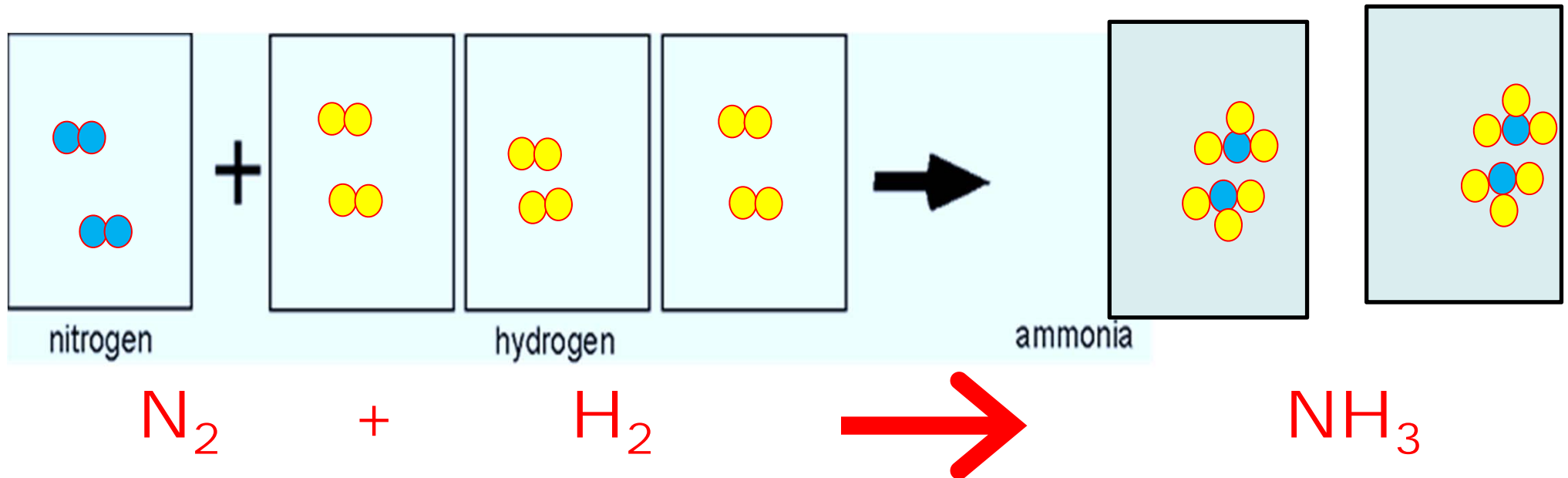
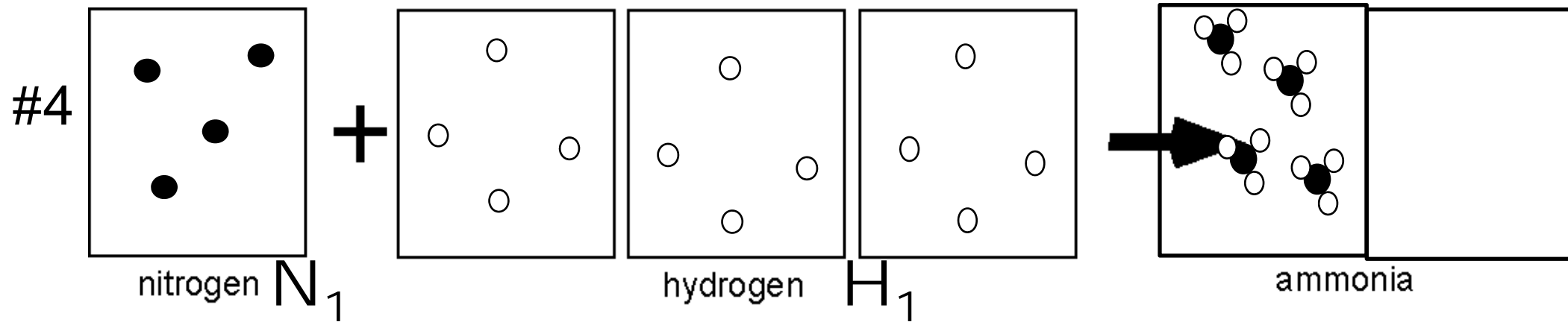


