

# GCSE Combined Science (Trilogy) Course Information

## Course Overview

- **Exam Board** – AQA
- **Usual Age Range** – 14 to 16
- **Qualification** – One GCSE
- **Curriculum Time** – Six 50-minute lessons per week in class plus work in Independent Learning Time
- **Assessment** – Six 1-hour-15-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/science/specifications/AQA-8464-SP-2016.PDF>

## Curriculum Intent

The **intent** of GCSE Combined Science 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:

### Biology

- Cell biology
- Organisation
- Infection and response
- Bioenergetics
- Homeostasis and response
- Inheritance, variation and evolution
- Ecology

### Chemistry

- Atomic structure and the periodic table
- Bonding, structure, and the properties of matter
- Quantitative chemistry
- Chemical changes
- Energy changes
- The rate and extent of chemical change
- Organic chemistry
- Chemical analysis
- Chemistry of the atmosphere
- Using resources

### Physics

- Energy
- Electricity
- Particle model of matter
- Atomic structure

- Forces
- Waves
- Magnetism and electromagnetism

At the UTC we specifically intend students to appreciate the relevance of science to the world of work, in particular healthcare science. Healthcare science **careers** are explicitly taught within relevant topics in the GCSE Combined Science 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 Combined Science so students have an appreciation of how science 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 science beyond GCSE, irrespective of prior attainment.

Suggested **destinations** after completion of this course include progression onto a level 3 course at the UTC such as A-level Biology , 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 science key words as each topic is taught students demonstrate their understanding of a growing scientific 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 science related titles that have been carefully selected by their science teachers that are available to borrow in our Learning Resource Centre.

The following five fundamental **numeracy** threads running through GCSE science are taught via the context of each of the 3 science disciplines (Biology, Chemistry and Physics) in collaboration with our mathematics specialists:

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

For example, in Biology lessons 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 Chemistry lessons, 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 Physics lessons 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 scientific numeracy as a significant proportion of the marks in GCSE Science 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 science 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/combined-science-trilogy-8464/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 Science is sequenced as follows.

*Note: the full Curriculum Plans are available on request to [info@nefuturesutc.co.uk](mailto:info@nefuturesutc.co.uk)*

**Revision Resources** – Click on the following for links to videos

The following website is used for **independent learning** and **catch-up** tasks alongside the **revision guide** provided by us at the UTC. Access the Free science lessons website and access the video learning as documented below.

