Assessment Schedule – 2005

Biology: Describe animal behaviour and plant responses (90716)

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
1(a)	Describes TWO methods of navigation. Eg: • (orientation to) sun • (orientation to) stars • polarised light • landmarks • earth's magnetism • (flight orientated to) angle of waves • (angle orientated to) wind direction • internal map.		
1(b)	Describes a benefit of migration to the cuckoo. Eg: • warmer temperatures in islands • can take advantage of long days • fewer (natural) predators in NZ for raising of cuckoo's young • can take advantage of plentiful food source • more suitable / abundant host species in NZ.	Explains how migration benefits the cuckoo by linking it to the outcome of the benefit (increased reproductive success in NZ / increased survival in islands). Eg: • They have a good food supply in the islands which increases their survival. • Longer days mean host bird has lots of time to locate food for offspring, giving the offspring better survival chances.	

Q	Achievement	Achievement with Merit	Achievement with Excellence
1(c)	Describes an effect of the egg-laying behaviour on the cuckoo AND the host birds. Eg: • Cuckoo doesn't have to feed / defend its young / can lay more eggs / saves energy. **AND** • Host bird wastes energy / has to feed / rear young that are not it's own	Describes an effect of the egg-laying behaviour on the cuckoo AND the host birds AND explains ONE effect on cuckoo / host bird. Eg: • The cuckoo benefits because it does not have to rear its young, and so has more energy for survival / feeding / reproducing AND the host bird wastes energy raising chicks that are not it's own • The host bird rears the cuckoo chicks so it's own chicks don't get as much food / protection **AND** cuckoo doesn't have to waste energy raising it's young	Links (with energy / time) explanations of advantages / disadvantages to the cuckoo AND the host birds. Eg: • The cuckoo does not have to spend much energy in reproduction of large numbers of offspring because it does not have to use its energy protecting / feeding / rearing its young, and so can put more energy into producing eggs. Whereas the host bird expends energy rearing the cuckoo instead of its own species, meaning there is less likelihood of its own species reproducing effectively. The young cuckoos compete with the host young for food and space, which means not as many host young can be reared.
2(a)	Drawing shows cells on the outside of the bend are longer than those on the inside of the bend. (Labels on 'STEM' drawing – not root drawing – which are wrong eg high auxin on elongated cells = NA)		
2(b)	Describes the results of ONE set of experiments (A+B or C+D) **OR** describes all the results of each experiment individually. Eg: • A+B shows the response is due to movement of chemical from root cap backwards • C+D shows the response is caused by the chemical moving downwards	Explanation links the results of ONE set of experiments (or all experiments) to a survival advantage **OR** compares the results of (A and B) to (C and D). Eg: • C+D shows the chemical causing the response moves downward due to gravity so that the root curves downward where it can get more water / nutrients • A+B results show that the chemical moves from cap to root inhibiting growth whereas C+D results show the chemical also moves downward due to gravity and inhibits growth	Discussion that links the comparison of **BOTH** sets of results to the survival advantage of geotropism. Eg: • The results from A and B show that the chemical moves from tip to root inhibiting growth in high concentration, while C and D show that the chemical accumulates on the underside of the root due to gravity causing the root to grow downwards. This allows the plant to gain access to the water and nutrients it needs to grow.

Q	Achievement	Achievement with Merit	Achievement with Excellence
3(a)	Describes a difference between territory and home range Eg: Territory: defended area / no overlap **AND** Home range: not defended / does overlap.		
3(b)	Describes a benefit of a linear hierarchy to the group of pūkeko: Eg: • less energy spent fighting • less aggressive behaviour • means strongest individuals get most access to resources such as food / mates • all individuals get some access to food / shelter / protection • strongest individual passes on 'best' genes.	Explains a benefit of a linear hierarchy to the group of pūkeko: Eg: • Less energy spent fighting means more energy is available to protect the group / raise the young / gather food. • Less aggressive behaviour, reduces the chance of injury or death. • More resources such as food going to the 'fittest' individuals means the strongest individuals will have the energy to defend the group. • Strongest male passes on 'best' genes so the offspring have a greater chance of survival / gene pool is improved.	
3(c)	Describes **ONE** benefit of colouring to the young bird. Eg: • young lack ability to display aggression • is able to show submission • less likely to attract predators.	Explains **ONE** benefit of colouring to the young bird. Eg: • Young lack ability to display aggression / can show submission so are less likely to be attacked / harmed by more dominant individuals. • Young lack ability to display aggression / can show submission so the young birds can learn the appropriate behavioural responses with less risk of injury.	Analyses how the colouring of the young benefits them by discussing **BOTH** beak colour and body colour. Eg: • Young lack ability to display aggression due to no red beak so are less likely to be attacked by more dominant individuals. This means they are more likely to survive uninjured to maturity. **AND** they can also show submission due to their body colouring / white tail feathers so less likely to be attacked.

