

**Assessment Schedule – 2016**

**Biology: Demonstrate understanding of biological ideas relating to the life cycle of flowering plants (90928)**

**Evidence Statement**

**Question One**

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response / no relevant evidence.	ONE relevant idea given.	TWO relevant ideas given.	THREE relevant ideas given.	FOUR relevant ideas given.	Explains TWO ideas.	Explains THREE ideas.	Discusses ONE point.	Discusses TWO points.
<ul style="list-style-type: none"> <li>• Seeds can be dispersed by: animals / wind / water / explosive / fire (TWO required).</li> <li>• Seeds have special structures or features such as: fleshy fruit / fine hair-like structures / wings / waterproof or hard coating / colour / odour that allows them to be dispersed (TWO required).</li> <li>• Seed dispersal is important for plants to continue their life cycle.</li> <li>• Seed dispersal reduces competition.</li> <li>• Seed dispersal allows population to expand into new environments / habitats.</li> </ul>					<ul style="list-style-type: none"> <li>• Seed sticks to an animal’s fur with hook / spikes. When the animal moves away from the parent plant the seed is taken with it and dispersed.</li> <li>• Animal is attracted to the bright / fleshy fruit that surrounds the seed because of its colour / odour. The animal eats the fruit with the seeds inside and passes out seeds with its faeces some distance away from the parent.</li> <li>• Wind dispersal is effective because the seeds are light weight / small / aerodynamic AND have structures like feathery bristles that catch the wind which can result in the seeds being moved away from the parent.</li> <li>• Seeds dispersed away from parent by water have a hard seed coat / air spaces for flotation.</li> <li>• As seed pod dries tension builds and when released spread the seeds out in a forceful manner.</li> <li>• Heat from a fire will open cones and release the seeds.</li> </ul>		<ul style="list-style-type: none"> <li>• Any Merit point linked to: dispersal reduces competition from the parent plant / other seedlings so that chances of germination / growth increase.</li> <li>• Animal is attracted to the bright / fleshy fruit that surrounds the seed because of its colour / odour. The animal eats the fruit with the seeds inside and passes out seeds with its faeces some distance away from the parent. Faeces may act as fertiliser to assist growth.</li> <li>• Seeds dispersed away from parent by water have a hard / waterproof seed coat / air spaces for flotation. Damage to the seed coat during transportation can allow water penetration which initiates the germination process.</li> </ul>	

**Question Two**

NØ	N1	N2	A3	A4	M5	M6	E7	E8
No response / no relevant evidence.	ONE idea given.	TWO ideas given.	THREE ideas given.	FOUR ideas given.	Explains TWO ideas.	Explains THREE ideas.	Links products of photosynthesis to two other life processes AND storage / structure.	Links products of photosynthesis to at least three other life processes AND storage / structure.
<p>• <b>Light intensity:</b> As the light intensity increases, so too does the rate of photosynthesis to a point then levels off.</p> <p><b>Carbon dioxide concentration:</b> similarly.</p> <p><b>Temperature:</b> At the extremes in temperature, photosynthesis does not occur or is slower / photosynthesis is fastest at a medium / optimum temperature. As temperature increases, the rate of photosynthesis increases also to an optimum point; beyond this the rate decreases again as the temperature continues to increase.</p> <p>• Products of PS include oxygen and glucose. PS equation given e.g. carbon dioxide + water <u>light energy</u> glucose + oxygen</p> <p>• Oxygen is used by the plant for respiration. OR Glucose is used by the plant for respiration. Glucose can be transformed into starch for storage. Glucose and starch can be used for making cellulose / plant protein / fats and oils. Glucose / starch can be moved to other plant structures for storage. Glucose used in development of fruit / flowers / other plant structures. Glucose used in formation of chlorophyll / chloroplast. etc.</p>					<p>• <b>Light intensity.</b> As light intensity increases there is more light energy available to drive the reaction. However, at the point of levelling off factors such as CO<sub>2</sub> conc / temp become the limiting factor.</p> <p>• As carbon dioxide concentration increases so does the rate of photosynthesis up to a maximum, where all chloroplasts are fully engaged / saturated.</p> <p>• Temperature. When temperatures are low, there is insufficient energy available to allow the reaction to proceed. As the temperature increases, the rate of reaction increases also, as there is sufficient energy available to allow the reaction to occur.</p> <p>• Temperature. As temperatures become too hot, the enzymes that control the reaction start to denature / change shape and the reaction slows / stops.</p> <p>• Oxygen made by photosynthesis is used for respiration is so that energy / ATP can be released from glucose.</p> <p>• Excess glucose is turned into starch so that it can be stored for later use.</p> <p>Glucose is transformed into starch for storage because glucose is water-soluble and it can leak through plant tissues and/or starch is insoluble in water and cannot leave the plant.</p>		<p>Oxygen and glucose are products of photosynthesis. Some of the oxygen is used for <b>respiration</b> so that energy can be released from glucose to be used in:</p> <ul style="list-style-type: none"> <li>• <b>growth</b> (by cell division / mitosis) and</li> <li>• <b>reproduction</b> (flower / seed production).</li> </ul> <p>When there is an excess of glucose, it is turned into starch so that it can be <b>stored</b> for later use. Glucose is transformed into starch for storage because glucose is water-soluble and it can leak through plant tissues and / or starch is insoluble in water and cannot leave the plant in the same way. (E.g. some plants translocate glucose to their roots, where it is stored as starch over winter, when the rate of photosynthesis is generally lower. The plant then transforms the starch back into glucose in the spring so that it can be used, for example, for spring growth.)</p> <p>Another use of starch is that it can be used in structural features, such as a building material for the cellulose cell walls, which provide structural support for the plant and also prevent cell damage. Starch and glucose can also be used for making plant proteins for plant <b>growth</b> and repair, (and fats and oils for storage by the plant).</p>	

