

WASHINGTON ALIGNMENT FOR NIH SUPPLEMENT DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY

<b>DOING SCIENCE: THE PROCESS OF SCIENTIFIC INQUIRY</b>		
Washington Essential Academic Learning Requirements/Grade Level Expectations: Science Grades 6, 7, 8		
<b>Lesson</b>	<b>GLE</b>	<b>Description</b>
<b>3</b>	<b>1.2.1</b>	Analyze how the parts of a system interconnect and influence each other.
<b>3</b>	<b>1.2.8</b>	Understand human life functions and the interconnecting organ systems necessary to maintain human life.
<b>All lessons</b>	<b>2.1.1.a</b>	Generate multiple questions based on observations.
<b>All lessons</b>	<b>2.1.1.b</b>	Generate a question that can be investigated scientifically.
<b>All lessons</b>	<b>2.1.1.c</b>	Generate a new question that can be investigated with the same materials and/or data as a given investigation.
<b>1, 3, 4</b>	<b>2.1.2.a</b>	Make predictions (hypothesize) and give reasons.
<b>All lessons</b>	<b>2.1.2.b</b>	Generate a logical plan for, and conduct, a systematic and complex scientific controlled investigation with the following attributes: prediction (hypothesis); appropriate materials, tools and available computer technology; controlled variables (kept the same); one manipulated (changed) variable; responding (dependent) variable; gather, record, and organize data using appropriate units, charts, and/or graphs; multiple trials.
<b>2</b>	<b>2.1.2.d</b>	Identify and explain safety requirements that would be needed in an investigation.
<b>1, 3, 4</b>	<b>2.1.3.a</b>	Generate a scientific conclusion including supporting data from an investigation using inferential logic.
<b>1, 3, 4</b>	<b>2.1.3.b</b>	Describe a reason for a given conclusion using evidence from an investigation.
<b>1, 3, 4</b>	<b>2.1.3.c</b>	Generate a scientific explanation of an observed phenomenon using given data.
<b>1, 3, 4</b>	<b>2.1.3.d</b>	Predict what logically might occur if an investigation lasted longer or changed.
<b>All lessons</b>	<b>2.1.3.e</b>	Explain the difference between evidence (data) and conclusions.
<b>1, 2, 3</b>	<b>2.1.4.a</b>	Compare models or computer simulations of phenomena to the actual phenomena.
<b>1, 2, 3</b>	<b>2.1.4.b</b>	Explain how models or computer simulations are used to investigate and predicts the behavior objects, events, systems, or processes.
<b>1, 2, 3</b>	<b>2.1.4.c</b>	Create a model or computer simulation to investigate, predict, and explain the behavior of objects, events, systems, or processes (e.g., phases of the Moon using a solar system model).
<b>1, 2, 3</b>	<b>2.1.4.d</b>	Explain the advantages and limitations of investigating with a model.
<b>1, 3, 4</b>	<b>2.1.5.a</b>	Report observations of scientific investigations without making inferences.
<b>All lessons</b>	<b>2.1.5.b</b>	Summarize an investigation by describing: reasons for selecting the investigative plan; materials used in the investigation; observations, data, results; explanations and conclusions in written, mathematical, oral, and

