Buckswood School

IB Diploma Programme

|  |  |
| --- | --- |
| Subject | IB BIOLOGY |
| HL / SL | SL/HL |
| Text book | IB BIOLOGY OXFORD PRESS |
| Lesson per week | 3 hours SL 5 Hours HL |
| Teacher | MRS BRAMLEY |
| Students | TBC |

**Christmas Term**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Topics covered** | **TOK Question** | **Connections** | **Prescribed Practicals** |
| 1  (11 Sept) | 6.2 The blood system. **HL: 11.1 antibody production and vaccination** | • Theories are regarded as uncertain—William Harvey overturned theories developed by the ancient Greek philosopher Galen on movement of blood in the body. | Biology  Topic 2.2 Water  Topic 2.3 Carbohydrates and lipids  Topic 6.4 Gas exchange  Topic 6.6 Hormones, homeostasis and reproduction | Use of a light microscope to investigate the structure of cells and tissues, with drawing of cells. Calculation of the magnification of drawings and the actual size of structures and ultrastructures shown in drawings or micrographs.  (Practical 1) |
| 2  (18 Sept) | 6.3 Defence against infectious disease. **HL: 11.1 movement** | Risks associated with scientific research—Florey and Chain’s tests on the safety of penicillin would not be compliant with current protocol on testing.  • Consider ethical implications of research—Jenner tested his vaccine for smallpox on a child. | Biology  Topic 5.2 Natural selection  Chemistry  Topic D2 Aspirin and penicillin |  |
| 3  (25 Sep) | 6.4 Gas exchange  **8.3 HL Respiration** | Obtain evidence for theories—epidemiological studies have contributed to our understanding of the causes of lung cancer | Biology  Topic 1.4 Membrane transport  Topic 1.6 Cell division  Topic 6.2 The blood system  Physics  Topic 3.2 Modelling a gas | Estimation of osmolarity in tissues by bathing samples in hypotonic and hypertonic solutions.  (Practical 2) |
| 4  (02 Oct) | 6.5 Neurons and synapses |  | Biology  Topic 1.4 Membrane transport  Chemistry  Topic C6 Electrochemistry, rechargeable batteries and fuel cells  Psychology  Core: Biological level of analysis |  |
| 5  (09 Oct) | 6.6 Hormones. **HL: 11.3 the kidney** |  | Topic 3.2 Chromosomes  Topic 3.3 Meiosis  Topic 10.1 Meiosis  Psychology  Core: Biological level of analysis | Experimental investigation of a factor affecting enzyme activity.  (Practical 3) |
| 6  (16 Oct) | **Assessment week:** Revision | | | |
| 7  (23 Oct) | **Half term** | | | |
| 8  (30 Oct) | 6.6 Homeostasis | What are the ethical implications of using insulin from animals? | Geography (topic 3)  Biology (topic 4) |  |
| 9  (06 Nov) | 6.6 Reproduction. **HL: 11.1 osmo regulation** | Discuss the arguments for and against IVF and abortions. | Biology (topic 4)  Chemistry (topic 11) |  |
| 10  (20 Nov) | Internal assessment/individual investigations. **HL: 8.3 photosynthesis** | The lollipop experiment used to work out the biochemical details of the  Calvin cycle shows considerable creativity. To what extent is the creation of  an elegant protocol similar to the creation of a work of art? | Biology  Topic 2.9 Photosynthesis  Topic 4.2 Energy flow  Topic 4.3 Carbon cycling  Chemistry  Topic 9.1 Oxidation and reduction |  |
| 11  (20 Nov) | Internal assessment/individual investigations. **HL: 9.1 transport in the xylem** |  | Biology  Topic 2.2 Water  Topics 2.9 and 8.3 Photosynthesis |  |
| 12  (27 Nov) | Internal assessment/individual investigations. **HL: 9.2 transport in the phloem** | Plants communicate chemically both internally and externally. To what extent  can plants be said to have language? |  |  |
| 13  (04 Dec) | Internal assessment/individual investigations. **HL: 9.3 growth in plants** | To what degree can looking at component parts give us knowledge of the whole? • The lollipop experiment used to work out the biochemical details of the Calvin cycle shows considerable creativity. To what extent is the creation of an elegant protocol similar to the creation of a work of art? |  | Separation of photosynthetic pigments by chromatograph.  (Practical 4) |
| 14  (11 Dec) | **Assessment Week**.  **HL: 9.4 higher level reproduction in plants** | | | |

