

# Electron Jumper Activity: Electron Transport in Photosynthesis

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## High School (NGSS Aligned) Teacher Guide

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### Overview

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

### Learning Objectives

- Students will model the flow of electrons in photosynthesis
- Students will identify energy inputs and outputs
- Students will explain how light energy becomes chemical energy

### Standards Alignment

- **HS-LS1-5:** Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy
- **SEP:** Developing and Using Models
- **DCI:** LS1.C: Organization for Matter and Energy Flow in Organisms
- **CCC:** Energy and Matter

### Prerequisites

- Basic understanding of photosynthesis
- Energy transformations

## Time Estimate

25 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

## NGSS Three-Dimensional Learning

- **Science Practices:** Developing and using models, analyzing data, constructing explanations
- **Crosscutting Concepts:** Patterns, cause and effect, systems thinking
- **Disciplinary Core Ideas:** See standards alignment above

### Remember:

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