



CARSON GRAHAM SECONDARY SCHOOL



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COURSE OUTLINE Science 10 Year 5- 2012-2013

Taught by: Mr. Blay, Mr. Bond, Mr. Chong, Ms. Johnston, Ms. Nelson, Ms Thornhill, Ms. Willis, Ms. Wood

Course Description:

Science 10 begins with a review of the Processes and Skills of Science by demonstrating competence and comprehension of experimentation and the scientific method. The Biology component focuses on Sustainability of Ecosystems with students assessing the significance of natural phenomena and human factors within ecosystems and their connection to environments. The Chemistry unit continues the Grade 9 study of chemical reactions with emphasis on factors affecting reaction rate. Radioactivity is explained using atomic theory. The Health and social implications on radioactivity will be investigated in this unit. The Physics unit examines the factors that affect motion and demonstrates the relationship between velocity, time and acceleration and how human ingenuity has condensed the global community. The Earth Science unit re-examines thermal energy and its affect on natural systems, as well as a comprehensive examination of plate tectonics, and the effect of these scientific process on the local and global community. Through the relationships investigated between the curriculum and the IB areas of interaction, students will develop and understanding of the 'real world' implications of science. This course continues to develop the student's investigative and inquiry skills through student centered hands-on activities and cooperative learning activities.

Course Aims and Objectives:

As an integral part of the International Baccalaureate Middle Years Program, the Aims and Objectives of the study of Science are to:

- Develop inquiring minds and curiosity about science and the natural world
- Acquire knowledge, conceptual understanding and skills to solve problems and make informed decisions in scientific and other contexts
- Develop skills of scientific inquiry to design and carry out scientific investigations and evaluate scientific evidence to draw conclusions
- Communicate scientific ideas, arguments and practical experiences accurately in a variety of ways
- Think analytically, critically and creatively to solve problems, judge arguments and make decisions in scientific and other contexts
- Appreciate the benefits and limitations of science and its application in technological developments
- Understand the international nature of science and the interdependence of science, technology and society, including the benefits, limitations and implications imposed by social, economic, political, environmental, cultural and ethical factors
- Demonstrate attitudes and develop values of honesty and respect for themselves, others, and their shared environment.

At the end of the course the student should be able to:

- Explain the interaction of abiotic and biotic factors within an ecosystem
- Assess potential impacts of bioaccumulation explaining change in natural populations
- Differentiate between atoms, ions and molecules
- Identify and clarify acids, bases and salts
- Distinguish organic and inorganic compounds
- Analyze chemical reactions
- Explain radioactivity
- Study the relationship between velocity, time and acceleration
- Explain the characteristics of thermal energy in the atmosphere
- Analyze the processes and theories associated with plate tectonics

Classroom resources:

- BC Science 10 McGraw-Hill Ryerson (2008 edition) supplied by school

Course Content (Methodology):

BIOLOGY UNIT-Biomes and Energy Flow

Unit Question: How do changing environments affect the components and their interactions with the larger system?

Area of interaction: Environments

Learner Profile: Caring

Objectives:

- Describe and discuss ways in which science is applied to solve local and global problems
- Show respect for living and non-living things
- Discuss and evaluate scientific information from a variety of sources

Content:

- Interaction of abiotic and biotic factors within an ecosystem, Energy flow in ecosystems.

BIOLOGY UNIT-Bioaccumulation

Unit Question: What is our impact on the environment?

Area of interaction: Health and Social

Learner Profile: Caring

Objectives:

- Show respect for living and non-living things
- Describe and discuss ways in which science is applied and used to solve local and global problems.
- Analyze and interpret data by identifying trends, patterns and relationships

Content:

- Potential impacts of Bioaccumulation in ecosystems.

BIOLOGY UNIT-Ecosystems and Sustainability

Unit Question: What are the consequences of systems functioning in and out of control?

Area of interaction: Environments

Learner Profile: Caring

Objectives:

- Describe and discuss ways in which science is applied to solve local and global problems
- Recognize and recall scientific information

Content:

- Students will explain various ways in which natural populations are altered or kept in equilibrium.

CHEMISTRY UNIT-Atomic Theory

Unit Question: Is seeing believing?

