Native American Stories
Science Connections

Created by Mechelle Lalanne May 13, 2020; Revised February 16, 2022

https://www.oercommons.org/courseware/lesson/65713
Author: MECHELLE LALANNE

Introduction

The original Native American story component lesson was developed as part of an Office of Superintendentof Public Instruction (OSPI) and Washington State Leadership and Assistance for Science Education Reform(LASER) project funded through an EPA Region 10 grant. The stories were told by Roger Fernandes of the Lower Elwha Klallam tribe. Mr. Fernandes has been given permission by the tribes to tell these stories.

Roger Fernandes Intro Video
Video Transcript: Storytelling (www.k12.wa.us)
Native American Story Connections Guide
Origin of Washington Indian Names

As these lessons and stories were shared prior to the adoption of the Washington State Science Learning Standards in 2013, there was a need to align these stories with the current science standards. This resourceprovides a current alignment and possible lesson suggestions on how these stories can be incorporated intothe classroom. This alignment work has been funded by the NGSS & Climate Science Proviso of the Washington State Legislature as a part of North Central Educational Service District's award.

You can view the original documents including the stories here: Native Education Curriculum Materials | OSPI (www.k12.wa.us) (click and scroll to “Native American Stories and Science Education”)

Attribution

NGSS Lead States. 2013. Next Generation Science Standards: For States, By States. Washington, DC: TheNational Academies Press | Public License

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ay-ay-ash (Yakama, Eastern WA)

This story is about a little girl who didn't listen very well to her family, adults, or other children and was called “ayayash” (stupid) by everyone. Cedar tree taught her to weave a basket, but it took several attempts forher to make a basket that would hold water.

Story link Story Transcription

Washington State Science Learning Standards

K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved objector tool.

K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an objecthelps it function as needed to solve a given problem.

K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare thestrengths and weaknesses of how each performs.

3-5-ETS1-1.

Define a simple design problem reflecting a need or a want that includes specified criteria forsuccess and constraints on materials, time, or cost.

3-5-ETS1-2.

Generate and compare multiple possible solutions to a problem based on how well each is likelyto meet the criteria and constraints of the problem.

3-5-ETS1-3.

Plan and carry out fair tests in which variables are controlled
and failure points are consideredto identify aspects of a model
or prototype that can be improved.

MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and thenatural environment that may limit possible solutions.

MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well theymeet the criteria and constraints of the problem.

MS-ETS1-3: Analyze data from tests to determine similarities and

differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meetthe criteria for success.

HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraintsfor solutions that account for societal needs and wants.

HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, moremanageable problems that can be solved through engineering.

HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

K-2

Kindergarten – Designing Paper Baskets – PictureSTEM. (2017). Retrieved May 13, 2020, fromPicturestem.org website: http://picturestem.org/picturestem-units/kindergarten-baskets/

First Grade – Designing Hamster Habitats – PictureSTEM. (2018). Retrieved May 13, 2020, fromPicturestem.org website: http://picturestem.org/picturestem-units/first-grade-hamsters/

Second Grade – Designing Toy Box Organizers – PictureSTEM. (2017). Retrieved May 13, 2020, fromPicturestem.org website: http://picturestem.org/picturestem-units/second-grade-toy-box/

3-5

Entwined with Life: Native American Basketry - Home - Burke Museum. (2020). Retrieved May 13, 2020, fromBurkemuseum.org website: https://www.burkemuseum.org/static/baskets/index.html

https://www.burkemuseum.org/static/baskets/Teachersguideforbasketry.html

Middle School

Roots of Wisdom - Education Resources. (2015). Retrieved May 13, 2020, from Omsi.edu website:https://omsi.edu/exhibitions/row/education-resources/

https://omsi.edu/exhibitions/row/docs/Roots-of-Wisdom_Weaving-Activity-Guide.pdf

High School

Teachings of the Tree People : : Curriculum for Engaged Learning Through Film. (n.d.). Retrieved fromhttps://www.newday.com/sites/default/files/resources/TeachingsCurriculum.pdf

- Use the weaving lesson and incorporate specific criteria and constraints.
- To rent the film https://www.newday.com/film/teachings-tree-people-work-bruce-miller

Beaver and Mouse (Tulalip, Western, WA)

This story is about Beaver who really wants to talk with Field Mouse and when he does, Field Mouse tells himthat he is too fat. Beaver remembers how useful Cedar Tree is and how Cedar Tree could help him.

