Accommodation and the pupil reflex

Student activity • observation and reasoning

YEAR 11 / LESSON 77 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How can the eye respond separately to object distance and light intensity?

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

Equipment

- Student booklet, pencil and ruler
- Near/distant-focus and bright/dim-light eye diagrams

Paper, modelling and written reasoning only. No chemicals or biological samples are handled. Use diagrams only; no lasers, torches or direct sunlight viewing.

Course coverage: Shared Biology / Double Award: 2.92. Focus and light responses.

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. For a near object, show ciliary muscle contraction, reduced ligament tension and a thicker, more curved lens.

2. For a distant object, show ciliary relaxation, taut ligaments and a thinner lens.

3. Explain how these changes alter refraction so the image remains on the retina.

4. For bright light, show circular iris muscle contraction and radial muscle relaxation, making the pupil smaller.

5. For dim light, show the opposite iris-muscle response and a larger pupil.

6. Compare accommodation with the pupil reflex; do not confuse ciliary muscles with iris muscles.

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

Accommodation changes lens curvature for distance. Pupil responses alter the amount of light entering. Near focus: ciliary contraction → less ligament tension → thicker lens. Bright light: circular iris contraction → smaller pupil. Use diagrams only; no lasers, torches or direct sunlight viewing.

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. What happens to the ciliary muscle for near focus?

2. What happens to suspensory ligaments?

3. How does the lens change?

4. What contracts in the iris in bright light?

5. Does a small pupil prove near focus?

6. Why keep the two muscle systems distinct?