Process of Science Lesson Plan

Objective:

- Students will be able to develop a hypothesis and experimental design as evidenced by their ability to generate a testable hypothesis and an experimental method that is able to answer their hypothesis.

Standard(s):

Investigation and Experimentation

- 1. Scientific progress is made by asking meaningful questions and conducting careful investigations
- 1d. Formulate explanations by using logic and evidence
- 1f. Distinguish between hypothesis and theory as scientific terms
- 1l. Analyze situations and solve problems that require combining and applying concepts from more than one area of science

Academic Language Considerations:

Vocabulary: Hypothesis, Prediction, Scientific Methods, Control, Variable, Quantative Data, Qualitative Data

Non-Vocabulary:

- List the Key Elements in the Process of Science:
  - Elements can also refer to chemical elements
- Determine a Control and Variable in your experiment
  - Students can mistake a control for it's common use meaning to exercise restraint over. It is important to make the distinction between the common term and a scientific control

Materials:

- PowerPoint Presentation on Process of Science
- Note-taking Guide on Process of Science
- Note-taking Guide on Designing Bee Experiment

Instructional Breakdown:

	Time Interval	**Teacher Actions**	**Student Actions**

Process of Science Lecture and Designing a Bee Experiment	50 min	• Explain the process of the scientific method
		• Address the difference between a hypothesis and a prediction
		• Explain deductive reasoning and how it is used to form a hypothesis
		• Model how to form a hypothesis using observations and questioning
		• How to make an "If…and …then" statement
		• Go over qualities of a good experiment
		  ○ Experimental Controls
		  ○ Sample size
			• Students take notes on the Process of Science Note-taking Guide
			• Students practice forming their own hypothesis and organize it to an if/then statement
			• Have students check to see if their experiment and prediction matches their hypothesis

Closure	5 min		• Students write down the difference between a hypothesis and prediction is in their own words