



Project-Based Life Science Correlation to the Washington Science Standards, Grades 6-8

EALR 1: Systems (SYS) Core Content: *Inputs, Outputs, Boundaries and Flows*

Content Standards/Performance Expectations	Location/Page where Standard is found
6-8 SYSA Any <i>system</i> may be thought of as containing <i>subsystems</i> and as being a <i>subsystem</i> of a larger <i>system</i> .	
Given a <i>system</i> , identify <i>subsystems</i> and a larger encompassing <i>system</i> (e.g., the heart is a <i>system</i> made up of tissues and cells, and is part of the larger circulatory <i>system</i>).	Throughout, for example: LT: 83-85; 113-126; 133-138 GF: 78-81; 86-91; 93; 96-97; 109-111; 124-130
6-8 SYSB The boundaries of a <i>system</i> can be drawn differently depending on the features of the <i>system</i> being <i>investigated</i> , the size of the <i>system</i> , and the purpose of the investigation.	
<i>Explain how</i> the boundaries of a <i>system</i> can be drawn to fit the purpose of the study (e.g., to study how insect <i>populations</i> change a <i>system</i> might be a forest, a meadow in the forest, or a single tree).	Throughout, for example: LT: 33-41; 83-85; 113-126; 133-138 GF: 78-81; 137-142 Genetics: 106-113
6-8 SYSC The <i>output</i> of one <i>system</i> can become the <i>input</i> of another <i>system</i> .	
Give an example of how <i>output</i> of <i>matter</i> or energy from a <i>system</i> can become <i>input</i> for another <i>system</i> (e.g., household waste goes to a landfill).*a	LT: 109-112; 127-132 GF: 29; 38-39
6-8 SYSD In an <i>open system</i> , <i>matter</i> flows into and out of the <i>system</i> . In a <i>closed system</i> , energy may flow into or out of the <i>system</i> , but <i>matter</i> stays within the <i>system</i> .	
Given a description of a <i>system</i> , analyze and defend whether it is open or closed.	LT: 109-112; 127-132 GF: 86-91; 93; 97-103; 105-111
6-8 SYSE If the <i>input</i> of <i>matter</i> or energy is the same as the <i>output</i> , then the amount of <i>matter</i> or energy in the <i>system</i> won't change; but if the <i>input</i> is more or less than the <i>output</i> , then the amount of <i>matter</i> or energy in the <i>system</i> will change.	

Measure the flow of <i>matter</i> into and out of an <i>open system</i> and <i>predict</i> how the <i>system</i> is likely to change (e.g., a bottle of water with a hole in the bottom, an <i>ecosystem</i> , an <i>electric circuit</i>). ^{*b}	Throughout, for example: LT: 14-16; 33-41; 46-50; 83-84; 109-112;113-125
6-8 SYSF The natural and <i>designed world</i> is complex; it is too large and complicated to <i>investigate</i> and comprehend all at once. Scientists and students learn to define small portions for the convenience of investigation. The units of investigation can be referred to as —systems.	
Given a complex societal issue with strong <i>science</i> and <i>technology</i> components (e.g., overfishing, global warming), <i>describe</i> the issue from a <i>systems</i> point of view, highlighting how changes in one part of the <i>system</i> are likely to influence other parts of the <i>system</i> .	Throughout, for example: LT: 14-16; 42-50; 83-84; 113-126 GF: 58-61 Genetics: 106-113

EALR 2: Inquiry (INQ)
Core Content: *Questioning and Investigating*

Content Standards/Performance Expectations	Location/Page where Standard is found
6-8 INQA Question Scientific <i>inquiry</i> involves asking and answering <i>questions</i> and comparing the answer with what scientists already know about the world.	
<i>Generate</i> a <i>question</i> that can be answered through scientific investigation. This may involve refining or refocusing a broad and ill-defined <i>question</i> .	Throughout, for example: LT: 4-13; 21-22; 33-34 GF: 3-8; 45 Genetics: 3-12; 105 AA: 3-10; 11
6-8 INQB Investigate Different kinds of <i>questions</i> suggest different kinds of scientific investigations.	
Plan and conduct a scientific investigation (e.g., <i>field study</i> , <i>systematic observation</i> , <i>controlled experiment</i> , <i>model</i> , or simulation) that is appropriate for the <i>question</i> being asked.	Throughout, for example: LT: 17-20; 33-39 GF: 45-50; 86-92 Genetics: 67-70; 96-102; 108-113 AA: 38-42; 102-106
Propose a <i>hypothesis</i> and give a reason for the <i>hypothesis</i> and <i>explain how</i> the planned investigation will test the <i>hypothesis</i> .	Throughout, for example: LT: 18-19; 39 GF: 45-50 Genetics: 89-92 AA: 82-86; 102-103; 115-117
Work collaboratively with other students to carry out the investigations.	Throughout, for example: LT: 17-20; 38-41 GF: 45-50; 97-99 Genetics: 79-81; 96-102 AA: 55; 68-71; 102-107
6-8 INQC Investigate Collecting, analyzing, and displaying data are essential aspects of all investigations.	
Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. ^{*a}	Throughout, for example: LT: 18-20; 40-41 GF: 52-54; 73-75 Genetics: 70; 76-81; 96-102; 226-234 AA: 48-51; 91-95; 105-107;

