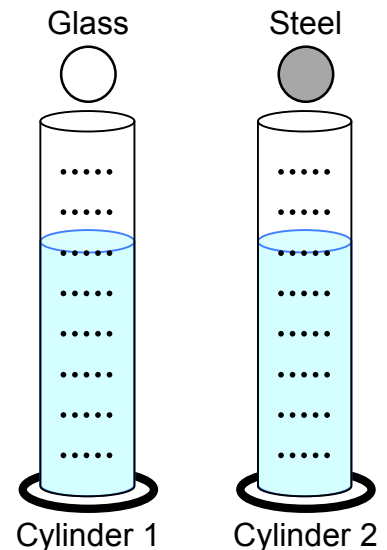


Quiz 1 – Page 1

1. The amount of matter in a given amount of space is called _____.
a. volume
b. mass
c. density

2. Which of the following statements is true?
a. Density does not change with sample size.
b. Mass does not change with sample size.
c. Volume does not change with sample size.

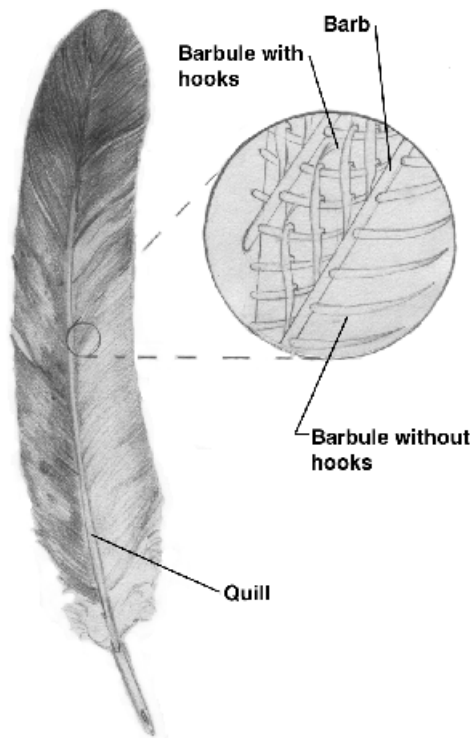
3. The two graduated cylinders in this drawing are filled to the same level with water. The two marbles are exactly the same size and shape. One is made of glass and the other is made of steel. When the glass marble is lowered into the first cylinder, it will sink to the bottom and the water will rise to the 7th mark. What will happen when the steel marble is lowered into the second cylinder?
a. The water will rise to the 7th mark.
b. The water will rise above the 7th mark.
c. The water will rise below the 7th mark.



4. Which of the following best describes your thinking about question 3?
a. The marbles are made of different materials.
b. The steel marble is heavier than the glass marble.
c. The marbles have the same volume.
5. Imagine you have a ball of clay. You use a balance to measure its mass. Next, you flatten the ball like a pancake and measure its mass again. Which of these statements is correct?
a. The pancake-shaped clay has more mass than the ball.
b. The pancake-shaped clay has the same mass as the ball.
c. The pancake-shaped clay has less mass than the ball.

Quiz 1 – Page 2

6. Which statement is true?
- a. Gases have mass, but they don't take up space.
 - b. Gases take up space, but they don't have mass.
 - c. Gases have mass, and they take up space.
7. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the diagram.



In the above diagram of a feather, what does the image inside the larger circle represent?

- a. a magnified view of the feather's structure
- b. a view of objects that are not part of a feather
- c. a life-size view of the feather's structure
- d. a miniature view of the feather's structure

Quiz 1 – Page 3

8. How can you use a syringe to demonstrate that air is compressible?

Quiz 2 – Page 1

1. The amount of matter in an object or sample is called _____.
 - a. density
 - b. mass
 - c. volume

2. How do you compare the densities of two substances?
 - a. compare their masses on a balance
 - b. compare their weights with a spring scale
 - c. compare the masses of equal volumes

3. A physical property is a feature of an object or material that can be observed or measured without changing its _____.
 - a. mass
 - b. appearance
 - c. identity

4. In the table below, write **P** if the process is a physical change, and **C** if the process is a chemical change.

Process	P or C?
glass breaking	
a bicycle rusting	
bleaching your hair	
separating sand from gravel	
food spoiling	
mowing a lawn	

