TIGER NATION

Mayerthorpe Jr. Sr. High School
Science 8 Course Outline

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Science in Action 8

Introduction

To become scientifically literate, students must develop a thorough knowledge of science and its relationship to technology 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 the 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 endeavors,

(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 interests to develop a comprehensive understanding of the diverse range of careers related to science, technology, and the environment. (Alberta Education, 2003)

Education in Alberta strives to celebrate cultural diversity and foster intercultural understanding. Students can 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
Coil Notebook/Key Tab
Eraser
Pencil Crayons
Blue pens
Pencils
Ruler

Program Organization

The Grade 8 Science program is divided into five 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 various forms. In investigating fluids, students discover that many common household materials are aqueous solutions or suspensions, in which the primary component is water, and learn that substances such as air and oil are also considered fluids. Students learn that the properties of individual fluids are essential to their use, including the fluid's density, buoyancy, viscosity, 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 behavior of fluids.

Topics

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

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

Living things take various forms, as reflected in their structures, internal processes, and responses to their environments. Finding patterns within this diversity has significantly challenged the biological sciences. It has led to ideas such as systems, cells, structures, and functions—ideas developed through the study of all living things. Students learn to interpret life at various levels, from individual cells to complex organisms, by applying these concepts. To develop their understanding, students investigate how 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 specific characteristics and possess structures that enable them to perform various 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 yields new knowledge about body systems and leads to innovative medical applications.

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

Our understanding of the world is primarily based on what we see directly, aided by optical devices that enhance and extend our vision. Tools such as the microscope and telescope have helped extend knowledge in various science fields, from studying cells to stars to exploring the nature of light. In learning about light, students investigate its interactions with different materials and interpret its behavior using a geometric ray model. As students extend their investigations, the wave model of light is introduced and then used in interpreting color and other electromagnetic phenomena. This knowledge is further applied in analyzing a variety of light-based technologies and envisioning new technologies that may be used in the future.

Topics

(a) Our understanding of light and vision stems from explanations, inventions, and investigations.
(b) Light behaves in predictable ways.
(c) Light is part of the electromagnetic spectrum and travels in the form of 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 everyday needs. Evaluation of efficiency, effectiveness, and impacts on daily life, the community,y and the environment are important considerations in this unit.

Topics

(a) Machines are tools that assist humans in their work.
(b) An understanding of mechanical advantage and work helps determine the efficiency of a machine.
(c) Science, society, and the environment are all critical 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," as over two-thirds of its 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 between these systems and the climate, the biosphere, and Earth's landscape. In the process, students become aware of the conditions that have led to the development of aquatic systems as they investigate factors that affect their characteristics and quality, which are essential to a life-supporting environment.

Topics

(a) Humans depend on a reliable water supply and its quality.
(b) Water in its various states affects the Earth's landforms and climate.
(c) Numerous factors influence the lives of living organisms in aquatic environments.
(d) Human activities affect aquatic environments.

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

Evaluation

Unit Assignments	20%
Section Quizzes	25%
Unit Finals	35%
Midterm Exam	10%
Final Examination	10%

Unit Assignments (20%)
Assignments will include chapter questions, vocabulary lists, and other relevant materials. All assignments must be turned in at the beginning of class.

Section Quizzes (25%) & Unit Finals (35%)
To ensure students maintain their daily studies, quizzes will be announced that require recalling information from previous lessons. At the end of each unit, a test will be administered with a primary focus on the most recently completed unit. However, understanding previous chapters and other courses will be essential because scientific knowledge builds upon itself and other subjects, particularly mathematics. (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.

Midterm Exam (10%)
A midterm exam will take place at the midpoint of the school year.

Final Examination (10%)
The final examination will follow a similar format to the unit tests, but on a larger scale, and will cover the work covered after the midterm exam. There will be review classes before the exam date.