	148-152
Recognize and interpret <i>patterns</i> – as well as <i>variations</i> from previously learned or observed <i>patterns</i> – in data, diagrams, symbols, and words.*a	Throughout, for example: LT: 18-20; 87-88 GF: 41-44; 93-96 Genetics: 39-44; 61-64; 96-102 AA: 64-67; 105-107
Use statistical procedures (e.g., median, mean, or mode) to analyze data and make <i>inferences</i> about <i>relationships</i> .*b	Throughout, for example: LT: 56-60 GF: 41-44; 93-96 Genetics: 61-65; 67-74; 96-102 AA: 20-27
6-8 INQD Investigate : For an <i>experiment</i> to be valid, all (<i>controlled</i>) variables must be kept the same whenever possible, except for the <i>manipulated (independent) variable</i> being tested, and the <i>responding (dependent) variable</i> being measured and recorded. If a <i>variable</i> cannot be <i>controlled</i>, it must be reported and accounted for.	
Plan and conduct a <i>controlled experiment</i> to test a <i>hypothesis</i> about a <i>relationship</i> between two <i>variables</i> . *c Determine which <i>variables</i> should be kept the same (<i>controlled</i>), which (<i>independent</i>) <i>variable</i> should be systematically <i>manipulated</i> , and which <i>responding (dependent) variable</i> is to be measured and recorded. Report any <i>variables</i> not <i>controlled</i> and <i>explain</i> how they might affect results.	Throughout, for example: LT: 17-20 GF: 45-50 Genetics: 106-113 AA: 102-107
6-8 INQE Model: <i>Models</i> are used to represent objects, events, systems, and processes. <i>Models</i> can be used to test <i>hypotheses</i> and better understand <i>phenomena</i>, but they have limitations.	
Create a <i>model</i> or <i>simulation</i> to represent the behavior of objects, events, <i>systems</i> , or processes. Use the <i>model</i> to explore the <i>relationship</i> between two <i>variables</i> and point out how the <i>model</i> or simulation is similar to or different from the actual phenomenon.	Throughout, for example: LT: 17-20; 56-60 GF: 86-92 Genetics: 39-44; 76-81; 96-102; 106-113 AA: 61-77
6-8 INQF Explain: It is important to distinguish between the results of a particular investigation and general conclusions drawn from these results.	
<i>Generate</i> a scientific conclusion from an investigation, using inferential logic, and clearly distinguish between results (i.e., <i>evidence</i>) and conclusions (e.g., explanation). <i>Describe</i> the differences between an objective summary of the findings and an <i>inference</i> made from the findings.	Throughout, for example: LT: 19-20; 39-41 GF: 86-92; 145-149 Genetics: 89-92; 96-102; 226-234 AA: 105-107; 116-119
6-8 INQG Communicate Clearly: Scientific reports should enable another investigator to repeat the study to check the results.	
Prepare a written report of an investigation by clearly describing the <i>question</i> being <i>investigated</i> , what was done, and an objective summary of results. The report should provide <i>evidence</i> to accept or reject the <i>hypothesis</i> , <i>explain</i> the <i>relationship</i> between two or more <i>variables</i> , and identify limitations of the investigation.	Throughout, for example: LT: 40-41; 51-52; 140-148 GF: 93-96; 52-54 Genetics: 96-102; 106-113 AA: 28-31; 47-52; 118-119
6-8 INQH Intellectual Honestly: <i>Science</i> advances through openness to new <i>ideas</i>, honesty, and legitimate <i>Skepticism</i>. Asking thoughtful <i>questions</i>, querying other scientists' explanations, and evaluating one's own thinking in response to the <i>ideas</i> of others are abilities of scientific <i>inquiry</i>.	

