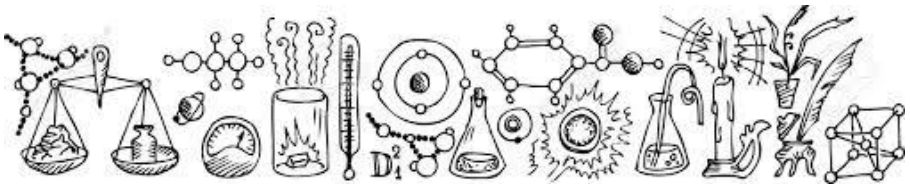
Science 10F



COMMUNICATION

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COURSE DESCRIPTION

In Grade 9, learners continue their explorations of science and strengthen their science literacy. They investigate atomic particles, electricity, and how living things reproduce and pass on information. The knowledge areas of matter, energy, genetics, and evolution provide a basis for study. A foundation for an active and practical approach to learning and doing science proceeds in Grade 9. This includes conducting scientific investigations, furthering tool and measurement skills, exploring science in everyday life, and looking into how science interacts with society and the environment. Learners continue to develop their agency and sense of belonging in science. In Grade 9, they have many opportunities to explore Indigenous ways of knowing, being and doing, including through interacting with local community and land-based learning.

GRADING POLICY

Assignments, Labs, Daily Work, Projects	45%
Tests, Quizzes	40%
Final Exam	15%

Make-Up Work: If you are absent, it is YOUR responsibility to catch up on missed work. During class time is not an appropriate time to ask for help on material you missed. Before school, during teacher prep periods, during lunch hour, or after school are all appropriate times to get help on previous day's work.

Re-Testing: Re-tests will be allowed under the discretion of the teacher. If you are given the opportunity for a retest you must first complete missed questions on the test, plus additional assigned work before the retest.

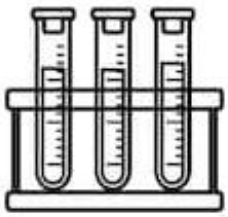
GENERAL OUTLINE

TECHNOLOGY

phones will not be prohibited in the classroom, unless the teacher gives permission.

Supplies needed:

- Writing Utensils
- Paper
- Binder
- Calculator



UNIT 1: Matter

SCI.9.SK.1 Demonstrate an understanding of pure substances vs. mixtures.

SCI.9.SK.2 Demonstrate an understanding of the difference between a chemical change and a physical change.

SCI.9.SK.3 Demonstrate an understanding of the law of conservation of mass and how it contributes to a scientific understanding of the nature of matter.
Include: contribution to the development of atomic theory, understanding chemical reactions

SCI.9.SK.4 Demonstrate an understanding that all matter is made up of tiny structures called atoms of which there are at least 118 different kinds. Include: atom, element, compound
SCI.9.SK.5 Demonstrate an understanding of the internal structure of atoms.
Include: nucleus, electron shell, electrons, protons, neutrons, isotopes, element symbol, atomic number, atomic mass, Bohr Model

SCI.9.SK.6 Demonstrate an understanding of the nature of static and current electricity.
Include: attraction, repulsion, negative and positive charge, electricity models of static and current electricity

SCI.9.SK.7 Demonstrate an understanding of the method of arrangement, and the significance of position, of elements on the periodic table.
Include: atomic number, valence electrons, periodicity, reactivity, metal, non-metal, metalloid, staircase, element family, alkali metal, alkaline earth metal, noble gas, halogen

UNIT 2: Energy

SCI.9.SK.8 Demonstrate an understanding of the many uses of alternating and direct current electricity in modern society.
Example: in the home, in transportation, in manufacturing, in technology, etc.

SCI.9.SK.9 Demonstrate an understanding of the law of conservation of energy and its implications.
Include: potential energy, energy sources, energy uses, efficiency

SCI.9.SK.10 Demonstrate an understanding of the basic principles of current electricity.
Include: polarity, cells, energy, current, voltage, resistance, simple circuits, series, and parallel circuits

SCI.9.SK.11 Demonstrate an understanding that there is a relationship between electrons and magnetic fields.
Include: electrical generator, permanent magnet, electromagnet, electromagnetism

SCI.9.SK.12 Demonstrate an understanding of various methods of electricity generation (e.g., hydro, fossil fuels, nuclear, solar, wind, etc.) and their pros and cons.
Include: sustainability, feasibility, economics
SCI.9.SK.13 Demonstrate an understanding of the basic process of the generation and transportation of hydroelectricity in Manitoba.
Include: potential energy of water, turbine, powerlines, household, appliances

UNIT 3: Genetics

SCI.9.SK.14 Demonstrate an understanding of the role of asexual reproduction in various living things.
Example: fission, budding, sporulation, vegetative propagation, regeneration, etc.

SCI.9.SK.15 Demonstrate an understanding of the mechanism of sexual reproduction in plants, animals, and humans.
Include: gamete, sperm, egg, meiosis, zygote, mitosis, stem cell, differentiation

SCI.9.SK.16 Demonstrate an understanding of the structure, function, and hormonal regulation (e.g. testosterone, estrogen, etc.) of the human reproductive system.