Story Link Story Transcription

Washington State Science Learning Standards

2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [*Assessment Boundary: Assessmentof quantitative measurements is limited to length.*]

K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an objecthelps it function as needed to solve a given problem.

3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each islikely to meet the criteria and constraints of the problem.

General Resources

Beaver video for K-5

Beavers. (2020). Retrieved April 29, 2020, from PBS LearningMedia website: https://thinktv.pbslearningmedia.org/resource/tdc02.sci.life.colt.beaver/beavers/#.XqnL0ZNKjBI

Cedar Clothing Exhibit

Clothing | AMNH. (2020). Retrieved April 29, 2020, from American Museum of Natural History website: https://www.amnh.org/exhibitions/permanent/northwest-coast/kwakwa-ka-wakw/kwakwa-ka-wakw- collection/clothing

Kindergarten- Second Grade

Have students review the different weave patterns and sketch a clothing design for various weather.

Basketry. (2020). Retrieved April 29, 2020, from Burkemuseum.org website: https://www.burkemuseum.org/static/baskets/Teachersguideforbasketry.htm

Third-Fifth Grade

Students examine different types of fabric and their characteristics. Using magnifying glasses and sandpaper, they test and observe the weave and wear quality of fabric samples. By comparing the qualitiesof different fabrics they come to understand why so many different types of fabric exist and are able to recognize or suggest different uses for them.

Compare Fabric Materials - Activity. (2018, February 10). Retrieved April 29, 2020, from TeachEngineering.org website: https://www.teachengineering.org/activities/view/compare_fabric_material

Blu-Jay and Bear (Chehalis, Western WA)

Blu-Jay and Bear is a story from the Chehalis People near Longview, WA. This story is about Blu-Jay and his desire to be able to do the things other animals are able to do and how Bear takes care of him after Blu-Jaybecomes injured.

Story Link Story Transcription

Washington State Science Learning Standards

The connections made to these standards are based on the description of the structure and function ofFishing Duck's external parts and Bear's padded feet.

1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or
animals use their external parts to help them survive, grow, and meet their needs.* [Clarification Statement:Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]

4-LS1-1: Construct an argument that plants and animals have internal and external structures that functionto support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [*Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.*]

First Grade

Inspired by Nature STEM Storyline | Educational Service DIstrict 112 | CC BY

Explore the practice of biomimicry by answering the driving question: How can we use our understanding ofnature to help our family solve a problem? (Also aligned to 1-LS3)

Fourth Grade

Animal Mouth Structures | PBS Learning Media | free online

This is a resource vetted by NSTA that allows students to explore how the mouth structures of differentanimals help them meet their need.

Changer and Dog Salmon (All Tribes, Western,WA)

This story describes how Changer who was born of an Earth mother who was carried into the Sky World andmarried a Star. Changer was stolen by the Dog Salmon People and when he was to return to his mother, he made his first transformation.

Story Link Story Transcription

Washington State Science Learning Standards

HS-ESS2-7: Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. [Clarification Statement: Emphasis is on the dynamic causes, effects, and feedbacks between the biosphere and Earth's other systems, whereby geoscience factors control the evolution of life, which in turn continuously alters Earth's surface. Examples include how photosynthetic life altered the atmosphere through the production of oxygen, which in turn increased weathering rates and allowed for the evolution of animal life; how microbial life on land increased the formation of soil, which in turn allowed for the evolution of land plants; or how the evolution of corals created reefs that altered patterns of erosion and deposition along coastlines and provided habitats for the evolution of new life forms.] [*Assessment Boundary: Assessment does not include a comprehensive understanding of the mechanisms of how the biosphere interacts with all of Earth's other systems.*]

Resources

Evolutionary history of Pacific salmon in dynamic environments is an article that describes the evolutionary history of the Pacific salmon in a changing landscape. This could be a great resource as a teacher to develop a lesson.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3352440/

Waples, R. S., Pess, G. R., & Beechie, T. (2008). Evolutionary history of Pacific salmon in dynamic environments. *Evolutionary applications*, *1*(2), 189–206. https://doi.org/10.1111/j.1752-4571.2008.00023.x

Columbia River Story (All tribes, Eastern WA)

A man's daughter became ill and nothing seemed to help her condition. The father prayed for help to thespirits and the ancestors and he had a dream about how to help his daughter.

