

Year	Lesson title	Lesson objectives
Year 10	Growing microorganisms	<ul style="list-style-type: none"> Describe the techniques used to produce uncontaminated cultures of microorganisms. Describe how bacteria reproduce by binary fission. Calculate the number of bacteria in a population.
Year 10	Testing new antibiotics	<ul style="list-style-type: none"> Use appropriate apparatus to investigate the effect of antibiotics on bacterial growth. Use microorganisms safely. Apply sampling techniques to ensure that samples are representative.
Year 10	Required practical: Investigating disinfectants	<ul style="list-style-type: none"> Carry out experiments with due regard to health and safety. Present and process data, identifying anomalous results. Evaluate methods and suggest further investigations.
Year 10	Learning about the circulatory system	<ul style="list-style-type: none"> Identify the parts of the circulatory system. Describe the functions of the parts of the circulatory system. Explain how the structure of each part of the circulatory system relates to its function.
Year 10	Exploring the heart	<ul style="list-style-type: none"> Describe the structure and functions of the heart. Identify the functions and adaptations of the parts of the heart. Explain the movement of blood around the heart.
Year 10	Studying blood	<ul style="list-style-type: none"> Identify the parts of the blood and their functions. Explain the adaptations of red blood cells. Explain how red blood cells and haemoglobin transport oxygen efficiently.
Year 10	Investigating gas exchange	<ul style="list-style-type: none"> Identify the parts of the human gas exchange system and know their functions. Explain how gas exchange occurs in humans. Explain the adaptations of the gas exchange surfaces.
Year 10	Learning about coronary heart disease	<ul style="list-style-type: none"> Identify the causes and symptoms of coronary heart disease and heart failure. Describe possible treatments of coronary heart disease and heart failure. Evaluate the possible treatments of coronary heart disease and heart failure.
Year 10	Learning about health	<ul style="list-style-type: none"> Recall the difference between health and disease. Explain how some diseases interact. Evaluate data about lifestyle and health. Recall the causes of some non-communicable diseases. Describe the impact of lifestyle on non-communicable diseases. Explain the impact of lifestyle on non-communicable diseases.
Year 10	Exploring non-communicable diseases	<ul style="list-style-type: none"> Identify risk factors for cancer. Explain the differences between types of tumours. Explain the impact of non-communicable diseases
Year 10	Studying pathogens	<ul style="list-style-type: none"> Recall the definition of a pathogen. Explain how communicable diseases can be controlled. Distinguish between epidemics and pandemics.

Year 10	Learning about viral diseases Studying bacterial diseases	<ul style="list-style-type: none"> • Describe the symptoms of some viral diseases. • Describe the transmission and control of some viral diseases. • Explain how some viral diseases are spread. • Describe the symptoms of some bacterial diseases. • Explain how some bacterial diseases can be controlled. • Compare and contrast bacterial and viral diseases.
Year 10	Looking at fungal diseases	<ul style="list-style-type: none"> • Recall the name and symptoms of a fungal disease. • Describe the transmission and treatment of rose black spot. • Explain how rose black spot affects the growth of the plant.
Year 10	Learning about malaria	<ul style="list-style-type: none"> • Recall that malaria is a protist disease. • Describe the lifecycle of the malarial vector. • Evaluate control methods for the spread of malaria.
Year 10	Protecting the body	<ul style="list-style-type: none"> • Describe how the body protects itself from pathogens. • Explain how the body protects itself from pathogens. • Explain how communicable diseases can be spread.
Year 10	Exploring white blood cells	<ul style="list-style-type: none"> • Describe phagocytosis. • Explain how antibody production can lead to immunity. • Explain the specificity of immune system responses
Year 10	Using antibiotics and painkillers	<ul style="list-style-type: none"> • Describe the uses of antibiotics and painkillers. • Explain how antibiotics and painkillers can be used to treat diseases. • Explain the limitations of antibiotics.
Year 10	Building immunity	<ul style="list-style-type: none"> • Recall how vaccinations prevent infection. • Explain how mass vaccination programmes reduce the spread of a disease. • Evaluate the global use of vaccination.
Year 10	Making new drugs	<ul style="list-style-type: none"> • Recall some traditional drugs and their origins. • Describe how new drugs are developed. • Explain why 'double-blind' trials are conducted.
Year 10	Investigating monoclonal antibodies (high demand only)	<ul style="list-style-type: none"> • Describe uses of monoclonal antibodies. • Explain how monoclonal antibodies are produced. • Evaluate the use of monoclonal antibodies.
Year 10	Looking at plant diseases	<ul style="list-style-type: none"> • Recall the causes of plant diseases. • Describe the symptoms and identification methods of some plant diseases. • Explain the use of monoclonal antibodies in identifying plant pathogens.
Year 10	Learning about plant defences	<ul style="list-style-type: none"> • Recall some physical plant defence responses. • Explain how mechanical plant defence systems help them survive. • Explain how chemical plant defence systems help them survive.
Year 10	Maths skills: Sampling and scientific data	<ul style="list-style-type: none"> • Understand why sampling is used in science. • Be able to explain different sampling techniques.
Year 10	Homeostasis	<ul style="list-style-type: none"> • Explain the importance of homeostasis in regulating internal conditions in the body. • Recall that these control systems involve nervous or chemical responses. • Describe how control systems involve receptors, coordination centres and effectors.
Year 10	The nervous system	<ul style="list-style-type: none"> • Describe the structure and function of the nervous system. • Explain how the nervous system is adapted to its functions.

