

MINNESOTA ALIGNMENT FOR NIH SUPPLEMENT THE SCIENCE OF ENERGY BALANCE: CALORIE INTAKE AND PHYSICAL ACTIVITY

THE SCIENCE OF ENERGY BALANCE: CALORIE INTAKE AND PHYSICAL ACTIVITY		
Minnesota Academic Standards and Benchmarks: Science – Grades 6 – 8		
Grade 6		
Lesson	Standard	Benchmark
1, 2, 3, 5	I.A.1	Distinguish between scientific evidence and personal opinion.
1, 4	I.A.2	Explain why scientists often repeat investigations to be sure of the results.
1, 3, 4	I.B.1	Identify questions that can be answered through scientific investigation and those that cannot.
1, 2, 4	I.B.2	Distinguish among observation, prediction and inference.
1, 2, 3, 4	I.B.3	Use appropriate tools and Système International (SI) units for measuring length, time, mass, volume and temperature with suitable precision and accuracy.
1, 3, 4	I.B.4	Present and explain data and findings from controlled experiments using multiple representations including tables, graphs, physical models and demonstrations.
1, 2, 4	I.C.2	Explain why scientists may work in teams or work alone, can collaborate and, at times, compete.
All lessons	II.C.1	Compare and contrast heat, chemical, mechanical and electrical energy and identify transformations of energy from one form to another in everyday situations
Grade 7		
Lesson	Standard	Benchmark
4, 5	I.A.1	Recognize how scientific knowledge is subject to change as new evidence becomes available, or as new theories cause scientists to look at old observations differently.
1, 2, 3, 4	I.A.2	Explain natural phenomena by using appropriate physical, conceptual and mathematical models.
1, 3, 4	I.B.1	Formulate a testable hypothesis based on prior knowledge.
1, 3, 4	I.B.2	Recognize that a variable is a condition that may influence the outcome of an investigation and know the importance of manipulating one variable at a time.
1, 3	I.B.3	Write a specific step-by-step procedure for a scientific investigation.
1, 2, 3, 4	I.B.4	Explain how classroom scientific investigations relate to established scientific principles.
2, 3, 4	IV.A.1	Know that cells are the fundamental units of life.
2, 3, 4	IV.A.4	Recognize that cells repeatedly divide for growth and repair.
2, 3, 4	IV.A.5	Recognize that cells convert energy from food for the production of molecules necessary for life, and for life processes including cell growth and cell division.
3	IV.A.6	Recognize that specialized cells in multi-cellular organisms perform specialized functions.
3, 4	IV.B.1	Explain that individuals are composed of specialized cells, tissues, organs and organ systems that perform

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		specialized functions.
3, 4	IV.B.3	Recognize that behavioral responses of organisms may be determined by heredity and past experience.
3, 4	IV.D.1	Recognize that inherited traits result from information contained in genes, which are located on chromosomes of each cell.
3, 4, 5	IV.D.4	Comprehend that interactions with the environment affect some inherited traits.
3, 4	IV.E.3	Explain how biological adaptations in structure, function and behavior enhance the reproductive success and survival of a species in a particular environment.
3, 4, 5	IV.G.1	Recognize that disease can be caused by genetics, infection by other organisms, exposure to environmental factors or a combination of these.
3	IV.G.3	Describe the structure and function of systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination and for protection from disease, in the human organism.

Grade 8

Lesson	Standard	Benchmark
1, 3, 4, 5	I.A.1	Explain and give examples of how science can be used to make informed ethical decisions by identifying likely consequences of particular actions
1, 3, 4	I.A.2	Explain the development, usefulness and limitations of scientific models in the explanation and prediction of natural phenomena.
1, 3, 4	I.B.1	Know that scientific investigations involve the common elements of systematic observations, the careful collection of relevant evidence, logical reasoning and innovation in developing hypotheses and explanations.
1, 3, 4	I.B.2	Describe how scientists can conduct investigations in a simple system and make generalizations to more complex systems.
1, 4	I.B.1	Specify variables to be changed, controlled and measured.
1, 4	I.B.2	Use sufficient trials and adequate sample size to ensure reliable data.
1, 2, 3, 4	I.B.3	Use appropriate technology and mathematics skills to access, gather, store, retrieve and organize data.
1, 3, 4, 5	I.C.1	Evaluate the credibility and validity of scientific and technological information from various sources.

Minnesota Academic Standards and Benchmarks: Mathematics – Grades 6 – 8 (11/2006 Draft Version)

Grade 6

Lesson	Standard	Benchmark
1, 2, 3, 4	Number Sense A.2	Understand the inverse relationship between addition and subtraction, and fluently perform addition and subtraction with positive rational numbers in both decimal and fractional form.
1, 2, 3, 4	Number Sense A.4	Understand the inverse relationship between multiplication and division, and fluently perform multiplication and division with positive rational numbers in decimal, fractional, and percent form.

