Arguing from authority.

C. Confusing cause and effect.

D. The use of bad statistics.

31. Which statement best describes science?

A. Science is a large body of factual knowledge.

B. Science is the process of discovery.

C. Science is the quest for ultimate truth.

 In 2005 the United States Congress mandated that NASA find 90 percent of large Near Earth asteroids (NEAs)-those that have the potential to impact Earth-by the year 2020. This mandate was created in response to recent scientific data indicating large impact events were common in Earth's geologic past and therefore will likely occur again in the future. Many new NEAs have been discovered as a result of NASA's efforts and research is under way to find ways to stop such impact events from occurring.

32. Which of the earth system scientist's roles is best illustrated in this paragraph?

A. Alerting public of natural hazards

B. Use of earth resources

C. Ensuring the future of human life

D. Informing society

33. In the context of the above paragraph, the hypothesis that another large asteroid impact will occur in the future is an example of \_\_\_\_\_\_.

A. bad science

B. deductive reasoning

C. inductive reasoning

34. The above paragraph suggests that, unlike other natural hazards, asteroid impacts \_\_\_\_\_\_.

A. may some day be prevented

B. are intensively studied by scientists

C. are not likely to occur in the near future

D. pose little threat to humans

35. Which component of the earth system relates to the solid earth?

A. Hydrosphere

B. Biosphere

C. Geosphere

D. Atmosphere

E. Exosphere

36. Which part of the earth system includes plants and animals?

A. Atmosphere

B. Biosphere

C. Hydrosphere

D. Solid earth

37. Which part of the earth system includes ice on Antarctica?

A. Atmosphere

B. Biosphere

C. Hydrosphere

D. Solid earth

38. In what context (why) was the 2001 Hutchinson, Kansas gas leak explosion discussed in Chapter 1?

A. To illustrate the need for more safety measures at gas storage facilities.

B. To illustrate the process of science in an actual situation.

C. To contrast the characteristics of "good" and "bad" science.

39. What distinguishes science from non-science?

A. Science is based on empirical observations.

B. Science is based on unchanging facts.

C. Science is based solely on experiments.

40. A hypothesis can be improved or rejected based on which of the following?

A. New data

B. New observations

C. Experiments

D. Any of the choices are correct.

41. Which of the following is a characteristic of empirical observations?

A. They can be measured by others.

B. They are observations that will not change.

C. They represent ethical interpretations.

42. Why was the mid-continent earthquake story discussed in Chapter 1?

A. It illustrated characteristics of bad science.

B. It illustrated the characteristics of good science.

C. It illustrated the characteristics of the limitations of science.

43. Why might the era we live in today one day be called the "Anthropocene"?

A. Because humans are the dominant life form on Earth at present.

B. Because humans population is increasing rapidly.

C. Because humans are causing significant changes to the planet.

44. Which of the following scenarios is an example of inductive reasoning?

A. Ben went fishing and caught 12 smallmouth bass with minnows, and only 2 with worms. Ben concludes that most fish prefer eating minnows instead of worms.

B. Ben read a magazine article that said most fish prefer to eat minnows instead of worms. Ben concludes that smallmouth bass probably also prefer eating minnows instead of worms.

45. Which of the following scenarios is an example of deductive reasoning?

A. This year the River City Roosters football team has won five home games but zero away games. Therefore, the River City Roosters cannot win away games.

B. The River City Roosters never win away games. Today they are playing an away game, so they will lose.

46. Which of the following natural hazards are we most likely to try to prevent?

A. Floods

B. Tornados

C. Hurricanes

D. Volcanic Eruptions

47. A hypothesis is supported by more scientific observation and research than a theory.

True False

48. Science provides answers to ethical dilemmas.

True False

49. Theories are developed so that they can not be found to be false.

True False

50. Most natural hazards such as earthquakes, tornadoes, and hurricanes can be prevented.

True False

51. Social factors affecting decisions on the environment are more difficult to quantify than physical or chemical factors.

True False

52. We can adjust to natural hazards.

True False

53. Evacuation of a city in advance of a hurricane would be an example of prevention.

True False

54. Inductive reasoning uses specific observations to reach a general conclusion.

True False

**Chapter 01 Test bank: Introduction to Earth Science KEY**

1. In the context of science, how would you classify the following statement? Iridium is present in relatively high concentrations in 65 million year old rock layers in several different locations on Earth.

