

BONDING UNIT: **Big Question: What we are trying to master!**
How and why does matter interact? (atoms/molecules/compounds)

D 11. Describe how atoms combine to form new substances by transferring electrons (ionic bonding) or sharing electrons (covalent bonding).

OBJECTIVE	TASKS	PLAYLIST
<p>Atoms combine to form molecules by sharing electrons to form covalent or metallic bonds or by exchanging electrons to form ionic bonds.</p>	<ol style="list-style-type: none"> 1. Identify the number of valence electrons in an atom. 2. Draw Lewis Dot diagrams for covalent and ionic compounds 	<p>TED ED VIDEO: http://ed.ted.com/lessons/the-science-of-macaroni-salad-what-s-in-a-molecule-josh-kurz</p>
<p>Electronegativity and ionization energy are related to bond formation.</p>	<ol style="list-style-type: none"> 1. Identify the properties of the different types of bonds 2. Evaluate the bond type in a compound using electronegativity and ionization energy 3. Describe the formation process of ionic and covalent bonds and the resulting bond structure 	
<p>Chemical bonds between atoms depend on atomic properties such as; biological molecules are covalent while salt crystals, are ionic and metallic bonds are a sea of electrons.</p>	<ol style="list-style-type: none"> 1. Write formulas for ionic and covalent compounds 2. Relate the electron sea model to the physical properties of the metal. 	

Chemical Bonding Mastery Based Project

Answer the big idea question: How and why does matter interact in your favorite recipe.

Create a presentation of your favorite recipe describing how and why the matter in your recipe interacts!

Your presentation must include:

1. Visual Component: Photos, Slide Show, Video etc.
2. Written Component: Flash card prompts, Recipe booklet, Poster etc.

Explaining the following in your recipe:

- a. Explain the types of compounds in your recipe:
(Ionic or molecular-polar, non-polar)
2 compounds-1 must be ionic and the other molecular = **proficient**
Additional compound = **exemplary**
 - b. Explain the types of bonds in the compounds: (Ionic or covalent)
2 bonds-1 must be ionic and the other molecular = **proficient**
Additional bond = **exemplary**
 - c. Describe the Lewis Dot diagram for one covalent molecule and one ionic compound = **proficient**. Additional Lewis Dot = **exemplary**
 - d. Describe how the compounds are interacting in the recipe (physical interaction, i.e. type of mixture, suspension AND chemical interaction, i.e. change in matter. Think-baking or cooking step) 3 interaction must be explained—2 physical and 1 chemical = **proficient**, Additional interaction = **exemplary**
3. Verbal explanation on Gallery Walk day.

Chemical Bonding Mastery Based Project

RUBRIC

COMPETENCY	EXPECTATION	SCORE
Content: Types of compound		
Content: Type of bonds		
Content: Lewis Dot Diagram		
Content: Type of Interactions		
Communication: Express ideas clearly		
Communication: Communicate appropriately to targeted audience		
Communication: Choose appropriate content, style, and tone suitable to purpose		
Communication: Create quality products in chosen media		

BONDING PLAYLIST

1. TED ED VIDEO The Science of Macaroni Salad and Worksheet: <http://ed.ted.com/lessons/the-science-of-macaroni-salad-what-s-in-a-molecule-josh-kurz>

The Science of Macaroni Salad Worksheet

Comprehension Quiz

Many larger complex molecules are just _____.

- a. Random bits of chemical information that scientists don't really understand
- b. Smaller molecules bonded together like building blocks
- c. Change their chemical composition randomly, but on a consistent basis
- d. Are unique to macaroni salad (that's why we're using it as an example), and can exist nowhere else in the world

Which is the starch molecule?

- a. Amylose
- b. Framtrose
- c. Maltose
- d. Hydrolase

Humans can't use the large molecules in proteins but can use _____.

- a. The complex carbohydrates found in all proteins
- b. Tools, like the wrench and the jigsaw, in order to aide digestion
- c. An auto filtration system evolved over billions of years to help us filter out all the parts of proteins we can't use
- d. The amino acids that make up the proteins

Atoms are the _____.

- a. Combination of one or more molecules
- b. Building blocks of the building blocks
- c. Components of proteins the body has to use in order to derive the proper nutrition from the food it digests
- d. Best thing man ever invented

Which is not an atom that repeatedly shows up in macaroni salad?

- a. Carbon
- b. Oxygen
- c. Nitrogen
- d. Phosphorus
- e. All of these repeatedly show up
- f. None of these repeatedly show up

Explain, in a nutshell, how everything is made out of the same stuff.