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1, 2, 3, 4	Number Sense A.6	Represent positive rational numbers as fractions, mixed numbers, decimals, or percents; and convert among various forms as appropriate in real world and mathematical problems.
1, 2, 3, 4	Algebra B.2	Solve one-step equations involving positive whole numbers or decimals.
2, 3, 4	Algebra B.3	Solve problems involving ratios and rates, such as unit conversion within a measuring system, geometry problems (circumference of a circle), and distance-speed problems.
1, 3, 4, 5	Data & Probability A.2	Use charts and graphs, including line graphs that display changes over time, to represent data.
1, 4	Information & Technology Literacy A.1	Use a computer with appropriate software or Internet applications to analyze and display data; explore two-dimensional shapes under transformations. Use a calculator to explore patterns with exponents as repeated multiplication or division.
1, 2, 3, 4	Information & Technology Literacy B.1	Generate research questions based on assigned topics or interests, gather data, organize, display and evaluate information, make conclusions, make predictions between data points, present results to an audience, and identify strengths and weaknesses of the process.

Grade 7

Lesson	Standard	Benchmark
1, 2, 3, 4	Number Sense A.1	Represent rational numbers as fractions, mixed numbers, decimals, percents, or scientific notation (positive and negative powers of 10) and convert among various forms as appropriate in real world and mathematical problems.
1, 2, 3, 4	Number Sense A.2	Efficiently and accurately perform addition, subtraction, multiplication, and division using positive and negative rational numbers, in decimal and fractional forms.
2, 3, 4	Algebra A.2	Use ratios and proportions to solve problems in numerous contexts including percent problems (taxes, discounts, tips), problems about similar geometric objects (using scale factors), and problems involving a constant rate of change (distance-speed), and unit conversion where the conversion factor is given.
1, 2, 3, 4	Algebra A.3	Recognize a proportional relationship (where the y-intercept is 0) in a real world situation; represent the relationship in tables, verbal descriptions, formulas, or graphs; and be able to translate from one to another. These situations may include geometric relationships such as that between the diameter and circumference of a circle.
1, 2, 3, 4	Algebra B.1	Use the properties of arithmetic (associative, commutative, distributive, and the properties of 1 and 0) and appropriate use of grouping symbols and order of operations to generate equivalent algebraic expressions and to solve simple multi-step equations.
1, 2, 3, 4	Algebra B.2	Solve simple equations with up to three variables, when the values of two of the variables are given, including those that express an inverse proportional relationship such as speed = distance/time.

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1, 3, 4	Data & Probability B.1	Use percentages to interpret, construct, and analyze circle graphs and histograms.
1, 4	Information & Technology Literacy A.1	Use a computer with appropriate software or Internet applications to analyze and display data; explore similarity. Use a calculator to explore patterns with exponents as repeated multiplication or division and to understand irrational roots and scientific notation.
1, 2, 3, 4	Information & Technology Literacy B.1	Generate research questions based on assigned topics or interests, gather data, organize, display and evaluate information, make conclusions, make predictions between data points, present results to an audience, and identify strengths and weaknesses of the results and process.

Grade 8

Lesson	Standard	Benchmark
3, 4	Algebra A.3	Recognize a linear function in a real world situation; represent the function in tables, verbal descriptions, symbols (including function notation like $f(x)$), or graphs; and be able to translate from one to another.
1, 2, 3, 4	Information & Technology Literacy B.1	Generate research questions based on assigned topics or interests, gather data, organize, display and evaluate information, make conclusions, make predictions between data points, present results to an audience, and identify strengths and weaknesses of the results and process.

Minnesota Academic Standards and Benchmarks: Language Arts – Grades 6 – 8

Grade 6

Lesson	Standard	Benchmark
1, 2, 3, 4	I.A.1	Read unfamiliar complex and multi-syllabic words using advanced phonetic analysis and structural analysis.
All lessons	I.B.1	Acquire, understand and use new vocabulary through explicit vocabulary instruction and independent reading.
1, 3, 4	I.C.1	Summarize and paraphrase what is read.
1, 3, 4	I.C.2	Recall and use prior learning and preview text to prepare for reading.
1, 3, 4	I.C.3	Generate and answer literal, inferential, interpretive and evaluative questions to demonstrate understanding about what is read.
1, 3, 4	I.C.5	Identify the main idea and supporting details.
1, 3, 4	I.C.7	Distinguish fact from opinion and give examples from text.
All lessons	I.C.9	Create outlines, logical notes and summaries across content areas.
All lessons	I.C.12	Compare and contrast information from different sources on the same topic.
1, 3, 4, 5	II.A.1	Write frequently in a variety of forms, including but not limited to the following: poems, stories, plays, essays,

