Fairfax Collegiate
2026 Summer Program
Hands-On Science Course Syllabus
Rising Grades 4-6

Course Description

Experiment like a real scientist.

Test plant growth, measure heart rates, discover bacteria, mix acids and bases, create oobleck, build bridges, design parachutes, and launch balloon rockets.

Make observations, keep a science notebook, and use the scientific method.

Students get to explore, experiment, and discover how the world works. IThey strengthen their curiosity and knowledge about living things, chemical reactions, and physical forces. With clear guidance and plenty of opportunities to test ideas, students build confidence as they learn to think and investigate like real scientists.

Families receive photos and videos capturing students' projects, experiments, and discoveries. Students leave the course excited about science, proud of what they created, and ready to keep exploring the world around them with curiosity and confidence.

Learning Objectives

Course Goals	**Scientific Principles:** Students are introduced to three major fields of science: Biology, Chemistry, and Physics. **Scientific Method:** Students understand, follow, and create various experiments that properly follow the Scientific Method. **Formal Presentation:** Students learn how scientists present their research and results in the form of a formal poster presentation.
Course Topics	**Biology:** Students observe and test how various living species (plants, bacteria, and humans) react in different conditions. **Chemistry:** Students understand the properties of various liquid and solid substances and experiment with combining them under different environmental conditions. **Physics:** Students are introduced to the concepts of structural integrity and aerodynamics and

	experiment with manipulating them to create efficient prototypes. **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. **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

Class Meeting 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.
Class Meeting 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.
Class Meeting 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.
Class Meeting 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.
Class Meeting 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.
Class Meeting 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.
Class Meeting 7	**Structural Integrity:** Students design an experiment to test the integrity of a structure made of gumdrops and toothpicks. **Structural Integrity:** Students design an experiment to test the integrity of a structure made of gumdrops and toothpicks.
Class Meeting 8	**Parachute Activity:** Students design a parachute to learn about aerodynamics. **Parachute Activity:** Students design a parachute to learn about aerodynamics.
Class Meeting 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.
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