<https://www.freesciencelessons.co.uk/videos/>

<p><b><u>Chemistry</u></b> <b><u>Paper 1 -</u></b> <b><u>Term start -September</u></b> <b>C1 Atomic structure</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">Elements, Compounds and Mixtures</a></li> <li>2. <a href="#">Interpreting a Chemical Formula</a></li> <li>3. <a href="#">Filtration and Crystallisation</a></li> <li>4. <a href="#">Simple Distillation</a></li> <li>5. <a href="#">Fractional Distillation</a></li> <li>6. <a href="#">Paper Chromatography</a></li> <li>7. <a href="#">Alpha-Scattering Experiment</a></li> <li>8. <a href="#">The Nuclear Model</a></li> <li>9. <a href="#">Atomic Number and Mass Number</a></li> <li>10. <a href="#">Relative Atomic Mass</a></li> </ol>	<p><b><u>Biology</u></b> <b><u>Paper 1 -</u></b> <b><u>Term start -September</u></b> <b>B1 Cell structure and transport</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">Eukaryotes vs Prokaryotes</a></li> <li>2. <a href="#">Size of cells</a></li> <li>3. <a href="#">Order of Magnitude</a></li> <li>4. <a href="#">Animal cells</a></li> <li>5. <a href="#">Plant cells</a></li> <li>6. <a href="#">Animal cell specialisation</a></li> <li>7. <a href="#">Plant cell specialisation</a></li> <li>8. <a href="#">Microscopes (Required practical 1)</a></li> <li>9. <a href="#">Microscopy</a></li> <li>10. <a href="#">Diffusion</a></li> <li>11. <a href="#">Surface area to volume ratio</a></li> <li>12. <a href="#">Osmosis</a></li> </ol>	<p><b><u>Physics</u></b> <b><u>Paper 1</u></b> <b><u>Term start -September</u></b> <b>P1 Conservation and dissipation of energy</b></p> <ol style="list-style-type: none"> <li>1. <a href="#">Changes in energy stores</a></li> <li>2. <a href="#">Conservation of energy</a></li> <li>3. <a href="#">Energy and work</a></li> <li>4. <a href="#">Gravitational potential energy</a></li> <li>5. <a href="#">Kinetic energy</a></li> <li>6. <a href="#">Elastic potential energy</a></li> <li>7. <a href="#">Energy dissipation</a></li> <li>8. <a href="#">Energy and efficiency</a></li> <li>9. <a href="#">Electrical appliances</a></li> <li>10. <a href="#">Energy and power</a></li> </ol> <p><b>P2 Energy transfer by heating</b></p>
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<p>11. <a href="#">Electron Energy Levels</a></p> <p><b>C2 The periodic table</b></p> <p>12. <a href="#">Electron Energy Levels</a></p> <p>13. <a href="#">Development of the Periodic Table</a></p> <p>14. <a href="#">Group 0</a></p> <p>15. <a href="#">Metals</a></p> <p>16. <a href="#">Group 1 Part 1</a></p> <p>17. <a href="#">Group 1 Part 2</a></p> <p>18. <a href="#">Group 7 Part 1</a></p> <p>19. <a href="#">Group 7 Part 2</a></p> <p>20. <a href="#">Group 7 Part 3</a></p> <p><b>C3 Structure and bonding</b></p> <p>21. <a href="#">The Three States of Matter</a></p> <p>22. <a href="#">Ionic Bonding 1</a></p> <p>23. <a href="#">Ionic Bonding 2</a></p> <p>24. <a href="#">Properties of Ionic Compounds</a></p> <p>25. <a href="#">Covalent Bonding 1</a></p> <p>26. <a href="#">Covalent Bonding 2</a></p> <p>27. <a href="#">Covalent Bonding 3</a></p> <p>28. <a href="#">Properties of Small Covalent Molecules</a></p> <p>29. <a href="#">Diamond and Silicon Dioxide</a></p> <p>30. <a href="#">Graphite</a></p> <p>31. <a href="#">Graphene and Fullerenes</a></p> <p>32. <a href="#">Bonding in Polymers</a></p> <p>33. <a href="#">Metals and Alloys</a></p> <p>34. <a href="#">Limitations of Bonding Diagrams</a></p> <p><b>C4 Chemical calculations</b></p> <p>35. <a href="#">Conservation of Mass</a></p> <p>36. <a href="#">Charges on Ions</a></p> <p>37. <a href="#">Formula of Ionic Compounds</a></p> <p>38. <a href="#">Balancing Chemical Equations</a></p> <p>39. <a href="#">Relative Formula Mass</a></p> <p>40. <a href="#">Calculating Moles of an Element</a> (HT only)</p> <p>41. <a href="#">Calculating Moles of a Compound</a> (HT only)</p>	<p>13. <a href="#">Osmosis (required practical 3)</a></p> <p>14. <a href="#">Active transport</a></p> <p><b>B2 Cell division</b></p> <p>15. <a href="#">Bacterial division</a></p> <p>16. <a href="#">Culturing microorganisms (Required practical 2)</a></p> <p>17. <a href="#">Mitosis</a></p> <p>18. <a href="#">Stem cells</a></p> <p><b>B3 Organisation and the digestive system</b></p> <p>19. <a href="#">Digestive system</a></p> <p>20. <a href="#">Digestive enzymes</a></p> <p>21. <a href="#">Effect of temperature on