Everett Public Schools

Biotechnology Framework		
Course: Biotechnology		**Total Framework Hours up to: 360**
CIP Code: 261202	☐ **Exploratory** ☒ **Preparatory**	**Date Last Modified: 3/29/2013**
Career Cluster: Health Science		**Cluster Pathway: Health Sciences / BioTechnology research and development**

COMPONENTS AND ASSESSMENTS	
Performance Assessments: Students will demonstrate safe lab operating procedures in all lab activities throughout the year.	
Standards and Competencies	
Standard/Unit: **Laboratory equipment & Safety**	
Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 30**
C-1.1 Students will carry out a protocol demonstrating careful attention to detail, and will recognize and address problems in equipment and supplies C-1.2 Students will use lab time efficiently and productively by using down time in experimental design to accomplish necessary tasks C-1.3 Read protocols, test procedures, or standard operating procedures. C-1.4 Be familiar with equipment and be able to determine if equipment is functioning properly. C-1.5 Students are knowledgeable of chemical hazards in the lab and follow rules for the safe use and disposal of chemicals C-1.6 Students use protective equipment, can operate emergency equipment, and can identify conditions presenting a threat to health and safety. C-1.7 Students use laboratory equipment safely. C-1.8 Students will work ethically in all academic, lab, and career situations A-1.9 Students will design and implement protocols, test procedures, using standard operating procedures for inquiry based lab	
Aligned Washington State Standards / Common Core State Standards	
Art	EALR 3 — Visual Arts: The student communicates through the arts *(dance, music, theatre and visual arts)*. Component 3.1: Uses visual arts to express and present ideas and feelings. Component 3.2: Uses visual arts to communicate for a specific purpose.
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.1 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively.

	2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
Health and Fitness	EALR 3: The student analyzes and evaluates the impact of real-life influences on health. Component 3.1: Understands how family, culture, and environmental factors affect personal health. Component 3.2: Evaluates health and fitness information. Component 3.3: Evaluates the impact of social skills on health
Math **Common Core**	CC.9-12.F.BF.1c Compose functions. CC.9-12.F.BF.2 Build a function that models a relationship between two quantities. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. CC.9-12.S.ID.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. CC.9-12.F.IF.8b Use the properties of exponents to interpret expressions for exponential functions.
Common Core Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Key Ideas and Details** 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*. 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*). **Integration of Knowledge and Ideas** 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
Science	9-12 INQA Question Scientists generate and evaluate questions to investigate the natural world. 9-12 INQB Investigate Scientific progress requires the use of various methods appropriate for answering different kinds of research questions, a thoughtful plan for gathering data needed to answer the question, and care in collecting, analyzing, and displaying the data. 9-12 INQC Explain Conclusions must be logical, based on evidence, and consistent with prior established knowledge. 9-12 INQD Communicate Clearly The methods and procedures that scientists use to obtain evidence must be clearly reported to enhance opportunities for further investigation. 9-12 INQE Model The essence of scientific investigation involves the development of a theory or conceptual model that can generate testable predictions. 9-12 INQF Communicate Science is a human endeavor that involves logical reasoning and creativity and entails the testing, revision, and occasional discarding of theories as new evidence comes to light.
Common Core Writing Standards for Literacy in History/Social	**Text Types and Purposes** 2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

Studies, Science, and Technical Subjects	**Production and Distribution of Writing** 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

COMPONENTS AND ASSESSMENTS

Performance Assessments: Students will demonstrate knowledge of macromolecule structure and function through successfully completing lab exercises that requires them to identify unknown macromolecules.

Standards and Competencies

Standard/Unit:
Macromolecules

Competencies C=Core A=Advanced | **Total Learning Hours for Unit: 25**

C-3.1 Describe the chemical composition of living systems
C-3.2 Students will understand and be able to describe the different types of macromolecule bonding: ionic, covalent, hydrogen.; etc
C-3.3 Recognize the four types of macromolecules in cells
C-3.4 Describe enzymes and their structural and functional properties
C-3.5 Students will understand and be able to use indicators to identify unknown macromolecules
A-3.6 Student will review macromolecule structure and function through laboratory activities

Aligned Washington State Standards

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Math **Common Core**	CC.9-12.A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. CC.9-12.F.IF.7 Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima. CC.9-12.F.IF.9 Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

	CC.9-12.S.IC.6 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Evaluate reports based on data. CC.9-12.S.ID.7 Interpret linear models. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
Common Core Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Key Ideas and Details** 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. 2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*. 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*). 6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. **Integration of Knowledge and Ideas** 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. 8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. **Integration of Knowledge and Ideas** 9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. **Text Complexity** 10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
Science	9-11 PS2D Ions are produced when atoms or molecules lose or gain electrons, thereby gaining a positive or negative electrical charge. Ions of opposite charge are attracted to each other, forming ionic bonds. Chemical formulas for ionic compounds represent the proportion of ion of each element in the ionic array. 9-11 PS2E Molecular compounds are composed of two or more elements bonded together in a fixed proportion by sharing electrons between atoms, forming covalent bonds. Such compounds consist of well-defined molecules. Formulas of covalent compounds represent the types and number of atoms of each element in each molecule. 9-11 PS2F All forms of life are composed of large molecules that contain carbon. Carbon atoms bond to one another and other elements by sharing electrons, forming covalent bonds. Stable molecules of carbon have four covalent bonds per carbon atom. 9-11 LS1F All of the functions of the cell are based on chemical reactions. Food molecules are broken down to provide the energy and the chemical constituents needed to synthesize other molecules. Breakdown and synthesis are made possible by proteins called

	enzymes. Some of these enzymes enable the cell to store energy in special chemicals, such as ATP, that are needed to drive the many other chemical reactions in a cell.
Common Core Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Text Types and Purposes** **1. Write arguments focused on *discipline-specific content.*** b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form and in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. **2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). **Production and Distribution of Writing** 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. **Research to Build and Present Knowledge** 7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. 9. Draw evidence from informational texts to support analysis, reflection, and research.