Recognize flaws in scientific <i>claims</i> , such as uncontrolled <i>variables</i> , overgeneralizations from limited data, and experimenter bias.	Throughout, for example: LT: 104-106; 140-148 GF: 48-50; 52-54 Genetics: 106-113 AA: 106; 22-23; 38-40; 111-113
Listen actively and respectfully to research reports by other students. Critique their presentations respectfully, using <i>logical argument</i> and <i>evidence</i> .	Throughout, for example: LT: 40-41; 125-126; 131-132 GF: 120-123; 41-44; 52-54 Genetics: 100-101; 106-113 AA: 28-30; 91-95; 105-107
Engage in reflection and self-evaluation.	Throughout, for example: LT: 104-106; 131-132 GF: 52-54; 123 Genetics: 106-113 AA: 30-31; 36-37; 39-41; 148-152

EALR 3: Application (APP)
Core Content: *Science, Technology, and Solving Problems*

Content Standards/Performance Expectations	Location/Page where Standard is found
6-8 APPA People have always used <i>technology</i> to solve problems. Advances in human civilization are linked to advances in <i>technology</i>.	
<i>Describe</i> how a <i>technology</i> has changed over time in response to societal challenges (e.g., population increase created a need for mass communication).	Throughout, for example: GF: 58-61; 137-142 Genetics: 186-187; 212-217 AA: 138-139
6-8 APPB <i>Scientists</i> and technological designers (including <i>engineers</i>) have different goals. <i>Scientists</i> answer <i>questions</i> about the <i>natural world</i>; technological designers solve problems that help people reach their goals.	
<i>Investigate</i> several professions in which an understanding of <i>science</i> and <i>technology</i> is required. <i>Explain</i> why that understanding is necessary for success in each profession.	Throughout, for example: GF: 15; 50; 59-61 Genetics: 120; 203-207 AA: 12-14; 53-56; 105
6-8 APPC <i>Science</i> and <i>technology</i> are interdependent. <i>Science</i> drives <i>technology</i> by demanding better instruments and suggesting <i>ideas</i> for new designs. <i>Technology</i> drives <i>science</i> by providing instruments and research methods.	
Give examples to illustrate how scientists have helped solve technological problems (e.g., how the <i>science</i> of biology has helped sustain fisheries) and how engineers have aided <i>science</i> (e.g., designing telescopes to discover distant planets).	Throughout, for example: GF: 58-61; 137-142 Genetics: 207-211; 212-218 AA: 138-141
6-8 APPD The process of <i>technological design</i> begins by defining a problem, identifying <i>criteria</i> for a successful solution, followed by research to better understand the problem, and brainstorming potential <i>solutions</i>.	
Formulate a problem that can be solved by the <i>technological design</i> process, and identify <i>criteria</i> for success.	Throughout, for example: LT: 33-41 Genetics: 3-12 AA: 3-10

Research how others have solved similar problems.	Throughout, for example: LT: 33-41 GF: 62-72 Genetics: 212-218 AA: 142-155
Brainstorm different <i>solutions</i> .	Throughout, for example: LT: 32-41; 140-148 GF: 120-123 Genetics: 220-223 AA: 142-155
6-8 APPE Scientists and engineers often work together to <i>generate creative solutions</i> to problems and decide which ones are most promising.	
Collaborate with other students to <i>generate</i> creative <i>solutions</i> to a problem, and <i>apply</i> methods for making trade-offs to choose the best <i>solution</i> . ^{*a}	Throughout, for example: LT: 140-148 Genetics: 228-233 AA: 142-155
6-8 APPF <i>Solutions</i> must be tested to determine whether or not they will solve the problem. Results are used to modify the <i>design</i>, and the best solution must be communicated persuasively.	
Test the best <i>solution</i> by building a model or other representation, and using it with the intended audience. Redesign if necessary.	Throughout, for example: LT: 17-20; 35-41 Genetics: 220-232 AA: 142-155
Present the recommended <i>design</i> using models or drawings and an engaging presentation. ^{*b}	Throughout, for example: LT: 140-148 Genetics: 228-229 AA: 142-155
6-8 APPG The benefits of science and technology are not available to all the people in the world.	
Contrast the benefits of science and technology enjoyed by people in industrialized and developing nations.	Throughout, for example: GF: 134-142; 58-61 Genetics: 230-234
6-8 APPH People in all <i>cultures</i> have made and continue to make contributions to society through <i>science</i> and <i>technology</i>.	
<i>Describe</i> scientific or technological contributions to society by people in various <i>cultures</i> .	Throughout, for example: GF: 58-61 Genetics: 7-8; 49; 86; 143; 203-207; 212-217 AA: 54-57

EALR 4: Physical Science

Content Standards/Performance Expectations	Location/Page where Standard is found
Big Idea: Force and Motion (PS1) Core Content: <i>Balanced and Unbalanced Forces</i>	

