Chapter 20 Homework Assignments

Section 1 Self-Check:

1. Infer. How are your senses important for identifying physical properties of matter?
2. Describe the physical properties of a baseball.
3. Think Critically. Explain why solubility is a size-independent physical property.
4. Compare and contrast. How do chemical and physical properties differ?

Section 2 Self-Check:

1. List five physical changes that you can observe in y our home.
2. Determine what kind of change occurs on the surface of bread when it is toasted.
3. Infer. How is mass conserved during a chemical change?
4. Think Critically. A log is reduced to a small pile of ash when it burns. Explain the difference in mass between the log and the ash.

Chapter 21 Homework Assignments

Section 1 Self-Check:

1. Compare and contrast substances and mixtures. Give two examples of each.
2. Describe how heterogeneous and homogenous mixtures differ.
3. Explain how a solution forms.
4. Identify the common name for a solid-solid solution of metals.
5. Think Critically. The tops of carbonated-beverage cans usually are made with a different aluminum alloy that the pull tabs are made with. Explain.

Section 2 Self-Check:

1. Identify the property of water that makes it the universal solvent.
2. Describe the two methods to increase the rate at which a substance dissolves.
3. Infer why it is important to ass sodium chloride to water when making homemade ice cream.
4. Think Critically. Why can the fluids used to dry-clean clothing remove grease even when water cannot?

Section 3 Self-Check:

1. Identify what ions are produced by acids in water and bases in water. Give two properties each of acids and bases.
2. Name three acids and three bases and list an industrial or household use of each.
3. Explain how the concentration of hydronium ions and hydroxide ions are related to pH.
4. Think Critically. In what ways might a company that uses a strong acid handle an acid spill on the factory floor?

Chapter 22 Homework Assignments

Section 1 Self-Check:

1. Define the two properties of matter that determine its state.
2. Describe the movement of particles within solids, liquids, and gases.
3. Name the property that liquids and solids share. What property do liquids and gases share?
4. Infer. A scientist places 25 mL of a yellow substance into a 50-mL container. The substance quickly fills the entire container. Is it a solid, liquid, or gas?
5. Think Critically. The particles in liquid A have a stronger attraction to each other than the particles in liquid B. If both liquids are at the same temperature, which liquid has a higher viscosity? Explain.

Section 2 Self-Check:

1. Describe how thermal energy and temperature are similar. How are the different?
2. Explain how a change in thermal energy causes matter to change from one state to another. Give two examples.
3. List the three changes of state during which energy is absorbed.
4. Describe the two types of vaporization.
5. Think Critically. How can the temperature if a substance remain the same even if the substance is absorbing thermal energy?
6. Write a paragraph in your Science Journal that explains why you can step out of the shower into a warm bathroom and begin to shiver.

Section 3 Self-Check:

1. Describe what happens to pressure as the force exerted on a given area increases.
2. Describe how atmospheric pressure changes as altitude increase.
3. State Pascal’s principle in your own words.
4. Infer. An object floats in a fluid. What can you say about the buoyant force on the object?
5. Think Critically. All the air is removed from a sealed metal can. After the air has been removed, the can looks as if it were crushed. Why?

Chapter 23 Homework Assignments

Section 1 Self-Check:

1. Evaluate whether the velocity of a jogger can be determined from the information that the jogger travels 2 km in 10 minutes.
2. Determine your distance traveled and displacement if you walk 100 m forward and the 35 m backward.
3. Describe how a speedometer needle moves when a car is moving with constant velocity, speeding up, and slowing down.
4. Think Critically. How could two observers measure a different speed for the same moving object?

Section 2 Self-Check:

1. Apply the first law of motion to the motion of an ice skater across the ice at a constant velocity.
2. Describe the information that must be given to specify a force.
3. Explain. When you sit in a chair, the force of gravity is pulling you downward. Is this a balanced or an unbalanced force?
4. Explain why a greater force is needed to move a refrigerator than is needed to move a book.
5. Think Critically. Explain whether the following statement is true: if an object is moving, there must be a force acting on it.

Section 3 Self-Check:

1. Identify the force that keeps a box from sliding down an angled conveyor belt that slopes upward.
2. Identify the force that causes a book to slow down and stop as it slides across a table top.
3. Explain why you feel Earth’s gravitational force, but not the gravitational force exerted by this book.
4. Determine how the acceleration of an object changes when the total force on the object increases.
5. Think Critically. A 1-kg book is at rest on a desk. Determine the force the desk exerts on the book.

Section 4 Self-Check:

1. Identify the action and reaction forces acting on this book when it rests on your hands.
2. Explain why, when you jump from a boat, the boat moves back as you move forward.
3. Infer. You and a child with half your mass are standing on ice. If the child pushes you, who will have the larger acceleration?
4. Compare and contrast the first two laws of motion with the third law of motion.
5. Think Critically. Identify the force that causes you to move forward when you walk on a floor.

Chapter 24 Homework Assignments

Section 1 Self-Check:

1. Explain why a high-speed collision between two cars would cause more damage than a low-speed collision between the same two cars.
2. Describe the energy transformations that occur when a piece of wood is burned.
3. Identify the form of energy that is converted into thermal energy by your body.
4. Explain how, if two cases are side by side on a shelf, one could have more potential energy.
5. Think Critically. A golf ball and a bowling ball are moving and both have the same kinetic energy. Which one is moving faster? If the move at the same speed, which one has more kinetic energy?

Section 2 Self-Check:

1. Describe the conversions between potential and kinetic energy that occur when you shoot a basketball at a basket.
2. Explain whether your body gains or loses thermal energy if your body temperature is 37 C and the temperature around you is 25 C.
3. Describe a process that converts chemical energy to thermal energy.
4. Think Critically. A light bulb converts 10 percent of the electrical energy it uses into radiant energy. Make a hypothesis about the other form of energy produced.

Section 3 Self-Check:

1. Diagram the energy conversions that occur when coal is formed, and then burned to produce thermal energy.
2. Explain why cola energy is considered an inexhaustible source of energy.
3. Explain how a heat pump is used to both heat and cool a building.
4. Think Critically. Identify advantages and disadvantages of using fossil fuels, hydroelectricity, and solar energy as energy sources.