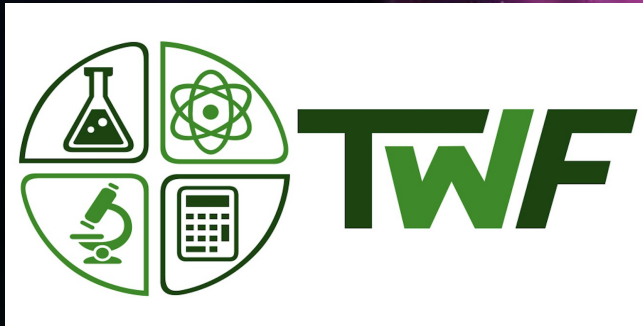


Nonrenewable Energy Sources

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

Nonrenewable Energy Sources 5E Lesson

Grades 5-11	Nonrenewable Energy Sources	Ongoing Learning
Lesson Objective: Students will learn about: • Biomass • Fossil Fuels • Coal • Oil • Natural Gas • Nuclear Power • Global Warming • Acid Rain • Fuel Harvest • Historical Fuel Sources		
Possible Student Misconceptions: • Oil forms in large empty spaces underground • Oil comes from dead dinosaurs • Oil won't be found under an ocean/desert/forest • Oil wells are drilled to the center or halfway to the center of the Earth • Other than oil spills, oil doesn't cause much trouble in our world • Fossil fuels can form in a short amount of time • Fossil fuels have been here since the beginning of Earth • People can make oil • The world will run out of oil very soon • A nuclear reactor can explode like a nuclear bomb • Nuclear energy is bad for the environment • Nuclear plants emit dangerous amounts of radiation		
Materials: • 1 device (smartphone, Chromebook, laptop, tablet, or computer) per student • A means of projecting a PowerPoint presentation • Internet access • General classroom objects		
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 don't believe in long lessons. If you feel your students are losing track, stop the PowerPoint and give them a 5-minute break. If you'd like to recommend my video collection here - http://www.teachwithfergy.cc are tons of brain-break videos to choose from all grouped by category.		

Nonrenewable Energy Sources – 5E Lesson

Engagement Phase Your students will watch the video 'Non-Renewable Energy Resources' and complete the questions found in the file – <u>Engagement – Nonrenewable Video</u> . Teacher Notes: - The video is about one and a half minutes long - You may need to show the video more than once or pause when an answer is given to one of the questions.	Elaborate Phase Elaborate – Scavenger Hunt Your students will complete – <u>Elaborate – Scavenger Hunt</u> . This activity will require your students to move beyond what was covered directly in the lesson and allow them to further develop their understanding. Teacher Notes: - Students will work individually or in small groups - Students will need one device per group	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
Exploration Phase Exploration – Lab Station Activity • In groups of 2-3, have your students complete <u>Exploration – Lab Station Activity</u>. 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 <u>START HERE – Instructions</u> file.	Evaluate Phase Quiz Have your students complete - <u>Evaluate – Nonrenewable Quiz</u> Teacher Notes: ➢ It's sometimes best to have the students peer evaluate ➢ Placing students in small groups and having them exchange papers to mark will accomplish two things 1) Provide immediate feedback on the questions they just completed 2) Significantly reduce your marking time ➢ Peer evaluation is not needed, only suggested when appropriate	Duration: 30 min Teacher Role – Distribute and collect evaluation Goal ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress
Explanation Phase PowerPoint Lesson • The lesson is found in the folder – <u>Explanation – Lesson</u> • This lesson is designed to be completed over one day • There are two embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson • The lesson covers the following topics: ➢ What is Biomass? ➢ Biomass → Fossil Fuels ➢ Burning Fossil Fuels and the Greenhouse Effect ➢ Fuel from Biomass ➢ Acid Precipitation and pH 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.		

Each phase is clearly described

A Complete Lesson

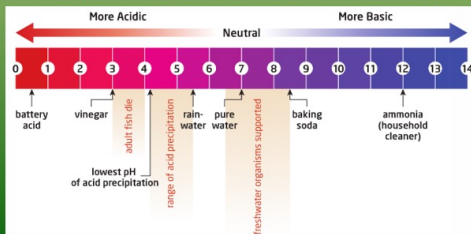
pH

- Is a measure of how acidic a substance is
 - Acid examples → sulfuric acid, citric acid
- It is measured on a scale (pH scale) from 0-14

7 (Neutral) = Water and Blood

3 (Acidic) = Vinegar

12 (Basic) = Ammonia (household cleaner)

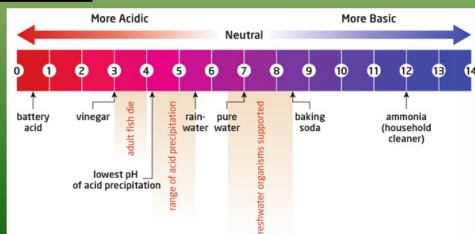


← Make sure your students are on track

Student copies with blanks
Videos embedded right into
your slideshow

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Acid Precipitation

Interactive and Engaging Activities

Nonrenewable Energy Sources Lab Station Activity



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

Device-Based Scavenger Hunt Fossil Fuel and Nuclear Energy Production

Includes



- 5 Unique Locations
- Online form submission
- Answer Key

Works on all smartphones, tablets, Chromebooks, and laptops

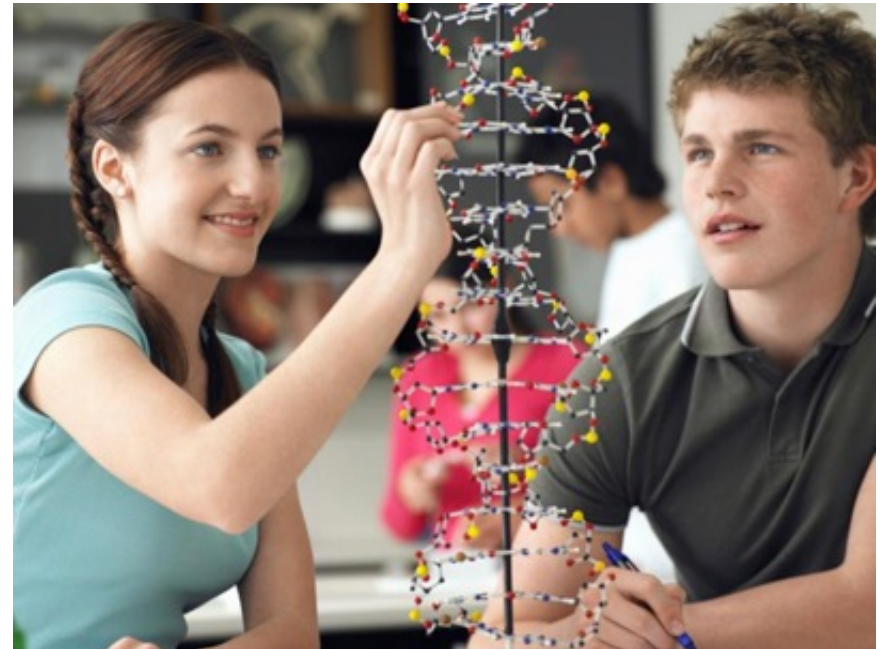
- **100% Digital**
- Simulations
- Quizzes
- Videos
- Games
- and more



Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

