

**PENINSULA SCHOOL DISTRICT
Science Curriculum
Seventh Grade**



Process / Investigation Terms

acquired characteristic	natural selection
artery / blood vessel	nerves
bacteria	nitrogen
capillary	nucleus
carbohydrates	organ
carbon dioxide	organic
cell	pesticide
cold-blooded	photosynthesis
diversity	predator
DNA	prey
evolution	protein
excretion	recycle
fats	recycle
gene/genetic	respiration
genetic	respirator
germination	reuse
herbicide	specialized
microorganism	stomach
microorganism	tissue
microscope	vein tissue

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1. Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems. (Essential Academic Learning Requirement)

Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources								
1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things											
1.1.1	*										
1.1.2	*										
1.1.3	*										
1.1.4	*										
1.1.5	*										
1.1.6	<p>Understand how to classify organisms by their external and internal structures W</p> <ul style="list-style-type: none"> • Describe how organisms can be classified using similarities and differences in physical and functional characteristics (both internal and external) • Explain an inference about whether organisms have a biological relationship or common ancestry based on given characteristics <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">bacteria</td> <td>warm-blooded</td> </tr> <tr> <td>genetic</td> <td>natural selection</td> </tr> <tr> <td>microorganism</td> <td>evolution</td> </tr> <tr> <td>cold-blooded</td> <td>organic</td> </tr> </table>	bacteria	warm-blooded	genetic	natural selection	microorganism	evolution	cold-blooded	organic		
bacteria	warm-blooded										
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Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems			
1.2.1	Analyze how the parts of a system interconnect and influence each other W <ul style="list-style-type: none"> • Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations) predator recycle prey respiration pattern photosynthesis		
1.2.2	*		
1.2.3	*		
1.2.4	*		

* Not formally addressed at this grade level

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Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems, <i>continued</i>			
1.2.5	*		
1.2.6	<p>Understand that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions W</p> <ul style="list-style-type: none"> • Describe and identify how plant and animal cells are similar and different in structure and function • Describe basic cell functions (i.e., extracting energy from food, using energy, and getting rid of waste) • Describe the life function of specialized cells or tissues (e.g., blood cells are different from bone cells; leaf tissues capture the energy from sunlight) • Describe the life function of organs or organ systems (e.g., the stomach breaks down food and the intestines absorb food in the digestive system) <p>cell carbon dioxide protein nucleus specialized tissue microorganism bacteria carbohydrates microscope respiration fats</p>		

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1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems, <i>continued</i>			
1.2.7	<p>Understand that organisms pass on genetic information in their life cycle and that an organism's characteristics are determined by both genetic and environmental influences W</p> <ul style="list-style-type: none"> • Explain that organisms require a set of instructions for specifying their traits (i.e., heredity is the passage of these instructions from one generation to another) • Describe that genes inherited from parents are combined in their offspring to produce a new combination of characteristics • Explain how physical characteristics of living things can be affected by genetic information and/or by interactions with the environment (e.g., nutrition, disease, sanitation) • Describe and compare sexual (two parents) and asexual (one parent) life cycles of plants and animals <p>nucleus genetic DNA Acquired characteristics gene germination</p>		

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1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems, <i>continued</i>			
1.2.8	<p>Understand human life functions and the interconnecting organ systems necessary to maintain human life W</p> <ul style="list-style-type: none"> • Describe the components and functions of the organ systems (i.e., circulatory, digestive, reproductive, excretory, nervous-sensory [brain, nerves, spinal cord, hearing, vision], respiratory, and muscular-skeletal systems) • Describe relationships among the organ systems of the human body (e.g., the role of the senses and the nervous system for human survival, the relationships between the digestive and excretory systems) • Compare human body systems to another organism's body system (e.g., human lungs to plant leaves, human skeletal or circulatory systems to plant stems) <p>nerves tissue blood vessel vein stomach capillary organ artery</p>		

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1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy			
1.3.1	*		
1.3.2	*		
1.3.3	*		
1.3.4	*		

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2. Inquiry: The student knows and applies the skills, processes, and nature of scientific inquiry.
(Essential Academic Learning Requirement)

Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
2.1 Investigating systems: Develop the knowledge and skills necessary to do scientific inquiry			
2.1.1	<p>Understand how to generate a question that can be answered through scientific investigation W</p> <ul style="list-style-type: none"> • Generate multiple questions based on observations • Generate a question that can be investigated scientifically • Generate a new question that can be investigated with the same materials and/or data as a given investigation 		
2.1.2	<p>Understand how to plan and conduct scientific investigations W</p> <ul style="list-style-type: none"> • Make predictions (hypothesize) and give reasons • Generate a logical plan for, and conduct, a scientific controlled investigation with the following attributes: <ul style="list-style-type: none"> √ Prediction (hypothesis) √ Appropriate materials, tools, and available computer technology √ Controlled variables (kept the same) √ One manipulated (changed) variable √ Responding (dependent) variable √ Gather, record, and organize data using appropriate units, charts, and/or graphs √ Multiple trials • Generate a logical plan for a simple field investigation with the following attributes: <ul style="list-style-type: none"> √ Identify multiple variables √ Select observable or measurable variables related to the investigative question • Identify and explain safety requirements that would be needed in the investigation 		

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Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
2.1 Investigating systems: Develop the knowledge and skills necessary to do scientific inquiry, <i>continued</i>			
2.1.3	<p>Apply understanding of how to construct a scientific explanation using evidence and inferential logic W</p> <ul style="list-style-type: none"> • Generate a scientific conclusion including supporting data from an investigation using inferential logic (e.g., chewing gum loses more mass than bubble gum after being chewed for 5 minutes; chewing gum lost 2.00 grams while bubble gum only lost 1.47 grams) • Describe a reason for a given conclusion using evidence from an investigation • Generate a scientific explanation of an observed phenomenon using given data • Predict what logically might occur if an investigation lasted longer or changed • Describe the difference between evidence (data) and conclusions 		
2.1.4	<p>Analyze how models are used to investigate objects, systems, and processes W</p> <ul style="list-style-type: none"> • Compare models or computer simulations of phenomena • Explain how models or computer simulations are used to investigate and predict the behavior of objects, events, systems, or processes • Create a model or computer simulation to investigate and predict the behavior of objects, events, systems, or processes (e.g., phases of the moon using a solar system model) • Explain the advantages and limitations of investigating with a model 		

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Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
2.1 Investigating systems: Develop the knowledge and skills necessary to do scientific inquiry, <i>continued</i>			
2.1.5	<p>Apply understanding of how to report investigations and explanations of objects, events, systems, and processes W</p> <ul style="list-style-type: none"> • Report observations of scientific investigations without making inferences • Summarize an investigation by describing: <ul style="list-style-type: none"> √ Reasons for selecting the investigative plan √ Materials used in the investigation √ Observations, data, results √ Explanations and conclusions in written, mathematical, oral, and information technology presentation formats √ Ramifications of investigations √ Safety procedures used • Describe the difference between an objective summary of data and an inference made from data 		

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Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
2.2 Nature of science: Understand the nature of scientific inquiry			
2.2.1	<p>Apply curiosity, honesty, skepticism, and openness when considering explanations and conducting investigations W</p> <ul style="list-style-type: none"> • Explain why an honest response to questionable results, conclusions, or explanations is important to the scientific enterprise • Describe a flaw in a claim or a conclusion (i.e., limited data, flawed procedure, or overgeneralization) • Describe how scientists accurately and honestly record, report, and share observations and measurements without bias • Explain why honest acknowledgement of the contributions of others and information sources are necessary 		
2.2.2	<p>Understand that scientific theories explain facts using inferential logic W</p> <ul style="list-style-type: none"> • Describe how a principle or theory logically explains a given set of facts • Describe how new facts or evidence may result in the modification or rejection of a theory (e.g., caloric theory of heat, theory of acquired characteristics) 		
2.2.3	<p>Analyze inconsistent results from scientific investigations to determine how the results can be explained W</p> <ul style="list-style-type: none"> • Compare two or more similar investigations and explain why different results were produced (e.g., insufficient data could be interpreted as inconsistent results) • Explain whether sufficient information has been obtained to make a conclusion • Explain why the results from a single investigation or demonstration are not sufficient to describe a phenomenon 		

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Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
2.2 Nature of science: Understand the nature of scientific inquiry, <i>continued</i>			
2.2.4	<p>Understand how to make the results of scientific investigations reliable and how to make the methods of investigation valid W</p> <ul style="list-style-type: none"> • Describe how the method of an investigation ensures reliable results (e.g., multiple trials ensure more reliable results) • Describe how to increase the reliability of the results of an investigation (e.g., repeating an investigation exactly the same way increases the reliability of the results) • Describe how the method of an investigation is valid (i.e., validity means that the investigation answered the investigative question with confidence; the manipulated variable caused the change in the responding or dependent variable) • Describe the purpose of the steps and materials of an investigation's procedure in terms of the validity of the investigation • Modify an investigation to improve the validity of the investigation and explain how the modifications improved the validity (e.g., more controlled variables, more accurate measuring techniques, greater sample size) 		
2.2.5	<p>Understand that increased comprehension of systems leads to new inquiry W</p> <ul style="list-style-type: none"> • Describe how scientific inquiry results in new facts, evidence, unexpected findings, ideas, and explanations • Describe how results of scientific inquiry may change our understanding of the systems of the natural and constructed world • Describe how increased understanding of systems leads to new questions to be investigated • Describe how new ideas need repeated inquiries before acceptance • Describe how new investigative questions arise at the completion of scientific inquiry 		

