

Science (4-5)

Five Town Graduation Standards and Essential Outcomes

Science Graduation Standard 1

NGSS - Next Generation Science Standards

ASKING QUESTIONS AND DEFINING PROBLEMS: Design and refine empirically testable questions in order to describe and explain the natural world or to clarify criteria and constraints for solving problems about the designed world, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 1)

4th Essential Outcomes

- A. Ask questions about what would happen if a variable were changed.
- B. Identify scientific (testable) and not-scientific (non-testable) questions.
- C. Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
- D. Use prior knowledge to describe problems that can be solved.
- E. Design a simple design problem that can be solved through the development of an object, tool, process, or system.

5th Essential Outcomes

- A. Ask questions about what would happen if a variable were changed.
- B. Identify scientific (testable) and not-scientific (non-testable) questions.
- C. Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
- D. Use prior knowledge to describe problems that can be solved.
- E. Design a simple design problem that can be solved through the development of an object, tool, process, or system.

Science Graduation Standard 2

DEVELOPING AND USING MODELS: Use and construct different types of models as tools for representing ideas and explanations, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 2)

4th Essential Outcomes

N/A

5th Essential Outcomes

N/A

Science Graduation Standard 3

PLANNING & CARRYING OUT INVESTIGATIONS: Plan and carry out safe, ethical, systematic field and laboratory investigations, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 3)

4th Essential Outcomes

- A. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence.
- B. Use fair tests in which variables are controlled and the numbers of trials considered.
- C. Evaluate appropriate methods and/or tools for collecting data.
- D. Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
- E. Make predictions about what would happen if a variable changes.
- F. Test two different models of the same proposed object, tool, or process to determine which better meets criteria for success.

5th Essential Outcomes

- A. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence.
- B. Use fair tests in which variables are controlled and the numbers of trials considered.
- C. Evaluate appropriate methods and/or tools for collecting data.
- D. Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
- E. Make predictions about what would happen if a variable changes.
- F. Test two different models of the same proposed object, tool, or process to determine which better meets criteria for success.

Science Graduation Standard 4

ANALYZING AND INTERPRETING DATA: Use a range of tools to identify the significant features and patterns in data, and calculate the degree of certainty in the results, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 4)

4th Essential Outcomes

- A. Represent data in tables and/or various graphical representations to reveal patterns that indicate relationships.

5th Essential Outcomes

- A. Represent data in tables and/or various graphical representations to reveal patterns that indicate relationships.

- B. Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings
- C. Analyze data to refine a problem statement or design.
- D. Use data to evaluate and refine design solutions.

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Science Graduation Standard 5

MATHEMATICS AND COMPUTATIONAL THINKING: Use mathematics and computation to represent physical variables and their relationships, to predict the behavior of systems, and to test the validity of such predictions, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 5)

4th Essential Outcomes

N/A

5th Essential Outcomes

- A. Organize simple data sets to reveal patterns that suggest relationships.
- B. Describe, measure, estimate, and/or graph quantities such as area, volume, weight, and the time to address scientific and engineering questions and problems.
- C. Create and/or use graphs and/or charts to compare alternative solutions to an engineering problem.

Science Graduation Standard 6

CONSTRUCTING EXPLANATIONS AND DESIGNING SOLUTIONS: Construct explanations for scientific investigations that describe phenomena in the natural world and design solutions for engineering problems that are based on scientific knowledge, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 6)

4th Essential Outcomes

N/A

5th Essential Outcomes

N/A

Science Graduation Standard 7

ENGAGING IN ARGUMENT FROM EVIDENCE: Construct explanations for scientific investigations that describe phenomena in the natural world and design solutions for engineering problems that are based on scientific knowledge, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 7)

4th Essential Outcomes

N/A

5th Essential Outcomes

N/A

Science Graduation Standard 8

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION: Use oral and written skills to communicate, evaluate and critique ideas and methods generated via research and experimentation, as demonstrated through the integration of cross-cutting concepts within the disciplines of earth/space science, biology, chemistry, and physics. (NGSS Practice 8)

4th Essential Outcomes

- A. Read and comprehend grade-appropriate complex texts and/or reliable media to summarize, obtain scientific and technical ideas, and describe how they are supported by evidence.
- B. Combine information in written text with that contained in tables, diagrams, and/or charts to support.
- C. Obtain and combine information from books and/or reliable media to explain phenomena or solutions to a design problem.
- D. Communicate scientific and/or technical information orally, and/or in written format.

5th Essential Outcomes

- A. Read and comprehend grade-appropriate complex texts and/or reliable media to summarize, obtain scientific and technical ideas, and describe how they are supported by evidence.
- B. Combine information in written text with that contained in tables, diagrams, and/or charts to support.
- C. Obtain and combine information from books and/or reliable media to explain phenomena or solutions to a design problem.
- D. Communicate scientific and/or technical information orally, and/or in written format.