Science:
Biology
Unit 4: Science as Inquiry

Essential Understandings	▪ The goal of science is to use explanations to make predictions.
Essential Questions	▪ What is science? ▪ How do you conduct a scientific experiment? ▪ What is the difference between quantitative and qualitative observations? ▪ How are a dependent variable and an independent variable related? ▪ Why is communication vital to the process of science?
Essential Knowledge	▪ The scientific method is used to solve problems and answer questions. ▪ Scientists use quantitative and qualitative data to answer questions. ▪ Scientific procedure requires a control. ▪ Modern science builds on previous knowledge.
Vocabulary	▪ <u>Terms</u>: ○ science, hypothesis, inference, theory, law, scientific method, control, observation, quantitative data, qualitative data
Essential Skills	▪ Use appropriate technology to measure and collect data. ▪ Design a scientific experiment. ▪ Apply the scientific method to conduct an experiment. ▪ Graphing.

Science:
Biology
Unit 4: Science as Inquiry

Related Maine Learning Results	Science B. The Skills and Traits of Scientific Inquiry and Technological Design B1. Skills and Traits of Scientific Inquiry Students methodically plan, conduct, analyze data from, and communicate results of in-depth scientific investigations, including experiments guided by a testable hypothesis. a. Identify questions, concepts, and testable hypotheses that guide scientific investigations. b. Design and safely conduct methodical scientific investigations, including experiments with controls. c. Use statistics to summarize, describe, analyze, and interpret results. d. Formulate and revise scientific investigations and models using logic and evidence. e. Use a variety of tools and technologies to improve investigations and communications. f. Recognize and analyze alternative explanations and models using scientific criteria. g. Communicate and defend scientific ideas. B2. Skills and Traits of Technological Design Students use a systematic process, tools and techniques, and a variety of materials to design and produce a solution or product that meets new needs or improves existing designs. a. Identify new problems or a current design in need of improvement. b. Generate alternative design solutions. c. Select the design that best meets established criteria. d. Use models and simulations as prototypes in the design planning process. e. Implement the proposed design solution. f. Evaluate the solution to a design problem and the consequences of that solution. g. Present the problem, design process, and solution to a design problem including models, diagrams, and demonstrations.

Science:
Biology
Unit 4: Science as Inquiry

Related Maine Learning Results	C3. Science, Technology, and Society Students describe the role of science and technology in creating and solving contemporary issues and challenges. a. Explain how science and technology influence the carrying capacity and sustainability of the planet. b. Explain how ethical, societal, political, economic, and cultural factors influence personal health, safety, and the quality of the environment. c. Explain how ethical, societal, political, economic, religious, and cultural factors influence the development and use of science and technology. C4. History and Nature of Science Students describe the human dimensions and traditions of science, the nature of scientific knowledge, and historical episodes in science that impacted science and society. a. Describe the ethical traditions in science including peer review, truthful reporting, and making results public. b. Select and describe one of the major episodes in the history of science including how the scientific knowledge changed over time and any important effects on science and society. c. Give examples that show how societal, cultural, and personal beliefs and ways of viewing the world can bias scientists. d. Provide examples of criteria that distinguish scientific explanations from pseudoscientific ones.
Sample Lessons And Activities	▪ Students will design an experiment allowing them to make observations and draw a conclusion based on observations. ▪ Students will write a lab report. ▪ Students will review scientific landmark experiments.
Sample Classroom Assessment Methods	▪ Quiz ▪ Chapter Test ▪ Worksheets ▪ Labs
Sample Resources	▪ Publications: o Biology -Kenneth Miller and Joseph Levine o Biology: The Dynamics of Life - Glencoe ▪ Other Materials: o Lab Supplies