

<b>DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY</b>		
<b>Indiana Science Academic Standards: Grades 6 – 8</b>		
<b>Grade 6</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
<b>All lessons</b>	<b>6.1.2</b>	Give examples of different ways scientists investigate natural phenomena and identify processes all scientists use, such as collection of relevant evidence, the use of logical reasoning, and the application of imagination in devising hypotheses and explanations, in order to make sense of the evidence.
<b>All lessons</b>	<b>6.1.3</b>	Recognize and explain that hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations.
<b>3</b>	<b>6.1.6</b>	Explain that computers have become invaluable in science because they speed up and extend people's ability to collect, store, compile, and analyze data; prepare research reports; and share data and ideas with investigators all over the world.
<b>3, 4</b>	<b>6.1.7</b>	Explain that technology is essential to science for such purposes as access to outer space and other remote locations, sample collection and treatment, measurement, data collection and storage, computation, and communication of information.
<b>3, 4</b>	<b>6.2.2</b>	Use technology, such as calculators or computer spreadsheets, in analysis of data.
<b>3, 4</b>	<b>6.2.5</b>	Organize information in simple tables and graphs and identify relationships they reveal. Use tables and graphs as examples of evidence for explanations when writing essays or writing about lab work, fieldwork, etc.
<b>3, 4</b>	<b>6.2.6</b>	Read simple tables and graphs produced by others and describe in words what they show.
<b>3, 4</b>	<b>6.2.7</b>	Locate information in reference books, back issues of newspapers and magazines, CD-ROMs, and computer databases.
<b>All lessons</b>	<b>6.2.8</b>	Analyze and interpret a given set of findings, demonstrating that there may be more than one good way to do so.
<b>3</b>	<b>6.7.2</b>	Use models to illustrate processes that happen too slowly, too quickly, or on too small a scale to observe directly, or are too vast to be changed deliberately, or are potentially dangerous.
<b>Grade 7</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
<b>All lessons</b>	<b>7.1.1</b>	Recognize and explain that when similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, which often takes further studies to decide.
<b>1, 3, 4</b>	<b>7.1.4</b>	Describe that different explanations can be given for the same evidence, and it is not always possible to tell which one is correct without further inquiry.
<b>1</b>	<b>7.2.6</b>	Read analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, or temperatures, and choose appropriate units.

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3, 4	7.2.7	Incorporate circle charts, bar and line graphs, diagrams, scatterplots, and symbols into writing, such as lab or research reports, to serve as evidence for claims and/or conclusions.
<b>Grade 8</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
All lessons	8.1.1	Recognize that and describe how scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.
All lessons	8.1.3	Recognize and describe that if more than one variable changes at the same time in an experiment, the outcome of the experiment may not be attributable to any one of the variables.
1, 2	8.1.8	Explain that humans help shape the future by generating knowledge, developing new technologies, and communicating ideas to others.
1	8.2.2	Determine in what units, such as seconds, meters, grams, etc., an answer should be expressed based on the units of the inputs to the calculation.
All lessons	8.2.6	Write clear, step-by-step instructions (procedural summaries) for conducting investigations, operating something, or following a procedure.
All lessons	8.2.7	Participate in group discussions on scientific topics by restating or summarizing accurately what others have said, asking for clarification or elaboration, and expressing alternative positions.
1, 3, 4	8.2.8	Use tables, charts, and graphs in making arguments and claims in, for example, oral and written presentations about lab or fieldwork.
2, 4	8.2.9	Explain why arguments are invalid if based on very small samples of data, biased samples, or samples for which there was no control sample.
3	8.7.3	Use technology to assist in graphing and with simulations that compute and display results of changing factors in models.
<b>Indiana Mathematics Academic Standards: Grades 6 – 8</b>		
<b>Grade 6</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
3, 4	6.2.1	Add and subtract positive and negative integers.
All lessons	6.3.9	Investigate how a change in one variable relates to a change in a second variable.
1	6.5.1	Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.
3, 4	6.6.1	Organize and display single-variable data in appropriate graphs and stem-and-leaf plots, and explain which types of graphs are appropriate for various data sets.
3, 4	6.7.5	Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.

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3, 4	6.7.9	Make precise calculations and check the validity of the results in the context of the problem.
<b>Grade 7</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
3, 4	7.2.1	Solve addition, subtraction, multiplication, and division problems that use integers, fractions, decimals, and combinations of the four operations.
3, 4	7.6.1	Analyze, interpret, and display data in appropriate bar, line, and circle graphs and stem-and-leaf plots and justify the choice of display.
3, 4	7.6.4	Analyze data displays, including ways that they can be misleading. Analyze ways in which the wording of questions can influence survey results.
3, 4	7.7.6	Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.
3, 4	7.7.10	Make precise calculations and check the validity of the results in the context of the problem.
<b>Grade 8</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
3, 4	8.2.1	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) in multi-step problems.
3, 4	8.6.1	Identify claims based on statistical data and, in simple cases, evaluate the reasonableness of the claims. Design a study to investigate the claim.
4	8.6.2	Identify different methods of selecting samples, analyzing the strengths and weaknesses of each method, and the possible bias in a sample or display.
3, 4	8.6.4	Analyze, interpret, and display single- and two-variable data in appropriate bar, line, and circle graphs; stem-and-leaf plots; and box-and-whisker plots and explain which types of display are appropriate for various data sets.
3, 4	8.7.6	Express solutions clearly and logically using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.
3, 4	8.7.10	Make precise calculations and check the validity of the results in the context of the problem.
<b>Indiana English Language Arts Academic Standards: Grades 6 - 8</b>		
<b>Grade 6</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
All lessons	6.1.4	Understand unknown words in informational texts by using word, sentence, and paragraph clues to determine meaning.
1, 3, 4	6.2.4	Clarify an understanding of texts by creating outlines, notes, diagrams, summaries, or reports.
1, 3, 4	6.2.7	Make reasonable statements and conclusions about a text, supporting them with evidence from the text.

