Year 12: Teacher A

All numbers refer to specification points

Timing	Unit Title	Key Question	Knowledge	Assessing understanding
Autumn	**3.1 Biological molecules**	**What are the basic units of life?**	An understanding that: ● All life on Earth shares a common chemistry. This provides indirect evidence for evolution. ● Carbohydrates are commonly used by cells as respiratory substrates. They also form structural components in plasma membranes and cell walls. ● Lipids have many uses, including the bilayer of plasma membranes, certain hormones and as respiratory substrates. ● Proteins form many cell structures. They are also important as enzymes, chemical messengers and components of the blood. ● Nucleic acids carry the genetic code for the production of proteins. The genetic code is common to viruses and to all living organisms, providing evidence for evolution. ● The most common component of cells is water; hence our search for life elsewhere in the universe involves a search for liquid water. **Specification reference:** 3.1	**How understanding is assessed** Students will be assessed on their ability to: ● Recall the knowledge covered ● Explain the Biological processes covered. ● Interpret graphical and experimental data, ● Make connections between different areas of understanding. Assessment will take the form of written questions in a test. **Skills** ● Description ● Explanation ● Evaluation ● Comparison ● Planning and carrying out investigations ● Carrying out statistical tests and applying maths formulae Students will also be assessed on their ability to effectively carry out the following: <u>Required practical 1</u>: Investigation into the effect of a named variable on the rate of an enzyme-controlled reaction.

Autumn 2	**3.3.3 digestion and absorption**	**How do humans make food useful?**	An understanding that: ● During digestion, large biological molecules are hydrolysed to smaller molecules that can be absorbed across cell membranes. Digestion in mammals of: ● carbohydrates by amylases and membrane-bound disaccharidases ● lipids by lipase, including the action of bile salts ● proteins by endopeptidases, exopeptidases and membrane-bound dipeptidases. Mechanisms for the absorption of the products of digestion by cells lining the ileum of mammals, to include: ● co-transport mechanisms for the absorption of amino acids and of monosaccharides ● the role of micelles in the absorption of lipids. **Specification reference:** 3.3.3	**How understanding is assessed** Students will be assessed on their ability to: ● Recall the knowledge covered ● Explain the Biological processes covered. ● Interpret graphical and experimental data, ● Make connections between different areas of understanding. Assessment will take the form of written questions in a test. **Skills** ● Description ● Explanation ● Evaluation ● Comparison ● Planning and carrying out investigations ● Carrying out statistical tests and applying maths formulae
Spring 1	**3.4 Genetic information, variation and relationships between organisms**		● Biological diversity – biodiversity – is reflected in the vast number of species of organisms, in the variation of individual characteristics within a single species and in the variation of cell types within a single multicellular organism. ● Differences between species reflect genetic differences. Differences between individuals within a species could be the result of genetic factors, of environmental factors, or a combination of both. ● A gene is a section of DNA located at a particular site on a DNA molecule, called its locus. The base	**How understanding is assessed** Students will be assessed on their ability to: ● Recall the knowledge covered ● Explain the Biological processes covered. ● Interpret graphical and experimental data, ● Make connections between different areas of understanding. Assessment will take the form of written questions in a test.

			sequence of each gene carries the coded genetic information that determines the sequence of amino acids during protein synthesis. The genetic code used is the same in all organisms, providing evidence for evolution. ● Genetic diversity within a species can be caused by gene mutation, chromosome mutation or random factors associated with meiosis and fertilisation. This genetic diversity is acted upon by natural selection, resulting in species becoming better adapted to their environment. ● Variation within a species can be measured using differences in the base sequence of DNA or in the amino acid sequence of proteins. ● Understanding of the fundamentals of taxonomy and classification. ● Defining and calculating biodiversity as well as exploring methods of investigating diversity within and between species. Statistics in Biology lessons **Specification reference:** 3.4.1-3.4.6	**Skills** ● Description ● Explanation ● Evaluation ● Comparison ● Planning and carrying out investigations ● Carrying out statistical tests and applying maths formulae Students will also be assessed on their ability to effectively carry out the following: <u>Required practical 6:</u> Use of aseptic techniques to investigate the effect of antimicrobial substances on microbial growth.
Post exam summer	**3.5.3/3.5.4 Energy and ecosystems Nutrient cycles**	**What is the biosphere and why does it matter?**	An understanding of: ● The ways in which living things use the products of photosynthesis ● Measurement of biomass ● GPP and NPP ● Nutrient cycling to include : o Nitrogen and phosphorus **Specification reference:**	**Students will be assessed on their ability to:** ● Recall the knowledge covered ● Explain the Biological processes covered. ● Interpret graphical and experimental data, ● Make connections between different areas of understanding. **Skills** ● Description ● Explanation

			3·5·3-3·5·4	• Evaluation • Comparison • Planning and carrying out investigations • Carrying out statistical tests and applying maths formulae Assessment will take the form of written questions in a test.