

Lesson Title: Visible Light, Refraction

Course: Grade 4/5

Designer: Jerome Schmeiser

Learning Outcomes/ Measurable Objectives

Formal Unit Outcome(s):

LI4.1

Investigate the characteristics and physical properties of natural and artificial sources of light in the environment.

LI4.2

Analyze how light interacts with different objects and materials to create phenomena such as shadows, reflection, refraction, and dispersion.

Measurable Objectives:

Students will draw a representation and label an example of refraction that they observe in class.

Students will fill in a bonus exit slip with some questions on the properties of light.

Assessment Evidence

Formative Assessments (Assessment for Learning):

Students will draw a representation and label an example of refraction that they observe in class.

Students will fill in a bonus exit slip with some questions on the properties of light.

Materials

Flashlight, prism, laptop connected to projector, whiteboard, clear plastic cups, pencils

Learning Plan

Learning Experiences & Instruction:

Engage: Hey students, today we are doing a lesson on light, I understand you are building towards using light to do a puppet show. Can you tell me a bit about what you have learnt about light so far? Scientists have been studying light and its properties for a long time now and have made some amazing discoveries.

Explore: The speed of light (3.00×10^8 m/s, 299 792 458 m/s, 299 793 km/s) show visuals

https://kardashev.fandom.com/wiki/Speed_of_light?file=Speed-of-light-distances.jpg. Light is the fastest thing that we know of in the Universe! It can travel huge distances super fast, it makes it from the Earth to the Moon in 1.3 seconds! A trip that usually takes astronauts 3 days! (distance to moon 384 000)

Explain: light as part of the electromagnetic spectrum (visual), white light contains all colours of visible light, we can affect light by passing it through different mediums (show prism). Light bends as it travels through different materials, and this causes it to slow down. This is called refraction! We are refracting the white light, bending of white light is what separates out the colours that are normally all mixed into it.

Have students pair up, hand out clear cups to each group. Fill the cup halfway with water, have each pair pick something they want to submerge halfway in the cup (a pencil or pen, or something else as long as its water is safe). Have the students look at the item above and below. Draw out the image of what they see. Have students label the effect as refraction.

<https://ingeniumcanada.org/scitech/education/try-this-out/broken-pencil-illusion>

Do a bonus exit slip about some of properties of light we discussed. Leave information on board for students.

Questions

How fast does light travel? (3.00×10^8 m/s, 299 792 458 m/s, 299 793 km/s)

How can we affect light? (pass it through different materials)

How is light affected by passing through different materials? (it bends/slows down)

What is the scientific term for light bending as it passes through different materials? (Refraction)