Chapter Science Investigation Name _____

Testing How Light Causes Changes

What You Need

three small plants of the same variety and similar size, in soil cups

Find Out

Do this activity to see how light affects plant life.

Process Skills

Predicting
Observing
Communicating

Time

- 30 minutes the first day
- 20 minutes twice a week for three weeks

What to Do

1. Set up the pages for your *Light Journal*. Use one page for each week.

2. Place one plant in direct light, such as directly in front of a window. Place another plant in indirect light, such as in a corner of your classroom, away from windows. Place the third plant in a place that is generally dark, such as a closet.

3. **Predict** how the differences in light sources will affect each plant.

4. Water each plant the same amount, with the help of your teacher, throughout the course of the investigation.

5. **Observe** the changes in each plant over time. **Record** those changes in your *Light Journal* by drawing what each plant looks like twice a week for three weeks.

Prediction: _____

_____

_____

Light Journal		
Week:	**Day 1**	**Day 2**
Plant 1 Direct Light		
Plant 2 Indirect Light		
Plant 3 Darkness		

Conclusions

1. What happened to each plant?

The plant in direct light grows normally; the plant in indirect light grows more slowly; the plant in dark pales, wilts, and looks unhealthy.

2. How did the lack of direct light and the lack of any light affect the plants?

The plants that did not receive enough light did not grow as well as the plant in direct light.

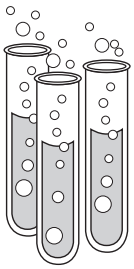
New Questions

1. How might a lack of light affect you and other living things?

Almost all living organisms need light to live and grow. Without light, plants cannot grow, so food would become hard to find.

2. Write a new question you have about light.

Accept any reasonable question.



Name _____

ACTIVITY

Making a Window

Predict which of the materials will allow light to pass through them. **Record** your predictions.

Predictions will vary.

	Material:	**Prediction:**
1.		
2.		
3.		
4.		
5.		
6.		

Test each of the materials by taping them one by one over the opening in the back of the box. One partner should hold her or his hand up to the opening behind the box, between the test material and the light source. The other partner should **observe** and **record** what can be seen through the box.

Observations will vary.

	Material:	**Prediction:**
1.		
2.		
3.		
4.		
5.		
6.		

Trade places with your partner and repeat the activity, using the rest of the test materials.

Observations will vary.

Name _____

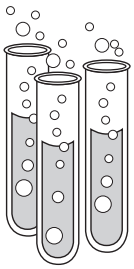
Conclusions

1. Which of the materials blocked the light?
Answers may include black paper, cardboard, and so on.

2. Were your predictions correct?
Answers will vary based on predictions, observations, and materials tested.

Asking New Questions

1. How do objects that block light and objects that do not block light help people?
Possible answers include: windows allow light into buildings; curtains and blinds keep light out; hats and sunglasses protect people from bright light; and so on.



Name _____

ACTIVITY

Bouncing Light

What does your name look like in the mirror? **Write** or **draw** what it looks like.

The word will be backward along with the letters.

Look at your face in the mirror. Touch the left side of your face. Which side of your face did you touch in the mirror?

Answers will vary. Students may think that it looks as if the reflected image is touching the right side.

How did you place the mirrors to get the light beam to show up on the other side of the book? **Draw** a picture showing where you put the mirrors.

Drawings will vary.

Name _____

Conclusions

1. What did the images look like in the mirror?
They were opposite from left to right.

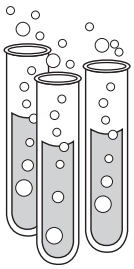
2. In what ways did you try to make the beam of light hit the other side of the textbook?
Answers will vary based on student experiments.

3. What was happening to make the light bounce?
It was reflected off the mirror.

Asking New Questions

1. What do you think would happen if you wrote a word backward and then held the paper up to a mirror?
Hint: Print the letters backward, too.
The letters and the word will look correct in the mirror.

2. You look in a mirror in the morning to brush your hair. Where else do people use mirrors?
Answers may include: in dental offices, clothing stores, hair salons and barber shops, in optical devices and cameras, in fun houses at amusement parks.



Name _____

ACTIVITY

Seeing White Light

What happens when you shine the flashlights on the white paper? **Record** what you see in the table.

On the White Paper

	What Happens?
Red Flashlight	
Blue Flashlight	
Green Flashlight	

What happens when you shine a red flashlight on blue paper?
The paper will appear black.

What happens when you shine a green flashlight on red paper?
The paper will appear black.

Shine two flashlights on one of the colored pieces of paper. What happens when you **experiment?**
Answers will vary.

Name _____

Conclusions

1. What happens when you shine all three flashlights in the same place?
A single area of white light appears.

2. What happens when you shine two different colors together on the white paper?
The answers will vary depending on which colors overlapped. Red + blue = magenta, blue + green = cyan (blue-green), red + green = yellow.

3. What happens when you shine different colored lights on the different colored papers?
Answers will vary. If one of the colors of light is the same as the color of paper, the paper will appear that color, otherwise the paper will appear black.

Asking New Questions

1. What color would a red rose appear to be if it were lit by a blue light?
black

2. Do you think it makes a difference what kind of surface you shine your lights on?
Answers will vary, but the kind of surface should not make much of a difference because this exercise relates to colors only.