Pearson BTEC National Diploma in Medical Science

Vision statement - Our vision is to develop knowledgeable, practical and professionally minded medical scientists who can confidently apply scientific knowledge, practical skills and evidence to real-world healthcare and medical challenges. Students will leave equipped for further study, apprenticeships and careers across healthcare, biomedical science and the wider medical sector.

Intent - Our Pearson BTEC Level 3 Medical Science curriculum is designed to develop knowledgeable, practical and professionally minded students who understand how scientific principles are applied to the diagnosis, treatment and prevention of human disease. Students develop an appreciation of the relationship between biological systems, medical technologies and patient outcomes while building the scientific, practical and transferable skills required for progression into higher education, healthcare, biomedical science and related careers.

The curriculum is carefully sequenced to establish a strong foundation in the scientific principles underpinning medical science before applying this knowledge to human health and disease. Students develop their understanding of anatomy and physiology, cells and tissues, biological molecules, genetics, microbiology, infection and immunity, disease processes and the principles of medical diagnosis. They explore how scientific techniques and technologies are used within healthcare, including laboratory investigation, microscopy, biochemical testing and other diagnostic approaches.

Students develop the ability to apply scientific knowledge to realistic medical and healthcare contexts. They learn to interpret patient information, laboratory results, experimental data and scientific evidence, making connections between changes at the cellular or molecular level and their consequences for human health. Quantitative skills are developed through calculations, data interpretation, graphs, measurements and the analysis of scientific results. Students are encouraged to justify conclusions using evidence and to recognise the limitations of diagnostic and experimental procedures.

Practical and vocational skills are central to the curriculum. Students develop confidence in following scientific protocols, using laboratory equipment safely, recording observations and measurements accurately and producing appropriate scientific documentation. They develop practical skills associated with areas such as microscopy, microbiology, biochemical analysis, investigation of physiological processes and medical diagnostic techniques. Students also learn to consider risk assessment, quality control, reliability, validity and sources of error, recognising the importance of accurate laboratory practice in real medical and scientific environments.

The curriculum promotes independence, organisation and professional communication through a combination of practical investigations, research, written assignments, examination preparation and applied scientific problem-solving. Students learn to communicate scientific information using appropriate terminology and to present evidence clearly for different purposes and audiences. Through the study of human disease, reproduction and fertility, genetics, infection, immunity and medical technologies, students develop an understanding of how scientific knowledge is continually applied to improve human health.

By the end of the course, students should be able to combine scientific knowledge, practical laboratory skills, data analysis, research and evaluation to address medical science problems confidently. The curriculum provides students with the academic and vocational foundations needed to progress to university-level study, apprenticeships and careers across healthcare, biomedical science, laboratory science and the wider medical sector.

Why study Medical Science at The Sixth Form at Ridgewood?

- The Medical science curriculum equips students who have a love or interest in biology with the scientific knowledge, practical skills and confidence to support progression into a wide variety of job roles within health care and medicine. This can be done through higher level apprenticeships on completion of the course or progression to further education.
- The roles linked to medical science can range from laboratory work or research, to front line work such as nurses/ paramedics/midwifery or care work or physiology.
- You will study in three specialist post-16 laboratories in Faraday where the majority of teaching takes place. All our labs are highly resourced with practical equipment you will use frequently during your studies.
- One of our largest departments, the Science team boasts twelve teachers and two technicians. Within this team we have highly qualified teachers in all three specialisms. Their backgrounds and expertise cover a wide breadth of areas including engineering, applied chemistry and biological sciences.
- Former alumni of the science department at Ridgewood have progressed to study medicine, astrophysics, radiography, physics, mathematics, mechanical engineering, chemical engineering, computer science, chemistry, bio-medical science and aeronautical engineering.

What topics will I study in this subject?

Topic	What this means
Unit 1: Principles of Physiology Anatomy and Pathology	Knowing how the human body works, in good and poor health, is key to learning how you can make a difference to others in the field of medical sciences. In this unit, you will study how the human body functions at a cellular and tissue level. You will go on to gain understanding of the various organ systems that comprise the human body – nervous, endocrine musculoskeletal, cardiovascular, respiratory, renal and digestive systems – and gain some insight into how these systems interrelate. This unit will give you a foundation for biological study in medical science, as you will gain knowledge of how the human body functions. You will also gain some insight into the factors that affect health and how an understanding of such factors may help to make a positive impact upon our lives.
Unit 2: Health Issues and Scientific Reporting	In this unit, you will explore a number of key areas in the field of medical science, with a focus on health issues faced by the human population today to explore their impact on the world we live in. You will gain an understanding of diagnostic techniques, before focusing on health issues themselves alongside associated initiatives including, cancer and various aspects of immune dysfunction, to the increasingly important world of genetics. You will learn how to research the impact of such health initiatives through developing knowledge in how to interpret and analyse different forms of scientific information, from newspaper articles to scientific journals. You will develop your critical thinking and analysis skills, including data analysis, learning how to assess the reliability of sources of published scientific information.
Unit 3: Practical microbiology and infectious diseases	In this unit, you will carry out your own investigation into the effect of antimicrobial agents on the growth of microorganisms. This will enable you to begin to understand the role of clinical microbiologists. To carry out your investigation you will explore a variety of tests using good laboratory practice. You will first develop an understanding of the significance of microorganisms as pathogens. You will link understanding of cell and tissue adaptation, function of biological molecules and the relationship between

	the structure, function and processes of key body systems with your knowledge of immune response to understand how diseases develop.
Optional module	This optional module will be decided upon based upon the interests of the group. A list of module titles is given below • Diseases, Disorders, treatments and Therapies • Biomedical Science • Human Reproduction and Fertility

What skills will I need in this subject?

