

Name _____

Date _____

Use with textbook pages 16–27.

Investigating matter

Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.

Term	Descriptor
1. _____ volume	A. amount of mass in a certain volume of a substance
2. _____ density	B. amount of matter in a substance or an object
3. _____ state	C. cannot be broken down into simpler substances
4. _____ conductivity	D. amount of space that a substance or object takes up
5. _____ element	E. measure of how easily electricity or heat can pass through
	F. can be solid, liquid, or gas

Circle the letter of the best answer.

6. Which of the following describes mass?

- A.** state of matter
- B.** anything with mass and volume
- C.** amount of matter in an object
- D.** amount of space that an object occupies

7. Which of the following are the main points of the kinetic molecular theory?

I.	Particles are constantly moving.
II.	All matter is made up of very small particles.
III.	There are empty spaces between particles in a substance.

- A.** I and II only
- B.** I and III only

C. II and III only

D. I, II, and III

8. Which of the following describes what happens when heat is added to a substance?

- A.** Particles lose kinetic energy and vibrate faster.
- B.** Particles gain kinetic energy and vibrate faster.
- C.** Particles gain kinetic energy and vibrate slower.
- D.** Particles lose kinetic energy and vibrate slower.

9. Which of the following changes of state require the removal of heat?

I.	melting
II.	boiling

- A.** I only
- B.** II only
- C.** both I and II
- D.** neither I nor II

10. Which of the following is the temperature at which a solid changes into a liquid?









- A.** boiling point
- B.** melting point
- C.** both A and B
- D.** neither A nor B

11. Which of the following is the temperature at which a liquid changes into a gas?

- A.** boiling point
- B.** melting point
- C.** both A and B
- D.** neither A nor B

2.1 Assessment

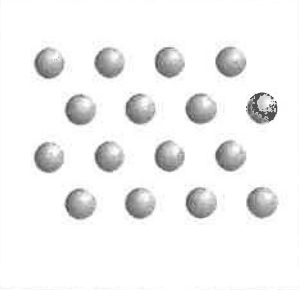
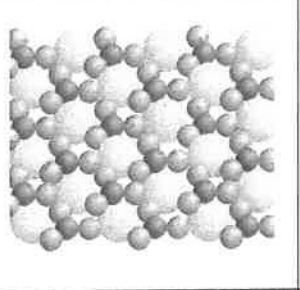
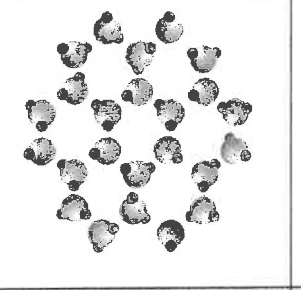
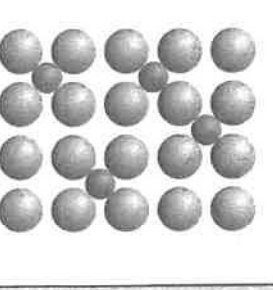
Match each description on the left with the best safety icon on the right. Each safety icon may be used only once.

Description	Safety Icon
1. ___ wear safety goggles to protect your eyes	A. 
2. ___ be careful when using electrical equipment	B. 
3. ___ be careful when working around open flames	C. 
4. ___ be careful when handling hot objects and glassware	D. 
5. ___ wear a lab apron to protect clothing and skin from spills	E. 
6. ___ wear gloves to protect the skin from corrosive chemicals	F. 
7. ___ be careful when working with sharp objects that can cause cuts	G. 
8. ___ be careful when handling chemicals that can cause burns or are poisonous when they come in contact with skin	H. 

Circle the letter of the best answer for questions 9 to 26.

9. Which of the following is made up of one type of particle?
- tea
 - lead
 - granite
 - garden salad
10. Which of the following consists of two or more pure substances?
- ice
 - oxygen
 - soda pop
 - ammonia

11. Classify matter by identifying the type of pure substances and mixtures shown below.

				
	W	X	Y	Z
A.	element	homogeneous mixture	compound	heterogeneous mixture
B.	compound	homogeneous mixture	heterogeneous mixture	element
C.	compound	heterogeneous mixture	element	homogeneous mixture
D.	element	heterogeneous mixture	compound	homogeneous mixture

12. Which of the following is correctly paired?

- A. element – air
- B. compound – baking soda
- C. heterogeneous mixture – perfume
- D. homogeneous mixture – pulpy orange juice

13. Which of the following is a mixture that has the same composition throughout?


- A. gravel
- B. wet sand
- C. granola cereal
- D. stainless steel spoon

14. Which of the following can be separated by physical means?

- A. platinum
- B. salt water
- C. apple juice
- D. iron filings and sand mixture

15. Boiling can be used to separate the parts of which of the following mixtures?

- A. salt water
- B. fruit smoothie
- C. liquid mercury
- D. marble and sand mixture

