

MASSACHUSETTS ALIGNMENT FOR NIH SUPPLEMENT CELL BIOLOGY AND CANCER

<b>CELL BIOLOGY AND CANCER</b>		
<b>Massachusetts Science Learning Standards: High School Biology, Science Inquiry Skills</b>		
<b>Activity</b>	<b>Standard</b>	<b>Description</b>
2	2.6	Describe the cell cycle and the process of mitosis. Explain the role of mitosis in the formation of new cells, and its importance in maintaining chromosome number during asexual reproduction.
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	4.8	Recognize that the body's systems interact to maintain homeostasis. Describe the basic function of a physiological feedback loop.
2, 3, 4	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.
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.
3, 4	SIS2.1	Articulate and explain the major concepts being investigated and the purpose of an investigation.
3, 4	SIS2.2	Select required materials, equipment, and conditions for conducting an experiment.
3, 4	SIS2.3	Identify independent and dependent variables.
4	SIS2.4	Write procedures that are clear and replicable.
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.
3, 4	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	SIS2.7	Follow safety guidelines.
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, 3, 4	SIS3.2	Use mathematical operations to analyze and interpret data results.
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.
3, 4	SIS4.1	Develop descriptions of and explanations for scientific concepts that were a focus of one or more investigations.

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1, 2, 3, 4	<b>SIS4.2</b>	Review information, explain statistical analysis, and summarize data collected and analyzed as the result of an investigation.
3	<b>SIS4.3</b>	Explain diagrams and charts that represent relationships of variables.
<b>All activities</b>	<b>SIS4.4</b>	Construct a reasoned argument and respond appropriately to critical comments and questions.
3, 4	<b>SIS4.5</b>	Use language and vocabulary appropriately, speak clearly and logically, and use appropriate technology (e.g., presentation software) and other tools to present findings.
2, 3, 4	<b>SIS4.6</b>	Use and refine scientific models that simulate physical processes or phenomena.

**Massachusetts Mathematics Learning Standards: Grades 9 & 10**

<b>Activity</b>	<b>Standard</b>	<b>Description</b>
3	<b>10.P.7</b>	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.
3	<b>10.P.8</b>	Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems
3	<b>10.M.4</b>	Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.
3	<b>10.D.1</b>	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.
3, 4	<b>10.D.3</b>	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**

<b>Activity</b>	<b>Standard</b>	<b>Description</b>
3, 5	<b>1.5</b>	Identify and practice techniques such as setting time limits for speakers and deadlines for decision-making to improve productivity of group discussions.
<b>All activities</b>	<b>2.5</b>	Summarize in a coherent and organized way information and ideas learned from a focused discussion.
2, 3, 4	<b>6.8</b>	Identify content-specific vocabulary, terminology, or jargon unique to particular social or professional groups.
<b>All activities</b>	<b>8.10</b>	Restate main ideas.
<b>All activities</b>	<b>8.15</b>	Locate facts that answer the reader's questions.
<b>All activities</b>	<b>8.16</b>	Distinguish cause from effect.
<b>All activities</b>	<b>8.17</b>	Distinguish fact from opinion or fiction.

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<b>All activities</b>	<b>8.22</b>	Identify and analyze main ideas, supporting ideas, and supporting details.
<b>All activities</b>	<b>8.27</b>	Identify evidence used to support an argument.
<b>2</b>	<b>19.26</b>	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
<b>3, 4</b>	<b>19.27</b>	Write well-organized research papers that prove a thesis statement using logical organization, effective supporting evidence, and variety in sentence structure.
<b>1, 2, 3, 4</b>	<b>20.5</b>	Use different levels of formality, style, and tone when composing for different audiences.
<b>All activities</b>	<b>22.9</b>	Use standard English spelling when writing and editing.
<b>3, 4</b>	<b>24.5</b>	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.
<b>2, 4</b>	<b>26.5</b>	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**

<b>Activity</b>	<b>Standard</b>	<b>Description</b>
<b>1, 2, 4</b>	<b>1.11</b>	Describe the impact of behavior and environment on failure of body systems (nervous, muscular, skeletal, circulatory, respiratory, endocrine, and excretory systems).
<b>1, 2, 3</b>	<b>1.13</b>	Describe how both heredity (including congenital factors) and the environment influence growth and development.
<b>1, 5</b>	<b>8.14</b>	Identify positive health behaviors that reduce the risk of disease.
<b>2, 3</b>	<b>8.18</b>	Analyze the interaction between genetics and disease.
<b>2, 3, 5</b>	<b>8.c</b>	Analyze the effects of urbanization, medical advances, politics, and public opinion on the transmission, prevention, and treatment of disease.
<b>3, 4</b>	<b>12.16</b>	Review the positive and negative influences of the media that impact on health.
<b>3, 4, 5</b>	<b>12.c</b>	Evaluate methods to determine the accuracy of emerging health research.
<b>5</b>	<b>14.7</b>	Analyze the effects of diseases on the community and society.
<b>3</b>	<b>14.10</b>	Identify prevalent health concerns and health promotion initiatives in the United States and compare with other parts of the world.
<b>3, 5</b>	<b>14.c</b>	Analyze the reciprocal relationships among social, economic, and environmental factors and community and public health.