Quiz 2 – Page 2

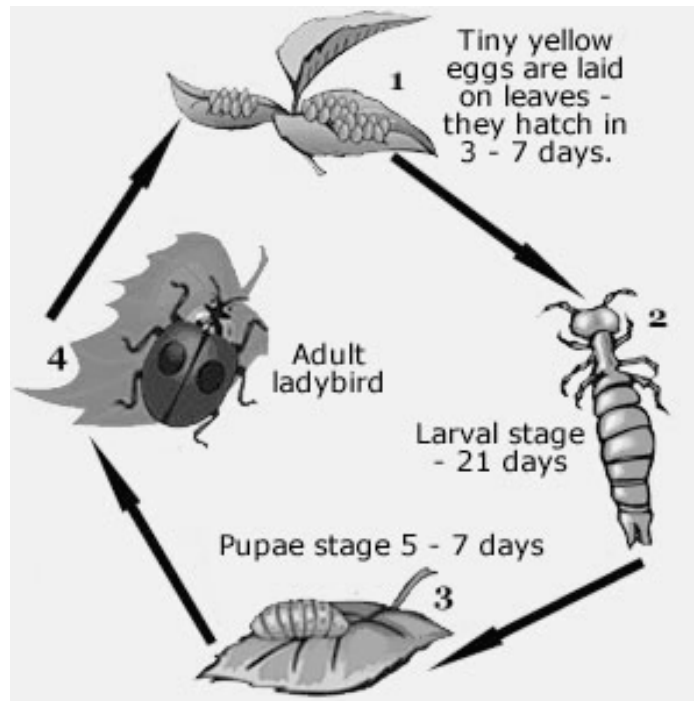
5. What is density?

What does density have to do with floating and sinking?

Quiz 2 – Page 3

6. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the figure.

Complete Metamorphosis of the Ladybird



According to the above figure, the third stage of metamorphosis occurs when a(n) _____ becomes a _____.

- a. egg; larva
- b. adult; pupae
- c. pupae; larva
- d. larva; pupae

Quiz 3 – Page 1

1. Imagine you have two blocks. One is made of steel and the other is plastic. Each block has a mass of 25 grams. If you use displacement to measure each object, what will you find?
 - a. The steel block will displace more water than the plastic block.
 - b. The plastic block will displace more water than the steel block.
 - c. The two blocks will displace the same amount of water.
2. Which of the following best describes your thinking about question 1?
 - a. Displacement depends on volume. The two blocks have the same mass, so the plastic block must be larger than the steel block.
 - b. Displacement depends on heaviness. They have the same mass, so they will displace same amount.
 - c. If the two blocks have the same mass, they must be the same size. So they will displace the same amount.
3. Imagine you have two vials. One contains 40 ml of water and the other contains 40 ml of oil. Which of the following statements is correct?
 - a. They both have the same mass.
 - b. They both have the same volume.
 - c. They both have the same density.
4. Which property is commonly measured in grams?
 - a. density
 - b. mass
 - c. volume
5. A feature that can be observed or measured without changing the chemical composition is called a _____.
 - a. physical property
 - b. chemical property
 - c. characteristic property

Quiz 3 – Page 2

6. A feature that doesn't change with sample size is called a _____.
a. physical property
b. chemical property
c. characteristic property
7. Which of the following is a chemical property?
a. density
b. solubility
c. flammability
8. Imagine you have a beaker of vinegar and a small cup of baking soda. You place them on one side of a balance, and you add paper clips to the other side until the balance is level. With the beaker still on the balance, you pick up the cup, pour the baking soda into the vinegar, and set the cup back down on the balance. What will happen to the balance?
a. It will still be level.
b. The side with the vinegar and baking soda will tilt down.
c. The side with the vinegar and baking soda will tilt up.
9. Which of the following best describes your thinking about question 8?
a. The chemical reaction produces a gas that is released into the atmosphere.
b. Nothing was added or taken away. The only thing that changed is the location of the baking soda.
c. The chemical reaction creates a new material that adds to the mass.
10. All matter is made up of tiny particles that _____.
a. are always moving
b. vibrate and wiggle in place
c. slide past each other and move around randomly

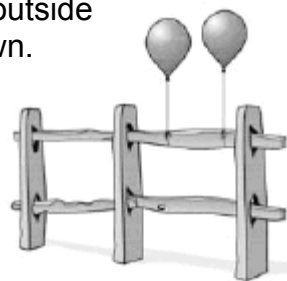
Quiz 3 – Page 3

11. The force of gravity acting on an object is called _____.
a. mass
b. weight
c. density
12. How do particles of a liquid compare with particles of a solid?
a. Liquid particles are slower and farther apart than solid particles.
b. Liquid particles are faster and farther apart than solid particles.
c. Liquid particles are slower and closer together than solid particles.
13. A force or set of forces that is spread over a surface is called _____.
a. inertia
b. weight
c. pressure

14. Two latex balloons filled with helium are taken outside on a hot, sunny day and tied to a fence as shown.

What will happen to the balloons?

- a. They will get smaller.
b. They will get bigger.
c. They will stay the same.



