

Answer Keys

Chapter 1 Lesson 1

Discussion Question

Possible response: Unlike other questions, a scientific question is one that is precise and can be answered through observation, measurement, testing, or analysis of research. A scientific question is also a question about the natural world.

Lesson Review

1. C
2. B
3. D
4. A

Lesson 2

Discussion Question

Answers will vary, but the set-up should include seedlings given different amounts of light per day, including one group given no light. The independent variable would be amount of light; the dependent variable would be height of the seedlings; variables kept constant would include age and size of seedlings at start, size of pots, type of soil, amount of water given, temperature of air.

Lesson Review

1. C
2. D
3. D

Lesson 3

Discussion Question

Possible response: Different tools are useful for collecting different kinds of information. For example, a microscope or hand lens is a good tool for studying the parts of a butterfly's body, but a video camera is more useful for studying how a butterfly comes out of its chrysalis.

Lesson Review

1. D
2. C
3. A
4. D

Lesson 4

Discussion Question

Possible response: The scientist should use a circle graph, which shows parts of a whole. In this case, the rock sample is the whole, or 100 percent. The minerals are the parts. The percentages of all the minerals add up to 100 percent.

Lesson Review

1. A
2. D
3. C
4. A

Lesson 5

Discussion Question

The scientist will find the average height of the seedlings in each treatment group. To do that, she will add the heights of the plants in each group and divide that sum by 50. Then she will be able to compare the average heights for the four treatment groups.

Lesson Review

1. D
2. A

Lesson 6

Discussion Question

Possible response: Although it seems likely that the fertilizer is killing the fish, there are many other variables that were not controlled. Changes in temperature or a decrease in available food could also account for the death of the fish. So the farmer cannot conclude that the fertilizer killed the fish.

Lesson Review

1. B
2. D
3. A

Lesson 7

Discussion Question

Possible response: Each scientist would be working on his or her own and would not be able to use new knowledge gained by others. Also, scientists would not be able to evaluate or repeat each other's investigations. Scientific knowledge would advance much more slowly.

Lesson Review

1. C
2. B
3. D

Lesson 8

Discussion Question

Possible response: Getting funding from the company might affect the way the scientist interprets the data. The scientist might try to reach the conclusion the company wants—that fertilizer runoff does not harm the wetland.

Lesson Review

1. C
2. D
3. D
4. A

Chapter 1 Review

1. B C INQ.8
2. C C INQ.5
3. D C INQ.7, C INQ.10
4. D C INQ.4
5. B C INQ.8
6. A C INQ.5
7. B C INQ.6
8. D C INQ.1
9. C C INQ.4
10. A C INQ.6
11. C C INQ.4
12. B C INQ.9
13. D C INQ.7

14. C C INQ.3

15. A C INQ.10

16. Possible response: The claim that the fish deaths are caused by pollutants in the water is most credible. This study was published in a scientific journal, so the findings were carefully reviewed by other scientists. The other scientist's study was published in a popular science magazine online. This study may not have been peer reviewed for accuracy and reliability. C INQ.2

Chapter 2 Lesson 9

Discussion Question

Possible response: Every element is made up of a single type of atom. Those atoms all contain the same kinds of subatomic particles. But atoms of different elements have different numbers of each kind of particle. Different elements also have different properties.

Lesson Review

1. B
2. A
3. B
4. C

Lesson 10

Discussion Question

Possible response: Copper is to the left of the step-like line, so copper is a metal. As a metal, copper is most likely shiny. It can probably be beaten into thin sheets or stretched into wires. It is most likely a good conductor of heat and electricity.

Lesson Review

1. C
2. D
3. D
4. B

Lesson 11

Discussion Question

Possible response: Compounds and mixtures are both made up of more than one substance. However, compounds form when two or more elements join chemically, while the substances that form a mixture are not chemically joined. Compounds are pure substances; mixtures are not pure substances. The elements that combine to form compounds cannot be separated by physical means, while you can use physical means to separate the parts of a mixture.

Lesson Review

1. A
2. D
3. C
4. D
5. B

Lesson 12

Discussion Question

Possible response: The students should mention a specific starting point as a reference point and a specific ending point. They would need to measure total distance and have someone time them, using appropriate units. Then they would need to divide total distance by total time.

