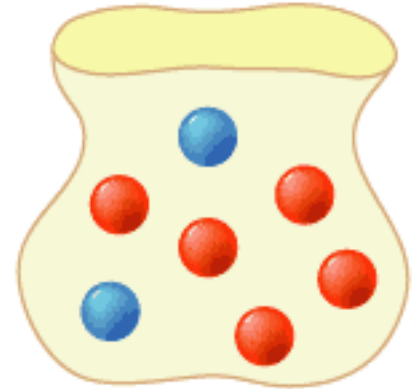


Activity: Bags O'Atoms (Part 1)



Materials: 4 Bags O' Atoms, Balance

According to the atomic models we learned about in the last topic, you know that atoms are made up of protons, neutrons, and electrons. Sometimes scientists create *models* to explain or describe things they cannot easily see. These bags are *models* of atoms. Examine the bags you are given and answer the questions that follow.



Record your four bag numbers here: _____

1. How are all of your “atom” bags the same?
2. What do you think the two colored stones *inside* the bag represent?
3. What does the inside of the bag represent?
4. What do you notice is on the outside of the bag?
 - a. What do you think they represent?
 - b. Why are they on the outside of the bag?
5. How are your “atom” bags different from each other?
6. What *quantitative* data about each bag could you record and use to tell the bags apart?
7. We can tell each bag apart by counting the parts. Count the pieces of each of your bag and complete the data table below.

Bag #	# Red Stones	# White Stones	# Black Dots

In your “atom” bag, red stones represent protons, white stones are neutrons, and black dots are electrons.

8. According to the data table, two of your “atom” bags have something in common. What characteristic do they share? If these bags were real atoms, what would that mean?

9. What is different about these two “atom” bags? If these bags were real atoms, what would that mean?



10. As you hold one of your bags, you’ll notice that it has mass. Where does almost all the mass of your “atom” bag come from?



11. Since this bag represents an atom, where does most of the mass of the atom come from?



12. Now put each of your four “atom” bags on an electronic balance and record the mass of each bag.

Bag #				
Mass (g)				

13. Why are the masses of your bags different?

14. Choose one of your bags. On an electronic balance find the *average* mass of each type of subatomic particle in your “atom” bag (do not cut the bag in any way) and record your averages here:

Proton: _____ g Neutron: _____ g Electron: _____ g

15. What do you notice about the masses of each type of subatomic particle?

16. Look at the black dots (electrons) on the outside of each bag. What do you notice about the pattern of these dots? Do you think that pattern is significant?

17. If red stones are protons (+ charge), and black dots are electrons (- charge), and white stones are neutrons (0 charge), what would the overall charge be on each of your “atom” bags?

Bag #				
Overall Charge				

18. What would the charge be in the *nucleus only* of each of your “atom” bags?

Bag #				
Nuclear Charge				

19. Define the following words:

Atom

Subatomic particle

Neutral

Nucleon