Marking Period 2 Project "An Interesting Molecule"

The main purpose of this project is to research an interesting molecule and present the information that you have gathered in a ***typed report format (paragraphs)***. You may choose any molecule from the list provided that contains covalent, ionic, and/or metallic bonds**.** Remember, it should be a molecule that is interesting to **you**. A rubric is attached to assist you.

Format: Required information should be in paragraph form. The most important part is that the specific information is provided on the pages that are indicated for ease of grading. Please use a decent sized, readable font (nothing playful or curly), 0.5" margins, and 1.5 spacing. The idea is to keep all the information that is required on the same page as indicated below, so if a page is not filled completely, add some appropriate clip art to make it aesthetically pleasing. If you go over a page, simply shrink the font.

Cover page:

1. Identifying information about the molecule chosen.
    a. a picture of the molecule,
    b. chemical formula,
    c. any common names for the molecule that are used or have been used in the past.
    d. your name and Chemistry period.

Page 1: *3 paragraphs*

2. Information about molecule:
    a. Common or other names for the molecule that are used or have been used in the past.
    b. Chemical Formula
    c. Systematic (IUPAC) name for your molecule
    d. Molar Mass
    e. Physical properties of molecule (mp, bp, density, specific gravity, solubility in water/alcohol, etc.)
    f. Chemical properties of molecule (reactivity w/ other substances, flammability, decomposition, etc...)
    g. Historical background (discovery of it-by whom and how)

3: Uses and Importance of this molecule:
    a. How is this molecule used in research, medicine, or industry?
    b. What role does this molecule play in science? What is its significance?

4: Source of this molecule (how is the molecule obtained, purified, synthesized in a lab, etc.):
    a. Is this molecule found in the earth already formed? If so, how is it collected and purified?
    b. Is this molecule formed in a lab? If so, how is it synthesized? Show the equations of the various reactions involved in this molecule's formation.

Page 2:

5. More than 2 pictures of this molecule's structure:
    a. Is the molecule ionic or covalent? ***Draw the following directly on one picture.***
    - If ionic, provide a diagram of the crystal lattice of this molecule. On a picture identify:
        - the shape of the lattice.
        - the charges of the ions.
    - If covalent, provide a diagram of the molecular structure of this molecule. ***On the picture*** identify:
        - the shape(s) that exist in the molecule by selecting a minimum of 3 central atoms and indicate the orientation of the atoms bonded to it (i.e., tetrahedral, trigonal planar, etc).
        - which bonds in the molecule are polar or non-polar; draw dipole moments of ***all bonds***.
        - any molecular dipoles only if the molecule is a dipole.
        - the hybridization of ***all the central atoms*** in the molecule.
        - select two central atoms and show the formal charges and how they were calculated.

    Remember, all of this information should be included on the picture. You may either type all of the information in (cumbersome) or you can print out a picture of the molecule, hand write in the information, take another picture of it, and then insert the picture into the report (probably the best way to go).
6. Calculate the percent composition of the various elements in the molecule. Show your work. This can be handwritten and inserted via a picture too.

Page 3:

7. Find some bizarre fact about your molecule--something that is unique and relatively unknown by the general population.
8. Discuss the reason why you chose this molecule. This needs to be genuine--not because your friend chose it too. Use this as a genuine opportunity to learn something.

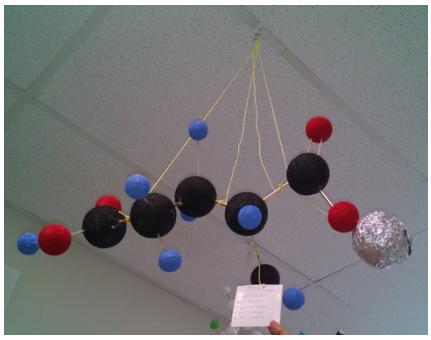
Page 4:

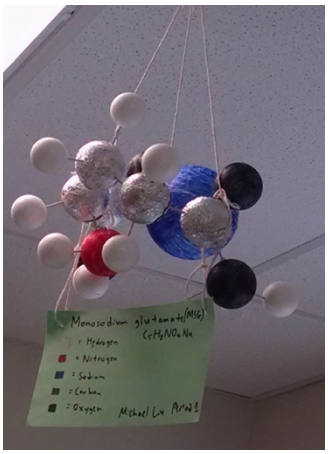
9. Bibliography
    a. MLA format
    b. You should have ***at least 3 reputable sources*** that you used for your research.