A. theory

B. hypothesis

**C.** observation

*Accessibility: Keyboard Navigation  
Bloom's: Level 2. Understand  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Characteristics of Science: Good and Bad*

2. Suppose you measure the flow of water from a drinking fountain 10 times and all your measurements agree very closely to one another, but differ significantly from the accepted flow value. Which of the following statements best describes your empirical data?

A. they are accurate but not precise

**B.** they are precise but not accurate

C. they are not accurate nor precise

*Accessibility: Keyboard Navigation  
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3. During orientation you learn that all classrooms on campus are air conditioned. You decide to bring a sweatshirt to class even on the hottest days. What type of reasoning did you use?

A. inductive

**B.** deductive

C. neither inductive nor deductive – the decision did not involve science

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4. Which statement best describes science?

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*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
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5. Which of the following is not a characteristic of scientific explanations?

A. they are tentative

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6. Which method of science reasoning uses specific observations to draw general conclusions?

**A.** inductive

B. deductive

C. logical

*Accessibility: Keyboard Navigation  
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7. Which process of a scientifically enlightened citizen deals with being aware that other's actions on Earth affect us and we affect others?

A. know

**B.** care

C. act

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
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8. Which role of earth scientists most directly relates to forecasting hurricane paths?

A. finding and sustaining earth resources

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Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
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9. Scientific results are unpredictable and are mainly determined by the personal views of the scientists.

**FALSE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Characteristics of Science: Good and Bad*

10. Once a scientific explanation has been established it never needs to be changed.

**FALSE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
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11. Which of the following statements does not describe some aspect of scientific investigation?

A. Observing that much of the water along the beach is no longer where it should be.

B. Reasoning that fair weather conditions do not normally result in rapid drops in ocean levels so something extraordinary is occurring.

C. Hypothesizing that the water would likely come back in as fast as it went out.

D. Concluding that this rising water process had to do with sinking land levels rather than rising water levels.

**E.** All of these choices are correct.

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12. Consider the following statement and choose which response best applies to it.  
  
"Over the last two centuries, there has been a marked decrease in the number of pirates in the world at the same time that global temperatures are rising. Therefore, the lack of pirates must be linked to global warming."

A. This is an example of attacking the scientists doing the research, rather than the science.

**B.** This is an example of flawed cause and effect reasoning.

C. This is an example of poor statistics, as the population size covers only 200 years of data.

D. This is an example of arguing a point on the basis of authority.

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13. If you were asked to describe some of the useful things that earth scientists might be involved in, which of the following would not be applicable?

A. Helping the public understand which areas and populations might be susceptible to earthquakes.

B. Trying to understand what causes flooding so it can be prevented.

**C.** Trying to predict when natural hazards might occur by using secret methods.

D. Trying to predict the weather so farmers might know when to plant crops.

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Bloom's: Level 2. Understand  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

14. In the context of science, how would you classify the following statement? Dinosaurs became extinct because a large asteroid collided with Earth.

A. Theory

**B.** Hypothesis

C. Observation

*Accessibility: Keyboard Navigation  
Bloom's: Level 5. Evaluate  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

 , Pluto was discovered in 1930, becoming the 9th planet in the solar system. As telescopes improved, other Sun-orbiting objects were discovered. Some of those were even larger than Pluto. By 2005, it was becoming apparent that many more objects would soon be discovered and that the number of planets in the Solar System could swell to as many as 50. After much debate, scientists in the International Astronomical Union (IAU) concluded that Pluto and the other similar celestial bodies orbiting the Sun should be classified as "dwarf" planets. Since a "planet" must clear the space surrounding its orbit, our Solar system now has 8 planets.

