TIGER NATION

Home of the MHS Tigers

Mayerthorpe Jr. Sr. High School
Science 8 Course Outline

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 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 knowledge of the wide spectrum of careers related to science, technology, and the environment. (Alberta Education, 2003)

Education in Alberta aims to honor cultural diversity and promote 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
Set of dividers (5 sections – one for each unit)
Loose leaf paper–lined and graph
Eraser
Pencil Crayons
Blue pens
Red (or another accent color) 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 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 essential to their use, including the fluid's density, buoyancy, and 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 ways of responding 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 from studying all living things. Students learn to interpret life at various levels, from individual cells to complex organisms, using these ideas. 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 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 mainly based on what we see directly and aided by optical devices that improve 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 studying 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 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 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	30%
Section Tests & Quizzes	50%
Midterm Exam	10%
Final Examination (cumulative)	10%

Unit Assignments (30%)
Individual assignments and labs to assess student progress will count for 20% of each unit mark. Assignments will include chapter questions, vocabulary lists, etc. To ensure consistent effort, students will not be informed whether 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 (50%)
To ensure that students keep up their studies daily, 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 and other subjects, particularly mathematics, understanding 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.

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 most of the year's work 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 student needs better. D.I. will also give students a more significant say in some areas they 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 student's work will be commented on and discussed without putting an actual mark on it. 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, etc., and are used for marks.

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

Tests- At the end of each unit a test will be written 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.

Final Exam- This will deal with all the material covered to date. 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 expectations for the course and reflects the corresponding level of achievement.

Homework

Efforts will always be made to provide ample class time to complete coursework, but sometimes, more time is required, and homework becomes 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. Inappropriate behavior 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 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 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!

All current school procedures and policies must be followed. (http://mayerthorpehigh.ca/parents-and-students/student-agenda) Please note: 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. Parents and administration will be contacted.

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 reassessment in a timely manner.

5. The reassessment may be in an alternative form to the original assessment but will 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 extra help. Assignments and tests are not the time to ask for help, as the assessment is not an accurate picture of the student's knowledge. 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. Therefore, students are expected to follow instructions and requests 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 requesting extra help or discussing a problem or concern can speak with me directly or via email. I will make myself available for extra help.