15. Which of the following best describes your thinking about question 14?
a. The particles of helium get warmer and move faster.
b. Nothing is being done to the balloons.
c. Some of the helium gas will leak out of the balloons.

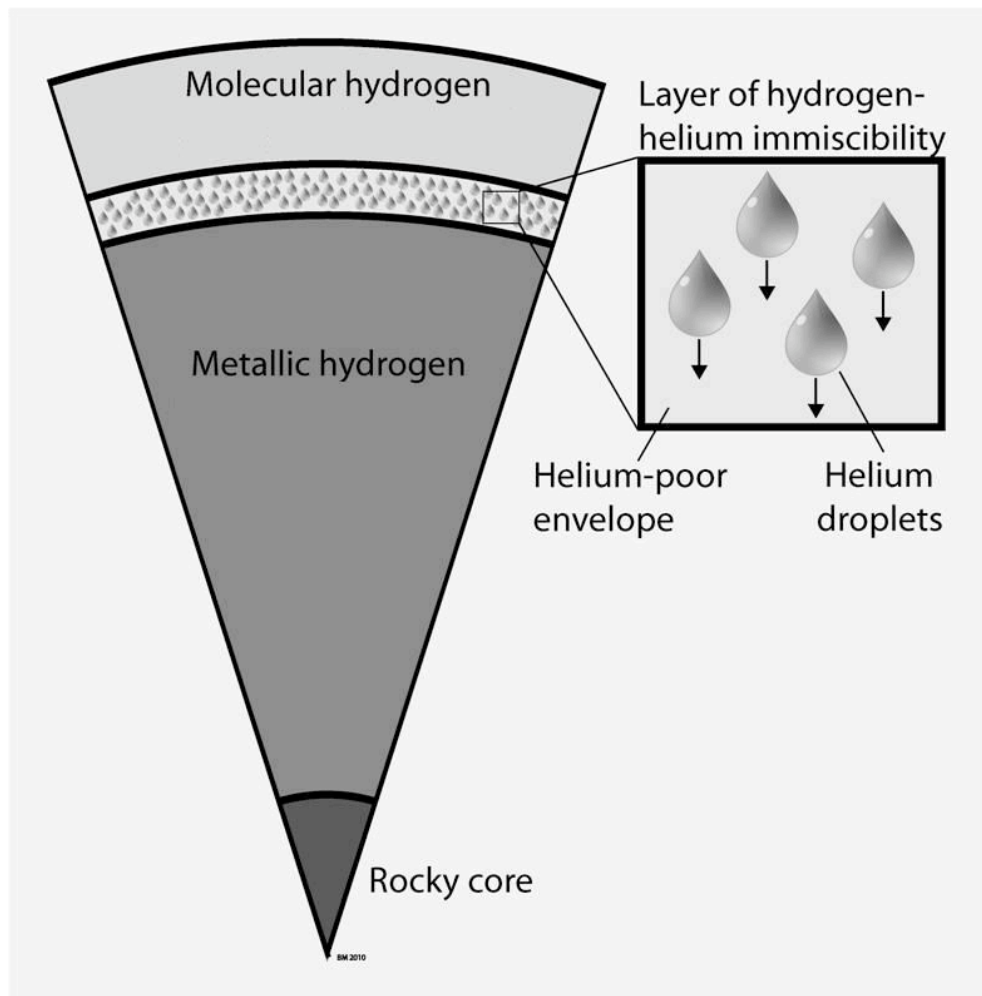
Quiz 3 – Page 4

16. If you could see the particles that make up a drop of water, what would they look like?

Quiz 3 – Page 5

17. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the diagram.

The Layers of the Planet Jupiter



According to the diagram above, there are helium droplets in which layer?

- a. molecular hydrogen layer
- b. layer of hydrogen-helium immiscibility
- c. metallic hydrogen layer
- d. rocky core

Quiz 4 – Page 1

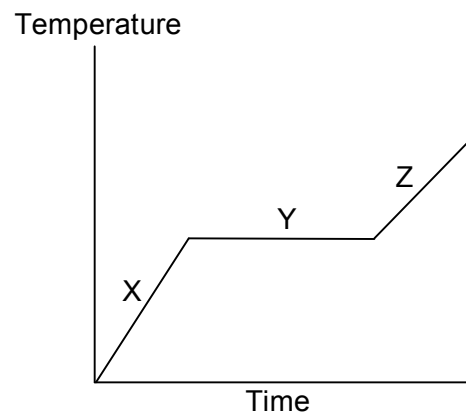
1. The particles that make up a solid _____.
 - a. do not move unless heat is applied
 - b. vibrate and wiggle in place
 - c. move randomly from place to place

2. If you have a fixed amount of gas at a constant temperature and you increase the size of the container that holds the gas, what will happen to pressure?
 - a. It will increase.
 - b. It will decrease.
 - c. It will stay the same.

