Assessment Report

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Level 1 Science 2020

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Standards 90940 90944 90948

Part A: Commentary

Generally, candidates used the scaffolding in questions to assist their response. For the highest grades candidates are reminded to answer the question rather than focus entirely upon the scaffolding. Candidates need to practise applying their knowledge to unknown situations to achieve the highest grades.

Part B: Report on standards

90940: Demonstrate understanding of aspects of mechanics

Candidates who were awarded **Achievement** commonly:

- used a speed versus time graph to correctly describe acceleration and constant speed
- read a constant speed correctly, and calculated acceleration from a speed versus time graph

- drew vectors with a direction and magnitude to represent a force
- chose correct formulae to apply to calculations of distance, force, work, power, and pressure
- calculated kinetic energy
- defined the terms mass and weight, and then used mass and gravity to calculate weight
- identified gravity as a force that caused weight and that this differed on different planets and meant that vehicles would sink more on Mars than on Earth
- stated 10 Newtons per kilogram as words instead of using the symbols N and / or kg.

Candidates whose work was assessed as **Not Achieved** commonly:

- drew free body force diagrams but used incorrect labels
- could not calculate $F = ma$
- could not calculate $P = W/t$ or $P = F/A$
- could not define mass or weight.

Candidates who were awarded **Achievement with Merit** commonly:

- demonstrated an in-depth understanding of conservation of energy
- related motion to balanced and unbalanced forces
- carried out multi-step calculations
- correctly calculated pressure but used incorrect units (P, pa, N, or nm).

Candidates who were awarded **Achievement with Excellence** commonly:

- could use a speed versus time graph to calculate the distance travelled by an object
- understood and clearly explained the concept of constant speed being the result of balanced forces as a consequence of equal forces being in an opposite direction and that unbalanced forces would result in acceleration
- carried out multi-step calculations and used units correctly
- discussed energy transformations

- compared variables in multi-step calculations.

Standard-specific comments

Candidates generally had a good understanding of most of the concepts examined. Candidates should use labelled force diagrams to aid explanations, and check calculated answers are sensible.

90944: Demonstrate understanding of aspects of acids and bases

Candidates who were awarded **Achievement** commonly:

- could identify the charge on chloride, calcium, and carbonate ions
- identified different pH levels for red and orange beakers
- knew particles with more energy moved faster
- could write word equations or correct formulae for ionic compounds
- gave a correct definition for rate of reaction or collision theory
- recognised that the rate of reaction would increase with higher concentration
- identified that a higher concentration had more acid particles in it
- stated that a higher temperature led to particles moving faster, or having more frequent collisions
- could write the electron arrangement of ions
- described loss or gain of electrons
- described ionic compounds as having no charge or charges of ions that cancel each other out
- were able to relate litmus paper or baking soda observations to acid, base or neutral solutions
- identified neutralisation reactions.

Candidates whose work was assessed as **Not Achieved** commonly:

- could not write word or formulae equations
- substituted incorrectly the word “faster” for frequency

- used the term “dissolving” incorrectly when referring to a marble chip reacting
- could not give correct electron arrangements for atoms or ions
- could not give charges for protons and electrons.

Candidates who were awarded **Achievement with Merit** commonly:

- could write correct but unbalanced symbol equations
- explained how more acid particles per volume led to a faster rate of reaction
- explained that acid particles at higher temperatures will have more energy so there will be more successful collisions
- explained how acid particles at higher temperatures move faster so there would be more frequent collisions / collisions per second
- explained how the loss or gain of electrons gives ions full outer shells
- explained the balance of protons and electrons for both ions
- explained how ions make neutral compounds which are stable.

Candidates who were awarded **Achievement with Excellence** commonly:

- recognised that the same reactant mass also meant the same product mass
- could use ionic formulae to explain the movement of electrons as ions form and create new stable compounds
- wrote correctly balanced symbol equations
- related an increase in concentration to an increase of available acid particles, leading to an increase of frequency of collisions; therefore a higher rate of reaction
- related an increase of temperature to a rise in energy of acid particles that causes a higher frequency of effective / successful collisions between reactant particles.

Standard specific comments

Candidates generally had a good understanding of most of the concepts examined. Using electron transfer to explain the formation of neutrally charged compounds was not as well understood, nor was relating the properties of acids and bases to reactions, which often inhibited the candidate’s level of achievement.

90948: Demonstrate understanding of biological ideas relating to genetic variation

Candidates who were awarded **Achievement** commonly:

- defined the terms genotype and phenotype
- defined the term mutation as a change in DNA base sequence
- distinguished between DNA, gene and allele
- drew correct Punnet squares
- identified the passing of alleles from parents to the offspring
- described variation as differences between individuals
- described meiosis as producing gametes
- defined the role of gametes in sexual reproduction
- described how variation can lead to survival of the species.

Candidates whose work was assessed as **Not Achieved** commonly:

- could not work out the genotype and phenotype
- could not define terms – DNA, gene, allele, mutation, genotype, and phenotype
- could not correctly draw a Punnet square
- could not distinguish between fertilisation and gametes
- could not describe variation.

Candidates who were awarded **Achievement with Merit** commonly:

- described how alleles interact to produce three genotypes, but only two phenotypes
- showed the link between DNA, gene and allele in producing phenotype
- understood how a mutation in DNA results in a new allele
- explained how alleles are passed on or inherited between parents and offspring

- explained genetic variation in relation to either gamete formation or random fertilisation
- linked genetic variation and the passing on of genes / alleles in populations being beneficial.

Candidates who were awarded **Achievement with Excellence** commonly:

- explained comprehensively how two alleles interact to produce three genotypes but only two phenotypes, in context
- linked comprehensively a DNA mutation to a new allele, gene and new phenotype, in context
- explained comprehensively how the genotype for an individual is a result of inheriting alleles from both parents
- discussed that characteristics are inherited via gametes but the acquired characteristics due to the environment cannot be passed on
- explained the role of meiosis and random fertilisation during sexual reproduction in producing genetic variation, in context
- linked genetic variation comprehensively to the survival of the population and the species.

Standard specific comments

Candidates generally had a good understanding of most of the concepts examined. Common issues for candidates included: defining genetic variation, sexual reproduction, meiosis, and fertilisation.

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Previous years' reports

2019 (PDF, 110KB)

2018 (PDF, 114KB)

2017 (PDF, 48KB)

2016 (PDF, 238KB)

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