*Topic: Characteristics of Science: Good and Bad*

15. Why weren't the other Pluto-like objects discovered earlier?

A. Scientific explanations are tentative.

B. Scientific hypotheses are falsifiable.

C. Scientific explanations make predictions.

**D.** Science is limited by technology.

*Bloom's: Level 3. Apply  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Characteristics of Science: Good and Bad*

16. Pluto still exists, so how do you explain that we now officially only have 8 planets in our solar system?

**A.** Scientific explanations are tentative.

B. Science is based on empirical observations.

C. Scientific explanations make predictions.

D. Science is limited by technology.

*Bloom's: Level 3. Apply  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science*

17. Why are scientists expected to publish the data they use to make discoveries?

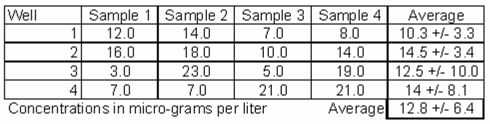
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Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
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 A group of concerned citizens was worried that their local water supply might be contaminated with naturally occurring arsenic. They decided to purchase a home arsenic monitoring kit and tested well water in their local area. After analyzing the data (shown below), the citizens wrote a letter to the editor of a local newspaper arguing that their data proved that the water supply is contaminated. They demanded immediate government action to address the problem. The local water board again tested the wells using their official water testing instruments and found average concentrations of 8.1 +/- 0.2 micrograms per liter. Assume the water board's reported measurements are the accepted value. The maximum permitted level of arsenic in water supplies is 10 micro-grams per liter.  
  
 

*Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

18. Which of the earth-system scientist's roles is best illustrated by this paragraph?

A. Alerting the public of natural hazards

B. Use of earth resources

C. Health of the environment

**D.** Informing society

*Bloom's: Level 4. Analyze  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society*

19. Which earth system interaction is illustrated in this passage?

A. Hydrosphere to atmosphere

B. Hydrosphere to biosphere

**C.** Geosphere to hydrosphere

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*Bloom's: Level 3. Apply  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: The Scope of Earth Science*

20. What is the most reasonable action for local government to officials to take in this situation?

A. Ignore the data collected by the concerned citizens.

**B.** Test the water samples using both testing methods.

C. Require the water board to test a third set of well samples.

D. Require the water board to create a plan to reduce arsenic levels in the well water.

*Bloom's: Level 5. Evaluate  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

21. It is later revealed that several of the citizens' samples from Well 2 were likely contaminated prior to testing, but the citizens decided to include these samples in their final data set anyway. Which characteristic of bad science does this illustrate?

A. Attacking the scientists, not the science.

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**C.** Making use of bad statistics.

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Chapter: 01 Introduction to Earth Science  
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Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

 Emission testing is required by federal law in areas that have had problems meeting health-based air quality standards. Such areas typically include industrialized urban areas and large cities. Supporters of this practice argue that all citizens benefit because vehicles with malfunctioning pollution control systems are identified. They also cite government data showing average failure rates of 10%. Critics of the testing argue that, of those vehicles that fail, 90% are vehicles 5 or more years old. A law has been placed on the ballot to save citizens money by no longer requiring vehicles less than 5 years old be tested unless they are obviously malfunctioning.

*Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

22. Suppose the law passed. What is likely to happen to air quality in those areas where testing is required?

A. Air quality should improve a lot.

B. Air quality should decline a lot.

**C.** There should be little change to air quality.

*Bloom's: Level 5. Evaluate  
Chapter: 01 Introduction to Earth Science  
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23. Complete the following sentence: The new emissions testing law is based on \_\_\_\_\_\_ reasoning.

A. deductive

**B.** inductive

*Bloom's: Level 2. Understand  
Chapter: 01 Introduction to Earth Science  
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Topic: Application of Earth Science*

 The U.S. government Strategic Plan for the Climate Change Science Program (CCSP) has five major goals related to the role of earth scientists in society. 1) Improve knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed variability and change. 2) Improve quantification of the forces bringing about changes in the Earth's climate and related systems. 3) Reduce uncertainty in projections of how the Earth's climate and related systems may change in the future. 4) Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes. 5) Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change.

*Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

24. What hypothesis underlies these goals?

A. Climate has changed in the past.

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 Suppose an electric-generating power plant is about to be built near your house. The local government has not decided whether to allow coal, nuclear, or oil as fuel for the plant (natural gas is not an option). Some groups argue coal is the best choice because there is a 200-year supply and using coal reduces our dependence on foreign oil. Critics argue that burning coal produces three times more global-warming gasses than oil. Coal also produces more dust and expels more acid-rain-causing gases than oil. Others argue that nuclear-generated power produces no greenhouse gases and no other atmospheric pollution. Critics argue that there is presently no long-term location to store the radioactive waste that will be generated and question the safety of nuclear power. Over the life of the plant, nuclear is the least expensive option, followed by coal and then oil.

