

Integrated Sciences 8

Curriculum Guide

Anchorage School District

Working Version
June/2006

8th Grade Integrated Science Integrated Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 IS 1	<p>The scientific method is a process people use to understand and predict natural phenomena.</p> <p>8 IS 1 = 5 days including safety</p>	<p><i>Science as Inquiry: Content Standard A, grades 5 - 8</i></p> <p>As a result of activities, all student should develop</p> <ul style="list-style-type: none"> • abilities necessary to do scientific inquiry. • understandings about scientific inquiry. 	<p><i>SA</i> Students develop an understanding of the processes and applications of scientific inquiry.</p> <p><i>SA1</i> Students develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations and defend scientific arguments.</p>	<p>The student demonstrates an understanding of science by</p> <p><i>[8] SA1.1</i> asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.</p> <p><i>[8] SA1.2</i> collaborating to design and conduct simple repeatable investigation, in order to record, analyze (i.e., range, mean, median, mode), interpret data, and present findings.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • utilize scientific equipment properly and correctly in an appropriate and safe manner. (application) • create an experiment, using the scientific method, that identifies independent and dependent variables, and recognize other variables to be help constant. (synthesize) • organize their data in table, graphs, and flow charts to identify the relationships among the data. (synthesize) • assess the reliability of their data. (evaluate) • generate conclusions based on their observations (synthesize) • evaluate the benefits and limitations in the use of midels (synthesis) 	<p>Product Testing Activity – Ex. Paper Towel, Antacids, Cereals, etc...</p> <p>Lab Aids: Lab-Aid No. 100 – A Scientific Method Problem Solving Kit</p> <p>Pendulum Lab (Ex. Prentice Hall: <u>Motion and Forces</u>, Try This, p. 151)</p>	<p>Students will design and carry out an experiment that follows the steps of the scientific method. Additionally, students will be able to assess the validity of the data collected.</p> <p>Science Olympiad event: Experimental Design</p> <p>Participation in school science fair or Alaska State Science and Engineering Fair.</p>	<p>Prentice Hall: <u>The Nature of Science and Technology</u> Chapter 1 – What is Science? Chapter 2 – The Work of Scientists</p> <p>Prentice Hall: <u>Product Testing Activities by Consumer Reports</u></p> <p>Prentice Hall: <u>Inquiry Skills Activity Book</u></p> <p>NSTA: <u>The Truth About Science: A Curriculum for Developing Young Scientists</u></p> <p>Activities from Tik Lim can be modified for investigation. <u>Invitations to Science Inquiry</u> ISBN: 1-878-10621-X</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References

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8 LS 1	<p>Food provides the fuel and the building materials for all organisms. The energy food provides moves through food chains via consumers, producers and decomposers.</p> <p>8 LS 1 – 7 = 20 days</p>	<p><i>Life Science Content Standard C, grades 5-8:Populations and Ecosystems</i></p> <p>All students should develop an understanding of populations and ecosystems.</p> <p>Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers – they make their own food. All animals, including humans, are consumers, which obtain food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food. Food webs identify the relationships among producers, consumers and decomposers in an ecosystem.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC3</i> Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and the transformation of matter and energy.</p>	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by:</p> <p>[7] <i>SC3.1</i> recognizing and explaining that organisms can cause physical and chemical changes (e.g., digestion, growth, respiration, photosynthesis) to matter and recognizing and explaining the importance of energy transfer in these changes.</p> <p>[7] <i>SC3.2</i> classifying organisms within a food web as producers, consumers, or decomposers.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> determine whether an organism is a producer, consumer, or decomposer based on how it obtains and uses energy. (evaluate) 	<p>Construct a generalized food chains containing Alaskan animals and plants.</p>	<p>Create multimedia presentation on the suspected environmental impact of the accidental introduction of an alien species to an Alaskan ecosystem.</p>	<p>Prentice Hall: <u>Environmental Science</u> Chapter 2- Ecosystems and Biomes</p> <p>Project Wild and Project Aquatic Wild</p> <p>Alaska Wildlife Curriculum, ADF&G, <u>Alaska's Ecology</u></p> <p>www.scilinks.org scn-0421 – Foods and Energy scn-0521 – Food Chains/Webs</p> <p>www.phschool.com</p>

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8 LS 2	<p>Over a time, matter is transformed from one organism to another and between organisms and their physical environment. As in all material systems, the total amount of matter remains constant, even though its form and location changes.</p> <p>8 LS 1 – 7 = 20 days</p>	<p><i>Life Science Content Standard C, grades 5-8: Populations and Ecosystems</i></p> <p>All students should develop an understanding of populations and ecosystems.</p> <p>For ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight, is transferred by producers into chemical energy through photosynthesis. That energy then passes from organisms to organisms in food webs.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC3</i> Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and the transformation of matter and energy.</p>	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by:</p> <p>[7] <i>SC3.1</i> recognizing and explaining that organisms can cause physical and chemical changes (e.g., digestion, growth, respiration, photosynthesis) to matter and recognizing and explaining the importance of energy transfer in these changes.</p> <p>[8] <i>SC3.1</i> stating that energy flows and that matter cycles but is conserved within an ecosystem.</p> <p>[8] <i>SC3.2</i> organizing a food web that shows the cycling of energy and matter.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> generate a food chain, web, pyramid showing the flow of energy through a community. (synthesize) 	<p>Food web – arctic (pg. 167 Prentice Hall: <u>Earth's Waters</u>)</p> <p>Use building blocks or other manipulatives to illustrate that matter is rearranged not created nor destroyed.</p>	<p>Write and illustrate a children's book that demonstrates your understanding of energy flow through a food web/ecosystem. What would happen if this flow were interrupted?</p>	<p>Prentice Hall: <u>Environmental Science</u> Chapter 2 – Ecosystems and Biomes</p> <p>Project Wild and Project Aquatic Wild</p> <p>www.phschool.com</p>

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8 LS 3	<p>Two types of organisms may interact with one another, in several ways: they may be in a producer/consumer, predator/prey, parasite/host relationship, or one organism may scavenge or decompose another.</p> <p>8 LS 1 – 7 = 20 days</p>	<p><i>Life Science Content Standard C; grades 5 – 8; Populations and Ecosystems</i></p> <p>Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers – they make their own food. All animals, including humans are consumers, which obtain food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food. Food webs identify the relationships among producers, consumers, and decomposers in an ecosystem.</p>	<p>SC Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p>SC3 Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p>	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by</p> <p>[7] SC3.2 classifying organisms within a food web as producers, consumers, or decomposers.</p> <p>[8] SC3.2 organizing a food web that shows the cycling of energy and matter.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • create a model of an ecosystem incorporating food webs. (synthesize) • assess the importance of DNA replication during the cell cycle. (evaluate) • determine the effects of a given food web when a particular organism is wiped out. (evaluate) • compare & contrast relationship between two organisms. (analyze) • identify the relationships one organism has with other organisms within food web. (apply) 	<p>Work backwards in the web (start w/ students' energy source and work backwards to sun). Make sure to include all relevant vocabulary.</p> <p>Create a model of an ecosystem incorporating food webs.</p> <p>Discuss/communicate what happens when certain population is affected.</p> <p>Salmonid life cycles, stream keepers/stream team</p> <p>Stream invertebrate sampling</p> <p>Aquatic insect sorting/identification</p>	<p>Students create a multimedia presentation showing a food web – detailing the relationships between each organism.</p> <p>Given a food web, students identify relationship between organisms & evaluate the effects the absence of one organism has on the other.</p> <p>Given a described symbiotic relationship, students will identify if it is parasitic, or mutualistic.</p> <p>How do benthic invertebrates influence fresh water food chains?</p>	<p>Prentice Hall: <u>Environmental Science</u> Chapter 1 – Populations and Communities</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0521 – Food Chains and Food Webs</p> <p>Project Wild and Project Aquatic Wild</p> <p><u>WOWBugs: New Life for Life Science</u> www.wowbugs.com</p> <p>Alaska Wildlife Curriculum, ADF&G, <u>Alaska Ecology</u></p>