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		information technology presentation formats; ramifications of investigations; and safety procedures used.
1, 2	2.1.5.c	Describe the difference between an objective summary of data and an inference made from data.
1, 2	2.2.1.c	Describe how scientists accurately and honestly record, report, and share observations and measurements without bias.
1, 2, 3	2.2.2.a	Describe how a theory logically explains a given set of facts.
All lessons	2.2.2.b	Describe how new facts or evidence may result in the modification or rejection of a theory (e.g., caloric theory of heat, theory of acquired characteristics).
All lessons	2.2.3.a	Compare two or more similar investigations and explain why different results were produced (e.g., insufficient data could be interpreted as inconsistent results).
All lessons	2.2.3.b	Explain whether sufficient data has been obtained to make a conclusion.
All lessons	2.2.5.a	Describe how scientific inquiry results in new facts, evidence, unexpected findings, ideas, and explanations.
1, 3, 4	2.2.5.b	Describe how results of scientific inquiry may change our understanding of the systems in the natural and constructed world.
1, 3, 4	2.2.5.c	Describe how increased understanding of systems leads to new questions to be investigated.
All lessons	2.2.5.e	Describe how new investigative questions arise at the completion of scientific inquiry.
All lessons	3.1.1.a	Describe how science and technology could be used to solve all or part of a human problem and vice versa.
All lessons	3.1.1.c	Explain how to scientifically gather information to develop a solution (e.g., perform a scientific investigation and collect data to establish the best materials to use in a solution to the problem).
All lessons	3.1.1.d	Describe an appropriate question that could lead to a possible solution to a problem.
All lessons	3.1.2.a	Propose, implement, and document the scientific design process used to solve a problem or challenge: define the problem; scientifically gather information and collect measurable data; explore ideas; make a plan; list steps to do the plan; scientifically test solutions; document the scientific design process.
All lessons	3.2.2.a	Describe how scientific investigations and scientific research support technology.
All lessons	3.2.2.b	Describe how technology supports scientific investigations and research.
All lessons	3.2.2.d	Compare the processes of scientific inquiry and scientific design in terms of activities, results, and/or influence on individuals and/or society.

**Washington Essential Academic Learning Requirements/Grade Level Expectations:  
Mathematics Grades 6, 7, 8 (2006 Draft Version)**

<b>Lesson</b>	<b>GLE</b>	<b>Description</b>
3, 4	1.1.1	Understand the concept and symbolic representation of fractions, decimals, and integers. (7)

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<b>3, 4</b>	<b>1.1.2</b>	Understand the relative values of decimals, fractions, or integers. (7)
<b>3, 4</b>	<b>1.1.4</b>	Understand the concepts of ratio and percent. (6) Understand the concept of direct proportion. (7) Apply the concepts of ratio, percent, and direct proportion. (8)
<b>3, 4</b>	<b>1.1.5</b>	Understand the meaning of addition and subtraction of integers. (7)
<b>3, 4</b>	<b>1.1.6</b>	Apply strategies or uses computational procedures using order of operations to add, subtract, multiply, and divide non-negative decimals and fractions. (7)
<b>3, 4</b>	<b>1.1.7</b>	Apply strategies and uses tools to complete tasks involving addition and subtraction of integers and the four basic operations on non-negative decimals and fractions. (7)
<b>1</b>	<b>1.2.3</b>	Understand how the unit of measure affects the precision of measurement. (7)
<b>2, 3, 4</b>	<b>1.4.3</b>	Understand how a question, collection method, (6) and/or population may affect the data collected. (7) Describe how different samples of a population may affect the data collected. (8)
<b>3, 4</b>	<b>1.4.5</b>	Read and interpret data presented in diagrams, single line graphs, and histograms. (6) Read and interpret data presented in diagrams, tables of ordered pairs, and scatter plots and makes predictions based on the data. (8)
<b>1, 3, 4</b>	<b>1.4.6</b>	Determine and explain how data can support a point of view. (6) Determine and explain how the same set of data can support different points of view. (7 & 8)
<b>3</b>	<b>1.5.1</b>	Apply knowledge of linear relationships to recognize, extend, and/or create patterns in tables and graphs. (7)
<b>All lessons</b>	<b>2.1.1</b>	Formulate questions to be answered to solve a problem.
<b>All lessons</b>	<b>2.1.2</b>	Determine what information is missing or extraneous.
<b>All lessons</b>	<b>2.1.3</b>	Identify what is known and unknown in complex situations.
<b>All lessons</b>	<b>2.2.1</b>	Select and use relevant information to construct solutions.
<b>All lessons</b>	<b>2.2.3</b>	Apply a variety of strategies and approaches to construct solutions.
<b>3, 4</b>	<b>2.2.4</b>	Determine whether a solution is viable, is mathematically correct, and answers the question(s).
<b>1, 3, 4</b>	<b>3.1.1</b>	Analyze numerical, measurement, geometric, probability, statistical, and/or algebraic information from a variety of sources.
<b>1, 3, 4</b>	<b>3.2.1</b>	Draw and support conclusions.
<b>1, 3, 4</b>	<b>3.2.2</b>	Evaluate selection and implementation of procedures and conclusions in various situations.
<b>1, 3, 4</b>	<b>3.3.1</b>	Justify results using evidence.
<b>1, 3, 4</b>	<b>3.3.2</b>	Evaluate reasonableness of results.
<b>1, 3, 4</b>	<b>3.3.3</b>	Validate thinking about numerical, measurement, geometric, probability, statistical, and/or algebraic ideas.

