

Mirrors & Reflection

- Students should be able to draw/identify the reflected ray given the incident ray.
- Students should be able to use the equation $\theta_i = \theta_r$

Refraction: Know

- Students should know that light travels at the speed c in a vacuum and slower than c in all other media which transmit light.
 - Addressed in catch and throw analogy
- Students should know that change in speed causes a light ray to bend towards the normal in a more optically dense medium and away in a less optically dense medium.
 - Pushpin lab, rollerskate analogy,
- Students should recognize that the frequency of light remains constant while the wavelength and speed change as light travels in different media.
 - Wave tank demo

Refraction: Do

- Students should be able to predict the path of a light ray when traveling through media of different indices of refraction using Snell's Law.
 - Post pushpin lab
- Students to use Snell's law to empirically determine the index of refraction of an unknown material.
 - Pushpin lab
- Students should be able to use the definition of the index of refraction ($n = c/v$) to determine the speed of light in a given material.
 - Practice problems after pushpin lab

Refraction: Overarching Understandings/Enduring Understandings

- Changing the environment alters behavior of nouns
- Boundary Conditions are important
- Weird crap happens at the boundary of two media.

For Our Lesson Study:

Speed of a wave changes in different media

why

Speed changes cause bending in path

Bend towards the normal going into a thicker medium, away going into a thinner medium

Something about the usefulness of analogies, though it's not

Assessment questions:

- 2 pictures of media changes (thin to thick, thick to thin).
Which material is more optically dense? In which material is the light traveling faster? How do you know?
- Why does light travel at different speeds in different materials?

"Refer to evidence from a class demonstration or experiment in your answer..."