**Climate & Drought in the Great Basin**

**Objective:** Students understand the difference between weather and climate. Students understand that humans are impacting the earth’s climate. Students understand the connection between climate change and drought in the Great Basin. Students evaluate their water use.

**Time Consideration:** One 50 minute lesson, followed by a 30 minute lesson

**Materials:** A whiteboard or poster to use for brainstorming, copies of the worksheet for each student

**Introduction:** In this two-part lesson, students will become familiar with the mechanism of climate change and the role that humans are playing in these processes. Students will learn about one major impact of climate change in the Great Basin - drought. Then, students will conduct an at-home water audit. In the follow-up lesson, teachers will assist students in performing calculations to determine their family’s water use. Then, students will brainstorm how they can conserve water.

**Content:**

**Background:**

Climate change is [described](https://www.un.org/en/climatechange/what-is-climate-change#:~:text=Climate%20change%20refers%20to%20long,like%20coal%2C%20oil%20and%20gas.) by the United Nations as “long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.” An important distinction when describing this concept to students is the difference between climate and weather. Weather refers to short-term conditions, which can change by the minute, hour, or day. Climate refers to weather patterns over a long period of time.

The mechanism of climate change can be explained to students in fairly simple terms. Humans burn fossil fuels such as coal, oil, and natural gas, they release Carbon dioxide and other greenhouse gasses into the atmosphere. These gasses create a “blanket.” When solar radiation reaches the earth’s surface, some of it is reflected back into the atmosphere. Some of this solar radiation is then “trapped” by the blanket of greenhouse gasses. Climate change includes all of the impacts created by this trapped solar radiation.

The impacts of climate change can vary widely by location. In the Great Basin region, scientists predict that drought will be one of the most severe impacts of climate change.

Severe drought will have impacts on many aspects of life in the Great Basin. Species will be at risk due to lack of water and decreased primary production by plants. Agriculture will be severely limited. Students who live in the Great Basin will likely already be aware of the concept of water scarcity. While it is important for students to understand the mechanics and impacts of climate change, this lesson does not need to be taught with a feeling of doom. Instead, it’s important to emphasize that humans have the agency to make good environmental choices and to conserve water.

**Lesson 1:**

**Introduction:**

Lead students through this introductory discussion. You can use [this slideshow](https://docs.google.com/presentation/d/1_IrbXm3zvir7GwX_XHPoooqZKQ0qaHO3uFxBJIYCHmw/edit#slide=id.g16bae787fa9_0_8).

1. Ask students if they have heard the word “climate”. Does anyone know the difference between weather and climate?
   1. Explain to students the difference between weather (short term) and climate (long term). One simple way to explain the concept is that weather + weather + weather + … = climate.
   2. Remind students that weather can change by the hour, day, or season. Climate, however, has been very consistent throughout the earth’s history. Now, though, the Earth’s climate is changing.
   3. Tell students that today they’re going to learn about the changes in the earth’s climate and what that means for humans.
2. Show students [this video](https://www.youtube.com/watch?v=QlQ-MEZgRGY) to introduce them to the mechanics of climate change. It’s a bit fast, so students won’t get a perfect grasp from the video, but you will also go over the mechanics again. This is just an introduction.
   1. After you’ve shown students the video, ask them what the video said. What is climate change? How does it work?
   2. Use the powerpoint show to slowly walk students through the climate change again to see how it works. Lean heavily on metaphors to help students understand the concept.
3. Ask students to remember from the video and what they already know - how do humans contribute to climate change?
   1. Create a brainstormed list of ways that humans emit greenhouse gasses.
   2. Then, introduce students to ways that humans can help with climate change. Have students come up with their own answers, pair and share, and then come back to the class.
4. Now, tell students that you are going to be looking at one of the major impacts of climate change in the Great Basin - drought.

**Activity:**

Ask students - do they know what a drought is? Discuss as a class.

1. Explain to students what a drought is. Use [this map](https://www.drought.gov/states/nevada#:~:text=There%20are%20no%20active%20National%20Weather%20Service%20drought%20information%20statements%20for%20Nevada.) to show students the drought conditions that currently exist in Nevada.
2. Use the powerpoint to explain to students the connection between climate change and droughts.
3. Tell students that they are going to conduct a water audit. Walk students through the [worksheet](https://docs.google.com/document/d/19zkh5v329sJ73Qy2XE2L_Nf7KMdpIUNmcopjNovhgxo/edit).
   1. Define the word “audit” simply for students: An audit is when you look at the way something works to see how it can be improved and what is working well. In this case, they will look at how much water their family uses.
   2. Walk students through the directions for the worksheet.
4. Have students complete the data collection portion of the water audit worksheet at home.

**Lesson 2:**

**Introduction:**

Have students bring out their water audit worksheet, which they should have completed at home. Tell them that they are going to work as a class to finish the worksheet.

**Activity:**

Walk students through the multiplication and addition necessary to come to a final water use number on their audit worksheet.

**Conclusion:**

Discuss the following questions as a class:

* 1. Where in your household do you use a lot of water?
  2. How could you reduce that level of water use?
  3. Why is it important to conserve water?

**Standards:**

4.ESS3.1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.