

National Certificate of Educational Achievement

2013 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

Candidates need to take time to read the question carefully, plan and form a response in a succinct manner, using the lined spaces provided as an indication of the length of response required.

Candidates should be encouraged to think carefully about what information is being asked for in each question, to avoid repeating the same information and often including information that was not related to the question.

Candidates also need to write legibly using appropriate sized letters to fit the lines provided and avoid attempting to write two lines in one in small print.

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:

- described the process of digestion in bacteria and fungi as 'extra-cellular digestion'
- described the processes of reproduction in bacteria (binary fission) and fungi (spores) using the correct terms
- identified the most effective antibiotic as penicillin and/or that the most effective antibiotic had the largest area of no bacterial growth around it
- described a sterile plate as not having any bacteria / fungi on it
- described the temperature changes from the graph but failed to link this to respiration
- described the use of oxygen in aerobic respiration or that air flow provided oxygen.

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:

- gave incomplete descriptions of the digestive process, omitting the use of enzymes
- incorrectly described or used biological terms, i.e. extra-cellular digestion, binary fission, hyphae, spores
- lacked recognition of the term 'inoculate', instead described incubation techniques
- confused the reason for using sterile agar and the purpose of a control
- listed several life processes (involved in temperature change) but did not identify respiration
- referred to composting in general terms but did not identify the role of micro-organisms in the process.

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 extra-cellular digestion in bacteria and fungi but stated enzymes excreted rather than secreted
- recognised that bacterial reproduction involved replication of DNA leading on to binary fission, while fungal reproduction involved dispersal of spores
- clearly explained a technique to transfer bacteria onto the agar plate
- communicated clearly the reason for use of sterile agar plate
- recognised that increase in temperature led to increased rate of respiration resulting in release of heat
- demonstrated understanding of the carbon cycle, but not necessarily in the context of the question.

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:

- recognised that asexual reproduction was common for both bacteria and fungi and were able to discuss this aspect
- made detailed comparisons of digestion in both bacteria and fungi including specific structures that are involved in this process
- demonstrated a clear understanding of microbiological techniques
- applied their understanding of the purpose of using an antibiotic to the results given in the question
- demonstrated an ability to discuss carbon cycle in the context provided
- comprehensively compared the requirements and efficiencies of both aerobic and anaerobic respiration
- wrote clearly and concisely, without ambiguity or contradiction.

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:

- described the processes of pollination and fertilisation in flowering plants
- were able to identify the features of pollen that make it suited for wind and insect dispersal
- knew the flowers' structures and their positions that made it suitable for its method of pollination
- described the formation of the fruit from the ovary which contains the seeds
- related the structure of the fruit and the seed that made it suitable for its method of dispersal
- described the processes of photosynthesis
- recognised the trend that as the light intensity increases so does the number of bubbles produced
- identified that a product of photosynthesis is glucose, which can be used for producing energy in the process of respiration
- identified that chlorophyll is the pigment responsible for absorbing the light energy.

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:

- confused pollen structures between wind and insect pollinated plants
- were unable to distinguish between fertilisation and pollination
- showed a lack of understanding of the processes of fertilisation and pollination
- were unable to correctly link the structure to the function in a flower, for the process of fertilisation
- repeated the information given in the scaffolding of the question and failed to build upon this information to show understanding of the different processes.

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 how the structure of the pollen is linked to dispersal by wind and insects
- accurately linked the production of pollen to the dispersal method
- clearly explained why the different structures of the flowers are suited to wind and insect pollinated plants
- explained the process of fertilisation and were able to correctly draw and label a diagram that correctly identified the structures involved
- explained how the flower changes after fertilisation, correctly naming the structures and identifying that the fertilised ovules form seeds and the ovary forms fruit
- showed understanding that photosynthesis creates energy (ATP) which the cell can then use for carrying out cellular processes like respiration, growth and reproduction
- recognised that by increasing light intensity, the rate of photosynthesis increases until it reaches a point where increasing the light intensity no longer increases the rate of photosynthesis
- demonstrated in-depth understanding of how photosynthesis is limited by the factor that is supplied in the least amount.

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:

- discussed differences between both insect distributed pollen and wind dispersed pollen
- related the structures and locations of pollen in both insect and wind pollinated flowers
- linked the structure of the flower to its method of pollination for both wind and insect pollinated flowers
- linked how different fruits are adapted to different types of dispersal and how this benefits the germination of the seedlings
- clearly and concisely explained limitations due to carbon dioxide and light intensity
- explained why a solution of potassium hydrogen carbonate (KHCO_3) was used in this experiment
- accurately identified the point at which light intensity reached its maximum output and justified this for an optimum rate of photosynthesis
- discussed the importance of photosynthesis for the survival of a plant

- were able to link the idea that photosynthesis results in the production of glucose which is important in the processes of respiration
- applied their understanding of the process of photosynthesis to the results of the experiment in the context of the question.

OTHER COMMENTS

Students who drew diagrams with annotated labels to support their answers were able to access higher scores or grades.

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:

- stated the basic structure and function of the small and large intestines; small intestines absorb nutrients and large intestines absorb water
- noted that small intestines are thinner and longer than large intestines
- demonstrated understanding of the difference between physical and chemical digestion, including where they occur
- understood that physical digestion broke up the food into small pieces but often referred to these small pieces incorrectly as molecules
- showed understanding that chemical digestion involves enzymes
- described the role of enzymes and knew that if the temperature or pH changed beyond the optimum, then the enzyme would stop working.

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:

- described incorrectly that food entered the large intestine before entering the small intestine, and were confused about the function of each part
- confused the meaning of digestion and absorption
- often had the misconception that assimilation occurs inside the small intestine
- were confused about physical and chemical digestion and did not talk about where they occurred in the digestive system
- stated incorrectly that low temperatures caused enzymes to denature and high temperatures killed them
- were unable to interpret given data.

ACHIEVEMENT WITH MERIT

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

- made links between the structures and digestive processes in the small and large intestines

- explained how specific adaptations helped increase efficiency of the digestive system. e.g. villi are finger-like structures found inside the small intestines; they increase the surface area of the small intestines so more nutrients can be absorbed
- demonstrated understanding that physical digestion involves breaking down of food into smaller pieces with an increased surface area while chemical digestion is the breaking down of food at the molecular level so that it is small enough to be absorbed into the blood
- recalled basic facts about adaptation such as villi, teeth and enzymes and went on to explain how these adaptations helped the organism carry out their specific function
- explained the trend observed for temperature in terms of either collision theory or denaturing of enzymes
- understood that enzymes required a certain pH/temperature to operate optimally and were able to explain what would happen if the enzyme was not operating in these conditions.

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:

- demonstrated an in-depth understanding of how structures within the small and large intestines function and how they lead to greater efficiency in the completion of digestion and absorption of nutrients and water
- demonstrated a comprehensive understanding of why physical digestion needs to occur before chemical digestion
- addressed all aspects of the question in an integrated way, rather than addressing each bullet point
- used clear, relevant and annotated diagrams to help clarify their answers
- were able to link enzyme activity to temperature and pH changes within the digestive system
- accurately discussed the effect of temperature and pH on enzymes, and what happens to the enzyme salivary amylase when they are outside their optimum conditions
- applied their knowledge to the given context, rather than simply regurgitating a learned answer
- wrote answers that were planned and organised in a logical way, using the correct terms and clearly linking their ideas to the question.