Auxin and shoot phototropism

Student activity • observation and reasoning

YEAR 10 / LESSON 45 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

Why does a shoot bend towards light?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, paper models, pencil and ruler

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Shared Biology / Double Award: 2.85. Auxin in shoot phototropism.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Draw a shoot tip receiving light from one side; label the lit and shaded sides.

2. Represent auxin redistribution so there is more auxin on the shaded side of the shoot.

3. Show greater cell elongation on the shaded side and explain how this produces bending towards light.

4. Use a paper strip model with unequal side lengths to demonstrate curvature; identify that it does not reproduce hormone chemistry.

5. Explain why the shoot tip and the elongating region have different roles.

6. Correct the claim that light pulls the shoot or that auxin simply makes every plant cell grow faster. Limit the explanation to shoots.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

In the standard shoot model, auxin produced near the tip becomes unevenly distributed under unilateral light. Greater elongation on the shaded side causes bending towards the light. Root responses to auxin differ and should not be inferred from this shoot model.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Where is auxin produced in this model?

2. Which side has more auxin?

3. Which side elongates more?

4. Which way does the shoot bend?

5. Does light physically pull the shoot?

6. Why not apply the same rule directly to roots?