COMPONENTS AND ASSESSMENTS	
Performance Assessments: Students will apply fundamental lab skills to perform DNA extraction, restriction, enzyme digests and analysis, PCR, and gel electrophoresis as demonstrated in their scientific lab notebook.	
Standards and Competencies	
Standard/Unit: **DNA and DNA Analysis**	
Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 40**
C-4.1 Students will review the structure and function of DNA C-4.2 Students will practice fundamental lab skills involving DNA extraction from various organisms. C-4.3 Students will learn and utilize restriction digest enzymes. C-4.4 Students will amplify DNA using PCR C-4.5 Students will analyze DNA using gel electrophoresis C-4.6 Students will return, archive, or dispose appropriately of all samples and reagents involved A-4.7 Students will review core concepts related to solution preparation A-4.8 Students will review core concepts related to DNA lab technique including extraction; restriction enzyme digests; and analysis utilizing electrophoresis and PCR A-4.9 Students will design, implement, and verify results of inquiry based lab involving DNA manipulationA-4.10 Students will design and build 3-D DNA model representing binding sites of DNA utilizing Rasmol and 3-D printer	
Aligned Washington State Standards	
Art	EALR 3 — Visual Arts: The student communicates through the arts *(dance, music, theatre and visual arts)*. Component 3.1: Uses visual arts to express and present ideas and feelings. Component 3.2: Uses visual arts to communicate for a specific purpose. Component 3.3: Develops personal aesthetic criteria to communicate artistic choices in visual arts. EALR 4 — Visual Arts: The student makes connections within and across the arts (dance, music, theatre and visual arts) to other disciplines, life, cultures and work. Component 4.1: Demonstrates and analyzes the connections among the arts disciplines. Component 4.2: Demonstrates and analyzes the connections among the arts and other content areas. Component: 4.3 Understands how the arts impact and reflect lifelong choices. Component 4.4: Understands how the arts influence and reflect cultures/civilization, place and time. Component 4.5: Understands how arts knowledge and skills are used in the world of work, including careers in the arts.
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.3 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively. 2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
Health and Fitness	EALR 3: The student analyzes and evaluates the impact of real-life influences on health. Component 3.1: Understands how family, culture, and environmental factors affect personal health.

	Component 3.2: Evaluates health and fitness information.
Math Common Core	CC.9-12.N.Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
Common Core Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Key Ideas and Details** 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*. 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*). **Integration of Knowledge and Ideas** 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. 8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. **Integration of Knowledge and Ideas** 10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
Science	9-11 LS1C Cells contain specialized parts for determining essential functions such as regulation of cellular activities, energy capture and release, formation of proteins, waste disposal, the transfer of information, and movement. 9-11 LS1D The cell is surrounded by a membrane that separates the interior of the cell from the outside world and determines which substances may enter and which may leave the cell. 9-11 LS1E The genetic information responsible for inherited characteristics is encoded in the DNA molecules in chromosomes. DNA is composed of four subunits (A,T,C,G). The sequence of subunits in a gene specifies the amino acids needed to make a protein. Proteins express inherited traits (e.g., eye color, hair texture) and carry out most cell function 9-11 LS1G Cells use the DNA that forms their genes to encode enzymes and other proteins that allow a cell to grow and divide to produce more cells, and to respond to the environment. 9-11 LS1H Genes are carried on chromosomes. Animal cells contain two copies of each chromosome with genetic information that regulate body structure and functions. Cells divide by a process called mitosis, in which the genetic information is copied so that each new cell contains exact copies of the original chromosomes. 9-11 LS1I Egg and sperm cells are formed by a process called meiosis in which each resulting cell contains only one representative chromosome from each pair found in the original cell. Recombination of genetic information during meiosis scrambles the genetic information, allowing for new genetic combinations and characteristics in the offspring. Fertilization restores the original number of chromosome pairs and reshuffles the genetic information, allowing for variation among offspring. 9-12 APPB The technological design process begins by defining a problem in terms of criteria and constraints, conducting research, and generating several different solutions.

	9-12 APPC Choosing the best solution involves comparing alternatives with respect to criteria and constraints, then building and testing a model or other representation of the final design. 9-12 APPD The ability to solve problems is greatly enhanced by use of mathematics and information technologies. 9-12 APPE Perfect solutions do not exist. All technological solutions involve trade-offs in which decisions to include more of one quality means less of another. All solutions involve consequences, some intended, others not. 9-12 APPF It is important for all citizens to apply science and technology to critical issues that influence society.
Common Core Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Text Types and Purposes** **1. Write arguments focused on *discipline-specific content.*** d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. **2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). **Production and Distribution of Writing** 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

COMPONENTS AND ASSESSMENTS

Performance Assessments: Students apply knowledge of DNA function, protein synthesis, and protein function through an authentic research project on Nicotine Addiction.

Standards and Competencies

Standard/Unit:
Gene Expression and Gene regulation: DNA, RNA, proteins, and traits.

Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 45**
C-5.1 Describe the overall structure of the DNA molecule C-5.2 Summarize the relationship between genes and DNA C-5.3 Summarize the events of DNA replication C-5.4 Relate the DNA molecule to chromosome structure C-5.5 Explain how RNA differs from DNA C-5.6 Identify the three main types of RNA C-5.7 Describe transcription and the editing of RNA C-5.8 Identify the genetic code C-5.9 Summarize translation C-5.10 Explain the relationship between genes and proteins	

C-5.11 Contrast gene mutation and chromosomal mutation C-5.12 Describe a typical gene C-5.13 Describe how the lac genes are turned off and on C-5.14 Explain how most eukaryotic genes are controlled C-5.15 Relate gene regulation to development A-5.16 Students will review core concepts related to gene expression and regulation A-5.17 Students utilize yeast as a model organism to conduct inquiry based labs on gene manipulation and regulation	
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	CC.9-12.F.IF.8b Use the properties of exponents to interpret expressions for exponential functions. CC.9-12.F.LE.2 Construct and compare linear, quadratic, and exponential models and solve problems.
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Common Core Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Text Types and Purposes** **1. Write arguments focused on *discipline-specific content.*** a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form and in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. **2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). **Production and Distribution of Writing** 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. 6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. **Research to Build and Present Knowledge** 7. Conduct short as well as more sustained research projects to answer a question (including a self generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

	8. Gather relevant information from multiple authoritative print and digital sources **(primary and secondary),** using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. 9. Draw evidence from informational texts to support analysis, reflection, and research. **Range of Writing** 10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
COMPONENTS AND ASSESSMENTS	
Performance Assessments: Students participate as active researcher in collaboration with a mentor scientist.	
Standards and Competencies	
Standard/Unit: Students participate as active researcher in collaboration with a mentor scientist.	
Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 100**
C-6.1 Students will participate as active researchers in collaboration with the University of Washington Starnet program. C-6.2 Students will be conduct bioinformatics research using standard databases. C-6.3 Students will read and analyze primary literature as related to proteomics and model construction. A-6.4 Students will participate in and complete an authentic research project in conjunction with a mentor scientist.	
Aligned Washington State Standards	
Art	EALR 4 — Visual Arts: The student makes connections within and across the arts (dance, music, theatre and visual arts) to other disciplines, life, cultures and work. Component 4.1: Demonstrates and analyzes the connections among the arts disciplines. Component 4.2: Demonstrates and analyzes the connections among the arts and other content areas. Component: 4.3 Understands how the arts impact and reflect lifelong choices. Component 4.4: Understands how the arts influence and reflect cultures/civilization, place and time. Component 4.5: Understands how arts knowledge and skills are used in the world of work, including careers in the arts.
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.5 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively. 2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
Health and Fitness	EALR 3: The student analyzes and evaluates the impact of real-life influences on health. Component 3.1: Understands how family, culture, and environmental factors affect personal health. Component 3.2: Evaluates health and fitness information. Component 3.3: Evaluates the impact of social skills on health.

Math **Common Core**	CC.9-12.A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. CC.9-12.F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of ***f*** is the graph of the equation y = f(x). CC.9-12.F.IF.5 Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. CC.9-12.F.IF.7 Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima. CC.9-12.F.IF.9 Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). CC.9-12.N.CN.9 Use complex numbers in polynomial identities and equations. Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials. CC.9-12.S.IC.6 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Evaluate reports based on data. CC.9-12.S.ID.7 Interpret linear models. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
Common Core Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Key Ideas and Details** 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. 2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*. 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*). **Integration of Knowledge and Ideas** 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. 8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. **Integration of Knowledge and Ideas** 9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.
Science	9-12 INQA Question Scientists generate and evaluate questions to investigate the natural world.

	9-12 INQB Investigate Scientific progress requires the use of various methods appropriate for answering different kinds of research questions, a thoughtful plan for gathering data needed to answer the question, and care in collecting, analyzing, and displaying the data. 9-12 INQC Explain Conclusions must be logical, based on evidence, and consistent with prior established knowledge. 9-12 INQD Communicate Clearly The methods and procedures that scientists use to obtain evidence must be clearly reported to enhance opportunities for further investigation. 9-12 INQE Model The essence of scientific investigation involves the development of a theory or conceptual model that can generate testable predictions. 9-12 INQF Communicate Science is a human endeavor that involves logical reasoning and creativity and entails the testing, revision, and occasional discarding of theories as new evidence comes to light. 9-12 APPA Science affects society and cultures by influencing the way many people think about themselves, others, and the environment. Society also affects science by its prevailing views about what is important to study and by deciding what research will be funded. 9-12 APPB The technological design process begins by defining a problem in terms of criteria and constraints, conducting research, and generating several different solutions. 9-12 APPC Choosing the best solution involves comparing alternatives with respect to criteria and constraints, then building and testing a model or other representation of the final design. 9-12 APPD The ability to solve problems is greatly enhanced by use of mathematics and information technologies. 9-12 APPE Perfect solutions do not exist. All technological solutions involve trade-offs in which decisions to include more of one quality means less of another. All solutions involve consequences, some intended, others not. 9-12 APPF It is important for all citizens to apply science and technology to critical issues that influence society
Common Core Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Text Types and Purposes** **1. Write arguments focused on *discipline-specific content.*** a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form and in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. **2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.

d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.

e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize
multiple sources on the subject, demonstrating understanding of the subject under investigation.

