

INDIANA ALIGNMENT FOR NIH SUPPLEMENT CELL BIOLOGY AND CANCER

<b>CELL BIOLOGY AND CANCER</b>		
<b>Indiana Academic Standards: Biology</b>		
<b>Activity</b>	<b>Standard</b>	<b>Description</b>
1, 2, 3	B.1.1	Recognize that and explain how the many cells in an individual can be very different from one another, even though they are all descended from a single cell and thus have essentially identical genetic instructions. Understand that different parts of the genetic instructions are used in different types of cells and are influenced by the cell's environment and past history.
2, 3	B.1.7	Explain that complex interactions among the different kinds of molecules in the cell cause distinct cycles of activities, such as growth and division. Note that cell behavior can also be affected by molecules from other parts of the organism, such as hormones.
2	B.1.8	Understand and describe that all growth and development is a consequence of an increase in cell number, cell size, and/or cell products. Explain that cellular differentiation results from gene expression and/or environmental influence. Differentiate between mitosis and meiosis.
2	B.1.14	Recognize and explain that communication and/or interaction are required between cells to coordinate their diverse activities.
1, 2, 3	B.1.17	Understand that and describe how the maintenance of a relatively stable internal environment is required for the continuation of life and explain how stability is challenged by changing physical, chemical, and environmental conditions, as well as the presence of disease agents.
1, 2, 3	B.1.18	Explain that the regulatory and behavioral responses of an organism to external stimuli occur in order to maintain both short- and long-term equilibrium.
2	B.1.20	Recognize that and describe how the human immune system is designed to protect against microscopic organisms and foreign substances that enter from outside the body and against some cancer cells that arise within.
2, 3	B.1.21	Understand and explain that the information passed from parents to offspring is transmitted by means of genes which are coded in DNA molecules.
1, 2, 3	B.1.23	Understand that and describe how inserting, deleting, or substituting DNA segments can alter a gene. Recognize that an altered gene may be passed on to every cell that develops from it, and that the resulting features may help, harm, or have little or no effect on the offspring's success in its environment.
1, 2, 3	B.1.24	Explain that gene mutations can be caused by such things as radiation and chemicals. Understand that when they occur in sex cells, the mutations can be passed on to offspring; if they occur in other cells, they can be passed on to descendant cells only.
All activities	B.1.25	Explain that gene mutation in a cell can result in uncontrolled cell division, called cancer. Also know that exposure of cells to certain chemicals and radiation increases mutations and thus increases the chance of cancer.
2	B.1.29	Understand that and explain how the actions of genes, patterns of inheritance, and the reproduction of cells and organisms account for the continuity of life, and give examples of how inherited characteristics can be observed

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		at molecular and whole-organism levels – in structure, chemistry, or behavior.
2	B.1.45	Recognize that and describe how the physical or chemical environment may influence the rate, extent, and nature of the way organisms develop within ecosystems.
2	B.2.2	Explain that Darwin argued that only biologically inherited characteristics could be passed on to offspring. Note that some of these characteristics were advantageous in surviving and reproducing. Understand that the offspring would also inherit and pass on those advantages, and over generations the aggregation of these inherited advantages would lead to a new species.

**Indiana Academic Standards: Algebra I**

Activity	Standard	Description
3	AI.3.1	Sketch a reasonable graph for a given relationship.
3	AI.3.2	Interpret a graph representing a given situation.
3	AI.9.2	Decide whether a solution is reasonable in the context of the original situation.

**Indiana Academic Standards: English Language Arts – Grades 9 & 10**

**Grade 9**

Activity	Standard	Description
4, 5	9.2.1	Analyze the structure and format of reference or functional workplace documents, including the graphics and headers, and explain how authors use the features to achieve their purposes.
All activities	9.2.3	Generate relevant questions about readings on issues or topics that can be researched.
All activities	9.2.8	Make reasonable statements and draw conclusions about a text, supporting them with accurate examples.
2, 3, 4, 5	9.4.2	Establish a coherent thesis that conveys a clear perspective on the subject and maintain a consistent tone and focus throughout the piece of writing.
3, 4	9.4.4	Use writing to formulate clear research questions and to compile information from primary and secondary print or Internet sources.
3, 4, 5	9.4.5	Develop the main ideas within the body of the composition through supporting evidence, such as scenarios, commonly held beliefs, hypotheses, and definitions.
1, 2, 3, 4	9.5.3	Write expository compositions, including analytical essays, summaries, descriptive pieces, or literary analyses that: gather evidence in support of a thesis (position on the topic), including information on all relevant perspectives, communicate information and ideas from primary and secondary sources accurately and coherently, make distinctions between the relative value and significance of specific data, facts, and ideas. use a variety of reference sources, including word, pictorial, audio, and Internet sources, to locate information in support of topic, include visual aids by using technology to organize and record information on charts, data tables, maps, and graphs, anticipate and address readers' potential misunderstandings, biases, and expectations, and use technical terms and notations accurately.