3. What could you do to change a gas to a liquid?
 - a. Bring its temperature above its boiling/condensation point.
 - b. Bring its temperature below its melting/freezing point.
 - c. Bring its temperature below its boiling/condensation point.

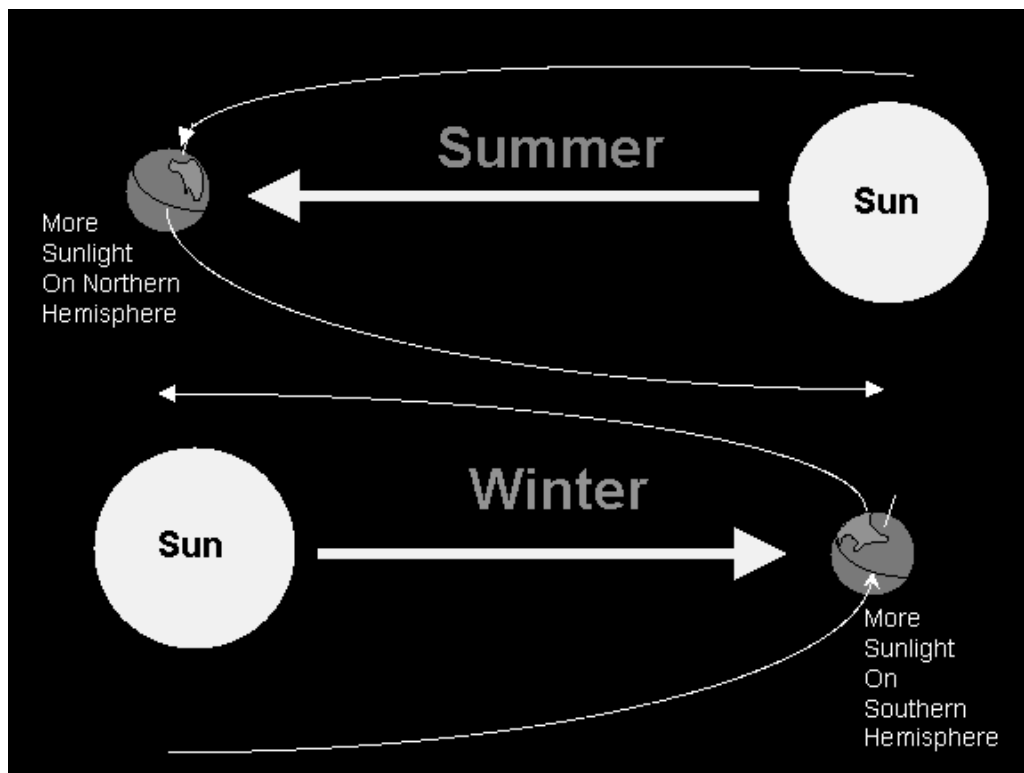
4. The graph below shows how the temperature of a solid changes as it is heated. What is happening to the particles of the solid during segment X?
 - a. They gradually start to move as the temperature increases.
 - b. They are moving so fast that solid particles are changing to liquid particles.
 - c. They move faster and faster and begin to spread out more.

5. What is happening to the particles of the solid during segment Y?
 - a. They gradually start to move as the temperature increases.
 - b. They are moving so fast that solid particles are changing to liquid particles.
 - c. They move faster and faster and begin to spread out more.



Quiz 4 – Page 2

6. Change of state is a _____ that requires the gain or loss of _____.
a. physical change; energy
b. chemical change; electrons
c. physical property; density
7. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the diagram.

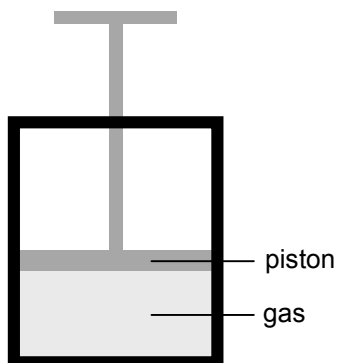


Because the Earth's axis is tilted, the Northern Hemisphere gets more direct sunlight during the summer than it does during the winter. This is the main reason that temperatures are higher in the summer.