Lesson Review

1. C
2. B
3. C
4. D
5. A
6. D

Lesson 13

Discussion Question

Inertia is the tendency of an object to resist changes in its motion. When a car in which you are riding comes to a sudden stop, your body tends to keep moving forward. (Your seatbelt exerts a force in the opposite direction.)

Lesson Review

1. B
2. A
3. C
4. B

Lesson 14

Discussion Question

Possible response: Gravity pulls the leaf down to the ground. Friction with the air (air resistance) slows the leaf's motion as it falls.

Lesson Review

1. B
2. A
3. B

Lesson 15

Discussion Question

Answers will vary. The student should be able to explain how each machine reduces the input force by increasing the distance over which the force is applied, changing the direction of the force, or both. Sample response: An inclined plane makes it easier to move an object from a lower level to a higher level. The object is moved over a longer distance, so less force is needed.

Lesson Review

1. B
2. A
3. C
4. B

Lesson 16

Discussion Question

Point C is the point at which the pendulum has its greatest kinetic energy and its least potential energy.

Lesson Review

1. A
2. D
3. C
4. D

Lesson 17

Discussion Question

Sample response: A lawn mower transforms the chemical energy stored in gasoline into the mechanical energy of blades that move to cut grass. A blender changes electrical energy into the mechanical energy of moving blades that mix foods together.

Lesson Review

1. C
2. D
3. A
4. D

Chapter 2 Review

1. B 7.1-C13
2. C 7.1-C14
3. D 8.1-C22
4. A 8.1-C23
5. D 6.1-C1
6. C 6.1-C2
7. D 6.1-C2
8. B 6.1-C1
9. B 8.1-C22
10. D 7.1-C14
11. A 7.1-C14
12. B 6.1-C1
13. D 6.1-C3
14. C 6.1-C1
15. D 7.1-C12
16. C 8.1-C24
17. D 6.1-C1
18. C 7.1-C13
19. A 8.1-C23
20. B 7.1-C14
21. C 8.1-C23

22. Possible response: The moon has inertia—a tendency to keep moving in a straight path. At the same time, the force of gravity pulls the moon toward the center of Earth. Gravity provides a centripetal force. This net force pulls the moon inward and keeps it moving in a circular path. 8.1-C24

Chapter 3 Lesson 18

Discussion Question

Possible response: The leaves contain chloroplasts in which photosynthesis takes place. Leaves also allow carbon dioxide to enter the plant through openings called stomata, and oxygen is released through the stomata.

Lesson Review

1. B
2. C
3. D
4. C

Lesson 19

Discussion Question

Possible response: As a predator, an animal gets energy from the animals it feeds on. As prey, the same animal passes some of that energy on to another predator.

Lesson Review

1. D
2. B
3. C

Lesson 20

Discussion Question

Possible response: Cougars, which are predators of white-tail deer, would probably be harmed by a major decline in deer population. Unless they found other prey, they would have less to eat and their population would decrease. Animals that eat the same plants as deer might benefit from a decline in the number of deer. They would have more to eat. Predators that hunt those animals would then also benefit.

Lesson Review

1. C
2. B
3. C

Lesson 21

Discussion Question

Possible response: I know that plants and animals are made up of cells. Different kinds of animals probably have similar cells that make up similar tissues, organs, and organ systems. But the cells that make up plants are different from animal cells. Their cells probably work together, but plants do not breathe or have blood like animals do. So, plant cells probably make up different structures than animal cells.

Lesson Review

1. C
2. A
3. C
4. D

Lesson 22

Discussion Question

Possible responses: They are similar because they both help the body get oxygen. Also, they both contain large tubes, the arteries, veins, and bronchi, and tiny branches, the capillaries and alveoli. They are different because the respiratory system opens to the outside and the blood does not. They are different because the circulatory system has plasma and blood cells to carry oxygen, and the respiratory system just lets air flow in and out.

Lesson Review

1. D
2. A
3. C
4. A

Lesson 23

Discussion Question

Possible response: The person means that the food or water has entered the trachea, which is the "wrong pipe" for food. Sometimes if you talk or laugh while swallowing, the epiglottis opens and lets food into the trachea. You cough to clear the food out of the trachea.

