



TIGER NATION



Mayerthorpe Jr. Sr. High School

Science 8 Course Outline 2021-2022

Mr. D. Moon

Room 113

donald.moon@ngps.ca

Science in Action 8

Introduction

To become scientifically literate, students must develop a thorough knowledge of science and its relationship to technologies and society. They must also develop the broad-based skills needed to identify and analyze problems; explore and test solutions; and seek, interpret and evaluate information. The Alberta Education Science Program of Studies presents science in a meaningful context – providing opportunities for students to explore the process of science, its applications and implications, and to examine related technological problems and issues. By doing so, students become aware of the role of science in responding to social and cultural change and in meeting needs for a sustainable environment, economy and society. (Alberta Education, 2003)

Goals

The following goals for Canadian science education are addressed through the Alberta science program. Science education will:

- (a) encourage students at all grade levels to develop a critical sense of wonder and curiosity about scientific and technological endeavours,
- (b) enable students to use science and technology to acquire new knowledge and solve problems, so that they may improve the quality of their own lives and the lives of others,
- (c) prepare students to critically address science-related societal, economic, ethical and environmental issues,
- (d) provide students with a foundation in science that creates opportunities for them to pursue progressively higher levels of study, prepares them for science-related occupations, and engages them in science related hobbies appropriate to their interests and abilities,
- (e) enable students, of varying aptitudes and interest, to develop a knowledge of the wide spectrum of careers related to science, technology and the environment. (Alberta Education, 2003)

Education in Alberta aims to honour cultural diversity and promote intercultural understanding. Students are able to build on foundational knowledge about First Nations, Metis and Inuit peoples. The program of studies provides opportunities for students to develop a knowledge and understanding of, and

respect for, the histories, cultures, languages, contributions, perspectives, experiences and contemporary contexts of First Nations, Metis and Inuit.

***Basic Materials (subject to change)**

Students are expected to have these materials:

3 ring binder	Blue pens
Set of dividers (5 sections – one for each unit)	Red (or another accent colour) pens
Loose leaf paper – lined and graph	Pencils
Eraser	Ruler
Pencil Crayons	

Program Organization

The Grade 8 Science program is divided into 5 units of study:

Unit A – Mix and Flow of Matter (Science and Technology Emphasis)

The materials that we use, including natural and manufactured ones, often take the form of fluids. Fluids are composed primarily of liquids and gases, but may also include solids in a variety of forms. In investigating fluids, students discover that many common household materials are aqueous solutions or suspensions, in which the main component is water, and learn that such diverse substances as air and oil are fluids. Students learn that the properties of individual fluids are important to their use, including such properties as density, buoyancy and viscosity of the fluid and its response to changes in temperature and pressure. The particle model of matter is introduced to help students make a conceptual link between the nature of matter and the specific behaviour of fluids.

Topics

- (a) Fluids are used in technological devices and everyday materials.
- (b) The properties of mixture and fluids can be explained by the particle model of matter.
- (c) The properties of gases and liquids can be explained by the particle model of matter.
- (d) Many technologies are based on the properties of fluids.

Unit B – Cells and Systems (Nature of Science Emphasis)

Living things take a variety of forms, as reflected in their structures, internal processes and ways of responding to their environments. Finding patterns within this diversity has been a major challenge for the biological sciences, and has led to the development of ideas such as systems, cells, structures and functions - ideas developed from the study of all living things. Using these ideas, students learn to interpret life at a variety of levels, from individual cells to complex organisms. To develop their understanding, students investigate ways that components of a living system work together, and through these studies learn that healthy organisms - including healthy humans - function as balanced Systems within a life-supporting environment.

Topics

- (a) Living things share certain characteristics and have structures to perform functions.
- (b) Cells play a vital role in living things.
- (c) Healthy human function depends on a variety of interacting and reacting systems.
- (d) Scientific investigation leads to new knowledge about body systems and new medical applications.