Area of interaction: Health and Social Education

Learner Profile: Knowledgeable

Objectives:

- Formulate a hypothesis and explain it using scientific reasoning
- Collect data and record it in the appropriate units

Content:

- Differentiate between atoms, ions, and molecules using knowledge about their structure and components.
- Distinguish between organic and inorganic compounds
- Classify substances as acids, bases, or salts.

CHEMISTRY UNIT- Classification of Compounds

Unit Question: Why is organization important?

Area of interaction: Human Ingenuity

Learner Profile: Knowledgeable

Objectives:

- Formulate a hypothesis and explain it using scientific reasoning
- Collect data and record it in the appropriate units
- Work effectively as members of a team while ensuring a safe work environment

Content:

- Classify substances as acids, bases, or salts based on their characteristics, name, and formulas.

CHEMISTRY UNIT- Chemical Reactions

Unit Question: Do two parts make a whole?

Area of interaction: Health and Social

Learner Profile: Knowledgeable

Objectives:

- Formulate a hypothesis and explain it using scientific reasoning
- Collect data and record it in the appropriate units
- Work effectively as members of a team while ensuring a safe work environment

Content:

- Analyze chemical reactions, including reference to conservation of mass and rate of reaction.

RADIOACTIVITY UNIT-Nuclear Energy in our World

Unit Question: Is nuclear power a panacea?

Area of interaction: Health and Social Education

Learner Profile: Knowledgeable

Objectives:

- Describe and evaluate the benefits and limitations of science and scientific applications as well as their effect on life and society
- Research a question to be tested by scientific investigation

Content:

- Radioactivity and its relationship to the modern atomic theory.

PHYSICS UNIT-Average Velocity

Unit Question: Are we there yet?

Area of interaction: Human Ingenuity

Learner Profile: Thinkers

Objectives:

- Collect and record data using appropriate units of measurement
- Design scientific investigations
- Process and communicate scientific information

Content:

- **Relationship of displacement and time interval to velocity for objects in uniform motion.**

PHYSICS UNIT-Acceleration

Unit Question: How fast will it take us to get there?

Area of interaction: Human Ingenuity

Learner Profile: Thinkers

Objectives:

- Collect and record data using appropriate units of measurement
- Design scientific investigations
- Process and communicate scientific information

Content:

- **Relationship between, velocity, time interval and acceleration.**

EARTH SCIENCES UNIT- Kinetic Molecular Theory and Thermal Energy

Unit Question: Can you break the law?

Area of interaction: Community and Service

Learner Profile: Balanced

Objectives:

- Analyze scientific information by identifying components, relationships and patterns, in experimental data and ideas.
- Present data in a variety of ways using appropriate communication modes
- Discuss and describe how science applications interact with social, political, environmental, cultural and ethical factors.

Content:

- Characteristics and sources of thermal energy.

EARTH SCIENCES UNIT-Plate Tectonics

Unit Question: Can we take the pressure?

Area of interaction: Health and Social

Learner Profile: Balanced

Objectives:

- Analyze scientific information by identifying components, relationships and patterns, in experimental data and ideas.
- Present data in a variety of ways using appropriate communication modes
- Discuss and describe how science applications interact with social, political, environmental, cultural and ethical factors.

Content:

- Students will describe the processes associated with energy transfer within the Earth's geosphere and atmosphere, and examine the processes and features associated with plate tectonics.

Assessment:

1. Some assignments will be assessed according to the following criteria from the IB-MYP rubrics for Science:
 - Criterion A – One World
 - Criterion B – Communication in Science
 - Criterion C – Knowledge and Understanding of Science
 - Criterion D – Scientific Inquiry
 - Criterion E – Processing Data
 - Criterion F – Attitudes in Science
2. Assessment is the systematic gathering of information about what students know, are able to do, and are working toward. Assessment strategies may include:
 - Teacher demonstrations
 - Student labs and lab reports
 - Oral and group presentations
 - Tests and quizzes
 - Written assignments and projects
 - Other class work and activities
3. Term Marks distribution and grading
 - Labs, Quizzes, and Projects 40%
 - Unit/Chapter Tests 50 %
 - Assignments 10%
4. Term and Final Letter Grades:
Each Term is worth 1/3 of 80% towards the final grade. The remaining 20% of the final grade is the June Provincial Exam.
5. Final Marks distribution and grading:
Term Marks 80%
Final Exam 20%

Student Signature: _____

Parent Signature: _____