

2016 AFRICAN AMERICAN HISTORY CALENDAR LESSON PLAN TEMPLATE

Month/Honoree(s): Carrie Sinkler-Parker

Lesson Title: Light Refraction and Why It Matters

Grade Level/Course: Science Grades 4 and 8

Subject: Science

SC Academic Standards and Skills Addressed:

SCI.4.P.4A.4 - [*Performance Indicator*] - Develop and use models to describe how light travels and interacts when it strikes an object (including reflection, refraction, and absorption) using evidence from observations.

SCI.8.P.3A.3 - [*Performance Indicator*] - Analyze and interpret data to describe the behavior of waves (including refraction, reflection, transmission, and absorption) as they interact with various materials.

Introductory Statement/Lesson Overview: Carrie Sinkler-Parker has worked for years as an advocate for senior adult health care. As people move into their senior years and their eyes age, they may find that they need reading glasses. The glass in the reading glasses helps adults focus the light and be able to comfortably read books, magazines, computer screens, and even prescriptions for medicines. Students will investigate how light refracts in various substances.

Goals/Lesson Objectives: Students will understand how and why light slows down and speeds up as it enters different mediums

Instructional Materials: see attached worksheet

Lesson Progression and Time Frame: This lesson needs to be completed in a computer lab.

Activity 1: Read the calendar information for Carrie Sinkler-Parker. Ask students to identify the common focus in her many jobs. (Her jobs involve helping aging people.) Put the word **presbyopia** on the board and ask students to find the definition. <http://www.merriam-webster.com/dictionary/presbyopia> Read the Greek and Latin stem is too.

presbyopia (Old man eyes) Discuss the definition and decide what it is that the eye is no longer doing that it once did when it was younger. **15 minutes**

Activity 2: The activity explores farsightedness and nearsightedness.

Part A Nearsightedness: Get an eye chart from the nurse's office and post it on the wall. Mark a point on the floor 20 feet away from the chart. Have students stand at the mark and read the letters on the eye chart. If there is one person in the class with

glasses, have them attempt to read with and without glasses. Let several students make an attempt. Ask the students: Why do people wear glasses? Lead them in a discussion which helps them understand how light must be bent to a proper focus point on a retina in order to see clearly.

Part B Farsightedness: Have students go to this link

<http://www.eyecarefun.com/content/why-do-some-people-need-reading-glasses-and-others-not>. This link has a video which explains why some people need reading glasses and some do not. (This would be good to use on a SMARTboard, if there is one, for all students to see at the same time.)

The teacher may want to talk about how the aging of the eye can cause a person to be both farsighted and nearsighted. When a person is both, they need bifocals.

15 min

Activity 3: Put the word **refraction** on the board and have students type it into the same site they used before <http://www.merriam-webster.com/dictionary>. They will find the definition of refraction and a diagram illustrating what happens to light when it is refracted. This diagram shows light passing from air to glass. Discuss what is happening to the light and discuss how reading glasses refract light so that the human eye can see clearly. **5 min**

Activity 4: Pass out the attached **Light Refraction activity sheet** to students and allow students to begin working. Pull up the physics classroom link <http://www.physicsclassroom.com/Physics-Interactives/Refraction-and-Lenses/Refraction/Refraction-Interactive> on the SMARTboard to show a model to the students. Students work in teams of 2 to complete the activity sheet. At the end of the lesson, review light refraction and how eye glasses refract the light so people can have the proper focus point and can see things clearly. **25 min**

Extensions/Differentiation:

Extension: Students could further research the difference between nearsightedness and farsightedness. They could draw diagrams of the human eye showing what it would look like for nearsighted and farsighted.

Assessment: The teacher will collect the activity sheet and grade based upon the scoring guide.

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