

# Bell Work, May14 – May 18, 2018

Unit 6: Internal Structure, Periodic Table, Metals & Non-Metals, Ionic Compounds & Formulas, Naming ionic Compounds

# Bell Work, Monday, May 14, 2018, 8 questions



**1. Name the two types of elements?**

**Metals (M) & non-metals (NM).**

**2. List the properties of metals (M).**

**Metals conduct electricity and heat well, most are solids, can be shaped (malleable) and stretched into wires (ductile).**

**3. List the properties of non-metals (NM).**

**Non-metals are poor conductors of heat and electricity.**

**Non-metal solids are brittle & cannot be shaped, and many are gases.**

**4. Why are metals better conductors of electricity than non-metals?**

**In non-metals electrons are not free to move from atom to atom.**

- In metals the electrons are free to move to different atoms thus, electrons can move easily to other atoms.**
- Metals atoms clump (bond) together in large numbers and large numbers of electrons can flow freely around the positive cores.**

5. How do atoms become cations (positive ions)?

If a neutral atom loses an electron it has more positive charges than negative charges and thus becomes positive.

6. How do atoms become anions (negative ions)?

If a neutral atom gains an electron it has more negative charges than positive charges and becomes negative.

7. Metal atoms become cations. Explain.

Electrons can easily move out of metal atoms. When metal atoms lose electrons they become positive ions or cations.

8. Non-metal atoms become anions. Explain.

Non-metals gain electrons. When non-metal atoms gain electrons they become negative ions or anions.

# Bell Work, Tuesday, May 15, 2018, 8 questions

1. We have seen that some substances are made from “compound particles” which combine in definite ratios (example:  $\text{H}_2\text{O}$ ). What is the property called that holds these compounded particles together/

This property is called charge. There are three types of charge: positive charge, negative charge, and neutral charge.

2. What is the charge?

Charge is a basic amount of electrical force (a force causes a push or a pull). There are two types of charge: positive and negative.

An electron is the basic particle of negative charge.

A proton is the basic particle of positive charge.

3. What are the fundamental properties of charge?

Opposite charges, negative and positive, attract. Like charges (positive-positive, negative-negative) repel.



# Bell Work, Tuesday, May 15, 2018

## 4. What is the meaning of neutral charge?

Equal numbers of positive and negative charge result in a neutral charge.

## 5. What is the charge of an atom?

An atom has an equal number of negative charges and positive charges, thus an atom has a neutral charge.

## 6. What is an ion?

An ion is an atom or group atoms that has a positive or negative charge.

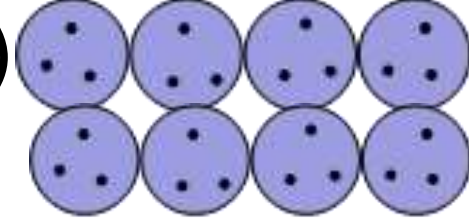
## 7. What is a cation?

A positive ion is known as a cation.

## 8. What is an anion?

A negative ion is known as an anion.

# Bell Work, Wednesday, 05/16/18 (7 questions)



**1. The atoms to the right have equal number of positive and negative charges. To become a positive tape:**

- A. The tape must gain positive charge, thus have more positive charge than negative charge (excess positive charge).
- B. the tape must lose positive charge, thus have more negative charge than positive charge (excess negative charge).
- C. The tape must gain negative charge, thus have more negative charge than positive charge (excess negative charge).
- D. The tape must lose negative charge, thus have more positive charge than negative charge (excess positive charge).**



**2. To become a negative tape (select answer from #1 A – D above.)**  
**The tape must gain negative charge, thus have more negative charge than positive charge (excess negative charge).**

**3. Which tape is similar to a metal? Which tape is similar to a non-metal?**

**The positive tape is like a metal because both metal and positive tape lose electrons.**

**The negative tape is like a non-metal because both gain electrons.**

**4. Experiments with the cathode-ray tube demonstrated that a cathode beam consists of charged particles**

**5. J.J. Thomson**

- a. discovered the nucleus of the atom
- b. suggested that the nucleus of the atom had a (+) charge
- c. proposed that the atom was a sphere of (−) charge
- d. concluded that atoms contained mobile particles with a (−) charge

**6. Describe how JJ Thomson concluded that the mobile charged particle in the atom had a (−) charge and that the mass must be much smaller than an atom.**

**The cathode ray was attracted to a + electric field and mass to charge ratio more than 1800 times smaller than hydrogen (the smallest atom).**

**7. Because any element used in the cathode ray tube during Thomson's cathode ray experiment, produced electrons, scientists concluded that all atoms contained electrons.**



1. Why is a periodic table useful?

The periodic table allows you to easily compare the properties of one or more element to other elements.



2. Explain how the periodic table is arranged.

- Each horizontal row of the periodic table is called a period.
- There are seven periods in the periodic table.
- Each vertical column of the periodic table is called a group.
- Elements within a group have similar chemical and physical properties.

3. Describe an ionic compound.

Ionic compounds are composed of metal cations and non-metal anions (M-NM).

- Ionic compounds are electrolytes (conducts electricity when dissolved).

4. Define main group elements.

Elements in groups 1 & 2 plus groups 13 – 18.

5. Define transition metals.

Elements in groups 3 - 12.

**6. How are cations (+ ions) named?**

**Cations use the element name. Example: sodium ion is called sodium.**

**7. How are anions (negative ions) named?**

**The end of the elements name is changed to “ide”. Example: Oxygen ion is called oxide. Nitrogen ion becomes nitride.**

**8. What is the symbol of the stable potassium ion (atomic # 19) ?**

**K<sup>+</sup>**

**9. What is the symbol of the stable calcium ion (atomic # 20) ?**

**Ca<sup>2+</sup>**

**10. What is the symbol of the stable sulfur ion (atomic # =16) ?**

**S<sup>2-</sup>**

**11. What is the symbol of the stable nitrogen ion (atomic # =7) ?**

**N<sup>3-</sup>**



**12. Write the formula for the following binary ionic compounds.**  
**Ionic compounds are neutral. Thus, the formula show that the compound has an equal number of positive and negative charges. The plus and minus signs are not used in the formula.**

a. lithium bromide      $\text{Li}^+ \text{Br}^-$       **$\text{LiBr}$**

b. barium hydride      $\text{Ba}^{2+} \text{H}^-$       **$\text{BaH}_2$**

c. aluminum fluoride      $\text{Al}^{3+} \text{F}^-$       **$\text{AlF}_3$**

d. potassium oxide      $\text{K}^+ \text{O}^{2-}$       **$\text{K}_2\text{O}$**

e. sodium nitride      $\text{Na}^+ \text{N}^{3-}$       **$\text{Na}_3\text{N}$**