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3. Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts. (Essential Academic Learning Requirement)

Benchmark 1 Seventh Grade	A Peninsula Seventh Grade Student will: from the Grade Level Expectations (GLEs)	Instructional Materials and Resources	Assessment Strategies and Resources
3.1 Designing solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges			
3.1.1	<p>Analyze common problems or challenges in which scientific design can be or has been used to design solutions W</p> <ul style="list-style-type: none"> • Describe how science and technology could be used to solve all or part of a human problem and vice versa (e.g., understanding erosion can be used to solve some flooding problems) • Describe the scientific concept, principle, or process used in a solution to a human problem (e.g., understanding of the relationship between electricity and magnetism has been used to make electric motors and generators) • Explain how to scientifically gather information to develop a solution (e.g., collect data by measuring all the factors and establish which are the most important to solve the problem) • Describe an appropriate question that could lead to a possible solution to a problem 		

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3.1 Designing solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges, <i>continued</i>			
3.1.2	<p>Apply the scientific design process to develop and implement solutions to problems or challenges W</p> <ul style="list-style-type: none"> • Propose, implement, and document a scientific design process used to solve a problem or challenge <ul style="list-style-type: none"> √ Define the problem √ Scientifically gather information and collect measurable data √ Explore ideas √ Make a plan √ List steps to do the plan √ Scientifically test solution √ Document the scientific design process • Explain possible solutions to the problem (e.g., use pulleys instead of levers to lift a heavy object) • Explain the reason(s) for the effectiveness of a solution to a problem or challenge 		
3.1.3	<p>Analyze multiple solutions to a problem or challenge</p> <ul style="list-style-type: none"> • Describe the criteria to evaluate an acceptable solution to the problem or challenge • Describe the reason(s) for the effectiveness of a solution to a problem or challenge using scientific concepts and principles • Describe the consequences of the solution to the problem or challenge (e.g., using rocks on the edge of a stream to prevent erosion may destroy habitat) • Describe how to change a system to solve a problem or improve a solution to a problem • Compare the effectiveness of different solutions to a problem or challenge based on criteria, using scientific concepts and principles 		

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3.2 Science, Technology, and Society: Analyze how science and technology are human endeavors, interrelated to each other, society, the workplace, and the environment			
3.2.1	<p>Analyze how science and technology have been developed, used, and affected by many diverse individuals, cultures, and societies throughout human history</p> <ul style="list-style-type: none"> • Explain how the contributions of diverse individuals have led to the development of science and technology • Explain how science and technology have affected individuals, cultures, and societies throughout human history 		
3.2.2	<p>Analyze scientific inquiry and scientific design and understand how science supports technological development and vice versa W</p> <ul style="list-style-type: none"> • Describe how scientific investigations and scientific research support technology (e.g., investigation into materials led to Gore-Tex and Kevlar) • Describe how technology supports scientific investigations and research (e.g., microscopes led to the discovery of unicellular organisms) • Describe how a scientifically designed solution to a human problem can lead to new tools that generate further inquiry (e.g., microscopes, telescopes, and computers) • Compare the processes of scientific inquiry and scientific design in terms of activities, results, and/or influence on individuals and/or society 		

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3.2 Science, Technology, and Society: Analyze how science and technology are human endeavors, interrelated to each other, society, the workplace, and the environment, <i>continued</i>			
3.2.3	Analyze the use of science, mathematics, and technology within occupational/career areas of interest <ul style="list-style-type: none"> • Examine scientific, mathematical, and technological knowledge and skills used in an occupation/career • Research occupations/careers that require knowledge of science, mathematics, and technology 		
3.2.4	Analyze how human societies' use of natural resources affects the quality of life and the health of ecosystems W <ul style="list-style-type: none"> • Discriminate between renewable and nonrenewable resources in an ecosystem • Explain the effects that the conservation of natural resources has on the quality of life and the health of ecosystems • Explain the effects of various human activities on the health of an ecosystem and/or the ability of organisms to survive in that ecosystem (e.g., consumption of natural resources; waste management; urban growth; land use decisions; pesticide, herbicide, or fertilizer use) 		