- According to the above diagram, the reason Northern Hemisphere temperatures are higher in the Summer is _____.
- the rotation of the Earth
 - the tilt of the Sun's axis
 - the tilt of Earth's axis
 - there is less sun

Quiz 4 – Page 3

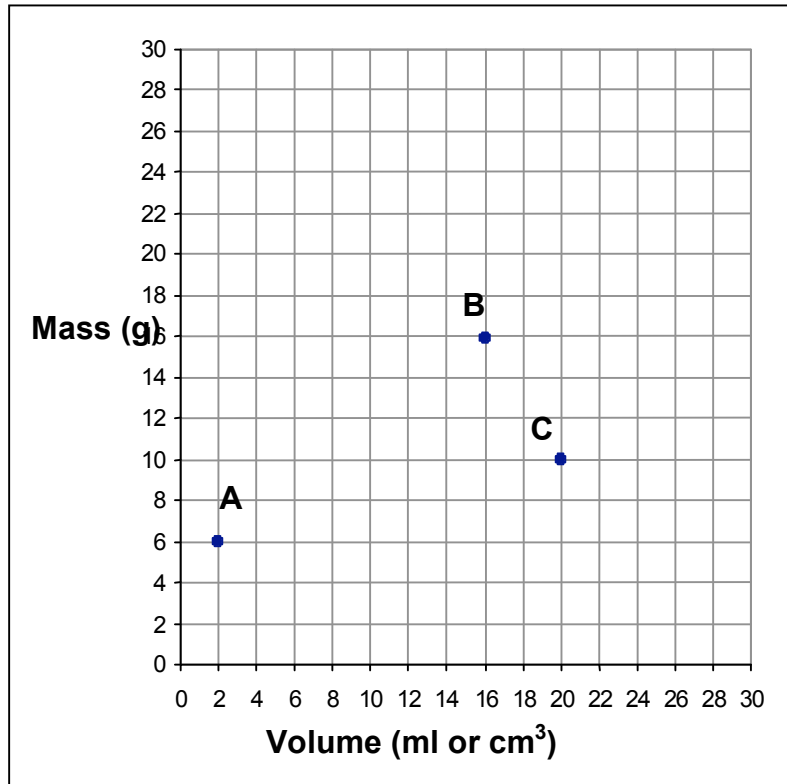
8. The figure below shows a sealed container of gas with a piston that can move up and down. The pressure inside the container is the same as the pressure outside, so the piston is not moving.



What will happen if the temperature of the gas decreases?

Quiz 5 – Page 1

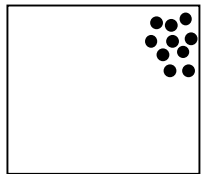
The graph below shows data about three samples. Two of the samples are solid objects, and the other is water. Use this graph to answer questions 1-3.



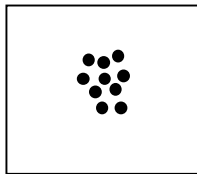
1. Which sample has the greatest volume?
 - a. A
 - b. B
 - c. C
2. Which sample is water?
 - a. A
 - b. B
 - c. C
3. Which sample will sink in water?
 - a. A
 - b. B
 - c. C

Quiz 5 – Page 2

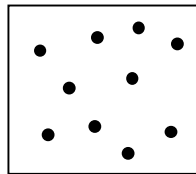
4. Imagine you spray perfume in the corner of a room.



X



Y



Z

Which diagram best shows where the perfume particles would be located immediately after you spray the perfume?

- a. X
 - b. Y
 - c. Z
5. Which diagram best shows where the perfume particles would be located after a few minutes?
- a. X
 - b. Y
 - c. Z
6. Imagine you have a fixed amount of gas in a sealed container with a fixed volume. If you increase the temperature of the gas, what will happen to pressure?
- a. It will increase.
 - b. It will decrease.
 - c. It will stay the same.
7. A wet shirt is hung from a clothesline on a hot summer day. The shirt dries because water particles _____.
- a. gain energy, change state, and become air particles
 - b. gain energy, change state, and mix with air particles
 - c. lose energy, change state, and mix with air particles
8. What could you do to change a liquid to a solid?
- a. Bring its temperature above its boiling/condensation point.
 - b. Bring its temperature below its melting/freezing point.
 - c. Bring its temperature below its boiling/condensation point.

