Assessment Schedule – 2007

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

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
1(a)	**Describes what controls the behaviour:** Eg: That the rhythm is reset daily by the drop in light intensity / onset of darkness. Eg: Controlled by an endogenous rhythm that is entrained by the zietgeber of light.	**Explains what controls the behaviour in relation to seasonal changes:** Eg: The weta has an endogenous rhythm that has to be entrained to the drop in light intensity so as the daylength changes throughout the year the weta still emerges after sunset.	
1(b)	**Period correct** Eg: 23.4-23.75 hours or 23 hours 35 minutes ± 10)	**Period correct and correct working:** Eg: Difference between start of activity on day 1 and day 7 ≈ 3 h or 180 minutes: 180 / 7 = 27 minutes less per day. 24h – 27 minutes = 23 h 33 minutes.	
1(c)	**Describes an advantage and a disadvantage OR explains one advantage / disadvantage:** Eg: Advantage: protection from predators / conservation of moisture / more food. **AND** eg disadvantage: preyed on by predators / less prey / lower temperature when active / less time in summer for feeding.	**Describes both an advantage and a disadvantage AND Explains how one affects the wetas survival;** Eg: The weta has protection from predators as most of the weta predators are diurnal such as birds and lizards so it is less likely to be predated. A disadvantage could be there is less prey at night. Eg: There may not be as many animals the weta preys upon active at night so the weta has to forage for longer to get the food it needs. An advantage is there are less predators at night.	**Both an advantage AND a disadvantage explained and one linked to the weta's survival: OR TWO advantages explained with one linked to the weta's survival and a disadvantage described.** Eg: Many of the weta's natural predators (natives) such as birds are diurnal, so nocturnal behaviour would avoid this. (Presumably the benefits would outweigh the fact that tuatara are nocturnal and also prey on weta.)However, such behaviour would put weta at increased risk of predation from introduced mammalian predators that are also nocturnal, eg rats, possums / there may be less food available but for the weta to have survived the reduced threat of predation is of greater benefit than the possibility of not enough food.

Q	Achievement	Achievement with Merit	Achievement with Excellence
2(a)	**Describes pattern of flowering :** Eg: *Kalanchoe* is a short-day / long-night plant.		
2(b)	**Describes how phytochrome controls flowering:** Eg: Phytochrome controls flowering as during the night the slow conversion of $P_{fr\,/\,725}$ to $P_{r\,/\,665}$ acts as a clock.	**Explains how phytochrome controls flowering in *Kalanchoe*:** Eg: Phytochrome controls flowering as during the night the slow conversion of $P_{fr\,/\,725}$ to $P_{r\,/\,665}$ acts as a clock. Once the concentration of $P_{fr\,/\,725}$ falls below a certain concentration the *Kalanchoe* will flower and that is determined by the length of the night.	
2(c)	**Describes what a nastic AND a tropic response is:** Eg: A nastic response is independent of the direction of the stimulus while a tropic response is a growth towards or away from the stimulus.	**Compare a tropic response and a nastic response using an example of each response from *Kalanchoe*:** Eg: A nastic response is independent of the direction of the stimulus while a tropic response is a growth towards or away from the stimulus. In *Kalanchoe* the opening and closing of the flower petals is a nastic response and the growing of the stem towards light is a (positive) tropic response	
2(d)	**Describes how the movement of the petals is produced OR how it enhances the plants reproductive success.** Eg: higher pressure in upper epidermis causes the petals to open. Eg: Flowers open in daytime when pollinators are active.	**Explains how the movement of the petals is produced OR how it enhances the plants reproductive success.** Eg: Higher pressure in upper epidermis caused by changes in the turgor pressure of the epidermal cells which causes the petals to open as the cells enlarge / elongate. Eg: Flowers open in daytime when pollinators are active improves chances of pollination.	**Discusses how the movement of the petals is produced at the cellular level AND how it enhances the plants reproductive success.** Eg: Higher pressure in upper epidermis caused by changes in osmotic potential / water entering the cells in the epidermal cells causes cell elongation and the petals to open. This means that the flowers open in daytime when pollinators are active improves chances of pollination / cross fertilisation within the species.

Q	Achievement	Achievement with Merit	Achievement with Excellence
3(a)	**Describes BOTH relationships:** (i) parasitism (Herbivory) (ii) mutualism.		
3(b)	**Describes how driving away insects the *Pittosporum* plants benefit.** Eg: the plant receives protection from other herbivores. Eg: There are fewer insects which could harm the Pittosporum.		
3(c)	**Describes the relationships AND gives examples of Both** (i) win / neutral eg barnacles on a whale (ii) win / lose eg fleas on a dog		
3(d)	**Describes how interspecific competition controls population size by affecting resources OR reproductive success.** Eg: In interspecific competition, both species access to / availability of resources is limited Eg: Competition may prevent some individuals from breeding.	**Explains how interspecific competition controls population size by affecting resources AND reproductive success.** Eg: In interspecific competition, both species access to / availability of resources is limited so neither can make full use of it and so neither gains maximum benefit from that resource. AND Competition may prevent some individuals from breeding reducing number of new individuals entering population of each species. Eg: Those less able to compete are less likely to acquire resources which decreases their chances of reproducing (less well-nourished, may not enter reproductive condition or be in poor condition). This controls population numbers as those individuals that are least successful in competition for resources are least likely to survive and reproduce / Majority of new individuals born will die / popn numbers remain relatively constant.	**Discusses how interspecific competition controls population size by affecting resources AND reproductive success with an example. (Not necessary NZ example due to standard / specifications)** Eg: Those less able to compete are less likely to acquire resources which decreases their chances of reproducing (less well-nourished, may not enter reproductive condition or be in poor condition). This controls population numbers as those individuals that are least successful in competition for resources are least likely to survive and reproduce / Majority of new individuals born will die / popn numbers remain relatively constant. examples of interspecific competition for resources: • barnacles on inter-tidal rocks • Argentine vs native ant species • competition for habitat between nymphs and different dragonfly species • between different Helminthe gut parasites.

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
SIX questions answered at Achievement level or higher. $6 \times A$	SEVEN questions answered, including at least 4 at Merit level or higher. $4 \times M + 3 \times A$	SEVEN questions answered including at least TWO at Excellence level and TWO at Merit level. $2 \times E + 2 \times M + 3 \times A$