**Bell Work, May 12 – May 15 , 2014**

**Modeling Units 4 and 6**

# Bell Work, Monday, May 12 , 2014

**1. Nitrogen and hydrogen react to form two volumes of gaseous ammonia. Draw the correct molecules below. Write the correct formulas.**



Bell Work, Monday, May 12 , 2014

## **2. Describe the four main concepts of Dalton's Atomic Theory**

- 1. All matter is composed of indivisible, indestructible particles called atoms.**
- 2. All atoms of a given element are identical; atoms of different elements have different properties.**
- 3. Chemical reactions involve the combination of atoms, not the destruction of atoms.**

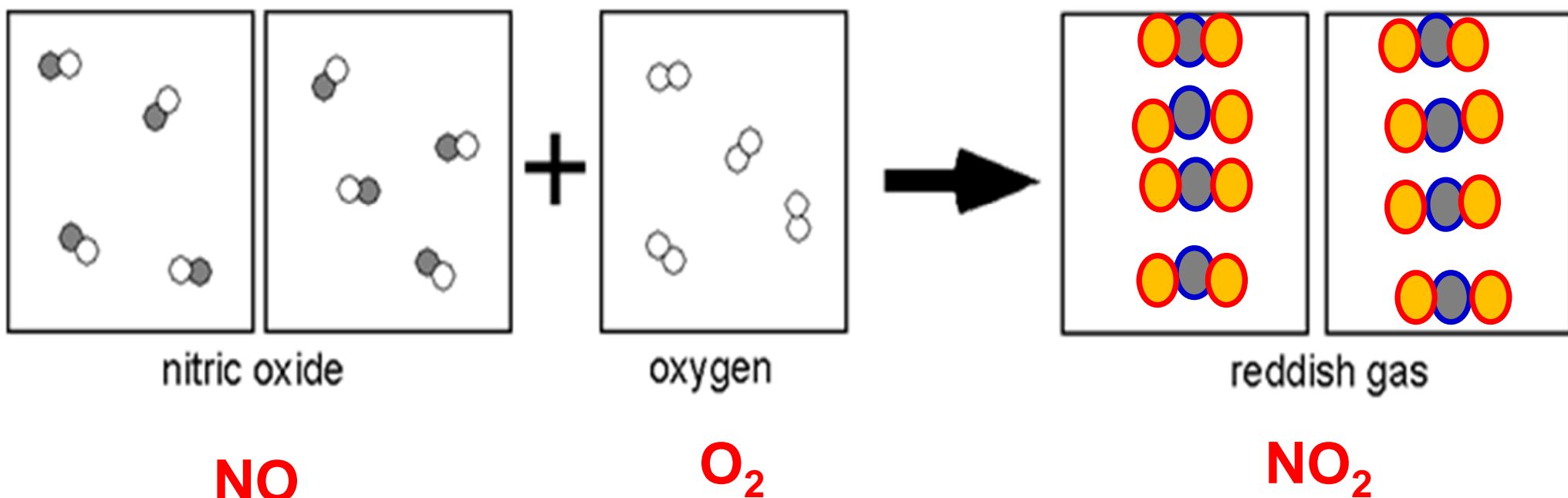
This was an extremely advanced concept for its time; while Dalton's theory implied that atoms bonded together, it would be more than 100 years before scientists began to explain the concept of chemical bonding.

## **4. When elements react to form compounds, they react in defined, whole-number ratios.**

Example:  $\text{H}_2\text{O}_1$  ( $\text{H}_2\text{O}$ ),  $\text{N}_1\text{H}_3$  ( $\text{NH}_3$ )

## Bell Work, Tuesday, 5/13/14

1. Two volumes of nitric oxide react with one volume of oxygen gas to form two volumes of a reddish-brown gas. Deduce the formula of this gas and sketch particle representations of its molecules.