Quiz 5 – Page 3

9. The table to the right shows the temperature of a substance that changed from a solid to a liquid.

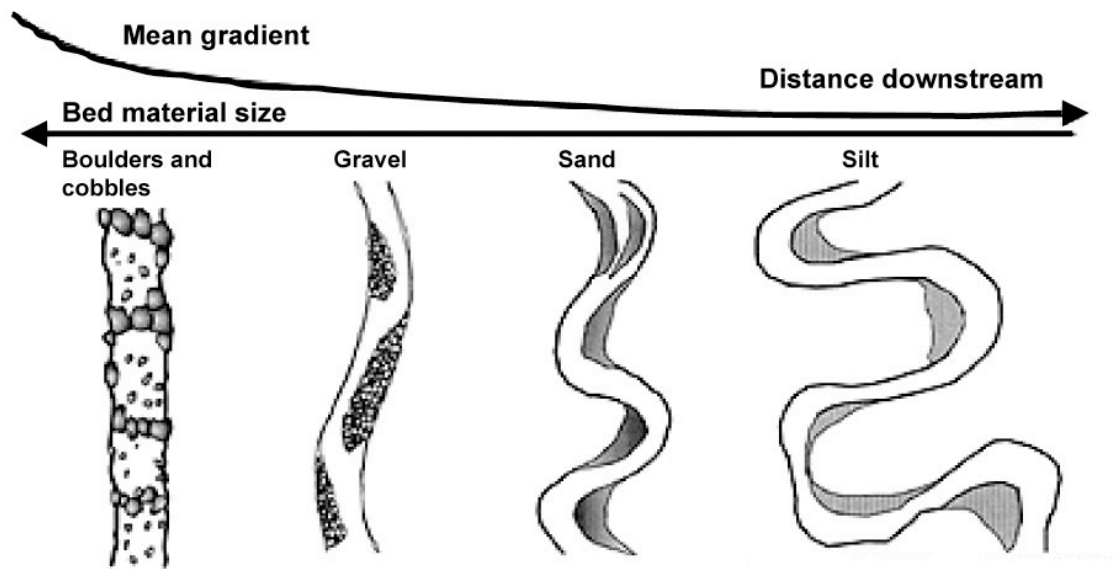
Time (Min)	Temp (°C)
0	20
1	28
2	35
3	39
4	39
5	39
6	39
7	39
8	40
9	44
10	48

Which of the following statements is true?

- a. The solid is completely melted after 3 minutes.
 - b. The solid is completely melted after 8 minutes.
 - c. The solid is still melting after 10 minutes.
10. Which of the following best describes your thinking about question 9?
- a. The temperature of a substance increases during melting.
 - b. The temperature of a substance does not change after melting.
 - c. The temperature of a substance does not change during melting.
11. Which statement is true?
- a. An element is represented by a chemical formula.
 - b. A compound is represented by a chemical symbol.
 - c. An element is represented by a chemical symbol.
12. Which of the following does **NOT** describe an element?
- a. can be broken down into simpler substances
 - b. has a unique set of properties
 - c. can join with other elements to form compounds
13. A substance that contains only one type of particle is called _____.
- a. a pure substance
 - b. a reactive substance
 - c. an atomic substance

Quiz 5 – Page 4

14. Which statement is correct?
- All elements and most compounds are pure substances.
 - All compounds and most elements are pure substances.
 - All compounds and all elements are pure substances.
15. If a substance has a density of 0.0027 g/cm^3 , it is most likely a _____.
a. solid
b. liquid
c. gas
16. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the diagram.



Using information from the above diagram, one can tell that _____ has a bed material size that is smaller than sand, while _____ has a bed material size that is larger than gravel.

- silt; gravel
- silt; sand
- gravel; sand
- silt; boulders and cobbles

Quiz 5 – Page 5

17. Give at least two examples to show that the properties of a compound are often very different from the properties of the elements it contains.

Quiz 6 – Page 1

1. When elements combine to form compounds _____.
 - a. their properties remain the same
 - b. their properties change
 - c. some properties change and some remain the same

2. What kind of changes can separate compounds into elements or simpler compounds?
 - a. physical changes only
 - b. chemical changes only
 - c. either physical or chemical changes

3. Which statement about compounds is true?
 - a. Compounds always have the same composition.
 - b. The elements that make up a compound are physically combined.
 - c. The properties of a compound are the same as the properties of the elements it contains.

4. Which of the following are pure substances?
 - a. elements only
 - b. compounds only
 - c. both elements and compounds

5. The composition of _____ can vary.
 - a. compounds
 - b. mixtures
 - c. compounds and mixtures

6. An element can be separated into simpler substances by _____.
 - a. physical changes
 - b. chemical changes
 - c. neither of the above

Quiz 6 – Page 2

7. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the diagram.



In the diagram above, what does this shade of gray stand for?



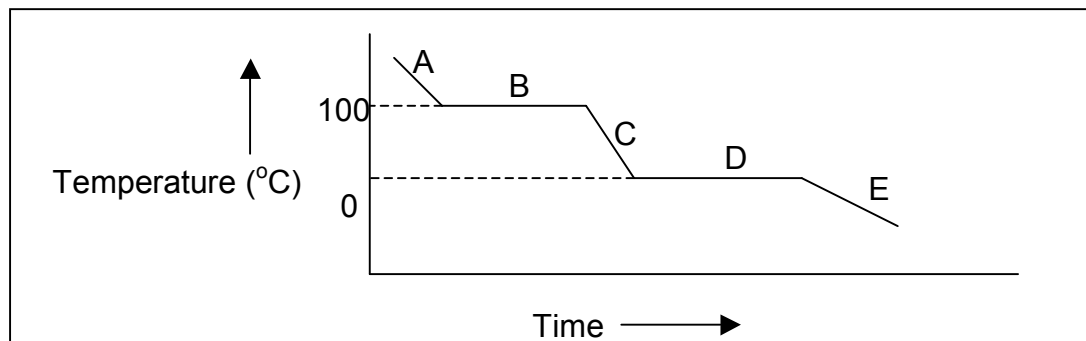
- a. Canada
- b. land
- c. islands
- d. water