8. Gather relevant information from multiple authoritative print and digital sources **(primary and secondary),** using advanced searches effectively; assess the usefulness of each source in answering
the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

9. Draw evidence from informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

COMPONENTS AND ASSESSMENTS

Performance Assessments: Students will perform and record results of bacterial transformations in scientific lab notebook.

Standards and Competencies

Standard/Unit:
Genetic Engineering

Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 20**

C-7.1 Students will demonstrate understanding of genetic manipulation through recombinant DNA technology.
C-7.2 Students will apply sterile technique and proper handling of microbes through performance of a bacterial transformation.
C-7.3 Students use proper precautions and disposal methods when working with microorganisms
C-7.4 Students will perform and record results of bacterial transformation.
C-7.5 Students will understand concepts related to recombinant and plasmid DNA technology

A-7.6 Students will review core concept of the transformation process A-7.7 Students will purify and identify plasmid and recombinant DNA A-7.8 Students will research, design, and perform a variety of different transformations.

Aligned Washington State Standards	
Art	EALR 4 — Visual Arts: The student makes connections within and across the arts (dance, music, theatre and visual arts) to other disciplines, life, cultures and work. Component 4.1: Demonstrates and analyzes the connections among the arts disciplines. Component 4.2: Demonstrates and analyzes the connections among the arts and other content areas. Component: 4.3 Understands how the arts impact and reflect lifelong choices. Component 4.4: Understands how the arts influence and reflect cultures/civilization, place and time. Component 4.5: Understands how arts knowledge and skills are used in the world of work, including careers in the arts.
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.6 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively. 2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
Health and Fitness	EALR 3: The student analyzes and evaluates the impact of real-life influences on health. Component 3.1: Understands how family, culture, and environmental factors affect personal health. Component 3.2: Evaluates health and fitness information. Component 3.3: Evaluates the impact of social skills on health.
Math **Common Core**	CC.9-12.A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. CC.9-12.F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of ***f*** is the graph of the equation y = f(x). CC.9-12.F.IF.5 Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. CC.9-12.F.IF.7 Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima. CC.9-12.F.IF.9 Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). CC.9-12.N.CN.9 Use complex numbers in polynomial identities and equations. Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials. CC.9-12.S.IC.6 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Evaluate reports

	based on data. CC.9-12.S.ID.7 Interpret linear models. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
Common Core Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Key Ideas and Details** 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*. **Integration of Knowledge and Ideas** 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. **Integration of Knowledge and Ideas** 9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. **Text Complexity** 10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
Science	9-11 LS1D The cell is surrounded by a membrane that separates the interior of the cell from the outside world and determines which substances may enter and which may leave the cell. 9-11 LS1E The genetic information responsible for inherited characteristics is encoded in the DNA molecules in chromosomes. DNA is composed of four subunits (A,T,C,G). The sequence of subunits in a gene specifies the amino acids needed to make a protein. Proteins express inherited traits (e.g., eye color, hair texture) and carry out most cell function 9-11 LS1F All of the functions of the cell are based on chemical reactions. Food molecules are broken down to provide the energy and the chemical constituents needed to synthesize other molecules. Breakdown and synthesis are made possible by proteins called enzymes. Some of these enzymes enable the cell to store energy in special chemicals, such as ATP, that are needed to drive the many other chemical reactions in a cell. 9-11 LS1G Cells use the DNA that forms their genes to encode enzymes and other proteins that allow a cell to grow and divide to produce more cells, and to respond to the environment. 9-11 LS1H Genes are carried on chromosomes. Animal cells contain two copies of each chromosome with genetic information that regulate body structure and functions. Cells divide by a process called mitosis, in which the genetic information is copied so that each new cell contains exact copies of the original chromosomes. 9-11 LS3A Biological evolution is due to: (1) genetic variability of offspring due to mutations and genetic recombination, (2) the potential for a species to increase its numbers, (3) a finite supply of resources, and (4) natural selection by the environment for those offspring better able to survive and produce offspring. 9-11 LS3B Random changes in the genetic makeup of cells and organisms (mutations) can cause changes in their physical characteristics or behaviors. If the genetic mutations occur in eggs or sperm cells, the changes will be inherited by offspring. While many of these changes will be harmful, a small minority may allow the offspring to better survive and reproduce.
Common Core Writing Standards for Literacy in History/Social	**Text Types and Purposes** **1. Write arguments focused on *discipline-specific content.***

Studies, Science, and Technical Subjects	d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. **2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). **Production and Distribution of Writing** 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. Component 3.3: Knows and applies appropriate grade level writing conventions. Component 4.1: Analyzes and evaluates others' and own writing. Component 4.2: Sets goals for improvement.
COMPONENTS AND ASSESSMENTS	
Performance Assessments: Students will use isolate, purify, and analyze proteins using various techniques including but not limited to chromatography and PAGE.	
Standards and Competencies	
Standard/Unit: Protein Product Purification-Pharmaceuticals and Chromatography Methods	
Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 20**
C-8.1 Students will extend experiences from previous units and culture bacteria that has been transformed and then purify the proteins. C-8.2 Students will be trained in various forms of chromatography as it is used in the purification of proteins. C-8.3 Students will learn to run PAGE gels for protein analysis. A-8.4 Students will review lab protocol for protein purification utilizing PAGE gels A-8.5 Students will review lab protocol for chromatography A-8.6 Students will perform protein purification A-8.7 Students will perform various chromatography based upon either size or charge A-8.8 Students will develop an understanding of the application chromatography and protein purification to the pharmaceutical industry.	
Aligned Washington State Standards	
Art	EALR 3 — Visual Arts: The student communicates through the arts *(dance, music, theatre and visual arts)*. Component 3.1: Uses visual arts to express and present ideas and feelings. Component 3.2: Uses visual arts to communicate for a specific purpose. Component 3.3: Develops personal aesthetic criteria to communicate artistic choices in visual arts. EALR 4 — Visual Arts: The student makes connections within and across the arts (dance, music, theatre and visual arts) to other disciplines, life, cultures and work. Component 4.1: Demonstrates and analyzes the connections among the arts disciplines.

