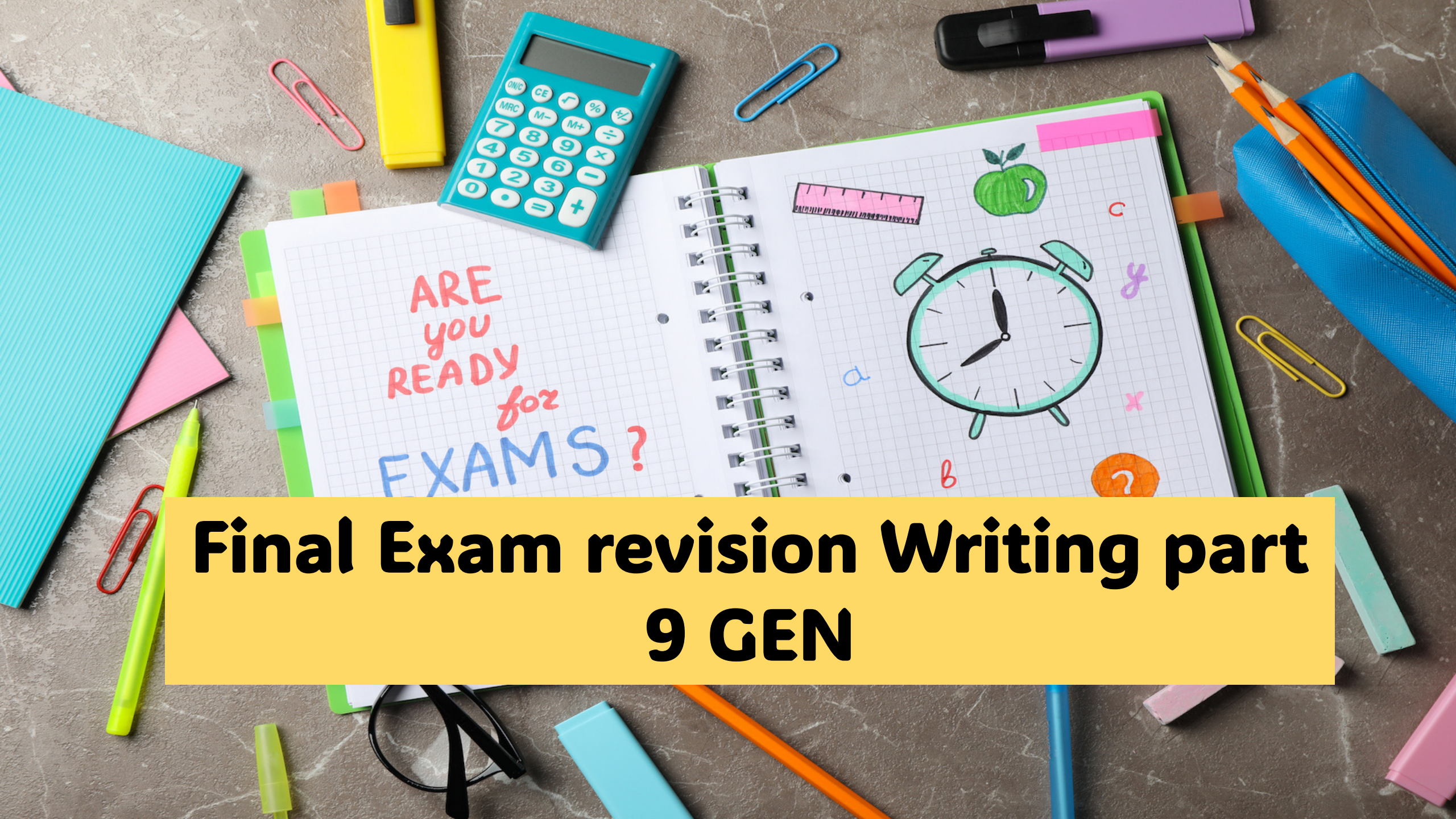


Final Exam revision Writing part 9 GEN

1	**List the series of procedure to use the scientific methods to solve problem, and differentiate between theory and scientific law**	textbook, figure 3	**Page number** 6, 11

