**Title of Investigation**: Controlling Solar Energy **Grade**: 6 **Kit**: SEPUP Physical Kit - 70

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**Key Question**: Which material works best at absorbing light (solar energy)?

**Objectives**: Students create a shadow box and measure light reflected from various materials.

**Summary of activity**: Students create a shadow box and determine the reflectivity of various materials in order to discover the least reflective material (material that absorbs the most light).

6.3.5 Use models or drawings to explain that Earth has different seasons and weather patterns because it turns daily on an axis that is tilted relative to the plane of Earth’s yearly orbit around the sun. Know that because of this, sunlight falls more intensely on different parts of Earth during the year (the accompanying greater length of days also has an effect) and the difference in heating produces seasons and weather patterns.

6.3.17 Recognize and describe that energy is a property of many objects and is associated with heat, light, electricity, mechanical motion, and sound.

6.1.2 Give examples of different ways scientists investigate natural phenomena and identify processes all scientists use, such as collection of relevant evidence, the use of logical reasoning, and the application of imagination in devising hypotheses\* and explanations, in order to make sense of the evidence.

**Materials**:

Box (closed)

Light Sensor probe

Labquest

Brightest light bulb you can find.

Adjustable office light

Mirror,

Assortment of reflective and seemingly non-reflective items

Optional:

Clamp

Cardboard

Tape

**Description of procedures**:

Students will seal box off from light, then they will cut a place for the light sensor to go through the rear of the box. The opposite side of the box needs a large enough hole for the reflected light to pass through. Set light in a place where it can shine onto materials that will reflect into the hole in the box. (We put the light on top of the box, shining in front.) Students will hold up various materials under the light and in front of the hole and record the highest lux reading for each material. An extension could be recording lux readings for set angles and distances from the box and light. Another extension is that students could also measure the temperature of the box after a set period of time.

**Science Questions:**

How do distances and angles effect the lux reading?

How does the brightness of bulb effect the lux reading? What do you mean by brightness?

How does the distance between the light sensor and the opening of the box effect the lux reading?

How does texture of material effect reflectivity?

How do actual solar panels measure solar energy and light absorption?