

National Certificate of Educational Achievement

2011 Assessment Report

Biology Level 1

- 90927 Demonstrate understanding of biological ideas relating to micro-organisms**
- 90928 Demonstrate understanding of biological ideas relating to the life cycle of flowering plants**
- 90929 Demonstrate understanding of biological ideas relating to a mammal as a consumer**

COMMENTARY

Note that the space provided for an answer gives an indication of the length of response required. Some candidates wrote considerably more than they needed to, often without answering the question.

STANDARD REPORTS

90927 Demonstrate understanding of biological ideas relating to micro-organisms

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:

- demonstrated knowledge of basic factual information such as names, descriptions, and roles of parts of micro-organisms
- recognised the link between micro-organisms, their life processes, and the environment
- recognised the difference between an infectious disease and an inherited illness
- described the life processes of micro-organisms, such as reproduction, excretion, and obtaining nutrients.

NOT ACHIEVED

Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:

- did not make sufficient attempt to answer questions
- demonstrated a lack of basic factual knowledge, such as names of parts of micro-organisms
- did not show understanding of the life processes of micro-organisms, or did not recognise that these life processes were significant
- wrote about fungi as if they were plants, referring to seed and roots, and calling the fungus itself a plant.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:

- applied their knowledge of micro-organisms to examples that were given in the questions
- showed in-depth understanding of the links between micro-organisms, their life processes, and the environment
- recognised the concept that many hundreds of viruses are produced in each host cell
- showed understanding of the concept that large numbers of bacteria are required for milk to spoil
- recognised that many hundreds of viruses are produced in each host cell.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:

- gave answers that showed comprehensive understanding of the links between micro-organisms, their life processes and the environment
- showed clear links between structure and function to the survival of an organism
- applied their knowledge to the specific applications in the questions
- wrote clearly and concisely, without ambiguity or contradiction
- demonstrated comprehensive understanding of the impact of the number of micro-organisms in a situation rather than simply their presence.

OTHER COMMENTS

Some common errors or misconceptions from candidates tended to create ambiguity and sometimes contradictions in the way they responded to the questions.

Listed below are correct versions of some of the misconceptions:

- A fungus is NOT a plant.
- Water and liquid are not interchangeable terms. A substance can contain liquid but no water.
- Water and nutrients are different things. Candidates made statements suggesting adding water to powder milk added nutrients – this is incorrect. The nutrients are already present.
- Water and contamination are different things. The addition of water does not necessarily introduce contamination.
- Bacteria reproduce rather than “form” in milk.

90928 Demonstrate understanding of biological ideas relating to the life cycle of flowering plants

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:

- identified the features for both wind pollinated and insect pollinated plants
- described pollen features for both wind pollinated and insect pollinated plants
- described the process of photosynthesis
- stated the word or symbol equation for photosynthesis
- knew that leaves absorbed light (via chlorophyll)
- identified the purpose of root hairs
- demonstrated knowledge of the environmental features required for germination
- described the purpose of different parts of the seed
- interpreted patterns from a graph correctly.

NOT ACHIEVED

Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:

- mistook anther for stigma
- showed evidence of having misread the given diagram
- described pollen as “large” or “sticky” rather than “rough” or “smooth”
- wrote incomplete equations or descriptions
- provided incomplete detail of leaf structure at cellular level
- did not make clear distinction between respiration and photosynthesis
- suggested pollen (not nectar) attracted hungry insects to flowers
- did not interpret the graph to describe the pattern
- incorrectly stated that light was necessary for germination
- attempted a description of geotropism or phototropism
- confused dry mass with live mass
- confused wind pollinated features with insect pollinated features
- did not describe an advantage of sexual reproduction
- did not describe the process of photosynthesis
- did not identify the different parts in the plants involved in photosynthesis
- did not describe germination or identify the roles of the different parts of the seed.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:

