Assessment Schedule – 2007

Biology: Describe concepts and processes relating to ecology (90461)

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
ONE (a)	TWO descriptors of niche including mode of feeding **and** habitat **or** adaptive feature which relates to feeding. Mode of feeding carnivore/ consumer/ forager/ hunter/predator/ eats fish/ eats marine organisms. **AND** Habitat marine/ sea/ ocean. **OR** Adaptive features dives for food/ feathers provide insulation/ waterproof feathers/ flippers propel/ tail and rear feet steer/ diurnal feeder/ feeds between dawn and dusk/ feeds during day.		
(b)	Completes the table to describe ONE structural adaptation **and** ONE behavioural adaptation **and** correctly identifies which type is which. Structural adaptation flippers/ tail and rear feet/ feathers/ eyes/ beak/ oil gland. **AND** Behavioural adaptation remain out of water during moulting/ diurnal feeder/ synchronised visits to burrow prior to breeding/ stretches flippers for stability when resting/ makes burrows.		

(c)	Describes ONE way that oil secretion aids survival • waterproofs feathers • traps air/ provides insulation • keeps streamlined.	Explanation of HOW this <u>aids survival</u> of the penguin while at sea foraging **or** escaping predators in the water **or** to swim efficiently **or** to conserve energy for a biological process. Eg • Waterproof feathers allows the penguin to spend time in the water without getting waterlogged so the penguin can swim properly because it is not weighed down. • The trapped air acts as an insulation layer to reduce conduction of heat away from penguin's body so it can swim in the water for longer. • Oil makes the penguin more streamlined by reducing friction with the water. This makes the penguin swim faster to get prey or swim away from predators. • The oil creates a waterproof coating. This means the penguin can swim and forage in the sea to eat as it's feathers don't become waterlogged and weigh the penguin down decreasing the mobility. • The waterproof coat stops water getting in between the feathers which would decrease the body temperature of the penguin. This lets the penguin swim all day without getting cold, allowing it to gain adequate food for survival. • The oil keeps the penguin waterproof so the cold water doesn't touch its skin. This is so the penguin can conserve energy to use for swimming and catching food.	

TWO (a)	Phytoplankton photosynthesise/ use solar energy to produce food/ are autotrophic producers. Phytoplankton **and** idea of photosynthesis required.		
(b)	Comparison of the food chains leading to baleen whales and toothed whales. Baleen whale food chain has fewer steps/ Baleen whale food chain has only one link/ Baleen whale food chain is shorter/Baleen whale is a secondary consumer but the toothed whale is a tertiary consumer. NOT – food chain is more complicated.	Explanation links energy loss and tropic levels in the food chain. There is an energy loss of about 90% from one trophic level to the next: a food chain with only a few trophic levels results in more energy being available to the final trophic level. There are only 3 trophic levels in this food chain, so the energy available to the baleen whale has not been reduced too many times.	
(c)	Description of the role of krill within the food web as the main food source for the consumers in the community. **OR** Population of any named species/ named trophic level from the food web that eats krill will decrease. **OR** Population of phytoplankton/ herbivorous zooplankton will increase. **OR** A named species will experience more competition/ seek an alternative food source/ move outside their normal feeding grounds/ displace another species in a new area (Gause's Principle).	Explanation of the role of krill within the food web as the main food source for the consumers in the community **AND** the potential change a decrease in krill will have on the population of a named species from the food web **OR** the effect overfishing of krill will have on the survival of a named species from the food web. Population of any named species/ named trophic level from the food web that eats krill will decrease. **OR** Population of phytoplankton/ herbivorous zooplankton will increase. **OR** A named species will experience more competition/ seek an alternative food source/ move outside their normal feeding grounds/ displace another species in a new area (Gause' Principle).	Discussion of role of krill within the foodweb **AND** the potential change for a named species **AND** effect of overfishing of krill on the foodweb. Ie, Recognition that the entire food web/ all trophic levels will be affected by the overfishing of krill (not just one food chain or one named species).

Q	Achievement	Achievement with Merit	Achievement with Excellence
THREE (a)(i)	Relationship is PARASITISM/ EXPLOITATION The scale insect benefits but the beech tree is harmed.		
(ii)	Relationship is COMMENSALISM The wasp benefits but the scale insect is not affected. **OR** Relationship is MUTUALISM Both species benefit.		
(b)	Description of the change that the arrival of the wasps will have on the species in the beech forest. the arrival of the wasps is likely to result in a decrease in biodiversity/ some species die out/ species become extinct. **OR** Competition between wasps and native birds/ reptiles/ insects. **OR** Exclusion of native birds/ reptiles/ insects from their niche by wasps. **OR** Birds/ insects who have roles as pollinators/ seed dispersers may decline.	Explanation of why / how there is decreased biodiversity due to the arrival of the wasps. the arrival of the wasps is likely to result in a decrease in biodiversity/ some species die out/ species become extinct. **AND** Competition between wasps and native birds/ reptiles/ insects. **OR** Exclusion of native birds/ reptiles/ insects from their niche by wasps. **OR** Birds/ insects who have roles as pollinators/ seed dispersers may decline.	Discussion of the wider impacts of decreased biodiversity in the beech forest. the arrival of the wasps is likely to result in a decrease in biodiversity/ some species die out/ species become extinct. **AND** Competition between wasps and native birds/ reptiles/ insects. **OR** Exclusion of native birds/ reptiles/ insects from their niche by wasps. **AND** The role of birds/ insects as pollinators/ seed dispersers in the forest. If these organisms are removed (and this role is not being assumed by wasps) then forest plants will be unable to reproduce effectively reducing biodiversity further.
(c)	Description of role of beech trees for carbon cycle. Beech trees enable atmospheric carbon/ carbon dioxide to enter the forest food chain (via photosynthesis)/ provide carbon compounds for herbivores.	Explanation of role of beech trees in terms of molecules Eg carbon is used in the process of photosynthesis in the production of plant carbohydrates used for growth and tissue development, which can then be eaten by animals. The inorganic CO_2 is incorporated into the organic $C_6H_{12}O_6$.	

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
FIVE opportunities answered at Achievement level (or higher). Minimum of 5 × A	SEVEN opportunities answered including at least TWO at Merit level (or higher) and FIVE at Achievement level (or higher). Minimum of 2 × M + 5 × A	EIGHT opportunities answered including at least ONE at Excellence level and TWO at Merit level (or higher) and FIVE at Achievement level (or higher). Minimum of 1 × E + 2 × M + 5 × A