Assessment Strategies:
The learning strategies that 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 leads to varied instruction methods to meet students' needs. D.I. will also give students a more significant say in some areas on which they focus their studies 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 and discussed without assigning an actual mark. 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 -Individual assignments will be regularly taken in and carefully marked to check student understanding and progress. These will include Applying Concept and Critical Thinking questions, book/lab reports, mapping projects, and other assignments, and are used for assessment purposes.

Quizzes - To ensure students stay on track with their daily studies, short quizzes will be administered, asking students to recall the previous day's work and explain key concepts or terms.

Tests - At the end of each unit, a test will be administered covering the work just completed. However, because most courses build on previous knowledge, understanding the ideas from earlier chapters will be necessary. Depending on the course, tests will consist of various multiple-choice questions, vocabulary words, and written response questions. 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.

Midterm Exam- The midterm exam will follow a similar format to that of the unit tests, but on a larger scale, and will cover Semester 1's work. There will be time to review before the exam date.

Final Exam - This will cover all material covered from the midterm forward. The format will be similar to the chapter tests and midterm, 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 course expectations and reflects the corresponding level of achievement.

Homework
Efforts will always be made to provide ample class time to complete coursework; however, sometimes more time is required, and homework may become necessary.

Classroom Expectations
For our classroom to be a positive learning community, we must 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 PREPARE EVERY DAY. You will need your binder, textbook, journal, blue pen, red pen, pencil, eraser, highlighter, ruler, and agenda. **Students must be on time for class.** They are expected to be in class at the bell. Students who miss 25% of the class will be marked absent. (10 min for 40 min class, 20 min for 80 min class)

2. RESPECT is an essential part of working in a learning community:

    a. All students are expected to respect themselves, each other, the teacher, and all property and equipment. Name-calling, teasing, inappropriate language, damage to property, etc will not be tolerated. Unacceptable behavior will be dealt with immediately. Further incidents may involve parents and administration.

    b. Use class time effectively and complete your work on time. Misusing class time will result in less time to work on assignments and other tasks.

    c. Do not talk when someone else is talking, whether the teacher or a classmate. You want to be heard when speaking and are expected to demonstrate the same respect.

3. Inform the teacher if you know you will be absent so you can complete the missed work on time. If you are absent unexpectedly, **you must** find out what you missed from the teacher or a classmate and get up to date.

4. Please speak with the teacher immediately if you need help with a concept. The longer you wait, the further behind you find yourself!

All current school procedures and policies must be followed. Please refer to https://www.mayerthorpehigh.ca/parents-and-students/student-agenda for details.
Please note that the policy regarding electronic devices will be strictly enforced.

Cheating and plagiarism will not be tolerated. Anyone caught cheating or participating in plagiarism may receive a grade of zero for the assessment in question. This also includes the use of AI to claim as your own work. Parents and administration will be contacted.

Appeals Process

Discuss the matter with the teacher outside class time if a student is unsatisfied with an assessment outcome. If the teacher and the student cannot resolve the issue, the teacher will approach another teacher for an assessment of the assignment. (The teacher will not know the student's name or the previous grade for the given assignment). If the issue persists, a meeting will be scheduled between the student, teacher, parents, and administration to resolve the matter. An appeal must be commenced within 48 hours of receiving the marked assignment. In return, the appeal process will be completed as soon as possible.

Please see the student agenda for more detailed information on appeals.

Reassessment Policy

The purpose of reassessment is to allow a student to remove an uncharacteristic grade.
Individual reassessments will only be granted in extenuating circumstances.

To qualify for a reassessment, the following requirements must be met:

1. You must show evidence of preparing for the original assessment.
    a. For example:
        i. Completion of all formative and summative assessments (assignments/quizzes/projects).
        ii. Completion of practice questions/formative assessments
        iii. Actively engaged in lessons/class/learning activities and effectively used class time.