Unit C – Light and Optical Systems (Nature of Science Emphasis)

Our understanding of the world is based largely on what we see—both directly, and aided by optical devices that improve and extend our vision. Tools such as the microscope and telescope have helped extend knowledge in a variety of science fields, from the study of cells to stars, to studies of the nature of light itself. In learning about light, students investigate its interactions with different materials and interpret its behaviour using a geometric ray model. As students extend their investigations, the wave model of light is introduced and then used in interpreting colour and other electromagnetic phenomena. This knowledge is further applied in interpreting a variety of light-based technologies and envisaging new technologies we may use in the future.

Topics

- (a) Our knowledge about light and vision comes from explanations, inventions, and investigations.
- (b) Light behaves in predictable ways.
- (c) Light is part of the electromagnetic spectrum and travels in waves.
- (d) Eyes and cameras capture images using the properties of light.

Unit D – Mechanical Systems (Science & Technology Emphasis)

Machines are used for many purposes in our daily lives, when we need to transfer energy into motion, or move materials in a controlled way. In learning about mechanical devices, students investigate how components are linked so that energy is transferred efficiently and desired functions are performed. A comparison of past and present technologies helps students recognize that different approaches have been used over time to meet common needs. Evaluation of efficiency, effectiveness and impacts on daily life, the community and the environment are important considerations in this unit.

Topics

- (a) Machines are tools that help humans work.
- (b) An understanding of mechanical advantage and work helps in determining the efficiency of the machine.
- (c) Science, society, and the environment are all important in the development of mechanical devices and other technology.

Unit E – Fresh and Saltwater Systems (Social and Environmental Emphasis)

Earth is sometimes described as the water planet: over two-thirds of Earth's surface is covered by oceans and freshwater features. By exploring examples of aquatic systems, students come to appreciate their dynamic nature and learn about the interactions of these systems with climate, the biosphere and Earth's landscape. In the process, students become aware of conditions which have led to the development of aquatic systems, as they investigate factors that affect their characteristics and quality as part of a life-supporting environment.

Topics

- (a) Humans depend on water supply and quality.
- (b) Water in its various states affects the Earth's landforms and climate.
- (c) Living things in aquatic environments are affected by many factors.
- (d) Human activities affect aquatic environments.

Order of Instruction: Unit E – Freshwater and Saltwater Systems (**Sept. / Nov.**)
Unit A – Mix and Flow of Matter (**Nov. / Jan.**)
Unit B – Cells and Systems (**Feb. / March**)
Unit C – Light and Optical Systems (**March/ April**)
Unit D – Mechanical Systems (**April/ June**)

Evaluation

Unit Assignments	45%
Section Tests & Quizzes	35%
Final Examination (cumulative)	20%

Unit Assignments (45%)

Individual assignments and labs taken in for an assessment of student progress will count for 20% of each unit mark. Assignments will include chapter questions, vocabulary lists, etc. In order to ensure consistent effort, students will not be informed as to whether or not an assignment will be taken in or become part of their binder. All assignments must be turned in at the beginning of class

Section Tests & Quizzes (35%) – To ensure that students keep up their studies on a daily basis, there will be announced quizzes in which students will be asked to recall information from the previous lessons. At the end of each unit, a test will be written with the main emphasis on the most recently completed unit. However, because science knowledge builds upon itself, as well as other subjects, particularly mathematics, understanding of previous chapters and other courses will be essential. (All math concepts required for science will be covered in science class.) Unit tests will consist of matching, fill-in-the-blank, multiple-choice, numerical answer and written answer questions.

Final Examination (20% of Final Mark, June)

The final examination will follow a similar format to that of the unit tests but on a larger scale and will cover the entire year's work. There will be review classes prior to the exam date.

Assessment Strategies:

The learning strategies which will be used to help students reach their potential include:

➤ Differentiated Instruction (D.I.) and Assessment for Learning (A4L).

