

WASHINGTON ALIGNMENT FOR NIH SUPPLEMENT HUMAN GENETIC VARIATION

HUMAN GENETIC VARIATION		
Washington Essential Academic Learning Requirements/Grade Level Expectations: Science Grades 9 – 10		
Activity	GLE	Description
1, 3	1.1.6	Analyze the relationship among organisms based on their shared physical, biochemical, genetic, and cellular characteristics and functional processes.
2	1.2.1.a	Describe the function of a system's parts or subsystems.
2	1.2.1.c	Explain the interconnections between a system's parts or subsystems.
2	1.2.6.b	Describe how DNA molecules are long chains linking four kinds of smaller molecules, whose sequence encodes genetic information.
2, 3	1.2.6.c	Describe how genes (DNA segments) provide instructions for assembling protein molecules in cells.
2	1.2.7b	Describe the possible results from mutation in DNA (e.g., only mutations in sex cells can be passed to offspring; mutations in other cells can only be passed to descendant cells).
1, 2	1.2.7.d	Describe how organisms pass on genetic information via sexual life cycles (i.e., the replication of genes in asexual reproduction results in the same gene combinations in the offspring as those of the parent).
2	1.3.9.a	Describe the factors that drive natural selection (i.e., overproduction of offspring, genetic variability of offspring, finite supply of resources, competition for resources, and differential survival).
2	1.3.9.b	Explain how natural selection and adaptation lead to organisms well suited for survival in particular environments.
1, 3, 4	2.1.1.a	Generate a new question that can be investigated with the same materials and/or data as a given investigation.
1, 2, 3, 4	2.1.1.b	Generate questions, and critique whether questions can be answered through scientific investigations.
2, 3	2.1.2.a	Make a hypothesis about the results of an investigation that includes a prediction with a cause-effect reason.
3	2.1.2.b	Generate a logical plan for, and conduct, a systematic and complex scientific controlled investigation with the following attributes: hypothesis (with cause-effect reason); appropriate materials, tools, and available computer technology; controlled variables; one manipulated variable; responding (dependent) variable; gather, record, and organize data using appropriate units, charts, and/or graphs; multiple trials; experimental control condition when appropriate; and additional validity measures.
1, 2, 3	2.1.3.a	Generate a scientific conclusion, including supporting data from an investigation, using inferential

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		logic.
1, 2, 3, 4	2.1.3.b	Describe a reason for a given conclusion using evidence from an investigation.
1, 2, 3, 4	2.1.3.c	Generate a scientific explanation of an observed phenomenon using given data.
3, 4	2.1.3.d	Predict and explain what logically might occur if an investigation lasted longer or changed.
1, 3, 4	2.1.3.e	Explain the difference between evidence (data) and conclusions.
2, 3	2.1.3.f	Revise a scientific explanation to better fit the evidence and defend the logic of the revised explanation.
2, 3	2.1.3.g	Explain how scientific evidence supports or refutes claims or explanations of phenomena.
3, 4	2.1.4.a	Compare how a model or different models represent the actual behavior of an object, event, system, or process.
3, 4	2.1.4.b	Evaluate how well a model describes or predicts the behavior of an object, event, system, or process.
3, 4	2.1.4.c	Create a physical, conceptual, and/or mathematical (computer simulation) model to investigate, predict, and explain the behavior of objects, events, systems, or processes (e.g., DNA replication).
1, 2, 3	2.1.5.a	Report observations of scientific investigations without making inferences.
3	2.1.5.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 information technology presentation formats; ramifications of investigations to concepts, principles, and theories; and safety procedures used.
1	2.1.5.c	Describe the difference between an objective summary of data and an inference made from data.
1, 2, 3	2.1.5.d	Compare the effectiveness of different graphics and tables to describe patterns, explanations, conclusions, and implications found in investigations.
2, 3	2.1.5.e	Critique a scientific report for completeness, accuracy, and objectivity.
2, 3, 4	2.2.1.b	Explain why a claim or a conclusion is flawed (e.g., limited data, lack of controls, weak logic).
2, 3	2.2.2.a	Describe how a theory logically explains a set of facts, principles, concepts, and/or knowledge.
2, 3	2.2.2.b	Describe a theory that best explains and predicts phenomena and investigative results.
2, 3	2.2.2.c	Explain how scientific theories are open to investigation and have the capacity to be modified.
3	2.2.3.a	Evaluate similar investigations with inconsistent or unexpected results.
3, 4	2.2.3.b	Explain whether sufficient data has been obtained to make an explanation or conclusion (e.g., reference previous and current research; incorporate scientific concepts, principles, and theories).
2, 3	2.2.5.a	Explain how existing ideas were synthesized from a long, rich history of scientific explanations and how technological advances changed scientific theories.

