Lewis dots and molecule shapes **DRAFT #1** **Nov 7, 2002**
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Objective:
Students will practice drawing Lewis dot structures and predict molecular shapes

Target student audience: College prep high school chemistry

ChemSense User Level: BEGINNING / INTERMEDIATE

ChemSense Tools used: DRAWING, MODELLING

TEXT NOTES – SUMMARIZE / PREDICT / EXPLAIN

FEEDBACK – TEACHER / PEER

Specialized Tools needed: none

Classroom Implementation

Time: approx. 30-40 minutes
Student Grouping: pairs
Activity type: on screen and on paper sketching of molecules and predicting shapes.

Chemistry Concepts in Activity (linked to CA stds & ChemSense 5 themes):
California Science standards:
1d. Students know how to use the periodic table to determine the number of electrons available for bonding.

2e. *Students know* how to draw Lewis dot structures.

2f.* *Students know* how to predict the shape of simple molecules and their polarity from Lewis dot structures.

ChemSense themes: aggregation, connectivity and geometry

Pre-requisite Chemistry Concepts:
Knowledge of valence electrons, Lewis dot structures, formation of covalent bonds, types of molecular geometry

Inquiry Skills (linked to NSES):
Formulate and revise scientific explanations and models using logic and evidence (NSES)
Double and triple bonds: NSES content standard A- structures and properties of matter
Electron pairs in covalent bonds part of NSES standard A- structures and properties of matter
Valence electrons- part of NSES standard A- structures and properties of matter
ACTIVITY Summary:

- In pairs, students construct Lewis dot structures for six compounds , using the drawing tool .($SiCl_4$,CO_2 , SO_2 , SCl_2, HCN, NF_3)
- Using the text tool, determine and label the shape of each molecule
- Make a sketch of each molecule on paper, and label the molecular shape.
- Summarize : Which shapes were linear? Are CO_2 and SO_2 the same shape? Explain. In which molecules/shapes are there **no** unshared electrons on the central atom?
- In class lesson check/ wrap up – Show completed molecules and name of shapes on large TV monitor / or board.

Sources:

Application: Earth science application of geometry/ polarity of water molecule to enrich a unit on meteorology/ or erosion . Description of water as "universal solvent"

ACTIVITY (several pages):
Rubric/s for scoring:
Drawing component:
Insufficient mastery: Incorrect number or placement of electrons in 3 or more compounds

Basic mastery: Placement of electrons and satisfaction of octet rule in 4 or more compounds is correct

Exceptional mastery: Placement of electrons and satisfaction of octet rule in 5-6 compounds is correct

Text Tool:
Insufficient mastery: Incorrect molecular shape predicted for 3 or more compounds.

Basic mastery: Correct molecular shape predicted for 4 compounds

Exceptional mastery : Correct molecular shape predicted for 5-6 compounds