

WASHINGTON, D.C. ALIGNMENT FOR NIH SUPPLEMENT HUMAN GENETIC VARIATION

HUMAN GENETIC VARIATION		
Washington, D.C. Science Learning Standards: High School Biology		
Activity	Standard	Description
3, 4	B.1.1	Know the elements of scientific methodology (identification of a problem, hypothesis formulation and prediction, performance of experimental tests, analysis of data, falsification, developing conclusions, reporting results) and be able to use a sequence of those elements to solve a problem or test a hypothesis. Also understand the limitations of any single scientific method (sequence of elements) in solving problems.
2, 3	B.1.2	Know that scientists cannot always control all conditions in order to obtain evidence, and when they are unable to do so for ethical or practical reasons, they try to observe as wide a range of natural occurrences as possible so as to be able to discern patterns.
2, 3	B.1.3	Recognize the cumulative nature of scientific evidence.
1, 2, 3, 4	B.1.4	Recognize the use and limitations of models and theories as scientific representations of reality.
1, 2, 3	B.1.5	Distinguish between a conjecture (guess), a hypothesis, and a theory as these terms are used in science.
3, 4	B.1.6	Plan and conduct scientific investigations to explore new phenomena, to check on previous results, to verify or falsify the prediction of a theory, and to use a crucial experiment to discriminate between competing theories.
2, 3, 4	B.1.7	Use hypotheses to choose what data to pay attention to and what additional data to seek, and to guide the interpretation of the data.
3	B.1.8	Identify and communicate the sources of error (random and systematic) inherent in an experiment.
1, 3	B.1.9	Identify discrepant results and possible sources of error or uncontrolled conditions.
1, 3	B.1.10	Select and use appropriate tools and technology to perform tests, collect data, analyze relationships, and display data. (The focus is on manual graphing, interpreting graphs, and mastery of metric measurements and units, with supplementary use of computers and electronic data gathering when appropriate.)
1, 2, 3, 4	B.1.11	Formulate and revise explanations using logic and evidence.
2, 3	B.1.12	Analyze situations and solve problems that require combining concepts from more than one topic area of science and applying these concepts.
2, 5	B.1.15	Explain that science discoveries can have both positive and negative implications, involve different decisions regarding ethics and allocation of resources (e.g., organ transplants, stem cell research, forest management and land use).
1, 3	B.1.16	Recognize and deal with the implications of statistical variability in experiments and explain the need for controls in experiments.
1, 2	B.2.5	Know that living things have many different kinds of molecules, including small ones such as water, medium-sized ones such as sugars, amino acids, and nucleotides, and large ones such as starches, proteins, and DNA.
1, 2, 4, 5	B.4.3	Explain how hereditary information is passed from parents to offspring in the form of "genes" which are long stretches

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		of DNA consisting of sequences of nucleotides. Explain that in eukaryotes, the genes are contained in chromosomes, which are bodies made up of DNA and various proteins.
1, 2, 3	B.4.4	Know every species has its own characteristic DNA sequence.
1, 2, 3, 4	B.4.7	Understand that and describe how inserting, deleting, or substituting short stretches of DNA alters a gene. Recognize that changes (mutations) in the DNA sequence in or near a specific gene may (or may not) affect the sequence of amino acids in the encoded protein or the expression of the gene.
2, 4	B.5.3	Research and explain how natural selection provides a mechanism for evolution and leads to organisms that are optimally suited for survival in particular environments.
2, 4	B.8.4	Describe how the physical or chemical environment may influence the rate, extent, and nature of the way organisms develop within ecosystems.

Washington, D.C. Mathematics Learning Standards: Algebra I & Probability and Statistics

Activity	Standard	Description
1, 2, 3, 4	AI.N.1	Use the properties of operations on real numbers, including the associative, commutative, identity, and distributive properties, and use them to simplify calculations.
1, 2, 3, 4	AI.N.3	Calculate and apply ratios, proportions, rates, and percentages to solve a range of consumer and practical problems.
1, 3, 4	AI.P.4	Translate between different representations of functions and relations: graphs, equations, sets of ordered pairs (scatter plots), verbal, and tabular.
1, 3, 4	PS.9	Describe and explain how the relative sizes of a sample and the population affect the validity of predictions from a set of data.

Washington, D.C. Reading / English Language Arts Learning Standards: Grades 9 & 10

Activity	Standard	Description
All activities	9.LD-D.1	Implement techniques to improve productivity of group discussions, including setting clear goals, understanding the purpose of the team project and the ground rules for decision-making, and setting deadlines.
All activities	9.LD-Q.2	Summarize in a coherent and organized way the information and ideas learned from a focused discussion.
1, 2, 3, 4	9.LD-V.8	Determine the meanings of multiple-meaning words by using context.
1, 2, 3, 4	9.IT-E.1	Analyze the main or controlling idea in passages or paragraphs.
1, 2, 3, 4	9.IT-E.5	Support conclusions drawn from ideas and concepts in informational and technical passages.
2, 3, 4	9.R.1	Formulate open-ended research questions and apply steps for obtaining and evaluating information from a variety of sources, organizing information, and presenting research.
All activities	9.W-E.2	Produce functional texts (e.g., memos, e-mails, correspondence, project plans, proposals, bios) that: address audience needs; state purpose and context; and adopt a customary format, including proper salutation, closing, and signature when appropriate.