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8 LS 4	<p>In all environments organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter (together referred to as "habitat").</p> <p>8 LS 1 – 7 = 20 days</p>	<p><i>Life Science Content Standard C; grades 5 – 8: Populations and Ecosystems</i></p> <p>The number of organisms and ecosystem can support depends on the resources available and abiotic factors, such a quantity of light and water, range of temperatures, and soil composition. Given adequate biotic and abiotic resources and no disease or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC3</i> Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p>	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by</p> <p><i>[8] SC3.2</i> organizing a food web that shows the cycling of energy and matter.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<p>Construct & interpret graphs from data illustrating the correlation. (synthesize)</p> <p>Compare & contrast limiting factors w/in & between biomes. (analyze)</p>	<p>Given a habitat, a student designs an animal that is adapted to that habitat.</p> <p>Simulation of competition, predator/prey with limited habitat resources: Musk ox Game or lynx vs. hares</p> <p>Discussion of ANWR issues</p> <p>Population (crowding) and nutritional studies using Wisconsin Fast Plants</p> <p>Discussion of limiting factors in each biome/habitat</p> <p>Fisheries management activities: Fish Banks "Oh Deer" to "Oh Salmon" (Project Wild)</p>	<p>Students collect, analyze and present their findings on a crowding or nutritional study. (e.g., using fast plants)</p>	<p>Prentice Hall: <u>Environmental Science</u> Chapter 1 – Populations and Communities Chapter 2 – Ecosystems and Biomes</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0525 – Aquatic Ecosystems</p> <p><u>Spiraling Through Life:</u> Wisconsin Fast Plants – www.fastplants.org</p> <p>Project Wild</p>

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8 LS 5	<p>Under normal conditions, organisms produce many more young than the environment can support, causing intense competition for available resources.</p> <p>8 LS 1 – 7 = 20 days</p>	<p><i>Life Science Content Standard C; grades 5 –8; Populations and Ecosystems</i></p> <p>The number of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. Given adequate biotic and abiotic resources and no disease or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors such as predation and climate, limit the growth of populations in specific niches in the ecosystem.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC3</i> Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p>	<p>The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by.</p> <p><i>[10] SC3.2</i> exploring ecological relationships (e.g., competition, niche, feeding relationships, symbiosis).(L)</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • calculate populations. (comprehend) • determine the theoretical growth of a population. (evaluate) • deduce why population does not grow at the exponential rate. (synthesize) 	<p>Project Wild: Oh Deer!</p> <p>Zero Population Growth Activities</p> <p>Population studies using e.g: brine shrimp</p>	<p>“Think Tank” meeting: agenda: futuristic thinking and problem solving</p>	<p>Prentice Hall: <u>Environmental Science</u> Chapter 1 – Populations and Communities</p> <p>Prentice Hall: <u>Animals</u> Chapter 3 – Fish, Amphibians, and Reptiles</p> <p>www.phschool.com</p> <p>www.zpg.org</p>

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8 LS 6	<p>Energy sources can be classified as renewable or nonrenewable.</p> <p>8 LS 1 – 7 = 20 days</p>	<p><i>Life Science Content Standard B: grades 9 – 12, Matter, Energy, and Organization in Living Systems</i></p> <p>The distribution and abundance of organisms and populations in ecosystems are limited by the availability of matter and energy and the ability of the ecosystem to recycle materials.</p> <p>As matter and energy flows through different levels of organization of living systems – cells, organs, organisms, communities – and between living systems and the physical environment, chemical elements are recombined in different ways. Each recombination results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change.</p>	<p>SA. Students develop an understanding of the processes and applications of scientific inquiry.</p> <p>SA3 Students develop an understanding that culture, local knowledge, history, and interaction with the environment contribute to the development of scientific knowledge, and that local applications provide opportunity for understanding scientific concepts and global issues</p>	<p>The student demonstrates an understanding that interactions with the environment provide an opportunity for understanding scientific concepts by:</p> <p>[8] SA3.1 conducting research to learn how the local environment is used by a variety of competing interests (e.g., competition for habitat/resources, tourism, oil and mining companies, hunting groups).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • examine the variety of affects the different kinds of energy consumption has on the local environment. (comprehension) • compare the pros and cons of each energy source including cost effectiveness and availability, etc. (analyze) 		<p>Write an editorial supporting a particular side of an energy issue.</p> <p>Create a poster to educate others on a particular side of an energy issue.</p>	<p>Prentice Hall: <u>Environmental Science</u> Chapter 6 – Energy Resources</p> <p>NEED resources</p>

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8 LS 7	<p>Different methods of obtaining, transforming, and distributing energy have different environmental consequences.</p> <p>(8 PSP 3 can also be addressed at this time.)</p> <p>8 LS 1 – 7 = 20 days</p>	<p><i>Life Science Content Standard B: grades 9 – 12, Matter, Energy, and Organization in Living Systems</i></p> <p>The distribution and abundance of organisms and populations in ecosystems are limited by the availability of matter and energy and the ability of the ecosystem to recycle materials.</p> <p>As matter and energy flows through different levels of organization of living systems – cells, organs, organisms, communities – and between living systems and the physical environment, chemical elements are recombined in different ways. Each recombination results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change.</p>	<p>SA. Students develop an understanding of the processes and applications of scientific inquiry.</p> <p>SA3 Students develop an understanding that culture, local knowledge, history, and interaction with the environment contribute to the development of scientific knowledge, and that local applications provide opportunity for understanding scientific concepts and global issues</p> <p>SC Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p>SC3 Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.</p>	<p>The student demonstrates an understanding that interactions with the environment provide an opportunity for understanding scientific concepts by:</p> <p>[8] SA3.1 conducting research to learn how the local environment is used by a variety of competing interests (e.g., competition for habitat/resources, tourism, oil and mining companies, hunting groups).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • examine the variety of affects the different kinds of energy consumption has on the local environment. (comprehension) • compare the pros and cons of each energy source including cost effectiveness and availability, etc. (analyze) 	<p>Debate of local controversy: (i.e. spruce beetle/forest management, ANWR, etc.)</p> <p>Simulation of these factors on a society, the trickle down effect</p> <p>Make a biofuel.</p>	<p>Write an editorial supporting a particular side of an energy issue.</p> <p>Create a poster to educate others on a particular side of an energy issue.</p>	<p>Prentice Hall: <u>Environmental Science</u></p> <p>Chapter 3 – Living Resources</p> <p>Chapter 4 – Land and Soil Resources</p> <p>Chapter 5 – Air and Water Resources</p> <p>Chapter 6 – Energy Resources</p> <p>NEED resources</p>