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		journals, letters, directions, editorials, business communications and reports.
1, 3, 4, 5	II.B.1	Create multiple paragraph compositions that state, maintain and use details in a logical order to support a main idea.
1, 3, 4, 5	II.B.3	Create informative reports, including gathering material, formulating ideas based on gathered material, organizing information, and editing for logical progression.
1, 3, 4, 5	II.C.1	Compose complete sentences when writing.
1, 3, 4, 5	II.C.3	Apply grammar conventions correctly in writing.
1, 3, 4, 5	II.C.4	Apply punctuation conventions correctly in writing.
All lessons	II.D.1	Gather and synthesize information from a variety of sources, including electronic and print.
All lessons	III.A.1	Participate in and follow agreed-upon rules for conversation and formal discussions in large and small groups.
All lessons	III.A.2	Know and apply listening rules and expectations for formal settings and demonstrate comprehension.
All lessons	III.A.3	Actively listen and comprehend messages.
All lessons	III.A.5	Distinguish between a speaker's opinion and verifiable facts.
All lessons	III.A.6	Orally communicate information, opinions and ideas effectively to different audiences for a variety of purposes.
1, 3, 4	III.C.2	Evaluate the accuracy and credibility of information found on Internet sites.
Grade 7		
Lesson	Standard	Benchmark
1, 2, 3, 4	I.A.1	Read unfamiliar complex and multi-syllabic words using cueing systems, advanced phonetic analysis and structural analysis.
All lessons	I.B.1	Acquire, understand and use new vocabulary through explicit vocabulary instruction and independent reading.
1, 3, 4	I.B.2	Analyze word structure and use context clues to understand new words.
1, 3, 4	I.C.1	Comprehend, interpret and evaluate text by asking and answering questions.
1, 3, 4	I.C.2	Recall and use prior learning and preview text to prepare for reading.
1, 3, 4, 5	I.C.4	Make inferences and draw conclusions based on explicit and implied information from texts.
All lessons	I.C.5	Create outlines, logical notes and summaries across content areas.
1, 3, 4	I.C.7	Distinguish statements of fact from opinion and give examples from text.
1, 2, 3, 4	I.C.9	Follow written directions in technical reading.
1, 3, 4, 5	II.A.1	Write frequently in a variety of forms, including but not limited to the following: poetry, stories, essays, editorials, letters, directions and research reports.
1, 3, 4, 5	II.B.1	Create multiple paragraph compositions that state, maintain and use details in a logical order to support a main idea.

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1, 3, 4, 5	II.B.3	Create informative reports, including gathering material, formulating ideas based on gathered material, organizing information, and editing for logical progression.
1, 3, 4, 5	II.B.5	Consider the intended audience when composing text.
1, 3, 4, 5	II.C.1	Compose complete sentences when writing.
1, 3, 4, 5	II.C.3	Apply grammar conventions correctly in writing.
1, 3, 4, 5	II.C.4	Apply punctuation conventions correctly in writing.
1, 3, 4, 5	II.D.1	Formulate questions and collect and assess relevant information to address these questions.
All lessons	II.D.3	Gather and organize information from a variety of sources, including electronic and print.
All lessons	III.A.1	Participate in and follow agreed-upon rules for conversation and formal discussions in large and small groups.
All lessons	III.A.2	Know and apply listening rules for formal settings.
All lessons	III.A.4	Distinguish between speaker's opinion and verifiable facts and analyze the credibility of the presentation.
All lessons	III.A.6	Orally communicate information, opinions, and ideas effectively to different audiences for a variety of purposes.
All lessons	III.A.7	Adjust delivery and language in oral presentations for the intended audiences and purposes.
1, 3, 4	III.C.2	Evaluate the accuracy and credibility of information found on Internet sites.
1, 3, 4	III.C.4	Critically analyze the messages and points of view employed in different media, including advertising, news programs, web sites, and documentaries.

Grade 8

Lesson	Standard	Benchmark
All lessons	I.B.1	Acquire, understand and use new vocabulary through explicit and indirect vocabulary instruction and independent reading.
1, 3, 4	I.C.1	Summarize and paraphrase main idea and supporting details.
1, 3, 4	I.C.2	Recall and use prior learning and preview text to prepare for reading.
1, 3, 4, 5	I.C.3	Comprehend, interpret and evaluate information in a variety of texts using a combination of strategies before, during and after reading.
1, 3, 4, 5	I.C.4	Make inferences and draw conclusions based on explicit and implied information from texts.
All lessons	I.C.8	Create outlines, logical notes, and summaries of text in various content areas.
1, 2, 3, 4	I.C.12	Follow written directions in technical reading.
1, 3, 4, 5	II.A.1	Write frequently in a variety of forms, including but not limited to the following: poetry, stories, essays, editorials, letters, directions and research reports. <i>By the end of grade 8, student will have written in all forms listed.</i>
1, 3, 4, 5	II.B.1	Create multiple paragraph compositions that state, maintain and use details in a logical order to support a main idea.

