

GCSE Biology Course Information

Course Overview

- **Exam Board** – AQA
- **Usual Age Range** – 14 to 16
- **Qualification** – One GCSE
- **Curriculum Time** – Three 50-minute lessons per week in class plus work in Independent Learning Time
- **Assessment** – Two 1-hour-45-minute examinations taken at the end of the two-year course
- **Grading** – Reformed Linear GCSE Scale of 9, 8, 7, 6, 5, 4, 3, 2, 1. UTC students taking Foundation Tier examinations will be awarded within the range of 1 to 5. UTC students taking Higher Tier examinations will be awarded within the range of 4 to 9.
- **Full specification** - <https://filestore.aqa.org.uk/resources/biology/specifications/AQA-8461-SP-2016.PDF>

Curriculum Intent

The **intent** of GCSE Biology is to give UTC students an opportunity to develop a broad understanding of the content within the following four fundamental areas that are further split into topics and to be able to apply this understanding to explain biological phenomena:

- Cells and organisation
- Disease and bioenergetics
- Biological responses
- Genetics and evolution
- Ecology

At the UTC we specifically intend students to appreciate biology's relevance to the world of work, in particular healthcare science. Healthcare science **careers** are explicitly taught within relevant topics in the GCSE Biology sequence of learning. Students will also have direct first-hand experience of our healthcare science partners through project days and other aspects of UTC life such as our extensive UTC extra programme or via our assessed non-GCSE technical healthcare science curriculum. A variety of careers outside this specialism are also taught in appropriate topics in GCSE Biology so students have an appreciation of how biology relates to the wider world of work so they can make an informed choice to the career they would like to pursue.

A further intent is to motivate all students to pursue further study in biology beyond GCSE, irrespective of prior attainment. All students are motivated through the study of separate science GCSE Biology; commonly known as a triple science, as GCSE Biology is available at Higher Tier and Foundation Tier at this UTC.

Suggested **destinations** after completion of this course include progression onto a level 3 course at the UTC such as A-level Biology along with the other related A-level sciences of A-level Chemistry and A-level Physics or Medical Science.

Throughout GCSE Biology students are encouraged to develop their **literacy skills**. Students are regularly exposed to reading material in class and extended writing activities such as experimental write ups. Extended response questions allow students to demonstrate their ability to construct and develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. Through the explicit teaching of specific biology key words as each topic is taught students demonstrate their understanding of a growing biology vocabulary as topics are taught through carefully designed written tasks, as well as verbally through questioning techniques used by their

teacher. This **love of reading** is further developed by both non-fiction and fiction biology related titles that have been carefully selected by their biology teachers that are available to borrow in our Learning Resource Centre.

The following five fundamental **numeracy** threads running through all three GCSE sciences are taught via the context of GCSE Biology in collaboration with our mathematics specialists. These are reinforced further albeit through a complementary subject in GCSE Chemistry and GCSE Physics:

- Arithmetic and numerical computation
- Handling data
- Algebra
- Graphs
- Geometry and trigonometry

For example, in GCSE Biology UTC students may draw and analyse a straight-line graph of the change in mass against concentration of sugar solution in the osmosis practical. Whilst in GCSE Chemistry students may draw and analyse a straight-line graph of total volume of sodium hydroxide added against mean maximum temperature in the temperature changes practical. Students in GCSE Physics may also draw and analyse a straight-line graph but of the temperature against work done in the specific heat capacity practical. Higher Tier students will also be taught how to complete multi-step calculations. Our students are well prepared in biological numeracy as 10% of the marks in GCSE Biology examinations now requires such a skill.

The students at our UTC experience more than the ten required practical activities that the examination board requires. All students benefit from a combination of a hands-on approach and written work. Students are well prepared for further study and careers with a practical and procedural component. Students are engaged in biology because they have this opportunity.

Remote Learning and Revision

Students will benefit from additional study on-site and at home using their personal copy of their Oxford University Press Revision Guide provided by the UTC.

Students can communicate with the teacher via the message function on Teams if absent from school and well enough to do some work.

Students should use the following websites:

- Free Science Lessons – <https://www.freesciencelessons.co.uk>
- AQA Practice Papers - <https://www.aqa.org.uk/subjects/science/gcse/biology-8461/assessment-resources?f.Resource+type%7C6=Question+papers>

Students may choose to use the following additional websites:

- GCSE Pod – <https://www.gcsepod.com>
- Seneca – <https://senecalearning.com/en-GB/>

Curriculum Overview

The learning in GCSE Biology is sequenced as follows.

Note: the full Curriculum Plans are available on request to info@nefuturesutc.co.uk

Revision Resources – Click on the following for links to videos

The following links are used for **independent learning** and **catch-up** tasks alongside the **revision guide** provided by us at the UTC.