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8 LS 8	<p>Changes in environmental conditions can affect the survival of individual organisms and entire species. Individual organisms with certain inherited and learned traits are more likely than others to survive and have offspring. Successful species are able to adapt to changes in their environment.</p> <p>8 LS 8 – 12 = 25 days</p>	<p><i>Life Science Content Standard C; grades 5 – 8; Regulation and Behavior</i></p> <p>An organism’s behavior evolves through adaptation to its environment. How a species moves, obtains food, reproduces, and responds to danger are based in the species’ evolutionary history.</p> <p><i>Life Science Content Standard C; grades 5 – 8; Diversity and Adaptations of Organisms</i></p> <p>Biological evolution accounts for the diversity of species developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment.</p> <p><i>Life Science Content Standard C; grades 5-8; Reproduction and Heredity</i></p> <p>The characteristics of an organism can be described in terms of a combination of traits. Some traits are inherited and others result from interactions with the environment.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC1</i> Students develop an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection. (evolution)</p>	<p>The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection by</p> <p><i>[8] SC2.2</i> explaining that most organisms utilize inherited and learned behaviors to meet the basic requirements of life.</p> <p><i>[10] SC1.2</i> explaining how the processes of natural selection can cause speciation and extinction.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> predict the survivability of a population based on environmental changes. (analyze) 	<p>Given an environmental scenario, students will predict the survivability of a population, citing case study and evidence to support their prediction.</p> <p>Debate the value vs cost of saving an endangered species e.g., whooping crane.</p> <p>Genetic and Natural Selection – Toothpick Fish. Toothpicks are three different colored "fish." The activity has the environment change and certain colors are more likely to survive and pass on genes.</p>	<p>Students present their findings to the representative activity in a multimedia presentation.</p>	<p>Prentice Hall: <u>Environmental Science</u> Chapter 1 – Populations and Communities</p> <p>Prentice Hall: <u>Animals</u> Chapter 5 – Animal Behavior</p> <p>www.phschool.com</p>

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8 LS 9	<p>In asexual reproduction, a single individual is the sole parent and passes copies of all its genetic material to the offspring.</p> <p>8 LS 8 – 12 = 25 days</p>	<p>Life Science Content Standard C: grades 5 – 8; Reproduction and Heredity</p> <p>Every organism requires a set of instructions for specifying its traits. Heredity is the passage of these instructions from one generation to another.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC1</i> Students develop an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection. (evolution)</p>	<p>The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection by</p> <p><i>[7] SC1.1</i> comparing and contrasting sexual and asexual reproduction.</p> <p><i>[10] SC1.3</i> examining issues related to genetics (L).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • list advantages and disadvantages of asexual and sexual reproduction. (analyze) • demonstrate how DNA makes a copy of itself. (analyze) 			<p><u>From Bacteria to Plants</u> Chapter 2 – Viruses and Bacteria Chapter 3 – Protists and Fungi</p>

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8 LS 10	<p>In sexual reproduction, a single, specialized cell from a female merges with a specialized cell from a male. The specific combination of DNA from each parent is what determines the probabilities of characteristics in the offspring.</p> <p>8 LS 8 – 12 = 25 days</p>	<p><i>Life Science Content Standard C: grades 5 – 8; Reproduction and Heredity</i></p> <p>In many species, including humans, females produce eggs and males produce sperm. Plants also reproduce sexually – the egg and sperm are produced in the flowers of flowering plants. An egg and sperm unite to begin development of a new individual. That new individual receives genetic information for its mother (via the egg) and its father (via the sperm). Sexually produced offspring never are identical to either of their parents.</p> <p>Every organism requires a set of instructions for specifying its traits. Heredity is the passage of these instructions from one generation to another.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC1</i> Students develop an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection. (evolution)</p>	<p>The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection by</p> <p>[7] <i>SC1.1</i> comparing and contrasting sexual and asexual reproduction.</p> <p>[8] <i>SC1.1</i> describing the role of genes in sexual reproduction (i.e., traits of the offspring).</p> <p>[9] <i>SC1.2</i> using probabilities to recognize patterns of inheritance (e.g., Punnett Squares).</p> <p>[10] <i>SC1.3</i> examining issues related to genetics (L).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • complete Punnett Squares and describe phenotypes from genotypes. (synthesize) • criticize the results to determine the probability of offspring inheriting specific traits. (evaluate) • understand that through the process of meiosis, the number of chromosomes is reduced by half. (comprehend) • examine different genetic diseases/conditions based on chromosomal abnormalities. (analyze) • demonstrate how DNA makes a copy of itself. (analyze) 	<p>Students complete single trait and double trait/Sex-linked Punnett Squares and report results of offspring.</p> <p>Create a face-using predetermined chart w/ a variety of traits. Students flip coins to see what their "child" has for each trait. When done, create chromosomes based on their genotypes.</p> <p>Randomly select chromosomes to match w/chromosomes of opposite sex. Groups evaluate chromosomes – draw "grandkid" based on new traits.</p> <p>Have students create chains of DNA, zip apart, and then create new complimentary strands – emphasizing importance of each cell getting exact replicate.</p>	<p>Complete Punnett Square giving ratio of phenotypes & genotypes.</p> <p>When given karyotypes, students determine chromosomal abnormality & figure out the disease/condition.</p> <p>When given single strand of DNA, student can create a complimentary strand.</p> <p>Be able to determine new genotypes & phenotypes of an offspring based on which chromosome is passed on from parent.</p>	<p>Prentice Hall: <u>Cells and Heredity</u> Chapter 3 – Genetics: The Science of Heredity Chapter 4 – Modern Genetics</p> <p><u>From Bacteria to Plants</u> Chapter 5 – Seed Plants</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0341 – Genetics</p> <p>Internet web search - genetic disorders</p>

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8 LS 11	<p>Small differences between parents and offspring can accumulate (through selective breeding) in successive generations so those descendants are very different from their ancestors.</p> <p>8 LS 8 – 12 = 25 days</p>	<p><i>Life Science Content Standard C; grades 5-8; Diversity and Adaptations of Organisms</i></p> <p>Biological evolution accounts for the diversity of species developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC1</i> Students develop an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection. (evolution)</p>	<p>The student demonstrates on understanding of how science explains changes in like forms over time, including genetics, heredity, the process of natural selection, and biological evolution by</p> <p><i>[8] SC1.1</i> describing the role of genes in sexual reproduction (i.e., traits of the offspring).</p> <p><i>[10] SC1.3</i> examining issues related to genetics (L).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • diagram or explain how genetic material is disseminated during the formation of sex cells & passed to the next generation. (comprehend) • examine how populations seek out specific traits within each other. (analyze) 	<p>Simulation game: roll the dice to determine the frequency of a gene.</p> <p>Probability: using marbles</p> <p>Diagram or explain how genetic material is disseminated during the formation of sex cells and passed to the next generation.</p>	<p>Combine assessment strategies with life science/genetics.</p>	<p>Prentice Hall: <u>Cells and Heredity</u> Chapter 4 – Modern Genetics</p> <p>Prentice Hall: <u>From Bacteria to Plants</u> Chapter 5 – Seed Plants</p> <p>www.phschool.com</p> <p>PBS: Evolution Series</p> <p>SEPUP module: "Risk Comparison" (statistics and probability)</p>

