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COLLINGWOOD SCHOOL

MORVEN CAMPUS

 70 Morven Drive, West Vancouver, B.C. V7S 1B2 Phone: 604.925.3331 Fax: 604.925.3862

**Course Outline – Science 8 2017-2018**

**Course Overview**

Science 8 focuses on students learning various core competencies specific to science while focusing on content specific to biology, physics, chemistry and geology. The first unit is Biology during which students will develop an understanding of cells as the basic unit as life. They will also learn about the basic functions of the immune system, how vaccinations and antibiotics work, as well as the impact of epidemics and pandemics on the human population. The second unit is Chemistry in which students use the kinetic molecular theory to explain the characteristics of solids, liquids and gases, as well as learn the basic structure of the atom. The third unit in Science 8 is Physical Science: Optics, in which the knowledge and behaviour of waves, properties of light and other types of electromagnetic radiation will be studied. During this unit, students also study the properties of light by designing and building pinhole cameras and developing their own photos; this study becomes part of the school wide Science Expo. The fourth unit is Geology where students will explore plate tectonics and the different layers of the Earth. Within all of these units, students will develop place-based knowledge about the area in which they live, learning about and building on Aboriginal knowledge and other traditional knowledge of the area.

The curricular competencies for Science 8 include:

* Questioning and Predicting
* Planning and Conducting
* Processing and Analyzing Data and Information
* Evaluating
* Applying and Innovating
* Communicating

**Course Content (Unit Overview)**

Unit 1. Life Science - Cells and Systems

Unit 2. Physical Science - Optics

Unit 3. Physical Science - Atomic Theory

Unit 4. Earth and Space Science - Plate Tectonics on Earth

**Course Texts/Resources**

BC Science 8 Connections

1. [www.mrmurraysci.weebly.com](http://www.mrmurraysci.weebly.com)
2. [www.msramsden.weebly.com](http://www.msramsden.weebly.com)
3. [www.dowscience.weebly.com](http://www.msdowsciencecenter.weebly.com)

**Assessment & Evaluation**

**Course Mark: 80%**

* Tests (20%)
* Projects/Labs/Assignments (40%)
* Homework/participation (10%)
* Quizzes (10%)

**School Based Final Assessment: 20%**

**Policies & Procedures**

Please ensure that you have read and understand the following Collingwood School policies and documents:

* Punctuality Protocol (for assignments and tests)
* Acceptable Computer Use Policy
* Academic Integrity Document (Plagiarism Policy)
* Habits of A Successful Learner / Work Habits Rubric

**How to contact your teacher:**

Email:

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**Unit 1: Life Science – Cells and Systems**

Big Idea: Life processes are performed at a cellular level

*It is expected that students will understand:*

 Living things respire, grow, take in nutrients, produce waste, respond to stimuli, and reproduce; there is a debate as to whether or not to classify viruses as living things

 Cell Theory: living things are made of one or more cells, all cells come from pre‐

existing cells, the cell is a basic unit of life

 Types of cells: prokaryotic and eukaryotic cells, plant and animal cells, cells contain structures that carry out essential functions

 Photosynthesis and cellular respiration

 The relationship of micro‐organism with living things: basic functions of the immune system, vaccination and antibiotics, impacts of epidemics and pandemics on human populations

**Unit 2: Physical Science – Optics**

Big Idea: Energy can be transferred as both a particle and a wave

*It is expected that students will understand:*

 Types and effects of electromagnetic radiation

 Light: properties, behaviours and ways of sensing

**Unit 3: Physical Science – Atomic Theory**

Big Idea: The behavior of matter can be explained by the kinetic molecular theory and atomic theory

*It is expected that students will understand:*

 Kinetic Molecular Theory: explains how particles move in different states

 Atomic theory and models: Provides evidence for the existence of atoms and molecules

 Protons, Neutrons and quarks are held together by a strong nuclear force

 Electrons and Leptons are held at a distance from the nucleus through electromagnetism

**Unit 4: Earth and Space Science – Plate Tectonics on Earth**

Big Idea: The theory of plate tectonics is the unifying theory that explains Earth’s geological processes

*It is expected that students will understand:*

 Plate tectonic movement: types, plate boundaries and earthquakes and volcanoes

 Major geological events of local significance

 First People knowledge of: local geological formations, and significant local geological events

 Layers of the Earth

Academic Integrity

According to the Collingwood School Academic Integrity Document, students are expected to behave in an open and honest manner. This includes avoiding plagiarism and writing tests on the assigned date. Refer to the Collingwood School Academic Integrity Document in the August mail out for more details, found at the link below: <http://www.collingwood.org/uploaded/user_files/august_mailouts/22._Academic_Integrity.pdf>

Late Assignments

Collingwood’s Morven Campus has the following policy in place regarding late assessments:

|  |  |
| --- | --- |
| Submission Date | Punctuality Deductions |
| 1 school day late | 10% off total assessment mark |
| 2 school days late | 20% off total assessment mark |
| 3 school days late | 30% off total assessment mark |
| 4‐6 school days late | Assessment will be on pass‐fail basis only |
| 7+ school days late | Assessment will be given a zero |

Teachers will consider extenuating circumstances (injury, prolonged illness, family emergency, absence due to school‐sponsored event) for late assignments but only upon receipt of a note from a doctor, administrator, or teacher sponsoring an event. Refer to the Punctuality Protocol in the August mail out for more details, found at the link below: <http://www.collingwood.org/uploaded/user_files/august_mailouts/23._Punctuality_Protocol.pdf>

