

COLORADO ALIGNMENT FOR NIH SUPPLEMENT HUMAN GENETIC VARIATION

<b>HUMAN GENETIC VARIATION</b>		
<b>Colorado Model Content Standards: Science – Grades 9 – 12</b>		
<b>Activity</b>	<b>Standard</b>	<b>Descriptor</b>
2, 3	1.1	Ask questions and state hypotheses, using prior scientific knowledge to help design and guide their development and implementation of a scientific investigation.
1, 2, 3, 4	1.2	Select and use appropriate technologies to gather, process, and analyze data and to report information related to an investigation.
1, 2, 3, 4	1.4	Recognize and analyze alternative explanations and models.
2, 3, 4	1.5	Construct and revise scientific explanations and models, using evidence, logic, and experiments that include identifying and controlling variables.
2	3.6	Changes in an ecosystem can affect biodiversity and biodiversity contributes to an ecosystem's dynamic equilibrium.
2	3.10	Cell reproduction/division has various processes and purposes (mitosis, meiosis, binary fission).
2, 3	3.11	DNA has a general structure and function and a role in heredity and protein synthesis ( <i>for example: replication of DNA and the role of RNA in protein synthesis</i> ).
1, 2, 3	3.12	Genes serve as the vehicles for genetic continuity and the source of genetic diversity upon which natural selection can act.
1, 2, 3, 4	3.13	Some traits can be inherited while others are due to the interaction of genes and the environment ( <i>for example: skin cancer triggered by over-exposure to sunlight or contact with chemical carcinogens</i> ).
2	3.15	Mutation, natural selection, and reproductive isolation can lead to new species and affect biodiversity.
3	3.16	An organism's adaptations ( <i>for example, structure, behavior</i> ) determine its niche (role) in the environment.
2	3.17	Variation within a population improves the chances that the species will survive under new environmental conditions.
1, 2, 3, 4	3.18	Organisms change over time in terms of biological evolution and genetics.
2, 3, 5	5.1	Print and visual media can be evaluated for scientific evidence, bias, or opinion.
4	5.3	Graphs, equations, or other models are used to analyze systems involving change and constancy ( <i>for example: comparing the geologic time scale to shorter time frame, exponential growth, a mathematical expression for gas behavior, constructing a closed system such as aquarium</i> ).
3, 4, 5	5.4	There are cause-effect relationships within systems ( <i>for example: the effect of temperature on gas volume, effect of carbon dioxide level on the greenhouse effect, effects of changing nutrients a the base of a food pyramid</i> ).
2, 3	5.5	Scientific knowledge changes and accumulates over time; usually the changes that take place are small modifications of prior knowledge but major shifts in the scientific view of how the world works do occur.
3, 5	5.6	Interrelationships among science, technology, and human activity lead to further discoveries that impact the world in positive and negative ways.

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2, 3	5.7	There is a difference between a scientific theory and a scientific hypothesis.
<b>Colorado Model Content Standards: Mathematics – Grades 9 – 12</b>		
<b>Activity</b>	<b>Standard</b>	<b>Benchmark</b>
1, 2, 3	1.1	Demonstrate meanings for real numbers, absolute value, and scientific notation using physical materials and technology in problem-solving situations.
2	2.1	Model real-world phenomena (for example, distance versus time relationships, compound interest, amortization tables, mortality rates) using functions, equations, inequalities, and matrices.
1, 2, 3, 4	2.2	Represent functional relationships using written explanations, tables, equations, and graphs, and describing the connections among these representations.
2, 4	2.3	Solve problems involving functional relationships using graphing calculators and/or computers as well as appropriate paper-and-pencil techniques.
1	5.2	Select and use appropriate techniques and tools to measure quantities in order to achieve specified degrees of precision, accuracy, and error (or tolerance) of measurements.
2, 3	6.1	Use ratios, proportions, and percents in problem-solving situations.
<b>Colorado Model Content Standards: Reading &amp; Writing – Grades 9 – 12</b>		
<b>Activity</b>	<b>Standard</b>	<b>Descriptor</b>
All activities	1.A	Using a full range of strategies to comprehend essays, speeches, autobiographies, and first-person historical documents in addition to directions, nonfiction material, technical writing, newspapers, and magazines.
All activities	2.B	Conveying technical information in a written form appropriate to the audience.
All activities	2.C	Supporting an opinion using various forms of persuasion (factual or emotional) in speaking and writing.
All activities	2.F	Writing in various specialized fields such as career and academic interest areas ( <i>for example, scientific, technical, business communications</i> ).
All activities	4.B	Using reading, writing, listening, articulate speaking, and viewing to solve problems.
All activities	5.B	Evaluating information in light of what they know and their specific needs.
2, 3, 4, 5	5.D	Using strategies to gain information from journals, research studies, and technical documents.
2, 3	5.E	Using available technology to access information, conduct research, and produce a carefully documented product.
<b>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</b>		
<b>Activity</b>	<b>Standard</b>	<b>Performance Indicator</b>
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.

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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.