Quiz 6 – Page 3

8. How are elements and compounds different?

Quiz 7 – Page 1

1. Which statement about particles of matter is true?
 - a. Particles of liquids and gases move, but particles of solids do not move.
 - b. Particles of matter attract each other, sort of like magnets or static electricity.
 - c. Because particles of liquids move randomly from place to place, liquids have no definite volume or shape.
2. The graph below shows the temperature of a substance that is losing energy.



- Which letter shows when the substance is changing from liquid to solid?
- a. A
 - b. B
 - c. C
 - d. D
 - e. E
3. The physical forms that matter can take are called _____.
 - a. pure substances
 - b. states of matter
 - c. physical properties
 4. Why do solids, liquids, and gases have different physical properties?
 - a. because of the arrangement and movements of their particles
 - b. because they are made of different materials
 - c. because liquids are very dense and gases have no mass

Quiz 7 – Page 2

5. Which statement is true?
 - a. All matter can change from one state to another.
 - b. Change of state is a chemical change.
 - c. The temperature of a substance decreases when the substance is changing from one state to another.

6. When air **IS NOT** in a container with a fixed volume, what will happen if the temperature of the air decreases?
 - a. The air will take up more space.
 - b. The air will take up less space.
 - c. The air will take up the same amount of space.

7. When air **IS** in a container with a fixed volume, what will happen if the temperature of the air decreases?
 - a. The air pressure will increase.
 - b. The air pressure will decrease.
 - c. The air pressure will stay the same.

8. What does a chemical formula show?
 - a. the composition of a compound
 - b. the density of a pure substance
 - c. the concentration of a solution

9. Chemical symbols are used to represent _____.
 - a. elements
 - b. compounds
 - c. mixtures

10. Which statement is true?
 - a. Compounds do not have a definite density.
 - b. The elements that make up compounds are chemically combined.
 - c. The composition of a compound can vary.

Quiz 7 – Page 3

11. Liquids form layers based on _____.
a. mass
b. weight
c. density
12. A solution is a type of _____.
a. element
b. compound
c. mixture
13. Which statement is true?
a. The particles that make up mixtures are chemically combined.
b. Mixtures can be separated by physical changes.
c. Mixtures can be identified by characteristic properties like density.

14. Imagine you add salt to water and stir until all the salt dissolves. The solution after stirring is shown in Figure 1.

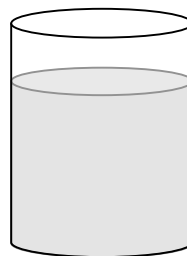


Figure 1

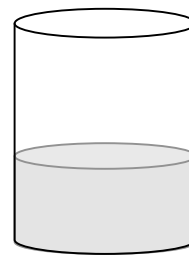


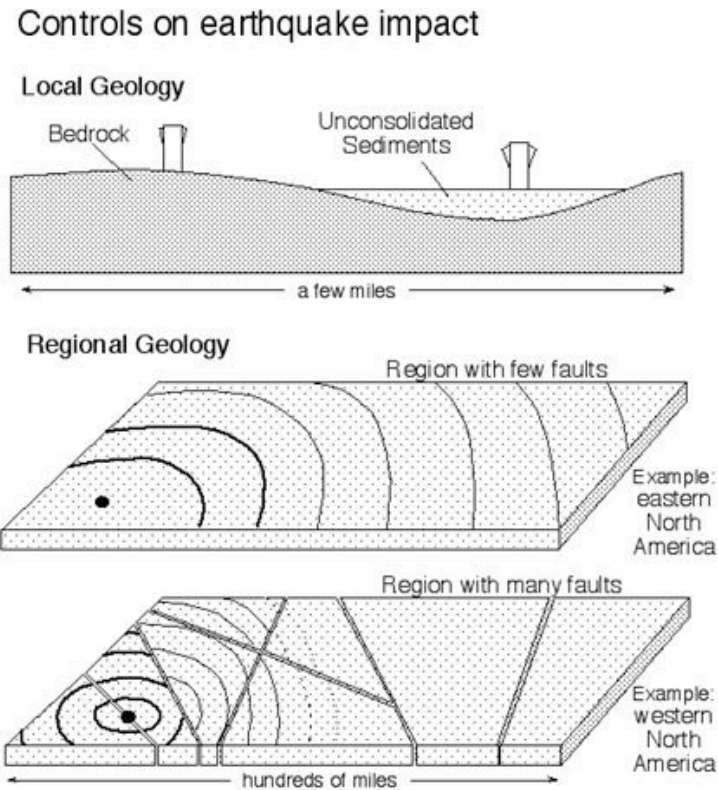
Figure 2

You heat the solution and let it boil for 20 minutes. The solution after boiling is shown in Figure 2.

