Assessment Schedule – 2007

Biology: Describe diversity in the structure and function of plants (90463)

Evidence Statement

NB Plant/plant groups must be included eg mosses, ferns, gymnosperms, angiosperms (monocotyledons, dicotyledons), hydrophytes, mesophytes, xerophytes, halophytes etc.

Q	Achievement	Achievement with Merit	Achievement with Excellence
1 & 2	A **description** of "what the structure is AND how it works (function)" over THREE named plant groups. Also accept structural, physiological, behavioural, adaptations. *Evidence may come from either Q1 or Q2.* **Nutrition:** • large SA/vol ratio • leaf arrangement around stem – whorls, alternate, etc • structures of insectivorous plants, sundew, pitcher plants, • sun plants/shade plants • C3, C4, CAM plants. **Transport:** • mosses – no specialised cells for transport, rely on • diffusion. Rhizoids for attachment, hydroids for water transport and leptoids for sugar transport in some. • ferns – transitional, have tracheids or simple conducting tissues • angiosperms – xylem vessels, more sophisticated than gymnos or ferns allows rapid uptake of water. • monocotyledons/ dicotyledons – arrangement of vascular tissue, secondary thickening, etc • phloem- glucose, hormones.	Answers explain how these structures/adaptations function to allow each group to survive in relation to a process of at least TWO named plant groups. *Evidence may come from either Q1 or Q2* **Nutrition:** Reasons for adaptation linked to survival. Eg: • large SA/vol ratio – to absorb max light and gases for photosynthesis • larger air spaces in spongy mesophyll increase/provide flotation for : aquatic plants. • insectivorous plants in low nutrient habitats. **Transport:** Reasons for adaptation linked to survival. Eg: • capillary action/and evaporation/transpiration in xylem vessels have allowed transportation of water from the roots to the leaves of even the tallest of trees in a terrestrial environment with minimal moisture available. • mosses need to live in wet environments, capillary action of water up outside of leaves. Leaves thin therefore diffusion is sufficient.	A discussion of the **DIVERSITY,** in relation to a process, to enable plant groups to **live, survive, be successful in their habitat**. Compares and contrasts the diversity across at least TWO plant groups. *Evidence may come from either Q1 or Q2.* **Nutrition:** eg: • Significance of C3, C4 and CAM plants allowing occupation of different habitats. • Diversity linked to plant nutrition in habitat. • Shade plants v light v water. • Insectivorous plants, nutrition linked to different habitats. **Transport:** Mosses remain as small plants – unable to conduct material over large areas, etc; large trees with efficient conducting tissue able to live in dry environments, etc.

Q	Achievement	Achievement with Merit	Achievement with Excellence
	Transpiration: • modified leaves; curled, reduced, hairs (stem also photosynthetic eg broom) • leaves absent, cacti • stomata; sunken, upper / lower leaf • deciduous plants / over-wintering • cuticle thickness reducing water loss	**Transpiration:** Reasons for adaptation linked to survival in habitat, eg: • curled leaves prevent transpiration because the inside of the leaf develops a high humidity which reduces the concentration gradient, therefore less transpiration • similar for sunken stomata. • Hairs around stomata create microclimate of increased humidity by holding onto vapour shell. Therefore transpiration reduced • link these to reduced water loss and dryer environments.	**Transpiration:** • adaptations linked to the different habitats • diversity in carrying out the same process in different habitats.
	Reproduction: *Mosses* • produce antheridia and archegonia (at tips of gametophyte) • produce sperm (gametes) – • sporophyte attached to base of gametophyte produces spores, etc. *Ferns* • prothallus structure produces antheridia and archegonia • structure of sporangia – mechanism for release of spores. *Gymnosperms* • male / female cones • seed structure, etc *Angiosperms* • wind pollinated • insect pollinated • specialisation of floral structure for fertilisation by specialised pollinator.	**Reproduction:** Reasons for adaptation linked to survival. Eg: *Mosses* • gametes flagellated in mosses, in **wet** environment • spores light, produced in large numbers carried by wind • photosynthetic gametophyte **supports** the sporophyte. *Ferns* • mechanism for release of spores • prothallus – antheridia release sperm swim to archegonia, etc **still need for moisture.** *Gymnosperms* • location and function of cones • quantity of pollen produced • seed structure for movement in air currents, etc.	**Reproduction:** • significance of the increasing dominance of the sporophyte generation • the significance of the mechanisms to increase genetic variability within the species • complexity of floral structures relevant to increasing specialisation of pollination / mutualistic relationships • sperm / flagellated gametes suitable in a wet environment • wind pollination suitable in windy environment when large numbers of the species are present, etc. • Reduction in gametophyte in size and time and separation of male and female gametes leading to increased genetic variability.

Judgement Statement

Achievement
Structure and function of THREE named plant groups described.
Minimum of A1 + A2 + A3

Achievement with Merit
Structure and function of THREE named plant groups described and reasons for how the plant carries out the process linked to structure and function for minimum of 2 plant groups.
Minimum of 2M plus A1 + A2 + A3

Achievement with Excellence
Structure and function of THREE named plant groups described and reasons for how the plant carries out the process linked to structure and function for minimum of 2 plant groups and discussion links the need for **diversity** to survive in a range of habitats.
Minimum of 1E plus 2M plus A1 + A2 + A3