

Name
TA

Science 10
2022-2023



Learning Guide # 10: Nuclear Energy and Radioactive Decay

BIG IDEA: *Working with Kinetic, Potential and Mechanical Energy*

Fundamental Knowledge (I know)

- The different types of radioactive decay and can describe/explain each type
- The difference between fusion and fission and can describe/explain each
- The moral and ethical views around using nuclear reactors as a source of energy and can explain them.

Curricular Competencies (I can)

	Proficiency Scale Teacher and Student self assessment (Circle one)	Evidence (How do you know?)
I can: Assess risks in the context of personal safety and social responsibility.	Emerging (EMG) Initial Understanding Developing (DEV) Partial/Near Complete Understanding Proficient (PRF) Complete Understanding Extending (EXT) Sophisticated Understanding	
Communicate scientific ideas and information, and perhaps suggested course of action, for specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations.	Emerging (EMG) Initial Understanding Developing (DEV) Partial/Near Complete Understanding Proficient (PRF) Complete Understanding Extending (EXT) Sophisticated Understanding	

Student Signature:

Teacher Signature:

Date:

Instructions To help guide your learning, make your way through the activities in Option 1, Option 2, or Option 3. You may “mix and match” between the different Option columns.

TOPIC	OPTION 1 (Worksheet)	OPTION 2 (Textbook)	OPTION 3
Nuclear Energy	<p>Watch the video and take notes to help you with the below definitions. A good place to start is “Radiation Rays: Alpha, Beta and Gamma” https://www.youtube.com/watch?v=KYDil96NR5Q</p> <p>Read and take notes from the “7.1: Atomic Theory Isotopes and Decay” worksheet</p> <p>Create a glossary and define each of the following terms: <i>radioactivity, radiation, daughter and parent isotopes, alpha decay, alpha particle, beta decay, beta particle, gamma decay, gamma particle, half-life, carbon dating, critical mass, proton, helium nucleus.</i></p>	<p>Watch the video and take notes to help you with the below definitions. A good place to start is “Radiation Rays: Alpha, Beta and Gamma” https://www.youtube.com/watch?v=KYDil96NR5Q</p> <p>Read and take notes for p. 286 – 299 and Pg. 302-311 in the Science 10 Textbook.</p> <p>Create a digital presentation defining AND explaining the following terms: <i>radioactivity, radiation, daughter and parent isotopes, alpha decay, alpha particle, beta decay, beta particle, gamma decay, gamma particle, half-life, carbon dating, critical mass, proton, helium nucleus.</i></p>	<p>Choose your own adventure!</p> <p>Pick up a planning sheet from the Science Kiosk.</p> <p>Create a plan! Make sure you read through the first page of this LG, as you will need to design ways to learn/practice and show your understanding of the topic(s) and skill(s) (competencies.)</p> <p>You will need to have a teacher approve your plan before beginning the LG.</p>
Radioactive Isotopes	<p>Complete the “7.1: Atomic Theory Isotopes and Decay” worksheet</p> <p>List 3-5 technologies that use radioactive isotopes to function (how do they use isotopes to complete their function).</p>	<p>Complete questions 1-13 on Pg. 301 in the Science 10 Textbook.</p> <p>OR</p> <p>Complete the “Radioactive Decay and Nuclear Equations” Worksheet</p> <p>Create a digital presentation outlining 3-5 technologies that use radioactive isotopes to function (how do they use isotopes to complete their function).</p>	
Half Life	<p>Read and complete the “7.2: Half Life” worksheet</p>	<p>Read and take notes for p. 302 – 307 and in the Science 10 Textbook.</p> <p>Complete questions 1-9 on Pg. 311 in the Science 10 Textbook.</p>	
Nuclear Reactions	<p>Read and complete the “7.3: Nuclear Reactions” worksheet</p>	<p>Read Pgs. 312 – 321 (fission and fusion) in the Science 10 Textbook. Complete the “Check Your Understanding” on: Pg. 325 #s: 1-6, 9, 10</p>	
Fission and Fusion	<p>Research and Explain 3 advantages and 3 disadvantages of using nuclear reactions to produce energy. Record your sources.</p>		
Lab	Modeling Rates of Radioactive Decay (Pg. 303)		
Self Assessment	Reflect on the Fundamental Knowledge and Curricular Competencies. Use the rubric and make goals to improve for your next learning guide.		
Interview or Quiz	See you teacher for an interview or to have a quiz slip signed for the test center. Bring your work and staple it to your quiz when complete.		

Resources can be found at www.THSSscience.com or the Science Kiosk

User: **THSS**

Password: **science**