

NOTE: This is a science laboratory day. If your classroom is not your science lab, make sure you have signed up for the lab.

TITLE OF LESSON

Biology Unit 1 Lesson 19 – Making and Releasing Energy: Lab 6
How does energy move in and out of a cell?

TIME ESTIMATE FOR THIS LESSON

One class period

ALIGNMENT WITH STANDARDS

California – Biol CB 1f & i; IE1

MATERIALS

Lab 6: Making and Releasing Energy, Photosynthesis handout – Student Page
Blank Strand Diagram handout – Student Page
Lab Report #2 Requirements handout – Student Page
Fresh spinach leaves (from young, growing plants is best)
Light source (50W, 150W lamps in fixtures)
Support stands and clamps for lamps
#3 Cork borer or soda straw
250-ml flask with 2-hole rubber stoppers
Vacuum source and tubing
0.2% sodium bicarbonate (NaHCO₃)
Petri dishes – 4 for different light intensities and 4 for different colored filters
2 1L or 2L beakers
Colored filters (that pass or don't pass wavelengths necessary for photosynthesis)
Culture dish to collect sunken disks
Forceps to move disks

NOTE: For images and outline of an alternative method for leaf disks go to <http://www.susqu.edu/facstaff/r/richard/photosynthlab.html>.

LESSON OBJECTIVES

- To demonstrate an understanding of the constituents and functions of chloroplasts
 - To demonstrate an understanding of the principles of photosynthesis
 - To work successfully and safely in a science laboratory
 - To complete a lab experiment
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FOCUS AND MOTIVATE STUDENTS – WARM-UP ACTIVITY

- 1) Homework Check – Hand back all graded notes and homework assignments. Have students place them in their binders in the appropriate sections. Collect all homework assignments.
 - 2) **Agenda** – Have students copy it.
 - 3) Review – Briefly review with students the principles of photosynthesis.
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ACTIVITIES – INDIVIDUAL AND GROUP

1. Lab 6 – Hand out **Lab 6: Making and Releasing Energy, Photosynthesis**. Tell students there are 2 parts to this lab. Review with them the instructions for each. Take any questions. Tell them today it will be their job to come up with their question and their hypothesis in their groups. Tell them you will be stopping them 10 minutes before the end of the period to clean up and go over with them their homework for the evening. Have them begin.

2. Lab Report 2 – Ten minutes prior to the end of class, hand out **Lab Report #2 Requirements** and a **Blank Strand Diagram**. Tell students they will be required to write their second Lab Report on Making and Releasing Energy Labs 5 or 6 and everything they have been taught this week. Tonight, they must complete their Strand Diagram, as they will be writing their first draft in class tomorrow. Tell them they may use their **Strand Diagram Instructions for Lab Report** sheet as a sample of how to fill in their **Strand Diagram**, if they cannot remember how. Review with them the requirements for this Lab Report. Field all questions.
 3. Clean Up – Have them clean up their workstations. Initial or stamp all completed labs. You will not be able to grade these tonight, as they will need to use them to complete their **Strand Diagrams**.
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HOMEWORK

- 1) Complete your **Blank Strand Diagram** for Lab Report #2
 - 2) Study vocabulary to date.
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GROUP ROLES

Recorder – The Recorder will record all results during the laboratory. All group members are recorders.

Facilitator – The Facilitator will keep group members focused on the activity.

Illustrator – The Illustrator will draw a scheme or illustration of the data discussed.

Manager – The Manager is responsible for getting materials the group needs during the laboratory.

DOCUMENTATION FOR PORTFOLIO

Lab Report #1