

Electricity Production

5E Lesson

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

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



Complete Teacher Instructions

Electricity Production 5E Lesson

Grades 7-10	Electricity Production	Ongoing
Lesson Objective: Students will learn about: - Renewable sources - Non-renewable sources - Fossil Fuels - Nuclear Power - Solar - Wind - Hydroelectric - Future Technologies		
Possible Student Misconceptions: - Energy is lost once it's used - Energy from one source is better or worse than another - Energy can be created and/or destroyed - Non-renewable energy will be available for the long-term		
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) - A means of projecting a PowerPoint presentation - Internet access		
Teacher Notes: - All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, 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 focus, stop the PowerPoint and give them a 5-minute break. If you'd like to see more of my video collection here - http://www.teachwithferg.com are tons of brain-break videos to choose from all grouped by category.		

Electricity Production – 5E Lesson

Engagement Phase Your students will watch the video 'How Much Energy Does The Internet Use?' This video is simply of means of engaging your students in something they're already aware of and can relate to. The video can be found here - http://www.teachwithferg.com/how-much-energy-does-the-internet-use/ Although there are no questions specifically associated with the video, it does bring up some very interesting points that can lead to meaningful discussions about the need for energy conservation especially as our use of the internet continues to increase. Teacher Notes: → If the video doesn't work for one reason or another, go to www.youtube.com and type in "How Much Energy Does The Internet Use SciShow"	Duration: 20 hour 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 Exploration – 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 START HERE – Instructions 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 results, and make connections
Explanation Phase PowerPoint Lessons - The lesson is found in the folder – Explanation – Lesson - This lesson is designed to be completed over two days - There are multiple embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson - The lessons cover the following topics: - Renewable sources - Non-renewable sources - Fossil Fuels - Nuclear Power - Solar - Wind - Hydroelectric	Duration: 2 – 3 hours Teacher Role – Explain the concepts by presenting the material found in the presentation.

Future Technologies Teacher Notes: All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon while in slideshow mode and it will automatically open for you. If they don't open, right-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 I have also enclosed a .PDF version of both the teacher and student versions	Goals - Students develop understanding of the content - Observations and experiences are discussed and critiqued - Students develop vocabulary - Students are able to connect the content presented to previous experiences
Evaluate Phase Scavenger Hunt Activity Students will complete – Elaborate - Scavenger Hunt Activity . This will require your students to move beyond what was covered in the lesson and allow them to demonstrate why what they're learning is so applicable and important. Notes: Students will work in groups of two or three Each group will only require a single device (smartphone, tablet, Chromebook, laptop, etc.).	Duration: 1 hour Teacher Role – Facilitate learning and keep students focused Goal Students use their newly obtained knowledge to propose solutions and extend their learning to new situations
Evaluate Phase Our students complete – Evaluate – Electricity Production Project . This project requires your students to research and present the energy they feel will be most important in the future. Notes: I typically provide one class period for the students to complete some preliminary research but most of the work is done outside the classroom I only allow each energy source to be used once on a first-come, first-served basis Each group member is marked individually based on their section of the presentation In the past I have added a peer evaluation component but it's not needed	Duration: 1 hour in class Teacher Role – Distribute and collect evaluation Goal Students are given the opportunity to demonstrate their understanding and evaluate their own progress

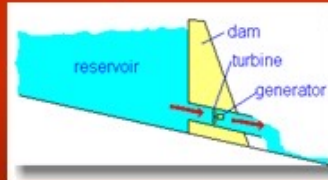
Each phase is clearly described

A Complete Lesson

Hydro-electric Energy

A dam is built to trap water, usually in a valley where there is an existing lake.

- Water is allowed to flow through tunnels in the dam, to turn turbines and thus drive generators.



Hydroelectric

← Make sure your students are on track

↙ Videos embedded right into your slideshow

Student copies with blanks

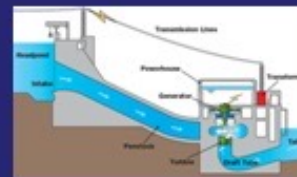
Geothermal

- _____
- _____
- We drill holes down to the hot region, steam comes up and is used to drive turbines, which drive electric generators.



Where does Electricity Come From?

1. Renewable sources
2. Non-renewable sources
3. Fossil Fuels
4. Nuclear Power
5. Solar
6. Wind
7. Hydroelectric
8. Future Technologies



Interactive and Engaging Activities

Current and Circuit Diagrams Lab Station Activity



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

Device-Based Scavenger Hunt Electricity Generation



Includes

- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks and laptops

- 100% Digital
- Simulations
- Quizzes
- Videos
- Games
- Word Scramble
- and more



Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