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2, 3	2.2.5.b	Explain how scientific inquiry results in new facts, evidence, unexpected findings, ideas, explanations, and revisions to current theories.
2, 3	2.2.5.c	Explain how increased understanding of systems leads to new questions to be investigated.
2	2.2.5.d	Explain how new ideas need repeated inquires before acceptance.
2	2.2.5.e	Use new tools to investigate a system to discover new facts about the system that lead to new ideas and questions.
2, 3	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).
2, 3	3.1.1.d	Describe an appropriate question that could lead to a possible solution to a problem.
3	3.1.1.e	Describe a change that could improve a tool or a technology.
3	3.1.2.a	Research, propose, implement, and document the scientific design process used to solve a problem challenge: define the problem; scientifically gather information and collect empirical data; explore ideas; make a plan; list steps to do the plan; scientifically test solutions; document the scientific design process.
2, 3	3.2.2.b	Explain risks associated with investigations involving living things (e.g., drug trials on animals, testing of genetically engineered plants, release of African snails into the environment after experimentation).

**Washington Essential Academic Learning Requirements/Grade Level Expectations:
Mathematics Grades 9 – 10 (2006 Draft Version)**

Activity	GLE	Description
2	1.1.1	Understand and use scientific notation.
2	1.1.5	Compute using scientific notation.
2, 4	1.1.6	Complete multi-step computations with combinations of rational numbers using order of operations and addition, subtraction, multiplication, division, powers, and square roots.
3	1.4.1	Understand the concepts of dependent and independent events.
1, 3, 4	1.4.3	Determine possible sources of bias in questions, data collection methods, samples, and/or measures of central tendency and describe how such bias can be controlled.
1, 2, 3, 4	1.4.5	Read and interpret data presented in diagrams, tables of ordered pairs, and scatter plots and makes predictions based on the data.
1, 2, 3, 4	1.4.6	Determine and explain how the same set of data can support different points of view.

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2, 3	2.1.1	Formulate questions to be answered to solve a problem.
2, 3	2.1.2	Determine what information is missing or extraneous.
3, 4	2.1.3	Identify what is known and unknown in complex situations.
3, 4	2.2.1	Select and use relevant information to construct solutions.
3, 4	2.2.3	Apply a variety of strategies and approaches to construct solutions.
3, 4	2.2.4	Determine whether a solution is viable, is mathematically correct, and answers the question(s).
3, 4	3.1.1	Analyze, compare, and integrate mathematical information from multiple sources.
2, 3, 4	3.2.1	Draw and support conclusions, using inductive or deductive reasoning.
3	3.2.2	Evaluate procedures and conclusions to make needed revisions.
2, 3, 4	3.3.1	Justify results using inductive or deductive reasoning.
2, 3	3.3.2	Evaluate reasonableness of results.
2, 3, 4	3.3.3	Validate thinking about mathematical ideas.
2, 3, 4	4.1.2	Extract mathematical information from multiple sources.
2, 3, 4	4.2.1	Organize, clarify, and refine mathematical information relevant to a given purpose.
2, 3, 4	4.2.2	Represent mathematical information in graphs or other appropriate forms.
2, 3, 4	4.2.3	Use mathematical language to explain or describe mathematical ideas and information in ways appropriate for audience and purpose.
1, 2, 3, 4	5.1.1	Apply concepts and procedures from two or more content strands, including number sense, measurement, geometric sense, probability and statistics, and/or algebraic sense, in a given problem or situation.
1, 3, 4	5.1.2	Relate and use different mathematical models and representations of the same situation.
2, 3, 4	5.2.1	Use mathematical patterns and ideas to extend mathematical thinking and modeling to other disciplines.
2, 3, 4	5.3.1	Understand that mathematics is used extensively in daily life outside the classroom.
1, 2, 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 9 – 10		
Activity	GLE	Description
2, 3, 4	1.2.2	Apply strategies to comprehend words and ideas.

