Life Science Answer Key

Chapter 1 The World of Life Science

SECTION 1 ASKING ABOUT LIFE

1. asking questions
2. They can help people learn how to stay healthy. They can learn how to produce food more efficiently.
3. Possible answers: What makes plants grow larger? What makes plants grow faster? How can we preserve food better?
4. anyone who studies organisms
5. Irene Duhart Long: How does space travel affect the human body?

   Geerat Vermeij: How have shells changed over time?

   Irene Pepperberg: Can parrots learn human language?

Review

1. Scientists ask questions to learn about the world. Scientists gather information by observing the world and asking and answering questions about what they see.
2. a scientist who studies living things
3. Answers will vary. Almost any answer is acceptable.
4. Where does it live? What does it eat? How does it reproduce? How does it interact with its environment?
5. Life scientists studied polio and learned how to prevent it from spreading.
6. They can study the effects of pollution and teach people how to make less pollution. They can help reduce the harm caused by pollution. They can study the effects of people's use of resources and help people learn how to use resources without harming as many organisms.

SECTION 2 SCIENTIFIC METHODS

1. a series of steps scientists use to answer questions and to solve problems
2. Answers will vary.
3. to help guide their research
4. If they are not accurate, then a scientist cannot be sure that his or her results are true.
5. length, temperature, shape
6. a possible answer to a question
7. They are all possible answers to the question, and they are all testable.
8. Predictions are based on hypotheses. The predictions determine the tests that are conducted in an experiment.
9. They could catch deformed and undeformed frogs and examine them for parasites.
10. something that can change an experiment's results
11. The variable changes between the control and experimental groups.
12. Group 1 is the control group because it received no UV light, which is the variable.
13. to eliminate the effects of differences between individuals
14. A single bar should be drawn on the graph at 24 days of UV light; the bar should extend to almost the "50" on the y-axis.
15. Answers will vary. In general, negative results can tell scientists that they are looking in the wrong spot or can point them in new directions.
16. Sharing results allows other scientists to test them and determine whether they are reliable.

Review

1. The factors affecting control and experimental groups are the same, except for the variable. The variable changes between experimental groups.
2. Answers include: A scientist might make more than one hypothesis to answer a question. A scientist might analyze the results of an experiment in different ways.
3. oral presentations, papers, Internet
4. a statement of cause and effect that can be used to plan an experiment
5. to check to make sure he or she didn't make a mistake or to produce more data for analysis
6. Repeat the experiment, or look at the question in a different way.

SECTION 3 SCIENTIFIC MODELS

1. because models can never be exactly like the thing they represent
2. The model shows where a person's organs are. It does not show how they work.
3. 50%
4. to study things that are difficult or dangerous to study in real life
5. Possible answers: The data may not clearly show just one relationship. Different scientists may analyze data in different ways.

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6. scientific theory, scientific law

Review

1. Scientific theories are based on observations and evidence. Theories explain all observations and evidence about a certain topic.
2. Scientists use models to help them study things in detail. Models can help scientists to study things that are too large, too small, too fast, too slow, or too dangerous for them to study in reality.
3. Many tests and pieces of evidence support it.
4. New observations can support a scientific theory. They can also indicate that the theory is incorrect.
5. Physical model: globe, map
   Mathematical model: equation, graph
   Conceptual model: drawing, flowchart
6. A scientific law describes observations and makes predictions about what will happen in certain conditions. A scientific theory explains how observations are connected. Scientific theories can be supported by scientific laws.

SECTION 4 TOOLS, MEASUREMENT, AND SAFETY

1. stage, light, tube with lenses
2. The scientist should use a light microscope because it can be used to study living organisms.
3. It would be much harder for scientists to compare and share their data.
4. the meter
5. Multiply its width by its length.
6. the amount of space an object takes up
7. It pushed 10 mL of liquid out of the way when it was put into the graduated cylinder.
8. 1,000 mg = 1 g
9. a measure of how hot or cold something is
10. It is easier to convert °C into K than to convert °F into K or °C.
11. Answers include: eye protection in the lab area, heating safety near hot plates

Review

1. Place the object in a known volume of liquid. Then, measure the volume of the object and the liquid together. The volume of the object is the difference between the volume of the liquid and the object and the volume of the liquid alone.
2. Looking at something that is very small: microscope, magnifying glass

   Measuring how tall your friend is: ruler, meterstick

   Measuring how much water is in a glass: graduated cylinder, beaker
3. °C and K
4. Follow teacher's directions; follow written directions; do not take shortcuts.

Chapter 2 It's Alive!! Or Is It?

SECTION 1 CHARACTERISTICS OF LIVING THINGS

1. cells
2. Possible answer: chemicals, light, sounds
3. stimulus
4. The conditions inside your body would change. Chemical reactions in your body might not work correctly.
5. two
6. by sexual reproduction
7. DNA carries instructions for the organism's traits.
8. A single-celled organism makes its cell larger. Organisms with many cells grow by making more cells.

Review

1. made of cells, respond to changes, reproduce, have DNA, use energy, grow
2. In asexual reproduction, only one parent produces offspring. In sexual reproduction, two parents are needed to produce offspring.
3. The offspring from asexual reproduction are identical to the parent.
4. A bear's fur helps it to stay warm, even when the temperature of the environment changes. The bear can keep a stable body temperature.

SECTION 2 THE NECESSITIES OF LIFE

1. About 70% to 85% of a cell is made of water. Most of the reactions that happen in a cell need water.
2. so it can have air to breathe
3. It gives them energy and nutrients to live and grow.
4. We are all consumers. We have to eat other organisms to get energy.

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