

Semester 1 Standards: Additions to sludge

H.1P.1 Explain how atomic structure is related to the properties of elements and their position in the Periodic Table.

Identify your metal/metalloid in your sludge. Draw an atom structure of it. What period/family is it in the period table? What about its atomic structure would make it reactive or stable?

Explain how the composition of the nucleus is related to isotopes and radioactivity.

Is there a radioactive compound in your sludge? How could you find out if there was one? What part of the atom makes it radioactive?

H.1P.2 Describe how different types and strengths of bonds affect the physical and chemical properties of compounds.

Identify the bonds in liquids as ionic, covalent or metallic. Would the compound dissolve in water, conduct electricity if dissolved, share electrons equally or unequally? Does this compound have a strong or weak bond?

H.2P.1 Explain how chemical reactions result from the making and breaking of bonds in a process that absorbs or releases energy.

Identify an exothermic or endothermic reaction in sludge. What energy is released or absorbed in the reaction?

Explain how different factors can affect the rate of a chemical reaction.

Identify a chemical reaction in your sludge, how could you slow down the reaction and speed it up?

H.2P.2 Explain how physical and chemical changes demonstrate the law of conservation of mass.

Where did a chemical change happen in your sludge? Was mass destroyed or what happened to the mass?

H.3S.1 Based on observations and science principles, formulate a question or hypothesis that can be investigated through the collection and analysis of relevant information.

*****Problem Statement or Hypothesis of sludge*****

H.3S.2 Design and conduct a controlled experiment, field study, or other investigation to make systematic observations about the natural world, including the collection of

sufficient and appropriate data.

***** Part 2 of sludge, enough labs to identify substances in sludge*****

H.3S.3 Analyze data and identify uncertainties. Draw a valid conclusion, explain how it is supported by the evidence, and communicate the findings of a scientific investigation.

***** Part 3 & 4 of sludge *****

H.3S.4 Identify examples from the history of science that illustrate modification of scientific knowledge in light of challenges to prevailing explanations.

Research at home and identify two examples in history where science concepts have changed from a new discovery/knowledge.

H.3S.5 Explain how technological problems and advances create a demand for new scientific knowledge and how new knowledge enables the creation of new technologies.

Identify a technology that you used in sludge and how that technology lead to understanding.