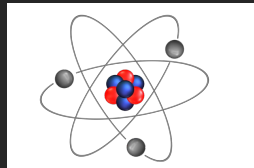


Nuclear Energy – Fission and Fusion Middle School 5E Lesson

The 5E model is a scientifically proven method to improve student engagement and learning in your classroom



- ✓ Engagement
- ✓ Exploration
- ✓ Explanation
- ✓ Elaborate
- ✓ Evaluate



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Complete Teacher Instructions



Nuclear Energy – Fission and Fusion 5E Lesson

Grades 6-8	Nuclear Energy – Fission and Fusion	Ongoing Lesson (6-7 hours)
Lesson Objective: Students will learn about the following: • Atoms • Nuclear Energy • Fission • Fission Safety • Chernobyl Disaster Case Study • Nuclear Weapons – Fission • Fusion and Controlled Fusion • Controlled Fusion Challenges and Benefits • Nuclear Energy Applications • Nuclear Weapons – Fusion • Power plants • Environmental Impact		
Possible Student Misconceptions: • Nuclear power plants can explode like nuclear bombs. • Nuclear energy causes widespread illness and mutations. • Fusion reactors can have meltdowns like fission reactors. • Fusion power is already widely available. • Fission and fusion produce the same kinds of waste.		
Materials: • 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 students • A means of projecting a presentation • Internet access • General classroom objects		
Teacher Notes: ➢ The presentations as well as the student notes are in Google and Office format which can easily be used in class or online ➢ All videos can be accessed directly from the presentation. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If it doesn't for some reason, right-click on the image and click Edit Hyperlink or something similar. ➢ I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ ➢ I don't believe in long lessons. If you feel your students are losing their focus, don't force it. Stop the presentation and give them a 5-minute break. If you'd like to show a quick video, I'd recommend my video collection here - http://www.teachwithfergy.com/science-videos/. There are tons of brain-break videos to choose from all grouped by category.		

Nuclear Energy – Fission and Fusion - 5E Lesson

Engagement Phase Your students will complete 'Nuclear Energy – Fission and Fusion – Digital Science Reading Article.' Teacher Notes: - The students will be asked to watch a video and answer questions about it. They will then be asked additional questions which can be answered using information from the video as well as their previous knowledge and each other.	Duration: 60 minutes Teacher Role – Facilitate learning and guide student understanding Goals ☐ Connect student's experiences ☐ Create interest ☐ Ask questions ☐ Understand the objectives of the lesson
Exploration Phase Exploration – Lab Station Activity • In groups of 2-3, have your students complete 'Nuclear Energy – Fission and Fusion Lab Station Activity'. Once they're done, they will submit their passport to you. Teacher Notes: • The complete instructions for my Lab Station activity can be found in the <i>START HERE – Instructions</i> file.	Duration: 1 hour Teacher Role – Facilitate learning and guide student understanding Goals ☐ Students receive real experience with the topic ☐ Students use and develop creative thinking skills ☐ Students make observations, record
Explanation Phase Lesson • Complete the lesson 'Nuclear Energy – Fission and Fusion'. • In the lesson, there are multiple embedded videos and an opportunity to engage, interact and check for your student understanding throughout the lesson. Teacher Notes: • All videos can be accessed directly from the presentation. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, click the image and select Edit Hyperlink or something similar. • I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/oCIKIP9SaDQ	Elaborate Phase Your students will complete 'Fission vs Fusion Infographic'. This activity will allow your students to go beyond what they've done in the classroom and demonstrate their understanding in a different way. Teacher Notes: - Students will work individually or in small groups - Students will need one device per group
	Evaluate Phase Have your students complete – <i>Evaluate - Nuclear Energy</i> . The test includes multiple choice, true and false, and short answer questions. Answer key is included. Goal ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress

Each phase is clearly described

Complete Lessons



Fission – Energy Release

- The released energy is used to heat water which becomes steam (3)



Fission – Energy Release

- The released energy is used to heat water which becomes steam (3)
- The steam turns a turbine which spins a generator to create electricity (4)



Student and Teacher versions
the presentations

Fission – Breaking Atoms Apart

- Fission is what we use in our nuclear power plants
- Fission happens when atoms are split apart
- This releases energy as heat which is used to generate electricity



Nuclear Reactor

Videos embedded directly into the
slides. One-click access.

