J.A. WILLIAMS HIGH SCHOOL

Science 14

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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: McGraw-Hill Science.Connect 1
2. Supplies needed: A ring binder for handouts and assignments, calculator, ruler, pencils, and paper.
3. Google Classroom

Course Objectives

To develop the science-related knowledge, skills and attitudes that students need to solve problems and make decisions, and at the same time help them become lifelong learners — maintaining their sense of wonder about the world around them.

Timeline of Content

Unit 1	Properties of Matter	September
Unit 2	Energy Transfer Technologies	October
Unit 3	Matter and Energy in Living Systems	November
Unit 4	Matter and Energy in the Environment	December

Course Evaluation

Unit A	
Assignments, Labs, Quizzes	8.5%
Unit Exam	9.0%
Unit B	
Assignments, Labs, Quizzes	8.5%
Unit Exam	9.0%
Unit C	
Assignments, Labs, Quizzes	8.5%
Unit Exam	9.0%
Unit D	
Assignments, Labs, Quizzes	8.5%
Unit Exam	9.0%
Final Exam	30.0%

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 Final Exam will be held in January and will test you on all 4 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 final (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: Investigating Properties of Matter

- **Overview:** The safe handling of chemicals, whether in the home or in the workplace, requires an understanding of the properties of pure substances and mixtures. Students will actively investigate the properties of a variety of samples of matter, including mixtures and solutions, elements, and compounds encountered in everyday life. The atom as the basic building block of matter is introduced. Students also investigate the classification of elements on the periodic table.
- **Focusing Questions:** How do we use properties to classify matter? How can an understanding of the properties of matter be used practically? What is the underlying structure of matter that helps us to classify and understand matter?
- *Students will:*
    - classify various forms of matter, including commonly used household substances, on the basis of their properties, and relate these properties to their safe use, storage and disposal
    - describe solutions and solubility, solutes and solvents; and then describe how these concepts are applied to the production of prepared foods and other useful materials
    - describe the properties of elements and compounds, and use the periodic table to identify trends in properties

Unit B: Understanding Energy Transfer Technologies

- **Overview:** Energy can be transferred by means of heat and by use of force or distance multipliers called machines. The optimal design of such energy transfer technologies is based upon an understanding of energy transfer, heat and temperature, and force. Students will gain an understanding that the design of energy transfer technologies also takes into consideration the need for safety and for efficiency as a means of reducing reliance on nonrenewable energy resources
- **Focusing Questions:** How do common energy transfer technologies work in meeting our daily needs? Why are efforts to promote energy conservation, by improving the efficiency of these technologies, important to society?
- *Students will:*
    - describe how natural and technological cooling and heating systems are based upon the transfer of thermal energy (heat) from hot to cold objects
    - explain the functioning of common methods and devices designed to control the transfer of thermal energy
    - describe and compare simple machines as devices that transfer energy and multiply forces or distances

Unit C: Investigating Matter and Energy in Living Systems

- **Overview:** Life processes require the exchange of matter between living systems and the external environment. Students will investigate life processes at the organism and system level, and extrapolate these processes to the cellular level. In closely studying the digestive and circulatory systems, students will understand that a healthy diet and lifestyle is crucial to their wellness.
- **Focusing Questions:** What lifestyle choices can be made to help our organs and organ systems function optimally? How do cells, which are microscopic and invisible to the naked eye, work together in organs and organ systems to carry out life functions?

- *Students will:*
    - describe, in general terms, the exchange of matter by the digestive and circulatory systems, the functional relationship between the two systems and the need for a healthy diet and lifestyle
    - describe disorders of the digestive and circulatory systems as imbalances induced by genetic, lifestyle and environmental factors
    - describe, in general terms, the structure and function of plant and animal cell parts; and trace the development of the cell theory
    - identify and compare, in general terms, the life functions common to living systems, from cells to organ systems

Unit D: Investigating Matter and Energy in the Environment

- Overview: Energy from the Sun sustains living systems and maintains equilibrium in the biosphere. In the biosphere, matter is recycled along natural pathways. However, the increasing human population, human activity, and increasing human use of energy and reliance on manufactured materials are having an impact on the movement of matter and energy in the biosphere. This raises global concerns about sustainability.
- Focusing Questions: How is human activity influencing the natural flow of matter and energy in the biosphere? Should humans as a species be concerned about the effects of their activities on other species and the environment?
- *Students will:*
    - describe how the flow of matter in the biosphere is cyclical along characteristic pathways and can be disrupted by human activity
    - analyze a local ecosystem in terms of its biotic and abiotic components, and describe factors of the equilibrium