J.A. WILLIAMS HIGH SCHOOL

Science 9

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Note to parents: the preferred method of communication is e-mail, which will be answered between the hours of 1530-1700 on school days and 2000-2100 on the evening prior to the beginning of the school week. If you need to phone, please do not hesitate to call the school during school hours. If your e-mail address with the school is not current, please send me an e-mail from your preferred e-mail account.

Resources

1. Text: Addison Wesley Science in Action 9
2. Supplies needed: A ring binder for handouts and assignments, calculator, ruler, pencils, and paper.
3. Google Classroom

Course Objectives

To enhance students' knowledge of scientific processes through various units in science, including Biology, Chemistry, Environmental Science, Electricity & Space.

Timeline of Content

Unit 1	Biological Diversity	September
Unit 2	Matter and Chemical Change	October
Unit 3	Environmental Chemistry	November
Unit 4	Electricity	December
Unit 5	Space Exploration	December-January

Course Evaluation

Unit A	
Assignments, Labs, Quizzes	6%
Unit Exam	9%
Unit B	
Assignments, Labs, Quizzes	6%
Unit Exam	9%
Unit C	
Assignments, Labs, Quizzes	6%
Unit Exam	9%
Unit D	
Assignments, Labs, Quizzes	6%
Unit Exam	9%
Unit E	
Assignments, Labs, Quizzes	6%
Unit Exam	9%
Provincial Achievement Test	25%

Labs, Assignments and Quizzes

These will occur frequently and are excellent tools to help ensure a good mark in this course. If you put the necessary effort into studying and completing your work, they will provide you with the background to do well on exams. If an assignment is late and has been handed back to the rest of the class, you will no longer be able to hand in that assignment. You will have to speak with me to arrange a suitable assessment alternative.

Unit Exams

Exams will be comprehensive assessments on the entire unit's material. They typically are composed of a mixture of multiple choice items, short answer questions and diagrams. Please give me as much notice as possible when you know you will be missing exams. An alternate time may be possible, but I reserve the right to carry the weight of a missed unit exam forward to be added on to the weight of the final exam. This may be done in cases of longer absences so the class can move on and I can hand back the exams for review purposes.

Final Exam

The Provincial Achievement Test will be held in January and will test you on all 5 units covered in the course. The final exam is a comprehensive test on all course material. If your performance on the exam is positive, I am willing to replace your lowest unit exam mark with the mark from the P.A.T. (only if it improves the mark).

Formative Assessment

Students will be given many opportunities to assess their own progress through informal conferences with the teacher, practice activities, exam review and classroom discussion. Although these activities are not for summative marks, they can have a very large impact on your grade indirectly. If you take these opportunities seriously and reflect on strengths and weaknesses discovered during the process, you will be able to move things forward in an efficient manner. It will help guide you regarding study priorities and extra help requirements.

Assessment Policies

Students missing summative assessment marks (whether from absenteeism, incompletion, illness, bereavement, religious observance, academic dishonesty or otherwise) will be given multiple opportunities to demonstrate; the school will offer three (3) 'Zero Days' throughout each semester where students can sign up to write an alternate assessment for up to three (3) academic courses that will be used by the teacher to replace missing assessments, Teacher discretion will be used to determine which items students need to complete in order to demonstrate the required outcomes. Students may not write identical assessments when they miss the original assessment time, and must adhere to the 'Zero Day' schedule and teacher-provided re-assessment tool, Assessments will cover the same outcomes but may not necessarily emulate the original assessment in format. When teachers determine a student needs to re-demonstrate ('re-write') because of a previously unsuccessful attempt, the teacher may allow these students to participate in Zero Days; the students must understand that the teacher will choose to use the most, recent, consistent performance; this means if the student's 're-write' mark is lower, the teacher may choose to use that, considering it is the most recent evidence. The teacher may also request evidence of further learning (attending tutorials, completing study guides, completing more practice examples etc.) prior to allowing a student to re-demonstrate. Best interests of student learning must always guide teacher discretion.

Instructor Expectations

At its core, there are two main expectations in this class: you will **work hard** and **be kind**. This course covers a lot of material and requires a lot of effort on your part. This may mean extra reading to get caught up on material you are not familiar with. Show responsibility and initiative when absent from class to make up any missed work - I will not chase you, but if you show initiative I will be behind you one hundred percent. Listen well in class, ask plenty of questions when you don't understand, do your homework, keep on top of things and you will do well in this class.

