UBD Unit Design Template

<table>
<tr><td>Time Frame: 2 weeks</td><td>Unit Title: Isotopes, fission and fusion</td><td>Course Name: Physical Science</td></tr>
<tr><td colspan="3">Stage 1: Desired Results</td></tr>
<tr><td>Established Goal(s)</td><td colspan="2">Transferable Skills</td></tr>
<tr><td rowspan="5"><u>Enduring Understandings</u>

NGSS
HS-PS1-8 Structure and Properties of Matter

HS-PS3-2 Energy

HS-PS4-4 Waves and Electromagnetic Radiation

NJrSrHS Competencies
Systems and System

Models Energy and Matter

in Systems Structure and

Function

21st Century Skills
Analysis
Research Skills
Information and Communication Technology Global Awareness</td><td colspan="2">Students will be able to independently use their learning to...

Analyze a complex global issue
Describe how different types energy are transformed into electricity
Calculate a percent abundance (weighted average)
Understand the role nuclear technology plays in our lives</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td><u>Understandings</u>
Students will understand...

<u>The structure and function of Isotopes</u>
Applied to medicine, environmental science, geology and energy generation.

<u>Nuclear fusion, fission and nuclear decay.</u>
Students will understand the balance between an atom's attractive nuclear force and the repulsive electric forces that are distorted when a neutron is absorbed by the nucleus creating a large amount of kinetic, radiant and gamma radiation.

<u>The global impacts of nuclear technology</u> students will understand there is a trade off between power generation, society and the environment.</td><td><u>Essential Questions</u>

● How can the nucleus of an atom of the same element differ?
● What makes an atom stable?
● How does a nucleus produce energy? ● How does nuclear fission work and what are its implications on the planet and people?
● What is the potential for nuclear fusion?</td></tr>
<tr><td colspan="2">Acquisition</td></tr>
</table>

	Students will know... ● Isotopes ● percent abundance ● radioactivity ● Radioactive decay ● Half-life ● fission vs. fusion ● EM spectrum ● nuclear technologies ● how power is generated	Students will be able to... Describe an isotope Calculate average atomic mass Discuss nuclear technology, how it works, what it is used for and geopolitical issues surrounding its use Differentiate between fission and fusion Understand how nuclear decay happens and calculate halflife