		<ul style="list-style-type: none"> Describe the structure of sensory, motor and relay neurones.
Year 10	Reflex actions	<ul style="list-style-type: none"> Explain the importance of reflex actions. Describe the path of a reflex arc. Explain how the structures in the reflex arc relate to their function.
Year 10	The brain	<ul style="list-style-type: none"> Recall that the brain controls complex behaviour using billions of interconnected neurones. Identify the three main regions of the brain and describe their functions. Describe how the regions of the brain are mapped.
Year 10	Required practical: Investigating reaction time	<ul style="list-style-type: none"> Select appropriate apparatus and techniques for the measurement of biological processes. Carry out physiological experiments safely. Use appropriate techniques in problem-solving contexts.
Year 10	The eye	<ul style="list-style-type: none"> Relate the structures of the eye to their functions. Explain how the eye is adapted to seeing in colour and in dim light.
Year 10	Seeing in focus	<ul style="list-style-type: none"> Understand how the eye is able to focus on near or distant objects. Describe and understand why short-sightedness (myopia) occurs. Describe and understand why long-sightedness (hyperopia) occurs. Demonstrate how techniques are used to correct eye defects.
Year 10	Controlling body temperature	<ul style="list-style-type: none"> Describe the mechanisms by which body temperature is controlled when too hot or cold. Explain how body temperature can be controlled in a specific context.
Year 10	The endocrine system	<ul style="list-style-type: none"> Recall that the endocrine system is made up of glands that secrete hormones into the blood. Know the location of the major endocrine glands. Understand why the pituitary gland is the 'master gland'.
Year 10	Controlling blood glucose	<ul style="list-style-type: none"> Recall that blood glucose is monitored and controlled by the pancreas. Understand how insulin controls blood glucose levels. Understand how insulin works with another hormone – glucagon – to control blood sugar levels.
Year 10	Diabetes	<ul style="list-style-type: none"> Understand the causes of Type 1 and Type 2 diabetes. Compare Type 1 and Type 2 diabetes. Evaluate information on the relationship between obesity and diabetes, and make appropriate recommendations.
Year 10	Water balance	<ul style="list-style-type: none"> Recall the ways in which the body loses water. Explain why cells do not function efficiently if they lose or gain too much water. Explain how excess protein is converted to urea for excretion.
Year 10	The kidneys	<ul style="list-style-type: none"> Recall that excess water, ions and urea are removed from the body by the kidneys in urine. Describe how the kidneys produce urine. Explain how the hormone ADH regulates the amount of water in the urine, and therefore, in the body.
Year 10	Negative feedback (Higher tier only)	<ul style="list-style-type: none"> Explain the role of thyroxine in the body. Understand the principles of negative feedback, as applied to thyroxine.
Year 10	Kidney failure	<ul style="list-style-type: none"> Recall that people who suffer from kidney failure can be treated by dialysis or kidney transplant. Understand the principles of dialysis. Evaluate the advantages and disadvantages of treating organ failure using a mechanical device or transplant.
Year 10	Dialysis or transplant?	<ul style="list-style-type: none"> Describe different forms of dialysis. Use data to draw conclusions.