Missed Tests

Students with an **excused** absence have the opportunity to write the following Thursday morning at

7:10 AM. There will be a Science teacher on duty. If the student fails to do so, they will receive a zero. The only exceptions will be in the submission of a doctor’s note. Teachers will notify parents via an email or phone call before the final day that the writing can occur. For more information, see <http://www.collingwood.org/uploaded/user_files/august_mailouts/22._Academic_Integrity.pdf>

**Class Expectations**

Respect

Students are expected to have a respectful attitude in the classroom. This involves respecting classmates by listening to their ideas and addressing ideas with constructive criticism. It is important

to challenge ideas, but equally important that the person presenting the idea is not belittled. Ideas can

be criticised, but people can not be for raising those ideas. Respect also involves respecting the teacher by listening when the teacher is giving instructions (and following them, etc.). Additionally, a respectful atmosphere is demonstrated when the teacher is respectful of the students. Finally, students are expected to respect the classroom environment by keeping careful care of all equipment, materials and samples, and cleaning up after themselves.

Participation

Students are expected to arrive prepared (both with materials and in proper mindset) for each class. Please bring the necessary supplies and no extra materials that may distract you or other students. Participation in all classroom discussions and activities is expected.

Attendance

Students who miss class are responsible for making up missed work themselves. Remember, Trips and extracurricular activities are a privilege, and when a commitment is made to them, it is understood

that extra work needs to be done so not to fall behind in classes. Unexcused absences will result in zeros for missed assignments, labs, quizzes and tests.

Homework

Homework will be assigned regularly. In the absence of a specific assignment, students should spend time updating and reviewing notes, and completing their course workbook.

Laptops, Tablets, and Cell Phones

While extremely useful for learning and research, laptops, tablets**,** and cell phones almost always hinder students from active learning. They are extremely distracting to the user and to surrounding students, and studies show that they almost always lower learning outcomes. Do not use laptops, tablets, and cell phones during class unless instructed to, however, you are free to use them as you wish during work periods. Wise time management is encouraged.

Safety

Safety measures must be followed at all times. Safety in the science classroom is important because of the potential for danger due to equipment and chemicals. Please do not run or engage in horseplay in the lab. If you are curious and wish to perform an experiment and are not sure of the safety of your actions, ask the instructor.

Food and Drink

Eating is not allowed during class as it is a lab space and safety must always pervade. Drinks are permitted if they are in a sealable container.

Tutorials

Tutorials are available upon request. Students are strongly encouraged to get help as soon as difficulties occur. Talk to your teacher to set up an appointment.

**Curricular Competencies**

Questioning and predicting

 Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest

 Make observations aimed at identifying their own questions about the natural world

 Identify a question to answer or a problem to solve through scientific inquiry

 Formulate alternative “If…then…” hypotheses based on their questions

 Make predictions about the findings of their inquiry

Planning and conducting

 Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified

 Measure and control variables (dependent and independent) through fair tests

 Observe, measure, and record data (qualitative and quantitative), using equipment, including digital technologies, with accuracy and precision

 Use appropriate SI units and perform simple unit conversions

 Ensure that safety and ethical guidelines are followed in their investigations

Processing and analyzing data and information

 Experience and interpret the local environment

 Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information

 Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, keys, models, and digital technologies as appropriate

 Seek patterns and connections in data from their own investigations and secondary sources

 Use scientific understandings to identify relationships and draw conclusions

Communicating

 Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate

 Express and reflect on a variety of experiences and perspectives of place

Evaluating

 Reflect on their investigation methods, including the adequacy of controls on variables

(dependent and independent) and the quality of the data collected

 Identify possible sources of error and suggest improvements to their investigation methods

 Demonstrate an awareness of assumptions and bias in their own work and secondary sources

 Demonstrate an understanding and appreciation of evidence (qualitative and quantitative)

 Exercise a healthy, informed skepticism and use scientific knowledge and findings from their own investigations to evaluate claims in secondary sources

 Consider social, ethical, and environmental implications of the findings from their own and others’ investigations

Applying and innovating

 Contribute to care for self, others, community, and world through personal or collaborative approaches

 Co‐operatively design projects

 Transfer and apply learning to new situations

 Generate and introduce new or refined ideas when problem solving

Critical Thinking

The Science Department considers the development of the critical thinking skills of our students to be essential to their success in science and in life. Critical thinking is a complex process with many essential facets. In order to address this complexity, there are areas of focus for each grade. These are indicated in the table below. As students progress through these grades, they will continue to master the skills from earlier grades. The skills chosen as a focus for later grades will also not be ignored in the earlier grades. Each student report card will include a comment on the progress being made in the grade specific area of critical thinking.

|  |  |
| --- | --- |
| Grade | Critical Thinking Skills |
| 7 | Ask pertinent questions |
| 7 | Adjust opinions when new facts are found. |
| 7 | Admit a lack of understanding or information where necessary |
| 8 | Look for evidence |
| 8 | Examine problems carefully |
| 8, 9 | Analyze data |
| 9 | Define criteria |
| 9 | Weigh evidence and draw reasoned conclusions |
| 10 | Reject incorrect or irrelevant information |
| 10, 11 | Assess statements and arguments |
| 10, 11 | Identify assumptions and biases |
| 11, 12 | Consider a variety of explanations |
| 11 | Identify missing information |
| 12 | Suspend judgment until all facts have been gathered and considered |
| 12 | Synthesize concepts across disciplines |