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5	9.5.4	Write persuasive compositions that: organize ideas and appeals in a sustained and effective fashion with the strongest emotional appeal first and the least powerful one last, use specific rhetorical (communication) devices to support assertions, such as appealing to logic through reasoning; appealing to emotion or ethical belief; or relating a personal anecdote, case study, or analogy, clarify and defend positions with precise and relevant evidence, including facts, expert opinions, quotations, expressions of commonly accepted beliefs, and logical reasoning, and address readers' concerns, counterclaims, biases, and expectations.
1, 2, 3	9.5.7	Use varied and expanded vocabulary, appropriate for specific forms and topics.
1, 2, 3	9.5.8	Write for different purposes and audiences, adjusting tone, style, and voice as appropriate.
1, 2, 3	9.6.3	Produce legible work that shows accurate spelling and correct use of the conventions of punctuation and capitalization.
All activities	9.7.7	Make judgments about the ideas under discussion and support those judgments with convincing evidence.
1, 3, 4	9.7.15	Deliver expository (informational) presentations that: provide evidence in support of a thesis and related claims, including information on all relevant perspectives, convey information and ideas from primary and secondary sources accurately and coherently, make distinctions between the relative value and significance of specific data, facts, and ideas, include visual aids by employing appropriate technology to organize and display information on charts, maps, and graphs, anticipate and address the listeners' potential misunderstandings, biases, and expectations, and use technical terms and notations accurately.
5	9.7.18	Deliver persuasive arguments (including evaluation and analysis of problems and solutions and causes and effects) that: structure ideas and arguments in a coherent, logical fashion from the hypothesis to a reasonable conclusion, based on evidence, contain speech devices that support assertions (such as by appeal to logic through reasoning; by appeal to emotion or ethical belief; or by use of personal anecdote, case study, or analogy), clarify and defend positions with precise and relevant evidence, including facts, expert opinions, quotations, expressions of commonly accepted beliefs, and logical reasoning, and anticipate and address the listener's concerns and counterarguments.
<b>Grade 10</b>		
<b>Activity</b>	<b>Standard</b>	<b>Description</b>
4, 5	10.2.1	Analyze the structure and format of various informational documents and explain how authors use the features to achieve their purposes.
2, 3, 4, 5	10.2.3	Demonstrate use of sophisticated technology by following technical directions.
2, 4, 5	10.2.4	Evaluate an author's argument or defense of a claim by examining the relationship between generalizations and evidence, the comprehensiveness of evidence, and the way in which the author's intent affects the structure and tone of the text.
All activities	10.2.5	Make reasonable statements and draw conclusions about a text, supporting them with accurate examples.
2, 3, 4, 5	10.4.2	Establish a coherent thesis that conveys a clear perspective on the subject and maintain a consistent tone and focus throughout the piece of writing.
3, 4, 5	10.4.5	Develop main ideas within the body of the composition through supporting evidence, such as scenarios, commonly held beliefs, hypotheses, and definitions.

