**A level Biology Specification topics - 7402**

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| 3.1 | Biological molecules |  |
| 3.1.1 | Monomers and polymers |  |
| 3.1.2 | Carbohydrates |  |
| 3.1.3 | Lipids |  |
| 3.1.4.1 | Proteins |  |
| 3.1.4.2 | Enzymes |  |
|  | Required Practical 1 - Enzymes |  |
| 3.1.5.1 | DNA and RNA structure |  |
| 3.1.5.2 | DNA replication |  |
| 3.1.6 | ATP |  |
| 3.1.7 | Water |  |
| 3.1.8 | Ions |  |

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| 3.2 | Cells |  |
| 3.2.1.1 | Eukaryotic cell structure |  |
| 3.2.1.2 | Prokaryotic cell structure and viruses |  |
| 3.2.1.3 | Studying cells |  |
| 3.2.2 | Cell cycle |  |
|  | Required practical 2 |  |
| 3.2.3 | Transport across membranes |  |
|  | Required practical 3 |  |
|  | Required practical 4 |  |
| 3.2.4 | Immune system |  |

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| 3.3 | Exchange with environment |  |
| 3.3.1 | Surface area to volume ration |  |
| 3.3.2 | Gas exchange |  |
| 3.3.3 | Digestion and absorption |  |
| 3.3.4.1 | Mass transport in animals |  |
|  | Required practical 5 |  |
| 3.3.4.2 | Mass transport in plants |  |

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| 3.4 | Genetic information |  |
| 3.4.1 | DNA, genes and chromosomes |  |
| 3.4.2 | DNA and protein synthesis |  |
| 3.4.3 | Genetic diversity – mutation and meiosis |  |
| 3.4.4 | Genetic diversity and adaptation - Evolution |  |
|  | Required practical 6 |  |
| 3.4.5 | Species and taxonomy |  |
| 3.4.6 | Biodiversity in a community (index) |  |
| 3.4.7 | Investigating biodiversity |  |

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| 3.5 | Energy transfers |  |
| 3.5.1 | Photosynthesis |  |
|  | Required practical 7 |  |
|  | Required practical 8 |  |
| 3.5.2 | Respiration |  |
|  | Required practical 9 |  |
| 3.5.3 | Energy and ecosystems |  |
| 3.5.4 | Nutrient cycles |  |

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| 3.6 | Response |  |
| 3.6.1.1 | Survival and response |  |
| 3.6.1.2 | Receptors |  |
| 3.6.1.3 | Control of heart rate |  |
| 3.6.2.1 | Nerve impulses |  |
| 3.6.2.2 | Synaptic transmission |  |
| 3.6.3 | Skeletal muscles |  |
| 3.6.4.1 | Homeostasis and negative feedback |  |
| 3.6.4.2 | Control of blood glucose |  |
|  | Required practical 11 |  |
| 3.6.4.3 | Control of blood water potential |  |

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| 3.7 | Genetics, populations, evolution and ecosystems |  |
| 3.7.1 | Inheritance |  |
| 3.7.2 | Population genetics |  |
| 3.7.3 | Evolution and speciation |  |
| 3.7.4 | Populations in ecosystems |  |
|  | Required practical 12 |  |

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| 3.8 | Control of gene expression |  |
| 3.8.1 | Alteration of base sequence |  |
| 3.8.2.1 | Most of a cell’s DNA is not translated |  |
| 3.8.2.2 | Regulation of transcription and translation |  |
| 3.8.2.3 | Gene expression and cancer |  |
| 3.8.3 | Using genome projects |  |
| 3.8.4.1 | Recombinant gene technology |  |
| 3.8.4.2 | Identification and diagnosis of heritable conditions |  |
| 3.8.4.3 | Genetic fingerprinting |  |

Year 12

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| Half term | Teacher 1 (HW / JBo) | Teacher 2 (EH / AH) |
| 1 | 3.1.6 ATP  3.1.7 Water  3.1.8 Ions  3.1.4.1 Proteins  Class practical – chromatography with amino acids | 3.1.1 Monomers and polymers  3.1.2 Carbohydrates  Class practical – qualitative food tests  Class practical – reducing sugar calibration curve  3.1.3 Lipids  MS 1.9 Statistical tests |
| Assessments: | 3.1.6 - 8 EOT test | 3.1.1 – 3.1.3 EOT test  MS1.9 Statistical tests |
| 2 | 3.1.4.2 Enzymes  Required Practical 1 – Enzymes  3.2.3 Transport across membranes | 3.1.5.1 DNA and RNA structure  3.1.5.2 DNA replication  3.2.1.1 Eukaryotic cell structure  3.2.1.2 Prokaryotic cell structure & viruses |
| Assessments: | 3.1.4 EOT test | 3.1.5 – 3.1.6 EOT test  3.2.1 EOT test |
| 3 | Required practical 3 – Osmosis  3.2.4 Immune system | 3.2.1.3 Studying cells  3.2.2 Cell cycle  Required practical 2 – Mitosis |
| Assessments: | 3.2.3 EOT test  3.2.4 EOT test  January mock | 3.2.2 EOT test |
| 4 | Required practical 4 – Permeability  3.3.3 Digestion and absorption | 3.3.1 Surface area to volume ratio  3.3.2 Gas exchange |
| Assessments: | 3.3.3 EOT test | 3.3.1 – 3.3.2 EOT test |
| 5 | 3.3.4.2 Mass transport in plants | 3.3.4.1 Mass transport in animals |
| Assessments: | 3.3.4.2 EOT test | 3.3.4.1 EOT test |
| 6 | 3.4.3 Genetic diversity  3.4.5 Species and taxonomy  3.4.6 Biodiversity  3.4.7 Investigating biodiversity  Required practical 6 | 3.4.1 DNA, genes and chromosomes  3.4.2 DNA and proteins synthesis  3.4.4 Genetic diversity and adaptation - evolution |
| Assessments: | 3.4.5 – 7 EOT test  Y12 EOY mock | 3.4.1 – 2 EOT test  3.4.3 EOT test |
| Field trip – Required practical 12 Sampling techniques taught   * Required practical 10 | | |

Year 13

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| Half term | Teacher 1 (HW / JBo) | Teacher 2 (EH) |
| 1 | 3.5.2 Respiration  Required practical 9 | 3.5.1 Photosynthesis  Required practical 7  Required practical 8  Essay skills - membranes |
| Assessments: | 3.5.2 EOT test | 3.5.1 EOT test |
| 2 | 3.5.4 Nutrient cycles  Essay skills – cycles  3.6.4 Homeostasis  Required practical 11 | 3.7.4 Populations in ecosystems (Ind)  3.5.3 Energy and ecosystems  Class practical - calorimetry |
| Assessments: | 3.5.4 EOT test  3.6.4 EOT test  January mock | 3.5.3 EOT test  3.7.4 EOT test |
| 3 | 3.7.1 Inheritance  3.7.2 Population genetics | 3.6.1 Survival and response  3.6.2 Nervous system |
| Assessments: | 3.7.1 Inheritance | 3.6 EOT test |
| 4 | 3.8.1 Alteration of base sequence  3.8.2 Control of gene expression  3.8.3 Genome projects  3.8.4 Gene technology | 3.6.3 Muscles  3.7.3 Evolution and speciation  Essay skills |
| Assessments: | 3.8.1 – 2 EOT test  3.8.3 – 4 EOT test  Gene technology application test | 3.6.3 EOT test  3.7.3 EOT test  Essay mock |
| 5 | Buffer  Review and practise | Buffer  Review and practise |