BIOLOGY

FOUNDATION SCIENCE

Content

- The seven life processes - MRS GREN
- The parts and functions of cells - organelles
- Microscope work on cells
- Cells - tissues - organs - organ systems - organisms
- Graph skills
- Circulatory system
- Heart, blood vessels, blood
- Respiratory system
- Lung structure and function
- Ventilation, gas exchange
- Aerobic/anaerobic respiration
- Components of a balanced diet
- Deficiency diseases
- Digestive system
- Physical and chemical digestion
- Absorption

Resources & ICT

- Core paper practice questions
- Work sheets
- Models
- Microscope slides on cells, tissues and organs
- Digital microscope
- memrise.com

Types of assessment

- Quizzes
- Question and answer in class
- Practicals and write ups
- Topic test

Students to Know

- The seven life processes
- The parts and functions of cells
- Labels and functions of heart, blood vessels, blood and lungs
- The processes of gas exchange and cellular respiration
- Diet - the constituents of a balanced diet
- Digestion - labels and functions of the digestive system

Students to Understand

- How structure is related to function in specialised cells
- The importance of diffusion and osmosis in animals and plants
- How the three systems are linked
- How the energy from respiration is used in animals and plants
- Why a balanced diet is important
- How enzymes are affected by temperature and pH changes

Students to be able to Do

- Relate the structure to the function of parts of the three systems
- Carry out food tests and relate these to diet
- Dissect a heart
- Conduct experiments and construct graphs based on osmosis
- Identify variables to change, measure and keep constant
- Work with a microscope, make their own slides

Cross curricular links

- Mathematics; percentages, bar charts versus line graphs
- PSHE; health, heart and lung disease
- PSHE; balanced diet
- Sports; fitness

Differentiation incl. EAL

- Put students into groups based on relative strengths and weaknesses
- Set work to cover basics depending on prior knowledge
- Extension work

Learning styles activities

- Question and answer
- Practicals
- Application of knowledge to unfamiliar questions

Fighting impalas

Muhammad Mahdi Karim / GFDL 1.2

Global citizenship, internationalism, local environment

- Discuss the adaptations of plants found in Switzerland's (temperate climate), lakes (aquatic adaptations), and mountains (low water adaptations)
- Statistics of heart, lung and digestive system diseases from around the world

BRILLANTMONT International School

www.brillantmont.ch

Throughout the year - 33% of allocated time

CHEMISTRY

FOUNDATION SCIENCE

Content

- Solid, liquid and gaseous states
- Diffusion and Brownian motion
- Experimental techniques
- Separation techniques
- Balancing equations
- Atomic structure
- Periodic table
- Periodicity
- Ionic bonding
- Covalent bonding
- Metallic bonding
- Bonding and structure

Resources & ICT

- Textbook
- Keynote presentation
- Online resources available from BM website
- Internet research

Types of assessment

- Quality of practical work
- Exercises from textbook
- Multiple choice questions and structured questions
- Peer assessment
- Judgements on effort and attitude towards learning

Students to Know

- Matter can be under solid, liquid or gaseous states
- Atoms are bonded together through ionic, covalent or metallic bonding in order to form molecules and compounds
- Elements are found in the Periodic Table which helps chemists to determine the structure of the atom and hence its reactivity, type of bonding or charge of its ion(s)

Students to Understand

- The kinetic theory explains the conversion from one state to another
- Different separation techniques used depending on the mixture
- The numbers indicated in the periodic table relate to the number of protons, neutrons and electrons in the atom
- The type of bonding depends on the number of electrons on the outer shell

Students to be able to Do

- Recall and explain scientific concepts connected to the states of matter, the periodic table and the different types of bonding

Cross curricular links

- Biology; chromatography
- Geography; salt evaporation ponds
- Economy; economical importance of selected chemicals: salt, platinum
- Physics; the kinetic theory of matter

Differentiation incl. EAL

- Extension tasks for students who previously studied material or have a good grasp of it
- Group work considerations; mixed ability

Learning styles activities

- Lectures
- Individual and group exercises
- Quizzes
- Tests
- Presentation production
- Poster production

Coloured fireworks, Kurume, Japan

Global citizenship, internationalism, local environment

- Connections with commonly used elements: chlorine, neon, tungsten...
- Desalination facilities in the United Arab Emirates
- Images in the presentation connect to international or to local culture (salt evaporation ponds in France, Swiss coins)
- Acceptance of new scientific theories, as exemplified by Mendeleev's proposal of a Periodic Table

BRILLANTMONT International School

www.brillantmont.ch

Throughout the year - 33% of allocated time

PHYSICS

FOUNDATION SCIENCE

Content

- Types of energy
- Forms of potential energy
- Energy transfer
- Conservation of energy
- Kinetic energy calculations
- Gravitational potential energy calculations
- Efficiency
- Renewable energy resources
- Non-renewable energy resources
- Production of electricity
- Conductors and insulators
- Conduction, convection and radiation
- Absorbers and emitters
- Practical applications

Resources & ICT

- Textbooks
- Worksheets
- PowerPoint presentations
- Past exam papers
- Lego energy models
- YouTube clips
- Internet research
- Online resources from the BM website

Types of assessment

- Quizzes
- Exercises from textbooks
- End of unit topic tests
- Presentations
- Posters

Students to Know

- The law of conservation of energy
- The formulae for kinetic energy and gravitational potential energy
- The meaning of renewable and non-renewable energy resources
- The meaning of conduction, convection and radiation

Students to Understand

- How objects gain gravitational potential energy
- How energy is conserved in energy transformations
- How electricity is generated in power stations in terms of energy transfers
- How the sun's energy and energy stored in water can be harnessed

Students to be able to Do

- Identify different forms of energy
- Calculate the kinetic energy and/or gravitational potential energy of an object
- Calculate the efficiency of an energy transfer
- Describe the advantages and disadvantages of different energy sources and their impact on the environment
- Identify and explain everyday applications of conduction, convection and radiation

Cross curricular links

- Mathematics; basic algebra, percentages
- Geography; energy resources, onshore and offshore breezes, trade winds
- Chemistry; organic chemistry, greenhouse gases, carbon cycle
- Biology; carbon cycle

Differentiation incl. EAL

- Extension work for gifted students
- Mixed ability practical groups
- Group work, individual and with teacher support

Learning styles activities

- Lectures
- YouTube clips
- Quizzes and tests
- Individual exercises
- Group discussions
- Posters
- Presentations

The Nesjavellir geothermal power plant in Þingvellir, Iceland

Gretar Ívarsson / Public domain

Global citizenship, internationalism, local environment

- Global impact of a nuclear power disaster
- Different countries' uses of energy resources and their environmental impact
- Images in the presentations depict local or international environments
- Connection with energy transformations encountered daily

BRILLANTMONT International School

www.brillantmont.ch

Throughout the year - 33% of allocated time