

# Year 10 Biology Learning Outcomes

## Unit 4: Bioenergetics

### Unit 4.1: Photosynthesis

- Describe photosynthesis as an endothermic reaction in which energy is transferred from the environment to the chloroplasts by light.
- Explain the effects of temperature, light intensity, carbon dioxide concentration and the amount of chlorophyll on the rate of photosynthesis.
- Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.
- Describe all the ways plants use the glucose made in photosynthesis.
- Use data to relate limiting factors to the cost effectiveness of adding heat, light or carbon dioxide to greenhouses.

### Unit 4.2: Respiration

- Describe cellular respiration as an exothermic reaction which is continuously occurring in living cells.
- Investigate the effect of exercise on the body.
- Compare anaerobic respiration in humans with that in plants and yeast.
- Explain metabolism – the sum of all reactions in a cell or the body.

## Unit 5: Homeostasis & Response

### Unit 5.1: Nervous System

- Explain that homeostasis is the regulation of the internal conditions of a cell or organism.
- Plan and carry out an investigation into the effect of a factor on human reaction time.
- Explain how the structure of the nervous system is adapted to its functions.
- Explain how the various structures in a reflex arc relate to their function and understand why reflex actions are important.

### Unit 5.2: Hormonal Control

- Describe the principles of hormonal coordination and control by the human endocrine system
- Identify positions of 6 key organs and glands
- Explain how insulin controls blood glucose (sugar) levels in the body.
- Explain what diabetes is and how diabetes can be treated
- Explain the roles of thyroxine and adrenaline in the body.
- Describe the roles of hormones in human reproduction, including the menstrual cycle

- Explain the interactions of FSH, oestrogen, LH and progesterone, in the control of the menstrual cycle, by extracting and interpreting data
- Evaluate the different hormonal and non-hormonal methods of contraception.
- Explain the use of hormones in modern reproductive technologies to treat infertility.

## Unit 6: Reproduction, Variation & Evolution

### Unit 6.1: Reproduction

- Describe the differences in asexual and sexual reproduction in terms of number of gametes involved, variation and chromosome number.
- understand that meiosis leads to non-identical cells.
- being formed while mitosis leads to identical cells being formed.
- Discuss the benefits of studying the human genome and describe the structure of DNA
- Complete a Punnett square diagram and extract and interpret information from genetic crosses and family trees.
- Evaluate how polydactyly and cystic fibrosis disorders are inherited.
- Evaluate embryo screening for genetic diseases.

### Unit 6.2: Variation and Evolution

- Describe simply how the genome and its interaction with the environment influence the development of the phenotype of an organism.
- Describe how the inherited characteristics of a population over time through a process of natural selection may result in the change of a species.
- Explain how selective breeding happens and the impact of selective breeding of food plants and domesticated animals.
- Describe the process of genetic engineering to give a desired characteristic.
- Explain the potential benefits and risks of genetic engineering in agriculture and in medicine and that some people have objections.

### Unit 6.3: Genetics and Variation

- Explain how fossils are formed and what we can learn from them
- Describe factors which may contribute to the extinction of a species
- Explain how bacteria become antibiotic resistant and what we can do to reduce the spread of antibiotic resistant bacteria
- Describe the Linnaean system of classification and describe the impact of developments in biology on classification systems.