8th Grade Integrated Science Life Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 LS 12	<p>New varieties of cultivated plants and domestic animals have resulted from selective breeding for particular traits. (artificial selection)</p> <p>8 LS 8 – 12 = 25 days</p>	<p><i>Life Science Content Standard C, grades 5 – 8: Reproduction and Heredity</i></p> <p>The characteristics of an organism can be described in terms of a combination of traits. Some traits are inherited and others result from interactions with the environment.</p>	<p><i>SC</i> Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.</p> <p><i>SC1</i> Students develop an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection. (evolution)</p>	<p>The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, and the process of natural selection by</p> <p>[7] <i>SC1.2</i> describing possible outcomes of mutations (i.e., no effect, damage, benefit).</p> <p>[8] <i>SC1.1</i> describing the role of genes in sexual reproduction (i.e., traits of the offspring).</p> <p>[10] <i>SC1.3</i> examining issues related to genetics (L).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • cite examples of plants and/or animals and construct a genetic phenotype tree. (know) • relate gene-splicing procedures to producing desired end products. (apply) 	<p>Present to students a variety of examples of how cross pollination/hybrid/gene splicing.</p> <p>Discussion of why and/or how humans first domesticated plants/animals for producers & consumers.</p> <p>Cite hybrid examples of plants and/or animals and construct genetic phenotype tree.</p>	<p>Give student a situation where they must communicate how selective breeding would benefit/solve problem.</p> <p>Defend/refute the statement; "hybrid vigor".</p> <p>Students conduct their own plant experiment in which they breed for a specific characteristic –e.g: "the wooly booger" (Fast Plants).</p>	<p>Prentice Hall: <u>Cells and Heredity</u> Chapter 3 – Genetics: The Science of Heredity Chapter 4 – Modern Genetics</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0343 – Genetic Engineering</p> <p><u>Spiraling through Life: Wisconsin Fast Plants</u>; www.fastplants.org</p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 1	<p>The Solar System consists of planets that move around the Sun. Many of these planets have objects that orbit them. In addition to the planets, the solar system also includes asteroids and comets.</p> <p>8 ES 1 – 6 = 15 days</p>	<p><i>Earth & Space Science Content Standard D; grades 5-8; Earth in the Solar System</i></p> <p>The earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, and smaller objects, such as asteroids and comets. The sun, an average star, is the central and largest body in the solar system.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD4</i> Students develop an understanding of the theories regarding the evolution of the universe.</p>	<p>The student demonstrates an understanding of the theories regarding the origin and evolution of the universe by</p> <p><i>[8] SD4.1</i> creating models of the solar system illustrating size, location/position, composition, moons/rings, and conditions. (L)</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> compare / contrast objects of our solar system star, asteroids, comets, planets, satellites. (analyze) 	<p>Build a relative scale model of solar system.</p> <p>Design an adapted alien to specific stellar body in solar system.</p> <p>Travel brochures for planets.</p> <p>Planet Walk</p>	<p>Simulation: Great Solar System Rescue</p>	<p>Prentice Hall: <u>Astronomy (Book J)</u> Chapter 2 – The Solar System</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0633 – Planets scn-0635 – Comets, Asteroids, Meteors</p> <p>www.education.nasa.gov</p> <p>ASD Unit 701061 “The Great Solar System Rescue”</p> <p>ASD VHS 206886 (Eyewitness) <u>Planets</u></p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 2	<p>Planets in the Solar System have different compositions and conditions.</p> <p>(8PSP 1 can also be addressed at this time.)</p> <p>8 ES 1 – 6 = 15 days</p>	<p><i>Earth and Space Science Content Standard D, grades 5-8: Earth in the Solar System</i></p> <p>The earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, and smaller objects, such as asteroids and comets. The sun, an average star, is the central and largest body in the solar system.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD4</i> Students develop an understanding of the theories regarding the evolution of the universe.</p>	<p>The student demonstrates an understanding of the theories regarding the origin and evolution of the universe by</p> <p><i>[8] SD4.1</i> creating models of the solar system illustrating size, location/position, composition, moons/rings, and conditions. (L)</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • compare Earth's composition and atmosphere to another planet's characteristics. (analyze) • compare planet characteristics to star characteristics. (analyze) 	<p>Prentice Hall: <u>Inside Earth</u> p 22 – Earth Like an Apple</p> <p>Research another planet, compare and contrast its characteristics to Earth's.</p>	<p>Make a cross-section-scale model or diagram of earth that includes the Earth's interior, the hydrosphere, the lithosphere, and atmosphere.</p> <p>Research a planet and present the information to the class, including a handout, a multimedia portion and an assessment tool (e.g., quiz, crossword)</p>	<p>Prentice Hall: <u>Astronomy</u> Chapter 2 – The Solar System</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0633 – Planets scn-1011 – Structure of the Earth</p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 3	<p>The light-year is used to measure vast distances in space.</p> <p>8 ES 1 – 6 = 15 days</p>	<p><i>Earth & Space Science Content Standard D; grades 5-8; Earth in the Solar System</i></p> <p>The earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, and smaller objects, such as asteroids and comets. The sun, an average star, is the central and largest body in the solar system.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD4</i> Students develop an understanding of the theories regarding the evolution of the universe.</p>	<p>The student demonstrates an understanding of the theories regarding the origin and evolution of the universe by</p> <p><i>[7] SD4.2</i> using light-years to describe distances between objects in the universe.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> calculate amount of time needed to travel a distance based on light years. (synthesize) 	<p>Determine time to travel to various planets in the universe & determine age when you arrive</p> <p>Define the word "light year", and discuss why it is used as a unit of measure for distance in the solar system and universe.</p>		<p>Prentice Hall: <u>Astronomy</u> Chapter 3 – Stars, Galaxies, and the Universe</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0644 – Galaxies scn-0645 – The Expanding Universe</p> <p>www.education.nasa.gov</p> <p>ASD VHS 207277 (Bill Nye) <u>The Moon/Outer Space</u></p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 4	<p>Stars have unique characteristics. Brightness of stars is determined by the size, temperature and distance the star is from Earth.</p> <p>8 ES 1 – 6 = 15 days</p>	<p><i>Earth & Space Science Content Standard D; grades 5-8; Earth in the Solar System</i></p> <p>The earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, and smaller objects, such as asteroids and comets. The sun, an average star, is the central and largest body in the solar system.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD4</i> Students develop an understanding of the theories regarding the evolution of the universe.</p>	<p>The student demonstrates an understanding of the theories regarding the origin and evolution of the universe by</p> <p><i>[7] SD4.1</i> comparing and contrasting characteristics of planets and stars. (i.e., light reflecting, light emitting, orbiting, orbited, composition.)</p> <p><i>[8] SD4.2</i> comparing the brightness of a star to its distance and size.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • 			<p>Prentice Hall: <u>Astronomy</u> Chapter 3 – Stars, Galaxies, and the Universe</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0644 – Galaxies scn-0645 – The Expanding Universe</p> <p>www.education.nasa.gov</p> <p>ASD VHS 208617 <u>Stardust</u></p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 5	<p>The Sun's gravitational pull holds Earth and other planets in their orbits, just as the planets gravitational pull keeps their moons in orbit around them.</p> <p>8 ES 1 - 6 = 15 days</p>	<p><i>Earth & Space Science Content Standard D: grades 5-8; Earth in the Solar System</i></p> <p>Gravity is the force that keeps planets in orbit around the sun and governs the rest of the motion in the solar system. Gravity alone holds us to the earth's surface and explains the phenomena of the tides.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD4</i> Students develop an understanding of the theories regarding the evolution of the universe.</p>	<p>The student demonstrates an understanding of the theories regarding the origin and evolution of the universe by</p> <p><i>[7] SD4.1</i> comparing and contrasting characteristics of planets and stars. (i.e., light reflecting, light emitting, orbiting, orbited, composition.)</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • examine the Sun's gravitational force on our solar system. (analyze) • compare the orbital periods of various planets. (analyze) 			<p>Prentice Hall: <u>Astronomy</u> Chapter 2 – The Solar System</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-0612 – Gravity</p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 6	<p>Man's understanding of Earth's place in the universe has changed. Technological advancements have driven this understanding.</p> <p>8 ES 1 – 6 = 15 days</p>	<p><i>History of Nature and Science; Science Content Standard G; grades 5-8: History of Science</i></p> <p>Many individuals have contributed to the traditions of science. Studying some of these individuals provides further understanding of scientific inquiry, science as a human endeavor, the nature of science, and the relationships between science and society.</p> <p>Tracing the history of science can show how difficult it was for scientific innovators to break through the accepted ideas of their time to reach the conclusions that we currently take for granted.</p>	<p><i>SG</i> Students develop an understanding of the history and nature of science.</p> <p><i>SG3</i> Students develop an understanding that scientific knowledge is ongoing and subject to change as new evidence becomes available through experimental and/or observational confirmation(s).