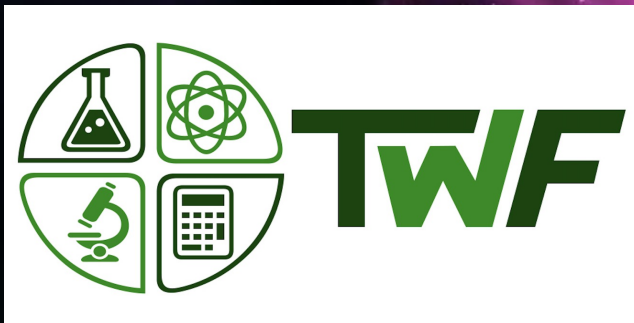


The Human Eye

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

The Human Eye 5E Lesson

Grades 7-10	The Human Eye	Ongoing
Lesson Objective: Students will learn about: • Eye anatomy • Eye function • Vision problems • Laser eye surgery		
Possible Student Misconceptions: • Not wearing proper glasses will hurt your eyes • Reading in dim light can damage your eyes • Eating carrots will improve your vision • There is no way to prevent sight loss • You should only get an eye exam if you're having problems		
Materials: • 1 device (smartphone, Chromebook, laptop, tablet, or computer) • 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 focus, stop the PowerPoint and give them a 5-minute break. If you'd like to recommend my video collection here - http://www.teachwithferguy.com are tons of brain-break videos to choose from, all grouped by category.		

The Human Eye – 5E Lesson

Engagement Phase Your students will watch the video 'Lens Accommodation Whiteboard' and complete the following: 1. Watch the video and answer the questions. The video can be found here - https://www.youtube.com/watch?v=43hu11ah28Q Teacher Notes: - The video is two minutes long - You may need to show the video more than once or pause when an answer is given to one of the questions.	Duration Teacher learning : understand ☐ Connect ☐ Create ☐ Ask ☐ Understand
Exploration Phase Exploration – Lab Station Activity • In groups of 2-3, have your students complete <i>Exploration – Lab Station Activity</i>. 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 Teacher learning : understand ☐ Student experience ☐ Student creativity ☐ Student observation ☐ Results connection
Explanation Phase PowerPoint Lessons • The lesson is found in the folder – <i>Explanation – The Human Eye Lesson</i> • This lesson is designed to be completed over one day • There are multiple embedded videos and plenty of opportunity to engage, interact and check for your students' understanding throughout the lesson • The lesson covers the following topics: ➢ Blind spot ➢ Eye anatomy	Duration Teacher concepts material : presentation

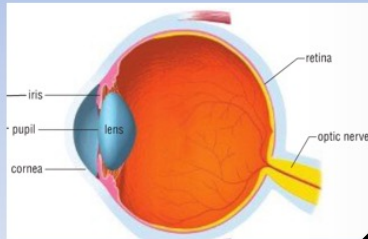
➢ Eye and the brain ➢ Camera lens vs. eye lens ➢ Accommodation ➢ Focusing ➢ Myopia, hyperopia, and presbyopia ➢ Diverging lens – negative meniscus ➢ Converging lens – positive meniscus Teacher Notes: • All videos can be accessed directly from the PowerPoint. To retrieve them, click on the video icon 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
Elaborate Phase Elaborate – Reading Your students will complete – <i>Elaborate – Laser Eye Surgery Reading</i> . This reading will require your students to move beyond what was covered directly in the lesson and allow them to further develop their understanding.	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
Teacher Notes: - Students will work individually or in small groups - This reading contains 6 comprehension questions and 1 extension question. It is fully editable so I encourage you to remove any question(s) in order to meet the needs of your students as well as your time frame.	
Evaluate Phase Quiz Have your students complete - <i>Evaluate – The Human Eye Quiz</i>	Duration: 30 min Teacher Role – Distribute and collect evaluation Goal ☐ Students are given the opportunity to demonstrate their understanding and evaluate their own progress
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	

Each phase is clearly described

A Complete Lesson

Blind Spot

- There are no light-sensitive areas where the optic nerve connects to the retina
- If an image is formed on the blind spot, we cannot see it
- The reason we normally do not notice our blind spots is because our other eye compensates and "fills in" the gap



