

SCIENCE COMPETENCIES & PERFORMANCE INDICATORS

Content Area Competency	Performance Indicators
<p>1. Questioning: Students can develop and use relevant scientific questions to investigate a phenomena, test a hypothesis, conduct an experiment or solve a problem.</p>	<ul style="list-style-type: none"> a. Develop questions from observations, phenomena, prior knowledge and data. b. Construct questions to determine cause/effect relationships between variables. c. Ask questions to clarify an explanation, challenge a scientific argument or refine a model or design. d. Evaluate questions based on relevance, usefulness, and specificity.
<p>2. Investigation: Students can design and conduct appropriate scientific investigations.</p>	<ul style="list-style-type: none"> a. Formulate a testable hypothesis for an investigation that demonstrates relationships between variables and connections to scientific concepts. b. Select and use appropriate tools, laboratory equipment and techniques to gather data and make observations. c. Conduct investigations safely and ethically, using appropriate protocols. d. Evaluate and refine experiments and design solutions as needed to improve reliability and relevance.
<p>3. Modeling: Students can construct and use models to represent and analyze phenomena and systems.</p>	<ul style="list-style-type: none"> a. Design and construct scientific models to represent, explain and predict scientific phenomena. b. Design, construct and justify scientific models to represent and predict interactions between natural and designed systems or between components of a system. c. Construct and use multiple types of models to represent similar phenomena or systems. d. Evaluate and refine scientific models.
<p>4. Data Analysis: Students can analyze and interpret scientific data and solve problems using a range of tools, technology and mathematical techniques.</p>	<ul style="list-style-type: none"> a. Demonstrate patterns and relationships in data sets by constructing appropriate representations through technology and graphical displays. b. Compare and contrast various types of data sets to examine consistency of measurement and observations. c. Analyze data in order to make valid and reliable scientific claims and predictions. d. Analyze and interpret data sets by applying concepts of statistics and probability. e. Apply a range of mathematical techniques and computations, including limitations, to make sense and interpret data in real world applications.
<p>5. Explanation & Argumentation: Students can develop, evaluate and critique scientific claims/explanations, arguments and solutions based on evidence from the natural and designed world.</p>	<ul style="list-style-type: none"> a. Construct a scientific claim/explanation that describes phenomena or relationships between variables. b. Assess claims/explanations for issues of credibility, bias, and validity in scientific ideas, data, or results. c. Construct, use and present oral and written arguments supported by a variety of evidence and scientific reasoning to defend or refute scientific claims/explanations. d. Critique and evaluate arguments and rebuttals for a scientific topic based on appropriate criteria. e. Evaluate solutions to complex, real-world problems based on evidence and design criteria.