



Unit 1 Nuclear Processes

High School Chemistry

Unit Length and Description:

4 Instructional Weeks

Students will use the periodic table to predict the relative properties of elements based on valence electrons and composition of nucleus. Students will apply this knowledge to illustrate the composition of the nucleus and the energy released during fission, fusion, and radioactive decay. Students will also evaluate claims in published materials about the viability of nuclear power as a source of alternative energy relative to other forms of energy (fossil fuels, wind, solar, geothermal).

Science Standards:

- HS-PS1-1** Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level and the composition of the nucleus of atoms.
- HS-PS1-8** Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.
- HS-PS6-6** Evaluate the validity and reliability of claims in published materials about the viability of nuclear power as a source of alternative energy relative to other forms of energy (e.g., fossil fuels, wind, solar, geothermal).

Enduring Understandings- Unit Anchor Phenomenon:

Japanese people living in the area where the Fukushima Daiichi nuclear disaster took place have a higher risk of developing cancer.

Essential Questions- Reflective Summaries:

- How are fission and fusion reactions different?
- What role do fission and fusion reactions play in powering nuclear power plants?
- Over the past 300 years, how have discoveries related to atomic structure affected life on our planet?
- How do economic, environmental, social and political factors affect the development and emergence of new nuclear technologies?
- How is nuclear energy regulated in the United States?
- What is the role of a reactor in a nuclear power plant?
- Make a claim supporting or refuting the use of nuclear energy in the United States or Louisiana. Use evidence to support your response.