**Question Three**

N0	N1	N2	A3	A4	M5	M6	E7	E8
No response / no relevant evidence.	ONE idea given.	TWO ideas given.	THREE ideas given.	FOUR ideas given.	Explains TWO ideas.	Explains THREE ideas.	Discusses ONE idea.	Discusses TWO ideas.
<ul style="list-style-type: none"> <li>Sexual reproduction: two parents (pollen and ovule) / combining two sets of genetic material AND asexual reproduction: one parent / no seeds.</li> <li>Sexual reproduction produces increased genetic variation <b>OR</b> Asexual reproduction produces no genetic variation.</li> <li>Sexual reproduction has advantage of reduced competition with parent <b>or</b> asexual reproduction has disadvantage of competing with parent.</li> <li>Sexual reproduction has disadvantage of requiring more energy / time to produce flowers / seeds <b>OR</b> asexual reproduction has advantage of reduced energy / time requirement for reproduction.</li> </ul>					<ul style="list-style-type: none"> <li><b>Sexual reproduction:</b> variation may mean ability to survive climate change / novel disease AND <b>Asexual reproduction:</b> no variation means equal susceptibility to climate change / novel disease.</li> <li><b>Sexual reproduction</b> is an advantage in unstable environments as variation may mean ability to survive climate change / novel disease AND <b>Asexual reproduction</b> is an advantage in stable environments as quick reproductive rate allows rapid colonisation.</li> <li><b>Sexual reproduction</b> requires more energy to produce flowers / seeds / fruits AND relies on dispersal vectors such as pollinators / animals / wind / water.</li> <li><b>Sexual reproduction:</b> Dispersal increases survival / reproductive success as competition reduced AND <b>Asexual reproduction:</b> Competition / offspring close to parent reduces survival / reproductive success.</li> </ul>		<ul style="list-style-type: none"> <li>Variation in sexually reproducing populations may mean some members of the population / species are able to survive climate change / novel disease AND no variation in asexually reproducing populations means all members of the population / species have equal susceptibility to climate change / novel disease.</li> <li>Sexual reproduction is an advantage in unstable environments as variation may mean some members of the population are able to survive climate change / novel disease AND asexual reproduction is an advantage in stable environments as quick reproductive rate (due to not having to produce flowers / seeds / fruits) allows rapid colonisation.</li> <li>Proximity of offspring to parent linked to competition for named resources and survival for sexual AND asexual reproduction.</li> </ul>	

**Cut Scores**

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 7	8 – 13	14 – 19	20 – 24