

COURSE OUTLINE – MYP YEAR 4 SCIENCES



Course Overview & Expectations:

In the words of Rosalind Franklin, “Science and everyday life cannot and should not be separated.” This course deepens students’ understanding of the natural and technological world. Students continue to develop a “scientific way of thinking” as well as growing a broad knowledge of the underpinnings of modern science.

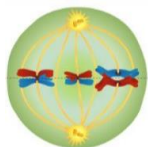
This year students will get the opportunity to further develop scientific knowledge, skills, and attitudes that will be relevant in their everyday life. We will investigate scientific questions while building on students’ curiosity about the world. Students will also work to develop as communicating,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

Learning:

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

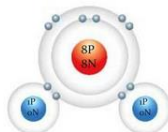
Life Science

Cells are derived from cells.



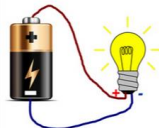
Chemistry

The electron arrangement of atoms impacts their chemical nature.



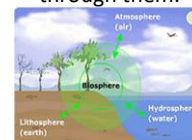
Physics

Electric current is the flow of electric charge.



Earth Science

The biosphere, geosphere, hydrosphere, and atmosphere are interconnected, as matter cycles and energy flows through them.



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

Statement of Inquiry	Concepts	Unit Title/Topic
The collection of valid, empirical evidence leads to predictions and conclusions based upon logic.	Logic, Evidence, Consequences	Experimental Design, Analysis and Evaluation
We are all related to every living thing through the form and function of DNA and the patterns of mitosis	Relationships , Form, functions, Patterns	Asexual Reproduction
Reproductive relationships have consequences resulting in patterns, transformation and diversity.	Relationships , Consequences Transformation	Cell Division – Meiosis and Sexual Reproduction
Through centuries of collecting evidence Scientists have developed a system to categorize the patterns found in atomic structure models.	Systems , Models, Patterns Evidence	Electronic Structure of the Atom and the Periodic Table
An Understanding of the underlying structure and models of interacting atoms enables one to predict the changes that may result from that interaction.	Change , Interaction, Models	Electronic Structure of the Atom and Chemical Interactions
Ohm’s Law describes the mathematical relationship between energy and the movement of electrons modelled by electrical circuits.	Relationships , Interaction, Models, Movement	Electricity – Relationship Between Voltage, Resistance and Current
Human behaviors/habits/practices/laws have consequences that impact balanced systems. First Nations perspectives on sustainability and interconnectedness guide our inquiry throughout the year.	Systems , Consequences Interaction, Balance	Interconnectedness of the Spheres
Changes to biotic and abiotic factors in a balanced ecosystem have environmental consequences.	Change , Consequences, Environment Balance	Ecology - Biosphere

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

CURRICULAR COMPETENCIES	EXAMPLES
Questioning and Predicting	Predicting the results of the Flame Test lab on metallic ion solutions.
Planning and Conducting	Designing and enacting a lab exploring Ohm's law in Play Doh.
Processing and Analyzing Data and Information	Graphing the data and writing a report on the result of the Resistance Wire Rheostat lab.
Evaluating	Reflecting on the success of the method used to gather data on the emission spectra of metallic elements during the Flame Test lab.
Applying and Innovating	Designing a method to investigate the effect of an abiotic factor in the production of compost.
Communicating	Research and report on the implications of modern fire suppression technology and the use of Traditional Ecological Knowledge.

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

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

Category Skill indicator	Examples
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...

This course will focus on developing skills related to the following areas.	Formative assessment is assessment <i>as</i> learning, or assessment <i>for</i> learning. Formative assessments could include;	Summative assessment is assessment <i>of</i> learning. Summative assessments could include;
A: Knowing and understanding	Quizzes, worksheets	Tests, Projects
B: Inquiring and designing	Lab activities,	Lab Reports
C: Processing and evaluating	Lab activities,	Lab Reports,
D: Reflecting on the impacts of science	Journal reflections, group activities,	Research papers, Presentations, Projects

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>

Assessment Rubrics

Grade 9

Criterion A: Knowing and understanding

Achievement level	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1-2	The student is able to: <ul style="list-style-type: none"> • state scientific knowledge • apply scientific knowledge and understanding to suggest solutions to problems set in familiar situations • apply information to make judgments.
3-4	The student is able to: <ul style="list-style-type: none"> • outline scientific knowledge • apply scientific knowledge and understanding to solve problems set in familiar situations • apply information to make scientifically supported judgments
5-6	The student is able to: <ul style="list-style-type: none"> • describe scientific knowledge • apply scientific knowledge and understanding to solve problems set in familiar situations and suggest solutions to problems set in unfamiliar situations • interpret information to make scientifically supported judgments
7-8	The student is able to: <ul style="list-style-type: none"> • explain scientific knowledge • apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations • analyse information to make scientifically supported judgments

Criterion B: Inquiring and designing

Achievement level	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1-2	The student is able to: <ul style="list-style-type: none"> • state a problem or question to be tested by a scientific investigation, with limited success • state a testable hypothesis • state the variables • design a method, with limited success
3-4	The student is able to: <ul style="list-style-type: none"> • state a problem or question to be tested by a scientific investigation • outline a testable hypothesis using scientific reasoning • outline how to manipulate the variables, and state how relevant data will be collected • design a safe method in which he or she selects materials and equipment
5-6	The student is able to: <ul style="list-style-type: none"> • outline a problem or question to be tested by a scientific investigation • outline and explain a testable hypothesis using scientific reasoning • outline how to manipulate the variables, and outline 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	The student is able to: <ul style="list-style-type: none"> • describe a problem or question to be tested by a scientific investigation • outline and explain a testable hypothesis using correct scientific reasoning • describe how to manipulate the variables, and describe 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	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1-2	The student is able to: <ul style="list-style-type: none"> • collect and present data in numerical and/or visual forms • accurately interpret data • state the validity of a hypothesis with limited reference to a scientific investigation • state the validity of the method with limited reference to a scientific investigation • state limited improvements or extensions to the method
3-4	The student is able to: <ul style="list-style-type: none"> • correctly collect and present data in numerical and/or visual forms • accurately interpret data and describe results • 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 that would benefit the scientific investigation
5-6	The student is able to: <ul style="list-style-type: none"> • correctly collect, organize and present data in numerical and/or visual forms • accurately interpret data and describe results using scientific reasoning • 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
7-8	The student is able to: <ul style="list-style-type: none"> • correctly collect, organize, transform and present data in numerical and/or visual forms • accurately interpret data and describe results using correct 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

Criterion D: Reflecting on the impacts of science

Achievement level	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1-2	The student is able to: <ul style="list-style-type: none"> • state the ways in which science is used to address a specific problem or issue • state the implications of the use of 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	The student is able to: <ul style="list-style-type: none"> • 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 • sometimes apply scientific language to communicate understanding • sometimes document sources correctly
5-6	The student is able to: <ul style="list-style-type: none"> • 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 • usually apply scientific language to communicate understanding clearly and precisely • usually document sources correctly
7-8	The student is able to: <ul style="list-style-type: none"> • describe the ways in which science is applied and used to address a specific problem or issue • discuss and analyse 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