

Photosynthesis & Energy Flow

DURATION 75 minutes	UNIT Cell energy · Week 3	STANDARDS HS-LS1-5, HS-LS2-3	DATE March 18, 2025
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OBJECTIVE

Students will be able to trace the flow of energy from sunlight to ATP and explain, in their own words, why plants appear green — assessed via the exit ticket (3 of 4 correct).

1 MATERIALS & PREP

25 min total — set lamps out during period 3, check BTB colour before the bell

☐ Spinach leaves, 16 pairs · 5 min

☐ Elodea sprigs · 5 min

☐ Beakers + desk lamps · 10 min

☐ BTB indicator, 0.04% · 5 min

☐ Energy-flow handout, 32 · print

☐ Exit tickets, 32 · print

☐ Goggles + gloves · 2 min

TIME	ACTIVITY	NOTES
0:00	Warm-up Where does the mass of a tree come from? Think-pair-share; board the best two hypotheses.	Collect prior knowledge
0:10	Direct instruction Light reactions vs. Calvin cycle with the energy-flow diagram; cold-call checkpoints.	15 min max — keep pace
0:25	Lab: Elodea + BTB Pairs observe colour change under lamp vs. dark cupboard; record observations.	Safety: goggles
0:50	Debrief Groups explain results using today's vocabulary; correct the warm-up hypotheses.	Sentence stems on board
1:05	Exit ticket Four questions: two recall, one explain, one extend (why green?).	Grade tonight

CRITERION	1 · APPROACHING	2 · PROFICIENT	3 · ADVANCED
Energy pathway Q1-Q2	Names inputs and outputs, skips the middle	Traces sunlight, light reactions, the Calvin cycle, then glucose	Predicts what fails when light is removed, and why
Evidence from the lab Q3	Restates the BTB colour change	Uses the BTB result to support a claim	Compares lamp vs. dark and names the control
Scientific vocabulary Q4	Everyday words for the process	Chloroplast, pigment and ATP used correctly	Ties each term to a place on the diagram

4 DIFFERENTIATION

- ELL: glossary strip with cognates (fotosintesis)
- Support: partly filled diagram + word bank
- IEP: extended time, oral exit-ticket option
- Pair emerging readers with fluent ones
- Print the diagram at 150% for Marcus and Dee

5 EXTENSION

- Graph O₂ output vs. lamp distance (data set on Classroom)
- Design a fair test for leaf colour and absorption
- Early finishers: rebuild the diagram from memory
- Optional write-up: "why do leaves change colour?", 200 words

6 STANDARDS

HS-LS1-5
Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

HS-LS2-3
Construct and revise an explanation for the cycling of matter and flow of energy.

RST.9-10.7
Translate quantitative information expressed in words into visual form.

7 POST-LESSON REFLECTION

Complete before Friday's planning block

8 NEXT LESSON

Cellular respiration — connect today's energy flow to mitochondria. Homework due: diagram the mitochondria link.

Bring the fermentation demo kit; check the yeast before Friday.