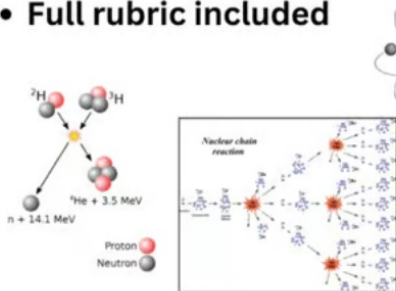
Interactive and Engaging Activities

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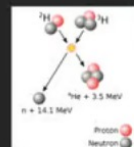
FISSION VS. FUSION INFOGRAPHIC ASSIGNMENT

Middle School

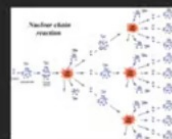
- Students are tasked with creating an infographic that demonstrates their understanding of photosynthesis
- Full rubric included



Nuclear Energy – Fission and Fusion Lab Station Activity



VS



Station 1

Get Hands-On – We've seen drawings of photosynthesis occurring in a plant. Without looking at any examples, you must re-create this drawing which everything the

Station 5

Applicability Reading – Read the following information article and answer the associated questions found below in the Applicability Reading section of your passport.



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7 Lab Station Activities to get your kids out of their seats and engaged in their learning.

Nuclear Energy Fission and Fusion

Scientific Reading Comprehension Article and Extension Activity – **Grades 5-7**



Improve your students **Literacy and Analysis Skills**, use as an **Emergency Substitute Plan** or create **Applicability** in your classroom

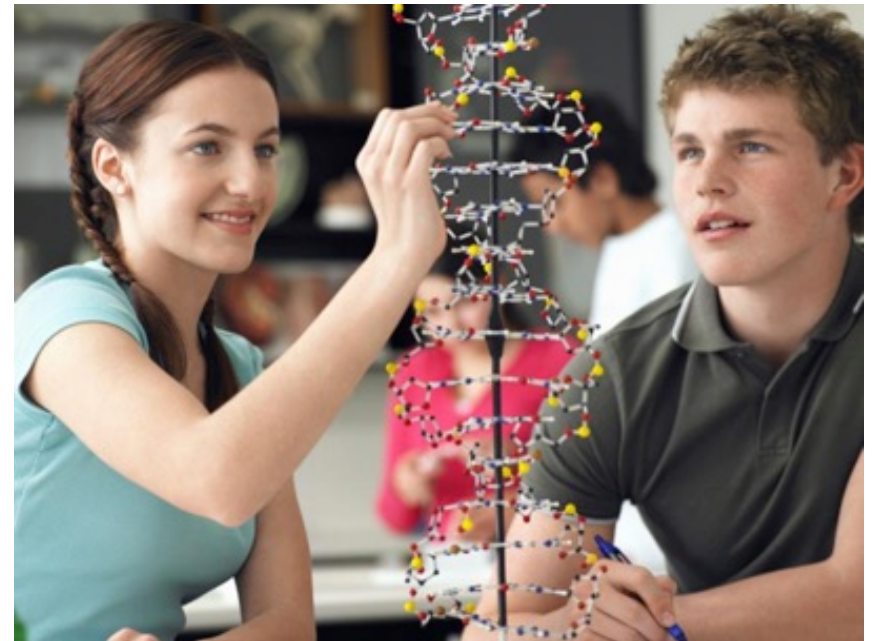
Get away from tired practices and unengaged students



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Provide a Scientifically-Proven means of instruction

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Incorporate Technology and Increase Collaboration



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