Loyola HIGH SCHOOL

Science & Technology: Course Outline

Secondary II Cycle 1 (Year 2)

Instructor: Ms. S. Bhola

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Periods per cycle: 6

Description:

Cycle 1 (year 2) Science and Technology provides students the opportunity to familiarize themselves further with the scientific method. Students learn to construct a hypothesis, test its prediction through experimentation, identify different variables, and analyze their findings.

In this course, students will develop the ability to seek answers to problems, learn to communicate effectively using scientific language, and begin to apply their newfound knowledge.

Concepts covered incorporate the perspectives of biology, chemistry, physics, and earth/space sciences. Proper lab techniques, the use of technology, the collection of data, math applications, and graphing techniques are reinforced.

In addition, students will be required to generate a science fair **topic** by the end of the year for use next year in Secondary III Science.

Goals:

- Students will participate in hands-on activities and group work
- Students will be able to apply their knowledge of science and technology to better understand scientific phenomena encountered in everyday life, through media, and in future classes
- Students will develop a lifelong interest in science

Requirements:

- Students must come prepared to every lesson with all of their materials and are expected to keep their binders organized and in good condition.
- Respectful behavior towards other students and the instructor is expected at all times. Students are expected to work cooperatively with their peers
- Students are expected to develop good study habits. Review and practice of daily work is essential to understanding and retaining the information taught.
- All assignments must be completed on time and with care. Homework will be checked on the day it is due. Late assignments will be completed during Academic JUG and/or will be penalized 20% per day. Messy or incomplete work will not be accepted.

Materials:

- 3 Ring binder (1 or 1 1/2 inch) with dividers

This should be a single topic binder (only for use in this course)

- Hole-punched graph paper (**metric**)
- Loose-leaf paper for notes and rough work
- Several pencils (NO pens needed in this class!!), eraser, highlighters
- Calculator (same as Math)
- 15 or 30 cm ruler
- Safety glasses will be provided, but students may purchase their own

Students should bring their textbook (*Explorations B*) and iPad to every class. The use of personal devices (e.g., laptops) is not permitted.

Component	Science Competencies	Examples	Weighting
Practical	Seeks answers or solutions to scientific or technological problems Communicates in the languages used in science and technology	Labs, lab reports activities, lab exam, etc.	**40%**
Theory	Makes the most of his knowledge of science and technology Communicates in the languages used in science and technology	Tests, quizzes, homework, June exam, etc.	**60%**

Evaluation, Components & Competencies:

Term breakdown

Term 1	20%	Ends Nov. 2nd
Term 2	20%	Ends Feb. 13th
Term 3	60% (June exam is worth 50% of this term)	Ends May 30th

For the Term 1 and Term 3 reports, each student will have comments regarding at least two (2) of the following four (4) cross-curricular competencies:

- Exercises critical judgment
- Organizes his work
- Communicates effectively
- Works in a team

Extra Help

Extra help sessions are announced before every major evaluation. Students may also email the instructor to arrange for additional help. Tutorials are usually offered at lunch or after school.

Topics covered:

Term 1

Scientific Method
- Review of the scientific method
- Laboratory report writing (review Scientific Laboratory Report Guidelines document)
- Laboratory safety

Engineering
- Specifications
- Design plan
- Technical drawing
- Manufacturing process sheet
- Raw material, Material & Equipment
- Safety in use of tools

Forces and Motion
- Types of motion
- Effects of a force
- Simple machines
- Mechanisms that transmit motion
- Mechanisms that change motion

Technological Systems
- System (overall function, inputs, processes, outputs, control)
- Components of a system
- Basic mechanical functions (links, guiding control)
- Energy transformation

Term 2

Science Techniques
- Cross-multiplication
- Manipulation of variables/parameters (mass, volume, density, for example)
- Graphing data

Properties of matter
- Characteristic properties
- Mass & Volume
- Temperature
- States of matter
- Acidity/alkalinity

Transformation of matter
- Physical change
- Chemical change
- Conservation of matter
- Mixtures & Solutions
- Separation of mixture

Organization of matter
- Atoms, Elements, Periodic Table
- Molecule

Term 3

Cell Division
- DNA & Mitosis
- Microscope use
- Functions of cell division (reproduction, growth, regeneration)
- Meiosis and sexual development (meiosis, fertilization)
- Genetic diversity

Tissues, Organs & Systems
- Tissues, organs and systems

Reproduction & Reproductive Systems
- Puberty
- Hormone regulation in men
- Spermatogenesis
- Erection & Ejaculation
- Hormone regulation in women
- Oogenesis, Ovarian and menstrual cycles

Survival of Species
- Asexual and sexual reproduction
- Reproductive mechanisms in plants
- Reproductive mechanisms in animals
- Reproductive organs
- Gametes
- Fertilization and pregnancy
- Stages of human development
- Contraception and abortion
- Sexually transmitted diseases

Science Fair
- Introduction and selection of topic

Moodle course: Sec 2 Science Ms. Bhola