

<b>THE SCIENCE OF ENERGY BALANCE: CALORIE INTAKE AND PHYSICAL ACTIVITY</b>		
<b>Indiana Science Academic Standards: Grades 6 – 8</b>		
<b>Grade 6</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
1, 3, 4	6.1.2	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.
1, 3, 4	6.1.3	Recognize and explain that hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations.
1, 4	6.1.6	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.
1, 3, 4	6.1.7	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.
1, 2, 3	6.2.2	Use technology, such as calculators or computer spreadsheets, in analysis of data.
1, 2, 3, 4	6.2.5	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.
All lessons	6.2.6	Read simple tables and graphs produced by others and describe in words what they show.
1, 3, 4	6.2.7	Locate information in reference books, back issues of newspapers and magazines, CD-ROMs, and computer databases.
1, 2, 3, 4	6.2.8	Analyze and interpret a given set of findings, demonstrating that there may be more than one good way to do so.
1, 2, 3, 4	6.3.17	Recognize and describe that energy is a property of many objects and is associated with heat, light, electricity, mechanical motion, and sound.
2, 3	6.4.11	Describe that human beings have body systems for obtaining and providing energy, defense, reproduction, and the coordination of body functions.
2	6.7.1	Describe that a system, such as the human body, is composed of subsystems.
2, 4	6.7.2	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.
1, 2, 3	6.7.3	Identify examples of feedback mechanisms within systems that serve to keep changes within specified limits.
<b>Grade 7</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>

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1, 4	7.1.1	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.
1, 4	7.1.4	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.
1, 2	7.2.6	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.
1, 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.
1, 2, 3, 4	7.3.14	Explain that energy in the form of heat is almost always one of the products of an energy transformation, such as in the examples of exploding stars, biological growth, the operation of machines, and the motion of people.
2, 3	7.4.4	Explain that cells continually divide to make more cells for growth and repair and that various organs and tissues function to serve the needs of cells for food, air, and waste removal.
1, 2	7.4.5	Explain that the basic functions of organisms, such as extracting energy from food and getting rid of wastes, are carried out within the cell and understand that the way in which cells function is similar in all organisms.
2, 3	7.4.6	Explain how food provides the fuel and the building material for all organisms.
All lessons	7.4.11	Explain that the amount of food energy (calories) a person requires varies with body weight, age, sex, activity level, and natural body efficiency. Understand that regular exercise is important to maintain a healthy heart/lung system, good muscle tone, and strong bone structure.
1	7.5.4	Describe that the larger the sample, the more accurately it represents the whole. Understand, however, that any sample can be poorly chosen and this will make it unrepresentative of the whole.
1, 2, 3, 4	7.7.1	Explain that the output from one part of a system, which can include material, energy, or information, can become the input to other parts and this feedback can serve to control what goes on in the system as a whole.
2, 4	7.7.2	Use different models to represent the same thing, noting that the kind of model and its complexity should depend on its purpose.
1, 2, 3, 4	7.7.3	Describe how physical and biological systems tend to change until they reach equilibrium and remain that way unless their surroundings change.
<b>Grade 8</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>
1, 4	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.
1, 4	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.
4	8.1.5	Explain why research involving human subjects requires that potential subjects be fully informed about the risks and benefits associated with the research and that they have the right to refuse to participate.
4	8.1.8	Explain that humans help shape the future by generating knowledge, developing new technologies, and communicating ideas to others.

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1, 2, 3	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.
2	8.2.3	Use proportional reasoning to solve problems.
2, 3	8.2.4	Use technological devices, such as calculators and computers, to perform calculations.
1, 4	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.
All lessons	8.2.8	Use tables, charts, and graphs in making arguments and claims in, for example, oral and written presentations about lab or fieldwork.
1, 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.
All lessons	8.3.13	Explain that energy cannot be created or destroyed but only changed from one form into another.
All lessons	8.4.5	Explain that energy can be transferred from one form to another in living things.
1, 4	8.5.4	Illustrate how graphs can show a variety of possible relationships between two variables.
2, 3	8.7.1	Explain that a system usually has some properties that are different from those of its parts but appear because of the interaction of those parts.
1, 4	8.7.3	Use technology to assist in graphing and with simulations that compute and display results of changing factors in models.
1, 2, 3, 4	8.7.5	Observe and describe that a system may stay the same because nothing is happening or because things are happening that counteract one another.