*Chapter: 01 Introduction to Earth Science  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

27. Place the fuel options from this paragraph in order from highest impact on global warming to least impact.

A. Nuclear, oil, coal

B. Oil, coal, nuclear

C. Coal, nuclear, oil

**D.** Coal, oil, nuclear

*Bloom's: Level 3. Apply  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

28. Which earth system interaction is illustrated by this passage?

**A.** Geosphere to atmosphere

B. Atmosphere to geosphere

C. Geosphere to hydrosphere

D. Hydrosphere to geosphere

*Bloom's: Level 4. Analyze  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Topic: The Scope of Earth Science*

29. Which of the earth-system scientist's roles is best illustrated by this paragraph?

A. Alerting public of natural hazards

**B.** Use of earth resources

C. Ensuring the future of human life

D. Informing society

*Bloom's: Level 4. Analyze  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: Characteristics of Science: Good and Bad*

Many people think that water draining from a sink rotates in a particular direction due to something called the Coriolis effect, which is generated by the rotation of the earth. Furthermore, such people frequently argue that the direction of water flow is reversed in the opposite hemisphere. In reality, the Coriolis effect in that situation is too small to affect the direction water drains from a sink or toilet. The drainage direction is instead related to the shape of the sink bowl or the direction water flushes into a toilet.

*Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

30. Which characteristic of "bad science" related to draining water is most prevalent in this passage? Which characteristic of "bad science" related to draining water is most prevalent in this passage?

A. Attack on the scientist, not the science.

B. Arguing from authority.

**C.** Confusing cause and effect.

D. The use of bad statistics.

*Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: Characteristics of Science: Good and Bad*

31. Which statement best describes science?

A. Science is a large body of factual knowledge.

**B.** Science is the process of discovery.

C. Science is the quest for ultimate truth.

*Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: Characteristics of Science: Good and Bad*

 In 2005 the United States Congress mandated that NASA find 90 percent of large Near Earth asteroids (NEAs)-those that have the potential to impact Earth-by the year 2020. This mandate was created in response to recent scientific data indicating large impact events were common in Earth's geologic past and therefore will likely occur again in the future. Many new NEAs have been discovered as a result of NASA's efforts and research is under way to find ways to stop such impact events from occurring.

*Topic: Characteristics of Science: Good and Bad*

32. Which of the earth system scientist's roles is best illustrated in this paragraph?

A. Alerting public of natural hazards

B. Use of earth resources

**C.** Ensuring the future of human life

D. Informing society

*Bloom's: Level 4. Analyze  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

33. In the context of the above paragraph, the hypothesis that another large asteroid impact will occur in the future is an example of \_\_\_\_\_\_.

A. bad science

B. deductive reasoning

**C.** inductive reasoning

*Bloom's: Level 3. Apply  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

34. The above paragraph suggests that, unlike other natural hazards, asteroid impacts \_\_\_\_\_\_.

**A.** may some day be prevented

B. are intensively studied by scientists

C. are not likely to occur in the near future

D. pose little threat to humans

*Bloom's: Level 5. Evaluate  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Characteristics of Science: Good and Bad*

35. Which component of the earth system relates to the solid earth?

A. Hydrosphere

B. Biosphere

**C.** Geosphere

D. Atmosphere

E. Exosphere

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: The Scope of Earth Science*

36. Which part of the earth system includes plants and animals?

A. Atmosphere

**B.** Biosphere

C. Hydrosphere

D. Solid earth

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: Earth Science: An Introduction*

37. Which part of the earth system includes ice on Antarctica?

A. Atmosphere

B. Biosphere

**C.** Hydrosphere

D. Solid earth

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: The Scope of Earth Science*

38. In what context (why) was the 2001 Hutchinson, Kansas gas leak explosion discussed in Chapter 1?

A. To illustrate the need for more safety measures at gas storage facilities.

**B.** To illustrate the process of science in an actual situation.

C. To contrast the characteristics of "good" and "bad" science.

*Accessibility: Keyboard Navigation  
Bloom's: Level 5. Evaluate  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Characteristics of Science: Good and Bad*

39. What distinguishes science from non-science?

**A.** Science is based on empirical observations.

B. Science is based on unchanging facts.

C. Science is based solely on experiments.

*Accessibility: Keyboard Navigation  
Bloom's: Level 2. Understand  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: Characteristics of Science: Good and Bad*