Story Link Story Transcription

Washington State Science Learning Standards

3-ESS2-1: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Clarification Statement: Examples of variables to testcould include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] [*Assessment Boundary: Assessment is limited to a single form of weathering or erosion.*]

4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth's features. [ClarificationStatement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.]

MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. [Clarification Statement: Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave graduallybut are punctuated by catastrophic events. Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]

HS-ESS2-1: Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. [Clarification Statement: Emphasis is on how the appearance of land features (such as mountains, valleys, and plateaus) and sea-floor features (such as trenches, ridges, and seamounts) are a result of both constructive forces (such as volcanism, tectonic uplift, and orogeny) and destructive mechanisms (such as weathering, mass wasting, and coastalerosion).] [*Assessment Boundary: Assessment does not include memorization of the details of the formationof specific geographic features of Earth's surface.*]

HS-ESS2-2: Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. [Clarification Statement: Examples should include climate feedbacks, such as how an increase in greenhouse gases causes a rise in global temperatures that melts glacial ice, which reduces the amount of sunlight reflected from Earth's surface, increasing surface temperatures and further reducing the amount of ice. Examples could also be taken from other system interactions, such as how the loss of ground vegetation causes an increase in water runoff and soil erosion;how dammed rivers increase groundwater recharge, decrease sediment transport, and increase coastal erosion; or how the loss of wetlands causes a decrease in local humidity that further reduces the wetland extent.]

HS-ESS2-5: Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. [Clarification Statement: Emphasis is on mechanical and chemical investigations withwater and a variety of

solid materials to provide the evidence for connections between the hydrologic cycle and system interactions commonly known as the rock cycle. Examples of mechanical investigations include stream transportation and deposition using a stream table, erosion using variations in soil moisture content, or frost wedging by the expansion of water as it freezes. Examples of chemical investigations include chemical weathering and recrystallization (by testing the solubility of different materials) or melt generation (by examining how water lowers the melting temperature of most solids).]

Resources

An Introduction to the Ice Age Floods – Ice Age Floods Institute. (2020). Retrieved May 13, 2020, from Iafi.orgwebsite: https://iafi.org/about-the-ice-age-floods/introduction/

NOVA | Mystery of the Megaflood | Explore the Scablands (non-Flash) | PBS. (2020). Retrieved May 13, 2020,from Pbs.org website: https://www.pbs.org/wgbh/nova/megaflood/scab-nf.html

Glacial Lake Missoula and the Ice Age Floods. (2020). Retrieved May 13, 2020, from Glaciallakemissoula.orgwebsite: http://www.glaciallakemissoula.org/story.html

Ice Age Floods-Discover Glacial Lake Missoula and Lake Bonneville. (2015, November 3). Retrieved May 13,2020, from Hugefloods.com website: http://hugefloods.com/

Sculpted by Floods: The Northwest's Ice Age Legacy | PBS LearningMedia. (2020). Retrieved May 13, 2020,from PBS LearningMedia website: https://www.pbslearningmedia.org/resource/sculpted-by-floods-the- northwests-ice-age-legacy/sculpted-by-floods-the-northwests-ice-age-legacy/support-materials/

Fourth Grade

Glaciers, Water and Wind, Oh My! - Activity. (2019, October 9). Retrieved May 13, 2020, from TeachEngineering.org website: https://www.teachengineering.org/activities/view/cub_earth_lesson5_activity1

Grade 4 - 4-ESS2 Earth's Systems. (2020). Retrieved May 13, 2020, from Exploringnature.org website:https://www.exploringnature.org/db/view/Grade-4-4-ESS2-Earthrsquos-Systems

Middle School

Goldberg, A. (2013, November 15). AUTHENTIC LANDSCAPES INDOORS. Retrieved May 13, 2020, fromNsta.org website: http://digital.nsta.org/publication/?i=184198&article_id=1562453&view=articleBrowser&ver=html5

High School

See Resources section above.

