

National Certificate of Educational Achievement

2014 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 who took their time and read the question carefully before planning their answer avoided just rewriting the information given in the body of the question.

Those that planned their responses, linking to the detail provided within the question, generally did much better than those candidates that just used a rote learned answer.

Candidates who used memorised answers from previous examinations and did not relate the information to the current examination question were unable to show understanding of the required information from the standard.

Candidates who had a sound understanding of the vocabulary required by the standard and used these terms correctly in their answers, were able to write more detailed and coherent answers and gained higher grades.

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 commonly:

- were able to describe bacteria, viruses and fungi and their methods of reproduction
- were able to make simple comparisons of the reproductive methods of the three groups
- understood that viruses are non-living and need a host cell to reproduce
- knew that living things must be able to perform the seven life processes
- described a pathogen as a disease-causing micro-organism
- described the process of extracellular digestion
- identified that yeast is a fungus that has uses in food technology.

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 commonly:

- were confused about the descriptions of the three microbe groups
- were unclear about the methods of reproduction for some microbe groups
- did not recognise the difference between living and non-living
- were unable to compare similarities or differences
- did not identify the purpose of a question and rambled off the topic
- did not use resource material in their explanation
- had preconceived expectations of a paper and imposed those expectations incorrectly on questions, e.g. in Question 3 some students anticipated a question on recycling and imposed this interpretation on the food technology question

- described a fungus (such as the mushroom) as food rather than how a fungus can be used to modify a food through its life processes and their by-products.

ACHIEVEMENT WITH MERIT

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

- were able to explain the reproductive methods of micro-organisms
- compared two microbe groups and explained their similarities and differences
- explained why living specimens are difficult to grow in a laboratory
- explained that viruses mutate and that this makes them unrecognisable for antibodies
- explained why viruses are always pathogens
- used resource material to provide evidence
- explained the process of extracellular digestion
- explained that enzyme function was dependent on environmental conditions such as temperature
- could clearly explain the processes of respiration in fungi
- were able to explain how extracellular digestion or respiration contributed to flavour or texture of food
- explained that extracellular digestion releases nutrient resources for the supply of energy
- used correct terminology in their explanations.

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 commonly:

- compared and contrasted the reproductive processes of all three microbes
- linked the mutation of a virus to the inability of existing immunity and its effectiveness in controlling it
- wrote a detailed explanation of why viruses are always pathogens
- linked the destruction of cells during viral reproduction to the general decline in body function leading to illness
- were able to link the process of extracellular digestion to its respiratory processes and explain how these led to different textures and flavours in specific foods
- used correct terminology in their explanations.

OTHER COMMENTS

Some candidates presented answers that were illegible and as a result, not all of their evidence were able to be taken into account.

A small number also used pencil extensively in diagrams and some wrote entirely in pencil. This meant their work in pencil could not be used for reconsideration purposes..

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 commonly:

- named at least three different dispersal methods
- provided a basic description of the benefits of effective seed dispersal
- identified seed structures that could assist in dispersal
- used correct terminology to describe seed structures (e.g. testa, cotyledon)
- recognised the general direction of primary and secondary growth
- named the conditions needed for successful germination
- specified the location of primary and/or secondary growth
- described leaf adaptations as outlined in the diagram
- wrote a word equation for photosynthesis and used this to identify glucose/starch as a product for the subsequent iodine test
- identified chloroplasts as the photosynthetic organelle
- recognised glucose or starch as the cause of a positive iodine test.

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 commonly:

- described pollination instead of seed dispersal
- identified nectar as an attraction for seed dispersers
- described how only one or two method(s) of dispersal was linked to structure
- did not describe how the seed structure assisted the seed in its dispersal method
- classified sandbur spikes as an adaptation that protects against herbivory or explosive seed dispersal mechanism
- wrote limited or inaccurate descriptions of the dispersal methods for the seeds (e.g. rolling for coconut, explosion for sandbur, falling for miro)
- limited descriptions to 'when' primary or secondary growth took place and did not include any details on where or how these processes occurred
- included inaccurate vocabulary to describe germination (oxygen was needed for plants to 'breathe' (not respire); seeds 'hatch' (not germinate) etc.)
- provided a limited description of root gravitropism
- suggested oxygen was a reactant for photosynthesis
- identified only one other requirement for successful germination (e.g. water)
- wrote sunlight as a necessary environmental condition for germination
- outlined general plant adaptations unrelated to the given diagram or to photosynthesis
- identified stomata as the site of water intake for the plant
- named a specific leaf tissue as the organelle for photosynthesis
- suggested that iodine test result was due to injury or death of the leaf.