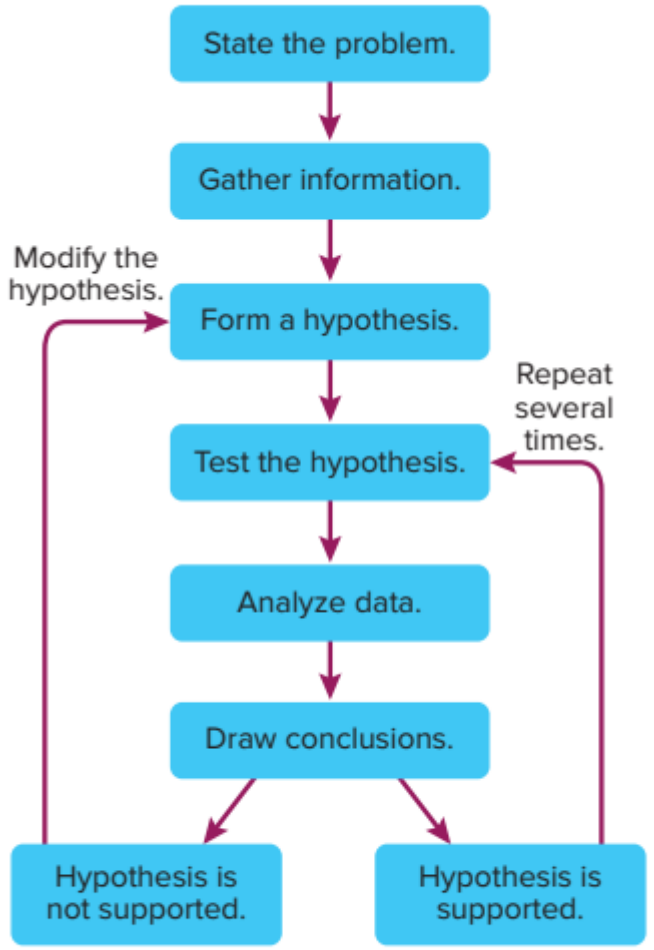


Figure 3 The series of procedures shown here is one way to use scientific methods to solve a problem.

Scientific method : The series of procedure to solve scientific question

- **The six common steps are:**

1) state the problem
2) research and gather information
3) form a hypothesis
4) test a hypothesis
5) analyze data
6) draw conclusions

How are a hypothesis and a theory similar?

- ○ A hypothesis and a theory cannot be revised.
- ○ Theories and hypotheses are produced by experts.
- ○ They are attempts to explain natural phenomena.
- ○ They are about equally true.

Answer :C

Which of the following questions CANNOT be answered by science?

- ○ How do birds fly?
- ◉ Is this a good song?
- ○ What is an atom?
- ○ How does a clock work?

1. **The series of procedure to solve scientific question is called ……..**

A. **Scientific method**
B. **Hypothesis**
C. **Variable**
D. **Peer review**

What is the correct order of the steps in the scientific method to solve a problem?

a.

State the problem → Form a Hypothesis → Gather information → Analyze Data → Test the Hypothesis → Draw Conclusions →
→ Hypothesis is supported, or it's not supported

b.

State the problem → Gather information → Form a Hypothesis → Test the Hypothesis → Analyze Data → Draw Conclusions →
→ Hypothesis is supported, or it's not supported

c.

Gather information → Analyze Data → State the problem → Form a Hypothesis → Test the Hypothesis → Draw Conclusions →
→ Hypothesis is supported, or it's not supported

d.

Gather information → State the problem → Analyze Data → Form a Hypothesis → Test the Hypothesis → Draw Conclusions →
→ Hypothesis is supported, or it's not supported

2	**Define Matter and how to classify it (mixtures & pure substances) and give examples for every category, differentiate between physical change and chemical change and the resulted matter from each change**	**Textbook, figure 1**	**Page number** 384, 389, 390