Q	Achievement	Achievement with Merit	Achievement with Excellence
4(a)	Describes how photoperiod affects short-day plant flowering. Eg: • flowering is initiated by a daylength less than a critical value / nightlength greater than critical value • Shortening photoperiod / daylength initiates flowering • Short-day plants flower as the night gets longer • SDP need a long night to flower NOT need a longer night than day to flower / need a short day to flower		
4(b)	Describes a benefit of flowering in a certain photoperiod. Eg: • plants will only flower when conditions are favourable for pollinators to be active • it synchronises gamete production in the species • the plant doesn't waste energy producing gametes/flowering all the time.	Explains a benefit of flowering in a certain photoperiod. Eg: • Flowering in plants needs to be synchronised with the activity of their pollinators so that there is a greater chance of pollination / fertilisation occurring. • Synchronising gamete production in a species increases the chance of cross-pollination. • The plant doesn't waste energy producing gametes / flowering when there are no pollinators.	
4(c)	Describes an aspect of the results Eg: • Group 3 shows leaves are necessary to detect daylength. • The plants can send signal for flowering from branch B / illuminated branch to branch A	Explains at least one of the results with respect to phytochrome OR flowering of short-day plants. Eg: • Phytochrome is a pigment in the leaves of plants which in daylight forms an active substance, and reverts back to an inactive form slowly in the dark or quickly in far red light. The message to flower has to be able to be sent to all the plant . • Group 3 plants did not flower because there were no leaves to detect the daylength, so no P_{fr} is converted back to P_r.	Discusses all three of the results with respect to phytochrome AND flowering of short-day plants. Eg: • In short-day plants the active form (P_{fr}) inhibits flowering. A long day converts P_r to P_{fr} and so no flowering occurs. Long nights allow the P_{fr} to convert back to P_r and then they will flower. With no leaves in Branch B of Gp 3 to detect the daylength / light it **could not send a message** to branch A to causing flowering as happened in Gp's 1 and 2. $P_r = P_{665}$ = 'inactive form' $P_{fr} = P_{725}$ = 'active form'

Q	Achievement	Achievement with Merit	Achievement with Excellence
5(a)	Describes the orientation response as **positive phototaxis**.		
5(b)	Describes the timing response as a **circadian / diurnal / daily rhythm.**		
5(c)	Describes that a rhythm / pattern of activity would still occur. Eg: • Pattern of activity would persist. • Pattern of activity would drift.	Explains why the rhythm / pattern of activity will still occur. Eg: • the rhythm persists because it is controlled internally (by a biological clock) **AND** not controlled by environmental factors. • The pattern of activity would drift because the (free-running) period is not exactly 24hrs and there is no zeitgeber to keep the rhythm in synch.	

Judgement Statement

Note: ^{a} = an animal question
^{p} = a plant question

Achievement	Achievement with Merit	Achievement with Excellence
Total of EIGHT opportunities answered. 8 × A, with at least 2 × A from Questions Two and Four.	Total of EIGHT opportunities answered. At least 2 × A from Questions Two and Four *and* *either* 3 × M^{a} from Questions One, Three, Five *or* 2 × M^{p} from Questions Two and Four. 3 × M^{a} *plus* 5 × A *or* 2 × M^{p} *plus* 6 × A	Total of NINE opportunities answered. At least 2 × A from Questions Two and Four *and* *either* 3 × M^{a} and 1 × E^{a} *or* 2 × M^{p} and 1 × E^{p} . 1 × E^{a} *plus* 3 × M^{a} *plus* 5 × A *or* 1 × E^{p} plus 2 × M^{p} *plus* 6 × A