- explained the link between pollen structure and the process of pollination
- explained why the different structures are suited to its method of pollination
- linked the significance of structure of stigma to its ability to successfully receive pollen
- fully explained the role of nectar in attracting insect pollinators
- explained how plants could overcome environmental challenges to improve the process of photosynthesis
- explained how roots and leaves collectively contribute towards photosynthesis
- explained with sufficient detail, the position of chloroplasts/chlorophyll in relation to raw material(s) for photosynthesis
- provided specific detail when interpreting the graph
- linked environmental conditions to their impact on respiration, germination, and growth
- recognised the importance of water absorption in the seed before radicle/plumule emerge
- correctly identified the role of photosynthesis to the increase in mass of a seedling.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:

- compared pollen and flower features relevant to pollination of insect and wind pollinated plants

- evaluated effectiveness of pollination
- contrasted different methods through which pollination could be achieved
- linked the idea that chloroplast contain chlorophyll
- discussed the effectiveness of raw materials in roots.
- clearly articulated the process of osmosis by recognising that root hairs provided greater surface area
- recognised links between roles of different parts of plants when obtaining raw materials for photosynthesis
- linked root and leaf structure with function in relation to the process of photosynthesis
- contrasted the role of respiration in mobilising energy stores to the role of photosynthesis in new leaves
- compared the rate of water absorption to the rate of increase provided for by photosynthesis
- justified conclusions by appropriately interpreting data from the graph provided
- discussed the metabolic aspects of germination and growth.

90929 Demonstrate understanding of biological ideas relating to a mammal as a consumer

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:

- recalled basic facts about enzymes, describing the role of an enzyme and/or which nutrient is broken down by which enzyme
- described factors that affect enzyme activity in the body; pH, crushing of food by teeth/increased surface area or length of digestive system
- showed understanding of the role of bile and identified that the alimentary canal consists of compartments and each part has different pH
- recalled what mammals need energy for e.g. MRSGREN and link respiration to the production of energy
- demonstrated a basic understanding of the respiration process and knowledge of how the digestive system and respiratory system were linked to energy production
- identified the types of teeth and the role of each part during ingestion.

NOT ACHIEVED

Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:

- did not recall basic concepts linking to enzymes, respiration and types of teeth
- described temperature as a factor that affects enzyme activity in the body
- stated that different parts of the digestive system have different temperatures, therefore temperature is a factor that effects enzyme efficiency in a mammal
- gave a report of the movement of food down the digestive tract but made no reference to enzyme efficiency or incorrectly focussed on villi as an adaptation that increased enzyme efficiency or named incorrect enzymes
- talked about energy being created not transferred or released for the food

- did not recognise the difference between breathing and respiration and/or that respiration was a chemical reaction that captured energy from our food
- did not name the types of teeth or recall what their function was and often made general statements such as canine and molars are used for chewing or grinding food.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:

- clearly explained how teeth/physical digestion increases the enzyme activity by increasing the surface area of the substrate that the enzyme works on
- had a sound understanding of the digestive system and was able to link different pHs to the correct parts of the body and explain how pH affected enzyme activity in different parts of the body
- explained in detail how enzymes work most efficiently in certain conditions and not as well outside their optimum range
- linked adaptation to how it increased enzyme efficiency (several candidates referred to 'collision theory')
- linked at least two of the systems (digestive, circulatory, and respiratory) and understood that respiration was a series of chemical reactions that released the energy from the glucose molecules from our food
- clearly demonstrated knowledge of the fact that the energy was released from the glucose in the presence of oxygen and that the food we digest supplied the glucose
- explained how energy was used for life processes such as muscle contraction or active transport, etc
- described and explained the difference in the size and number of teeth in the two mammals by linking it to their diet.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:

- clearly discussed how the different parts of the digestive system have different pH and linked them to specific named enzyme examples and the pH they worked best at
- linked bile to both its effect on pH and its ability to increase surface area of the fats so that the enzyme lipase was able to work more efficiently by increasing the number of collisions or increasing the contact of enzyme with the substrate
- clearly linked the fact that if the condition was not correct then the enzyme would not work or would work very slowly or be denatured
- clearly discussed how the three systems are linked together; had a clear understanding of how (ATP) captures the energy in the third phosphate bond and that this meant that the energy could be released when needed by the organism for its life processes
- discussed the similarities and differences in the type, size, and number of teeth in dogs and sheep and clearly linked it to their diet.