CARSON GRAHAM SECONDARY

Middle Years Programme

COURSE OUTLINE – MYP YEAR 3 SCIENCES

Course Overview & Expectations:

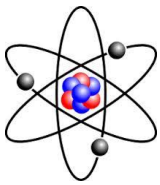
In the words of Carl Sagan, "science is more than a body of knowledge, it is a way of thinking." This course serves as an introduction to high school science, where students begin to develop a scientific way of thinking as well as growing a broad knowledge of the underpinnings of modern science.

This year students will get the opportunity to develop scientific knowledge, skills, attitudes and curiosity that will be relevant in their everyday life as well as providing a solid base for future IB MYP sciences course. Students will also work to develop as communicating, caring, inquiring, risk taking, knowledgeable, reflective, open-minded, principled, balanced, and thinking individuals.

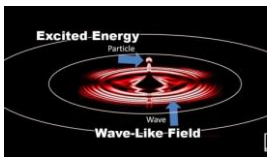
Learning:
Through engaging with this course, students should UNDERSTAND…

Life Science
Life processes are performed at the cellular level.

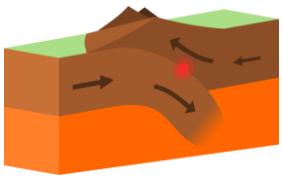
Physical Science: Chemistry
The behavior of matter can be explained by the kinetic molecular theory (KMT) and atomic theory.



Physical Science: Physics
Energy can be transferred as both a particle and a wave.



Earth Science
The theory of plate tectonics is the unifying theory that explains Earth's geological processes.



Through engaging with this course, students will KNOW…

Statement of Inquiry	Concepts	Unit Title/Topic
Systematic approaches to the collection of evidence allows us to draw conclusions.	**Systems**	Processes of Science
Scientific and technical innovation allow us to observe the cell as an example of a system, where interacting components with their own functions work together to respond to changing environments.	**Systems**	Cell Theory
Movement occurs in natural systems as they change to attain balance.	**Change**	Diffusion and Osmosis
Humanity's relationship with microscopic organisms has had consequences on human health and societal development.	**Relationships**	Relationship of Microorganisms with Living Things - Immune System
Transformation and movement are governed by changes in energy.	**Change**	Kinetic Molecular Theory - Matter and Density
New scientific evidence throughout history has been used to make changes to and improve scientific models at key turning points.	**Change**	Atomic Theory
Our relationship with energy allows for greater interaction with our environment through scientific and technical innovation.	**Relationships**	Light - Properties, Behaviors, and Ways of Seeing
The scientific innovation that led to the plate tectonics model explain the interactions between Earth's plates, which result in our natural environment and landscape.	**Relationships**	Plate Tectonics

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Through engaging with this course, students will DO…

CURRICULAR COMPETENCIES CATEGORIES	EXAMPLES
Questioning and Predicting	Create their own questions to drive scientific inquiry through design labs (ex: penny drop lab).
Planning and Conducting	Create their own scientific labs by designing hypotheses, material lists and procedures. (ex: chemical solubility lab).
Processing and Analyzing Data and Information	Collect and analyze data from labs done in class (ex: change of state of water lab).
Evaluating	Research how infectious diseases affect populations and evaluate the positive and negative impacts of using science to cure and/or treat the disease.
Applying and Innovating	Plan and conduct their own design lab (ex: gummy bear lab)
Communicating	Communicate their scientific knowledge in a variety of ways: writing tests, creating and presenting with posters, research papers, stop motion animation, podcasts, etc.

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,	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

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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: • **recall** scientific knowledge • apply scientific knowledge and understanding to **suggest solutions** to problems set in **familiar situations** • **apply** information to make **judgments**.
3-4	Developing	The student is able to: • **state** scientific knowledge • apply scientific knowledge and understanding to **solve problems** set in **familiar situations** • **apply** information to make **scientifically supported judgments**.
5-6	Proficient	The student is able to: • **outline** 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	Extending	The student is able to: • **describe** 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	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, with **limited success** • **state** a testable hypothesis • **state** the variables • design **a method, with limited success**.
3-4	Developing	The student is able to: • **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	Proficient	The student is able to: • **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 s**ufficient, relevant data** will be collected • design **a complete and safe method** in which he or she **selects appropriate materials and equipment**.
7-8	Extending	The student is able to: • **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**.

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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 • **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	Developing	The student is able to: • **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	Proficient	The student is able to: • **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	Extending	The student is able to: • **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	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** 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	Developing	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 • **sometimes apply** scientific language to communicate understanding • **sometimes** document sources **correctly**.
5-6	Proficient	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 • **usually apply** scientific language to communicate understanding **clearly and precisely** • **usually** document sources **correctly**.
7-8	Extending	The student is able to: • **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**.