

TEACHER INFORMATION

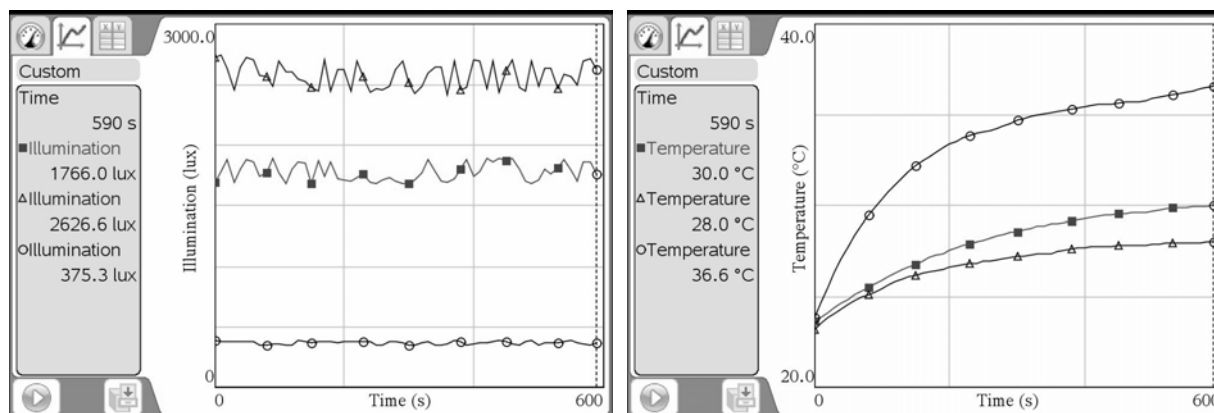
Reflection and Absorption of Light

1. Editable Microsoft Word versions of the student pages and pre-configured TI-Nspire files can be found on the CD that accompanies this book. See *Appendix A* for more information.
2. This experiment is not intended for use with Easy or Go! Products since data from two sensors must be collected at the same time. While you can use two different handhelds, each with their own sensor or multiple Go! Products on the same computer, to collect the data, a single, multi-channel interface is preferred.
3. The straw is used to keep the temperature probe from moving around during the length of the experiment.
4. Heavy construction paper works well in this experiment. Try to obtain pieces with the same texture and thickness. Rectangular 10 cm x 20 cm pieces work well.
5. If you are using a TI Light Probe (order code TILT-BTA) for data collection, the sensor will measure Light Level rather than Illumination.
6. Remind your students not to touch a hot bulb.
7. To make it easier for the students to tell which run is which, you can have them rename the runs. To do this, from the table, double click on the run name and type in the color of the paper.
8. Be sure that the aluminum foil does not get wrinkled as the reflectance value will be greatly diminished. If the foil does get wrinkled, replace it.
9. Do not use compact florescent or led lights for this experiment.

SAMPLE RESULTS

Color	White	Black	Aluminum	Purple	Yellow
Starting temperature (°C)	23.7	23.9	23.2	25.2	24.1
Final temperature (°C)	30.0	36.6	28.0	31.0	30.1
Change in temperature (°C)	6.3	12.7	4.8	5.8	6
Reflection value (lux)	1778	372	2579	1012	1539
Percent reflectivity	68.9%	14.4%	100%	39.2%	59.7%

Experiment 6



Reflection values and temperature changes for white paper (■), black paper (○), and aluminum foil (△).

ANSWERS TO QUESTIONS

1. Black paper had the largest temperature increase.
2. White paper had the smallest temperature increase.
3. Black would work best for a solar collector since it absorbs radiant energy best.
4. White paper has the highest reflectivity.
5. Black paper has the lowest reflectivity.
6. The lower the reflectivity, the greater the temperature change.
7. Snow, ice, sand, clouds, and water would be expected to give a planet high reflectivity.
8. Planet Earth has high reflectivity because much of it is covered by snow, ice, sand, clouds, and water. The results of this experiment suggest that dark-colored parts of the Earth, such as forests and green cropland, would have lower reflectivity.

ACKNOWLEDGEMENT

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