The Coming of Slahal (All tribes, Western, WA)

This story is about the order of the world and how it came to be.

Story Link Story Transcription

Washington State Science Learning Standards

MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]

HS-LS2-6: Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintainrelatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. [Clarification Statement: Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise.]

HS-LS4-6: Create or revise a simulation to test a solution to mitigate adverse impacts of human activity onbiodiversity.* [Clarification Statement: Emphasis is on testing solutions for a proposed problem related to threatened or endangered species, or to genetic variation of organisms for multiple species.]

Middle School

WA History Curriculum, OSPI *Since Time Immemorial* Tribal Sovereignty Curriculum for the Social Studies

WA – Contemporary Washington State: Middle School Unit 3 Washington State History | OSPI (www.k12.wa.us) Retrieved February 9, 2022 from Since Time Immemorial: Tribal Sovereignty in Washington State | OSPI (www.k12.wa.us)

The Invasive Species Council has a unit with several lesson. Lesson 3 aligns well, but you could really usemost of their activities.

Palador. (2020, February 6). School Curriculum - Invasive Species Council. Retrieved May 5, 2020, from Invasive Species Council website: https://invasivespecies.wa.gov/educational-materials/teacher-curriculum/

High School

Northwest Indian Fisheries Commission: Treaty Hunting Rights FAQ

Treaty Hunting Rights FAQ. (2008, June 5). Retrieved May 5, 2020, from Northwest Indian FisheriesCommission website: https://nwifc.org/about-us/wildlife/treaty-hunting-rights-faq/

Population Dynamics 5E Instructional Model Plan from New Visions for Public Schools

Population Dynamics 5E Instructional Model Plan - New Visions Science Curriculum. (2020). Retrieved May 5,2020, from New Visions - Science website: https://curriculum.newvisions.org/science/resources/resource/living-environment-unit-7-5E-instructional-model-plan-population-dynamics-5e-instructional-model-plan/

Coyote and Bear (All tribes, Eastern WA)

This story is about how Coyote tricked Bear with the splitting of plant crops.

Story Link Story Transcription

Washington State Science Learning Standards

1-LS3-1: Make observations to construct an evidence-based account that young plants and animals are like,but not exactly like, their parents. [Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [*Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.*]

4-LS1-1: Construct an argument that plants and animals have internal and external structures that functionto support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structurescould include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [*Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.*]

First Grade

Plants on Our Plates. (n.d.). Retrieved from https://www.wastatelaser.org/wp-content/uploads/Plants_on_Our_Plates.pdf

Fourth Grade

That's Not a Plant, It's a Weed! Discovering Functions of External Plant Parts; What Makes a Plant a Plant?

Mary Ellen Kanthack. (2015, July 10). That's Not a Plant, It's a Weed! Discovering Functions of External PlantParts; What Makes a Plant a Plant? Retrieved May 5, 2020, from BetterLesson website: https://betterlesson.com/lesson/603965/that-s-not-a-plant-it-s-a-weed-discovering-functions-of-external- plant-parts-what-makes-a-plant-a-plant?from=cc_lesson

Related resource to *Plants on Our Plates*: *PDF Download View*

Coyote's Deal with the Wind (Spokane. EasternWA)

This story shares about how the Wind would blow through the land and how Coyote set a trap to capture the Wind.