## Bell Work, Tuesday, 5/13/14

2. State Avogadro's hypothesis

**Equal volumes of gases contain the same number of molecules at the same pressure and temperature.**

3. State the Law of Definite Proportions

**Atoms combine in simple whole-number ratios.**

**The ratio of atoms of each element in a compound is fixed.**

**Example: water is always 2 hydrogens to 1 oxygen:**

**H<sub>2</sub>O, carbon dioxide is always 1 carbon & 2 oxygen's, CO<sub>2</sub>**

4. State the Law of Multiple Proportions

**The same two elements can form compounds with different ratios of these elements.**

**Example: nitrogen & oxygen can combine like this:**

**NO, NO<sub>2</sub>, N<sub>2</sub>O, N<sub>2</sub>O<sub>2</sub>**

## Bell Work, Wednesday, May 14 , 2014 (8 ques)

**1. When you ripped the tapes apart in the Sticky Tape Lab, the two pieces of tape were then attracted to each other. A hypothesis was proposed to account for this observation. Which of the following features of our hypothesis is NOT supported by this observation alone?**

- a. Some charged particle was transferred between atoms of the two tapes.
- b. Atoms contain smaller particles that carry an electric charge.
- c. The smaller, charged particle in the atom is negatively charged.
- d. The smaller, charged particle in the atom is mobile.

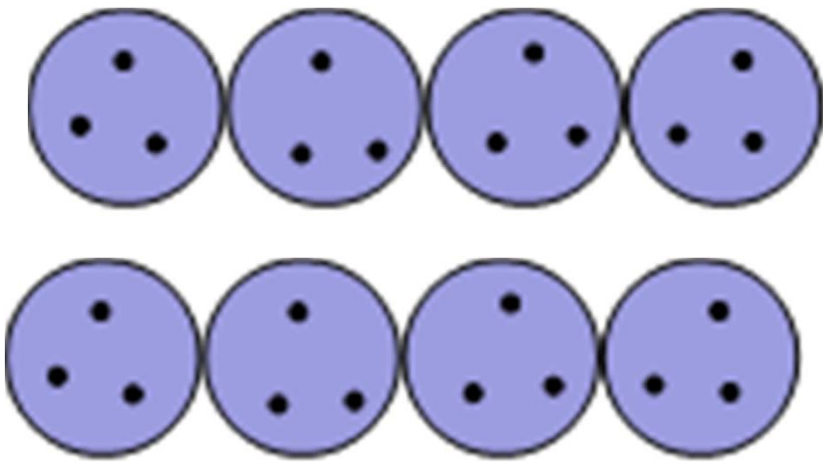
**2. We determined the top piece of tape was:**

- a. positive because it was repelled by another top tape
- b. positive, because it was attracted to the plastic rod, which was defined as having negative charge.
- c. negative, because it was repelled by the other top tape.
- d. positive, because it was attracted to the bottom tape.

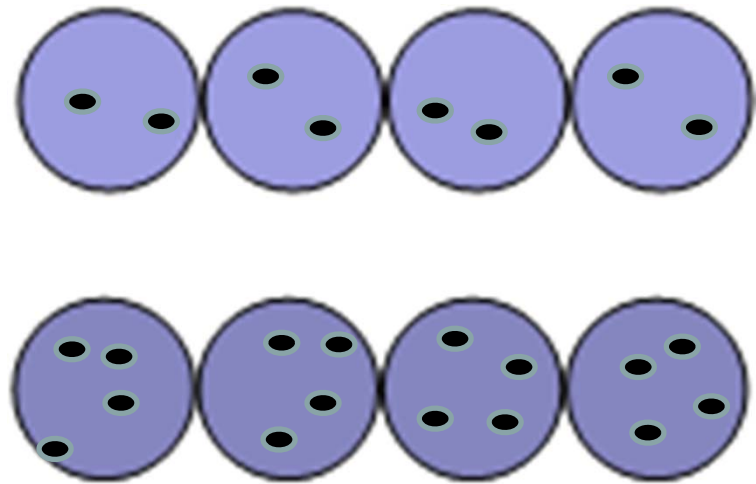
# Bell Work, Wednesday, May 14 , 2014



3. Below are groups of the inner cores of the atoms of the tapes after they have been pulled apart. Sketch in the mobile negative charges to show how the top tape becomes (+) and the bottom becomes (-).



Before tapes are separated



After tapes are separated

Show more dots on the negative tape, less dots on the positive tape.