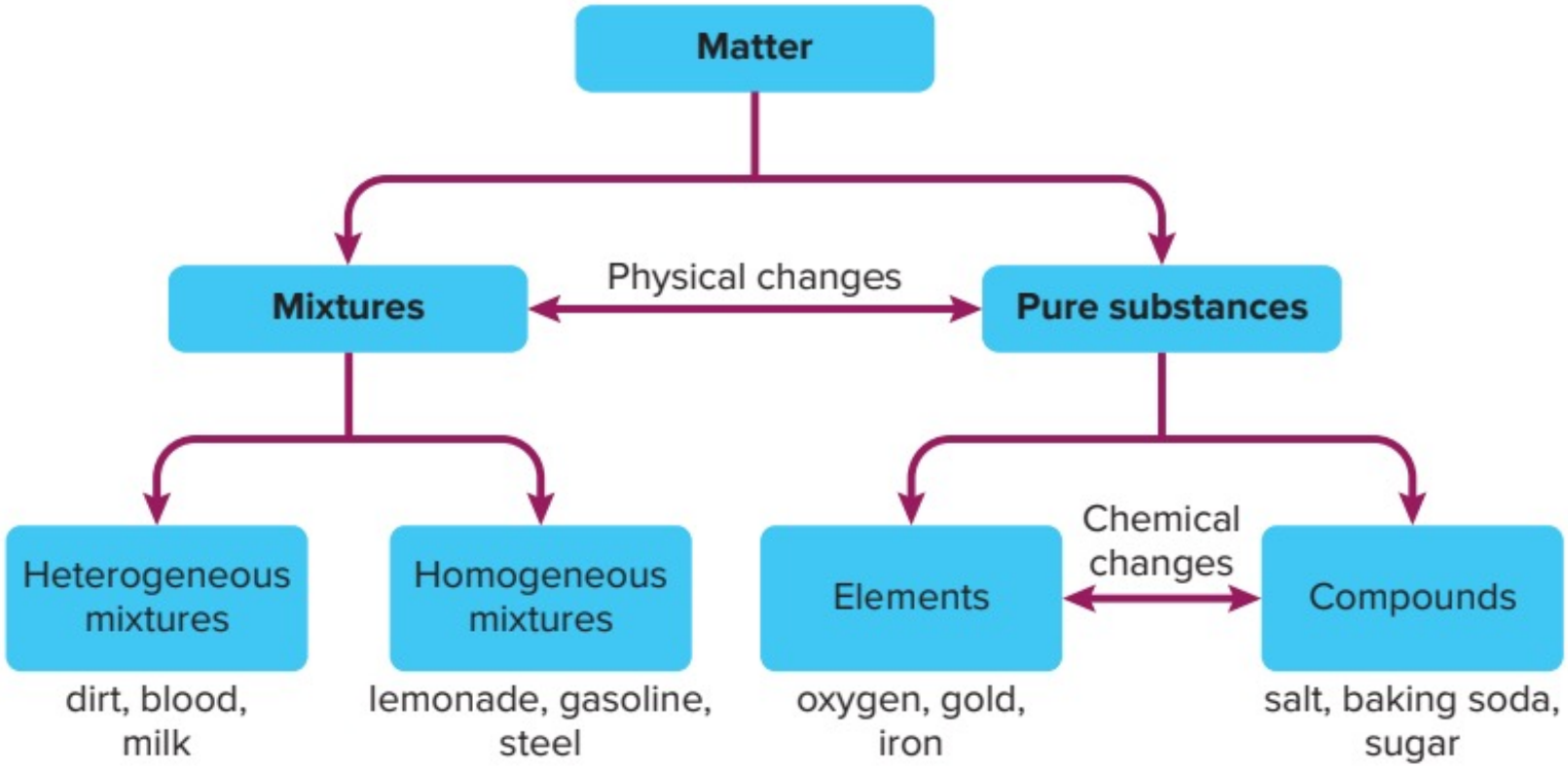


Figure 11 The concept map shows that mixtures can be either heterogeneous or homogeneous. Pure substances can be elements or compounds.

Examine *Where on this chart would you classify pizza?*

Which of the following is an example of a homogenous mixture?

Learning Outcomes Covered

- SCI.4.1.02.044

Answer :a

a. Gasoline

b. Blood

c. Dirt

d. Milk

Which of the following is an example of a heterogenous mixture?

Answer : a

a. Blood

b. Lemonade

c. Gasoline

d. Steel

1. A substance can be……
A. Element
B. compound
C. both A and B
D. none of these

2. A ……is a substance in which atoms of two or more elements are combined in a fixed proportion.
A. Compound B. mixture C Substance D atom

3. A mixture in which different materials can be distinguished easily is called a …….. mixture.
A. Homogeneous B. heterogeneous C. Compound D.atom

4. A(n) …… is a substance made up of atoms that are all alike.

A. Atom
B. mixture
C. compound
D. element

5. Which of the following is a pure substance?

A. colloid
B. Mixture
C. compound
D. solutions

6. H2O is a/an ……

A. Compound
B. element
C. Mixture
D. D. atom

7 Which of the following is an element?

A. H_2O B. CO_2 C.NH_3 D. O_2

8. Which of these describe an element?

A. Element is made of different kinds of atom
B. Element is made of same type of atom
C. Element is made of compound
D. all of the above

9. Which of the following is the only sure sign that a chemical change is taking place?

A. New substances are produced.
B. A sound is produced.
C. Heat is produced.
D. Bubbles are produced.

10. Air is a ……

A. Mixture B. element C. compound D. none of these

11. Which of the following are physical change?
A. A log burns in a fireplace.
B. Ammonia boils at −33°C.
C. Bread bakes in an oven.
D. Rusting of Iron

12. A(n) _____ is a material made up of two or more substances that can be separated by physical means
A. Mixture
B. substance
C. Element
D. Compound

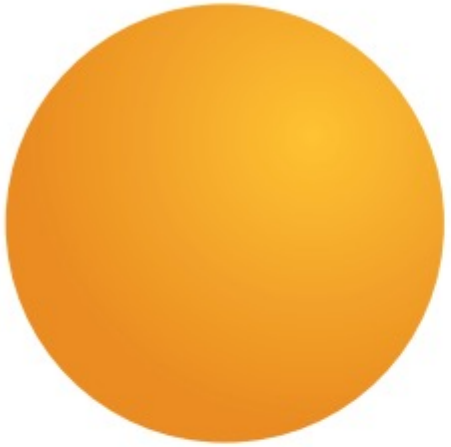
13. Which of the following is an example of physical weathering?
A. Flowing water carves erosion channels in a hillside.
B. Acid rain corrodes a monument.
C. Calcium carbonate in limestone changes to calcium hydrogen carbonate.
D. Stalactites precipitate in a cave

14. Which of the following is a chemical change?
A. Gas burns in an engine.
B. Water expands as it freezes
C. Glass bends as it is heated.
D. Sugar dissolves in a cup of water.