	Component 4.2: Demonstrates and analyzes the connections among the arts and other content areas. Component: 4.3 Understands how the arts impact and reflect lifelong choices. Component 4.4: Understands how the arts influence and reflect cultures/civilization, place and time. Component 4.5: Understands how arts knowledge and skills are used in the world of work, including careers in the arts.
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.7 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively. 2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
Health and Fitness	EALR 3: The student analyzes and evaluates the impact of real-life influences on health. Component 3.1: Understands how family, culture, and environmental factors affect personal health. Component 3.2: Evaluates health and fitness information.
Math **Common Core**	CC.9-12.A.CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. CC.9-12.F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of ***f*** is the graph of the equation y = f(x). CC.9-12.F.IF.5 Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. CC.9-12.F.IF.7 Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima. CC.9-12.F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). CC.9-12.N.CN.9 Use complex numbers in polynomial identities and equations. Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials. CC.9-12.S.IC.6 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Evaluate reports based on data.
Common Core Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Key Ideas and Details** 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*.

	Integration of Knowledge and Ideas 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. **Integration of Knowledge and Ideas** 9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. 10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
Science	9-12 APPB The technological design process begins by defining a problem in terms of criteria and constraints, conducting research, and generating several different solutions. 9-11 PS2A Atoms are composed of protons, neutrons, and electrons. The nucleus of an atom takes up very little of the atom's volume but makes up almost all of the mass. The nucleus contains protons and neutrons, which are much more massive than the electrons surrounding the nucleus. Protons have a positive charge, electrons are negative in charge, and neutrons have no net charge. 9-11 PS2F All forms of life are composed of large molecules that contain carbon. Carbon atoms bond to one another and other elements by sharing electrons, forming covalent bonds. Stable molecules of carbon have four covalent bonds per carbon atom.
Common Core Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Text Types and Purposes** **1. Write arguments focused on *discipline-specific content.*** d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. **2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). **Production and Distribution of Writing** 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
COMPONENTS AND ASSESSMENTS	
Performance Assessments: Students will demonstrate understanding of ethical principles through use of Socratic seminars; debates; and completion of an outside reading project.	
Standards and Competencies	
Standard/Unit: **Biotechnology and Ethics**	

Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 20**
C-9.1 Students will learn the basic principles of ethics(autonomy; beneficence; nonmalfesience; justice) C-9.2 Students will research, question, and debate ethics of all concepts related to current scientific discoveries C-9.3 Students will be exposed to ethical decision making models and will apply these models to a variety of ethical dilemmas. A-9.4 Students will review core principles of ethics (autonomy; beneficence; nonmalfesience; justice) A-9.5 Students will continue to research, question, and debate ethics of all concepts related to current scientific discoveries	
Aligned Washington State Standards	
Art	EALR 4 — Visual Arts: The student makes connections within and across the arts (dance, music, theatre and visual arts) to other disciplines, life, cultures and work. Component 4.2: Demonstrates and analyzes the connections among the arts and other content areas. Component: 4.3 Understands how the arts impact and reflect lifelong choices. Component 4.4: Understands how the arts influence and reflect cultures/civilization, place and time
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.8 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively. 2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
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Common Core Reading Standards for Literacy	**Key Ideas and Details** 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

in History/Social Studies, Science, and Technical Subjects	2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*. 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*). 6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. **Integration of Knowledge and Ideas** 8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. **Integration of Knowledge and Ideas** 9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. 10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
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e. Provide a concluding statement or section that follows from or supports the argument presented.

2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

a. Introduce a topic and organize ideas, concepts, and information to make important connections
and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.

d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.

e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects to answer a question (including a self generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize
multiple sources on the subject, demonstrating understanding of the subject under investigation.

8. Gather relevant information from multiple authoritative print and digital sources **(primary and secondary),** using advanced searches effectively; assess the usefulness of each source in answering
the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

9. Draw evidence from informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

COMPONENTS AND ASSESSMENTS

Performance Assessments: Students will successfully perform lab procedures related to identification of disease.
Students will research, develop, and design molecular models & posters related to specific diseases.

