Combined Science (Biology)

**Paper 1SC0/1BH Biology Higher Paper 1**

**Topics not assessed in this paper:**

**• Topic 1 Key concepts in Biology – transport into and out of cells (1.15–1.17)**

**\*\*TOPICS MAY STILL BE ON PAPER 2\***

1.12 Explain the importance of enzymes as biological catalysts in the synthesis of carbohydrates, proteins and lipids and their breakdown into sugars, amino acids and fatty acids and glycerol

1.15 Explain how substances are transported into and out of cells, including by diffusion, osmosis and active transport

1.16 Core Practical: Investigate osmosis in potatoes

1.17 Calculate percentage gain and loss of mass in osmosis

**• Topic 3 Genetics – variation (3.19– 3.23)**

3.19 State that most phenotypic features are the result of multiple genes rather than single gene inheritance

3.20 Describe the causes of variation that influence phenotype,

including:

a genetic variation – different characteristics as a result of mutation and sexual reproduction

b environmental variation – different characteristics caused by an organism’s environment (acquired characteristics)

3.21 Discuss the outcomes of the Human Genome Project and its potential applications within medicine

3.22 State that there is usually extensive genetic variation within a population of a species and that these arise through mutations

3.23 State that most genetic mutations have no effect on the phenotype, some mutations have a small effect on the

phenotype and, rarely, a single mutation will significantly affect the phenotype

**• Topic 5 Health, disease, and the development of medicines – defence against**

**disease (5.12–5.14)**

5.12 Describe how the physical barriers and chemical defences of the human body provide protection from pathogens, including:

a physical barriers, including mucus, cilia and skin

b chemical defence, including lysozymes and hydrochloric acid

5.13 Explain the role of the specific immune system of the human body in defence against disease, including:

a exposure to pathogen

b the antigens trigger an immune response which causes the production of antibodies

c the antigens also trigger production of memory lymphocytes

d the role of memory lymphocytes in the secondary response to the antigen

5.14 Explain the body’s response to immunisation using an inactive form of a pathogen

**Paper 1SC0/2BH Biology Higher Paper 2**

**Topics not assessed in this paper:**

**• Topic 1 Key concepts in biology – enzymes (1.7–1.12)**

**\*\*TOPICS MAY STILL BE ON PAPER 1\***

1.7 Explain the mechanism of enzyme action including the active site and enzyme specificity

1.8 Explain how enzymes can be denatured due to changes in the shape of the active site

1.9 Explain the effects of temperature, substrate concentration and pH on enzyme activity

1.10 Core Practical: Investigate the effect of pH on enzyme activity

1.11 Demonstrate an understanding of rate calculations for enzyme activity

1.12 Explain the importance of enzymes as biological catalysts in the synthesis of carbohydrates, proteins and lipids and their breakdown into sugars, amino acids and fatty acids and glycerol

**• Topic 1 Key concepts in biology – transport into and out of cells (1.15–1.17)**

**\*\*TOPICS MAY STILL BE ON PAPER 1\***

1.15 Explain how substances are transported into and out of cells, including by diffusion, osmosis and active transport

1.16 Core Practical: Investigate osmosis in potatoes

1.17 Calculate percentage gain and loss of mass in osmosis

**• Topic 6 Plant structures and their functions – limiting factors on photosynthesis**

**(6.3–6.6)**

6.3 Explain the effect of temperature, light intensity and carbon dioxide concentration as limiting factors on the rate of photosynthesis

6.4 Explain the interactions of temperature, light intensity and carbon dioxide concentration in limiting the rate of

photosynthesis

6.5 Core Practical: Investigate the effect of light intensity on the rate of photosynthesis

6.6 Explain how the rate of photosynthesis is directly proportional to light intensity and inversely proportional

to the distance from a light source, including the use of the inverse square law calculation

**• Topic 9 Ecosystems and material cycles – communities (9.1–9.3)**

9.1 Describe the different levels of organisation from individual organisms, populations, communities, to the whole ecosystem

9.2 Explain how communities can be affected by abiotic and biotic factors, including:

a temperature, light, water, pollutants

b competition, predation

9.3 Describe the importance of interdependence in a community