15. Table salt (NaCl) is an example of which type of material??
A. Mixture
B. element
C. colloid
D.compound

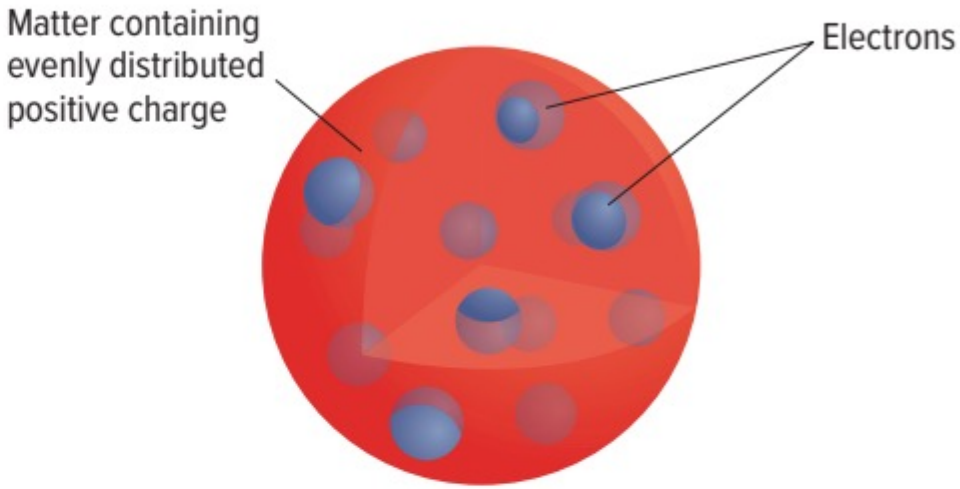
3	**Compare and contrast between the atomic models that lead to the modern one (electron cloud model)**	Textbook, figures 4, 5	**Page number 402, 403**

400 B.C. Democritus Model



400 B.C. Democritus Model Democritus first proposed that elements consist of tiny, solid particles that cannot be subdivided. He called these particles *atomos*, meaning "uncuttable." Democritus's ideas were criticized by Aristotle, who believed that empty space could not exist. Because Aristotle was one of the most influential philosophers of his time, Democritus's atomic theory was rejected.

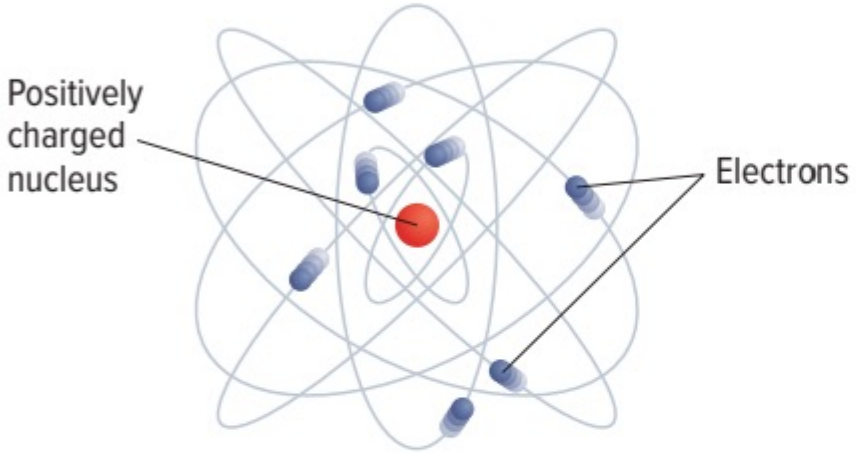
1904 Thomson Model



1904 Thomson Model English physicist Joseph John Thomson proposed a model that consisted of a spherical atom containing small, negatively charged particles. He thought these "electrons" (in blue) were evenly embedded throughout a positively charged sphere, much like chocolate chips in a ball of cookie dough.

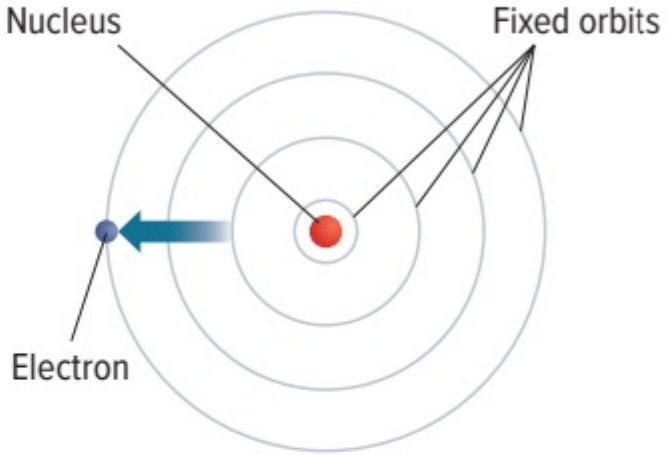
3	**Compare and contrast between the atomic models that lead to the modern one (electron cloud model)**	Textbook, figures 4, 5	**Page number 402, 403**

1911 Rutherford Model



1911 Rutherford Model English physicist Ernest Rutherford proposed the idea that all the positive charge of an atom is concentrated in a central atomic nucleus that is surrounded by electrons.

1913 Bohr Model



1913 Bohr Model Danish physicist Niels Bohr hypothesized that electrons travel in fixed orbits. He suggested that electrons could jump between orbits as they absorb or release specific amounts of energy. The Bohr model worked very well for hydrogen, but did not work as well for atoms with many electrons.

