

Assessment Schedule – 2015**Biology: Demonstrate understanding of biological ideas relating to the life cycle of flowering plants (90928)****Evidence**

| ONE | 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 the structures and their functions involved in ONE process to the importance of the process in the life cycle of the plant. | Links the structures and their functions involved in TWO processes to the importance of the processes in the life cycle of the plant. |
| | <p>Examples of possible ideas include:</p> <ul style="list-style-type: none">• Pollination is the transfer of pollen from the anther of one flower to another flower / stigma (or within the same flower).• Pollination can occur by wind / insect / bird.• Fertilisation is the joining of male nuclei / sperm / male gamete / male sex cell with female sex cell / ovule / egg.• Before fertilisation can occur, a pollen tube grows down inside the style with the male sex cells / pollen nuclei / sperm inside.• Pollination is important because it brings male sex cell closer to female sex cell.• Fertilisation is important because it fuses egg and sperm / produces a zygote or seed or embryo plant.• Ovules become the seeds.• Ovary wall becomes the fruit.• Receptacle becomes the fruit.• The fruit helps with dispersal of the seed.• The fruit can provide nutrients for the germinating seed. <p>etc</p> | | | | | <p>Examples of possible responses:</p> <p>Pollination is the transfer of pollen from the anther to the stigma in a flower. This occurs so that the male sex cell / gamete / sperm is closer to / able to reach the female sex cell / gamete / egg / ovule so that a seed can form. The reason that the pollen tube grows towards the ovary is the ovary releases chemicals which guide the growth.</p> <p>After fertilisation has occurred, the ovules develop into the seeds. This is so that when the seed is in the right growing conditions, it will grow into a new plant.</p> <p>After fertilisation, the ovule will swell and become the fruit, which carry the seeds ready to be dispersed. Dispersal of seed reduces competition with the parent plant.</p> <p>etc</p> | <p>Examples of possible responses:</p> <p>Pollination is the transfer of pollen from the anther to the stigma in a flower. This occurs so that the male sex cell / gamete / sperm is closer to / able to reach the female sex cell / gamete / egg / ovule so that a seed can form. This is important because it allows fertilisation to occur and thus the development of a seed.</p> <p>Fertilisation occurs when the male nuclei from the end of the pollen tube move through the micropyle into the ovary and fuse with the ovule, thus allowing a zygote and a food store to form. This process is important because it allows a seed to form and thus the continuation of the life cycle.</p> <p>etc</p> | | |

| | | | | | | | | | |
|-----|--|-----------------|------------------|--------------------|-------------------|--|---|--|--|
| 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 ONE idea. | Explains TWO ideas. | Links the process of germination to at least two parts of the seed AND at least two environmental factors. PLUS A discussion of the change in the dry mass or the live mass of a plant. | Links the process of germination to all parts of the seed and at least three environmental factors. PLUS a discussion of the change in the dry mass and the live mass of a plant. Must link to the numbers in the graph. |
| | <p>Examples of possible ideas include:</p> <ul style="list-style-type: none">• Germination is the development / growth of the seed into a seedling.• Germination requires water / moisture, oxygen, and certain changes in temperature / warmth.• Germination starts with growth of the radicle (young root) growing through the seed coat.• The seed needs to absorb water before germination can begin.• Enzymes inside the seed are involved in germination.• The endosperm / food store of a seed provides the energy for germination to occur.• The plumule grows into the first shoot of the plant.• The first leaves of the seedling will start to photosynthesise.• Some seeds require scarification before they can germinate.• Some seeds required vernalisation before they can germinate. <p>Etc</p> | | | | | <p>Examples of possible responses:</p> <p>In order for germination to occur, the seed must absorb water. This is because the water is required to activate the enzymes required for energy for growth to be released from the food store.</p> <p>The radicle breaks through the seed coat and into the surrounding environment. This is because the radicle or young root needs to absorb more water from the surrounding environment so that germination and growth of the seedling can continue.</p> <p>The dry mass decreases after day 2, as respiration is increasing and using the starch (energy) stored in the cotyledon and it is used until the seedling can expose its first leaves to the sunlight for photosynthesis, which is why the dry mass starts to increase after day 10. The live mass increases very rapidly, gaining 1 g in 2 days as water enters the seedling activating enzymes necessary for respiration and required for cell division and cell growth.</p> <p>Etc.</p> | <p>Examples of possible responses:</p> <p>In order for germination to occur, the seed must absorb water. This is because the water is required to activate the enzymes required for energy for growth to be released from the food store. The seed coat or testa has a micropyle or tiny hole in it so that water can be absorbed to start the process. Oxygen is also absorbed through the micropyle. Oxygen is required by the seed so that aerobic respiration can occur in the seed and germinating seedling, allowing the release of energy for growth to occur.</p> <p>Note to panel leader:</p> <p>This could be an example of an E7 response because:</p> <p>Water, oxygen = 2 × environmental factors</p> <p>Testa, micropyle, food store, = 3 × seed parts</p> <p>etc</p> <p><i>Must link mass in grams to number of days as shown in the graph to changes in dry mass and live mass of the seedling.</i></p> | | |

| THREE | 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 at least THREE ideas. | Links at least TWO plant structures to the process of photosynthesis and the growth of the plant. | Links at least THREE plant structures to the process of photosynthesis and the growth of the plant. |
| | Examples of possible ideas include: <ul style="list-style-type: none"> Describes the process of photosynthesis. Eg: word equation, chemical equation (balancing not required), sentences. Eg: carbon dioxide + water $\xrightarrow{\text{light energy}}$ glucose + oxygen Photosynthesis takes place in the chloroplasts / chlorophyll inside the leaf There are gaps between the (mesophyll) leaf cells which allow carbon dioxide gas to move through the leaf to be used in photosynthesis. Water travels in the xylem to the leaf to be used for photosynthesis. Oxygen, a product of photosynthesis, is released into the air through the stomata. Glucose (sugar) made in the process of photosynthesis is used as energy for plant growth. Some of the sugar made in photosynthesis is stored by plants as starch. | | | | | Examples of possible responses: There are many chloroplasts in some of the leaf cells. Chloroplasts are the place where photosynthesis occurs in the leaf. Therefore, it is important that leaves have many of these so that sufficient photosynthesis occurs to meet the requirements of the plant for growth. One of the products of photosynthesis is glucose, which is an energy-rich sugar molecule. If the plant produces more glucose in the leaf than it needs for its requirements, the glucose is converted to starch and stored for later use by the plant, eg in the roots. This allows plants to have the extra energy required for parts of the life cycle that may need extra energy, for example producing flowers for reproduction. | | Examples of possible responses: One of the products of photosynthesis is glucose, which is an energy-rich sugar molecule. If the plant produces more glucose in the leaf than it needs for its requirements, the glucose is converted to starch and stored for later use by the plant eg in the roots . This allows plants to have the extra energy required for parts of the life cycle that may need extra energy, for example producing flowers for reproduction. The starch can also be converted back into glucose when extra energy is needed for plant growth, for example in the spring. Therefore we can say that photosynthesis provides the energy in the form of glucose, which is required by the plant for growth. | |

Cut Scores

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