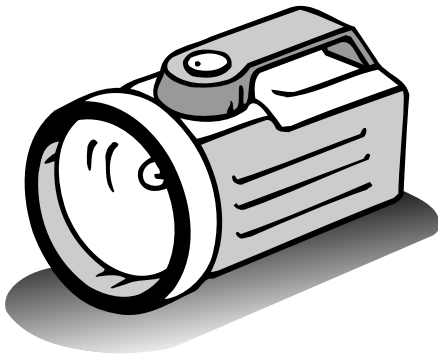
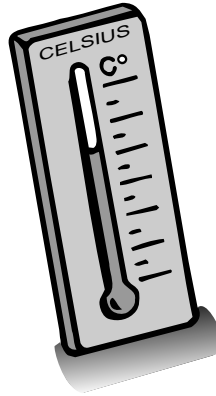


Absorbing Heat

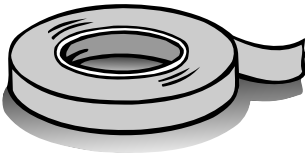
WHAT YOU NEED



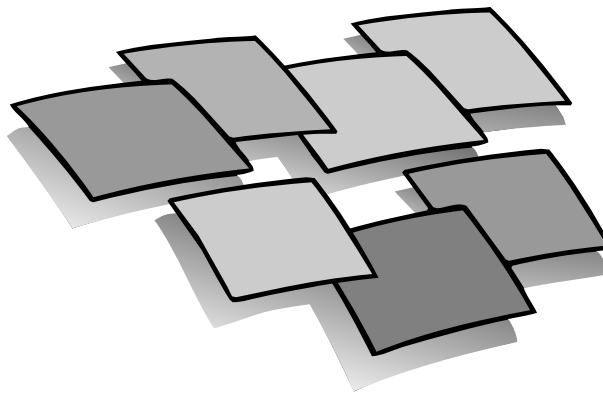
beam flashlight with
6-volt dry cell



thermometer
(Celsius)



masking tape



pieces of construction paper (14 cm × 14 cm),
red, orange, yellow, green, blue, indigo,
violet, white, and black

Find Out

Do this activity to see which colors absorb the most heat.

Process Skills

Measuring
Communicating
Experimenting
Controlling Variables
Using Numbers

Time

- 20 minutes each day for two weeks

WHAT TO DO



1. Fold a piece of construction paper in half and fold the two side edges. Using the masking tape, seal the sides to make a pouch. Also, seal the top of the pouch, except for a 1.5-cm opening. Place the thermometer inside the pouch through the opening in the top.
2. **Measure** and **record** the starting temperature. Shine the flashlight on the pouch for 10 minutes. **Measure** and **record** the ending temperature.

3. The next day, repeat Step 2. **Calculate** and **record** the **average** of the two trials. Also, repeat Step 2 for a different-colored piece of construction paper.
4. Every day, repeat Steps 2 and 3 until you have **tested** each color of construction paper twice. Be sure that the only **variable** that changes is the color of the construction paper.



Observing Temperature and Color				
Color	Day	Beginning Temperature	Ending Temperature	Average Temperature
Red	1			
	2			
Orange	1			
	2			
Yellow	1			
	2			
Green	1			
	2			
Blue	1			
	2			
Indigo	1			
	2			
Violet	1			
	2			
White	1			
	2			
Black	1			
	2			

Conclusions

1. Which color of pouch had the greatest average change in temperature?

Which color of pouch had the least average change in temperature?

2. What can you conclude about the amount of heat absorbed by the different colors of the visible light spectrum?

3. What color of clothing would you wear on a hot day in Florida?

What color of clothing would you wear on a cold day in the mountains?

New Questions

1. Will snow on the ground melt equally in all places, or will it melt faster in certain areas? Explain.

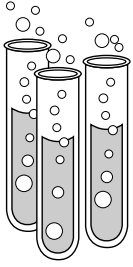
2. What are some reasons that support your answer?

3. In what other situations is color a factor in helping to cool or heat something?



Activity Journal

Lesson 1 • Properties of Solar Radiation



Name _____

ACTIVITY

Making Waves

What happens when you move the end of the rope up and down?

What do you **predict** will happen if you increase the speed of your movement?

What do you **observe** when you increase the speed of your movement?

What do you **predict** will happen if you increase the height of your movement?

What do you **observe** when you increase the height of your movement?

Activity Journal

Lesson 1 • Properties of Solar Radiation

Name _____

Conclusions

- ① What happened to the frequency and wavelength when you increased the speed of movement?

- ② What happened to the wave when the rope hit the stationary object?

- ③ What type of wave was modeled?

- ④ Describe the relationship between the source and the wave.

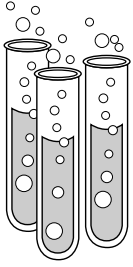
Asking New Questions

- ① How many ropes would you need to demonstrate electromagnetic waves?

- ② What would you need to demonstrate sound waves?

Activity Journal

Lesson 2 • Visible Light



Name _____

ACTIVITY

Making Colors from Light

What do you **see** when white light passes through the prism?

What colors do you **predict** you will see if you place a second prism between the first one and the paper?

What happens when you use two prisms?

Illustrate the effects of using one or two prisms with colored pencils.

Name _____

Conclusions

① How does the prism change the white light?

② What colors do you see?

③ What happens when two prisms are used?

Asking New Questions

① When you look at the visible light spectrum, what is the order in which the bands of color appear?

② Make a **hypothesis** about what would happen if only one color of light was shown through the prism.

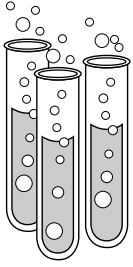
③ **Design an investigation** to test your **hypothesis**.

④ Write a report to include the steps and results of your investigation. Present your findings to your class.

Activity Journal

Lesson 3 • Radiation and Earth's Energy

Name _____



ACTIVITY

Making Wind Work

Draw a plan for a device that can use wind to pick up paper clips.

How My Wind Device Performed

Wind Speed	Prediction: How Many Paper Clips Will It Pick Up?	How Many Paper Clips Did It Pick Up?

Activity Journal

Lesson 3 • Radiation and Earth's Energy

Name _____

Conclusions

1 How many paper clips did your device pick up when you first built it?

2 How well did it work at different wind speeds?

3 Did your design changes result in more paper clips being picked up?

4 Why was it important to design the windmill before it was built?

Asking New Questions

1 Wind speed can vary a lot. How could you control the work your windmill does at different speeds?

2 How could your machine be useful?