		<ul style="list-style-type: none"> Use data to evaluate the advantages and disadvantages of dialysis and kidney donation.
Year 10	Human reproduction	<ul style="list-style-type: none"> Describe the roles of hormones in sexual reproduction. Explain how hormones interact in the menstrual cycle.
Year 10	IVF (Higher tier only)	<ul style="list-style-type: none"> Explain the use of hormones in technologies to treat infertility. Describe the technique of in-vitro fertilisation. Evaluate the scientific, emotional, social and ethical issues of in-vitro fertilisation.
Year 10	IVF evaluation (Higher tier only)	<ul style="list-style-type: none"> Evaluate data regarding in-vitro fertilisation and use this to draw conclusions. Evaluate the scientific, emotional, social and ethical issues of in-vitro fertilisation.
Year 10	Systems working together (Higher tier only)	<ul style="list-style-type: none"> Describe the effects of adrenaline. Understand that automatic control systems may involve nervous responses and chemical responses. Understand that combinations of hormones work to produce a response.
Year 10	Contraception	<ul style="list-style-type: none"> Define the purpose of contraception. Describe hormonal methods and non-hormonal methods of contraception. Explain how these methods are effective at preventing pregnancy.
Year 10	Which contraceptive?	<ul style="list-style-type: none"> Describe the advantages and disadvantages of different contraceptive methods. Use data to evaluate the effectiveness of different contraceptive methods.
Year 10	Auxins	<ul style="list-style-type: none"> Recall that plants produce hormones to coordinate and control growth, and responses to light and gravity. Describe how unequal distributions of auxins cause unequal growth rates in plant shoots and roots.
Year 10	Applications of auxins	<ul style="list-style-type: none"> Explain how auxins coordinate and control responses to light and gravity. Explain that auxins act on 'stem cells' in plants called meristems. Describe some applications of auxins.
Year 10	Required practical: The effect of light and gravity on the growth of germinating seeds	<ul style="list-style-type: none"> Describe how an experiment is planned for a specific purpose. Make and record observations and translate data from one form to another. Interpret observations and other data, identifying patterns and trends, make inferences and draw conclusions.
Year 10	Other plant hormones (Higher tier only)	<ul style="list-style-type: none"> Recall that gibberellins are important in seed germination, and ethene in cell division and ripening of fruit. Explain the application of the plant hormones ethane and gibberellins.
Year 10	Maths skills: The spread of scientific data	<ul style="list-style-type: none"> Be able to use range bars on graphs. Understand how box and whisker plots can be used to show the spread of data. Understand how to use percentiles.
Year 10	DNA and genes	<ul style="list-style-type: none"> Describe the structure of DNA. Describe a gene as a small section of DNA that codes for a protein.
Year 10	The human genome	<ul style="list-style-type: none"> Describe a gene as a small section of DNA that codes for a protein. Explain the importance of understanding the human genome.
Year 10	Tracing human migration	<ul style="list-style-type: none"> Explain the importance of understanding the human genome. Discuss the use of the human genome in understanding human migration patterns.
Year 10	The structure of DNA	<ul style="list-style-type: none"> Describe the structure of DNA as repeating nucleotide units. Identify the four bases in DNA. Explain that the bases A and T, and C and G, are complementary.
Year 10	Proteins	<ul style="list-style-type: none"> Describe how proteins are synthesised according to the DNA template of a gene. Explain that the genetic code of a gene specifies the protein to be made.

Year 10	Mutations	<ul style="list-style-type: none"> • Model changes to the base sequences of DNA to illustrate mutations. • Describe the negative and, sometimes, positive effects of mutations. • Describe how mutations can affect protein function.
Year 10	Meiosis	<ul style="list-style-type: none"> • Explain how meiosis halves the number of chromosomes for gamete production. • Explain how fertilisation restores the chromosome number. • Understand that the four gametes produced by meiosis are genetically different.
Year 10	Asexual and sexual reproduction	<ul style="list-style-type: none"> • Understand that asexual reproduction involves just one parent and produces genetically identical offspring. • Understand that sexual reproduction leads to variety in the offspring.
Year 10	Genetics	<ul style="list-style-type: none"> • Understand and be able to use genetics terms, such as dominant, recessive, genotype, phenotype, homozygous and heterozygous. • Know that some human conditions are caused by a recessive allele.
Year 10	Genetic crosses	<ul style="list-style-type: none"> • Use the terms dominant, recessive, genotype, phenotype, homozygous and heterozygous. • Know that some human conditions, such as cystic fibrosis, are caused by a recessive allele. • Complete or construct a Punnett square to predict the outcome of a genetic cross.