



Loyola

HIGH SCHOOL

Science & Technology

Secondary 2

Mr. Seccareccia

Contact

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Description

Cycle 1 (year 2) Science and Technology provides students the opportunity to construct a hypothesis, test it by experimentation, identify the different variables, and familiarize themselves with the general scientific method. The course develops the student's ability to seek answers to problems, communicate in the language used in the science & technology fields, and apply their knowledge to real scenarios. The curriculum integrates concepts of biology, chemistry, physics, and earth/space science. Proper lab techniques, the use of technology, the collection of data, math applications and graphing techniques are reinforced.

Goals

Students will:

- participate in hands-on activities and group-work.
- be able to apply class material to everyday life.
- better understand the scientific phenomena they encounter on a daily basis.
- be more inclined to pursue or consider a science or technology-related career.
- begin to develop a topic for their upcoming Science Fair project.

Requirements

Students are to:

- maintain well-organized science binders throughout the year.
- produce one formal lab report per term.
- complete worksheets and/or textbook readings for homework (a maximum of two hours of homework per cycle (9 days) is to be expected).

A 20% late penalty per day may be applied for missing or incomplete work.

Extra help in the form of group tutorials and individual meetings is offered as required by appointment, and are usually held at lunch or after school. Students are encouraged to seek extra help as soon as a concept is unclear. Extra help may be requested in person or by email.

If a student is absent (or knows he will be absent due to an activity, sport, appointment, etc.) he must contact the lab technician, Mr. Elie Dagher (daghere@loyola.ca) no less than 24 hours ahead of the lab to make appropriate plans to complete it.

Resources

- *Eureka!* student textbook B
- Google Classroom (class code to be given in class)
- Various apps (e.g. Gizmos) and videos to be used throughout the year

Materials

- 3-ring binder (1 or 1.5 inch) with 5 dividers
- Graph paper
- Loose leaf (or notebook)
- Pencil, eraser, pens
- Scientific calculator (same calculator used for math)
- Ruler (15 cm is fine)

Term Breakdown

Term 1: 20% of the year

Term 2: 20% of the year

Term 3: 60% of the year

Evaluation

Practical Component (labs, reports, activities, etc.): 40%

Theory Component (homework, quizzes, tests, June exam): 60%

Topics

*Note: topic order may be adjusted, and may overlap adjacent terms.

Term 1	Term 2	Term 3
<p>Scientific Method</p> <ul style="list-style-type: none"> • Review of the scientific method • Laboratory report writing (Scientific Laboratory Report Guidelines document) • Laboratory safety <p>Engineering</p> <ul style="list-style-type: none"> • Specifications • Design plan • Technical drawing • Manufacturing process sheet • Raw material, material & equipment • Safety in use of tools <p>Technological Systems</p> <ul style="list-style-type: none"> • System (overall function, inputs, processes, outputs, control) • Components of a system • Basic mechanical functions (links, guiding control) • Energy transformation • Mousetrap car project <p>Forces and Motion</p> <ul style="list-style-type: none"> • Types of motion • Effects of a force • Simple machines (inclined planes, levers, pulleys) • Work, force, and energy (potential and kinetic) • Mechanisms that transmit motion • Mechanisms that change motion 	<p>Science Techniques</p> <ul style="list-style-type: none"> • Cross-multiplication • Manipulation of variables/parameters (mass, volume, density, for example) • Graphing data <p>Properties of matter</p> <ul style="list-style-type: none"> • Characteristic properties • Mass & volume • Density • Temperature • States of matter • Acidity/alkalinity <p>Organization of matter</p> <ul style="list-style-type: none"> • Atoms, elements • Atomic theory • Periodic table • Molecules • Element hockey card project <p>Transformation of matter</p> <ul style="list-style-type: none"> • Physical change • Chemical change • Conservation of matter • Mixtures & solutions • Separation of mixture 	<p>Cells</p> <ul style="list-style-type: none"> • Plants versus animal cells, organelles (similarities and differences) • Reproductive mechanisms in plants • Plant growth project <p>Cell Division</p> <ul style="list-style-type: none"> • DNA & Mitosis • Microscope use • Functions of cell division (reproduction, growth, regeneration) • Meiosis and sexual development (meiosis, fertilization) • Genetic diversity <p>Reproduction & Reproductive Systems</p> <ul style="list-style-type: none"> • Puberty • Hormone regulation in men • Spermatogenesis • Erection & ejaculation • Hormone regulation in women • Oogenesis, ovarian and menstrual cycles <p>Survival of Species</p> <ul style="list-style-type: none"> • Asexual and sexual reproduction • Plants versus animal reproduction • Reproductive mechanisms in animals • Reproductive organs • Gametes • Fertilization and pregnancy • Stages of human development • Contraception and abortion • Sexually transmitted infections <p>Science Fair</p> <ul style="list-style-type: none"> • Introduction and selection of topic