The Eye

- Is an optical instrument that we use to see around us.
- It acts very much like a camera
 - _____
 - Lets more or less light in when needed
 - Allows us to view the image

← Make sure your students are on track

Student copies with blanks
Videos embedded right into
your slideshow

Accommodation

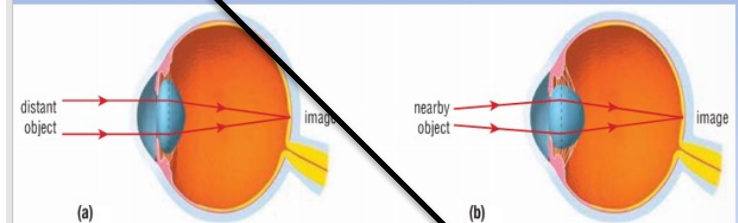


Figure 3 A healthy eye can focus light from both distant objects (a) and nearby objects (b) on the retina. Notice that the lens is slightly fatter when focused on nearby objects.



How light enters the eye

Interactive and Engaging Activities

Laser Eye Surgery

Scientific Reading Comprehension Article and Extension Activity

Laser Eye Surgery



What is Laser Eye Surgery?

Laser eye surgery is a type of refractive surgery. Refractive surgery corrects nearsightedness (myopia), farsightedness (hyperopia), and/or astigmatism so that patients either no longer need corrective lenses or need a lower prescription. In all types of laser eye surgery, an excimer laser (one that uses short wave ultraviolet light to clear away some tissue from the surface of the eye) is used to reshape the cornea to allow light to be better focused on the retina, making vision clearer. To properly understand this, let's familiarize ourselves with how the eye works and the three most common vision problems mentioned above.



How Do Eyes Work?

The eye is composed of several parts, but for our purposes, we need to understand the function of the iris, pupil, cornea, retina, lens, and optic nerve. The clear cornea sits at the front of the eye and acts as a window. When light rays pass through the cornea, they are bent—refracted—so they pass through the pupil. The pupil is the opening in the center of the iris, a flat, colored membrane. When we talk about what color someone's eyes are, we are referring to the color of their iris. Depending on how much light is available, the iris changes the size of the pupil.



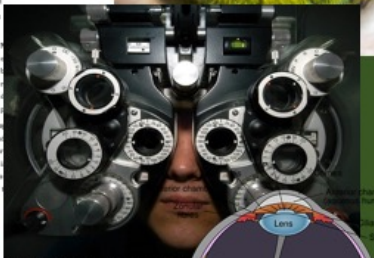
to ensure the proper amount of light enters the eye. This light passes through the lens, which can change its width to focus light rays onto the retina. The retina sits at the back of the eye and captures the rays using cells called photoreceptors. Photoreceptors process light energy into electrical impulses, which are sent through nerve endings and optic nerve fibers into the optic nerve. The optic nerve then carries these impulses to the brain, where they are processed into an image.

Common Vision Problems

The three most common refractions:



Farsightedness (hyperopia) In this condition, light from distant objects appears blurry or a person has a cornea that is too curved. About 5 to 10 percent of people are farsighted.



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

The Human Eye— Lab Station Activity

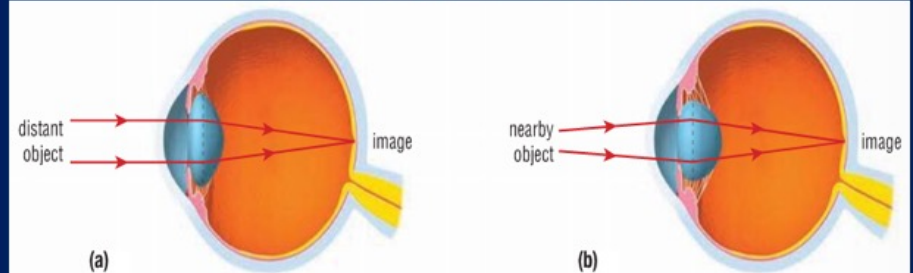


Figure 3 A healthy eye can focus light from both distant objects (a) and nearby objects (b) on the retina. Notice that the lens is slightly fatter when focused on nearby objects.

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