</p>	<p>The student demonstrates an understanding that scientific knowledge is ongoing and subject to change by</p> <p><i>[7] SG3.1</i> revising a personal idea when presented with experimental/observational data inconsistent with that personal idea (e.g., the rates of falling bodies of different masses). (L)</p> <p><i>[8] SG3.1</i> revising a personal idea when presented with experimental/observational data inconsistent with that personal idea (e.g., the rates of falling bodies of different masses). * (L)</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • apply knowledge of past scientific resistance to current issues / scientific findings. (apply) • compare how scientists used evidence to show others using non-scientific methods. (apply) 	<p>Mock trial of Galileo. Witnesses could include Ptolemy, Copernicus, and Kepler.</p> <p>Report writing – Cover the history of space exploration including early knowledge of Earth's place in the universe and modern day exploration.</p>	<p>Participation in the mock trial. Students write a reflective essay.</p>	<p>Prentice Hall: <u>Astronomy</u> Chapter 2 – The Solar System Chapter 3 Stars, Galaxies, and the Universe</p> <p>www.phschool.com</p> <p>ASD CD Rom 110050 <u>The Universe</u></p> <p>ASD VHS 207921 <u>Black Holes & Beyond</u></p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 7	<p>Heat flow and movement of material within the earth cause earthquakes and volcanic eruptions and create mountains and ocean basins.</p> <p>8 ES 7 – 12 = 30 days</p>	<p><i>Earth & Space Science Content Standard D; grades 5-8; Structure of the Earth System</i></p> <p>The solid earth is layered with a lithosphere; hot, convecting mantle; and dense metallic core.</p> <p>Lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle. Major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD2</i> Students develop an understanding of the origins, ongoing processes, and forces that shape the structure, composition, and physical history of the Earth.</p>	<p>The student demonstrates an understanding of the forces that shape Earth by</p> <p>[8] <i>SD2.2</i> using models to show the relationship between convection currents within the mantle and the large-scale movement of the surface. (L)</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • create a model of the earth showing the layering & convection currents. (synthesize) • examine a model of convection currents to creation of earthquakes, volcanoes, uplifts, mountains and ocean basins. (analyze) 	<p>SoftSoap demonstration showing convection currents.</p> <p>Design a laboratory investigation model to identify the forces and motion in convection currents, then describe and illustrate the relationships between the model and the crustal plates of the earth.</p> <p>Convection oven vs. microwave oven vs. conventional oven</p>	<p>Evaluate a model showing earth's convection currents and geologic events/structures</p>	<p>Prentice Hall: <u>Inside Earth</u> Chapter 1 – Plate Tectonics Chapter 2 – Earthquakes Chapter 3 – Volcanoes</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1032 – Eruptions scn-1034 – Volcanic Effects</p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 8	<p>Geological features are a result of the geologic processes that drive the rock cycle.</p> <p>Some changes in the earth's surface are abrupt (such as earthquakes and volcanic eruptions) while other changes happen very slowly (such as uplift and wearing down of mountains, chemical and physical weathering).</p> <p>(an application of 8 PSP 1)</p> <p>8 ES 7 – 12 = 30 days</p>	<p><i>Earth and Space Science Content Standard D, grades 5-8: Structure of the Earth System / Earth's History</i></p> <p>Landforms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while the destructive forces include weathering and erosion.</p> <p>The earth processes we see today, including erosion, movement of lithospheric plates, and changes in atmospheric composition, are similar to those that occurred in the past. Earth history is also influenced by occasional catastrophes, such as the impact of an asteroid or comet.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD1</i> Students develop an understanding of Earth's geochemical cycles.</p> <p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD2</i> Students develop an understanding of the origins, ongoing processes, and forces that shape the structure, composition, and physical history of the Earth.</p>	<p>The student demonstrates an understanding of geochemical cycles by</p> <p>[8] <i>SD1.1</i> making connections between components of the locally observable geological environment and the rock cycle.</p> <p>The student demonstrates an understanding of the forces that shape Earth by</p> <p>[7] <i>SD2.2</i> describing how the movement of the tectonic plates results in both slow changes (e.g., formation of mountains, ocean floors, and basins) and short-term events (e.g., volcanic eruptions, seismic waves, and earthquakes) on the surface.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • explain the role of plate tectonics in the rock cycle (comprehension) • compare/contrast destructive & constructive forces on Earth and the land forms that they formed. (analyze) • assess a given landform to determine the forces required to create it. (evaluate) • propose a hypothesis to explain a landform found on another planet. (synthesize) 	<p>Conduct a laboratory investigation to demonstrate how constructive and destructive forces can cause changes on the earth's surface. Explain the processes involved. (Play Dough™ lab)</p> <p>Given photos or a geologic map of an area, construct a model that would explain the formation of that landform. Defend your theory.</p> <p>Research, make a poster and present your findings to the class on a particular geologic landform. (Mt. Susitna, Mt. Augustine, Denali, Flattop, Earthquake Park, Mat Valley Butte, Eagle River, etc.)</p>		<p>Prentice Hall: <u>Inside Earth</u> Chapter 1 – Plate Tectonics Chapter 2 - Earthquakes Chapter 3 – Volcanoes</p> <p>Prentice Hall: <u>Earth's Changing Surface</u> Chapter 2 – Weathering and Soil Formation Chapter 3 – Erosion and Deposition</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1013 – Continental Drift scn-1021 – Faults scn-1023 – Earthquake Measurement scn-1032 – Eruptions scn- 1034 – Volcanic Effects</p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 9	<p>As water moves over the earth's surface, erosion occurs changing land formations.</p> <p>8 ES 7 – 12 = 30 days</p>	<p><i>Earth and Space Science Content Standard D, grades 5-8: Structure of the Earth System</i></p> <p>Landforms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while destructive forces include weathering and erosion.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD1</i> Students develop an understanding of Earth's geochemical cycles.</p>	<p>The student demonstrates an understanding of geochemical cycles by:</p> <p>[7] <i>SD1.2</i> explaining the water cycle's connection to changes in the Earth's surface.</p> <p>[8] <i>SD1.2</i> applying knowledge of the water cycle to explain changes in the Earth's surface.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • predict landform changes caused by running water. (apply) • analyze effects of freezing water on landforms. (analyze) 	<p>Prentice Hall: <u>Earth's Waters</u> pg. 34-36 Demonstrate the water cycle using the Table Top Water Cycle Activity.</p> <p>Prentice Hall: <u>Earth's Waters</u> pg. 15 - "Every Drop Counts"</p> <p>Prentice Hall: <u>Earth's Water</u> pg. 70 - "Soil Testing"</p> <p>GEMS: "River Cutters"</p>		<p><u>Prentice Hall: Earth's Changing Surface</u> Chapter 3 – Erosion and Deposition</p> <p>Prentice Hall: <u>Earth's Waters</u> Chapter 1 – Earth: The Water Planet</p> <p>www.phschool.com</p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 10	<p>Topographic maps show surface features of an area.</p> <p>8 ES 7 – 12 = 30 days</p>	<p><i>Earth & Space Science Content Standard D; grades 5-8: Structure of the Earth System</i></p> <p>Landforms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while the destructive forces include weathering and erosion.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD2</i> Students develop an understanding of the origins, ongoing processes, and forces that shape the structure, composition, and physical history of the Earth.</p>	<p>The student demonstrates an understanding of the forces that shape Earth by</p> <p><i>[8] SD2.1</i> interpreting topographical maps to identify features (i.e., rivers, lakes, mountains, valleys, islands, permafrost, and tundra).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> recognize topographic map features. (knowledge) 	<p>Make topographic models using cardboard, foam core (etc.)</p> <p>Make topographic maps using plastic mountain models</p>		<p>Prentice Hall: <u>Earth's Changing</u> Chapter 1 – Mapping Earth's Surface</p> <p>www.phschool.com</p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 11	<p>Although weathered rock is the basic component of soil, the composition and texture of soil and its fertility and resistance to erosion are greatly influenced by plant roots and debris, bacteria, fungi, worms, rodents, and other organisms.</p> <p>8 ES 7 – 12 = 30 days</p>	<p><i>Earth and Space Science Content Standard D, grades 5-8: Structure of the Earth System</i></p> <p>Soil consists of weathered rocks and decomposed organic material from dead plants, animals, and bacteria. Soils are often found in layers, with each having a different chemical composition and texture.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD1</i> Students develop an understanding of Earth's geochemical cycles.</p>	<p>The student demonstrates an understanding of the forces that shape Earth by</p> <p><i>[6] SD2.1</i> describing the formation and composition (i.e., sand, silt, clay, organics) of soils.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • classify different organisms found in soil samples. (evaluate) • create a “recipe” for the soil sample – naming each of the “ingredients” and calculate the percentage of each ingredient. (synthesize) 	<p>Prentice Hall: <u>Earth's Changing Surfaces</u> – pg. 54 – “A Square Meter of Soil”</p> <p>Observe and analyze different samples of leaf litter</p> <p>Prentice Hall: <u>Earth's Changing Surfaces</u> pg. 56 “Getting to Know the Soil”</p>	<p>Create a multimedia collage that demonstrates the roles of organisms in soil formation. Include a member from each kingdom.</p> <p>When given a representative sample of various soil horizons, students will correctly classify as to age or composition.</p> <p>Teachers should assess students based on their work in representative activities (labs, investigations, and assignments).</p>	<p>Prentice Hall: <u>Earth's Changing Surface</u> Chapter 2 – Weathering and Soil Formation</p> <p>www.phschool.com</p> <p>ASD VHS 207388 <u>The Science of Soil</u></p>