**Indiana Mathematics Academic Standards: Grades 6 – 8**

**Grade 6**

Lesson	Standard	Description
1, 2, 3, 4	6.2.1	Add and subtract positive and negative integers.
2, 3	6.2.2	Multiply and divide positive and negative integers.
2, 3	6.2.3	Multiply and divide decimals.
2	6.2.7	Understand proportions and use them to solve problems.
2, 3	6.2.10	Use mental arithmetic to add or subtract simple fractions and decimals.
1, 2, 4	6.3.9	Investigate how a change in one variable relates to a change in a second variable.
1, 2	6.5.1	Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.
1, 2, 4	6.6.1	Organize and display single-variable data in appropriate graphs and stem-and-leaf plots, and explain which types

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		of graphs are appropriate for various data sets.
1, 2, 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.
1, 2, 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>
1, 2, 3, 4	7.2.1	Solve addition, subtraction, multiplication, and division problems that use integers, fractions, decimals, and combinations of the four operations.
1, 2, 3, 4	7.2.5	Use mental arithmetic to compute with simple fractions, decimals, and powers.
1, 2	7.5.1	Compare lengths, areas, volumes, weights, capacities, times, and temperatures within measurement systems.
1, 2, 4, 5	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.
1, 2	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.
1, 2, 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.
1, 2, 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>
1, 2, 3, 4	8.2.1	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) in multi-step problems.
1, 2, 3, 4	8.2.4	Use mental arithmetic to compute with common fractions, decimals, powers, and percents.
1, 2	8.5.1	Convert common measurements for length, area, volume, weight, capacity, and time to equivalent measurements within the same system.
1, 5	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.
1	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.
1, 2, 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.
1, 2, 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.
1, 2, 3, 4	8.7.10	Make precise calculations and check the validity of the results in the context of the problem.

Indiana English Language Arts Academic Standards: Grades 6 - 8		
Grade 6		
Lesson	Standard	Description
All lessons	6.1.4	Understand unknown words in informational texts by using word, sentence, and paragraph clues to determine meaning.
1, 2, 3, 4	6.2.4	Clarify an understanding of texts by creating outlines, notes, diagrams, summaries, or reports.
All lessons	6.2.7	Make reasonable statements and conclusions about a text, supporting them with evidence from the text.
All lessons	6.4.2	Choose the form of writing that best suits the intended purpose.
1, 2, 3, 4	6.4.3	Write informational pieces of several paragraphs that: engage the interest of the reader, state a clear purpose, develop the topic with supporting details and precise language, and conclude with a detailed summary linked to the purpose of the composition.
3, 4	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.
5	6.5.5	Write persuasive compositions that: state a clear position on a proposition or proposal, support the position with organized and relevant evidence and effective emotional appeals, and anticipate and address reader concerns and counterarguments.
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.
4	6.5.8	Write summaries that contain the main ideas of the reading selection and the most significant details.
All lessons	6.6.5	Spell correctly frequently misspelled words ( <i>their/they're/there, loose/lose/loss, choose/chose, through/threw</i> ).
All lessons	6.7.3	Restate and carry out multiple-step oral instructions and directions.
All lessons	6.7.6	Support opinions with researched, documented evidence and with visual or media displays that use appropriate technology.
3	6.7.11	Deliver informative presentations that: pose relevant questions sufficiently limited in scope to be completely and thoroughly answered, and develop the topic with facts, details, examples, and explanations from multiple authoritative sources, including speakers, periodicals, and online information.
All lessons	6.7.15	Ask questions that seek information not already discussed.
Grade 7		
Lesson	Standard	Description
All lessons	7.2.2	Locate information by using a variety of consumer and public documents.
All lessons	7.2.7	Draw conclusions and make reasonable statements about a text, supporting the conclusions and statements with evidence from the text.

