

How Does Light Move?

Third Grade

Activity: 3

Time: 1 Class Period

General Description

Understanding that white light is made up of a variety colors is a fairly difficult concept. Making this concept visual will enable students to grasp the scientific ideas more easily. Students will develop their own understanding of what is happening when they see a rainbow.

Objectives

Students will investigate the properties of white light.

Students will discover what colors make up white light.

Arizona State Standards

SC03 S1C1 PO1 Formulate relevant questions about the properties of objects, organisms, and events of the environment using observations and prior knowledge

SC03 S5C1 Energy and Magnetism: Investigate different forms of energy

W03 S3C2 SPO1 Record information (e.g., observations, notes, lists, charts, map labels and legends) related to the topic

W03 S3C2 SPO3 Write in a variety of expository forms (e.g., summary, newspaper article, reflective paper, log, journal)

W03 S3C3 SPO1 Write a variety of functional text (e.g., directions, recipes, procedures, rubrics, labels, graphs/tables)

Teacher Background

This particular set of activities would work well as stations. There are three activities that students can do in order to increase their understanding of how light behaves. Please note that the answers will vary from student to student but there are certain key ideas that should be included

Materials (per student)

Activity Cards 3-3a, 3-3b and 3-3c

Pencil/pen

Three index cards (3X5)

Hand mirror

Penny

Clear drinking glass

Water

Clay

Procedure/Exploration

1. Review the light spectrum and explain how only a small part of the light spectrum is visible. Distribute copies of Activity Cards 3-3a, 3-3b and 3-3c.
2. Have students conduct the experiments about visible light in groups.
3. Review students' answers as a class. Regardless of what they predicted, students' conclusions should include the following:

Activity #3-1-Yes, light travels in a straight line. The only way the light was able to pass through each of the cards was when the holes were arranged in a straight line. Light wasn't able to "bend" around misaligned holes to get through.

Activity #3-2-Yes, light rays can be bent. The penny "disappeared" because the water in the glass bent the light rays so they passed over your head—away from your eyes. The only way to see the penny at this point was to stand up so your eyes intercepted the rays.

Activity #3-3-Yes, light rays can bounce. The mirror changed the path of the light rays, directing them to a direction opposite the shiny surface. This was evident because the light rays hit a different wall instead of continuing forward "through" the mirror.

Writing Extension

Have students choose one of the experiments they conducted and write a lab report to communicate what they did and the results. The report should include a prediction, list of materials, procedures, observations, and conclusion.

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**Third Grade
Activity: 3
Activity Card: 3-3a**

Student Name:

Date:

Prediction

Will light move in a straight line? Write your prediction here.

Procedure

1. Punch a small hole in a group of three index cards.
2. Go to a darkened room with a flashlight turn it on and point it toward a wall.
3. Make a small ball out of the clay and press it on to a desk or table top. Place one index card in the clay and then shine the light on the card. How does the light look different on the wall as you shine it through the index card?
4. Make another small ball of clay and press it on the desk or table top placing it in front of the first card and clay. Now move the card until the light still shines on the wall.
5. Have another member of the group repeat step 4 with the last index card. Record your observations here.
6. What did you have to do to make the light shine on the wall when you were working with the three index cards?

Conclusions

Did you prove your prediction? Explain how you know that your prediction was correct or incorrect.

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How Does Light Move?

Third Grade
Activity: 3
Activity Card: 3-3b

Student's Name:

Date:

Prediction

Will water make light rays refract or bend?

Procedure

1. Place a penny on a table and put a clear drinking glass over the penny.
2. Sit down in front of the glass. Can you see the penny through the side of the glass?
3. Have a partner fill up the glass with water. Can you see the penny now?
4. How does the light look different on the wall as you shine it through the sheet of paper?
5. What happens when you stand up? Can you see the penny?

Conclusions

Did you prove your prediction? How do you know that your prediction was correct or incorrect?

How Does Light Move?

Third Grade
Activity: 3
Activity Card: 3-3c

Student's Name:

Date:

Prediction

Can light shine in a not straight line?

Procedure

1. Go to a darkened room with a flashlight and shine it in front of you. In what direction does the light travel?
2. Place a mirror in the path of the light. Does it travel in the same direction as it did before? How do you know? What happens when you angle the mirror?

Conclusions

Did you prove your prediction? How do you know that your prediction was correct or incorrect?