Assessment Schedule 2006

Biology: Describe animal behaviour and plant responses in relation to environmental factors (90716)

Assessment Schedule

Question	Achievement	Achievement with merit	Achievement with excellence
1(a)	**Response AND hormone given:** Positive phototropism. ("Phototropism" alone is insufficient.) **Hormone:** IAA (Indole-Acetic Acid). Auxin.		
1(b)	Cites evidence from the diagram that supports conclusion: • removing the tip • removing & replacing the tip (mica + gelatine comparison) • comparison of covered ones (opaque + transparent + base). **OR** reason but no evidence	Gives an evidence based reason Does not bend compared to control Gelatin bends or mica does not Movement of auxin from tip	
1(c)	Diagram must show **unequal** cell elongation of cells. (Diagram in same direction as resource diagram – may not have light but if facing opposite direction must have light). **If no diagram but good explanation, then Achieved only:** Eg, IAA induces elongation of cells on the shaded side → coleoptile bends towards the light.	Explains **action** of IAA on cells: • When light shines on a plant from the side, the result is a greater concentration of IAA on the shaded side. This stimulates elongation of cells on the shaded side, causing the stem to bend towards the light. • **OR** less "growth inhibitor" on the shaded side. This stimulates elongation of cells on the shaded side, causing the stem to bend towards the light. **PLUS** Diagram that clearly shows an unequal growth of cells. ***(Must have diagram to gain a Merit)***	
1(d)	More light / more or greater photosynthesis. **OR** Maximises light / maximum photosynthesis.	Explanation relates maximising light to maximising photosynthesis: Plants require light for photosynthesis. The ability to grow towards a directional light source would maximise the amount of light they are exposed to → *maximising* photosynthesis. Greatest amount of light maximum photosynthesis.	

1(e)	Recognises that thigmotropism allows the plant to use other plants / structures for <u>support.</u> (idea of support must be clear)	Explains benefits of this, eg: • Such support would help the plant climb upwards to <u>gain more light</u>. • Increasing amount of photosynthesis.	Clearly discusses the relationship between support and gives TWO advantages to the plant eg: • Plant can maximise access to light for photosynthesis, improving competitive success. • Plant can put resources into rapid upward growth rather than production of strong internal support structures → outgrowing competitors. • Flowers access for pollination. • Seed dispersal.
2(a)	Example of **kinesis** for a <u>suitable named</u> animal, eg: Slaters, Lice, Fleas etc. Eg, slaters move around more vigorously in hot / brightly lit / dry conditions. Must be suitable animal, stimulus, non random movement.		
2(b)		Increased rate of movement means the animal is more likely to encounter <u>optimum environment / conditions it prefers</u> (at which point its movement should slow, so that it remains in those conditions).	
2(c)	States that the wasp uses visual cues to find its burrow. **OR** uses the shape of the cones **OR** landmarks.	Provides <u>evidence</u> to support use for visual cues, eg: Wasp moves to centre of displaced cone / cone circle with no nest where it would expect to find its burrow (if relying on memory of visual cues).	
2(d)	Any reasonable environmental cue: • (Southwards migration) triggered by <u>shorter</u> day length OR <u>colder</u> temperatures. Not change in temperature **OR** change in day length.		
2(e)	ONE reasonable answer (candidates may not be aware that several generations pass during one migration cycle): • Avoid cold temp. • Ensures ready access to suitable food plants throughout the year. • Safe site for over-wintering. (warmer conditions.	<u>Explains</u> **ONE** benefit of migration. • <u>More</u> food supply. • Better reproductive success.	Needs to <u>discuss</u> benefits of **BOTH**: • Migration allows the butterflies to maximise feeding. **AND** • Maximises breeding opportunities / better reproductive success in the US over summer. (Must have reproductive success)

3(a)	Correct term: Photoperiodism.		
3(b)	Correctly describes required lighting conditions: • Shorter period of light • Shorter days OR • Longer nights OR • Less than 12 hours light per day in <u>run-up to Christmas.</u>	Explanation relates: This lighting regime and the triggering of the onset of flowering at the desired time. <u>with</u> Shortened day length will initiate flowering (at Christmas)	
3(c)	Recognises that life cycle events must be timed correctly Needs to be seasonal not day / night Eg, linked to: Pollination Reproductive cycle Climatic conditions etc.	**ONE** <u>explanation</u>: • Timing of flowering will also be influenced by dependence on availability of pollinators **OR** • Flowering in spring – in winter the buds would be destroyed by low temperatures **OR** • In autumn, it would be too late for fruit to develop before damaging frosts begin. • Leaves dropping off.	<u>Discusses</u> **TWO** ideas in relation to flowering at the correct time • Timing of flowering will also be influenced by dependence on availability of pollinators. • Flowering in spring – in winter the buds would be destroyed by low temperatures. • In autumn, it would be too late for fruit to develop before frosts begin. • Leaves dropping off.
4(a)	Two advantages: Ensures access to a resource: • protection of young • sufficient food • ensure shelter • nesting sites • mates. Should qualify in some way.		
4(b)		Some potential territories may have: • <u>more shallow water</u>, suitable for feeding cygnets, than others. **OR** Some swans may need to defend larger territories: • to obtain the minimum area of <u>shallow water</u> needed for their cygnets.	

4(c)	One of Saves time **OR** Reduces energy expended **OR** Reduces injury.	Explanation of **TWO** of: • Energy reduction. **AND** • Use of displays reduces likelihood of harm to the individual. **OR** • In a social grouping all know their "place" & displays are unlikely to escalate to actual fighting.	
4(d)	Major peak in July **AND EITHER** • Drops off after July. **OR** • Gradually increase from January / February. Must have July **AND** one other. Needs to specifically identify the months - winter, summer are not specific enough.		

4(e)	Correctly recognises that the July peak is related to fertilisation in August (cygnets appear a month later).	Gives **ONE** explanation:
		
		• Fertilisation in July ensures that hatching coincides <u>with spring abundance of food.</u>
		OR
		Suggests alternative functions for the activity prior to July eg:
		• maintaining pair bond
		• stay together for breeding
		• indicating health of partner.
		OR
		Measures of mate quality ensure best possible mate → best possible genetic outcome for individual's offspring
		OR
		Parental care – September / October
			Discusses **TWO** ideas:
			
			• Fertilisation in July ensures that hatching coincides with spring abundance of food.
			• Suggests alternative functions for the activity prior to July eg:
			  • maintaining pair bond
			  • stay together for breeding
			  • indicating health of partner.
			• Measures of mate quality ensure best possible mate → best possible genetic outcome for individual's offspring.
			
			Parental care – September October.

Judgement Statement

Biology: Describe animal behaviour and plant responses in relation to environmental factors (90716)

Achievement	Achievement with Merit	Achievement with Excellence
EIGHT questions answered correctly, including at least 4 × A from Questions One and Three.	EIGHT questions answered correctly, including at least 4 × A from Questions One and Three *and* at least 4 × M from EITHER Questions One and Three (plants), OR from Questions Two and Four (animals).	EIGHT questions answered correctly, including at least 4 × A from Questions One and Three; *and* at least 4 × M from EITHER Questions One and Three (plants), OR from Questions Two and Four (animals) *and* at least 1 × E.