Fairfax Collegiate

703 481-3080 · www.FairfaxCollegiate.com

Hands-On Science 3-4 Syllabus

Course Goals

1 Scientific Principles
Students are introduced to three major fields of science: Biology, Chemistry, and Physics.

2 Scientific Method
Students understand, follow, and create various experiments that properly follow the Scientific Method.

3 Formal Presentation
Students learn how scientists present their research and results in the form of a formal poster presentation.

Course Topics

1 Biology
Students observe and test how various living species (plants, bacteria, and humans) react in different conditions.

2 Chemistry
Students understand the properties of various liquid and solid substances and experiment with combining them under different environmental conditions.

3 Physics
Students are introduced to the concepts of structural integrity and aerodynamics and experiment with manipulating them to create efficient prototypes.

4 Laboratory Notebooks
Students learn to maintain adequate records of each experiment that they conduct in the form of a composition notebook, as real-life scientists do.

5 Projects
Students put together a formal poster presentation at the end of the session detailing one experiment that they found the most interesting.

Course Schedule

Day 1

Introduction and Ice-Breaker
Students are introduced to each other and to the instructor.

Introduction of Class Rules
Students learn the rules of Fairfax Collegiate as well as class rules that the instructor sets.

Course Objectives and Activity Overview
Students learn about the objectives and activities of the course.

Composition Notebook Set-Up
Students learn how to maintain a scientific journal of experiments.

Parts of an Experiment
Students understand how to set up and identify the parts of an experiment.

Plant Lab Setup and Initial Recordings
Students set up the plant experiment which will continue throughout the session.

Observation Activity
Students learn about qualitative and quantitative observations.

Day 2

Heart Rate Activity
Students learn how to measure heart rate and the variables that affect heart rate.

Hand Hygeine and Bacteria
Students test which method of hand hygeine is most effective in killing bacteria.

Day 3

Reflexes and Reaction Time
Students understand the importance of reflexes and reaction time through a series of activities.

Sensory Activity
Students experiment with the various senses and understand how eliminating one or more impacts the ability to complete tasks.

Day 4

Introduction to Chemical Reactions
Students learn about the differences between acids and bases and use pH paper to test whether substances are acids or bases

Acid/Base Lab
Students conduct an experiment to observe the result of an acid-base reaction.

Day 5

States of Matter (Part 1)
Students learn about the three different states of matter and possibly determine whether a fourth state exists.

States of Matter (Part 2)
Students make another type of non-Newtonian fluid called Oobleck.

Day 6

Properties of Water
Students learn about the properties of water and test the cohesiveness of water.

Density Tower

Students understand the concept of density and experiment with liquids of various densities.

Day 7

Structural Integrity
Students design an experiment to test the integrity of a structure made of gumdrops and toothpicks.

Day 8

Parachute Activity
Students design a parachute to learn about aerodynamics.

Day 9

Balloon Propulsion Activity
Students learn about thrust and design an experiment to test the propulsion of a balloon.

Poster Presentations
Students learn about data reporting and create a poster based on one activity from the session.

Day 10

Poster Presentations
Students learn about data reporting and create a poster based on one activity from the session.

Updated on 4/4/2022