6-8 PS1A Average speed is defined as the distance traveled in a given period of time.	
Measure the distance an object travels in a given interval of time and calculate the object's <i>average speed</i> , using $S = d/t$. (e.g., a battery-powered toy car travels 20 meters in 5 seconds, so its <i>average speed</i> is 4 meters per second).*a	N/A
Illustrate the <i>motion</i> of an object, using a graph, or <i>infer</i> the <i>motion</i> of an object from a graph of the object's position vs. time or <i>speed</i> vs. time.*b	N/A
6-8 PS1B Friction is a force that acts to slow or stop the motion of objects.	
Demonstrate and explain the <i>frictional force</i> acting on an object with the use of a physical <i>model</i> .	N/A
6-8 PS1C Unbalanced forces will cause changes in the speed or direction of an object's motion.	
Determine whether <i>forces</i> on an object are balanced or unbalanced and justify with <i>observational evidence</i> .	N/A
Given a description of <i>forces</i> on an object, <i>predict</i> the object's <i>motion</i> .*c	N/A
6-8 PS1D The same unbalanced force will change the motion of an object with more mass more slowly than an object with less mass.	
Given two different <i>masses</i> that receive the same unbalanced <i>force</i> , <i>predict</i> which will move more quickly.	N/A
Big Idea: Matter: Properties and Change (PS2) Core Content: Atoms and Molecules	
6-8 PS2A Substances have characteristic intrinsic properties, such as density, solubility, boiling point, and melting point, all of which are independent of the amount of the sample.	
Use <i>characteristic intrinsic properties</i> such as <i>density</i> , <i>boiling point</i> , and <i>melting point</i> to identify an unknown substance.	N/A
6-8 PS2B Mixtures are combinations of substances whose chemical properties are preserved. Compounds are substances that are chemically formed and have different physical and chemical properties from the reacting substances.	

Separate a <i>mixture</i> using differences in <i>properties</i> (e.g., <i>solubility</i> , <i>size</i> , <i>magnetic attraction</i>) of the substances used to make the <i>mixture</i> .	N/A
Demonstrate that the <i>properties</i> of a <i>compound</i> are different from the <i>properties</i> of the reactants from which it was formed.	N/A
6-8 PS2C All matter is made of atoms. Matter made of only one type of atom is called an element.	
<i>Explain</i> that all <i>matter</i> is made of <i>atoms</i> , and give examples of <i>common elements</i> —substances composed of just one kind of <i>atom</i> .	N/A
6-8 PS2D Compounds are composed of two or more kinds of atoms, which are bound together in well-defined molecules or arrays.	
Demonstrate with a labeled diagram and explain the <i>relationship</i> among <i>atoms</i> , <i>molecules</i> , <i>elements</i> , and <i>compounds</i> .	N/A
6-8 PS2E Solids, liquids, and gases differ in the motion of individual particles. In solids, particles are packed in a nearly rigid structure; in liquids, particles move around one another; and in gases, particles move almost independently.	
<i>Describe</i> how <i>solids</i> , <i>liquids</i> , and <i>gases</i> behave when put into a container (e.g., a <i>gas</i> fills the entire volume of the container). Relate these <i>properties</i> to the relative movement of the particles in the three <i>states of matter</i> .	N/A
6-8 PS2F When substances within a closed system interact, the total mass of the system remains the same. This concept, called conservation of mass, applies to all physical and chemical changes.	
<i>Apply</i> the <i>concept of conservation of mass</i> to correctly <i>predict</i> changes in <i>mass</i> before and after <i>chemical reactions</i> , including reactions that occur in closed containers, and reactions that occur in open containers where a <i>gas</i> is given off.*a	N/A
Big Idea: Energy: Transfer, Transformation, and Conservation (PS3) Core Content: Interactions of Energy and Matter	
6-8 PS3A Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	
List different forms of energy (e.g., thermal, light, chemical, electrical, kinetic, and sound energy).	N/A
<i>Describe</i> ways in which energy is <i>transformed</i> from one <i>form</i> to another and <i>transferred</i> from one place to another (e.g., chemical energy to electricity in a battery, electrical to light energy in a bulb).	N/A
6-8 PS3B Heat (thermal energy) flows from warmer to cooler objects until both reach the same temperature. Conduction, radiation, and convection, or mechanical mixing, are the means of heat transfer.	