Paper 1 – Y10

Half term 1

B1 Cell structure and transport

1. [Eukaryotes vs Prokaryotes](#)
2. [Size of cells](#)
3. [Order of Magnitude](#)
4. [Animal cells](#)
5. [Plant cells](#)
6. [Animal cell specialisation](#)
7. [Plant cell specialisation](#)
8. [Microscopes \(Required practical 1\)](#)
9. [Microscopy](#)
10. [Diffusion](#)
11. [Surface area to volume ratio](#)
12. [Osmosis](#)
13. [Osmosis \(required practical 3\)](#)
14. [Active transport](#)

Half term 2

B2 Cell division

15. [Bacterial division](#)
16. [Culturing microorganisms \(Required practical 2\)](#)
17. [Mitosis](#)
18. [Stem cells](#)

B3 Organisation and the digestive system

19. [Digestive system](#)
20. [Digestive enzymes](#)
21. [Effect of temperature on enzymes](#)
22. [Effect of pH on amylase \(required practical 5\)](#)
23. [Food tests \(required practical 4\)](#)
24. [Absorption in the small intestine](#)

Half term 3

B4 Organising animals and plants

- 25. [The heart and circulation](#)
- 26. [Arteries veins and capillaries](#)
- 27. [The blood](#)
- 28. [Cardiovascular disease](#)
- 29. [Gas exchange and the lungs](#)
- 30. [Plant tissues](#)
- 31. [Transpiration](#)

Half term 4

B5 Communicable diseases

- 32. [Pathogens](#)
- 33. [Measles and HIV](#)
- 34. [Salmonella and gonorrhoea](#)
- 35. [Malaria](#)
- 36. [Infectious disease in plants](#)
- 37. [Plant disease detection](#) (HT only)
- 38. [Plant defence responses](#)

B6 Preventing and treating disease

- 39. [Vaccination](#)
- 40. [Antibiotics](#)
- 41. [Testing medicines](#)
- 42. [Monoclonal antibodies](#) (HT only)
- 43. [Uses of monoclonal antibodies](#) (HT only)

Half term 5

B7 Non-communicable diseases

- 44. [Cancer](#)
- 45. [Communicable vs non-communicable](#)
- 46. [Risk factors](#)
- 47. [Lifestyle diseases](#)

B8 Photosynthesis

- 48. [Photosynthesis](#)
- 49. [Uses of glucose from photosynthesis](#)
- 50. [Photosynthesis \(required practical 6\)](#)
- 51. [Factors affecting photosynthesis](#)

B9 Respiration

- 52. [Respiration](#)
- 53. [Exercise and respiration](#)
- 54. [Metabolism](#)

Half term 6

Revision

Paper 2 – Y11

Half term 1

B10 The human nervous system

- 55. [Homeostasis](#)
- 56. [The Nervous System](#)
- 57. [Reaction Time \(required practical 7\)](#)
- 58. [The Brain](#)
- 59. [The Eye](#)
- 60. [How the eye focuses](#)
- 61. [Thermoregulation](#)

Half term 2

B11 Hormonal coordination

- 62. [The Endocrine System](#)
- 63. [Blood Glucose Regulation](#)
- 64. [Menstrual Cycle \(Interaction of hormones HT only\)](#)
- 65. [Contraception](#)
- 66. [Hormones to treat infertility](#)
- 67. [Negative Feedback](#)
- 68. [Plant hormones \(gibberlins and ethene HT only\)](#)
- 69. [Plant Responses \(Required practical 8\)](#)
- 70. [Uses of Plant Hormones](#)

B12 Homeostasis in action

- 71. [Controlling body temperature](#)
- 72. [The Kidneys](#)
- 73. [Maintaining Water Balance](#)

Half term 3

B13 Reproduction

- 74. [Sexual and Asexual reproduction](#)
- 75. [Meiosis](#)
- 76. [Advantages and disadvantages of sexual/asexual reproduction](#)
- 77. [DNA and the genome](#)
- 78. [DNA structure](#)
- 79. [Protein Synthesis](#)

- 80. [Mutations](#)
- 81. [Alleles](#)
- 82. [Cystic Fibrosis](#)
- 83. [Polydactyly](#)
- 84. [Family trees](#)
- 85. [Inheritance of Sex](#)

B14 Variation and evolution

- 86. [Variation](#)
- 87. [Evolution by Natural Selection](#)
- 88. [Selective Breeding](#)
- 89. [Genetic Engineering](#)
- 90. [Cloning Plants](#)
- 91. [Cloning Animals](#)

Half term 4

B15 Genetics and evolution

- 92. [The History of Genetics](#)
- 93. [Darwin and Natural Selection](#)
- 94. [Speciation](#)
- 95. [Fossils as evidence for evolution](#)
- 96. [Resistant Bacteria as evidence for evolution](#)
- 97. [Classification](#)

B16 Adaptation and interdependence

- 98. [Competition and Interdependence](#)
- 99. [Biotic and abiotic factors](#)
- 100. [Adaptations](#)
- 101. [Sampling Organisms](#)
- 102. [Required practical 9](#)
- 103. [Mean, median, mode](#)

B17 Organisation of an ecosystem

- 104. [Food chains and predator-prey relationships](#)
- 105. [Carbon cycle](#)
- 106. [Water cycle](#)
- 107. [Decomposition](#)
- 108. [Decay \(required practical 10\)](#)

B18 The effect of human interactions on ecosystems and biodiversity

- 109. [Environmental change](#)
- 110. [Biodiversity](#)
- 111. [Waste Management](#)
- 112. [Land Use](#)

- 113. [Climate Change](#)
- 114. [Maintaining Biodiversity](#)
- 115. [Trophic Levels](#)
- 116. [Pyramids of Biomass](#)
- 117. [Food Security](#)
- 118. [Modern Farming Methods](#)
- 119. [Sustainable Fisheries](#)
- 120. [Biotechnology](#)