3	**Compare and contrast between the atomic models that lead to the modern one (electron cloud model)**	Textbook, figures 4, 5	**Page number 402, 403**

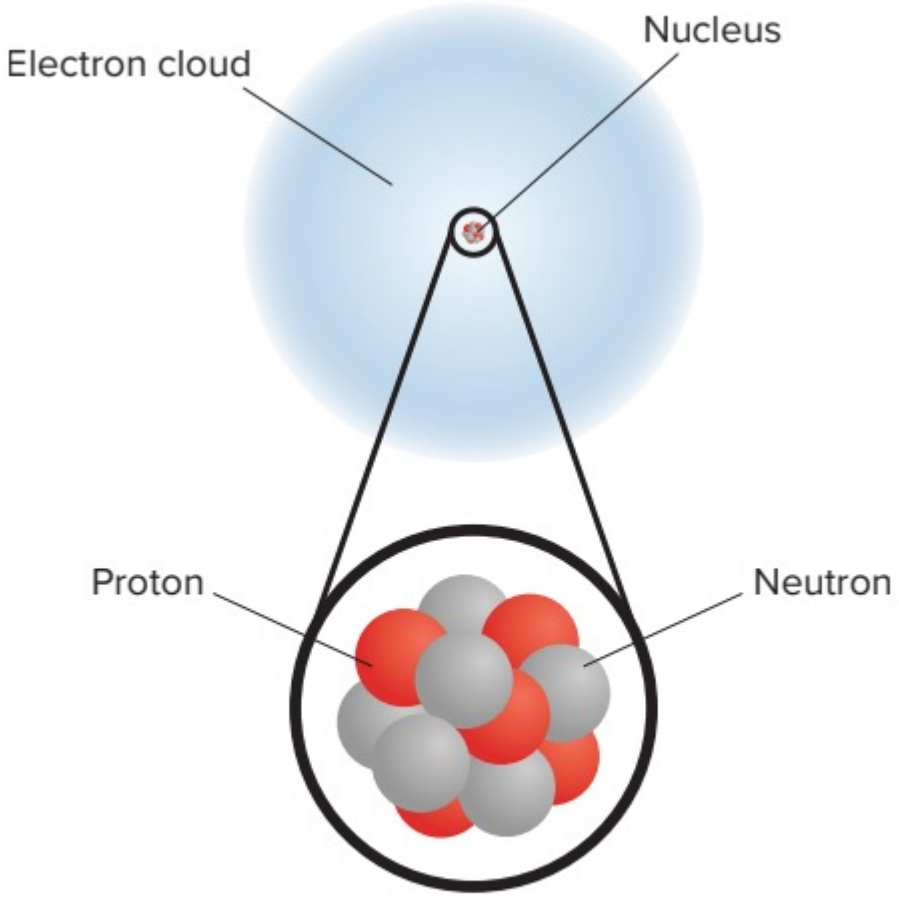
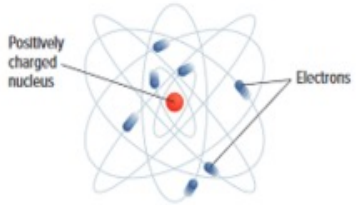


Figure 5 Most of an atom is empty space. The electron cloud represents the area in which the electrons are moving.

Which atomic model is represented by the idea that all the positive charge of an atom is concentrated in a central atomic nucleus that is surrounded by electrons, shown in the figure below?



a. Rutherford Model

b. Democritus Model

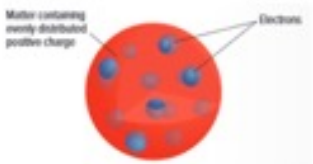
c. Thomson Model

d. Bohr Model

Which of the following atomic models explained the electron jumps between orbits in **hydrogen** atom when electrons absorbs or release energy?

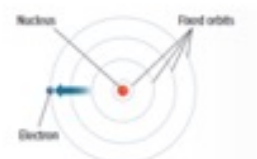
a.

b.



c.

d.



4	**Compare between the properties of metals and nonmetals, Identify the nonmetal & metal part in different chemical compounds (ionic) using the periodic table of element, compare between the alkali metals & alkaline earth metals**	textbook, periodic table fig 15, figures 4, 7, 10, 13,	**Page number 415, 424, 427, 430, 433**

