

Name:

Date:

Section:

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## Plant Response Activity: Plant Hormones and Tropisms

### Investigating Plant Light Responses: Survival Through Sensing

**Background:** \_\_\_\_\_

Plants cannot move to find optimal conditions, so they've evolved sophisticated mechanisms to sense and respond to light. These responses are critical for photosynthesis optimization and reproductive timing.

#### Phase 1: ENGAGE (10 minutes)

##### Getting Started:

Open [peebedu.com](http://peebedu.com) and navigate to Plant Response Simulator

##### Initial Exploration:

1. Click the Phototropism tab and observe the plant setup
2. Note the light source, plant stem, and auxin molecules
3. Drag the light source to different positions

##### Pre-Assessment Questions:

1. Define the fitness advantage of phototropism:

1. Predict: If light comes from the left, which side of the stem will have more auxin?

1. Hypothesis: How might day length affect flowering time in temperate plants? \_\_\_\_\_

## Phase 2: EXPLORE (30 minutes)

### Investigation 1: Phototropism Mechanics

Systematically test light positions and measure plant responses.

#### Data Collection Table 1: Light Position vs. Stem Bending

Auxin Distribution ----- 90 Lower right

Night Length (h) ----- 16 14 12 10 8 6 4 Plant Phototropism

#### 1. Application Question:

Space agriculture challenge:

- Design LED array for Mars greenhouse: \_\_\_\_\_

- Energy optimization: \_\_\_\_\_

#### 1. Model Evaluation:

Simulation strengths:

- \_\_\_\_\_

Missing complexities:

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- Darwin's phototropism experiments
- Garner and Allard photoperiodism discovery
- Current research on photoreceptors
- Agricultural light management guides