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1, 2, 3, 4	9.W-E.3	Write interpretations of literary or expository reading that: exhibit careful reading, understanding, and insight; organize the interpretation around several clear ideas, premises, or images; and justify the interpretation through sustained use of examples and textual evidence.
3	9.W-E.5	Write persuasive (problem/solution) essays that: include a thesis or purpose of the paper; use a logical organizational pattern; include persuasive evidence or explanation for the validity of the assertions; use different levels of formality, style, and tone when composing for different audiences; and contain effective introductory and concluding paragraphs that guide and inform the reader's understanding of key ideas and evidence.
All activities	9.EL.5	Identify and use: correct and consistent verb tense (present, past, and future perfect and perfect progressive; regular and irregular verbs; transitive and intransitive verbs) and subject-verb agreement, and appropriate noun-pronoun agreement (nominative, objective, possessive, reflexive, and relative pronouns; pronoun/antecedent agreement; and clear pronoun reference).
All activities	9.EL.6	Identify and use functional sentence structure. Make effective use of parallel structure. Place modifiers properly. Avoid run-on sentences, comma splices, and sentence fragments. Use different types of clauses and phrases, including adverb and adjective clauses. Use a variety of sentence structures, including compound and compound-complex sentences with effective coordination and subordination of ideas and parallel, repetitive, and analogous sentence structures.
All activities	10.LD-D.1	Participate productively in self-directed teams for a particular purpose, including posing relevant questions; extracting essential information from others' input, building on the ideas of others, and contributing relevant information or ideas in group discussions; and summarizing orally, in a coherent and organized way, information and ideas learned.
All activities	10.LD-Q.2	Formulate judgments about the ideas under discussion and support those judgments with convincing evidence.
1, 2, 3, 4	10.IT-E.3	Describe the controlling idea or specific purpose of passages and paragraphs and determine the essential elements that elaborate it.
1, 2, 3, 4	10.IT-E.5	Make relevant inferences by synthesizing concepts and ideas from a single reading selection.
1, 2, 3, 4	10.IT-DP.6	Synthesize information from multiple sources (e.g., maps, illustrations, schematic diagrams, manuals, product information, consumer publications) to draw conclusions about the ideas presented.
All activities	10.IT-DP.7	Analyze the presentation of information.
2, 3, 4	10.R.1	Formulate open-ended research questions and apply steps for obtaining and evaluating information from a variety of sources, organizing information, and presenting research.
3	10.W-E.5	Write persuasive (controversial issue) essays that: structure ideas and arguments in a sustained and logical fashion; engage the reader; use specific rhetorical devices to back up assertions (e.g., via an appeal to logic through reasoning; via an appeal to emotion or ethical belief; or by personal anecdote, case study, or analogy); clarify and defend positions with precise and relevant evidence, including facts, expert opinions, quotations, and/or expressions of commonly accepted beliefs and logical reasoning; and anticipate and address the reader's concerns and counterclaims with evidence.
All activities	10.EL.3	Use ending punctuation, correct internal punctuation (commas, ellipses, colons, semicolons, parentheses), apostrophes for contractions and possessives, and correct punctuation for quotations (quotation marks, ellipses, brackets).

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All activities	10.EL.4	Produce legible work that shows accurate spelling and correct use of the conventions of punctuation and capitalization.
National Health Education Standards – Grades 9 – 12: cited from pre-publication document of National Health Education Standards, Pre K-12, American Cancer Society, December 2005 – August 2006		
Activity	Standard	Performance Indicator
4, 5	1.12.1	Predict how healthy behaviors can impact health status.
2, 3, 4, 5	1.12.4	Analyze how genetics and family history can impact personal health.
4, 5	1.12.5	Propose ways to reduce or prevent injuries and health problems.
4, 5	1.12.7	Compare and contrast the benefits and barriers to practicing a variety of healthy behaviors.
4	1.12.8	Analyze personal susceptibility to injury, illness, or death if engaging in unhealthy behaviors.
4	1.12.9	Analyze the potential severity of injury or illness if engaging in unhealthy behaviors.
4, 5	2.12.1	Analyze how family influences the health of individuals.
4	2.12.3	Analyze how peers influence healthy and unhealthy behaviors.
4, 5	2.12.8	Analyze the influence of personal values and beliefs on individual health practices and behaviors.
4	2.12.9	Analyze how some health risk behaviors can influence the likelihood of engaging in unhealthy behaviors.
5	2.12.10	Analyze how public health policies and government regulations can influence health promotion and disease.
5	3.12.1	Evaluate the validity of health information, products, and services.
5	3.12.4	Determine when professional health services may be required.
4, 5	5.12.1	Examine barriers that can hinder healthy decision-making.
4, 5	5.12.2	Determine the value of applying a thoughtful decision-making process in health related situations.
5	5.12.3	Justify when individual or collaborative decision-making is appropriate.
5	5.12.5	Predict the potential short and long-term impact of each alternative on self and others.
4, 5	5.12.6	Defend the healthy choice when making decisions.
4, 5	5.12.7	Evaluate the effectiveness of health-related decisions.
4, 5	7.12.1	Analyze the role of individual responsibility for enhancing health.
4	7.12.2	Demonstrate a variety of healthy practices and behaviors that will maintain or improve the health of self and others.
4	7.12.3	Demonstrate a variety of behaviors to avoid or reduce health risks to self and others.
4, 5	8.12.2	Demonstrate how to influence and support others to make positive health choices.
4, 5	8.12.4	Adapt health messages and communication techniques to a specific target audience.