

Light and its 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

Light and its Production 5E Lesson

Grades 8-11	Light and its Production	Ongoing Lesson
Lesson Objective: Students will: - Investigate the properties of light - Learn about how light is created - Be able to identify and define key terms related to light and its production - Understand the basics behind key phenomena related to light including how prisms work, and the reason behind color blindness - Gain an understanding of the electromagnetic spectrum as well as luminous objects - Overcome many misconceptions they would otherwise bring with them in		
Possible Student Misconceptions: - Light is heat and heat is light - Only shiny objects like mirrors reflect light - Water doesn't reflect light - Light always moves in a straight line and never changes direction - Our eyes produce light so we can see things - Light travels only a little faster (or the same speed as) sound		
Materials: 1 device (smartphone, Chromebook, laptop, tablet, or computer) per 3 students - 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 it doesn't, 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, stop the PowerPoint and give them a 5-minute break. If you'd like to see my video collection here - http://www.teachwithfergy.com/science are tons of brain-break videos to choose from all grouped by category.		

Light and its Production – 5E Lesson

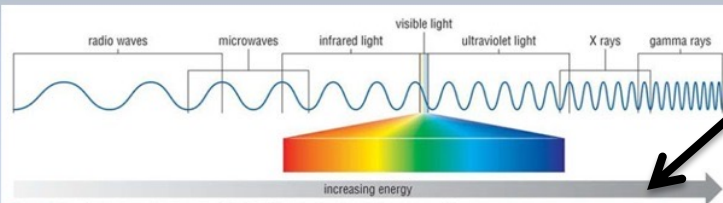
Engagement Phase As they're watching the video, have your students complete the questions found in the file – <i>Engagement – What is Light?</i> The video can be found here - http://www.teachwithfergy.com/what-is-light/ They may need to watch it twice to get all the answers. Once the video is complete, create a class discussion around their answers. Teacher Notes: - The video is about two and half minutes long - If for some reason the video doesn't play, go to www.youtube.com and type in "What is Light? Kurzgesagt – In a Nutshell"	Elaborate Phase Your students will complete – <i>Elaborate – Why is the Sky Blue Article</i> This activity will require your students to move beyond what was covered directly in the lesson and allow them to demonstrate why their learning is so applicable and important. Teacher Notes: Students will work individually or in groups of two	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 - The activity is found in the folder - <i>Exploration – Lab Station Activity</i> - 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 <i>START HERE – Instructions</i> file.	Evaluate Phase Have your students complete - <i>Evaluate – Light and its Production – Quiz</i> 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 - 40 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 be found in the folder – "Explanation – Light" - 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/oCikIP9SaDQ - I have also enclosed a .PDF version of both the teacher and student versions		

Each phase is clearly described

Two Complete Lessons

Modern electromagnetic waves

- Today we have identified many types of electromagnetic waves which makes up our electromagnetic spectrum



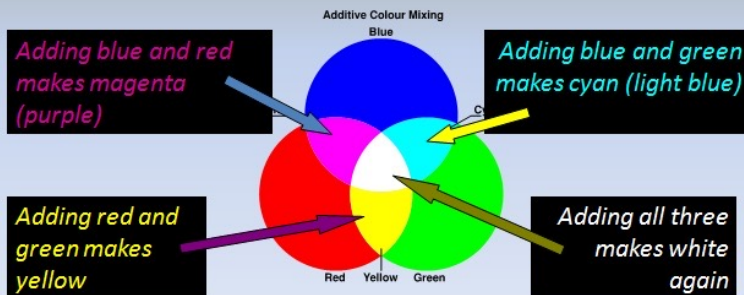
The Electromagnetic Spectrum video



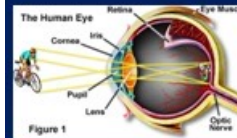
- Informative and engaging
- Student copies with blanks
- Videos embedded right into your slideshow

Adding colours

- White light can be split up to make separate colours. These colours can be added together again.
- The primary colours of light are _____:



Optics



Light

- Overview of light
- Properties of light
- Luminous and non-luminous objects
- History of light
- The electromagnetic spectrum
- Prisms
- Colour & Colour Blindness

The Production of Light - Optics Lesson

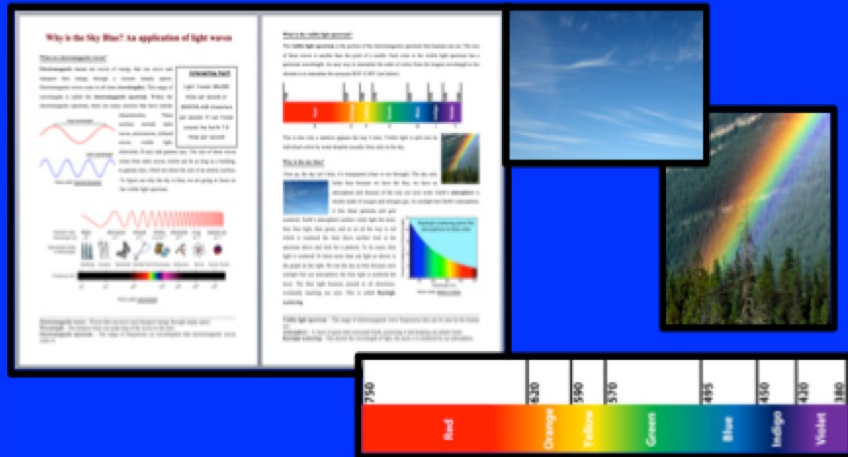
- Incandescence
- Light-Emitting Diode (LED)
- Fluorescent lights
- Compact Fluorescent lights (CFLs)
- Electric Discharge
- Phosphorescence
- Fluorescence
- Chemiluminescence
- Bioluminescence



Engaging Activities including my Lab Station and Scavenger Hunt Activities

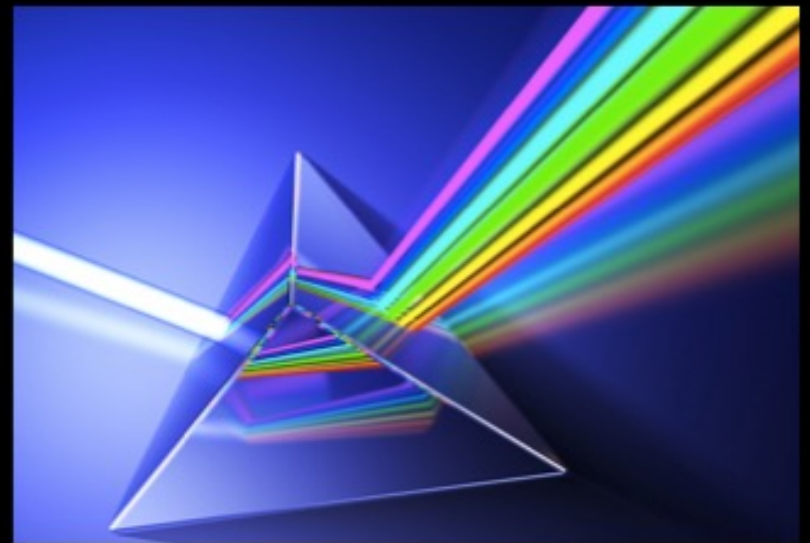
Why is the Sky Blue? An application of light waves

Scientific Reading Comprehension Article



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

Light Optics and The Production of Light Lab Station Activity



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

Get away from tired practices and unengaged students



Provide a Scientifically-Proven means of instruction



Incorporate Technology and Increase Collaboration