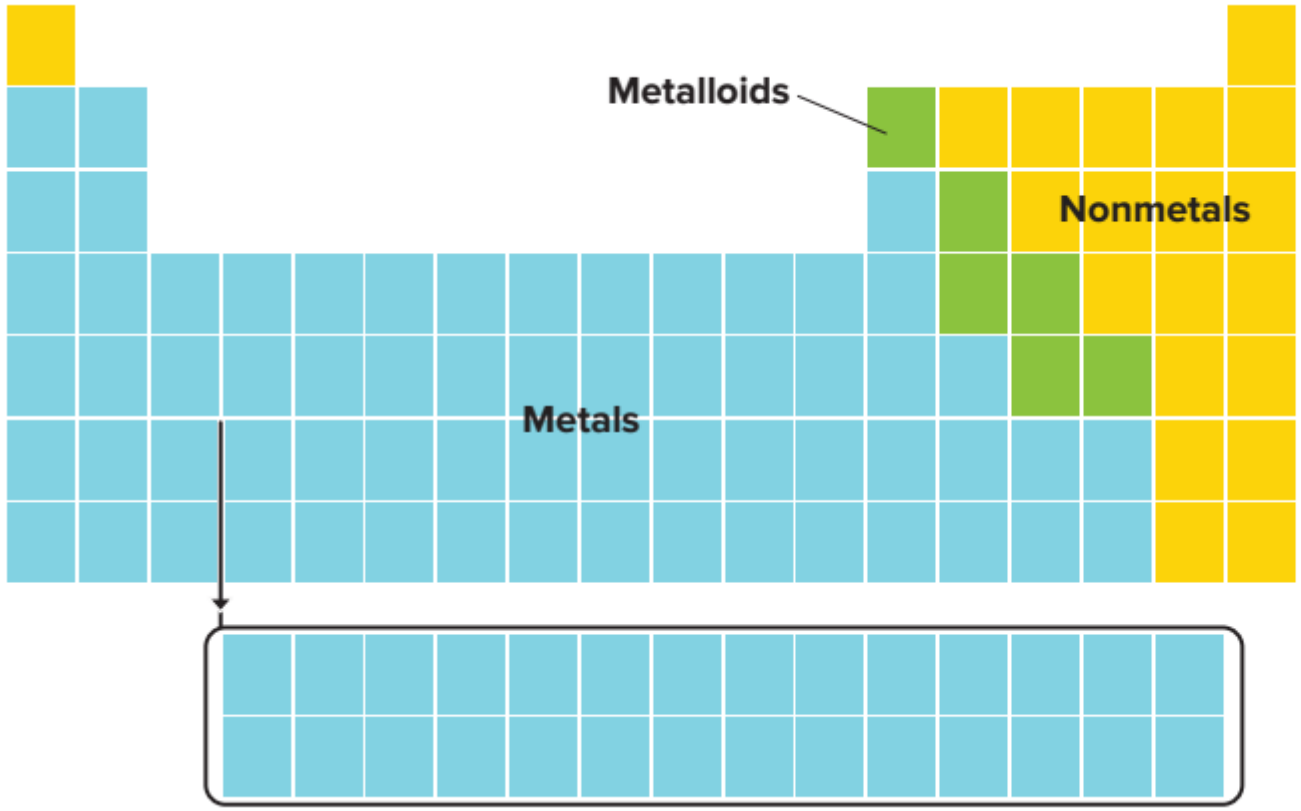


Figure 15 Metalloids are located along the green stair step line in the periodic table. Metals are located to the left of the metalloids and are shown in blue. Except for hydrogen, nonmetals are located to the right of the metalloids and are shown in yellow.

4	**Compare between the properties of metals and nonmetals, Identify the nonmetal & metal part in different chemical compounds (ionic) using the periodic table of element, compare between the alkali metals & alkaline earth metals**	textbook, periodic table fig 15, figures 4, 7, 10, 13,	**Page number 415, 424, 427, 430, 433**

Figure 4 Alkali metals are very reactive. For example, the vigorous reaction between potassium and water releases enough thermal energy to ignite the hydrogen gas that forms.

Figure 7 Copper is often mixed with zinc or nickel to make modern coins. Gold, silver, and bronze—an alloy of copper and tin—are used to make athletic medals.

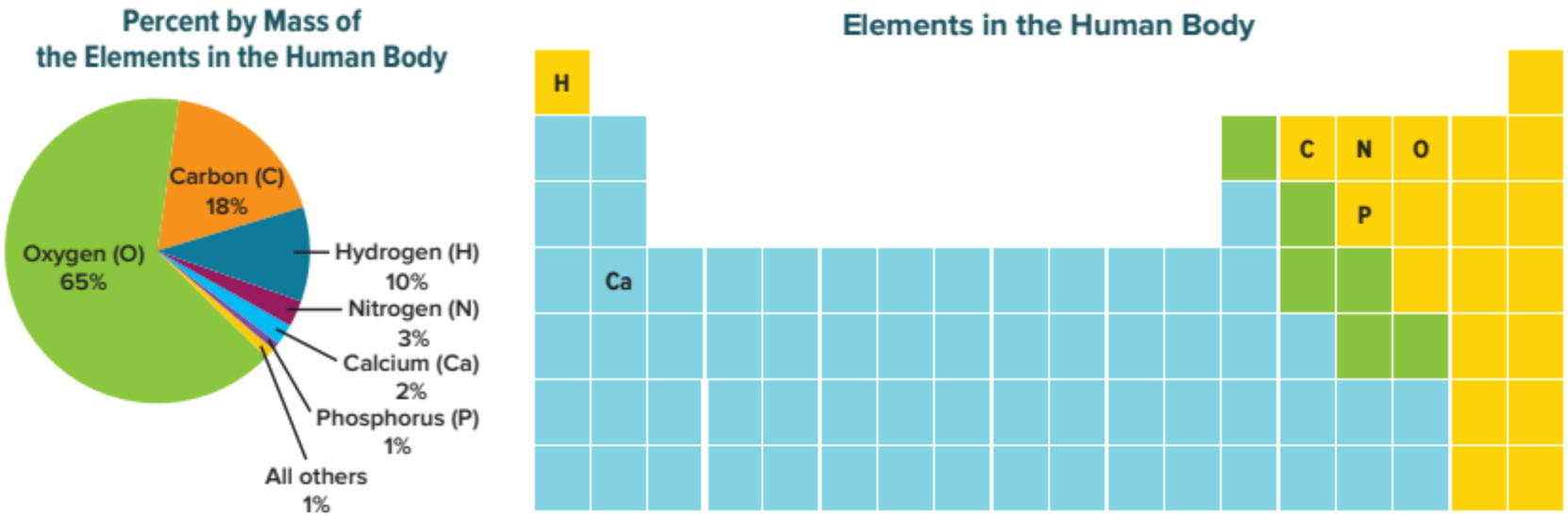


Figure 10 Humans are composed of mostly nonmetals. The pie chart breaks down the ratio of elements in the human body by mass (left). These elements mostly fall in the nonmetal portion of the periodic table (right).

