InterActions Unit 6 Chapter 1 Sample Quiz KEY

See the Scientists' Consensus Sheets for assistance.

1. Which of the following statements is TRUE in the Small Particle Theory?

    a. Air fills the space between particles.

    b. There is nothing between particles.

    c. Something fills the space between particles, but it is not air.

    d. There is nothing between gas particles. Liquids and Solids don't have any space between their particles.

    Nothing fills the space between particles, and there is empty space between particles of gases, liquids, and solids. To answer this question you need to know that no matter exists between particles.

2. An atom is about _____ wide.

    a. 0.001 m

    b. 0.000,001 m

    c. 0.000,000,000,1 m

    d. 0.000,000,000,000,000,1 m

    An atom is about a tenth of a nanometer wide. To answer this question you need to know the approximate size of an atom.

3. When a drop of liquid food dye is placed in a dish of water, it spreads out. This is called

    a. compression

    b. diffusion

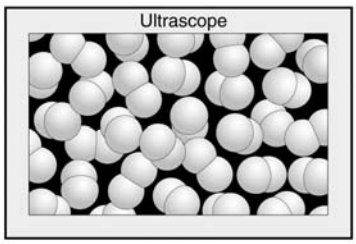
    c. collision

    d. cohesion

    As the dye and water particles move around they bump into each other and spread throughout the liquid, this is called diffusion To answer this question you need to know the definition of diffusion.

Images for Questions 4 and 5

A.



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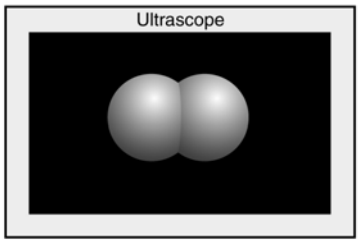

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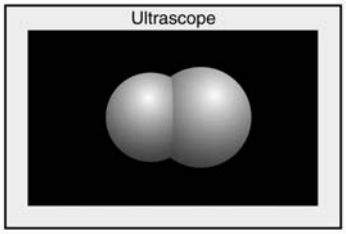
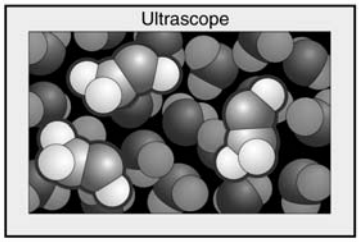


D.



4. Which of the Ultrascope images above represents a compound?

   a. A and B

   b. C & D

   c. C only

   d. D only

   A compound consists of two or more types of atoms. To answer this question you need to know what a compound looks like in the Ultrascope model.

5. Which of the images above represents an element?

   a. A and B

   b. C and D

   c. A only

   d. C only

   An element consists of one kind of atom. To answer this question you need to know what an element looks like in the Ultrascope model.

6. Atoms/Molecules of a substance

a. are constantly moving.

b. only move when they collide with another atom/molecule.

c. move in gases and in liquids, but not in solids.

d. only move in the direction that the substance is moved.

The particles of a substance are continually moving in different directions and with different speeds. To answer this question you need to know that the atoms and molecules of any substance are in constant motion.

7. Gases are

a. difficult to compress and have no definite volume.

b. are easy to compress and have a definite shape.

c. are easy to compress and have no definite volume.

d. Are difficult to compress and have no definite shape.

Gases are not very dense, easy to compress, have no definite shape or volume and diffuse about 2 cm in seconds. To answer this question you need to know properties of a gas.

8. Liquids are

a. difficult to compress and have no definite volume.

b. are easy to compress and have a definite shape.

c. are easy to compress and have no definite volume.

d. are difficult to compress and have no definite shape.

Liquids are dense, difficult to compress, have no definite shape but have a definite volume and diffuse about 2 cm in minutes. To answer this question you need to know properties of a gas.

9. During a collision interaction between two identical gas particles

a. they bounce apart in different directions.

b. they stick together and move in a different direction.

c. they stick together and stop.

d. they bounce apart and move in the same direction.

When particles collide, they bounce apart and move in different directions. To answer this question you need to know properties of a gas.

10. A cohesion interaction is

a. an attractive interaction between particles of an element or compound.

b. a repulsive interaction between particles of an element or compound.

c. an attractive interaction between particles within an element

d. a repulsive interaction between particles within an element.

The cohesion interaction is the continual attractive interaction between particles of an element or compound even when they are not touching. To answer this question you need to know the cohesion interaction.

11. A cohesion interaction between particles of a substance is related to

a. a gravitational interaction between the particles.

b. a chemical interaction between the particles.

c. an electric-charge interaction between the particles.

d. a magnetic interaction between the particles.

To answer this question you need to know the cohesion interaction is a type of electric-charge interaction.

12. Which of the following correctly lists the cohesion interaction in order of increasing strength (weakest to strongest) for substances at room temperature:

    a. gas, solid, liquid.