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3, 4	4.1.1	Develop and follow a plan for collecting numerical, measurement, geometric, probability, statistical, (6) and/or algebraic information. (7 & 8)
3, 4	4.1.2	Extract numerical, measurement, geometric, probability, statistical, (6) and/or algebraic information from multiple sources. (7 & 8)
3, 4	4.2.1	Organize numerical, measurement, geometric, probability, statistical, (6) and/or algebraic information for a given purpose. (7 & 8)
3, 4	4.2.2	Represent numerical, measurement, geometric, probability, statistical, (6) and/or algebraic information in graphs or other appropriate forms. (7 & 8)
3, 4	4.2.3	Use mathematical language to explain or describe numerical, measurement, geometric, probability, statistical, (6) and/or algebraic ideas and information in ways appropriate for audience and purpose. (7 & 8)
3, 4	5.1.1	Apply concepts and procedures from two or more of the content strands, including number sense, measurement, geometric sense, probability and statistics, and/or algebraic sense, in a given problem or situation.
3, 4	5.1.2	Relate and use different mathematical models and representations of the same situation.
3, 4	5.2.1	Use mathematical patterns and ideas to extend mathematical thinking and modeling to other disciplines.
3, 4	5.3.1	Understand that mathematics is used extensively in daily life outside the classroom.
3, 4	5.3.2	Understand that mathematics is used in many occupations or careers.

**Washington Essential Academic Learning Requirements/Grade Level Expectations: Reading Grades 6, 7, 8**

<b>Lesson</b>	<b>GLE</b>	<b>Description</b>
All lessons	1.2.2	Apply a variety of strategies to comprehend words and ideas (8) in complex text. (6, 7)
All lessons	1.3.1	Understand and apply new vocabulary (6, 7)
All lessons	1.3.2	Understand and apply content/academic vocabulary critical to the meaning of the text,(6, 7) including vocabularies relevant to different contexts, cultures, and communities. (8)
All lessons	2.1.3	Apply comprehension monitoring strategies during and after reading: determine importance using theme, main idea, and supporting details in grade-level informational/expository text and/or literary/narrative text.
All lessons	2.1.4	Apply comprehension monitoring strategies before, during, and after reading: use prior knowledge.
All lessons	2.1.5	Apply comprehension monitoring strategies before, during, and after reading: predict and infer.
All lessons	2.1.6	Apply comprehension monitoring strategies to understand fiction, nonfiction, informational, and task-oriented text: monitor for meaning, create mental images, and generate and answer questions.

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<b>All lessons</b>	<b>2.1.7</b>	Apply comprehension monitoring strategies during and after reading: summarize grade-level informational/expository text and literary/narrative text (6 & 7); determine importance and summarize text. (8)
<b>All lessons</b>	<b>2.2.2</b>	Apply understanding of (complex organizational features of [8]) printed and electronic text features to locate information and comprehend text.
<b>All lessons</b>	<b>2.3.2</b>	Analyze sources for information appropriate to (6 & 7) / for relevance in meeting (8) a specific topic or for a specific purpose.
<b>All lessons</b>	<b>2.4.1</b>	Apply the skills of drawing conclusions, providing a response, and expressing insights about informational/expository text and literary/narrative text. (6) ... to draw conclusions and develop insights. (7 & 8)
<b>All lessons</b>	<b>2.4.5</b>	Understand how to generalize/extend information beyond the text (7) to another text or to a broader idea or concept. (6)
<b>All lessons</b>	<b>2.4.5</b>	Analyze text to generalize, express insight, or respond by connecting to other texts or situations. (8)
<b>All lessons</b>	<b>3.1.1</b>	Analyze/Evaluate appropriateness of a variety of resources and use them to perform a specific task or investigate a topic. (6 & 7)
<b>All lessons</b>	<b>3.1.1</b>	Analyze web-based and other resource materials (including primary sources and secondary sources) for relevance in answering research questions. (8)