Chlorine compounds are used to disinfect water in swimming pools.

Scientists use a bromine compound to stain DNA samples.

Iodine will sublime at room temperature.

Figure 13 Halogens have a wide variety of uses and properties.

1. How many electrons do atoms of the alkali metals have in their outer energy levels?

A. 1 B. 2 C. 3 D. 4

2. Which one of these elements is always found in nature combined with other elements?

A. copper B.silver
C. Magnesium D. gold

3. Which group of elements in the periodic table contains the noble gases?

A. group 3 B.group 8
C. group 13 D.group 18

4. Elements in group 2 of the periodic table are the

A. alkali metals B.transition metals.
C. coinage metals D. alkaline earth metals.

5. **Which group of elements in the periodic table is known as the halogens?**

A.group 15 B.group 16
C. group 17 D. group 18

6. Which of the following groups contains the most active metals?

A.group 1 B.group 2
C. group 17 D. group 18

7.Which of the following groups contains the most active nonmetals?

A.group 1 B.group 2
C. group 17 D. group 18

8.In the gaseous state, the _____ form diatomic covalent molecules.

A.noble gases B.halogens
C.alkaline earth metals D.alkali metals

9. Elements from which group all have two electrons in their outer energy levels?

A.noble gases B.halogens
C.alkaline earth metals D.alkali metals

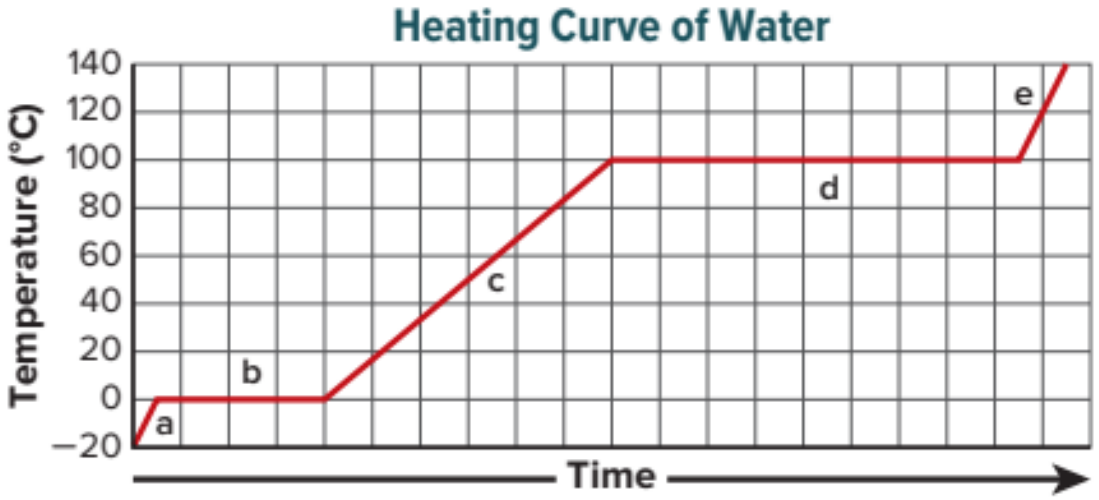
10. **When magnesium and fluorine react, what type of bond is formed?**

A.Diatomic B.Covalent
C. Ionic D. metallic

11. Which type of bonding consists of positively charged ions that are surrounded by a sea of freely moving electrons?

A.Diatomic B.Covalent
C. Ionic D. metallic

5	**Describe changes of state in terms of the attractive forces, and energy of particles, Analyze all feature on heating curves. & Predict the cooling curve features for the same matter**	textbook, figure 7	**Page number** 358



Q- What we call this diagram?

- **a heating curve**

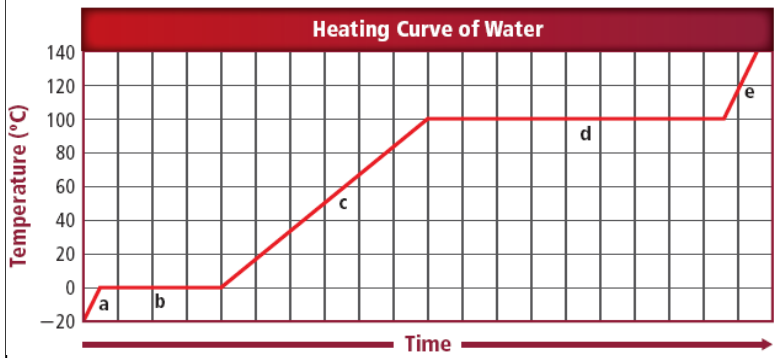
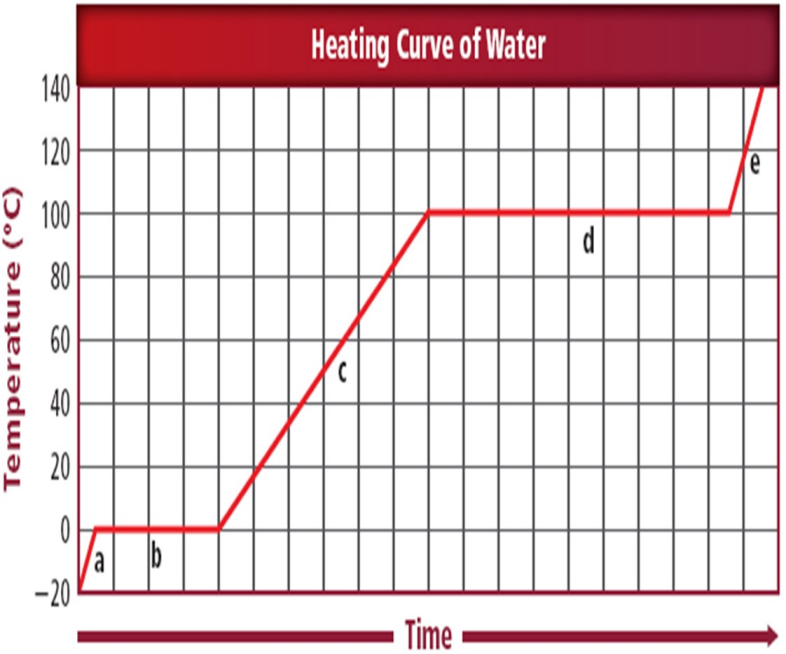


