

COURSE OUTLINE – MYP YEAR 5 SCIENCES



Course Overview & Expectations:

Science 10 introduces main topics from Biology, Chemistry, Physics and Earth Science. This will form the basis for further studies in future grades and provide students with knowledge to find areas of interest. This course has four main units of study: DNA, Genetics and Natural Selection; Chemical Reactions and Radioactivity; Law of Conservation of Energy; The Universe.

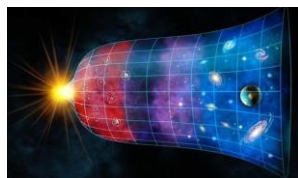
Students will get the opportunity to develop scientific knowledge, skills, and attitudes that will be relevant in their everyday life. We will investigate scientific questions while building on students' curiosity about the world. Students will also work to develop as communicating, caring, inquiring, risk taking, knowledgeable, reflective, open-minded, principled, balanced, and thinking individual.

Learning:

Through engaging with this course, students should UNDERSTAND...

Space Exploration

The formation of the universe can be explained by the big bang theory.



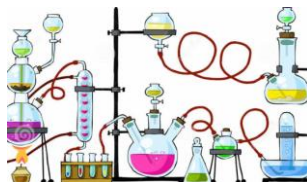
Physical Science: Physics

Energy is conserved and its transformation can affect living things and the environment



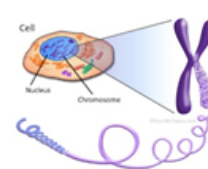
Physical Science: Chemistry

Chemical processes require energy change as atoms are rearranged



Life Science

Genes are the foundation for the diversity of living things



Through engaging with this course, students will KNOW...

Statement of Inquiry	Concepts	Unit Title/Topic
At various turning points in human history, evidence has been used to create models of change.	Change	The Big Bang
Changes in energy provide opportunities that have risks, benefits, and consequences.	Change	Radioactivity and Nuclear Energy
Human interactions, through the use of energy, affect environmental sustainability.	Global Interaction	Sustainability - Interdisciplinary
There are global climate consequences to energy transformation.	Change	Energy
Scientific Innovation leads to the creation of models to help us understand that balance exist when chemical species undergo transformations.	Change	Chemical Models
Our relationships with chemical species and natural resources have consequences.	Relationships	Effects of pH on the Environment

Natural conservation laws balance chemical changes.	Change	Chemical Reactions
When environments change species adaptations drive evolution.	Change	Evolution and Selections
Patterns of inheritance are observed to design genetic models that explain individual traits.	Systems	Mendellian Genetics
Our relationships with genetically modified organisms have consequences requiring ethical judgements.	Relationships	Ethics and Applications in Genetics

Through engaging with this course, students will DO...

CURRICULAR COMPETENCIES CATEGORIES	EXAMPLES
Questioning and Predicting	Question and predict how characteristics are genetically inherited.
Planning and Conducting	Design a controlled experiment to study how the rate of a chemical reaction can be affected.
Processing and Analyzing Data and Information	Use the data from a pedigree to explain the inheritance pattern of a genetic trait.
Evaluating	Discuss and evaluate how to reduce sources of error in a lab when measuring mass change in a reaction.
Applying and Innovating	Discuss how new technologies are being developed and used to create cleaner sources of energy.
Communicating	Create a presentation to best communicate knowledge of a scientific model.

Through this course, students will develop the following Approaches to Learning skills...

Below are some examples of how we develop ATL skills in Science:

Category Skill indicator	Category Skill indicator
Thinking skills	Interpret data gained from scientific investigations
Social skills	Practice giving feedback on the design of experimental methods
Communication skills	Use appropriate visual representations of data based on purpose and audience skills
Self-management skills	Structure information appropriately in laboratory investigation reports
Research skills	Make connections between scientific research and related moral, ethical, social, economic, political, cultural or environmental factors

Assessment:

Throughout this course, students will demonstrate their learning...