ACHIEVEMENT WITH MERIT

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

- explained the significance of dispersing seeds at sufficient distance away from the parent plant
- recognised the benefits of adding fertiliser or nutrient for germination in seeds that are eaten by animals
- explained the challenges for successful dispersal methods
- effectively linked named seed structures to correct dispersal method
- identified the benefits of plant population shifting into new habitats
- identified high seed or plant density as a challenge to successful germination and growth
- explained the importance of respiration in successful germination
- explained the significance of water and temperature on enzyme reactions
- noted the significance of three requirements for successful germination
- correctly named the plant tissues involved in specific stages of primary or secondary growth
- made links of warmer temperatures to increased action of enzymes
- explained the role of photosynthesis in different leaf tissues but did not link it to the neighbouring leaf layers
- included a detailed explanation of chlorophyll in the production of glucose or starch
- made links between columnar shape of palisade mesophyll to effective light absorption
- identified the significance of chloroplasts around the cell perimeter for palisade mesophyll photosynthesis
- recognised that higher chloroplast density contributed to increased rates of photosynthesis.

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 commonly:

- evaluated different seed dispersal methods in terms of success rate across different environmental conditions
- compared the different success rates of different dispersal methods
- related dispersal away from parent plant to competitive advantage for both parent and offspring
- made links between successful dispersal methods to a viable population of animal dispersal agents
- discussed benefits and challenges of different dispersal methods in terms of seed movement, germination, and survival of the adult plant
- included a detailed outline of the sequential stages of primary growth
- elaborated on the crushing of phloem in secondary growth and filling of vacuoles in primary growth
- linked the role of primary or secondary growth to competitive advantage
- effectively compared the benefits of primary and secondary growth and made links between these two processes

- linked guard cell function to turgor pressure and to the availability of water in different environmental conditions (e.g. drought)
- discussed cytoplasmic streaming as a method of maximising the rate of photosynthesis
- identified the roles of neighbouring leaf tissues for effective photosynthesis
- explained the significance of relative chloroplast density in palisade or spongy mesophyll layers
- related both the columnar palisade cell arrangement and the less compact spongy mesophyll layout to efficiency of photosynthesis
- related the role of guard cells, stomata and transpiration in providing a reliable supply of water as a reactant for photosynthesis.

OTHER COMMENTS

A number of pre-learnt answers on wind or animal pollination of flowers were provided in response to question one. Candidates who were able to achieve in this standard generally had a good understanding of the terminology used in the life cycle of plants as prescribed in the Achievement Standard.

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

ACHIEVEMENT

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

- were able to identify a herbivore and a carnivore from the skulls provided
- distinguished between the types of teeth for herbivores and carnivores but commonly mentioned that herbivores have only molars to chew while carnivores have only canines to kill prey
- were able to identify the role of enzymes and give examples of an enzyme in the human digestive system and also link it to the enzyme and its optimum pH
- identified that enzymes were substrate specific and only worked on one type of food
- identified that aerobic respiration took place in the presence of oxygen and anaerobic respiration did not require oxygen
- knew that both these types of respiration produced 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 commonly:

- struggled to identify a herbivore and a carnivore by looking at the skulls provided
- confused the different teeth types what each teeth type did
- gave general statements about the teeth without actually naming them (e.g. all teeth in a herbivore are blunt)
- were unable to link digestive enzymes to the breakdown of food molecules
- incorrectly stated that enzymes have a pH, when in fact it is the pH of the environment that controls whether an enzyme is able to function at its optimum level
- gave generalised answers on why many different enzymes are needed rather than focussing on the specific ones being asked for

- stated that the digestive system was from mouth to anus and did not actually answer the question
- were unable to recall the differences between aerobic and anaerobic respiration, often confusing the two.

ACHIEVEMENT WITH MERIT

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

- made links between the different teeth types, describing their shape and explaining how their shape related to their function
- linked the differences in teeth shape to the diet of herbivores and/or carnivores
- were able to not just recall the role of enzymes but also recognised that enzymes were specific because of the shape of their active site or because they needed a specific pH in order to work at their optimum rate
- were able to clearly make links that each part of the gut offered different pH and therefore each part was ideal for different enzymes to work at digesting the different types of food
- showed an understanding that if an enzyme was placed outside of its optimum pH, the enzyme would denature and stop functioning.
- were able to explain similarity or difference between aerobic and anaerobic respiration making clear links to the need for food or glucose
- explained that anaerobic respiration released energy much faster than aerobic respiration so was used by the cheetah.

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 commonly:

- demonstrated an in-depth understanding, by justifying how structures and function of the different teeth related to their diet
- comprehensively explained how the different enzymes throughout the digestive system are affected by pH, and why the digestive system is compartmentalised in relation to chemical digestion
- accurately discussed the two types of respiration and linked each to a real life situation
- wrote comprehensive answers that addressed all of the question in an integrated way, rather than simply addressing each bullet point without making links between them
- used clear well-labelled diagrams to help clarify their written answers
- wrote answers that were planned, organised and well-written in a logical way, using the correct terms and making clear links to the question
- were able to apply their knowledge to the given context.