

Figure 4.

Lesson extension ideas.

- Investigate what chlorophyll is and how, on a basic level, it uses solar energy to make glucose as part of the process of photosynthesis (see [http://www.agrium.com/in\\_the\\_community/photo.htm](http://www.agrium.com/in_the_community/photo.htm); see <http://www.cedu.niu.edu/scied/resources/sciencemisconceptions.htm> for common alternate conceptions about plants obtaining and using energy; click on #17 “living things”).
- Conduct an experiment using leaf chromatography to separate pigments from leaves (see <http://www.hometrainingtools.com/articles/leaf-experiments.html>).
- Discuss the size, structure, and orientation of leaves in dry, hot climates. For example, the small, waxy leaves of the Manzanita plant, found in California’s Mediterranean shrubland, are oriented vertically toward the sun reducing the amount of sunlight hitting them and preventing them from drying out (see [http://www.calacademy.org/exhibits/california\\_hotspot/habitat\\_mediterranean\\_shrublands.htm](http://www.calacademy.org/exhibits/california_hotspot/habitat_mediterranean_shrublands.htm)).
- Identify the species of tree or plant being investigated (see <http://www.oplin.org/tree/> or <http://www.arboday.org/trees/treeid.cfm>).
- Have students research how solar cells work (see <http://www.howstuffworks.com/solar-cell.htm> or <http://www.energyquest.ca.gov/story/chapter15.html>); see [http://www1.eere.energy.gov/solar/solar\\_timeline.html](http://www1.eere.energy.gov/solar/solar_timeline.html) for a solar timeline).
- Use different estimation strategies to determine the average surface area of a leaf on a particular tree (ex. by measuring the surface area of three different sized leaves and then averaging surfaces areas, a more accurate representation of the average leaf size of the tree can be obtained).
- Use a multiplicative strategy to estimate the number of leaves on a tree (see: <http://education.guardian.co.uk/primaryresources/story/0,,920994,00.html>).
- Investigate the array structure of solar panels, including how the array can assist with calculating the total number of panels using the operation of multiplication.