Plant Response Activity: Plant Hormones and Tropisms

AP Biology/College Level Teacher Guide

Overview

This guide supports implementation of the Plant Response Activity: Plant Hormones and Tropisms using the 5E instructional model.

Learning Objectives

- Students will model phototropic responses and auxin distribution
- Students will analyze photoperiodic control of flowering
- Students will quantify the relationship between light stimuli and plant responses
- Students will evaluate adaptive significance of light responses

Standards Alignment

- **ESSENTIAL KNOWLEDGE 4.5.A.1:** Organisms must exchange information with their environment.
- **ESSENTIAL KNOWLEDGE 4.5.C.1:** Environmental changes can affect the behavior and physiology of organisms.
- **ESSENTIAL KNOWLEDGE 7.1.B.1:** Organisms respond to changes in their environment through behavioral and physiological mechanisms.

Prerequisites

- Plant hormone function (auxins)
- Signal transduction pathways
- Circadian rhythms

- Evolution of adaptive responses

Time Estimate

90 minutes

Materials Needed

- Computer/tablet with internet access
- Student worksheet
- Protractor for angle measurements
- Graph paper or spreadsheet software

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!