enzymes</a></p> <p>22. <a href="#">Effect of pH on amylase (required practical 5)</a></p> <p>23. <a href="#">Food tests (required practical 4)</a></p> <p>24. <a href="#">Absorption in the small intestine</a></p> <p><b>B4 Organising animals and plants</b></p> <p>25. <a href="#">The heart and circulation</a></p> <p>26. <a href="#">Arteries veins and capillaries</a></p> <p>27. <a href="#">The blood</a></p> <p>28. <a href="#">Cardiovascular disease</a></p> <p>29. <a href="#">Gas exchange and the lungs</a></p> <p>30. <a href="#">Plant tissues</a></p> <p>31. <a href="#">Transpiration</a></p> <p><b>B5 Communicable diseases</b></p> <p>32. <a href="#">Pathogens</a></p> <p>33. <a href="#">Measles and HIV</a></p> <p>34. <a href="#">Salmonella and gonorrhoea</a></p> <p>35. <a href="#">Malaria</a></p> <p>36. <a href="#">Infectious disease in plants</a></p> <p><b>B6 Preventing and treating disease</b></p> <p>37. <a href="#">Vaccination</a></p> <p>38. <a href="#">Antibiotics</a></p> <p>39. <a href="#">Testing medicines</a></p>	<p>11. <a href="#">Energy transfer by conduction</a></p> <p>12. <a href="#">Specific heat capacity</a></p> <p>13. <a href="#">Specific heat capacity (Required practical 1)</a></p> <p>14. <a href="#">Heating and insulating buildings</a></p> <p><b>P3 Energy resources</b></p> <p>15. <a href="#">Energy demands</a></p> <p>16. <a href="#">Renewable energy</a></p> <p>17. <a href="#">Nuclear energy</a></p> <p>18. <a href="#">Big energy issues</a></p> <p><b>P4 Electric circuits</b></p> <p>19. <a href="#">Electrical charge</a></p> <p>20. <a href="#">Current and charge</a></p> <p>21. <a href="#">Potential difference</a></p> <p>22. <a href="#">Component characteristics</a></p> <p>23. <a href="#">Series and parallel circuits</a></p> <p>24. <a href="#">Resistance (Required practical 3)</a></p> <p>25. <a href="#">I-V characteristics (Required practical 4)</a></p> <p><b>P5 Electricity in the home</b></p> <p>26. <a href="#">AC and DC supply</a></p> <p>27. <a href="#">Mains electricity</a></p> <p>28. <a href="#">Electrical power</a></p> <p>29. <a href="#">Energy transferred by appliances</a></p> <p>30. <a href="#">Appliances and efficiency</a></p> <p><b>P6 Molecules and matter</b></p> <p>31. <a href="#">Density</a></p> <p>32. <a href="#">Density (Required practical 5)</a></p> <p>33. <a href="#">Internal energy</a></p> <p>34. <a href="#">Specific Latent heat</a></p> <p>35. <a href="#">Pressure in gases</a></p> <p><b>P7 Radioactivity</b></p> <p>36. <a href="#">Atomic structure</a></p> <p>37. <a href="#">Changes in the nucleus</a></p> <p>38. <a href="#">Properties of alpha, beta, and gamma radiation</a></p> <p>39. <a href="#">Half life</a></p> <p>40. <a href="#">Nuclear issues</a></p>
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<p>42. <a href="#">Calculating Mass of a Number of Moles</a> (HT only)</p> <p>43. <a href="#">Using Moles to Balance Equations</a> (HT only)</p> <p>44. <a href="#">Avogadro's Constant 1</a> (HT only)</p> <p>45. <a href="#">Avogadro's Constant 2</a> (HT only)</p> <p>46. <a href="#">Reacting Masses 1</a> (HT only)</p> <p>47. <a href="#">Reacting Masses 2</a> (HT only)</p> <p>48. <a href="#">Limiting Reactant</a> (HT only)</p> <p>49. <a href="#">Calculating Percentage Yield 1 (Triple)</a> (HT only)</p> <p>50. <a href="#">Calculating Percentage Yield 2 (Triple)</a> (HT only)</p> <p>51. <a href="#">Atom Economy</a></p> <p>52. <a href="#">Concentration of Solutions</a></p> <p>53. <a href="#">Using Concentration of Solutions 1</a></p> <p>54. <a href="#">Using Concentration of Solutions 2</a></p> <p><b>C5 Chemical changes</b></p> <p>55. <a href="#">Reaction of Metals with Oxygen</a></p> <p>56. <a href="#">The Reactivity Series</a></p> <p>57. <a href="#">Extraction of Metals</a></p> <p>58. <a href="#">Oxidation and Reduction in terms of Electrons</a> (HT only)</p> <p>59. <a href="#">Acids and Alkalis</a></p> <p>60. <a href="#">Acids Reacting with Metals 1</a></p> <p>61. <a href="#">Acids Reacting with Metals 2</a></p> <p>62. <a href="#">Three Reactions of Acids</a></p> <p>63. <a href="#">Required Practical 1: Making Soluble Salts</a></p> <p>64. <a href="#">Strong and Weak Acids</a> (HT only)</p> <p><b>C6 Electrolysis</b></p> <p>65. <a href="#">Introducing Electrolysis</a></p> <p>66. <a href="#">Electrolysis of Aluminium Oxide</a></p> <p>67. <a href="#">Electrolysis of Aqueous Solutions 1</a></p>	<p><b>B7 Non-communicable diseases</b></p> <p>40. <a href="#">Cancer</a></p> <p>41. <a href="#">Communicable vs non-communicable</a></p> <p>42. <a href="#">Risk factors</a></p> <p>43. <a href="#">Lifestyle diseases</a></p> <p><b>B8 Photosynthesis</b></p> <p>44. <a href="#">Photosynthesis</a></p> <p>45. <a href="#">Uses of glucose from photosynthesis</a></p> <p>46. <a href="#">Photosynthesis (required practical 6)</a></p> <p>47. <a href="#">Factors affecting photosynthesis</a></p> <p><b>B9 Respiration</b></p> <p>48. <a href="#">Respiration</a></p> <p>49. <a href="#">Exercise and respiration</a></p> <p>50. <a href="#">Metabolism</a></p>	
