

MASSACHUSETTS ALIGNMENT FOR NIH SUPPLEMENT HUMAN GENETIC VARIATION

HUMAN GENETIC VARIATION		
Massachusetts Science Learning Standards: High School Biology, Science Inquiry Skills		
Activity	Standard	Description
1, 2, 3	3.3	Explain how mutations in the DNA sequence of a gene may or may not result in phenotypic change in an organism. Explain how mutations in gametes may result in phenotypic changes in offspring.
2	5.3	Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity within a population.
All activities	SIS1.1	Observe the world from a scientific perspective.
2, 3, 4	SIS1.2	Pose questions and form hypotheses based on personal observations, scientific articles, experiments, and knowledge.
2, 3, 4, 5	SIS1.3	Read, interpret, and examine the credibility and validity of scientific claims in different sources of information, such as scientific articles, advertisements, or media stories.
2, 3	SIS2.1	Articulate and explain the major concepts being investigated and the purpose of an investigation.
3, 4	SIS2.3	Identify independent and dependent variables.
1, 2, 3, 4	SIS2.5	Employ appropriate methods for accurately and consistently: making observations, making and recording measurements at appropriate levels of precision, and collecting data or evidence in an organized way.
1, 2	SIS2.6	Properly use instruments, equipment, and materials (e.g., scales, probeware, meter sticks, microscopes, computers) including set-up, calibration (if required), technique, maintenance, and storage.
3, 4	SIS3.1	Present relationships between and among variables in appropriate forms. Represent data and relationships between and among variables in charts and graphs. Use appropriate technology (e.g., graphing software) and other tools.
1, 2, 3, 4	SIS3.2	Use mathematical operations to analyze and interpret data results.
1, 2, 3, 4	SIS3.3	Assess the reliability of data and identify reasons for inconsistent results, such as sources of error or uncontrolled conditions.
3, 4	SIS3.4	Use results of an experiment to develop a conclusion to an investigation that addresses the initial questions and supports or refutes the stated hypothesis.
3, 4	SIS3.5	State questions raised by an experiment that may require further investigation.
2, 3, 4	SIS4.1	Develop descriptions of and explanations for scientific concepts that were a focus of one or more investigations.
1, 2, 3, 4	SIS4.2	Review information, explain statistical analysis, and summarize data collected and analyzed as the result of an investigation.
1, 2, 3	SIS4.3	Explain diagrams and charts that represent relationships of variables.
All activities	SIS4.4	Construct a reasoned argument and respond appropriately to critical comments and questions.
All activities	SIS4.5	Use language and vocabulary appropriately, speak clearly and logically, and use appropriate technology (e.g., presentation software) and other tools to present findings.

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3, 4	SIS4.6	Use and refine scientific models that simulate physical processes or phenomena.
Massachusetts Mathematics Learning Standards: Grades 9 & 10		
Activity	Standard	Description
2, 3	10.P.7	Solve everyday problems that can be modeled using linear, reciprocal, quadratic, or exponential functions. Apply appropriate tabular, graphical, or symbolic methods to the solution. Include compound interest, and direct and inverse variation problems. Use technology when appropriate.
1	10.D.1	Select, create, and interpret an appropriate graphical representation (e.g., scatterplot, table, stem-and-leaf plots, box-and-whisker plots, circle graph, line graph, and line plot) for a set of data and use appropriate statistics (e.g., mean, median, range, and mode) to communicate information about the data. Use these notions to compare different sets of data.
1, 4	10.D.3	Describe and explain how the relative sizes of a sample and the population affect the validity of predictions from a set of data.
Massachusetts English Language Arts Learning Standards: Grades 9 & 10		
Activity	Standard	Description
2, 3, 4, 5	1.5	Identify and practice techniques such as setting time limits for speakers and deadlines for decision-making to improve productivity of group discussions.
All activities	2.5	Summarize in a coherent and organized way information and ideas learned from a focused discussion.
All activities	6.8	Identify content-specific vocabulary, terminology, or jargon unique to particular social or professional groups.
1, 2, 3, 5	8.10	Restate main ideas.
1, 2, 3, 5	8.15	Locate facts that answer the reader's questions.
All activities	8.16	Distinguish cause from effect.
All activities	8.17	Distinguish fact from opinion or fiction.
All activities	8.22	Identify and analyze main ideas, supporting ideas, and supporting details.
All activities	8.27	Identify evidence used to support an argument.
2, 3, 5	19.26	Write well-organized essays (<i>persuasive, literary, personal</i>) that have a clear focus, logical development, effective use of detail, and variety in sentence structure
3	19.27	Write well-organized research papers that prove a thesis statement using logical organization, effective supporting evidence, and variety in sentence structure.
All activities	20.5	Use different levels of formality, style, and tone when composing for different audiences.
All activities	22.9	Use standard English spelling when writing and editing.
2, 3	24.5	Formulate open-ended research questions and apply steps for obtaining and evaluating information from a variety of sources, organizing information, documenting sources in a consistent and standard format, and presenting research.

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2, 5	26.5	Analyze visual or aural techniques used in a media message for a particular audience and evaluate their effectiveness.
Massachusetts Comprehensive Health Learning Standards: High School		
Activity	Standard	Description
4, 5	1.11	Describe the impact of behavior and environment on failure of body systems (nervous, muscular, skeletal, circulatory, respiratory, endocrine, and excretory systems).
2, 3, 4, 5	1.13	Describe how both heredity (including congenital factors) and the environment influence growth and development.
5	2.24	Identify life-management skills and protective factors that contribute to achieving personal wellness health goals, including researching, evaluating, and implementing strategies to manage personal wellness, monitor progress, and revise plans.
4, 5	8.14	Identify positive health behaviors that reduce the risk of disease.
2, 3, 4, 5	8.18	Analyze the interaction between genetics and disease.
3	12.c	Evaluate methods to determine the accuracy of emerging health research.
5	14.10	Identify prevalent health concerns and health promotion initiatives in the United States and compare with other parts of the world.