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All lessons	6.4.2	Choose the form of writing that best suits the intended purpose.
All lessons	6.5.2	Write descriptions, explanations, comparison and contrast papers, and problem and solution essays that: state the thesis (position on the topic) or purpose, explain the situation, organize the composition clearly, and offer evidence to support arguments and conclusions.
All lessons	6.5.7	Write for different purposes (information, persuasion, description) and to a specific audience or person, adjusting tone and style as necessary.
All lessons	6.6.5	Spell correctly frequently misspelled words ( <i>their/they're/there, loose/lose/loss, choose/chose, through/threw</i> ).
1, 3, 4	6.7.3	Restate and carry out multiple-step oral instructions and directions.
3, 4	6.7.6	Support opinions with researched, documented evidence and with visual or media displays that use appropriate technology.
All lessons	6.7.15	Ask questions that seek information not already discussed.
<b>Grade 7</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
3, 4	7.2.2	Locate information by using a variety of consumer and public documents.
2, 3, 4	7.2.7	Draw conclusions and make reasonable statements about a text, supporting the conclusions and statements with evidence from the text.
All lessons	7.4.5	Identify topics; ask and evaluate questions; and develop ideas leading to inquiry, investigation, and research.
All lessons	7.5.7	Write for different purposes and to a specific audience or person, adjusting style and tone as necessary.
All lessons	7.7.1	Ask questions to elicit information, including evidence to support the speaker's claims and conclusions.
All lessons	7.7.4	Arrange supporting details, reasons, descriptions, and examples effectively.
<b>Grade 8</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
All lessons	8.1.3	Verify the meaning of a word in its context, even when its meaning is not directly stated, through the use of definition, restatement, example, comparison, or contrast.
2, 3, 4	8.2.9	Make reasonable statements and draw conclusions about a text, supporting them with accurate examples.
All lessons	8.4.2	Create compositions that have a clear message, a coherent thesis (a statement of position on the topic), and end with a clear and well-supported conclusion.
All lessons	8.4.11	Identify topics; ask and evaluate questions; and develop ideas leading to inquiry, investigation, and research.
All lessons	8.5.7	Write for different purposes and to a specific audience or person, adjusting tone and style as necessary.
All lessons	8.6.1	Use correct and varied sentence types (simple, compound, complex, and compound-complex) and sentence openings to present a lively and effective personal style.
All lessons	8.6.5	Use correct punctuation.
All lessons	8.6.6	Use correct capitalization.

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<b>All lessons</b>	<b>8.6.7</b>	Use correct spelling conventions.
<b>Indiana Health Education Academic Standards: Grades 6 – 8</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
4	6.1.1 7.1.1 8.1.1	Explain the importance of assuming responsibility for personal health behaviors.
4	6.1.2 7.1.2 8.1.2	Explain the relationships between personal health behaviors and the prevention of injury, illness, disease, and premature death.
4	6.1.4 7.1.4 8.1.4	Explain how personal health behaviors influence the functioning of body systems. (6) Explain the interrelationships between behaviors, the functioning of body systems, and overall health. (7 & 8)
4	6.1.7 7.1.7 8.1.7	Discuss health problems that should be detected and treated early. (6) Explain how appropriate health care can prevent, detect, and treat health problems. (7 & 8)
3, 4	6.1.8 7.1.8 8.1.8	Describe how pathogens are related to the cause or prevention of disease. (6) Describe how pathogens, family history, and other risk factors are related to the cause or prevention of disease and other health problems. (7 & 8)
3, 4	6.1.9 7.1.9 8.1.9	Explain key health terms and concepts.
4	6.2.2 7.2.2 8.2.2	Demonstrate the ability to utilize resources from home, school, and community that provide valid health information.
3	6.2.5	Identify the role of medical, dental, and other health-related specialists.
3, 4	7.2.6	Describe situations requiring professional health services.
<b>All lessons</b>	6.5.4 7.5.4 8.5.4	Demonstrate ways to communicate care, consideration, and respect of self and others.
<b>All lessons</b>	6.5.5 7.5.5 8.5.5	Demonstrate attentive listening and other communication skills to build and maintain healthy relationships.
3, 4	6.6.1 7.6.1 8.6.1	Demonstrate the ability to apply a decision-making process to health issues and problems individually and collaboratively.

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4	6.6.2 7.6.2 8.6.2	Predict how decisions regarding health behaviors have consequences for self and others.
3, 4	6.7.2 7.7.2 8.7.2	Demonstrate the ability to express information and ideas about health issues.