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1, 2, 3, 4	10.5.3	Write expository compositions, including analytical essays, summaries, descriptive pieces, or literary analyses that: gather evidence in support of a thesis (position on the topic), including information on all relevant perspectives, communicate information and ideas from primary and secondary sources accurately and coherently, make distinctions between the relative value and significance of specific data, facts, and ideas, use a variety of reference sources, including word, pictorial, audio, and Internet sources to locate information in support of a topic, include visual aids by using technology to organize and record information on charts, maps, and graphs, anticipate and address readers' potential misunderstandings, biases, and expectations, and use technical terms and notations correctly.
5	10.5.4	Write persuasive compositions that: organize ideas and appeals in a sustained and effective fashion with the strongest emotional appeal first and the least powerful one last, use specific rhetorical (communication) devices to support assertions, such as appealing to logic through reasoning; appealing to emotion or ethical belief; or relating a personal anecdote, case study, or analogy, clarify and defend positions with precise and relevant evidence, including facts, expert opinions, quotations, expressions of commonly accepted beliefs, and logical reasoning, and address readers' concerns, counterclaims, biases, and expectations.
All activities	10.5.7	Use varied and expanded vocabulary, appropriate for specific forms and topics.
All activities	10.6.3	Produce legible work that shows accurate spelling and correct use of the conventions of punctuation and capitalization.
All activities	10.7.7	Make judgments about the ideas under discussion and support those judgments with convincing evidence.
1, 3, 4	10.7.15	Deliver expository (informational) presentations that: provide evidence in support of a thesis and related claims, including information on all relevant perspectives, convey information and ideas from primary and secondary sources accurately and coherently, make distinctions between the relative value and significance of specific data, facts, and ideas, include visual aids by employing appropriate technology to organize and display information on charts, maps, and graphs, anticipate and address the listeners' potential misunderstandings, biases, and expectations, and use technical terms and notations correctly.
5	10.7.18	Deliver persuasive arguments (including evaluation and analysis of problems and solutions and causes and effects) that: structure ideas and arguments in a coherent, logical fashion using inductive or deductive arguments, contain speech devices that support assertions (such as by appeal to logic through reasoning; by appeal to emotion or ethical belief; or by use of personal anecdote, case study, or analogy), clarify and defend positions with precise and relevant evidence, including facts, expert opinions, quotations, expressions of commonly accepted beliefs, and logical reasoning, and anticipate and address the listeners' concerns and counterarguments.
<b>Indiana Academic Standards: Health Education – Basic and Advanced</b>		
<b>Activity</b>	<b>Standard</b>	<b>Description</b>
1, 4, 5	9.1.1	Analyze the role of individual responsibility for enhancing health.
All activities	9.1.2 10.1.2	Analyze how behavior can impact health maintenance and disease prevention.

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1, 2, 3, 5	9.1.4	Explain the interrelationships between behaviors, the functioning of body systems, and overall health.
1, 2, 3, 5	9.1.6 10.1.6	Describe how to delay the onset of and reduce risks related to potential health problems during adulthood (9) and throughout the life span (10).
2, 3, 5	9.1.8 10.1.8	Analyze how the prevention and control of health problems are influenced by research and medical advances. (9) Explain conclusions drawn from worldwide health issues. (10)
2, 3, 5	9.1.9 10.1.9	Explain complex health terms and concepts.
5	9.3.5 10.3.5	Demonstrate the ability to evaluate a personal health assessment to determine strategies for health enhancement and risk reduction.
1, 4, 5	9.4.1 10.4.1	Analyze the influences of family, peers, schools, and communities on the health and health behavior of individuals.
4	9.4.3	Evaluate the effect of media and other factors on personal, family, and community health and health behaviors.
3, 4	9.4.4 10.4.4	Research (10) and evaluate (9) the impact of technology on personal, family, and community health and health behaviors.
5	9.4.5 10.4.5	Research (10) and analyze (9) how public health policies and government regulations influence health promotion and disease prevention.
<b>All activities</b>	9.5.1	Demonstrate skills for communicating effectively with family, peers, and others.
5	9.6.1	Demonstrate the ability to utilize various strategies when making decisions related to the health needs and risks of young adults.
5	10.6.1	Work cooperatively with others to identify potential solutions to personal family and community health concerns.
4, 5	9.6.2	Analyze health concerns that require collaborative decision-making.
2, 3, 5	9.6.3 10.6.2	Predict the immediate and long-term impact of health decisions on the individual, family, and community.
5	9.7.1 10.7.1	Research (10) and evaluate (9) the effectiveness of communication methods for accurately expressing health information and ideas related to health issues.
2, 3, 4, 5	9.7.2 10.7.2	Demonstrate the ability to give accurate information and express opinions about health issues.
5	9.7.4 10.7.4	Demonstrate the ability to influence and support others in making positive health choices.
2, 3, 4, 5	9.7.6 10.7.6	Demonstrate the ability to adapt health messages and communication techniques to the characteristics of a particular audience.
5	10.7.7	Evaluate techniques for supporting community, state, and federal agencies that advocate for healthier communities.