Unit Overview

Unit A: **Biological Diversity** (Social and Environmental Emphasis)

- **Overview:** Biological diversity is reflected in the range of species found in local and global environments and by subtle variations in characteristics found within individual species. In this unit, students learn that diversity is maintained through natural processes of sexual and asexual reproduction, through the survival of individual species—and variations within those species—may be influenced by ecological and human-caused factors. Students examine trends toward loss of diversity and examine related issues concerning environmental quality and the impact of technologies.
- **Focusing Questions:** What is biological diversity, and by what processes do diverse living things pass on their characteristics to future generations? What impact does human activity have on biological diversity?
- *Students will:*
    - investigate and interpret diversity among species and within species, and describe how diversity contributes to species survival
    - investigate the nature of reproductive processes and their role in transmitting species characteristics
    - describe, in general terms, the role of genetic materials in the continuity and variation of species characteristics; and investigate and interpret related technologies
    - identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making

Unit B: **Matter and Chemical Change** (Nature of Science Emphasis)

- **Overview:** Different materials have different properties. The ability to distinguish between different substances and make sense of their properties, interactions and changes requires the development of ideas about chemical substance.
- **Focusing Questions:** What are the properties of materials, and what happens to them during chemical change? What evidence do we have of chemical change; and what ideas, theories or models help us explain that evidence?
- *Students will:*
    - investigate materials, and describe them in terms of their physical and chemical properties
    - describe and interpret patterns in chemical reactions
    - describe ideas used in interpreting the chemical nature of matter, both in the past and present, and identify example evidence that has contributed to the development of these ideas
    - apply simplified chemical nomenclature in describing elements, compounds and chemical reactions

Unit C: **Environmental Chemistry** (Social and Environmental Emphasis)

- **Overview:** Environments are often viewed from a physical and biological perspective, but to fully understand how they function, it is important to view them from a chemical perspective as well. A study of environmental chemistry helps students understand that chemical substances make up the underlying fabric of the world and are part of the process in all natural cycles and changes. Through this unit, students also become aware of human-produced chemical substances that enter and interact with environments, and they investigate

potential impacts of different substances on the distribution and abundance of living things.

- Focusing Questions: What substances do we find in local and global environments? What role do they play, and how do changes in their concentration and distribution affect living things?
- *Students will:*
    - investigate and describe, in general terms, the role of different substances in the environment in supporting or harming humans and other living things
    - identify processes for measuring the quantity of different substances in the environment and for monitoring air and water quality
    - analyze and evaluate mechanisms affecting the distribution of potentially harmful substances within an environment

Unit D: Electrical Principles and Technologies (Science and Technology Emphasis)

- Overview: Electricity provides the means to energize many devices, systems and processes that are part of our technological environment. Electrical devices are used to transfer and transform energy, to provide mechanisms for control and to transmit information in a variety of forms. In this unit, students learn the principles that underlie electrical technologies, by studying the form and function of electrical devices and by investigating ways to transfer, modify, measure, transform and control electrical energy. Using a problem-solving approach, students create and modify circuits to meet a variety of needs. Students also develop skills for evaluating technologies, by comparing alternative designs and by considering their efficiency, effectiveness and environmental impact.
- Focusing Questions: How do we obtain and use electrical energy? What scientific principles are involved? What approaches can we use in selecting, developing and using energy-consuming devices that are efficient and effective in their energy use?
- *Students will:*
    - investigate and interpret the use of devices to convert various forms of energy to electrical energy, and electrical energy to other forms of energy
    - describe technologies for transfer and control of electrical energy
    - identify and estimate energy inputs and outputs for example devices and systems, and evaluate the efficiency of energy conversions
    - describe and discuss the societal and environmental implications of the use of electrical energy

Unit E: Space Exploration (Science and Technology Emphasis)

- Overview: Technologies have played an essential role in the study of space and in the emerging use of space environments. Our modern understanding of space has developed in conjunction with advances in techniques for viewing distant objects, for transmitting images and data through space, and for manned and unmanned space exploration. A study of space exploration provides an opportunity for students to examine how science and technology interact and to learn how one process augments the other. Students become aware that technologies developed to meet the challenges of space are applied to new purposes.
- Focusing Questions: How have humans attained a presence in space? What technologies have been developed and on what scientific ideas are they based?

How has the development of these technologies contributed to the exploration, use and understanding of space and to benefits on Earth?

- *Students will:*
    - investigate and describe ways that human understanding of Earth and space has depended on technological development
    - identify problems in developing technologies for space exploration, describe technologies developed for life in space, and explain the scientific principles involved
    - describe and interpret the science of optical and radio telescopes, space probes and remote sensing technologies
    - identify issues and opportunities arising from the application of space technology, identify alternatives involved, and analyze implications