5 E's Lesson Plan Template		
"Lesson": Land Stewardship		
Essential Question(s):		
What are good land stewardship practices?		
Materials/Resources		**Essential Vocabulary**
Teacher: OSEU #1 video by Stephanie Charging Eagle http://www.wolakotaproject.org/oceti-sakowin-essential-understanding-one/oseu-one-interview-with-stephanie-charging-eagle/ Lakota story of Devil's Tower https://www.nps.gov/deto/learn/historyculture/first-stories.htm	**Student:** ● Computers with Google Earth installed ● Stream table OR ● clear plastic tubs ● rocks/sand ● squeeze bottle ● water ● food coloring	Chemical Weathering Mechanical Weathering Erosion Acid rain Gradient Meandering Stewardship Worldview
Learning Experience		
Standard and Practice:	Content Standards HS-ESS2-4 Plan and carry out an investigation of the properties of water and its effects on Earth materials and surface processes.	

	HS-ESS2-1 Analyze geoscience data to make the claim that one change to the Earth's surface can create feedback that cause changes in other Earth systems. OSEU Standard 1.2 – Describe traditional and contemporary Oceti Sakowin perspectives on communal stewardship of land and natural resources (flora, fauna, geographic and sacred features). Standard 1.3 – Demonstrate understanding of the interrelationships of Oceti Sakowin people, places, and environments within all tribal lands in South Dakota. Standard 1.4 – Identify and explain contemporary environmental issues facing Oceti Sakowin lands (i.e. Dakota Pipeline, etc.). Standard 1.5 – Examine strategies the tribal governments and other tribal leaders are taking to improve the lands and natural gifts of Oceti Sakowin people.
Cultural Integration:	Traditionally, the Oceti Sakowin practiced communal land stewardship. The land was used and enjoyed by all members of a tribe; in turn, all members were responsible for caring for and maintaining the land for future generations. The Oceti Sakowin hold deep spiritual connections with the land and view it as a relative. European land laws and practices run counter to these beliefs. In this lesson, students will be able to identify different types of erosion and weathering, determine which are caused by Earth's processes and which are brought on by human disturbance or land management practices, and draw their own conclusions about best practices for land stewardship.
I Can Statement(s):	I can explain how water, wind, and humans impact the land. I can explain the Oceti Sakowin's spiritual connection to the land and describe ways that we can all be good stewards of it.
Engage: Activating Strategy/Hook:	Launch question: What do we mean when we refer to 'the land'? Is land something that needs to be cared for? If so, how?

	Have students watch the OSEU #1 video by Stephanie Charging Eagle http://www.wolakotaproject.org/oceti-sakowin-essential-understanding-one/oseu-one-interview-with-stephanie-charging-eagle/ Discussion: How is the worldview of land different from Western Europeans and Native American views (*if you work the land, you own it* as opposed to *if you doing something to the land that nature didn't intend, then you can't own the land*)? How would the concept of Unci Maka change the relationship with the place that you live? Pass out a poster board and markers to each group of 2-4 students. Have them brainstorm this question: What are some examples of how people take advantage of Unci Maka today? After 3 minutes, ask groups to share out their responses.
Explore: Learning Experiences	Part 1 1. Have students read the Lakota story of Devil's Tower https://www.nps.gov/deto/learn/historyculture/first-stories.htm Ask students to discuss in pairs or small groups prior knowledge about how this geographic feature was formed and how the stories align/differ. 3. Students share out their key points. Guide students to see how stories of this geographic feature involve various forms of weathering. 2. Provide specific photos of mechanical and chemical weathering and have students determine what caused the land shape. 3. Ensure students differentiate between chemical and mechanical weathering done by natural processes and humans. Part 2 1. Have students work in small groups. Use a stream table or pass out clear plastic tubs, rocks/sand, squeeze bottles, water, and food coloring. 2. Have the students create a meandering, mountain stream. Students will use the water bottle to add dyed water to the

	system and observe changes to the land/watershed as water rushes down a river and begins to flood the floodplain. 3.Have the students repeat the steps above, but by creating a channelized (straight), downhill ditch. Students will observe the differences in erosion and impacts to the land. Go over the activity as a class. Have groups respond about the following questions, helping them to see differences in “meandering” vs “channelization” and pointing out different geological features (bluffs, floodplain, beach, tributary, delta, valley) formed by the water in their models.
Explain: Learning Experiences	When water (simulated rain) was added to the natural, meandering stream, the position and direction of the stream shifted and the sand was deposited in different areas, creating different geographical features. The water remained relatively free of debris. When water was added to the channelized stream, it washed the debris away more quickly. The water became murky. Nutrients in the land are lost when washed into the water. Poor water quality would be harmful to fish and wildlife who drink it. Adding vegetation to the sides of the natural or channelized stream may reduce erosion. ● How does a natural stream respond to rain? ● Humans often channelize streams to keep owned land, crops, or homes/buildings from flooding. Did you see any pros or cons to channelization when water was added? ● How would this impact the health of the soil, land, animals? ● Do you notice a difference in water quality (e.g., turbidity)? Would vegetation growing on the surface change the impact?

Elaborate: Extending & Defining	Take students outdoors to identify types of erosion commonly found around the school (e.g., pathways, swing sets, ditches). Return indoors. Have students work in small groups to review EMOS maps to identify land uses and erosion in and around a reservation. Have students write out 1) sorts of land use practices they are seeing in the maps and 2) evidence of erosion (connecting those back to the land uses). *They will need to have Google Earth installed on the computer. Go to https://lta.cr.usgs.gov/emodis and download the kml file https://dds.cr.usgs.gov/ee-data/coveragemaps/kml/ee/emodis.kml* *Students can also view land management information for specific reservations, such as the Pine Ridge Land Information System http://lakotalands.net/.* *Google images will work if these options are not available.*
Evaluate: Summarizing Strategy	Class will engage in a final group discussion answering the following questions: ● Of the forms of weathering, which are negatively impacting the natural world? ● Of the more damaging forms of chemical and mechanical weathering that are linked to humans, which are most problematic for the area in which we live? Are we contributing to problems that other areas are experiencing? ● How is the explanation of how weathering and man impacts the Earth similar or different from the Lakota story of Devil's Tower? ● What forms of land stewardship might mitigate these issues?

Differentiation Strategies		
Extension	**Intervention**	**Language Development**

Have students interview elders in their community about changes in the land over time and how those changes have impacted humans and the environment.	Cut and paste activity involving photos of weathering and vocabulary.	

Assessment(s)	
Formative	**Summative**
	Create a slideshow with visuals (incorporating EROS mapping) to present an issue in land use management and then answers the question, "How can we use the Lakota view of the land to be good stewards of it?"
Teacher Reflection: (Next steps?)	