D.I. involves being more aware of the differences in how students learn which in turn leads to varied methods of instruction to better meet student needs. D.I. will also involve giving students a greater say in some of the areas they choose to focus their studies on and how they present their findings. A4L (*Learning Activities*) requires students to be more aware of the objectives and requirements of each assignment. It focuses on using assignments as a method of improvement rather than as a source of marks. In this light, some of the students' work will be commented on, discussed, without putting an actual mark on it. In this way, students will learn what is expected of them and how to improve their work. It is vital that students put their best effort into completing and learning from all assignments.

➤ Assessment of Learning

Assignments -on a regular basis individual assignments will be taken in and carefully marked as a check of student understanding and progress. These will include Applying Concept and Critical Thinking questions, book/ lab reports, mapping projects, etc. and are used for marks.

Quizzes- to ensure that students keep up with their studies on a daily basis there will be short quizzes in which students will be asked to recall work from the previous day, explain an important concept or term, etc.

Tests- at the end of each unit a test will be written covering the work just completed. However, due to the fact that most courses build on previous knowledge, understanding the ideas from earlier chapters will be necessary. Tests will consist of a variety of multiple-choice questions, vocabulary words, and

written response questions, depending on the course. All tests must be written. If you have a valid reason for missing a test, make arrangements to write a make-up as soon as you return.

Final Exam- these will deal with all the material covered to date. The format will be similar to the chapter tests but on a larger scale.

The Final Grade:

The evaluation for each course is based on the student's achievement of curriculum expectations and the demonstrated skills required for effective learning. The percentage grade represents the quality of the student's overall achievement of the expectations for the course and reflects the corresponding level of achievement.

Homework

Efforts will always be made to provide ample class time to complete course work but sometimes, more time is required and homework becomes a necessity.

Classroom Expectations

In order for our classroom to be a positive learning community, we all need to respect each other's right to learn and teach. All students in our class are capable of success in science if we all follow these basic expectations:

1. **ARRIVE ON TIME AND PREPARED EVERY DAY.** You will need your binder, textbook, journal, blue pen, red pen, pencil, eraser, highlighter, ruler and agenda.
2. **RESPECT** is an essential part of working in a learning community:
 - a. All students are expected to respect themselves, each other and the teacher, as well as all property and equipment. Name-calling, teasing, inappropriate language, damage to property, etc will not be tolerated. Inappropriate behaviour will be dealt with immediately. Further incidents may involve parents and administration.
 - b. Use class time effectively and complete your work on time. Misuse of class time will result in less class time to work on assignments, etc.
 - c. Do not talk when someone else is talking, whether it is the teacher or a classmate. You want to be heard when you are speaking and it is expected you would demonstrate the same respect.
3. Inform the teacher if you know you are going to be absent so you can complete missed work on your own time. If you are absent unexpectedly, **it is your responsibility** to find out what you missed from the teacher or a classmate and get caught up.
4. If you are struggling or unsure of a concept, please speak with the teacher immediately. The longer you wait, the further behind you find yourself!

Rewrite Policy

You will be allowed to rewrite unit tests only, not quizzes. In order to rewrite a unit test, the following criteria must be met:

- request the rewrite within one day of the return of your original test
- complete corrections for the original test on a separate sheet of paper, including explanations of errors and hand in within one week of the return of the original test
- After corrections are turned in, the date for the rewrite will be decided.

There will be one rewrite allowed, meaning that all students requesting a rewrite will be required to write it at the same time. Rewrites will be done on the students' time.

Extra Help Policy

It is the student's responsibility to request extra help outside the classroom. Advance notice is required. It is expected that students attempt work on their own before asking for extra help. Assignments and tests are not the time to ask for help, as then the assessment is not a true picture of what the student knows. Several opportunities for Learning Activities will take place – these are the activities that students should request help with or clarification if required.

We all need to do our part to ensure a successful year, the teacher has final responsibility for what goes on in our classroom and therefore, it is expected that students follow instructions and requests in order to maintain a safe and positive learning environment.

Any parent wishing to meet with me to discuss a problem or concern may arrange a meeting by calling the school (780-786-2624) or by email whichever is most convenient. Any student wishing to request extra help or wishing to discuss a problem or concern can speak with me directly or via email. I will do my best to make myself available for extra help.