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1, 3, 4, 5	II.B.3	Create informative reports, including gathering material, formulating ideas based on gathered material, organizing information and editing for logical progression.
1, 3, 4, 5	II.B.7	Consider the intended audience when composing text.
1, 3, 4, 5	II.C.1	Compose complete sentences when writing.
1, 3, 4, 5	II.C.3	Apply grammar conventions correctly in writing.
1, 3, 4, 5	II.C.4	Apply punctuation conventions correctly in writing.
All lessons	II.D.1	Formulate questions, collect, organize and synthesize relevant information from a variety of sources, including print and electronic media.
All lessons	III.A.1	Participate in and follow agreed-upon rules for conversation and formal discussions in large and small groups.
All lessons	III.A.2	Actively listen and comprehend messages.
All lessons	III.A.4	Distinguish between speaker's opinion and verifiable facts and analyze the credibility of the presentation.
All lessons	III.A.6	Orally communicate information, opinions and ideas effectively to different audiences, adjusting delivery and language for intended audience and purpose.
All lessons	III.A.7	Participate effectively in group meetings.
1, 3, 4	III.C.1	Evaluate the accuracy and credibility of information found on Internet sites.
1, 3, 4	III.C.3	Critically analyze the messages and points of view employed in different media, including advertising, news programs, web sites and documentaries.

National Health Education Standards – Grades 6 – 8: cited from pre-publication document of National Health Education Standards, Pre K-12, American Cancer Society, December 2005 – August 2006

Lesson	Standard	Performance Indicator
All lessons	1.8.1	Analyze the relationship between healthy behaviors and personal health.
3	1.8.2	Describe the interrelationship of emotional, intellectual, physical, and social health in adolescence.
All lessons	1.8.3	Analyze how the environment impacts personal health.
3, 5	1.8.4	Describe how family history can impact personal health.
2, 3, 4, 5	1.8.5	Describe ways to reduce or prevent injuries and other adolescent health problems.
2, 3, 4, 5	1.8.7	Describe the benefits and barriers to practicing healthy behaviors.
2, 3, 4, 5	1.8.8	Examine the likelihood of injury or illness if engaging in unhealthy behaviors.
2, 3, 4, 5	1.8.9	Examine the potential seriousness of injury or illness if engaging in unhealthy behaviors.
2, 3, 5	2.8.1	Examine how family influences the health of individuals.
2, 3, 5	2.8.3	Describe how peers influence healthy and unhealthy behaviors.
2, 3, 5	2.8.5	Analyze how messages from the media influence personal and family health.

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1, 2, 3, 5	2.8.8	Explain the influence of personal values and beliefs on individual health practices and behaviors.
2, 3, 4, 5	2.8.9	Describe how some health risk behaviors can influence the likelihood of engaging in unhealthy behaviors.
2, 3, 5	2.8.10	Explain how school and public health policies can influence health promotion and disease prevention.
2, 3, 4, 5	3.8.1	Analyze the validity of health information, products, and services.
2, 3, 5	3.8.4	Describe situations that may require professional health services.
2, 3, 4, 5	4.8.1	Apply effective verbal and nonverbal communication skills to enhance health.
2, 3, 5	5.8.1	Identify circumstances that can help or hinder healthy decision-making.
2, 3, 5	5.8.2	Determine when health-related situations require the application of a thoughtful decision-making process.
2, 3, 5	5.8.3	Distinguish when individual or collaborative decision-making is appropriate.
2, 3, 5	5.8.5	Predict the potential short and long-term impact of each alternative on self and others.
2, 3, 5	5.8.6	Choose healthy alternatives over unhealthy alternatives when making a decision.
1, 2, 3, 5	5.8.7	Analyze the outcomes of a health-related decision.
1, 2, 5	6.8.1	Assess personal health practices.
5	6.8.2	Develop a goal to adopt, maintain, or improve a personal health practice.
5	6.8.3	Apply strategies and skills needed to attain a personal health goal.
2, 3, 5	6.8.4	Describe how personal health goals can vary with changing abilities, priorities, and responsibilities.
1, 2, 3, 5	7.8.1	Explain the importance of assuming responsibility for personal health behaviors.
2, 5	7.8.2	Demonstrate healthy practices and behaviors that will maintain or improve the health of self and others.
2, 5	7.8.3	Demonstrate behaviors to avoid or reduce health risks to self and others.
All lessons	8.8.1	State a health enhancing position on a topic and support it with accurate information.
2, 3, 5	8.8.2	Demonstrate how to influence and support others to make positive health choices.
2, 3, 5	8.8.4	Identify ways that health messages and communication techniques can be altered for different audiences.