Standards and Competencies	
Standard/Unit: Microbiology, Infectious Disease and Immunology	
Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 20**
C-10.1 Students will research and develop an understanding of disease at the molecular level C-10.2 Students will continue to research and explore disease at the molecular level C-10.3 Students will gain an understanding of the structure and function of the human immune system C-10.4 Students will develop an understanding of public health at the global level C-10.5 Students will research, develop, and design molecular models related to specific disease C-10.6 Students will perform lab procedures related to identification of disease A-10.7Students will continue to investigate and research disease at the molecular level.	
Aligned Washington State Standards	
Art	EALR 3 — Visual Arts: The student communicates through the arts *(dance, music, theatre and visual arts)*. Component 3.1: Uses visual arts to express and present ideas and feelings. Component 3.2: Uses visual arts to communicate for a specific purpose. Component 3.3: Develops personal aesthetic criteria to communicate artistic choices in visual arts. EALR 4 — Visual Arts: The student makes connections within and across the arts (dance, music, theatre and visual arts) to other disciplines, life, cultures and work. Component 4.1: Demonstrates and analyzes the connections among the arts disciplines. Component 4.2: Demonstrates and analyzes the connections among the arts and other content areas. Component: 4.3 Understands how the arts impact and reflect lifelong choices. Component 4.4: Understands how the arts influence and reflect cultures/civilization, place and time. Component 4.5: Understands how arts knowledge and skills are used in the world of work, including careers in the arts.
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.9 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively. 2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
Health and Fitness	EALR 3: The student analyzes and evaluates the impact of real-life influences on health. Component 3.1: Understands how family, culture, and environmental factors affect personal health. Component 3.2: Evaluates health and fitness information.
Math **Common Core**	CC.9-12.F.BF.1 Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. CC.9-12.F.BF.1a Determine an explicit expression, a recursive process, or steps for calculation from a context. CC.9-12.S.IC.6 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Evaluate reports based on data.

	CC.9-12.S.ID.2 Summarize, represent, and interpret data on a single count or measurement variable. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. CC.9-12.S.ID.4 Summarize, represent, and interpret data on a single count or measurement variable. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. CC.9-12.S.ID.6 Summarize, represent, and interpret data on two categorical and quantitative variables. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. CC.9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.
Common Core Reading Standards for Literacy in History/Social Studies, Science, and Technical Subjects	**Key Ideas and Details** 1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. 2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text. 3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. **Craft and Structure** 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*. 5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*). 6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address. **Integration of Knowledge and Ideas** 7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. 8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. **Integration of Knowledge and Ideas** 9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. 10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.
Science	9-12 SYSA Feedback is a process in which the output of a system provides information used to regulate the operation of the system. Positive feedback increases the disturbance to a system. Negative feedback reduces the disturbance to a system. 9-12 SYSB Systems thinking can be especially useful in analyzing complex situations. To be useful, a system needs to be specified as clearly as possible. 9-12 SYSC In complex systems, entirely new and unpredictable properties may emerge. Consequently, modeling a complex system in sufficient detail to make reliable predictions may not be possible. 9-12 SYSD Systems can be changing or in equilibrium.

	9-12 INQA Question Scientists generate and evaluate questions to investigate the natural world. 9-12 INQB Investigate Scientific progress requires the use of various methods appropriate for answering different kinds of research questions, a thoughtful plan for gathering data needed to answer the question, and care in collecting, analyzing, and displaying the data. 9-12 INQC Explain Conclusions must be logical, based on evidence, and consistent with prior established knowledge. 9-12 INQD Communicate Clearly The methods and procedures that scientists use to obtain evidence must be clearly reported to enhance opportunities for further investigation. 9-12 INQE Model The essence of scientific investigation involves the development of a theory or conceptual model that can generate testable predictions. 9-12 INQF Communicate Science is a human endeavor that involves logical reasoning and creativity and entails the testing, revision, and occasional discarding of theories as new evidence comes to light. 9-12 APPA Science affects society and cultures by influencing the way many people think about themselves, others, and the environment. Society also affects science by its prevailing views about what is important to study and by deciding what research will be funded.
Common Core Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	Component 1.1: Pre-writes to generate ideas and plan writing. Component 1.2: Produces draft(s). Component 1.3: Revises to improve text. Component 1.4 Edits text. Component 1.5: Publishes text to share with audience. Component 1.6: Adjusts writing process as necessary. Component 2.1: Adapts writing for a variety of audiences. Component 2.2: Writes for different purposes. Component 2.3: Writes in a variety of forms/genres. Component 2.4: Writes for career applications. Component 3.1: Develops ideas and organizes writing. Component 3.2: Uses appropriate style. Component 3.3: Knows and applies appropriate grade level writing conventions. Component 4.1: Analyzes and evaluates others' and own writing. Component 4.2: Sets goals for improvement.
COMPONENTS AND ASSESSMENTS	
Performance Assessments: Students design and build molecular models and posters as related to disease and will participate in the NWABR Biotech Expo.	
Standards and Competencies	
Standard/Unit: **Advanced Technology and materials science as related to Biotechnology**	
Competencies C=Core A=Advanced	**Total Learning Hours for Unit: 20**
C-2.1 Students will learn to navigate the Protein Data Bank C-2.2 Students will learn to use Rasmol to design a molecular model C-2.3 Students will learn to use the 3D printer to construct and finish molecular models. A-2.4 Students will review techniques used in 3-D molecular model construction A-2.5 Students will design and build various molecular models of proteins related to disease	