Use everyday examples of <i>conduction, radiation, and convection</i> , or <i>mechanical mixing</i> , to illustrate the <i>transfer of heat</i> energy from warmer objects to cooler ones, until the objects reach the same temperature.	N/A
6-8 PS3C Heat (thermal energy) consists of random motion and the vibrations of atoms and molecules. The higher the temperature, the greater the atomic or molecular motion. Thermal insulators are materials that resist the flow of heat.	
<i>Explain how</i> various types of insulation slow <i>transfer of heat</i> energy, based on the atomic-molecular model of <i>heat</i> (thermal energy).	N/A
6-8 PS3D Visible light from the Sun is made up of a mixture of all colors of light. To see an object, light emitted or reflected by that object must enter the eye.	
<i>Describe</i> how to demonstrate that visible light from the Sun is made up of different colors.	AA: 72-73
Draw and label a diagram showing that to see an object, light must come directly from the object or from an external source reflected from the object, and enter the eye..	AA: 72-73
6-8 PS3E Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	
Illustrate the <i>transformations</i> of energy in an <i>electric circuit</i> when <i>heat, light, and sound</i> are produced. <i>Describe the transformation</i> of energy in a battery within an <i>electric circuit</i> .	N/A
6-8 PS3F Energy can be transferred from one place to another through waves. Waves include vibrations in materials. Sound and earthquake waves are examples. These and other waves move at different speeds in different materials.	
Contrast a light <i>wave</i> with a sound <i>wave</i> by identifying that both have <i>characteristic wavelengths</i> , but light <i>waves</i> can travel through a vacuum while sound <i>waves</i> cannot.	AA: 72-73; 124-130
<i>Explain that</i> sound results from the vibration of an object.	AA: 123-130; 137

EALR 4: Earth and Space Science

Content Standards/Performance Expecations	Location/Page where Standard is found
Big Idea: Earth and Space (ES1) Core Content: <i>The Solar System</i>	
6-8 ES1A The Moon's monthly cycle of phases can be explained by its changing relative position as it orbits Earth. An eclipse of the Moon occurs when the Moon enters Earth's shadow. An eclipse of the Sun occurs when the Moon is between the Earth and Sun, and the Moon's shadow falls on the Earth.	

Use a physical <i>model</i> or diagram to <i>explain how</i> the Moon's changing position in its <i>orbit</i> results in the changing phases of the <i>Moon</i> as observed from Earth.	N/A
<i>Explain how</i> the cause of an <i>eclipse</i> of the Moon is different from the cause of the Moon's phases.	N/A
6-8 ES1B Earth is the third planet from the sun in a <i>system</i> that includes the Moon, the Sun, seven other major <i>planets</i> and their <i>moons</i>, and smaller objects, such as <i>asteroids</i>, <i>plutoids</i>, and <i>comets</i>. These bodies differ in many <i>characteristics</i> (e.g., size, composition, relative position).	
<i>Compare</i> the relative sizes and distances of the Sun, Moon, Earth, other major <i>planets</i> , <i>moons</i> , <i>asteroids</i> , <i>plutoids</i> , and <i>comets</i> . *a	N/A
6-8 ES1C Most objects in the <i>Solar System</i> are in regular and predictable <i>motion</i>. These <i>motions</i> explain such <i>phenomena</i> as the day, the year, <i>phases of the moon</i>, and <i>eclipses</i>.	
Use a simple physical <i>model</i> of the Earth, Sun, Moon <i>system</i> or labeled drawing to <i>explain</i> day and night, <i>phases of the Moon</i> , and <i>eclipses</i> of the Moon and Sun.	N/A
6-8 ES1D <i>Gravity</i> is the <i>force</i> that keeps planets in <i>orbit</i> around the Sun and governs the rest of the <i>motion</i> in the <i>Solar System</i>. <i>Gravity</i> alone holds us to the Earth's surface.	
<i>Predict</i> what would happen to an <i>orbiting</i> object if <i>gravity</i> were increased, decreased, or taken away.	N/A
6-8 ES1E Our Sun is one of hundreds of billions of stars in the <i>Milky Way galaxy</i>. Many of these stars have planets <i>orbiting</i> around them. The Milky Way galaxy is one of hundreds of billions of galaxies in the universe.	
Construct a physical <i>model</i> or diagram showing Earth's position in the <i>Solar System</i> , the <i>Solar System's</i> position in the Milky Way, and the Milky Way among other galaxies.	N/A
Big Idea: Earth Systems, Structures, and Processes (ES2) Core Content: <i>Cycles in Earth Systems</i>	
6-8 ES2A The atmosphere is a <i>mixture</i> of nitrogen, oxygen, and trace <i>gases</i> that include <i>water vapor</i>. The atmosphere has different <i>properties</i> at different elevations.	
<i>Describe</i> the composition and <i>properties</i> of the troposphere and stratosphere.	N/A
6-8 ES2B The Sun is the major source of energy for <i>phenomena</i> on Earth's surface, such as <i>winds</i>, ocean currents, and the water cycle.	
Connect the uneven heating of Earth's surface by the Sun to global <i>wind</i> and ocean currents.	N/A

