

Get Critical! Class Discussion Questions

Note: The questions provided below are guide questions that students can discuss as a class in order to determine what they learned/took away from the kit.

Reflecting Light:

1. Explain the difference between reflected and refracted.
Reflected light is light that involves a change in direction of waves when they bounce off of a barrier. Refracted light involves change in direction as the light passes from one medium to another.
2. What happened to the boundaries between liquid and air when shining light on the water? The sugar solution?
The light changed direction when shining light on the water. Due to the sugar solution being denser, the ray of light reflected and refracted differently compared to just water.
3. Why do you suppose the critical angle changed when using a sugar solution rather than just water?
Adding sugar to the water makes the solution denser, thus changing the critical angle.
4. Compare the critical angles for the water, 45% sugar solution, and glass prism.
The addition of sugar makes the water more dense and therefore slows down the light waves. When light passes from a more dense to a less dense substance, the light is refracted away from the origin.
5. Why do jewelers shape diamonds into polygonal shaped faces?
Jewelers shape diamonds into polygonal shaped faces in order to take advantage of the reflection of light. This shape prevents light from escaping, making the diamond appear shiny and bright.

Tunnels of Light:

1. What will happen if light is shone through a long skinny glass rod?
The shape causes the angle to be greater than the critical angle. This means that nearly all of the light that enters one end of the rod will exit the other end through a series of bounces.

Diffraction of Light:

1. What does peering through the two pencils vertically and shining a light represent? How does this compare to using the spectroscope?
Peering through the two pencils vertically and shining a light is another way to make light bend due to the very narrow slit. As light passes through the narrow opening, the light waves fan out as they bend. Spectroscopes help to magnify the effect of one slit and is much easier to use compared to the pencils.
2. When shining the three lights through the fiber optic cable, how is it possible for the light to travel to the other side of the cable?
The light in the fiber optic cable travels by constantly bouncing from one mirror lined wall to the next. This internal reflection occurs because there is no refraction of the light wave.

Teacher Feedback Survey:

http://dat.cns-eoc.colostate.edu/STEMkits/stem_kit_survey.php

Thank You!