3D Molecular Model

10. Build a 3D model of your molecule using whatever items you choose (ping pong balls, toothpicks, skewers, paperclips, Al foil, Styrofoam balls, beads, straws).
    - Make sure to keep with the appropriate scale of the sizes of various elements as well as # bonds and bond angles. H and C are NOT the same size and should not be the same color.
    - The model must be able to be hung from the ceiling of the classroom. Make sure the string(s) are attached to your molecule ***before*** coming to class. You can use multiple strings throughout the molecule for support. ***This should be done before you bring it to class.***
    - Make sure to attach a key tag indicating the name of the molecule, how each atom is represented, your name, and period. The key should be large enough and legible enough to be seen from the ground.

Examples showing how molecule is hung using multiple pieces of string:





To help construct your molecule use these websites:
http://molview.org/
http://chemdata.r.umn.edu/resources/models360/models.php

they are great websites to use for 3D modeling.

PROJECT TOPIC LIST

http://www.reciprocalnet.org/edumodules/commonmolecules/list.html

ABSCISIC ACID
ACETAMINOPHEN
ACETYLCHOLINE
ACETYLSALICYLIC ACID
ADIPIC ACID
ASPARTAME
ATRAZINE
BACLOFEN
BILIRUBIN
CAFFEINE
CAPSAICIN
CHOLESTEROL
CORTISONE
DAUNOSAMINE
DDT
DEET
DEMEROL
DOPAMINE
EDTA
EPINEPHRINE
ESTRADIOL
FLECAINIDE
FOLIC ACID
FREON 113
FREON 12
FULLERENE
GLYCEROL
HISTAMINE
IBUPROFEN
INDIGO
INDOMETHACIN
ISOEUGENOL
ISOPRENE
KEVLAR
L-TRYPTOPHAN
LYCOPENE
METHADONE
MORPHINE
MSG
MUSTARD GAS
NEPETALACTONE
NIACIN
NICOTINE
NOVACAINE
PENICILLIN V
PHENOL
PHENYLALANINE
PHOSGENE
PHYSOSTIGMINE
PIPERINE
POLYESTER
PROZAC
PSEUDOEPHEDRINE
QUININE
RETINAL
RIBOFLAVIN
SACCHARIN
SALICYLIC ACID
SARIN
SEROTONIN
STYRENE
TESTOSTERONE
THEOBROMINE
THYROXINE
TOLMETIN
TRINITROTOLUENE
VALIUM
VANILLIN
VITAMIN B12
VITAMIN B6
VITAMIN C
VITAMIN E
VITAMIN K1
ZEATIN

Name:_____ Name:_____
Honors Chemistry Period_____ Honors Chemistry Period_____
Molecule_____ Molecule_____

	Cover page—2 points		**Cover page—2 points**
	Picture of molecule		Picture of molecule
	Chemical formula		Chemical formula
	Common name for the molecule		Common name for the molecule
	Name and period		Name and period
	Page 1—10 points		**Page 1—10 points**
	Common name for molecule		Common name for molecule
	Chemical formula		Chemical formula
	Molar Mass		Molar Mass
	Melting point/Boiling Point		Melting point /Boiling Point
	Solubility in water/alcohol		Solubility in water/alcohol
	Chemical properties		Chemical properties
	Historical background		Historical background
	Uses and importance		Uses and importance
	Source (how is it obtained)		Source (how is it obtained)
	Page 2—10 points		**Page 2—10 points**
	More than 2 pictures of molecular structure		More than 2 pictures of molecular structure
	Diagram of molecule/ionic lattice		Diagram of molecule/ionic lattice
	Bond polarity/Molecular polarity identified		Bond polarity/Molecular polarity identified
	Multiple bonds/hybridization indicated		Multiple bonds/hybridization indicated
	Formal Charge calculated and indicated		Formal Charge calculated and indicated
	Percent composition of each element		Percent composition of each element
	Page 3—10 points		**Page 3—10 points**
	Bizarre fact about molecule		Bizarre fact about molecule
	Why you chose this molecule		Why you chose this molecule
	Page 4—Bibliography—3 points		**Page 4—Bibliography—3 points**
	MLA format; at least 3 sources		MLA format; at least 3 sources
	Model —15 points 3-D Molecular Model with appropriate bond angles and element differentiation using size and color, legible key, successfully hung in classroom.		**Model —15 points** 3-D Molecular Model with appropriate bond angles and element differentiation using size and color, legible key, successfully hung in classroom.
	Total (50)		**Total (50)**