The MYP Science course will focus on developing skills related to 4 criteria based objectives.	Formative assessment is assessment as learning, or assessment for learning. Formative assessments could include;	Summative assessment is assessment of learning. Summative assessments could include;
A: Knowing and understanding	Quizzes, worksheets	Tests, Projects
B: Inquiring and designing	Lab activities, worksheets	Lab Reports
C: Processing and evaluating	Lab activities, worksheets	Lab Reports
D: Reflecting on the impacts of science	Journal reflections, group activities	Research papers, Presentations, Projects

Assessment Rubrics:

Criterion A: Knowing and understanding

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: • state scientific knowledge • apply scientific knowledge and understanding to suggest solutions to problems set in familiar situations • interpret information to make judgments.
3-4	Developing	• outline scientific knowledge • apply scientific knowledge and understanding to solve problems set in familiar situations • interpret information to make scientifically supported judgments.
5-6	Proficient	• describe scientific knowledge • apply scientific knowledge and understanding to solve problems set in familiar situations and suggest solutions to problems set in unfamiliar situations • analyse information to make scientifically supported judgments.
7-8	Extending	• explain scientific knowledge • apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations • analyse and evaluate information to make scientifically supported judgments.

Criterion B: Inquiring and designing

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: - state a problem or question to be tested by a scientific investigation - outline a testable hypothesis - outline the variables - design a method, with limited success.
3-4	Developing	- outline a problem or question to be tested by a scientific investigation - formulate a testable hypothesis using scientific reasoning - outline how to manipulate the variables, and outline how relevant data will be collected - design a safe method in which he or she selects materials and equipment.
5-6	Proficient	- describe a problem or question to be tested by a scientific investigation - formulate and explain a testable hypothesis using scientific reasoning - describe how to manipulate the variables, & describe how sufficient, relevant data will be collected - design a complete and safe method in which he or she selects appropriate materials and equipment.
7-8	Extending	- explain a problem or question to be tested by a scientific investigation - formulate and explain a testable hypothesis using correct scientific reasoning - explain how to manipulate the variables, and explain how sufficient, relevant data will be collected - design a logical, complete and safe method in which he or she selects appropriate materials and equipment.

Criterion C: Processing and evaluating

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: - collect and present data in numerical and/or visual forms - interpret data - state the validity of a hypothesis based on the outcome of a scientific investigation - state the validity of the method based on the outcome of a scientific investigation - state improvements or extensions to the method.
3-4	Developing	- correctly collect and present data in numerical and/or visual forms - accurately interpret data and explain results - outline the validity of a hypothesis based on the outcome of a scientific investigation - outline the validity of the method based on the outcome of a scientific investigation - outline improvements or extensions to the method that would benefit the scientific investigation.
5-6	Proficient	- correctly collect, organize and present data in numerical and/or visual forms - accurately interpret data and explain results using scientific reasoning - discuss the validity of a hypothesis based on the outcome of a scientific investigation - discuss the validity of the method based on the outcome of a scientific investigation - describe improvements or extensions to the method that would benefit the scientific investigation.
7-8	Extending	- correctly collect, organize, transform and present data in numerical and/or visual forms - accurately interpret data and explain results using correct scientific reasoning - evaluate the validity of a hypothesis based on the outcome of a scientific investigation - evaluate the validity of the method based on the outcome of a scientific investigation - explain improvements or extensions to the method that would benefit the scientific investigation.

Criterion D: Reflecting on the impacts of science

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: • outline the ways in which science is used to address a specific problem or issue • outline the implications of using science to solve a specific problem or issue, interacting with a factor • apply scientific language to communicate understanding but does so with limited success • document sources, with limited success.
3-4	Developing	The student is able to: • summarize the ways in which science is applied and used to address a specific problem or issue • describe the implications of using science and its application to solve a specific problem or issue, interacting with a factor • sometimes apply scientific language to communicate understanding • sometimes document sources correctly.
5-6	Proficient	The student is able to: • describe the ways in which science is applied and used to address a specific problem or issue • discuss the implications of using science and its application to solve a specific problem or issue, interacting with a factor • usually apply scientific language to communicate understanding clearly and precisely • usually document sources correctly.
7-8	Extending	The student is able to: • explain the ways in which science is applied and used to address a specific problem or issue • discuss and evaluate the implications of using science and its application to solve a specific problem or issue, interacting with a factor • consistently apply scientific language to communicate understanding clearly and precisely • document sources completely.

Academic Honesty and Personal Integrity

The faculty at Carson Graham expects our students to complete academic and nonacademic work that is authentic and respectful of intellectual property. All students are expected to adhere to the school's Policy for Academic Integrity. Ignorance of the standards related to academic honesty and student integrity is not an excuse for dishonesty, plagiarism and malpractice. You are expected to familiarize yourself with the policy.

<https://www.sd44.ca/school/carson/About/schoolpolicies/Documents/Carson%20Graham%20Academic%20Honesty%20Policy%20reviewed%20December%202018.pdf>