Skill	What this skill involves in this subject
AO1 – recall/ remember facts	Demonstrate knowledge of scientific fact, definitions of terms, and scientific formulae. *Command words: give, label, name, state.*
A02 – application of facts	Demonstrate understanding of scientific concepts, procedures, processes and techniques and their application. *Command words: calculate, compare, discuss, draw, explain, state, write.*
A03 – Scientific principles and interpreting information	Analyse, interpret and evaluate scientific information to make judgements and reach conclusions. *Command words: calculate, compare, comment, complete, describe, discuss, explain, state.*
AO4 – Making connections between scientific principles	Make connections, use and integrate different scientific concepts, procedures, processes or techniques. *Command words: compare, comment, discuss, explain.*

What will my lessons involve?

- Medical Science is taught by two dedicated KS5 Biology teachers.
- Lessons will contain a variety of different tasks to suit all learners' needs. Examples of activities in lessons include fact recall quizzes on A01 content, hands-on practicals in order to complete the practical aspects of the course, and paired discussions around higher level thinking. We also focus heavily on teacher-led worked examples and model answers.
- 42% of the course is coursework and therefore a large proportion of lessons will be completing coursework and practical aspects of the course.
- We also strive to give you regular written feedback on classwork so that you know exactly how to improve and achieve a better grade.

What will my independent study involve?

- A significant factor in your success at post-16 is the quality of your independent study work. Independent study for Medical Science will largely consist of making revision resources and answering questions, and completing coursework.
- We expect you to spend nine hours over two weeks completing high quality independent study for this course.
- A portion of your independent study will also consist of conducting research by searching online, in text books or revision guides. This could either involve finding practical methods to conduct in the class or researching content prior to lessons.

How will I be assessed?

Percentage exam assessment: 58%	Percentage coursework assessment: 42%

Assessment	Details of assessment
Unit 1 Assessment	This will be assessed through 1hour and 30min examination. That will take place in the summer of year one of the course. The questions will assess knowledge and understanding of the underpinning principles of human physiology, anatomy and pathology, as well as the ability to apply your knowledge to new situations and will also test the skills of analysing and interpreting data and information from graphs, diagrams or text. This assessment is worth 25% of your overall grade.
Unit 2 Assessment	This will be assessed through 2hour examination. That will take place in the January of year two of the course. Students will be assessed through a number of short- and long-answer questions. Students will need to explore and relate to contexts and data presented. The questions will assess understanding of health issues and associated initiatives and reporting This assessment is worth 33% of your overall grade.
Unit 3 Assessment	This topic is assessed through four independently set coursework modules. A. Understand the classification and nature of microorganisms B. Examine the transmission and treatments of infectious diseases C. Explore the application of techniques to culture and identify microorganisms D. Investigate the effects of antimicrobial agents on the growth of microorganisms. Each module will be taught and coursework set appropriately between September of year one and February of year one. This topic is worth 25% of your overall grade.
Option module Assessment	This topic is comprised of three independently set coursework modules, that correspond to each optional module. Only one optional module will be selected. Unit 4: Diseases Disorders, Treatments and Therapies A) Understand biological molecules and pathways and their effect on the body. B) Understand the effects of physiological diseases and disorders and associated treatments. C) Examine the development of innovative and future types of treatment for physiological diseases and disorders. Unit 5: Biomedical Science A) Understand the principles of haematology and its use in medical diagnosis. B) Examine the use of health screening, histology and cytology in medicine. C) Examine the use of urinalysis as an analytical and diagnostic tool. Unit 6: Human Reproduction and Fertility A) Understand the anatomy and physiology of the human reproductive system B) Understand the role of hormones in the regulation and control of the reproductive system C) Examine the causes, treatments and impact of infertility on people's health Each module will be taught and coursework set appropriately between September of year two and February of year two. This topic is worth 17% of your overall grade.

How do I know this is the right course for me?

- Studying Medical Science is not only interesting and challenging. It also opens up many future career possibilities as it offers an alternative pathway into a career in science.
- At the end of this course you will receive UCAS points; these can be used at many universities as entry points. However, it is important that you check to ensure the university course you wish to apply for accepts UCAS points as some do not.
- The content follows on from the GCSE Biology and Chemistry, but the demands and skill level are higher. Therefore, you have to be willing to dedicate your time to developing these.
- There are many practicals and subsequent lab reports to write; these all contribute to you overall final grade. This is better suited to people who don't always perform well on written examinations.