

Energy, Energy Transfer, and its Forms

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

Energy, Energy Transfer, and its Forms 5E Lesson

Grades 8-11	Energy, Energy Transfer, and its Forms	Or
Lesson Objective: Students will investigate: - Where our energy comes from - Thermal energy vs. temperature vs. heat - Heat transfer → Conduction, convection, and radiation - Specific heat capacity - Types of energy		
Possible Student Misconceptions: - Heat and temperature is the same thing - Things "use up" energy instead of it being changed from one form to another - An object at rest has no energy		
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. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/cCIKIP9SaDQ - I don't believe in long lessons. If you feel your students are bored, Stop the PowerPoint and give them a 5-minute break. If you recommend my video collection here - http://www.teachwithenergy.com are tons of brain-break videos to choose from all grouped by topic.		

Energy, Energy Transfer, and its Forms – 5E Lesson

Engagement Phase As they're watching the video, have your students complete the questions found in the file – Engagement – What is Energy? The video can be found here - http://www.teachwithenergy.com/what-is-energy/ They may need to watch it twice to get all the answers. Once the video is complete, create a class discussion around their answers. Teacher Notes: - The video is about four and half minutes long - If for some reason the video doesn't play, go to www.youtube.com and type in "World's Most Asked Questions: What is Energy?" The video is made by SciShow	Duration: 10 min 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 - The activity is found in the folder - Exploration – Lab Station Activity - Place your students into groups of 2-3, and have them complete it. Once they're done, they will submit their passport to you. Teacher Notes: - The complete instructions for the lab station activity can be found in the START HERE – Instructions file.	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 - There are two lessons included, both can be found in the folder – "Explanation – Energy" - The lessons are designed to be completed over two – three days - There are many embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lessons 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. - I've created a video walkthrough if needed. It can be accessed here - https://youtu.be/cCIKIP9SaDQ - I have also enclosed a .PDF version of both the teacher and student versions	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

Elaborate Phase Your students will complete – Elaborate - Scavenger Hunt Activity . This activity will require your students to move beyond what was covered directly in the lessons and allow them to demonstrate why their learning is so applicable and important. Teacher 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 - Have your students complete - Evaluate - Energy, Energy Transfer, and its Forms - Quiz. It covers the content from lessons 1 and 2 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 quiz they just completed 2) Significantly reduce your marking time - Peer evaluation is not needed, only suggested when appropriate	Duration: 30 - 50 min. 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

Two Complete Lessons

- Informative and engaging
- Student copies with blanks
- Videos embedded right into your slideshow

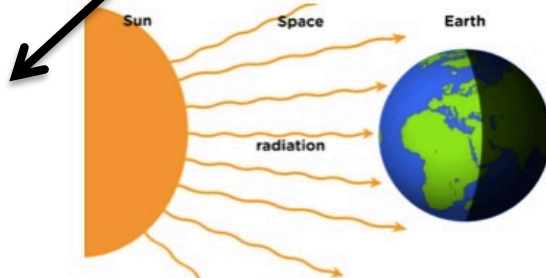
6. Kinetic Energy

- _____
- Anything that is moving has kinetic energy
- If an object gains potential energy by raising it up, it gains kinetic energy as it falls back down



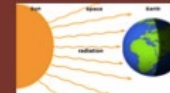
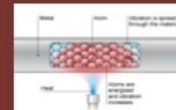
Methods of Heat Transfer - Radiation

- Radiation doesn't need a medium (particles) to transfer meaning it can move in outer space



Thermal Energy, Temperature and Heat

- Thermal Energy vs. Temperature vs. Heat
- Heat
- Heat Transfer
- Methods of Heat Transfer
 - Conduction, Convection and Radiation
- Specific Heat Capacity
- The Principle of Heat Exchange



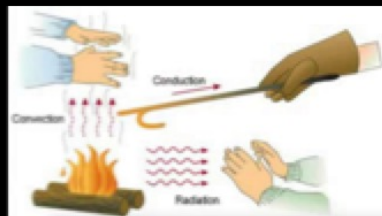
Energy And Its Forms

- Energy = Life
- Where do we get energy from?
- Types of energy
 - Thermal
 - Electrical
 - Radiant
 - Nuclear
 - Gravitational
 - Kinetic
 - Elastic
 - Sound
 - Chemical
- Energy units
- Energy transformation



Engaging Activities including my Lab Station and Scavenger Hunt Activities

Energy and Its Forms Lab Station Activity



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

Device-Based Scavenger Hunt Energy Transfer

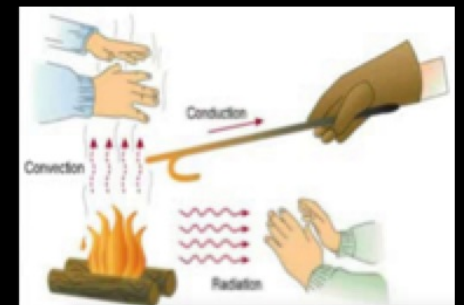


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