Describe the role of the Sun in the water cycle.	N/A
6-8 ES2C In the <i>water cycle</i>, water evaporates from Earth's surface, rises and cools, forms clouds, then condenses and falls as rain or snow, and collects in bodies of water.	
Describe the water cycle and give local examples of where parts of the water cycle can be seen.	N/A
6-8 ES2D Water is a solvent. As it passes through the water cycle, it dissolves minerals and gases and carries them to the oceans.	
Distinguish between bodies of saltwater and fresh water and <i>explain</i> how saltwater become salty.	N/A
6-8 ES2E The solid Earth is composed of a relatively thin <i>crust</i>, a dense metallic <i>core</i>, and a layer called the <i>mantle</i> between the <i>crust</i> and <i>core</i> that is very hot and partially melted.	
Sketch and label the major layers of Earth, showing the approximate relative thicknesses and consistency of the <i>crust</i> , <i>core</i> , and <i>mantle</i> . *a	N/A
6-8 ES2F The <i>crust</i> is composed of huge <i>crustal plates</i> on the scale of continents and oceans, which move centimeters per year, pushed by <i>convection</i> in the upper <i>mantle</i>, causing earthquakes, volcanoes, and mountains.	
Draw a labeled diagram showing how <i>convection</i> in the upper <i>mantle</i> drives movement of crustal plates.	N/A
Describe what may happen when plate boundaries meet (e.g., earthquakes, <i>tsunami</i> , <i>faults</i> , mountain building), with examples from the Pacific Northwest.	N/A
6-8 ES2G <i>Landforms</i> are created by processes that build up structures and processes that break down and carry away material through <i>erosion</i> and <i>weathering</i>.	
<i>Explain how</i> a given landform (e.g. mountain) has been shaped by processes that build up structures (e.g., uplift) and by processes that break down and carry away material (e.g., <i>weathering</i> and <i>erosion</i>).	N/A
6-8 ES2H The <i>rock cycle</i> describes the formation of <i>igneous rock</i> from magma or lava, <i>sedimentary rock</i> from compaction of eroded particles, and <i>metamorphic rock</i> by heating and pressure.	
Identify samples of <i>igneous</i> , <i>sedimentary</i> , and <i>metamorphic</i> rock from their <i>properties</i> , and <i>describe</i> how their <i>properties</i> provide <i>evidence</i> of how they were formed. <i>Explain how</i> one kind of rock could eventually become a different kind of rock.	N/A
Big Idea: Earth History (ES3) Core Content: <i>Evidence of Change</i>	

6-8 ES3A Our understanding of Earth history is based on the assumption that processes we see today are similar to those that occurred in the past.	
<i>Describe</i> Earth processes that we can observe and measure today (e.g., rate of <i>sedimentation</i> , movement of crustal plates, and changes in composition of the atmosphere) that provide clues to Earth's past.*a	N/A
6-8 ES3B Thousands of layers of <i>sedimentary rock</i> provide <i>evidence</i> that allows us to determine the age of Earth's changing surface and to estimate the age of <i>fossils</i> found in the rocks.	
<i>Explain how</i> the age of landforms can be estimated by studying the number and thickness of rock layers, as well as <i>fossils</i> found within rock layers.	N/A
6-8 ES3C In most locations <i>sedimentary rocks</i> are in horizontal formations with the oldest layers on the bottom. However, in some locations, rock layers are folded, tipped, or even inverted, providing <i>evidence</i> of geologic events in the distant past.	
<i>Explain why</i> younger layers of <i>sedimentary rocks</i> are usually on top of older layers, and <i>hypothesize</i> what geologic events could have caused huge blocks of horizontal <i>sedimentary</i> layers to be tipped or older rock layers to be on top of younger rock layers.	N/A
6-8 ES3D Earth has been shaped by many natural catastrophes, including earthquakes, volcanic eruptions, glaciers, floods, storms, <i>tsunami</i>, and the impacts of <i>asteroids</i>.	
Interpret current landforms of the Pacific Northwest as <i>evidence</i> of past geologic events (e.g., Mount St. Helens and Crater Lake provide <i>evidence</i> of volcanism, the Channeled Scablands provides <i>evidence</i> of floods that resulted from melting of glaciers).	N/A
6-8 ES3E Living <i>organisms</i> have played several critical roles in shaping landforms that we see today.	
List several ways that living <i>organisms</i> have shaped landforms (e.g., coral islands, limestone deposits, oil and coal deposits).	N/A

EALR 4: Life Science

Content Standards/Performance Expecations	Location/Page where Standard is found
Big Idea: Structure and Function of Organisms (LS1) Core Content: <i>From Cells to Organisms</i>	
6-8 LS1A All <i>organisms</i> are composed of cells, which carry on the many <i>functions</i> needed to sustain life.	
Draw and <i>describe observations</i> made with a microscope, showing that plants and animals are made of cells, and <i>explain that</i> cells are the fundamental unit of life.	GF: 27-37 Genetics: 171-175; 202

