Coastal Ecosystems of Washington 3-5th Grade

Themes: Ecosystem Exploration, Sensory Experiences

Location:

This lesson's activities can be done in the classroom with student computers.
Remote learning modification: Remote learning modification: Lesson can be taught over Zoom or Google Classrooms.
The PowerPoint, brainstorming, and assessments can be done in the classroom with student computers.

Standards:

NGSS

3-LS4-4

Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

3-ESS2-2

Obtain and combine information to describe climates in different regions of the world.

Modifications, Adaptations:

For COVID-19 distance learning, or other remote learning modification, look for **remote learning modifications** throughout the lesson plan.

Materials:

Worksheet and key for "Shorelines and Salmon: Friends of the San Juans' Immersive Education 360VR" + video link (assign as a pre-lesson homework assignment), Setting up a Beach Scene visualization sheet, What Are Coastal Ecosystems PowerPoint, Coastal Ecosystems of Washington PowerPoint, Compare and Contrast a Coast worksheet

Objectives:

Students will..

1. Describe what life looks like at the intersection of land and sea and how we rely on healthy coasts.
2. Examine what coastal ecosystems look like in Washington and what creatures live there.
3. Recognize that everyone has a connection to coastal ecosystems, regardless of where they live.
4. Compare two types of coastal ecosystems and investigate the diversity of species in these ecosystems.

Vocabulary:

Beach: The land along the coast, river, sea, or lake. It can be sandy or rocky.
Biodiversity: Biodiversity is the full range of life in all its forms. This includes the habitats in which life occurs, the ways that species and habitats interact with each other, and the physical environment necessary.
Coast: The geographic space where land and ocean meet. Coasts provide unique habitats for a variety of plant and animal species.

Vocabulary (continued):

Channel: A long, narrow body of water that joins two larger bodies of water.
Ecosystem: All the plants and animals that live in a particular area together and their relationship with the non-living environment.
Estuary: Areas where freshwater rivers meet the saltwater ocean. Estuaries often have ecosystems like bays, marshes, swamps, and inlets.
Gravity: The invisible force that pulls objects towards each other. The moon's gravitational pull causes large bodies of water on Earth to experience tides.
Habitat: The food, water, shelter, and space that an animal or plant needs to survive.
Shoreline: A narrow ribbon of land and shallow water that rings Puget Sound. It includes the cliffs or bluffs that neighbor beaches, portions of streams and rivers that are influenced by the tides, and shallow water areas to a depth where sunlight no longer supports marine vegetation.
Puget Sound: Coastal area in northwestern Washington where saltwater from the Pacific Ocean meets freshwater from rivers around a collection of islands.
Tides: The rise and fall of the ocean where it meets land, caused by the gravitational pull of the moon. When the tide goes out and dry land is exposed, that is low tide. When the water climbs back up the beach and less of the beach is exposed, that is high tide.
Tidepool: A small amount of water left in low places on the shore even at low tide. Each tide pool has a whole community of different plants and animals living there. There are tide pools all around the world, wherever there's a rocky seashore.
Watershed: An area of land from which water drains into a river, lake, or underground water.

Procedure:

Imagining Coastal Ecosystems

Assign students to watch "Shorelines and Salmon: Friends of the San Juans' Immersive Education 360VR" and complete the Shorelines and Salmon worksheet before starting the lesson. This activity should take students between 20-30 minutes at home.

In your next science period, have students review their answers to the worksheet in small groups. **Remote learning modification:** Zoom/Google breakout rooms. Come back as a class and discuss their favorite thing and the most interesting/coolest thing they explored in the 360 video.

Open audio (on YouTube) for the coastal visualization activity. Next, tell students they are going to take a trip to the beach. Ask students to close their eyes (no peaking) and imagine a beach, any beach! If students don't feel comfortable closing their eyes, then can keep them open, but ask them to try and picture themselves on a beach. Begin playing the audio (don't show the video) for the coastal visualization activity. Give the audio about 10 seconds to play before you begin reading the, "Setting up a Beach Scene" document. This activity is meant to virtually transport students to the beach and will set the tone for the lesson. Afterwards, have students open their eyes

and ask them to describe their experience with a partner. How did it make them feel? Could they imagine the salty air and feel the cool ocean breeze? If they have never visited a beach, what did they visualize their imaginary beach was like?

Introduction to Coastal Ecosystems of Washington
Open the "What Are Coastal Ecosystems" PowerPoint and go through slides. Make sure presenter notes are turned on. This PowerPoint will introduce basic vocabulary regarding coasts, tides, and biodiversity.

Next, open the "Washington Coastal Ecosystems" PowerPoint and go through slides. Again, make sure that presenter notes are on. This presentation shows how everyone in Washington has a connection to coastal ecosystems.

Final Assessment
Introduce the extended project, "Compare and Contrast a Coast" and explain directions to students. Students will research and choose a coastal ecosystem outside of Washington, either somewhere else in the United States or in another country. After learning a bit about their chosen coast, they will write or draw five similarities and five differences it has to Washington's coastal ecosystems. They can write and draw their lists if they want but choosing just one medium is fine. We recommend having students share their pictures or their paragraphs of their chosen ecosystem with the class.

Idea: Show off your students' work! Share student projects from this lesson with WDFW.
Facebook:@WashingtonFishWildlife
Instagram:@TheWDFW
Twitter:@WDFW
#WildWashington #WildWa

Did you teach this lesson? Give us your feedback.

Additional Resources :

We encourage you to use the following resources as either a supplement to this lesson, or to share the resources with students for their project.

Supplemental activities:

- Online Estuary Education- Puget Sound Estuarium
- Coastal Ecosystems, Beach, Estuary, Marsh, and Swamp- University of Florida
- Explore Beaches- University of California: Santa Barbara
- Coastal and Ocean Activities- Sailors for the Sea
- Rocky Shore Curriculum- Seacoast Science Center

Other resources:

- Watershed Search- Padilla Bay National Estuarine Research Reserve
- Estuary Crossword and Word Search- Padilla Bay National Estuarine Research Reserve
- High and low tide scavenger hunt- Padilla Bay National Estuarine Research Reserve
- Washington Trails Association list of tidepooling locations
- Book a virtual fieldtrip with Washington State Parks
- Explore coastal ecosystems on Google Earth
- NOAA's tide predictor
- State of the Washington Coast- WDFW
- European Green Crab- WDFW
- Coastal Resilience and Rising Seas (video)- The Nature Conservancy

This lesson was written in collaboration with Washington State Parks and Washington Service Corps.