Story Link Story Transcription

Washington State Science Learning Standards

2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape ofthe land.* [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]

3-ESS2-1: Represent data in tables and graphical displays to describe typical weather conditions expectedduring a particular season. [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [*Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.*]

4-ESS2-1: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] [*Assessment Boundary: Assessment is limited to a single form of weathering or erosion.*]

MS-ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions. [Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within
probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).] [*Assessment Boundary: Assessment does not include recalling the names of cloud types or weather symbols used onweather maps or the reported diagrams from weather stations.*]

MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates**.** [Clarification Statement:Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents. Examples of models can be diagrams, maps and globes, or digital representations.] [*Assessment Boundary: Assessment does not includethe dynamics of the Coriolis effect.*]

Second Grade

Collins, M. (2015, June). Preventing Wind Erosion. Retrieved May 13, 2020, from BetterLesson website: https://betterlesson.com/lesson/637474/preventing-wind-erosion?from=search_results

Faber, J. (2015, June 15). How Can Wind Change the Shape of the Land? Retrieved May 13, 2020, from BetterLesson website: https://betterlesson.com/lesson/632923/how-can-wind-change-the-shape-of-the-land

Third Grade

Espin, M. (2015, March 2). Which Way Does The Wind Blow? A Weather Vane Can Show You! Retrieved May13, 2020, from BetterLesson website: https://betterlesson.com/lesson/635186/which-way-does-the-wind- blow-a-weather-vane-can-show-you?from=cc_lesson

STEM: Weather. (2013). Retrieved May 13, 2020, from Thinkport.orgwebsite: http://weather.thinkport.org/home.html

Fourth Grade

Experiment: Demonstrating Wind Erosion. (n.d.). Retrieved from https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_035714.pdf

Middle School

Tornado Alley! (Middle School NGSS Unit) https://www.oercommons.org/authoring/28983-tornado-alley- middle-school-ngss-unit

Father Ocean (All tribes, Western WA)

This story is about Ocean's children, the Clouds, and how they would travel across the land.

Story Link Story Transcription

Washington State Science Learning Standards

K-ESS2-1: Use and share observations of local weather conditions to describe patterns over
time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in differentmonths.] [*Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.*]

3-ESS2-1: Represent data in tables and graphical displays to describe typical weather conditions expectedduring a particular season. [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [*Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.*]

5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere,and/or atmosphere interact. [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere.The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [*Assessment Boundary: Assessment is limited to the interactions of two systems at a time.*]

MS-ESS2-4: Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. [Clarification Statement: Emphasis is on the ways water
changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.] [*Assessment Boundary: A quantitative understanding of the latent heats of vaporization and fusion is not assessed.*]

MS-ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions. [Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within
probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).] [*Assessment Boundary: Assessment does not include recalling the names of cloud types or weather symbols used onweather maps or the reported diagrams from weather stations.*]

MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. [Clarification Statement:Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat

by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents. Examples of models can be diagrams, maps and globes, or digital representations.] [*Assessment Boundary: Assessment does not includethe dynamics of the Coriolis effect.*]

Kindergarten

Feeling Hot, Hot, Hot! | Kilauea School and Maunawili School for Gather, Reason, Communicate | CC BY SA

Addresses Patterns in Daily Temperature and the Phenomenon focus is: We are hotter and sweatier afterlunch recess than morning recess. The investigation is about patterns and graphing with simple data.
Includes formative assessment.

Analyzing and Interpreting Data - Kindergarten

Develop for the Climate Science Proviso Canvas Course hosted by Capital Region ESD in Tumwater. (Seeattached resources)

Third Grade

Analyzing and Interpreting Data - Third Grade

Develop for the Climate Science Proviso Canvas Course hosted by Capital Region ESD in Tumwater. (Seeattached resources)

Fifth Grade

Nelson, K. (2015, July 10). Researching The Rain Shadow Effect. Retrieved May 13, 2020, from BetterLessonwebsite: https://betterlesson.com/lesson/634353/researching-the-rain-shadow-effect?from=cc_lesson

Middle School

Grade, & Macnevin, L. (n.d.). *General Science: Weather and Heat Transfers*. Retrieved from https://ambitiousscienceteaching.org/wp-content/uploads/2017/06/Gen-Sci-Weather-and-Heat-Transfer.pdf