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<p>68. <a href="#">Electrolysis of Aqueous Solutions 2</a></p> <p>69. <a href="#">Required Practical 3: Electrolysis</a></p> <p><b>C7 Energy changes</b></p> <p>70. <a href="#">Exothermic and Endothermic Reactions</a></p> <p>71. <a href="#">Bond Energy Calculations 1</a> (HT only)</p> <p>72. <a href="#">Bond Energy Calculations 2</a> (HT only)</p> <p>73. <a href="#">Required Practical 4: Temperature Changes</a></p> <p><b><a href="#">Revision and mocks – end of year 10</a></b></p>		
<p><b>Paper 2</b> <b><a href="#">Term start -January</a></b></p> <p><b>C8 Rates and equilibrium</b></p> <ol style="list-style-type: none"> <li><a href="#">Mean Rate of Reaction</a></li> <li><a href="#">Using Tangents to Determine Rate</a> (HT only)</li> <li><a href="#">Effect of Concentration on Rate</a></li> <li><a href="#">Required Practical 5: Rates of Reaction</a></li> <li><a href="#">Effect of Surface Area on Rate</a></li> <li><a href="#">Effect of Temperature on Rate</a></li> <li><a href="#">Catalysts</a></li> <li><a href="#">Reversible Reactions</a></li> <li><a href="#">Concentration and Reversible Reactions</a> (HT only)</li> <li><a href="#">Temperature and Reversible Reactions</a> (HT only)</li> <li><a href="#">Pressure and Reversible Reactions</a> (HT only)</li> </ol> <p><b>C9 Crude oil and fuels</b></p> <ol style="list-style-type: none"> <li><a href="#">Crude Oil and Hydrocarbons</a></li> <li><a href="#">Properties of Hydrocarbons</a></li> </ol>	<p><b>Paper 2</b></p> <p><b>B10 The human nervous system</b></p> <ol style="list-style-type: none"> <li><a href="#">Homeostasis</a></li> <li><a href="#">The Nervous System</a></li> <li><a href="#">Reaction Time (required practical 7)</a></li> </ol> <p><b>B11 Hormonal coordination</b></p> <ol style="list-style-type: none"> <li><a href="#">The Endocrine System</a></li> <li><a href="#">Blood Glucose Regulation</a></li> <li><a href="#">Menstrual Cycle (Interaction of hormones HT only)</a></li> <li><a href="#">Contraception</a></li> <li><a href="#">Hormones to treat infertility</a></li> <li><a href="#">Negative Feedback</a></li> </ol> <p><b>B12 Reproduction</b></p> <ol style="list-style-type: none"> <li><a href="#">Sexual and Asexual reproduction</a></li> <li><a href="#">Meiosis</a></li> <li><a href="#">DNA and the genome</a></li> <li><a href="#">Alleles</a></li> <li><a href="#">Cystic Fibrosis</a></li> <li><a href="#">Polydactyly</a></li> <li><a href="#">Family trees</a></li> <li><a href="#">Inheritance of Sex</a></li> </ol> <p><b>B13 Variation and evolution</b></p> <ol style="list-style-type: none"> <li><a href="#">Variation</a></li> </ol>	<p><b>Paper</b></p> <p><b>P8 Forces in balance</b></p> <ol style="list-style-type: none"> <li><a href="#">Vectors and scalars</a></li> <li><a href="#">Contact and non-contact forces</a></li> <li><a href="#">Resultant forces</a></li> <li><a href="#">Resolving forces HT</a></li> </ol> <p><b>P9 Motion</b></p> <ol style="list-style-type: none"> <li><a href="#">Distance-time graphs</a></li> <li><a href="#">Velocity-time graphs</a></li> <li><a href="#">Further acceleration calculations and terminal velocity</a></li> <li><a href="#">Velocity and acceleration</a></li> </ol> <p><b>P10 Forces and motion</b></p> <ol style="list-style-type: none"> <li><a href="#">Newton's first law</a></li> <li><a href="#">Newton's second law</a></li> <li><a href="#">Newton's third law</a></li> <li><a href="#">Acceleration (Required practical 7.)</a></li> <li><a href="#">Vehicle stopping distance</a></li> <li><a href="#">Forces and braking</a></li> <li><a href="#">Momentum HT</a></li> <li><a href="#">Forces and elasticity</a></li> <li><a href="#">Stretching a spring (Required practical 6.)</a></li> </ol> <p><b>P11 Wave properties</b></p>