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1, 2, 3, 4	7.4.5	Identify topics; ask and evaluate questions; and develop ideas leading to inquiry, investigation, and research.
5	7.5.4	Write persuasive compositions that: state a clear position or perspective in support of a proposition or proposal, describe the points in support of the proposition, employing well-articulated evidence and effective emotional appeals, and anticipate and address reader concerns and counterarguments.
4	7.5.5	Write summaries of reading materials that: include the main ideas and most significant details, use the student's own words, except for quotations, and reflect underlying meaning, not just the superficial details.
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.
All lessons	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.
1, 2, 3, 4	8.4.11	Identify topics; ask and evaluate questions; and develop ideas leading to inquiry, investigation, and research.
5	8.5.4	Write persuasive compositions that: include a well-defined thesis that makes a clear and knowledgeable appeal, present detailed evidence, examples, and reasoning to support effective arguments and emotional appeals, and provide details, reasons, and examples, arranging them effectively by anticipating and answering reader concerns and counterarguments.
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.
All lessons	8.6.7	Use correct spelling conventions.
3	8.7.12	Deliver research presentations that: define a thesis (a position on the topic), research important ideas, concepts, and direct quotations from significant information sources and paraphrase and summarize important perspectives on the topic, use a variety of research sources and distinguish the nature and value of each, and present information on charts, maps, and graphs.
<b>Indiana Health Education Academic Standards: Grades 6 – 8</b>		
<b>Lesson</b>	<b>Standard</b>	<b>Description</b>

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1, 2, 3, 5	6.1.1 7.1.1 8.1.1	Explain the importance of assuming responsibility for personal health behaviors.
2, 3, 5	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.
5	6.1.3 7.1.3 8.1.3	Describe the interrelationships of mental, emotional, social, and physical health during adolescence.
2, 3, 5	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)
5	6.1.5 7.1.5 8.1.5	Describe how one's surroundings influence mental, emotional, social, and physical health. (6) Analyze interrelationships between the mental, emotional, social, and physical environment and personal health. (7 & 8)
2, 3, 5	6.1.6 7.1.6 8.1.6	Describe ways to reduce risks related to common health problems among adolescents.
3	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)
All lessons	6.1.9 7.1.9 8.1.9	Explain key health terms and concepts.
1, 3, 4, 5	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.
1, 2, 5	6.3.5 7.3.5 8.3.5	Demonstrate the ability to analyze a personal health assessment to determine health strengths and risks.
3, 5	6.3.6 7.3.6 8.3.6	Demonstrate strategies to improve or maintain personal and family health.

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3	6.4.1 7.4.1 8.4.1	Describe how the family, school, and peers influence the health and health behaviors of adolescents.
3	6.4.3 7.4.3 8.4.3	Analyze how messages from media and other sources influence health behaviors.
All lessons	6.5.4 7.5.4 8.5.4	Demonstrate ways to communicate care, consideration, and respect of self and others.
All lessons	6.5.5 7.5.5 8.5.5	Demonstrate attentive listening and other communication skills to build and maintain healthy relationships.
3, 5	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.
1, 2, 3, 5	6.6.2 7.6.2 8.6.2	Predict how decisions regarding health behaviors have consequences for self and others.
5	6.6.3 7.6.3 8.6.3	Demonstrate the ability to set health goals that address personal strengths, needs, and health risks.
5	6.6.4 7.6.4 8.6.4	Demonstrate the ability to design a plan that includes strategies to monitor and attain personal health goals.
1, 2, 3, 5	6.7.1 7.7.1 8.7.1	Analyze various communication methods to accurately express health information and ideas.
All lessons	6.7.2 7.7.2 8.7.2	Demonstrate the ability to express information and ideas about health issues.
2, 3	6.7.3 7.7.3 8.7.4	Demonstrate the ability to influence and support others in making positive health choices.
3	6.7.4 7.7.4 8.7.5	Demonstrate the ability to work cooperatively when advocating for healthy individuals, families, and schools.