8th Grade Integrated Science Earth Science

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 ES 12	<p>People can implement a variety of methods to mitigate erosion caused by water and wind movement and human influence on Earth's surface.</p> <p>8 ES 7 - 12 = 30 days</p>	<p><i>Earth and Space Science Content Standard D, grades 5-8: Structure of the Earth System</i></p> <p>Landforms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while destructive forces include weathering and erosion.</p>	<p><i>SD</i> Students develop an understanding of the concepts, processes, theories, models, evidence, and systems of earth and space sciences.</p> <p><i>SD1</i> Students develop an understanding of Earth's geochemical cycles.</p>	<p>The student demonstrates an understanding of the forces the shape Earth by</p> <p>[7] <i>SD 2.1</i> identifying strategies (e.g., reforestation, dikes, wind breaks, off-road activity guidelines) for minimizing erosion.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> predict the consequences of human behavior (deforestation, construction, mining, dams, etc.) (apply) 	GEMS: "River Cutters"		<p><u>Prentice Hall: Environmental Science</u> Chapter 4 – Land and Soil Resources</p> <p>www.phschool.com</p>

8th Grade Integrated Science Physical Science - Chemistry

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSC 1	<p>On the Periodic Table, the elements are grouped into families that share common properties.</p> <p>8 PSC 1 – 5 = 20 days</p>	<p><i>Physical Science Content Standard B; grades 5 -8: Properties and Changes of Properties of Matter</i></p> <p>Chemical elements do not break down during normal laboratory reactions involving such treatments as heating, exposure to electric current, or reaction with acids. There are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for the living and nonliving substances that we encounter.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB1</i> Students develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior.</p>	<p>The student demonstrates an understanding of the structure and properties of matter by:</p> <p><i>[10] SB1.1</i> using the periodic table to describe atoms in terms of their base components (i.e., protons, neutrons, electrons).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
	<p>Alien Periodic Table</p> <p>"Chemical Families" Lab and video</p> <p>Book cover: periodic table, showing general information, chemical families and their characteristics and their uses</p> <p>SEPUP "Families of Atoms"</p>	<p>Place two elements from each of the described categories on a blank periodic table</p> <p>Book cover: periodic table, showing general information, chemical families and their characteristics and their uses</p>	<p>Prentice Hall: <u>Chemical Interactions</u> Chapter 1 – Chemical Reactions</p> <p>Prentice Hall: <u>Chemical Building Blocks</u> Chapter 3 – Elements of the Periodic Table</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1133 – Metals scn-1134 – Nonmetals</p> <p>ASD VHS 107048 <u>The Power of the Periodic Table</u></p> <p>ASD DVD 130003 <u>The Power of the Periodic Table</u></p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSC 2	<p>Substances have characteristic chemical properties such as pH and reactivity.</p> <p>8 PSC 1 – 5 = 20 days</p>	<p><i>Physical Science Content Standard B; grades 5-8; Properties and Changes of Properties in Matter</i></p> <p>A substance has characteristic properties, such as density, a boiling point and solubility. All of which are independent of the amount of the sample. A mixture of substances often can be separated into the original substances using one or more of the characteristic properties.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB1</i> Students develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior.</p>	<p>The student demonstrates an understanding of the structure and properties of matter by</p> <p><i>[8] SB1.1</i> using physical and chemical properties (i.e., density, boiling point, freezing point, conductivity, flammability) to differentiate among materials (i.e., elements, compounds, and mixtures).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> compare and contrast acids and bases, including physical & chemical properties. (analyze) rate substances on their relative acidity and alkalinity, using the pH scale. (evaluate) 	<p>Prepare a pH indicator using a fruit or vegetable (red cabbage)</p> <p>Measure pH of various household chemicals using pH paper or pH indicator</p> <p>Demonstration: acid/base indicator using phenolphthalein</p>	<p>Given a variety of pH indicators and household chemicals, students determine the (range) pH of the substance.</p>	<p>Prentice Hall: <u>Chemical Interactions</u> Chapter 1 – Chemical Reactions Chapter 3 – Acids, Bases, and Solutions</p> <p>Prentice Hall: <u>Chemical Building Blocks</u> Chapter 1 – An Introduction to Matter</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1233 – Acids and Bases</p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSC 3	<p>During chemical change atoms in compounds separate and recombine to form new compounds that have different properties. These chemical reactions involve energy changes.</p> <p>8 PSC 1 – 5 = 20 days</p>	<p><i>Physical Science Content Standard B; grades 5-8; Properties and Changes of Properties of Matter</i></p> <p>Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties. In chemical reactions, the total mass is conserved. Substances often are placed in categories or groups if they react similar ways; metals is an example of such a group.</p>	<p>SB Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p>SB3 Students develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.</p>	<p>The student demonstrates an understanding of the interactions between matter and energy and the effects of these interactions on systems by</p> <p>[9] SB3.1 recognizing that a chemical reaction has taken place.</p> <p>[9] SB3.2 explaining that in chemical and nuclear reactions, energy (e.g., heat, light, mechanical, and electrical) is transferred into and out of a system.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • describe the difference between endothermic and exothermic reactions. (comprehension) • distinguish between energy changes of an exothermic and endothermic reaction on a graph (analysis) • recognize whether a reaction is endothermic or exothermic. (analysis) 	<p>Reaction in a Baggie Lab - calcium chloride + baking soda</p> <p>Demonstration: (MRE) with chemical heating pack</p> <p>“Build a Molecule or Compound”</p>		<p>Prentice Hall: <u>Chemical Interactions</u> Chapter 1 – Chemical Reactions</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1221 – Chemical Changes</p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSC 4	<p>Atoms combine by forming different kinds of bonds between and among themselves.</p> <p>8 PSC 1 – 5 = 20 days</p>	<p><i>Physical Science Content Standard B; grades 5-8; Properties and Changes of Properties of Matter</i></p> <p>Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties. In chemical reactions, the total mass is conserved. Substances often are placed in categories or groups if they react similar ways; metals is an example of such a group.</p>	<p>SB Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p>SB3 Students develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.</p>	<p>The student demonstrates an understanding of the interactions between matter and energy and the effects of these interactions on systems by</p> <p>[8] SB3.2 exploring through a variety of models (e.g., gumdrops and toothpicks) how atoms may bond together into well defined molecules or bond together in large arrays. (L)</p> <p>[9] SB3.1 recognizing that a chemical reaction has taken place.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • compare and contrast mixtures and chemical reactions (synthesis) • determine the physical & chemical properties of the products in a chemical reaction & then compare them to the reactants. (synthesis) 	SEPUP – Toxic Waste Module	Poster showing a “new” compound that has positively impacted society/technology.	<p>Prentice Hall: <u>Chemical Interactions</u> Chapter 1 – Chemical Reactions Chapter 2 – Atoms and Bonding</p> <p>www.phschool.com</p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSC 5	<p>In a closed system matter is conserved. In a chemical reaction matter is neither created nor destroyed, thus the mass remains the same.</p> <p>8 PSC 1 – 5 = 20 days</p>	<p><i>Physical Science Content Standard B; grades 5-8; Properties and Changes of Properties of Matter</i></p> <p>Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties. In chemical reactions, the total mass is conserved. Substances often are placed in categories or groups if they react similar ways; metals is an example of such a group.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB1</i> Students develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior.</p>	

