

Science Works for You
Skills for learning science through inquiry and investigation:
Correlation to the National Research Council's *National Science Education Standards* Science Content Standards A and G for Grades 9-12

The following data describe the pages of the skill book *Science Works for You* that address the National Research Council's *National Science Education Standards* Science Content Standards A (Science as Inquiry) and G (History and Nature of Science) for students in grades 9-12. The analysis data includes the page number of the skill book that addresses the area of the standard indicated in the table.

National Science Education Standards Science Content Standard A: Science As Inquiry	Analysis Data (Grades 9-12)
All students should develop abilities necessary to do scientific inquiry.	
Identify questions and concepts that guide scientific investigations.	Pages 3, 4, 5, 6, 15
Design and conduct scientific investigations.	Pages 3, 6, 7, 8, 9, 12, 15
Use technology and mathematics to improve investigations and communications.	Pages 9, 12, 14
Formulate and revise scientific explanations and models using logic and evidence.	Pages 10, 11, 13
Recognize and analyze alternative explanations and models.	Page 13
Communicate and defend a scientific argument.	Pages 13, 14
All students should develop understandings about scientific inquiry.	
Scientists usually inquire about how physical, living, or designed systems function. Conceptual principles and knowledge guide scientific inquiries. Historical and current scientific knowledge influence the design and interpretation of investigations and the evaluation of proposed explanations made by other	Pages 4, 5

scientists.	
Scientists conduct investigations for a wide variety of reasons. For example, they may wish to discover new aspects of the natural world, explain recently observed phenomena, or test the conclusions of prior investigations or the predictions of current theories.	Page 2
Scientists rely on technology to enhance the gathering and manipulation of data. New techniques and tools provide new evidence to guide inquiry and new methods to gather data, thereby contributing to the advance of science. The accuracy and precision of the data, and therefore the quality of the exploration, depends on the technology used.	Pages 10, 12
Mathematics is essential in scientific inquiry. Mathematical tools and models guide and improve the posing of questions, gathering data, constructing explanations and communicating results.	Pages 9, 12
Scientific explanations must adhere to criteria such as: a proposed explanation must be logically consistent; it must abide by the rules of evidence; it must be open to questions and possible modification; and it must be based on historical and current scientific knowledge.	Pages 10, 11, 13
Results of scientific inquiry—new knowledge and methods—emerge from different types of investigations and public communication among scientists. In communicating and defending the results of scientific inquiry, arguments must be logical and demonstrate connections between natural phenomena, investigations, and the historical body of scientific knowledge. In addition, the methods and procedures that scientists used to obtain evidence must be clearly reported to enhance opportunities for	Pages 13, 14

further investigation.	
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National Science Education Standards Science Content Standard G: History and Nature of Science	Analysis Data (Grades 9-12)
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All students should develop understanding of science as a human endeavor.
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Scientists have ethical traditions. Scientists value peer review, truthful reporting about the methods and outcomes of investigations, and making public the results of work. Violations of such norms do occur, but scientists responsible for such violations are censured by their peers.	Page 10
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All students should develop understanding of the nature of scientific knowledge.

Scientific explanations must meet certain criteria. First and foremost, they must be consistent with experimental and observational evidence about nature, and must make accurate predictions, when appropriate, about systems being studied. They should also be logical, respect the rules of evidence, be open to criticism, report methods and procedures, and make knowledge public. Explanations on how the natural world changes based on myths, personal beliefs, religious values, mystical inspiration, superstition, or authority may be personally useful and socially relevant, but they are not scientific.	Page 10
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Because all scientific ideas depend on experimental and observational confirmation, all scientific knowledge is, in principle, subject to change as new evidence becomes available. The core ideas of science such as the conservation of energy or the laws of motion have been subjected to a wide variety of confirmations and are therefore unlikely to change in the areas in which they have	Page 10
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<p>been tested. In areas where data or understanding are incomplete, such as the details of human evolution or questions surrounding global warming, new data may well lead to changes in current ideas or resolve current conflicts. In situations where information is still fragmentary, it is normal for scientific ideas to be incomplete, but this is also where the opportunity for making advances may be greatest.</p>	
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