SCI.9.SK.17 Demonstrate an understanding of the role of sexual reproduction in generating variety in the traits of individuals.
Include: chromosome, dominant and recessive genes, diploid, haploid,
Recombination

SCI.9.SK.18 Demonstrate an understanding of naturally occurring and induced genetic mutations.
Include: somatic cell mutation, cancer, germ cell mutation, inheritance

SCI.9.SK.19 Demonstrate an understanding of the relationship between variations, selective pressures, and adaptation.
Example: natural selection, sexual selection, artificial selection, migration, etc.

SCI.9.SK.20 Demonstrate an understanding of the structure, function, and location of genetic material.
Include: nucleus, mitosis, human genome, DNA, genes, chromosomes, haploid, diploid, genotype, phenotype, trait

SCI.9.SK.21 Demonstrate an understanding of the nature of adaptation in infectious diseases, and related public health measures.
Include: preventative medicine, mutation, strain, antibiotics, vaccines, antibiotic resistance, waning effectiveness, waning immunity

UNIT 4: Evolution

SCI.9.SK.22 Demonstrate an understanding of the timeline of evolution of life on Earth.
Include: first appearance of life at least 3.5 billion years ago, simple cellorganisms, multi-cellular organisms, large animals, plants, and fungi

SCI.9.SK.23 Demonstrate an understanding of the methods and evidence used by scientists to estimate when, and what type(s) of living things first appeared on Earth.
Example: fossil record, geochemical evidence, molecular biological evidence, etc

SCI.9.SK.24 Demonstrate an understanding of the role of natural and sexual selection in the evolution of life on Earth.
Include: competition, resources, selective pressure, advantageous traits, variation, inheritance, adaptation

SCI.9.SK.25 Demonstrate an understanding that adaptations accumulating over time can lead to the formation of new species.
Include: common ancestor, natural selection, mutation, sexual selection

SCI.9.SK.26 Demonstrate an understanding of the similarities and differences between natural and artificial selection.
Include: selective breeding, domestication, agriculture

SCI.9.SK.27 Demonstrate an understanding that environmental changes cause changes in the selective pressures acting on populations.
Include: adaption, population growth, extinction, climate change

Plagiarism and Cheating

Students are expected to do and submit their own work. Neither plagiarism nor cheating is acceptable. Plagiarism means to take and use another person's ideas or writings as one's own (Oxford English Dictionary). Cheating includes, but is not limited to, copying answers from another student, downloading assignments off the Internet and passing off old assignments as one's own.
Any assignment found to be plagiarized whether in part or in whole MUST BE REWRITTEN to demonstrate learning.

Lab Safety Contract

Student Name _____Hour_____

You must have this contract completed before you can engage in any lab activity.

1. I will conduct myself in an appropriate manner in the lab. I will not engage in horseplay, shoving, hitting, squirting others with wash bottles, running, throwing any object, or play practical jokes.
2. I will follow all written and verbal instructions. If I do not understand any instruction, I will ask the instructor. I will not engage in any unauthorized experiments.
3. I will not eat food, chew gum, or drink beverages in the lab. I will not ingest any chemical from the lab.
4. When I first enter the science room or lab, I will not touch any chemicals, equipment, or materials until instructed to do so.
5. I will know the locations and operation of safety features in the science room and lab. This includes the emergency exits, fire extinguisher, fire blanket, eye wash, first aid kit, and goggles
6. I will not work in the laboratory alone, leave my lab station unattended, or disturb other lab groups unnecessarily.
7. I will consult with my physician about any medical condition (i.e. – contacts, allergies, pregnancy, or asthma) that can pose a hazard and will notify the instructor of any restriction.
8. I will put on lab goggles upon starting the lab and wear them the entire time I am working on the lab (including clean-up) or until the instructor indicates.
9. I will wear appropriate clothing to the lab. Loose and baggy clothes, dangling jewelry are not allowed when conducting labs. I will wear an apron or lab coat if it is necessary. I will tie back my hair if it is long.
10. I will wash my hands with soap and water after working in the lab. I will not touch my face, rub my eyes, or insert/remove contacts until my hands are washed.
11. I will report any accident or injury to the instructor immediately.
12. I will not remove any chemical or material from the laboratory.
13. I will clean up my lab station to its original condition and dispose of any waste according to the instructor. The sink will be free from all debris.
14. I understand that I will be charged for any broken equipment or damage resulting from my negligence.

I, _____(student) have read and agree to follow all of these safety rules in this contract. If I fail to adhere to any of them, I may be asked to leave the lab without opportunity for make-up and may be punished according to the student code of conduct. I will cooperate to the fullest extent with my instructor and fellow students to create and maintain a safe lab environment. I am aware that any violation can lead to unsafe lab conditions and can harm others and me.

_____

(student signature) (date)