<p>14. <a href="#">Combustion of Hydrocarbons</a></p> <p>15. <a href="#">Fractional Distillation of Crude Oil</a></p> <p>16. <a href="#">Cracking</a></p> <p>17. <a href="#">Alkenes</a></p> <p><b>C12 Chemical analysis</b></p> <p>18. <a href="#">Purity and Formulations</a></p> <p>19. <a href="#">Chromatography</a></p> <p>20. <a href="#">Required Practical 6: Chromatography</a></p> <p>21. <a href="#">Testing for Gases</a></p> <p>22. <a href="#">Flame tests</a></p> <p>23. <a href="#">Metal Hydroxide Precipitates</a></p> <p>24. <a href="#">Identifying Non-Metal Ions</a></p> <p>25. <a href="#">Required Practical 7: Identifying Ions</a></p> <p><b>C13 The Earth's atmosphere</b></p> <p>26. <a href="#">The Atmosphere</a></p> <p>27. <a href="#">Fossil Fuels</a></p> <p>28. <a href="#">The greenhouse effect</a></p> <p>29. <a href="#">Climate change</a></p> <p>30. <a href="#">Carbon footprint</a></p> <p>31. <a href="#">Pollutants from fuels</a></p> <p><b>C14 The Earth's resources</b></p> <p>32. <a href="#">Using the Earth's Resources</a></p> <p>33. <a href="#">Potable Water</a></p> <p>34. <a href="#">Required Practical 8: Water</a></p> <p>35. <a href="#">Waste Water Treatment</a></p> <p>36. <a href="#">Alternative Methods of Extracting Metals</a> (HT only)</p> <p>37. <a href="#">Life-Cycle Assessment</a></p> <p>38. <a href="#">Recycling</a></p> <p><b>C15 Using our resources</b></p> <p>39. <a href="#">Corrosion</a></p>	<p>19. <a href="#">Evolution by Natural Selection</a></p> <p>20. <a href="#">Selective Breeding</a></p> <p>21. <a href="#">Genetic Engineering</a></p> <p><b>B14 Genetics and evolution</b></p> <p>22. <a href="#">Fossils as evidence for evolution</a></p> <p>23. <a href="#">Resistant Bacteria as evidence for evolution</a></p> <p>24. <a href="#">Classification</a></p> <p><b>B15 Adaptation and interdependence</b></p> <p>25. <a href="#">Competition and Interdependence</a></p> <p>26. <a href="#">Biotic and abiotic factors</a></p> <p>27. <a href="#">Adaptations</a></p> <p>28. <a href="#">Sampling Organisms</a></p> <p>29. <a href="#">Required practical 9</a></p> <p>30. <a href="#">Mean, median, mode</a></p> <p><b>B16 Organisation of an ecosystem</b></p> <p>31. <a href="#">Food chains and predator-prey relationships</a></p> <p>32. <a href="#">Carbon cycle</a></p> <p>33. <a href="#">Water cycle</a></p> <p>34. <a href="#">Decomposition</a></p> <p>35. <a href="#">Decay (required practical 10)</a></p> <p><b>B17 The effect of human interactions on ecosystems and biodiversity</b></p> <p>36. <a href="#">Biodiversity</a></p> <p>37. <a href="#">Waste Management</a></p> <p>38. <a href="#">Land Use</a></p> <p>39. <a href="#">Climate Change</a></p> <p>40. <a href="#">Maintaining Biodiversity</a></p>	<p>18. <a href="#">Transverse and longitudinal waves</a></p> <p>19. <a href="#">Properties of waves</a></p> <p>20. <a href="#">The wave equation</a></p> <p>21. <a href="#">Waves in a ripple tank (Required practical 8 )</a></p> <p>22. <a href="#">Waves in a solid (Required practical 8 )</a></p> <p>23. <a href="#">Refraction HT</a></p> <p><b>P12 Electromagnetic waves</b></p> <p>24. <a href="#">Electromagnetic waves</a></p> <p>25. <a href="#">Uses of electromagnetic waves</a></p> <p>26. <a href="#">Infrared (Required practical 10 )</a></p> <p><b>P13 Electromagnetism</b></p> <p>27. <a href="#">Permanent and induced magnets</a></p> <p>28. <a href="#">Magnetic fields</a></p> <p>29. <a href="#">Electromagnets</a></p> <p>30. <a href="#">The motor effect HT</a></p> <p>31. <a href="#">The electric motor</a></p>
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