Describe the <i>functions</i> performed by cells to sustain a living <i>organism</i> (e.g., division to produce more cells, taking in <i>nutrients</i> , releasing waste, using energy to do work, and producing materials the <i>organism</i> needs).	LT: 89; 101-105 GF: 27-37 Genetics: 167-178; 179-183; 202
6-8 LS1B One-celled <i>organisms</i> must contain parts to carry out all life <i>functions</i>.	
Draw and <i>describe observations</i> made with a microscope, showing that a single-celled <i>organism</i> (e.g., paramecium) contains parts used for all life <i>functions</i> .	GF: 37-40 Genetics: 172-175
6-8 LS1C <i>Multicellular organisms</i> have specialized cells that perform different <i>functions</i>. These cells join together to form tissues that give organs their structure and enable the organs to perform specialized <i>functions</i> within organ systems.	
<i>Explain the relationship</i> between tissues that make up individual organs and the <i>functions</i> the organ performs (e.g., valves in the heart control blood flow, <i>air sacs</i> in the lungs maximize surface area for <i>transfer of gases</i>).	GF: 80-81; 86-92; 97-104
<i>Describe</i> the components and <i>functions</i> of the digestive, circulatory, and respiratory <i>systems</i> in humans, and how these systems interact.	GF: 97-104; 105-111; 86-91
6-8 LS1D Both plant and animal cells must carry on life <i>functions</i>, so they have parts in <i>common</i>, such as <i>nuclei</i>, <i>cytoplasm</i>, <i>cell membranes</i>, and <i>mitochondria</i>. But plants have specialized cell parts, such as <i>chloroplasts</i> and <i>cell walls</i>, because they are <i>producers</i> and do not move.	
Use labeled diagrams or <i>models</i> to illustrate similarities and differences between plant and animal cell structures and <i>describe</i> their functions (e.g., both have nuclei, cytoplasm, cell membranes, and mitochondria, while only plants have chloroplasts and cell walls).	LT: 89; 101-102 GF: 27-33; 37 Genetics: 171-178; 202
6-8 LS1E In classifying <i>organisms</i>, scientists <i>consider</i> both internal and external structures and behaviors.	
Use a classification key to identify <i>organisms</i> , noting use of both internal and external structures as well as behaviors.	LT: 86-91
6-8 LS1F Lifestyle choices and living <i>environments</i> can damage structures at any level of organization of the human body and can significantly harm the whole <i>organism</i>.	
<i>Evaluate</i> how lifestyle choices and living <i>environments</i> (e.g., tobacco, drug, and alcohol use, amount of exercise, quality of <i>air</i> , and kinds of food) affect parts of the human body and the <i>organism</i> as a whole.	LT: 42-50 GF: 40; 86-96
Big Idea: Ecosystems (LS2) Core Content: <i>Flow of Energy Through Ecosystems</i>	
6-8 LS2A An <i>ecosystem</i> consists of all the <i>populations</i> living within a specific area and the nonliving <i>factors</i> they interact with. One geographical area may contain many <i>ecosystems</i>.	

