AP CHEMISTRY Class Research Project

**The objective of this project is to learn about the structures, properties, and interactions of solids and liquids and to explain your understandings in the form of detailed particle diagrams.**

You have been assigned a research pair or trio to meet the learning objective(s) provided you, with the tools you have been given. If you feel that you need more tools, let the teacher know what and why. You will first conduct your research and document the information that you have on a scrap piece of paper and then collaboratively as a class, you will work on a way to combine all of your research in one complete presentation for your principal investigator (the teacher).

Every part of the learning objectives must be met and examples are highly encouraged to support information given. Your final project may involve chart paper, PowerPoints, a series of diagrams, etc. You will have an hour and a half to complete this whole project. Do not underestimate the power of teamwork to get this done.

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| You will be given a class grade on your final project. The following rubric will decide your class grade:   * Every part of each learning objective is met. [50 points]   + May include: definitions, drawings, examples, necessary facts, flow charts, etc. * Accurate and appropriate particle diagrams for liquids and solids provided. [25 points] * Coherent and cohesive meshing of each group’s work in final project. [15 points] * Equal participation of each student was observed. [10 points] * Bonus points for…   + Positive attitude and supporting one another   + Strong use of work time given   + Cool and relevant facts   + Creativity and neatness |

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| **Learning Objective** | **Tools to Learn** | **Assigned Researchers** |
| Learning objective 2.3 The student is able to use aspects of particulate models (i.e., particle spacing, motion, and forces of attraction) to reason about observed differences between solid and liquid phases and among solid and liquid materials. [See SP 6.4, 7.1; Essential knowledge 2.A.1] | Simulation:  <http://phet.colorado.edu/en/simulation/states-of-matter>  --Notes Given | Peter  Willie  Connor |
| Learning objective 2.9 The student is able to create or interpret representations that link the concept of molarity with particle views of solutions. [See SP 1.1, 1.4; Essential knowledge 2.A.3] | --Simulation… compare moles and volume (on SMART board)  <http://phet.colorado.edu/en/simulation/states-of-matter> | Sam  Dursitu |
| Learning objective 2.8 The student can draw and/or interpret representations of solutions that show the interactions between the solute and solvent. [See SP 1.1, 1.2, 6.4; Essential knowledge 2.A.3]  Learning objective 2.15 The student is able to explain observations regarding the solubility of ionic solids and molecules in water and other solvents on the basis of particle views that include intermolecular interactions and entropic effects. [See SP 1.4, 6.2; Essential knowledge 2.B.3, connects to 5.E.1] | --Dissolve different solids in water and draw particle diagram to represent interactions (give examples)  --Simulation…  <http://phet.colorado.edu/en/simulation/soluble-salts> | Emma  Webster |
| Learning objective 2.16 The student is able to explain the properties (phase, vapor pressure, viscosity, etc.) of small and large molecular compounds in terms of the strengths and types of intermolecular forces. [See SP 6.2; Essential knowledge 2.B.3] | --surface tension and viscosity demos…  <http://www.bozemanscience.com/ap-chem-013-physical-properties> | Theo  Ahshabibi |
| Learning objective 2.23 The student can create a representation of an ionic solid that shows essential characteristics of the structure and interactions present in the substance. [See SP 1.1; Essential knowledge 2.D.1]  Learning objective 2.31 The student can create a representation of a molecular solid that shows essential characteristics of the structure and interactions present in the substance. [See SP 1.1; Essential knowledge  2.D.4] | --Textbook  --Internet  <http://www.chemistryexplained.com/> | Sophia  Patrick |
| Learning objective 2.24 The student is able to explain a representation that connects properties of an ionic solid to its structural attributes and to the interactions present at the atomic level. [See SP 1.1, 6.2, 7.1; Essential knowledge 2.D.1]  Learning objective 2.32 The student is able to explain a representation that connects properties of a molecular solid to its structural attributes and to the interactions present at the atomic level. [See SP 1.1, 6.2, 7.1; Essential knowledge 2.D.4] | -- Notes Given  -- Textbook  <https://www.youtube.com/watch?feature=player_embedded&v=bzr-byiSXlA> | Claire  Pasquale |