**Spring Term**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Topics covered** | **TOK Question** | **Connections** | **Prescribed Practicals** |
| 1  (08 Jan) | Option D: Human physiology  D1: Human nutrition | There are positive effects of exposure to sun such as the production of Vitamin D as well as health risks associated with exposure to UV rays. How can conflicting knowledge claims be balanced? | Biology  Topic 6.1 Digestion and absorption  Geography  Part 2F The geography of food and health  Chemistry  Topic B5 Vitamins |  |
| 2  (15 Jan) | D2: Digestion | Excessive alcohol consumption may cause liver cirrhosis. Are attitudes to drugs and alcohol an example of something that is relative to culture? Is all knowledge dependent on culture? | Chemistry  Topic D4 pH regulation of stomach |  |
| 3  (22 Jan) | D3: Functions of the liver  **D5 HL ONLY** | There is a link between sickle cell anaemia and prevalence of malaria. How can we know whether there is a causal link in such cases or simply a correlation? | Geography (topic 3)  Biology (topic 5 and option C) |  |
| 4  (29 Jan) | D4: The heart  **D5 HL ONLY** | Symbols are used as a form of non-verbal communication. Why is the heart used as a symbol for love? What is the importance of symbols in different areas of knowledge? | Geography (topic 3);  Biology (option C) |  |
| 5  (05 Feb) | **Assessment Week:** final draft of I.A.s to be handed in | | | |
| 6  (12 Feb) | **Half Term** | | | |
| 7  (19 Feb) | Revision topic 1  **D6 HL ONLY** | Mendel’s theories were not accepted by the scientific community for a long time. What factors would encourage the acceptance of new ideas by the scientific community? • The law of independent assortment was soon found to have exceptions when looking at linked genes. What is the difference between a law and a theory in science? • The use of DNA for securing convictions in legal cases is well established, yet even universally accepted theories are overturned in the light of new evidence in science. What criteria are necessary for assessing the reliability of evidence? | Biology  Topic 6.4 Gas exchange  Physics  Topic 3.2 Modelling a gas |  |
| 8  (26 Feb) | Revision topic 2  **PLUS D6 HL ONLY** | The precautionary principle is meant to guide decision-making in conditions where a lack of certainty exists. Is certainty ever possible in the natural sciences? | Geography (topic 3; options  A, B and F); |  |
| 9  (05 Mar) | Revision topic 3 | The law of independent assortment was soon found to have exceptions  when looking at linked genes. What is the difference between a law and a  theory in science? | Geography (option B) |  |
| 10  (12 Mar) | Revision topic 4 |  | Chemistry  (topic 9; options  B and D |  |
| 11  (19 Mar) | **Assessment Week** | | | |

**Summer Term**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Week** | **Topics covered** | **TOK Question** | **Connections** | **Prescribed Practicals** |
| 1  (16 April) | Revision topic 5 | The soil system may be represented by a soil profile—since a model is, strictly speaking, not real, how can it lead to knowledge? | Geography (topic 3) |  |
| 2  (23 Apr) | Revision topic 6 | The theory of evolution by natural selection tells us that change in populations is achieved through the process of natural selection—is there a difference between a convincing theory and a correct one? | Biology  (options B and C)  Chemistry  (options B and C  Geography  (option F); |  |
| 3  (30 Apr) | COURSE FINISHED | IB EXAMS BEGIN |  | Setting up sealed mesocosms to try to establish sustainability.  (Practical 5) |
| 4  (07 May) |  |  |  |  |
| 5  (14 May) |  |  |  |  |
| 6  (21 May) | **Assessment week** | | | |
| 7  (28 May) | **Half term** | | | |
| 8  (04 Jun) |  |  |  |  |
| 9  (11 Jun) |  |  |  |  |
| 10  (18 Jun) | Revision | | | |
| 11  (25 Jun) | School Exam week | | | |