A-2.6 Students will understand manufacturing process and cost associated with model construction A-2.7 Students will gain an understanding of materials science related to biotechnology A-2.8 Students will explore the application of CADD software to modeling technology A-2.9 Students will prepare and present posters/models to various groups	
Aligned Washington State Standards	
Art	EALR 3 — Visual Arts: The student communicates through the arts *(dance, music, theatre and visual arts)*. Component 3.1: Uses visual arts to express and present ideas and feelings. Component 3.2: Uses visual arts to communicate for a specific purpose. Component 3.3: Develops personal aesthetic criteria to communicate artistic choices in visual arts. EALR 4 — Visual Arts: The student makes connections within and across the arts (dance, music, theatre and visual arts) to other disciplines, life, cultures and work. Component 4.1: Demonstrates and analyzes the connections among the arts disciplines. Component 4.2: Demonstrates and analyzes the connections among the arts and other content areas. Component: 4.3 Understands how the arts impact and reflect lifelong choices. Component 4.4: Understands how the arts influence and reflect cultures/civilization, place and time. Component 4.5: Understands how arts knowledge and skills are used in the world of work, including careers in the arts.
Educational Technology	**Integration**: Students use technology within all content areas to collaborate, communicate, generate innovative ideas, investigate and solve problems. 1.10 Innovate: Demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology. 1.2 Collaborate: Use digital media and environments to communicate and work collaboratively to support individual learning and contribute to the learning of others. 1.3 Investigate and Think Critically: Research, manage and evaluate information and solve problems using digital tools and resources. **Digital Citizenship**: Students demonstrate a clear understanding of technology systems and operations and practice safe, legal and ethical behavior. 2.1 Practice Safety: Demonstrate safe, legal and ethical behavior in the use of information and technology. 2.2 Operate Systems: Understand technology systems and use hardware and networks to support learning. 2.3 Select and Use Applications: Use productivity tools and common applications effectively and constructively. 2.4 Adapt to Change (Technology Fluency): Transfer current knowledge to new and emerging technologies.
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	CC.9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.
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Science	9-12 APPA Science affects society and cultures by influencing the way many people think about themselves, others, and the environment. Society also affects science by its prevailing views about what is important to study and by deciding what research will be funded. 9-12 APPB The technological design process begins by defining a problem in terms of criteria and constraints, conducting research, and generating several different solutions. 9-12 APPC Choosing the best solution involves comparing alternatives with respect to criteria and constraints, then building and testing a model or other representation of the final design. 9-12 APPD The ability to solve problems is greatly enhanced by use of mathematics and information technologies. 9-12 APPE Perfect solutions do not exist. All technological solutions involve trade-offs in which decisions to include more of one quality means less of another. All solutions involve consequences, some intended, others not. 9-12 APPF It is important for all citizens to apply science and technology to critical issues that influence society.
Common Core Writing Standards for Literacy in History/Social Studies, Science, and	**Text Types and Purposes** **1. Write arguments focused on *discipline-specific content.***

Technical Subjects	a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form and in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented. **2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.** a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic). **Production and Distribution of Writing** 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. 6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. **Research to Build and Present Knowledge** 7. Conduct short as well as more sustained research projects to answer a question (including a self generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. 8. Gather relevant information from multiple authoritative print and digital sources **(primary and secondary),** using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

	9. Draw evidence from informational texts to support analysis, reflection, and research. **Range of Writing** 10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Standards and Competencies

Standard/Unit: WR1 Career Planning: explores/analyze personal interests and aptitudes as they relate to education and career planning.

Competencies	**Total Learning Unit Hours: 20**

WR-1.1 Complete, discuss, and analyze the results of personality, career interest, and aptitude assessments;
WR-1.2 Explore the career clusters as defined by the U.S. Department of Education and summarize the career opportunities in a cluster of personal interest;
WR-1.3 Create a personal career portfolio including academic, certification and technical-skill requirement, career opportunities, expected wages, skills and aptitude necessary and the impact of technology on careers of personal interest.
WR-1.4 Determine academic/training or certification requirements for transition from one learning level to the next and explore opportunities for earning credit/certifications in high school such as advanced placement, tech prep, International Baccalaureate, college in the high school, military and apprenticeship opportunities.
WR-1.5 Develop and analyze tables, charts, and graphs related to career interests and make oral presentation regarding the career pathway of your choice.
WR-1.6 Develop an awareness of financial aid, scholarships, and other sources of income to support postsecondary education/training and discuss the impact of effective college and career planning.
WR-1.7 Identify how performance on assessments such as the SAT®, ACT®, ASVAB®, COMPASS® and ACCUPLACER® impact personal academic and career goals.
WR-1.8 Prepare a personal budget reflecting desired lifestyle and compare and contrast at least three careers of interest in regards to salary expectations and education/training costs.
WR-1.9 Prepare a program of study for at least one career of interest
WR-1.10 Apply knowledge gained from individual assessment to a set of goals and a career plan
WR-1.11 Develop strategies to make an effective transition from school to career
WR-1.13 Identify industry certification opportunities

LEADERSHIP ALIGNMENT

LEARNING & INNOVATION
Creativity and Innovation:
Think Creatively: Use a wide range of idea creation techniques (such as brainstorming)
Think Creatively: Create new and worthwhile ideas (both incremental and radical concepts)
Think Creatively: Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts
Work Creatively with Others: Develop, implement and communicate new ideas to others effectively.
Work Creatively with Others: Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work.
Work Creatively with Others: Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas.

Work Creatively with Others: View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes.
Implement Innovations: Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur.