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> mass reactants & products to demonstrate the Law of Conservation of Matter (apply) 	<p>Demonstration: use with manipulatives to demonstrate the Law of Conservation of Matter</p> <p>Essay: Why is the Law of Conservation of Mass difficult to quantify 100% in our lab?</p>		<p>Prentice Hall: <u>Chemical Interactions</u> Chapter 1 – Chemical Reactions</p> <p>www.phschool.com</p>

8th Grade Integrated Science Physical Science - Physics

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSP 1	<p>Waves move at different speeds in different materials.</p> <p>(Can be used as an application in 8 ES 7)</p> <p>8 PSP 1 – 7 = 25 days</p>	<p><i>Physical Science Content Standard B: grades 5-8; Motion and Forces</i></p> <p>The motion of an object can be described by its position, direction of motion and speed. The motion can be measured and represented on a graph.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB4</i> Students develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects</p>	<p>The student demonstrates an understanding of motions, forces, their characteristics, relationships, and effects by</p> <p>[6] <i>SB4.3</i> making waves move through a variety of media. (L)</p> <p>[7] <i>SB4.3</i> describing the characteristics of a wave (i.e., amplitude, wavelength, and frequency).</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> compare and contrast different types of waves generated through various media (water, earth, & air). (analyze) 	<p>Case Study: Alaska Earthquake 1964 – data collected used to expand the current theory on the internal layering of the earth.</p> <p>Demonstrate longitudinal and transverse waves with a slinky.</p> <p>Lab: water refraction</p> <p>Using a prism, conduct a lab showing how it can break down energy levels of waves.</p>	<p>Given earthquake (time) data for s and p waves, develop a model of the interior of the earth that supports this data</p>	<p>Prentice Hall: <u>Inside Earth</u> Chapter 2 - Earthquakes</p> <p>Prentice Hall: <u>Sound and Light</u> Chapter 1 – Characteristics of Waves</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1511 – Waves</p> <p>ASD VHS 206525 (Bill Nye) <u>Waves/Wind</u></p>

8th Grade Integrated Science Physical Science - Physics

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSP 2	<p>There are two kinds of charges – positive and negative. Like charges repel one another, opposite charges attract. In materials, there are almost exactly equal proportions of positive and negative charges, making the materials as a whole electrically neutral. A very small excess or deficit of negative charges in a material produces noticeable electric forces called static electricity.</p> <p>8 PSP 1 – 7 = 25 days</p>	<p><i>Physical Science Content Standard B;</i></p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB4</i> Students develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.</p>	<p>The student demonstrates an understanding of motions, forces, their characteristics, relationships, and effects by</p> <p><i>[8] SB4.2</i> describing the interactions between charges.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • classify the two kinds of charges and their characteristics. (knowledge) • translate that electricity is the transfer of electrons from one object to another. (comprehend) 	<p>Test for positive & negative charges with an electroscope</p> <p>Demonstrate electrostatic charges and electric neutrality with a balloon and tissue paper</p> <p>Scotch Tape Science</p> <p>NEED Fact sheets (National Energy Education Development)</p> <p>Explore interactions of pith balls and friction rods, balloons rubbing hair, and electroscopes.</p> <p>Test various objects for the presence of charge, cite evidence to support your lab results. (analyze)</p>		<p>Prentice Hall: <u>Electricity and Magnetism</u> Chapter 2 – Electric Charge and Static Electricity</p> <p>www.phschool.com</p> <p>ML&P (Municipal Light and Power) – Fact sheets</p> <p>Insights</p> <p>ASD VHS 206524 (Bill Nye) <u>Magnetism/Static Electricity</u></p>