<i>Explain that an ecosystem is a defined area that contains populations of organisms and nonliving factors.</i>	Throughout, for example: LT: 83-86; 92-95; 97; 120-121
Give examples of <i>ecosystems</i> (e.g., Olympic National Forest, Puget Sound, one square foot of lawn) and <i>describe</i> their boundaries and contents.	Throughout, for example: 83-86; 120-121; 133-139
6-8 LS2B Energy flows through an ecosystem from producers to consumers to decomposers. These relationships can be shown for specific populations on a food web	
Analyze the flow of energy in a local <i>ecosystem</i> , and draw a labeled <i>food web</i> showing the <i>relationships</i> among all of the <i>ecosystem's</i> plant and animal <i>populations</i> .	LT: 113-119; 130-132
6-8 LS2C The major source of energy for ecosystems on Earth's surface is sunlight. Producers (plants) transform the energy of sunlight into the chemical energy of food through photosynthesis. This food energy is used by plants, animals, and all other organisms to carry on life processes. Nearly all organisms on the surface of Earth depend on this energy source.	
<i>Explain how</i> energy from the Sun is transformed through <i>photosynthesis</i> to produce chemical energy in food.	Throughout, for example: LT: 101-103 GF: 29 Genetics: 32-33
<i>Explain that</i> plants are the only organisms that make their own food. Animals cannot survive without plants because animals, including humans, get food by eating plants or other animals that eat plants.	LT: 89; 101-103 GF: 29 Genetics: 32-33
6-8 LS2D Ecosystems are continuously changing. Causes of these changes include nonliving factors such as the amount of light, range of temperatures, and availability of water, as well as living factors such as the disappearance of different species through disease, predation, and overuse of resources or the introduction of new species.	
<i>Predict</i> what may happen to an <i>ecosystem</i> if nonliving <i>factors</i> change (e.g., the amount of light, range of temperatures, or availability of water), or if one or more <i>populations</i> are removed from or added to the <i>ecosystem</i> .	LT: 113-126; 140-148 Genetics: 105-113
6-8 LS2E Investigations of environmental issues should uncover factors causing the problem and relevant scientific concepts and findings that may inform an analysis of different ways to address the issue.	
<i>Investigate</i> a local <i>environmental</i> issue by defining the problem, researching possible causative <i>factors</i> , understanding the underlying <i>science</i> , and evaluating the benefits and risks of alternative <i>solutions</i> .	LT: 8-13; 140-148 Genetics: 95-102; 215-218
Identify resource uses that reduce the capacity of <i>ecosystems</i> to support various <i>populations</i> (e.g., use of pesticides, construction).	LT: 35-39; 42-45; 46-50; 92-96 Genetics: 129
Big Idea: Biological Evolution (LS3) Core Content: Variation and Adaptation	
6-8 LS3A The scientific theory of evolution underlies the study of biology and explains both the diversity of life on Earth and similarities of all organisms at the chemical, cellular (and molecular) level. Evolution is supported by multiple forms of scientific evidence.	
<i>Explain</i> and provide evidence of how biological <i>evolution</i> accounts for the <i>diversity</i> of <i>species</i> on Earth today.	Genetics: 103-106; 114-119; 120-123

6-8 LS3B Every <i>organism</i> contains a set of <i>genetic information</i> (instructions) to specify its traits. This information is contained within <i>genes</i> in the <i>chromosomes</i> in the <i>nucleus</i> of each cell.	
<i>Explain that information on how cells are to grow and function is contained in genes in the chromosomes of each cell nucleus and that during the process of reproduction the genes are passed from the parent cells to offspring.</i>	Genetics: 54-56; 58-60
6-8 LS3C <i>Reproduction</i> is essential for every <i>species</i> to continue to exist. Some plants and animals reproduce sexually while others reproduce asexually. Sexual reproduction leads to greater <i>diversity of characteristics</i> because children inherit <i>genes</i> from both parents.	
Identify sexually and asexually reproducing plants and animals.	Genetics: 45-48; 184-188 AA: 34-35
<i>Explain why offspring that result from sexual reproduction are likely to have more diverse characteristics than offspring that result from asexual reproduction.</i>	Genetics: 45-48; 189-198
6-8 LS3D In <i>sexual reproduction</i>, the new <i>organism</i> receives half of its <i>genetic information</i> from each parent, resulting in offspring that are similar but not identical to either parent. In <i>asexual reproduction</i>, just one parent is involved, and <i>genetic information</i> is passed on nearly unchanged.	
<i>Describe that in sexual reproduction the offspring receive genetic information from both parents and therefore differ from the parents.</i>	Genetics: 45-46; 48; 189-199
<i>Predict the outcome of specific genetic crosses involving one characteristic (using principles of Mendelian genetics).</i>	Genetics: 49-65; 67-74
<i>Explain the survival value of genetic variation.</i>	Genetics: 103-105; 118-121; 124-128
6-8 LS3E <i>Adaptations</i> are physical or behavioral changes that are inherited and enhance the ability of an <i>organism</i> to survive and reproduce in a particular <i>environment</i>.	
Give an example of a plant or animal adaptation that would confer a survival and reproductive advantage during a given <i>environmental</i> change.	LT: 139 Genetics: 114-119; 124-128 AA: 56; 60; 69; 74-77
6-8 LS3F <i>Extinction</i> occurs when the <i>environment</i> changes and the adaptive <i>characteristics</i> of a <i>species</i>, including its behaviors, are insufficient to allow its survival.	
Given an <i>ecosystem</i> , <i>predict</i> which <i>organisms</i> are most likely to disappear from that <i>environment</i> when the <i>environment</i> changes in specific ways.	LT: 113-126 Genetics: 95-102; 124-128
6-8 LS3G <i>Evidence for evolution</i> includes similarities among anatomical and cell structures and <i>patterns</i> of development make it possible to <i>infer</i> degree of relatedness among organisms.	
<i>Infer</i> the degree of relatedness of two <i>species</i> , given diagrams of <i>anatomical features</i> of the two <i>species</i> (e.g., chicken wing, whale flipper, human hand, bee leg).	LT: 86-91 Genetics: 39-43; 120-123