Critical Thinking and Problem Solving

Reason Effectively: Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation.
Use Systems Thinking: Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems.
Make Judgments and Decisions: Effectively analyze and evaluate evidence, arguments, claims and beliefs.
Make Judgments and Decisions: Analyze and evaluate major alternative points of view.
Make Judgments and Decisions: Synthesize and make connections between information and arguments.
Make Judgments and Decisions: Interpret information and draw conclusions based on the best analysis.
Make Judgments and Decisions: Reflect critically on learning experiences and processes.
Solve Problems: Solve different kinds of non-familiar problems in both conventional and innovative ways.
Solve Problems: Identify and ask significant questions that clarify various points of view and lead to

Communication and Collaboration:

Communicate Clearly: Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
Communicate Clearly: Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions.
Communicate Clearly: Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade).
Communicate Clearly: Utilize multiple media and technologies, and know how to judge their effectiveness a priority as well as assess their impact.
Communicate Clearly: Communicate effectively in diverse environments (including multi-lingual).
Collaborate with Others: Demonstrate ability to work effectively and respectfully with diverse teams.
Collaborate with Others: Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal.
Collaborate with Others: Assume shared responsibility for collaborative work, and value the individual contributions made by each team member.

INFORMATION, MEDIA & TECHNOLOGY SKILLS

Information Literacy

Access and Evaluate Information: Access information efficiently (time) and effectively (sources).
Access and Evaluate Information: Evaluate information critically and competently.
Use and Manage Information: Use information accurately and creatively for the issue or problem at hand
Use and Manage Information: Manage the flow of information from a wide variety of sources.
Use and Manage Information: Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information.

Media Literacy

Analyze Media: Understand both how and why media messages are constructed, and for what purposes.
Analyze Media: Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors.
Analyze Media: Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media.
Create Media Products: Understand and utilize the most appropriate media creation tools, characteristics and conventions.
Create Media Products: Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments.

Information, Communication and Technology

Apply Technology Effectively: Use technology as a tool to research, organize, evaluate and communicate
Apply Technology Effectively: Information.
Apply Technology Effectively: Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy.
Apply Technology Effectively: Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies.

LIFE & CAREER SKILLS

Flexibility and Adaptability

Adapt to Change: Adapt to varied roles, jobs responsibilities, schedules and contexts.
Adapt to Change: Work effectively in a climate of ambiguity and changing priorities.
Be Flexible: Incorporate feedback effectively.
Be Flexible: Deal positively with praise, setbacks and criticism.
Be Flexible: Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments.

Initiative and Self-Direction

Manage Goals and Time: Set goals with tangible and intangible success criteria.
Manage Goals and Time: Balance tactical (short-term) and strategic (long-term) goals.
Manage Goals and Time: Utilize time and manage workload efficiently.
Work Independently: Monitor, define, prioritize and complete tasks without direct oversight.
Be Self-directed Learners: Go beyond basic mastery of skills and/or curriculum to explore and expand one‘s own learning and opportunities to gain expertise.
Be Self-directed Learners: Demonstrate initiative to advance skill levels towards a professional level.
Be Self-directed Learners: Demonstrate commitment to learning as a lifelong process.
Be Self-directed Learners: Reflect critically on past experiences in order to inform future progress.

Social and Cross-Cultural

Interact Effectively with Others: Know when it is appropriate to listen and when to speak.
Interact Effectively with Others: Conduct themselves in a respectable, professional manner.
Work Effectively in Diverse Teams: Respect cultural differences and work effectively with people from a range of social and cultural backgrounds.
Work Effectively in Diverse Teams: Respond open-mindedly to different ideas and values.
Work Effectively in Diverse Teams: Leverage social and cultural differences to create new ideas and increase both innovation and quality of work.

Productivity and Accountability

Manage Projects: Set and meet goals, even in the face of obstacles and competing pressures.
Manage Projects: Prioritize, plan and manage work to achieve the intended result.
Produce Results: Demonstrate additional attributes associated with producing high quality products including the abilities to:
Produce Results: Work positively and ethically.
Produce Results: Manage time and projects effectively.
Produce Results: Multi-task.
Produce Results: Participate actively, as well as be reliable and punctual.
Produce Results: Present oneself professionally and with proper etiquette.

Produce Results: Collaborate and cooperate effectively with teams.
Produce Results: Respect and appreciate team diversity.
Produce Results: Be accountable for results.
Leadership and Responsibility
Guide and Lead Others: Use interpersonal and problem-solving skills to influence and guide others toward a goal.
Guide and Lead Others: Leverage strengths of others to accomplish a common goal.
Guide and Lead Others: Inspire others to reach their very best via example and selflessness.
Guide and Lead Others: Demonstrate integrity and ethical behavior in using influence and power.
Be Responsible to Others: Act responsibly with the interests of the larger community in mind.

21st Century Skills		
Check those that students will demonstrate in this course:		
LEARNING & INNOVATION **Creativity and Innovation** ☒Think Creatively ☒Work Creatively with Others ☒Implement Innovations **Critical Thinking and Problem Solving** ☒Reason Effectively ☒**U**se Systems Thinking ☒Make Judgments and Decisions ☒Solve Problems **Communication and Collaboration** ☒Communicate Clearly ☒Collaborate with Others	**INFORMATION, MEDIA & TECHNOLOGY SKILLS** **Information Literacy** ☒Access and /evaluate Information ☒Use and Manage Information **Media Literacy** ☒Analyze Media ☒Create Media Products **Information, Communications and Technology (ICT Literacy)** ☒Apply Technology Effectively	**LIFE & CAREER SKILLS** **Flexibility and Adaptability** ☒Adapt to Change ☒Be Flexible **Initiative and Self-Direction** ☒Manage Goals and Time ☒Work Independently ☒Be Self-Directed Learners **Social and Cross-Cultural** ☒Interact Effectively with Others ☒Work Effectively in Diverse Teams **Productivity and Accountability** ☒Manage Projects ☒Produce Results **Leadership and Responsibility** ☒Guide and Lead Others ☒Be Responsible to Others