Electron Jumper Activity: Electron Transport in Photosynthesis

Middle School (NGSS Aligned) Teacher Guide

Overview

This guide supports implementation of the Electron Jumper Activity: Electron Transport in Photosynthesis using the 5E instructional model.

Learning Objectives

- Students will trace how plants use sunlight to make food
- Students will identify where oxygen comes from in photosynthesis
- Students will explain why plants need light energy

Standards Alignment

- **MS-LS1-6:** Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms
- **SEP:** Developing and Using Models
- **DCI:** LS1.C: Organization for Matter and Energy Flow in Organisms
- **CCC:** Energy and Matter

Prerequisites

- Basic understanding that plants need sunlight
- Knowledge that plants make their own food

Time Estimate

20 minutes

Materials Needed

- Computer with internet access
- Student Activity Sheet

Teaching Tips by Phase

Phase 1: ENGAGE (5-10 minutes)

- Start with the phenomenon or problem presented
- Elicit student predictions and prior knowledge
- Create cognitive dissonance if possible
- Build excitement for investigation

Phase 2: EXPLORE (15-20 minutes)

- Allow students to investigate with minimal guidance
- Circulate and ask probing questions
- Encourage systematic data collection
- Note common discoveries and difficulties

Phase 3: EXPLAIN (10-15 minutes)

- Have students share their findings first
- Build on their observations to introduce concepts
- Address misconceptions directly
- Connect to broader biological principles

Phase 4: ELABORATE (10 minutes)

- Apply knowledge to new scenarios
- Make real-world connections
- Encourage deeper investigation
- Support transfer of learning

Phase 5: EVALUATE (5-10 minutes)

- Use varied assessment strategies
- Focus on conceptual understanding
- Provide immediate feedback
- Plan follow-up based on results

> **Remember:**
>
> The goal is student discovery through guided inquiry. Resist the urge to explain concepts before students have explored them!