Lesson Review

1. D
2. C
3. D
4. B

Lesson 24

Discussion Question

Possible response: There would be so many parts of the body needing attention that it would be impossible to think of all of them at once. As a result, some functions would not take place. Also, a person might not know how fast or often to move these muscles, so body functions could be too fast or too slow.

Lesson Review

1. C
2. C
3. D

Lesson 25

Discussion Question

Possible response: Genes are made up of DNA. A chromosome contains many genes.

Lesson Review

1. D
2. C
3. A
4. B

Lesson 26

Discussion Question

Possible response: 90,000,000,000 cells. All these cells are needed to replace cells that die or are lost due to injury or aging.

Lesson Review

1. C
2. B
3. B
4. A

Lesson 27

Discussion Question

Possible response: The reproductive systems of men and women are different because they produce different kinds of sex cells—sperm and eggs. If their systems were not structured the way they are, men would not be able to transmit their sex cells into women so that women's eggs can be fertilized. Then people would not be able to reproduce.

Lesson Review

1. D
2. A
3. C

Chapter 3 Review

1. B 6.2-C4
2. A 7.2-C17
3. B 6.2-C6
4. B 6.2-C5
5. C 7.2-C15
6. A 8.2-C27
7. C 7.2-C16
8. D 6.2-C4
9. C 7.2-C15
10. B 7.2-C16
11. A 8.2-C26
12. C 6.2-C6
13. B 7.2-C17
14. C 8.2-C26
15. D 8.2-C25
16. C 7.2-C16
17. A 6.2-C5
18. D 7.2-C16
19. D 8.2-C25
20. Possible response: In humans, the 23rd chromosome pair determines a person's gender or sex. The magnified portion of the chromosome shows part of a strand of DNA. It

most likely represents a gene. A gene is a sequence of DNA that determines a particular trait. 8.2-C27

Chapter 4 Lesson 28

Discussion Question

Possible response: Whenever a substance changes state, heat has been added or removed. Adding or removing heat affects how much energy the particles in a substance have and how quickly they move. This energy and movement determine the state of the substance. If enough heat is added to or removed from a substance, the substance's state changes.

Lesson Review

1. A
2. C
3. D
4. C

Lesson 29

Discussion Question

Possible response: If all the layers of gas around Earth absorbed all the sun's energy, then none of the energy would make it to the surface of the planet. Without the sun's energy, plants would not be able to photosynthesize, so there would be no energy to circulate through ecosystems. All life on Earth would die. Students may also answer in terms of the atmosphere becoming hotter.

Lesson Review

1. D
2. B
3. C
4. A

Lesson 30

Discussion Question

Responses will vary depending on location, but should mention distance from Long Island Sound or the Atlantic.

Lesson Review

1. D
2. D
3. B

Lesson 31

Discussion Question

Possible response: The global winds bring polar air down into the United States, which probably makes the weather in Connecticut cooler. The polar easterlies probably also bring Connecticut some of the snowstorms and freezing weather we experience in winter.

Lesson Review

1. A
2. D
3. B
4. C

Lesson 32

Discussion Question

Possible response: They help me decide what to wear, what activities make sense that day, and whether to bring an umbrella.

Lesson Review

1. B
2. A
3. B
4. D

Lesson 33

Discussion Question

Possible response: It would not be possible, since the extreme heat and pressure deep inside Earth would melt or crush any people or digging equipment.

Lesson Review

1. A
2. B
3. C
4. D

Lesson 34

Discussion Question

Possible response: Volcanoes and earthquakes both tend to occur at plate boundaries. Therefore, they often occur in the same general location.

Lesson Review

1. C
2. B
3. C

Lesson 35

Discussion Question

Possible response: Water can cause mechanical weathering by getting into cracks in rock, and then freezing and expanding to push the rock apart. Water, or substances dissolved in water, can react with the minerals in rock to dissolve it through chemical weathering.

Lesson Review

1. B
2. C
3. B
4. D

Lesson 36

Discussion Question

Possible responses: If Earth was more tilted, the seasons would be more extreme. If Earth was less tilted, no part of Earth would have really harsh winters. If Earth was tilted at 90°, the seasons would be very extreme because whichever part of the planet had summer would also have the midnight sun, and the sky would be dark all winter.

Lesson Review

1. B
2. A
3. B
4. C
5. A

Lesson 37

Discussion Question

Possible response: June is the beginning of summer because the weather in Connecticut will be hotter in July and August. I think this is because land and water both take time to heat up as the sunlight becomes more direct during the spring, and they hold onto the heat during the summer.