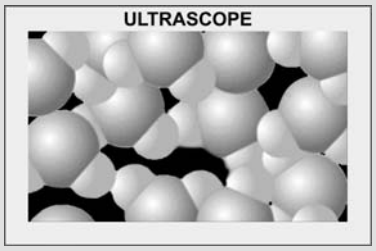
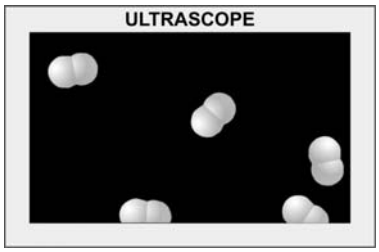
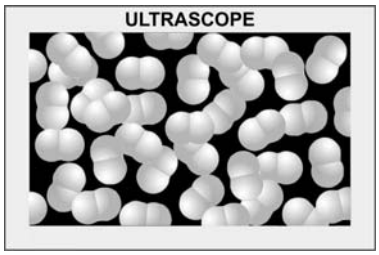
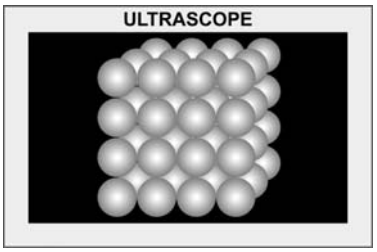
    b. solid, liquid, gas.

    c. solid, gas, liquid

    d. gas, liquid, solid

    The cohesion attraction between particles is different for different substances and determines the phase of the substance. To answer this question you need to know the cohesion interaction.

13. Which of the images is a liquid compound?

A. 	B. 
C. 	D. 

Liquids are closely packed particles that are not organized and a compound is a molecule containing more than one element. To answer this question you need to know what a liquid and a compound are and how they look in the Ultrascope model.

14. If the temperature of a substance is increasing then

    a. the stored cohesive bond energy is decreasing.

    b. the stored phase energy is constantly decreasing.

    c. the average motion energy of the particles is increasing.

    d. the stored volume energy is decreasing.

    Temperature is just a measure of the average motion energy of the particles. To answer this question you need to the relationship between temperature and motion energy in the Small Particle Theory.

15. When the temperature of a solid increases it

    a. contracts because the particles don't move as fast and move closer together because of the cohesive attraction between particles.

    b. doesn't change its size because the particles are in fixed positions.

    c. doesn't change its size because even though the particles move more, they are more attracted to each other.

    d. expands because the particles move faster and the average spacing between particles increases.

    As the temperature increases particles move more. Particles in a solid vibrate with a greater amplitude and hence need more space. The object expands (like wood doors or concrete in summer). To answer this question you need to know that particles have more motion energy when their temperature increases and that they can take up more space.

16. Air pressure is caused by

    a. the force of the air pushing on each unit area of an object.

    b. the suction of empty space (vacuum) pulling on each unit area of an object.

    c. the gravitational interaction between particles.

    d. the force exerted on each air particle by other particles.

    Air pressure is the force per unit area exerted on an object by the air particles colliding with it. To answer this question you need to know what causes air pressure.

17. The bubbles that form on the bottom of a pan of boiling water are

    a. air particles that have formed during heating.

    b. air particles that have formed during a chemical interaction between the water and the metal of the pot.

    c. made of water vapor as the water molecules move further apart during heating.

    d. made of hydrogen and oxygen gas as the water breaks down to its elements.

    During boiling the substance undergoes a phase change. The liquid water turns into water vapor as heat is absorbed. To answer this question you need to know that the particles of a substance move further apart as they change phase.

18. Electrons are

    a. negatively charged particles that move around the nucleus.

    b. positively charged particles that move around the nucleus.

    c. negatively charged particles in the nucleus.

    d. positively charged objects in the nucleus.

    Electrons are tiny particles that constantly move in the space around the nucleus. To answer this question you need to know what an electron is.

19. Essentially all the mass of an atom comes from

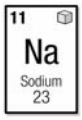
    a. the electrons.

    b. the neutrons.

    c. the protons.

    d. the protons and neutrons.

    Protons and neutrons are about the same mass and are about 2000 times more massive than an electron. To answer this question you need to know properties of electrons, protons, and neutrons.

20. The following element 

is sodium. It has

    a. 23 electrons, 23 neutrons, and 11 protons.

    b. 12 electrons, 12 neutrons, and 11 protons.

    c. 11 electrons, 23 neutrons, and 11 protons.

    d. 11 electrons, 12 neutrons, and 11 protons.

    The bottom number (23) is the number of protons plus neutrons. The top number is the number of protons. To answer this question you need to know about the atomic structure of an atom and how it is listed in the periodic table.

21. A beta decay occurs when

    a. an electron is released when a proton decays into a neutron and an electron.

    b. an electron is released when a neutron decays into a proton and an electron.

    c. radiation is released when a proton and electron turn into a neutron.

    d. radiation is released when a neutron turns into a proton and an electron.

    To answer this test question you need to know what causes beta decay.

22. Our Sun produces light and heat energy when two hydrogen nuclei combine to produce one nucleus of helium. This type of nuclear interaction is called

    a. alpha decay.

    b. beta decay.

    c. fusion.

    d. fission.

    Fusion occurs when two nuclei are combined. To answer this test question you need to know what fusion is.