40. A hypothesis can be improved or rejected based on which of the following?

A. New data

B. New observations

C. Experiments

**D.** Any of the choices are correct.

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

41. Which of the following is a characteristic of empirical observations?

**A.** They can be measured by others.

B. They are observations that will not change.

C. They represent ethical interpretations.

*Accessibility: Keyboard Navigation  
Bloom's: Level 2. Understand  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

42. Why was the mid-continent earthquake story discussed in Chapter 1?

**A.** It illustrated characteristics of bad science.

B. It illustrated the characteristics of good science.

C. It illustrated the characteristics of the limitations of science.

*Accessibility: Keyboard Navigation  
Bloom's: Level 2. Understand  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Characteristics of Science: Good and Bad*

43. Why might the era we live in today one day be called the "Anthropocene"?

A. Because humans are the dominant life form on Earth at present.

B. Because humans population is increasing rapidly.

**C.** Because humans are causing significant changes to the planet.

*Accessibility: Keyboard Navigation  
Bloom's: Level 5. Evaluate  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

44. Which of the following scenarios is an example of inductive reasoning?

**A.** Ben went fishing and caught 12 smallmouth bass with minnows, and only 2 with worms. Ben concludes that most fish prefer eating minnows instead of worms.

B. Ben read a magazine article that said most fish prefer to eat minnows instead of worms. Ben concludes that smallmouth bass probably also prefer eating minnows instead of worms.

*Accessibility: Keyboard Navigation  
Bloom's: Level 4. Analyze  
Chapter: 01  
Gradable: automatic  
Section: 01.03 Doing Science*

45. Which of the following scenarios is an example of deductive reasoning?

A. This year the River City Roosters football team has won five home games but zero away games. Therefore, the River City Roosters cannot win away games.

**B.** The River City Roosters never win away games. Today they are playing an away game, so they will lose.

*Accessibility: Keyboard Navigation  
Bloom's: Level 4. Analyze  
Chapter: 01  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

46. Which of the following natural hazards are we most likely to try to prevent?

**A.** Floods

B. Tornados

C. Hurricanes

D. Volcanic Eruptions

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

47. A hypothesis is supported by more scientific observation and research than a theory.

**FALSE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

48. Science provides answers to ethical dilemmas.

**FALSE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.02 The Scope of Earth Science  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

49. Theories are developed so that they can not be found to be false.

**FALSE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

50. Most natural hazards such as earthquakes, tornadoes, and hurricanes can be prevented.

**FALSE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

51. Social factors affecting decisions on the environment are more difficult to quantify than physical or chemical factors.

**TRUE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

52. We can adjust to natural hazards.

**TRUE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

53. Evacuation of a city in advance of a hurricane would be an example of prevention.

**FALSE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.04 Science and Society  
Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science*

54. Inductive reasoning uses specific observations to reach a general conclusion.

**TRUE**

*Accessibility: Keyboard Navigation  
Bloom's: Level 1. Remember  
Chapter: 01 Introduction to Earth Science  
Gradable: automatic  
Section: 01.03 Doing Science  
Topic: Application of Earth Science*

**Chapter 01 Test bank: Introduction to Earth Science Summary**

|  |  |
| --- | --- |
| *Category* | *# of Questions* |
| Accessibility: Keyboard Navigation | 34 |
| Bloom's: Level 1. Remember | 22 |
| Bloom's: Level 2. Understand | 12 |
| Bloom's: Level 3. Apply | 6 |
| Bloom's: Level 4. Analyze | 8 |
| Bloom's: Level 5. Evaluate | 6 |
| Chapter: 01 | 2 |
| Chapter: 01 Introduction to Earth Science | 54 |
| Gradable: automatic | 54 |
| Section: 01.02 The Scope of Earth Science | 9 |
| Section: 01.03 Doing Science | 29 |
| Section: 01.04 Science and Society | 15 |
| Topic: Application of Earth Science | 10 |
| Topic: Characteristics of Science: Good and Bad | 22 |
| Topic: Earth Science: An Introduction | 1 |
| Topic: Physical, Chemical, Social and Cultural Aspects of Earth Science | 20 |
| Topic: The Scope of Earth Science | 4 |