Lesson Review

1. C
2. A
3. D
4. D

Lesson 38

Discussion Question

Possible response: The position of the moon determines when high and low tides occur. Captains must know when these tides occur in order to avoid entering a harbor when the sea level is too shallow. Doing so could cause their ships to run aground.

Lesson Review

1. D
2. A
3. A

Lesson 39

Discussion Question

Possible response: There would be more solar eclipses, because the moon would block the sun's light in more positions. A solar eclipse would be visible from a larger area on Earth because the moon's shadow would be bigger. Lunar eclipses would occur less often. A total lunar eclipse would be unusual or even impossible, depending on the sizes of Earth and the moon.

Lesson Review

1. B
2. C
3. B
4. A

Chapter 4 Review

1. C 6.3-C9
2. A 6.3-C7
3. C 7.3-C18
4. C 8.3-C29
5. A 8.3-C28
6. A 6.3-C7
7. B 7.3-C19
8. D 7.3-C20
9. A 6.3-C8
10. C 6.3-C7

- 11. B 8.3-C29
- 12. C 7.3-C19
- 13. D 6.3-C7
- 14. C 6.3-C9
- 15. B 6.3-C8
- 16. D 8.3-C29
- 17. C 7.3-C19
- 18. D 6.3-C9
- 19. A 8.3-C28
- 20. A 8.3-C29
- 21. C 6.3-C8
- 22. B 7.3-C18
- 23. A 8.3-C29
- 24. B 6.3-C8
- 25. D 8.3-C29
- 26. Possible response: Liquid, Gas, Solid; In the first state shown, a liquid, the particles move about fairly quickly. They have a fixed volume, but they do not have a fixed shape. In the second state shown, a gas, the particles move even faster. The particles move more freely, so the gas does not not have a fixed shape or volume. In the last state shown, a solid, the particles only vibrate together. The substance has a fixed shape and volume because the particles cannot move about freely. 6.3-C7

Chapter 5 Lesson 40

Discussion Question

Possible response: As water seeps into the ground, it is filtered by the layers of soil and sediment it passes through. It is also not as exposed to as many types of pollutants as surface water is.

Lesson Review

- 1. C
- 2. D
- 3. D

Lesson 41

Discussion Question

Possible response: Non-point-source pollution is pollution that enters water systems from several locations. "Non-point source" means that it does not come from one place, or point, but from many. It can also mean that we don't know where the pollution comes from. Either way, these pollutants do come from somewhere, but not from a known point.

Lesson Review

- 1. A
- 2. B
- 3. C

Lesson 42

Discussion Question

Possible response: You should examine a map of the area to determine whether any industry could be dumping warm water into the lake around 2 p.m. If you find the source of the heat, you should work with the industry to stop this pollution.

Lesson Review

- 1. D
- 2. C
- 3. A

Lesson 43

Discussion Question

Answers will vary widely. Sample response: I had raisins and a turkey sandwich. The raisins were dehydrated. The bread and turkey that made up my sandwich were refrigerated.

Lesson Review

- 1. D
- 2. B
- 3. C
- 4. D

Lesson 44

Discussion Question

Possible response: There are a few beam bridges and truss bridges in my area. The beam bridges are easy to identify because each is a simple horizontal platform resting on some columns. They are not very long. The truss bridges are even easier to identify because they have lattice work, or truss systems, resting on the horizontal platform that we drive on.

Lesson Review

- 1. D
- 2. B
- 3. C
- 4. C

Chapter 5 Review

- 1. A 8.4-C30
- 2. C 6.4-C11
- 3. A 7.4-C21
- 4. D 6.4-C10
- 5. C 6.4-C11
- 6. D 6.4-C10
- 7. B 6.4-C11
- 8. B 7.4-C21
- 9. A 8.4-C30
- 10. C 6.4-C10
- 11. Possible response: The bridge shown is a suspension bridge. It can be identified by the towers and the cables they support. The major advantage of suspension bridges is that they balance the forces of compression and tension very well. This allows them to be safely built much longer than other kinds of bridges. The biggest disadvantage of suspension bridges is that the roadway platform can be unstable without further support from trusses.

8.4-C30