

PROCEDURE

1. Use a utility clamp and ring stand to fasten a Light Sensor 5 cm from and perpendicular to a piece of colored paper as shown in Figure 1. The Light Sensor should be set on the 0–6000 Lux position. The classroom lights should be on.
2. Connect the Light Sensor to the computer interface. Prepare the computer for data collection by opening the file “23 Reflectivity of Light” from the *Physical Science w Vernier* folder.
3. When the reading stabilizes, record the color and the reflected light value (in Lux). The Lux is the SI unit for light illumination.
4. Make and record readings for aluminum, black, white, and two other colors.

DATA

Color	Aluminum	Black	White	_____	_____
Reflection	_____	_____	_____	_____	_____
Value (Lux)					

PROCESSING THE DATA

1. Calculate the percent reflectivity (albedo) of each color using the formula given in the introduction. Show your work and record the results in the table below.

Color	Aluminum	Black	White	_____	_____
Percent	<u>100%</u>	_____	_____	_____	_____
Reflectivity					

2. Which color, other than aluminum, has the highest reflectivity?
3. Which color has the lowest reflectivity?
4. What materials might give a city or planet a high reflectivity or albedo? Explain.
5. Does the planet Earth have high reflectivity? Why?

EXTENSIONS

1. Design an experiment to test the reflectivity of sand, soil, water, and other materials.
2. Design an experiment to determine if there is a relationship between reflected light and heat absorbed by various colors or materials.

TEACHER INFORMATION**Reflectivity of Light**

1. The student pages with complete instructions for data collection using LabQuest App, Logger *Pro* (computers), EasyData or DataMate (calculators), and DataPro (Palm handhelds) can be found on the CD that accompanies this book. See *Appendix A* for more information.
2. Equal-size pieces of construction paper and aluminum foil can be used and saved for reuse.
3. The computer procedure directs students to record reflectivity values from the meter (without clicking on the Collect button). Another possibility is to have students use the Selected Events mode for each of the 5 trials. The Logger*Pro* file for this experiment is already set up for this option. Simply have your students click the Collect button and click the Keep button when the reflectivity reading is stable. This saves the reflectivity reading along with its trial number in the table.

SAMPLE RESULTS

Color	Aluminum	Black	White	Purple	Green
Reflection Value (Lux)	xxxx	xxxx	xxxx	xxxx	xxxx
Percent Reflectivity	xxxx	xxxx	xxxx	xxxx	xxxx

ANSWERS TO QUESTIONS

Answers have been removed from the online versions of Vernier curriculum material in order to prevent inappropriate student use. Graphs and data tables have also been obscured. Full answers and sample data are available in the print versions of these labs.