22. Which of the following is a safe practice in the science lab?
- A. tie back long hair
 - B. remove the electrical plug from the socket by pulling on the cord
 - C. place the container directly under your nose and inhale the fumes
 - D. dispose of leftover chemicals by pouring them back into the original container
23. An investigation requires you to pour some hydrochloric acid into a test tube. Which of the following describes why it is important to wear gloves when working with corrosive chemicals?
- A. to prevent contact with your skin
 - B. to have a better grip on the test tube
 - C. to protect the hydrochloric acid from contamination
 - D. to prevent the heat from your hands from reacting with the hydrochloric acid
24. You accidentally spilled some sodium hydroxide on your arm during an investigation. Which of the following is the best procedure to deal with this situation?
- A. wash your arm thoroughly with cold water
 - B. remove the chemical by rubbing it vigorously with a piece of paper towel
 - C. let the sodium hydroxide dry and see if your skin is irritated by the chemical
 - D. leave it alone because sodium hydroxide will evaporate off the surface of your skin
25. When would you see the following safety icon in a science investigation?
- 
- A. when you are working with open flames
 - B. when you are using a razor blade during a dissection
 - C. when you need to take care with the disposal of blood from your finger
 - D. when you are working with chemicals that can produce dangerous fumes

16. Solid tin becomes a liquid at 232 °C. Liquid tin becomes a gas at 2603 °C. What physical properties of tin are described?
- A. malleability and hardness
 - B. state of matter and solubility
 - C. melting point and boiling point
 - D. texture and ability to conduct heat and electricity
17. Which of the following statements uses viscosity and texture to describe the substance?
- A. Maple syrup flows slowly and is very smooth.
 - B. Bromine is a reddish brown liquid at room temperature.
 - C. Aluminum is shiny and can be hammered into thin sheets.
 - D. Copper is a soft metal that will allow electric currents to flow through it.
18. Sugar can dissolve in water. What physical property is described?
- A. solubility
 - B. viscosity
 - C. hardness
 - D. malleability
19. Gasoline vapour is highly flammable and can burn easily. What chemical property is described?
- A. combustibility
 - B. lack of reactivity
 - C. reactivity with acids
 - D. reactivity with oxygen
20. A colourless solution of calcium nitrate is added to a colourless solution of sodium carbonate. A white precipitate is formed. How do you know a chemical reaction has occurred?
- A. bubbles are formed
 - B. heat is given off
 - C. a gas is released
 - D. a new substance is formed
21. Concentrated sulfuric acid is added to a sugar solution. Bubbles form as a result. Which of the following explains the presence of the bubbles?
- A. a gas was formed
 - B. there was a colour change in the solution
 - C. smoke from the thermal energy was released
 - D. heat was produced in the chemical reaction

Use with textbook pages 28-33.

Contributions to atomic theory

Scientist
Bohr
Dalton
Rutherford
Thomson

Match each scientist to the statements describing his contribution to the atomic theory. Identify who was the first to propose these ideas. Each scientist may be used more than once.

1. Atoms cannot be created, destroyed, or divided into smaller particles.

2. Electrons occupy specific energy levels or shells.

3. Most of the mass of the atom is in the tiny, dense, positively charged nucleus.

4. Most of the atom is empty space.

5. All matter is made of small particles called atoms.

6. All atoms of the same element are identical.

7. Atoms contain negatively charged particles.

8. The nucleus contains positively charged particles called protons and particles with no electric charge called neutrons.

9. Different elements combine together to form compounds.

10. Electrons move around a central nucleus.

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Atomic theory

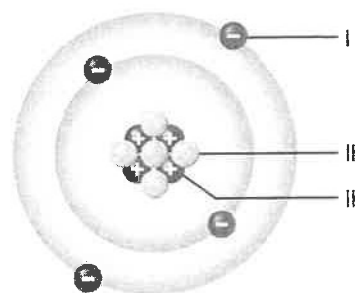
Match each Descriptor on the left with the corresponding Scientist on the right. Each Scientist may be used more than once.

Descriptor	Scientist
1. _____ discovered the nucleus	A. Bohr B. Dalton C. Rutherford D. Thomson
2. _____ suggested that all matter is made of atoms	
3. _____ proposed the “raisin bun” model of the atom	
4. _____ observed streams of negatively charged particles in gas discharge tubes	
5. _____ proposed that electrons exist in energy levels	

Circle the letter of the best answer.

6. Which of the following was not part of Dalton’s atomic theory?
- A.** All matter is made of small particles called atoms.
B. Atoms can be created or destroyed.
C. Atoms of the same element are identical.
D. Atoms of one element are different from the atoms of other elements.
7. Which of the following was not part of Rutherford’s atomic theory?
- A.** Most of the mass of the atom is concentrated in electrons.
B. Most of the atom is empty space.
C. The nucleus is the tiny, dense, central core of the atom.
D. The nucleus contains protons and neutrons.

Use the following diagram of an atom to answer questions 8 and 9.



8. Which of the following is the structure labelled II in the diagram?
- A.** atom
B. proton
C. neutron
D. electron
9. Which of the following exists in energy levels?
- A.** I only
B. II only
C. III only
D. II and III only
10. What is the electrical charge of the nucleus of an atom?
- A.** neutral charge
B. positive charge
C. negative charge
D. It depends on the element
11. The nucleus of the atom contains which of the following subatomic particles?
- A.** electron
B. proton and neutron
C. proton and electron
D. proton, neutron, and electron