Figure 7 Although thermal energy is added at a constant rate, the temperature of the water increases only at *a*, *c*, and *e*. At *b* and *d*, the added energy is used to overcome the attractions between the particles.

Infer *how this graph would be different if 2.0 kg of water were being heated instead of 1.0 kg of water. How would this graph be different if 0.5 kg of water were being heated?*



a – Solid state

b – Melting point

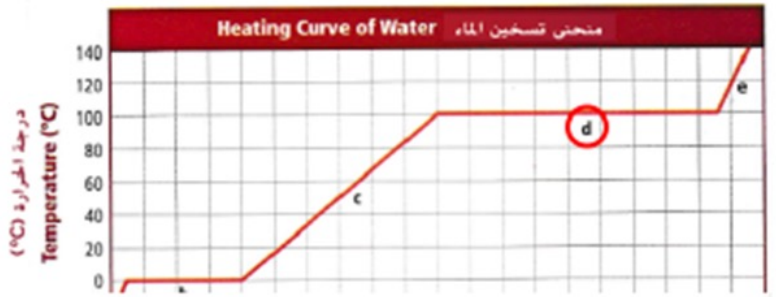
C- **Liquid** state

d- boiling point

e- gas state

Study the figure below and notice the temperatures at point c and d.
Why there is no change in the temperature overtime at point **d**?

ن بين درجات الحرارة عند النقطتين c و d،
بدرجة الحرارة مع مرور الزمن عند النقطة **d** ؟



Learning Outcomes Covered

- SCI.4.4.01.083

a. Because the added thermal energy is used to increase the water temperature gradually

ة الحرا ية المضافة تُستخدم لرفع درجة حرارة
جياً

b. Because the added thermal energy is used to overcome the attractions between the particles

ة الحرارية المُضافة تُستخدم للتغلّب على قوى
ن الجسـ ت

c. Because heating is slower, and temperature decrease over time

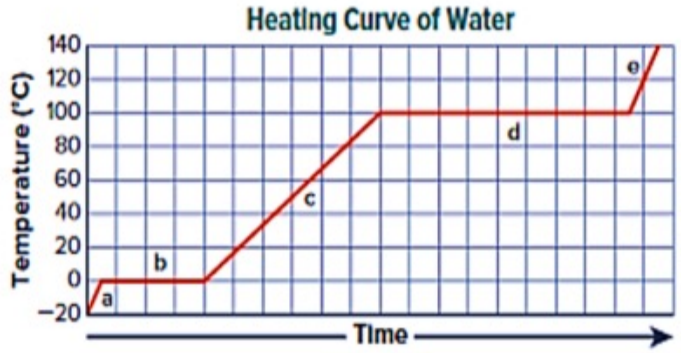
ين يكون أبطأ، وتقل درجة الحرارة مع الزمن

d. Because water is present in only one state which is the liquid

يكون فـ حالة واحدة فقط وهي السائلة

In the heating curve of water below, thermal energy is added at a constant rate.

Which intervals indicate that the added energy is used to overcome the attractions between the particles?



Answer :C

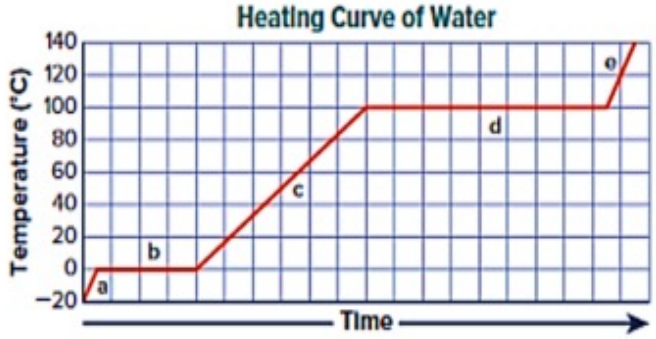
a. **a** & **b** only

b. **a**, **c**, & **e** only

c. **b** & **d** only

d. **c** & **d** only

In the heating curve of water below, in which intervals the temperature of water increases?



Answer :B

a. **a** & **b** only

b. **a**, **c**, & **e** only

c. **b** & **d** only

d. **c** & **d** only