2. You must review the assessment and receive feedback to understand your grade.
    a. For example:
        i. A student/teacher conference

ii. Post assessment self-reflection

3. You must provide evidence of enhanced learning of the outcomes.
    a. For Example:
        i. Completion of teacher tutorial sessions
        ii. Completion of additional practice materials
        iii. Exam Analysis - identifying errors/common mistakes/distractors

4. You must arrange to meet for a timely reassessment.

5. The reassessment may take an alternative form to the original assessment, but it will still assess the same outcome(s) from the programs of study.

Extra Help Policy

It is the student's responsibility to request extra help outside the classroom. Advance notice is required. Students are expected to attempt to work independently before asking for additional assistance. Assignments and tests are not the time to ask for help, as they do not provide an accurate picture of the student's knowledge. Several learning activities will take place. These are the activities that students should request help with or clarification on if required.

Exam Exemption Policy

The purpose of this policy is to acknowledge students who demonstrate substantial academic achievement **or** consistent attendance with the opportunity to exempt one final exam per academic year(Junior) or Semester (Senior). This policy outlines the criteria, limitations, and procedures for exam exemption eligibility.

Eligibility Criteria

A student may be eligible to exempt **one final exam per year (Junior)** or **one final exam per semester (Senior)** if they meet **either** of the following conditions:

1. **Academic Standing**: The student has achieved a final grade of **80% or above** in the classroom portion of the course.

OR

2. **Attendance**:
    - In a **semester course**, the student has been **absent 5 days or fewer**.
    - In a **year-long course**, the student has been **absent 10 days or fewer**.

Note: An absence is defined as missing more than 20 minutes of a class in senior high or more than 10 minutes in junior high, regardless of whether the absence is excused or unexcused. School-sanctioned absences (such as field trips or school athletics) do not count toward absences.

The academic mark and attendance record used to determine eligibility will be based on the data as of the day exemption forms are due (3 days before the start of exam week). Any changes after that date will not be considered.

Additional Eligibility Requirements

- All outstanding school and extracurricular (e.g., sports) fees must be paid **in full** by the exemption form due date. This also includes the payment or return of previous semester or year books.

> ***Students with unpaid fees will not be eligible for an exam exemption, regardless of their academic or attendance standing.***

Limitations and Conditions

- Students may only exempt one final exam per academic year (Junior High) or Semester (Senior High).
- Students may choose to write an exempted exam as a **"no-fault" final:**
  - The exam result will only be counted if it improves the student's grade.
  - This attempt still counts as an exemption under the two-year rule.
- A student may not exempt the same subject's final exam more than once within two years.

Example: If a student exempts their math final in Grade 10, they cannot exempt their math final in Grade 11.

Disciplinary Requirements

Students are **not eligible** for an exemption if they have received:

- One or more out-of-school suspensions,

or

- More than one in-school suspension during the course.

Application Process

- Exemption forms will be made available **7 days before the start of exam week.**
- Completed forms must be **submitted no later than three school days before the start of exams**.
- Students will be notified of approval or denial 2 days before exams start.

Eligibility will be determined based on the student's grades, attendance, behavior, and payment status as of the exemption form due date.

In-Class Final Exams

- All **in-class final exams must be written**, even if a student has qualified for exemption.

- If an exemption is granted:
    - The in-class final will be treated as a **"no-fault"** exam.
    - The student will **not be required to write the Part B** portion of the final.
    - The in-class final may raise the final grade, but cannot lower it.

Exceptions to Absence Policy

Absences due to bereavement or extreme illness may be excused at the discretion of the principal. These cases must be discussed with the administration within one week of the absence.

Reminder: ***Students are responsible for tracking their own eligibility, meeting all deadlines, and ensuring all school-related obligations (including fees) are fulfilled. Incomplete, late, or ineligible submissions will result in a requirement to write the complete final exa***m.

We all need to do our part to ensure a successful year. The teacher has final responsibility for what goes on in our classroom. Therefore, students must follow instructions and requests to maintain a safe and positive learning environment.

Questions?? Call 780-786-2624 or email donald.moon@ngps.ca