## Bell Work, Wednesday, May 14 , 2014



### **4. Experiments with the cathode-ray tube demonstrated that**

- a. visible light was influenced by a magnet
- b. a cathode beam consists of charged particles
- c. atoms are negatively charged
- d. atoms contain a nucleus

### **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 1000 times smaller than hydrogen (the smallest atom)**



Bell Work, Wednesday, May 14 , 2014



**7. Which of the following was one of Dalton's improvements over Democritus's ideas?**

- a. Matter consists of tiny particles called atoms.
- b. Atoms are indivisible
- c. Atoms retain their identity in a chemical reaction.
- d. Atoms are indestructible.

**8. The range in size of most atomic radii is approximately**

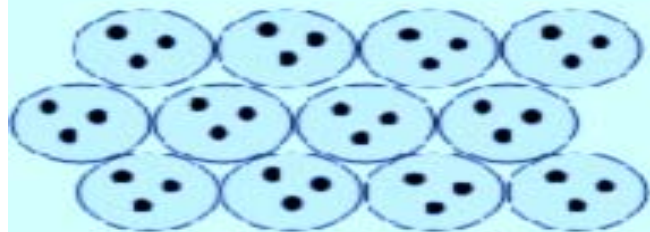
- a. 2 to 5 cm.
- b. 2 to 5 nm.
- c.  $5 \times 10^{-11} \text{ m}$  to  $2 \times 10^{-10} \text{ m}$
- d.  $5 \times 10^{-21} \text{ m}$  to  $2 \times 10^{-20} \text{ m}$ .



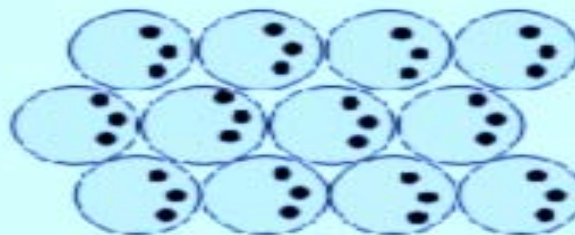
Bell Work, Thursday, May 15, 2014



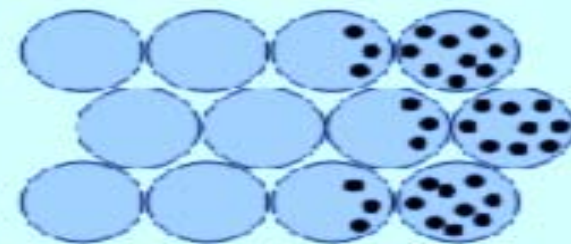
Draw the “bowls of pudding” below.



A



B



C

1. Which of the above models represents aluminum foil when a charged object is brought near.

- a. A    c. C  
b. B    d. none of the answers are correct

2. Which of the above models represents paper when a charged object is brought near.

- a. A    c. C  
b. B    d. none of the answers are correct

3. Which of the above models represents a neutral object when no charged object is near.

- A, B, C



## Bell Work, Thursday, May 15, 2014



**4. To what category of elements does an element belong if it is a good conductor of electricity?**

- a. nonmetals
- b. halogens
- c. metalloids
- d. metals

**5. To what category of elements does an element belong if it is a poor conductor of electricity?**

- a. nonmetals
- b. metals
- c. metalloids
- d. transition elements

**6. What is the basis of a metals conductivity?**

- a. mobile electrons
- b. the attraction between neutral metal atoms
- c. the neutralization of protons by electrons
- d. Fixed electron positions

**7. Atoms that gain or loose electrons and thus have positive or negative charge are called?**

- a. molecules
- b. elements
- c. compounds
- d. ions



## Bell Work, Thursday, May 15 , 2014



**8. Because a few positively charged particles bounced back from the foil, Rutherford concluded that such particles were**

- a. striking electrons.
- b. indivisible.
- c. repelled by densely packed regions of positive charge.

**9. Rutherford's experiments led him to conclude that atoms contain massive central regions that have**

- a. a negative charge.
- b. no charge.
- c. a positive charge.
- d. both protons and electrons.

**10. Because most particles fired at metal foil passed straight through, Rutherford concluded that**

- a. atoms were mostly empty space.
- b. atoms contained no charged particles.
- c. electrons formed the nucleus.
- d. atoms were indivisible