

Class: Grade 4 Science

Lesson Title: Light Kinulation (Day 2)

Class Size: 24
Time: 50 mins

Curriculum Outcomes:

303-2 demonstrate that light travels away from a source in all directions

303-4 investigate how a beam of light interacts with a variety of objects, to determine whether the objects cast shadows, allow light to pass through, or reflect the light

Learning Objectives:

1. Students will gain an understanding of how light photons are reflected on certain surfaces.
2. Students will have an understanding of how light travels and the path it travels from the source.

Materials:

- Colored pinnies
- Large object(s) to reflect off of (it can be a designated wall)

Preparation beforehand:

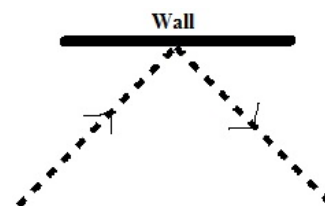
- Make sure a large space is cleared for the activity

Introduction:

1. Introduce the topic. Possible prompt questions include:
 - a. What happens to light if it hits a reflective surface? What is reflection of light?
 - b. Is there a way to direct light in one tiny beam so that all of the photons are in a straight line? (laser, so light all travels in one line instead of dispersed in normal lights)
2. Explain what a kinulation is, if you haven't done so the day before (broken up into kinesthetic and simulation). Tell them that these are used to help students learn difficult concepts that are otherwise difficult to picture. It allows students to become part of the demonstration, and therefore easier to remember and learn. Ask students if they would like to try one.

Activity: Light reflecting

1. Give each student a pinny so that they each represent one photon of light.
2. Have all the students line up in single file so that their path will be at a 45 degree angle to the wall (see image to the right). Do not instruct them to reflect at a 45 degree angle, simply give them the original direction as instruct them to predict where the light would reflect (if don't correctly the path should be similar to the image). Students should all get the chance to reflect on the wall.
3. Repeat the activity, this time line them up so that they are ALMOST perpendicular (90 degrees) to the wall, but so that they will still be able to reflect away from the original path. Discuss with students after they've reflected how it was different than the first round (when they reflected the second time, their path going forward was very close to their path upon reflecting off of the wall).
4. Finally, have students try to reflect at a perpendicular (90 degree angle) to the wall. They should quickly note that their forward path will actually be the same path as their reflection, other than in a different direction. I.e. students coming out of the laser will actually hit students who have yet to leave the laser.
5. If time permits, you may wish to add multiple reflectors around the room. Students can hypothesize where they would need to set up the reflecting objects in order to ensure that they can read the next object by bouncing off the first (as light can't turn mid-path, it needs to reflect in order to "turn").
6. After students are happy with their setup of reflectors, they can try travelling all at once in a continuous beam of light and reflect off each object to reach some final destination.



Conclusion – Possible wrap-up questions:

1. What practical uses is there for reflecting light? (light up dark spaces, direct light on art portraits, etc.)
2. Would the speed of the light change when it's reflected? (No, speed of light is constant)