- How does the concentration of salt compare in the two figures?
a. The concentration is greater in Figure 1 than in Figure 2.
b. The concentration is greater in Figure 2 than in Figure 1.
c. The concentration is the same in the two figures.
15. Which of the following best describes your thinking about question 14?
a. Dissolved salt evaporates faster than water.
b. Evaporation does not change the concentration of a solution.
c. Evaporation results in less water but the same amount of salt.

Quiz 7 – Page 4

16. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the diagram.



According to the above diagram, regional geology _____, while local geology _____.

- a. always has many faults; may include bedrock
- b. always has few faults; always has many fault
- c. covers hundreds of miles; covers a few miles
- d. covers a few miles; covers hundreds of miles

Quiz 7 – Page 5

17. Why do compounds have chemical formulas?

Quiz 8 – Page 1

1. In a solution, the substance that dissolves is called the _____.
 - a. solvent
 - b. solute
 - c. colloid

2. If you could remove all the atoms from a wooden chair, what would be left?
 - a. The chair would still look very much the same.
 - b. Only the cells that made up the tree the wood came from would remain.
 - c. There would be nothing left of the chair.

3. Flame color is a property that can be used to identify _____.
 - a. specific elements within a compound
 - b. the concentration of a solution
 - c. isotopes of the same element

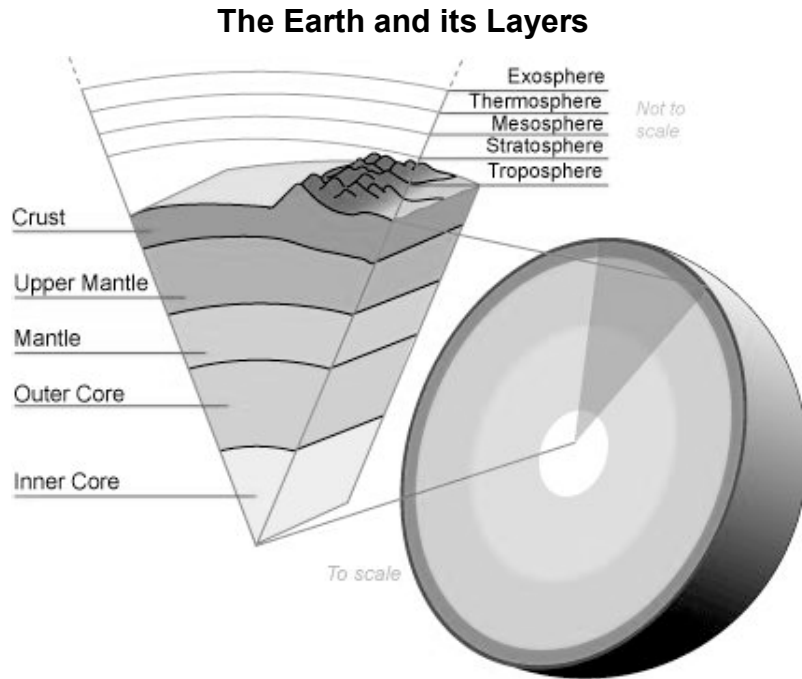
4. Which statement correctly explains why the development of atomic theory was possible?
 - a. Scientists developed powerful microscopes that enabled them to see protons, neutrons, and electrons.
 - b. Modern imaging techniques enabled scientists to see electron clouds surrounding the nucleus of an atom.
 - c. It is possible to gather information about something without actually seeing it.

5. Isotopes of the same element have the same _____ but a different _____.
 - a. atomic mass; atomic number
 - b. number of protons; atomic mass
 - c. atomic mass; number of neutrons

6. All atoms of the same element have the same _____.
 - a. atomic number
 - b. number of neutrons
 - c. atomic mass

Quiz 8 – Page 2

7. **Note to student:** We know you didn't learn this, but we want you to try to answer the question based on the information in the diagram.



According to the above figure, if one were to start in the center of the earth and then drill towards the surface, one would have to start in the _____.

- a. outer core
- b. mantle
- c. inner core
- d. crust

Quiz 8 – Page 3

8. What are atoms?
