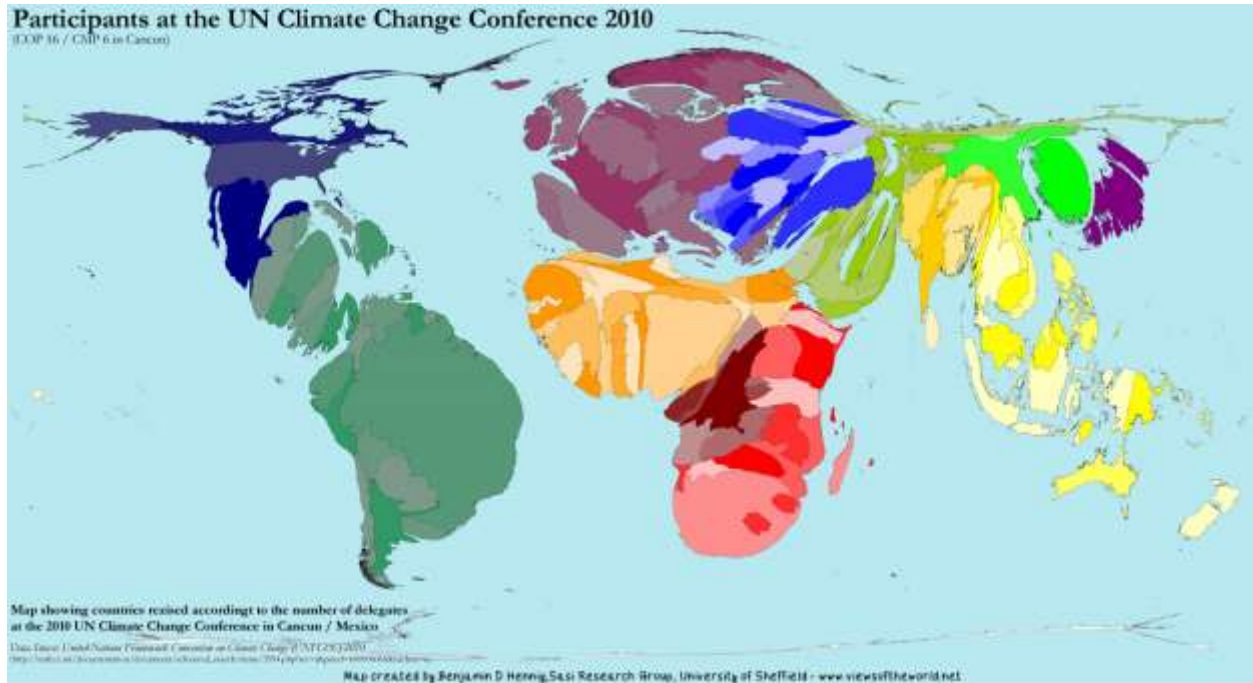


6th Grade Science Lesson Plan



“What Climate Change Means to ME”

SD Middle School Science Standards

- 6.E.1.2. Students are able to examine the role of water on the Earth.
- 6.A.E.1.2. Students are able to identify an effect of water on the surface of the Earth.
- 6.E.1.1. Students are able to describe how the spheres (lithosphere, hydrosphere, atmosphere, and biosphere) of the Earth interact.
- 6.S.1.1. Students are able to describe how science and technology have helped society to solve problems.
- 6.A.S.1.1 Students are able to recognize that technology helps solve problems.
- 6.S.2.1. Students are able to given a scenario, identify the problem(s) of human activity on the local, regional, or global environment.
- 6.A.S.2.1 Students are able to give an example of a problem caused by human activity.

Common Core

Speaking and Listening:

SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

OSEU

ESSENTIAL UNDERSTANDING 1: The original land base and natural resources of the Oceti Sakowin were under communal stewardship prior to immigrant settlement. The Oceti Sakowin tribes have a distinct and unique interrelationship with the environment that contributes to South Dakota.

Lesson:

- Discuss the map on the Prezi: What's strange about it? Why are the countries shaped like they are? What might this map say about the US commitment to solving climate change?
- View NASA film The Ocean: a Driving Force for Weather and Climate (in Prezi or at <https://youtu.be/6vgvTeuoDWY>)
 - Questions for discussion
 - What causes the currents in the ocean?
 - What causes the currents in the atmosphere?
 - What kinds of events can the transfer of heat cause?
- View NASA film A Year in the Life of Earth's CO2 (in Prezi or at <https://youtu.be/x1SgmFa0r04>)
 - Questions for discussion
 - What did the computer model of the movement of the red CO2 look like?
 - Do you think people would think differently about CO2 if it was visible in the air?
 - What areas was the CO2 coming from mostly?
 - How do the seasons effect the CO2 in the air (winter & summer)? Why?
 - What problems are caused by the fact that weather patterns transport CO2 and Carbon Monoxide across the planet?
- View TED talk Vicky Arroyo: Let's Prepare for Our New Climate (in Prezi or at <https://youtu.be/8Z24LCysq3A>)
 - Questions for discussion
 - What natural disasters are you most aware of? Do you know anyone who was hurt by a natural disaster?
 - Who is hit first and hurt most by disasters like hurricanes, tornados, wildfires or droughts? Why?
 - Do you have any ideas of ways we could ADAPT our homes or towns to be safer from these kinds of disasters?
 - Do you know of "safety plans" in cases of emergencies? Are there possible emergencies that you or your family and friends might NOT be prepared for?
 - What do you think about the PETS act?
 - Who might be hurt first in extreme weather (very hot summers or very cold winters)? Who might need help first if there was a food or clean water shortage?
 - What do you think about "green roofs" in cities? Do you know anyone who has a garden and provides fresh food for people?
 - We live a long way from the ocean, so we might not be too worried about flooding due to climate change, but what things might affect us here?
- View the Wolakota Project interview with Elder Gladys Hawk (in Prezi or at <http://www.wolakotaproject.org/oceti-sakowin-essential-understanding-one/oseu-one-interview-with-gladys-hawk/>)
 - Questions for discussion (consider using one or two of the "Learn From" questions)

Learn ABOUT
(deep listening, *information*)

1. What is the difference between “living off” the land, “living with” the Land and simply “living on” the land?
2. In what way is the Land your grandmother?
3. What things does “mother earth” provide for the people?

Learn FROM
(deep sharing, *transformation*)

1. Who has provided for me... a Grandmother? Grandfather? Mother? Father? Other? What kind of relationship develops when someone becomes a provider?
2. Have I ever felt like a place or a region was my provider? Why or why not?
3. What’s an appropriate response to a provider? How should the one being cared for show appreciation?
4. What might appreciation look like if “mother earth” is my provider?

OSEU 1: INTERVIEW WITH GLADYS HAWK
WoLakota Project



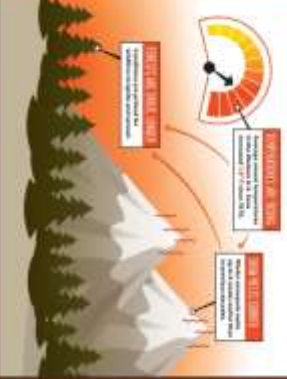
- View the Alaska Glaciers Then and Now video (embedded in the Prezi)
 - Depending upon time, engage students in some conversations around what the changes in our arctic regions can tell us.
- Distribute info-graphic handouts and help students make some interpretations of the statistics they see there.
- Help each student develop plans to address the carbon emissions THEY have influence over
- Share out ideas before class ends

SOLAR CONVICTION WESTERN WILDFIRES & CLIMATE CHANGE

Wildfires are increasing and wildfire season is getting longer in the Western U.S.



Climate change is driving up temperatures and increasing wildfire risk.



Wildfires are projected to burn more land as temperatures continue to rise.



THE IPCC

GROWING CONSENSUS & INCREASING CERTAINTY

Each consecutive report published by The Intergovernmental Panel on Climate Change has found with more support from more research and with more certainty that humans are responsible for climate change.

1990... Human activities are substantially increasing the atmospheric concentration of GHGs... resulting in additional warming.

78 lead authors, 400 contributing authors, 116 countries approved, 2200 publications. **1995**... The balance of evidence suggests a discernible influence on global climate.

2001... 122 lead authors, 512 contributing authors, 99 countries approved, 3900 publications. Most of the observed warming over the last 50 years is likely (66-90%) to have been due to the increase in GHG concentrations.

152 lead authors, 498 contributing authors, 113 countries approved, 6000 publications. Most of the observed increase in global avg. temperatures since the mid-20th cent. is very likely (>90%) due to observed increase in anthropogenic GHG concentrations.

2007... 209 lead authors, 600 contributing authors, and 199 countries who cited 9200 publications found... **2013**... It is extremely likely (>95% chance) that more than half of the observed increase in global avg. surface temperatures from 1951-2010 was caused by anthropogenic increase in GHGs.

Source: IPCC Working Group I Reports | climatetalk.us

WHAT Do Americans Really Believe About Global Warming?



HOW global warming has been perceived by Americans, for the past 6 years.



ThomsonReuters.com

What can I do to reduce carbon emissions NOW?

What are the sources of carbon emissions?	Transportation Fuels <i>(see graphic below)</i>	Waste Disposal and Treatment <i>(see graphic below)</i>	Residential, Commercial & Other Sources <i>(see graphic below)</i>	Farming (Agricultural By Products) <i>(see graphic below)</i>	Land Use and Biomass Burning <i>(see graphic below)</i>	Fossil Fuel Retrieval, Processing & Distribution <i>(see graphic below)</i>	Power Stations <i>(see graphic below)</i>	Industrial Processes <i>(see graphic below)</i>
Rank 1-8 the sources I have influence on <i>(1 highest, 8 lowest)</i>								

My plan for addressing the top three sources of carbon emissions that I have influence on:

Number One:	Number Two:	Number Three:
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