8th Grade Integrated Science Physical Science - Physics

ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSP 3	<p>Electrical energy can be generated from many sources. Moving electric charges produce magnetic forces and moving magnets can produce electric forces.</p> <p>8 PSP 1 – 7 = 25 days</p>	<p><i>Physical Science Content Standard B; grades 5-8: Transfer of Energy</i></p> <p>Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei and the nature of a chemical. Energy is transferred in many ways.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB4</i> Students develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.</p>	<p>The student demonstrates an understanding of motions, forces, their characteristics, relationships, and effects by</p> <p>[7] <i>SB4.2</i> recognizing that electric currents and magnets can exert a force on each other.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • 	<p>NEED Fact sheets (National Energy Education Development)</p> <p>Prentice Hall: <u>Electricity and Magnetism</u> Chapter 1 Section 3 pg. 30 -35</p> <p>Put a compass near a DC current (like from a battery, not a wall) and watch what happens to the needle as the current goes on and off.</p> <p>Magnets, Electromagnets and Fields of Force lab: http://www.iit.edu/~smile/ph9305.html</p>		<p>Prentice Hall: <u>Electricity and Magnetism</u> Chapter 1 – Magnetism and Electromagnetism Chapter 3 – Electricity and Magnetism at Work</p> <p>ML&P (Municipal Light and Power) – Fact sheets</p> <p>Insights</p> <p>www.phschool.com</p> <p>ASD LD 500055 <u>Science Essentials:</u> <u>Electricity, Magnetism</u></p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSP 4	<p>Different kinds of materials respond differently to electric forces. In conducting materials such as metals, electric charges flow smoothly, whereas in insulating materials such as glass, they can move hardly at all.</p> <p>8 PSP 1 – 7 = 25 days</p>	<p><i>Physical Science Content Standard B grades 5-8: Transfer of Energy</i></p> <p>Electrical circuits provide a means of transferring electrical energy when heat, light, sound and chemical changes are produced.</p>	<p><i>SB</i></p> <p>Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p>	

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> rate a variety of materials with regard to conductivity. 	<p>NEED Fact sheets (National Energy Education Development)</p> <p>Prentice Hall: <u>Electricity and Magnetism</u> Chapter 1 Section 3 pg. 30 -35</p> <p>Field trip to ML&P facility – through ASD Community Resources Dept.</p>	<p>Students given a box of “materials” build something to show that electrons are flowing. (example: flashlight) Prentice Hall: <u>Electricity and Magnetism</u> pg. 36 or pg.40</p>	<p>Prentice Hall: <u>Electricity and Magnetism</u> Chapter 1 – Magnetism and Electromagnetism</p> <p>www.phschool.com</p> <p>ML&P (Municipal Light and Power)</p> <p><u>Science PLUS Green</u></p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSP 5	<p>Electrical circuits provide a means of transferring electrical energy.</p> <p>8 PSP 1 – 7 = 25 days</p>	<p><i>Physical Science Content Standard B grades 5-8: Transfer of Energy</i></p> <p>Electrical circuits provide a means of transferring electrical energy when heat, light, sound and chemical changes are produced.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB4</i> Students develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.</p>	<p>The student demonstrates an understanding of how energy can be transformed, transferred, and conserved by:</p> <p>[9] SB2.2 recognizing simple electrical circuits.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> construct a simple circuit. (apply) 	<p>NEED Fact sheets (National Energy Education Development)</p> <p>Prentice Hall: <u>Electricity and Magnetism</u> Chapter 1 Section 3 pg. 30 -35</p> <p>Insights – “Secret Circuits or Mystery Circuit Box’ – Circuits & Pathways</p> <p>Build a Water Wheel</p> <p>Test current through a variety of circuits using a multi-meter.</p> <p>Given a D-cell, a small flashlight bulb (try Christmas tree bulbs) and wire, students try to make the bulb light (construct a circuit). Interesting cheap “wire”: strips of masking tape covered with aluminum foil. (TOPS Electricity)</p>	<p>Students will produce a quiz board based on their own questions and answers and then move around the room to complete each other’s quiz boards.</p> <p>Create and solve “Secret Circuits or Mystery Circuit Box.”</p>	<p>Prentice Hall: <u>Electricity and Magnetism</u> Chapter 2 – Electric Charges and Current</p> <p>www.phschool.com</p> <p>ML&P (Municipal Light and Power)</p> <p>Insights</p> <p>ASD VHS 206523 (Bill Nye) <u>Electrical Current/Light and Optics</u></p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSP 6	<p>Energy in the form of heat is almost always one of the products of an energy transformation.</p> <p>8 PSP 1 – 7 = 25 days</p>	<p><i>Physical Science Content Standard B grades 5-8: Transfer of Energy</i></p> <p>Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways.</p> <p>Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB2</i> Students develop an understanding that energy appears in different forms, can be transformed from one form to another, can be transferred or moved from one place or system to another, may be unavailable for use, and is ultimately conserved.</p>	

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> • compile data to show heat transfer over time. (synthesis) • reconstruct the pathway of energy transformation from the sun to earth to a living body. (synthesize) 	<p>Pg. 178-179 TG Prentice Hall: <u>Motion, Forces, and Energy</u> Just Add Water Lab</p> <p>Also see activities with 7 PSP 7</p>	<p>Write a story that details the path of heat transfer through objects in a typical day.</p>	<p>Prentice Hall: <u>Motion, Forces, and Energy</u> Chapter 6 – Thermal Energy and Heat</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1361 – Temperature and Heat scn-1362 – Heat Transfer</p> <p>Bill Nye – “Heat” Video</p>

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ASD Science Curriculum Code	ASD Framework and Pacing Guide	National Science Standard	Alaska State Science Content Standard	Grade Level Expectations
8 PSP 7	<p>Heat moves in predictable ways from warmer objects to cooler objects. Heat can be transferred through materials by conduction, radiation, and convection. Insulation in dwellings helps to deter heat transfer in buildings.</p> <p>8 PSP 1 – 7 = 25 days</p>	<p><i>Physical Science Content Standard B grades 5-8: Transfer of Energy</i></p> <p>Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature.</p>	<p><i>SB</i> Students develop an understanding of the concepts, models, theories, universal principles, and facts that explain the physical world.</p> <p><i>SB2</i> Students develop an understanding that energy appears in different forms, can be transformed from one form to another, can be transferred or moved from one place or system to another, may be unavailable for use, and is ultimately conserved.</p>	<p>The student demonstrates an understanding of how energy can be transformed, transferred, and conserved by:</p> <p>[9] <i>SB2.1</i> applying the concepts of heat transfer (i.e., conduction, convection, radiation) to Alaskan dwellings.</p>

Objectives (Bloom's) – Students will be able to:	Representative Activities	Assessments/Evaluations	References
<ul style="list-style-type: none"> examine a number of heat transfer scenarios, and determine which type of energy transfer is occurring. (e.g. conduction, radiation, convection) (analyze) 	<p>Pg. 171 TG Prentice Hall: <u>Motion, Forces, and Energy</u> - Discover</p> <p>Pg. 181 TG Prentice Hall: <u>Motion, Forces, and Energy</u> - Discover</p> <p>Pg. 173 TG Prentice Hall: <u>Motion, Forces, and Energy</u> - Inquiry- convection and particle motion</p> <p>Pg. 174 TG Prentice Hall: <u>Motion, Forces, and Energy</u> - Lab – radiation</p> <p>Classify materials as conductors or non-conductors of heat. Testing is done by measuring an increase or decrease in temperature of an object submerged in a hot bath. (Collision of atoms) (evaluate)</p>	<p>Pg. 167 TG Prentice Hall: <u>Motion, Forces, and Energy</u> - In Hot Water - assesses conduction and insulation</p> <p>Keep an Ice Cube – Science Plus and Science Olympiad: assesses conduction and insulation</p> <p>See ongoing performance assessments - TG Prentice Hall: <u>Motion, Forces, and Energy</u> pg. 173,175,177</p>	<p>Prentice Hall: <u>Motion, Forces, and Energy</u> Chapter 6 – Thermal Energy and Heat</p> <p>www.phschool.com</p> <p>www.scilinks.org scn-1362 – Heat Transfer</p> <p><u>SciencePlus Green</u></p> <p>Science Olympiad</p> <p>ASD VHS 201161 (Mr. Wizard) <u>Heat Transfers</u></p> <p>ASD VHS 206516 (Bill Nye) <u>Heat/Energy</u></p>