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2, 3, 4	1.3.2	Understand and apply content/academic vocabulary critical to the meaning of the text, including vocabularies relevant to different contexts, cultures, and communities.
2, 3, 4	2.1.4	Apply comprehension monitoring strategies for informational and technical materials, complex narratives, and expositions: use prior knowledge.
2, 3, 4	2.1.5	Apply comprehension monitoring strategies for informational and technical materials, complex narratives, and expositions: synthesize ideas from selections to make predictions and inferences.
2, 3, 4	2.1.6	Apply comprehension monitoring strategies for informational and technical materials, complex narratives, and expositions: monitor for meaning, create mental images, and generate and answer questions.
2, 3, 4	2.1.7	Apply comprehension monitoring strategies for informational and technical materials, complex narratives, and expositions: determine importance and summarize the text
2, 3, 4	2.2.2	Apply understanding of complex organizational features of printed text and electronic sources
2, 3, 4, 5	2.3.2	Evaluate informational materials, including electronic sources, for effectiveness.
2, 3, 4, 5	2.3.4	Synthesize information from a variety of sources.
2, 3, 4	2.4.5	Analyze text to generalize, express insight, or respond by connecting to other texts or situations.
2, 3, 4	3.1.1	Analyze web-based and other resource materials (including primary sources and secondary sources) for relevance in answering research questions.
2, 3, 4, 5	3.2.2	Apply understanding of complex information, including functional documents, to perform a task.
2, 3, 4	3.3.1	Apply appropriate reading strategies for interpreting technical and non-technical documents used in job-related settings

Washington Essential Academic Learning Requirements/Grade Level Expectations: Writing Grades 9 – 10

Activity	GLE	Description
All activities	1.1.1	Analyzes and selects effective strategies for generating ideas and planning writing.
All activities	1.5.1	Publishes in formats that are appropriate for specific audiences and purposes.
All activities	2.1.1	Applies understanding of multiple and varied audiences to write effectively.
All activities	2.2.1	Demonstrates understanding of different purposes for writing.
All activities	2.3.1	Uses a variety of forms/genres.

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All activities	3.1.1	Analyzes ideas, selects a manageable topic, and elaborates using specific, relevant details and/or examples.
All activities	3.1.2	Analyzes and selects effective organizational structures.
All activities	3.2.1	Analyzes audience and purposes and uses appropriate voice.
All activities	3.2.2	Analyzes and selects language appropriate for specific audiences and purposes.
All activities	3.2.3	Uses a variety of sentences consistent with audience, purpose, and form.
All activities	3.3.1	Uses legible handwriting.
All activities	3.3.5	Applies usage rules.
All activities	3.3.6	Uses complete sentences in writing.
All activities	3.3.7	Applies paragraph conventions.
All activities	4.1.2	Analyzes and evaluates own writing using established criteria.

Washington Essential Academic Learning Requirements/Grade Level Expectations: Communication Grades 9 – 10

Activity	GLE	Description
All activities	1.1.1	Applies a variety of listening strategies to accommodate the listening situation.
All activities	1.2.1	Evaluates effectiveness of and creates a personal response to visual and auditory information.
All activities	2.1.1	Analyzes the needs of the audience, situation, and setting to adjust language and other communication strategies.
All activities	2.2.1	Uses communication skills that demonstrate respect.
All activities	2.2.2	Applies skills and strategies to contribute responsibly in a group setting.
All activities	2.3.2	Creates personal intercultural communication norms to guide one’s self in a diverse social system.
2, 3	3.1.1	Applies skills to plan and organize effective oral communication and presentation.
2, 3	3.3.1	Applies skills and strategies for the delivery of effective oral communication and presentations.

Washington Essential Academic Learning Requirements: Health and Fitness – High School

Activity	EALR	Description
3, 5	2.1.3.b	Develop strategies to manage hereditary factors that affect growth development and health.

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3, 4	2.1.3.c	Describe how nutrition, rest, exercise, disease, and substance abuse influence health throughout the life span.
2, 3, 5	2.2.3.a	Evaluate the effect and validity of personal health practices, public policies, research and medical advances on the prevention and control of non-communicable diseases.
4	2.3.3.d	Analyze the implications of decisions regarding the use of nicotine, alcohol, and other drugs, based on laws, and the steps leading to dependence or addiction.
2, 3, 5	3.2.3.a	Evaluate the accuracy and usefulness of health information for selection of products and services.
3, 5	3.2.3.c	Solve a health and fitness problem or issue: *List alternative courses of action. *Choose the course that most fully addresses the needs and requirements of the situation. *Back up the choice with evidence. *Evaluate the outcome.