

## Build an Atom

Demos for pre-lesson and clicker questions for post-lesson  
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### Learning Goals- Students will be able to:

- Make atom models that show stable atoms or ions.
- Use given information about subatomic particles to
- Identify an element and its position on the periodic table
- Draw models of atoms
- Determine if the model is for a neutral atom or an ion.
- Predict how addition or subtraction of a proton, neutron, or electron will change the element, the charge, and the mass of their atom or ion.
- Describe all vocabulary words needed to meet the goals.
- Use a periodic symbol to tell the number of protons, neutrons, and electrons in an atom or ion.
- Draw the symbol for the element as you would see on the periodic table

## Rules

1. The toothpick must have a marshmallow on each end
2. Each part must be used.

1. What can you make with 2 marshmallows and one toothpick?



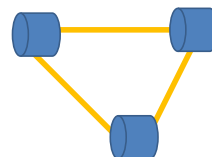
1a. What would you call this?



2. What can you make with 3 marshmallows and 3 toothpicks?



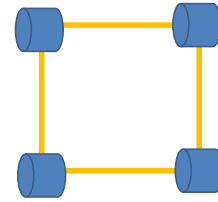
2a. What would you call this?



3. What can you make with 4 marshmallows and 4 toothpicks ?

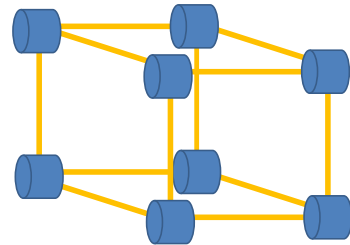


3a. What would you call this?



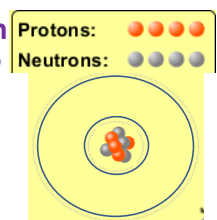
4. How many marshmallows and how many toothpicks would you need to make a box?

4a. 8 marshmallows and 12 sticks



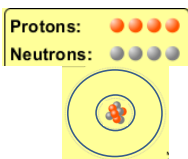
Clicker questions for Post-Lesson

1. What can you make with 4 protons and 4 neutrons?



- A. Oxygen atom
- B. Oxygen ion
- C. Beryllium atom
- D. Beryllium ion
- E. 2 of these

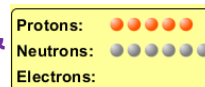
2. Would you predict that 4 protons and 4 neutrons will make a stable nucleus?



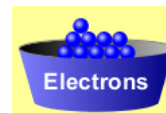
- A. No, because the net charge is high  
B. No, because there should always be more protons than neutrons  
C. Yes, because the number of protons and neutrons are about equal



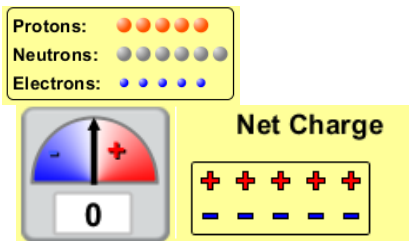
3. If you have 5 protons & 6 neutrons, how many electrons would you add to make a neutral atom?



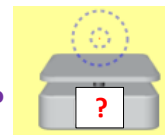
- A. 5 electrons  
B. 6 electrons  
C. 11 electrons



3. Reasoning: Neutrons don't matter because they have zero charge; need equal number of protons and electrons

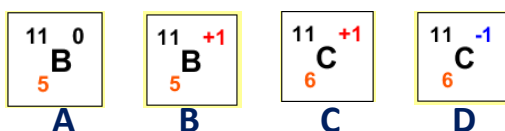
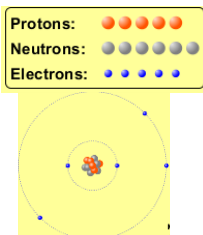


4. What is mass for an atom with 8 protons, 9 neutrons and 8 electrons?

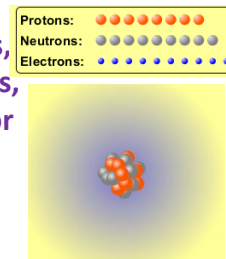


- A. Zero  
B. 8  
C. 16  
D. 17  
E. 25

5. If you have 5 protons, 6 neutrons, & 5 electrons, what would the symbol look like?

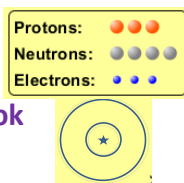


6. If you have 8 protons, 9 neutrons, 10 electrons, what would the atom or ion be?



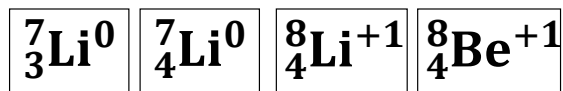
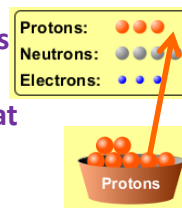
- A. Zero, it's an atom  
B. +2 ion  
C. +1 ion  
D. -1 ion  
E. -2 ion

7. If you have 3 protons, 4 neutrons, & 3 electrons, what would the model look like?



- A. 3 red & 3 blue in center; 4 grey on rings
- B. 3 red & 4 grey in center; 3 blue on rings
- C. 3 blue & 4 grey in center; 3 red on rings

8. If a particle has 3 protons, 4 neutrons, & 3 electrons, then a proton is added what would the symbol be?



A

B

C

D