Related resources

Kindergarten Analyze and Interpret Data Teacher Directions

DOCX Download

KinderSunnyGraph

DOCX Download

KinderSnowyGraph

DOCX Download

KinderRainyGraph

DOCX Download

Third Grade Analyzing and Interpreting Data

DOCX Download

Weather Data Locations

DOCX Download

Colville Rain

PDF Download View

Our Weather Prediction for Ozette

DOCX Download

Pullman Temperature

PDF Download View

Pullman Rain

PDF Download View

Long Beach Rain

PDF Download View

Long Beach Temperature

PDF Download View

Neah Bay Temperature

PDF Download View

Our Weather Prediction

DOCX Download

Grandview Rain

PDF Download View

Grandview Temperature

PDF Download View

Neah Bay Rain

PDF Download View

Colville Temperature

PDF Download View

Blank Rain Bar Graph

DOCX Download

Brewster Temperature

PDF Download View

Blank Pictograph

DOCX Download

Bellingham Rain

PDF Download View

Bellingham Temperature

PDF Download View

The Gossiping Clam (Puget Sound, Western WA)

This is a story about the Clams being everywhere and gossiping about you until a little clam gossips aboutRaven and Raven takes the clams and pushed them under the sand on the beach.

Story Link Story Transcription

Washington State Science Learning Standards

4-LS4-1: Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [*Assessment Boundary:Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.*]

MS-LS4-1: Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. [Clarification Statement: Emphasis is on finding patterns of changes in the level of complexity of anatomical structures in organisms and the chronological order of fossilappearance in the rock layers.] [Assessment Boundary: Assessment does not include the names of individualspecies or geological eras in the fossil record.]

Third Grade

Mud Fossils. (2014, July 22). Retrieved May 13, 2020, from Earth Science Weekwebsite: https://www.earthsciweek.org/classroom-activities/mud-fossils

Middle School

NSTA. (2019). Deep Thinking Over Geologic Time. Retrieved May 13, 2020, from Nsta.org website:https://ngss.nsta.org/Resource.aspx?ResourceID=999

Handout: http://static.nsta.org/connections/middleschool/201712Handout.pdf

Student Guide:

http://static.nsta.org/connections/middleschool/201712StudentGuide.p

df Teacher Guide:

http://static.nsta.org/connections/middleschool/201712TeacherGuideN

ew.pdf

How Fire Came to Earth (All tribes, Eastern WA)

This story shares how the animals went to the Sky World to get fire.

Story Link Story Transcription

Washington State Science Learning Standards

2- **PS1-3**: Make observations and measurements to identify materials based on their properties. [ClarificationStatement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [*Assessment Boundary: Assessment does not include density or distinguishing mass and weight.*]

MS-PS1-2: Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. [Clarification Statement: Examples of reactions could include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with hydrogen chloride.] [*Assessment boundary: Assessment is limited to analysis of the following properties: density, melting point, boiling point, solubility, flammability, and odor.*]

Fifth Grade

Mystery Powders. (2018). Retrieved May 13, 2020, from Uen.org website: https://www.uen.org/lessonplan/view/2176

Middle School

What's This Stuff? | PBS LearningMedia. (2020). Retrieved May 13, 2020, from PBS LearningMedia website: https://www.pbslearningmedia.org/resource/nvms.sci.phys.matter.makingstuff/whats-this-stuff/

The Huckleberry Medicine (Puget Sound,Western WA)

A man's daughter became ill and nothing seemed to help her condition. The father prayed for help to thespirits and the ancestors and he had a dream about how to help his daughter.

Story Link Story Transcription

Washington State Science Learning Standards

MS-LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. [Clarification Statement: Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems.] [*Assessment Boundary: Assessment does not include the mechanism of one body system independent of others.*
Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.]

MS-LS1-5: Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. [Clarification Statement: Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting growth of organisms. Examples of evidence could
include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in smallponds.] [*Assessment Boundary: Assessment does not include genetic mechanisms, gene regulation, or biochemical processes.*]

MS-PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. [Clarification Statement: Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.] [*Assessment Boundary: Assessment is limited to qualitative information.*]

Resources

Straus, K. M., & Chudler, E. H. (2016). Online Teaching Resources about Medicinal Plants andEthnobotany. *CBE—Life Sciences Education*, *15*(4), fe9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5132387/

Middle School

Lessons - Sowing the Seeds of Neuroscience. (2013). Lessons - Sowing the Seeds of Neuroscience. RetrievedMay 13, 2020, from Neuroseeds.org website: http://www.neuroseeds.org/Lessons

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