

INSPIREus 2020 Program Overview

OVERARCHING SKILLS:

Problem-solving and Critical Thinking

Engineering Process: Evaluation, Design, Testing, and Modification

Scientific concepts in the Fields of Biology, Chemistry, and Physics

Scientific Method:

Basic Experimental Components and Design

Executing and Following Lab Procedures

Data Evaluation, Collection, and Presentation

Research and Presentation

Understanding Concepts Through Real-world Application

PROGRAM LESSONS:

September: Egg Drop

October: DNA (Strawberry DNA Extraction Lab)

November: Bottle Flip

December (TBD): Flower Anatomy (Flower Dissection Lab)

January: pH (Volcano Lab)

February: Aerodynamics (Paper Airplanes Lab)

March: Cell Membranes and Diffusion (Osmosis in Cucumbers Lab)

April: Heat Transfer (Ice Cream Lab)

May: End of the Year Celebration

Main Idea	Skills
Egg Drop	Problem-solving and Critical Thinking
Date	Engineering Process: Evaluation, Design, Testing, and Modification
September	
Overview	
Students will go through the process of designing and testing a device that can protect a raw egg when dropped.	

Main Idea	Skills
Genetics and Gene Expression	Scientific concepts in Biology Scientific Process:
Date	Executing and Following Lab Procedures
October	Understanding Concepts Through Real-world Application
Overview	
Students will model the structure and explore the function of DNA, then perform a lab to extract DNA from strawberries. In addition, we will cover how genes in DNA are expressed to produce proteins.	

Main Idea	Skills
Physics (Inertia and Velocity)	Scientific concepts in Physics Scientific Method:
Date	Basic Experimental Components and Design
November	Executing and Following Lab Procedures Data Evaluation, Collection, and Presentation Understanding Concepts Through Real-world Application
Overview	
Students will design and conduct their own experiments on the effect of different volumes of water on the success of bottle flipping, then learn about the physics behind this phenomenon.	

Main Idea	Skills
Flower anatomy	Problem-solving and Critical Thinking
Date	Scientific concepts in Biology
December (TBD)	Research and Presentation
	Understanding Concepts Through Real-world Application
Overview	
Students will dissect flowers in order to study plant anatomy and the purpose of flower structures. They will research the method of fertilization used among a specific plant species, presenting it in a creative format. Lastly, we will cover how plants spread their seeds in order to reproduce.	

Main Idea	Skills
pH (acids & bases)	Scientific concepts in Chemistry
Date	Scientific Method:
January	Executing and Following Lab Procedures
	Data Evaluation, Collection, and Presentation
	Understanding Concepts Through Real-world Application
Overview	
Students will learn about the basic function and underlying scientific principles of the pH scale and perform a basic volcano lab with a variety of acids and bases.	

Main Idea	Skills
Aerodynamics	Engineering Process: Evaluation, Design, Testing, and Modification
Date	Scientific concepts in Physics
February	Understanding Concepts Through Real-world Application
Overview	
Students will learn about the basic principles of aerodynamics, as well as design and test different paper airplanes to understand the attributes that help them to fly successfully.	

Main Idea	Skills
Cell Membranes and Diffusion	Scientific concepts in Biology Scientific Method:
Date	Executing and Following Lab Procedures
March	Data Evaluation, Collection, and Presentation Understanding Concepts Through Real-world Application
Overview	
Students will explore the topics of diffusion and tonicity through a cucumber osmosis lab as well as the basics of cell membrane structure and function.	

Main Idea	Skills
Heat Transfer	Scientific concepts in Biology and Chemistry Scientific Method:
Date	Basic Experimental Components and Design
April	Executing and Following Lab Procedures Data Evaluation, Collection, and Presentation Understanding Concepts Through Real-world Application
Overview	
Students will learn about the basic principles of heat transfer. They will be guided through designing and conducting their own experiment evaluating the effectiveness of salt on lowering the freezing point of ice cream.	