**Washington Essential Academic Learning Requirements/Grade Level Expectations: Writing Grades 6, 7, 8**

<b>Lesson</b>	<b>GLE</b>	<b>Description</b>
<b>All lessons</b>	<b>1.1.1</b>	Applies more than one strategy for generating ideas and planning writing. (6) Analyzes and selects effective strategies for generating ideas and planning writing. (7 & 8)
<b>All lessons</b>	<b>1.5.1</b>	Publishes in formats that are appropriate for specific audiences and purposes.
<b>All lessons</b>	<b>2.1.1</b>	Applies understanding of multiple and varied audiences to write effectively.
<b>All lessons</b>	<b>2.2.1</b>	Demonstrates understanding of different purposes for writing.
<b>All lessons</b>	<b>2.3.1</b>	Uses a variety of forms/genres.
<b>All lessons</b>	<b>3.1.1</b>	Analyzes ideas, selects a manageable topic, and elaborates using specific, relevant details and/or examples.
<b>All lessons</b>	<b>3.1.2</b>	Uses (6) / Analyzes and selects (7 & 8) an effective organizational structure.
<b>All lessons</b>	<b>3.2.1</b>	Applies understanding that different audiences and purposes affect writer's voice.
<b>All lessons</b>	<b>3.2.2</b>	Analyzes and selects language appropriate for specific audiences and purposes.
<b>All lessons</b>	<b>3.2.3</b>	Uses a variety of sentences (6 & 7) consistent with audience, purpose, and form. (8)

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<b>All lessons</b>	<b>3.3.1</b>	Uses legible handwriting.
<b>All lessons</b>	<b>3.3.5</b>	Applies usage rules.
<b>All lessons</b>	<b>3.3.6</b>	Uses complete sentences in writing.
<b>All lessons</b>	<b>3.3.7</b>	Applies paragraph conventions.
<b>All lessons</b>	<b>4.1.2</b>	Analyzes and evaluates own writing using established criteria.

**Washington Essential Academic Learning Requirements/Grade Level Expectations: Communication Grades 6, 7, 8**

<b>Lesson</b>	<b>GLE</b>	<b>Description</b>
<b>All lessons</b>	<b>1.1.1</b>	Applies a variety of listening strategies to accommodate the listening situation.
<b>All lessons</b>	<b>1.1.2</b>	Applies a variety of listening and observation skills/strategies to interpret information.
<b>All lessons</b>	<b>1.2.1</b>	Analyzes relationships within and between visual and auditory information. (6 & 7) Evaluates effectiveness of and creates a personal response to visual and auditory information. (8)
<b>All lessons</b>	<b>2.1.1</b>	Analyzes the needs of the audience, situation, and setting to adjust language (6 & 7) and other communication strategies. (8)
<b>All lessons</b>	<b>2.2.1</b>	Uses communication skills that demonstrate respect.
<b>All lessons</b>	<b>2.2.2</b>	Applies skills and strategies to contribute responsibly in a group setting.
<b>All lessons</b>	<b>3.1.1</b>	Applies skills to plan and organize effective oral communication and presentation.
<b>All lessons</b>	<b>3.3.1</b>	Applies skills and strategies for the delivery of effective oral communication and presentations.

**Washington Essential Academic Learning Requirements: Health and Fitness Grade 8**

<b>Lesson</b>	<b>EALR</b>	<b>Description</b>
<b>3, 4</b>	<b>2.2.2.b</b>	Describe personal and health care practices that result in prevention, detecting, and treatment of communicable diseases.
<b>3, 4</b>	<b>3.1.2</b>	Describe the influence of environmental factors that positively and negatively affect health.
<b>4</b>	<b>3.2.2.a</b>	Distinguish between safe and unsafe use of health-care products.
<b>3, 4</b>	<b>3.2.2.c</b>	Analyze health-care needs and identify sources of health care.