Climate Change Module Adaptation **Prework**

Information:

In order to fully understand the implications of how climate is changing today, it is important to look at historical records to see how climate has changed in the past. Current climate data collection methods, including satellite observations, only cover a very small window of Earth's long history with respect to climate change time scales. Luckily, clues to past climatic conditions, dating hundreds of thousands of years back in time, are recorded in glacial ice all over the world.

To start to think about past climate, you will watch the following videos, as well as open a dataset to look at real ice-core data:

* https://www.youtube.com/watch?v=JS2PhRd\_5NA
* https://www.pbslearningmedia.org/resource/clim10.sci.ess.earthsys.icecores/tropical-ice-cores-measure-climate/#.Xdwvii2ZPzU

Additionally, go to the website below to learn about how isotopes record climate change:

* https://earthobservatory.nasa.gov/features/Paleoclimatology\_OxygenBalance

Questions:

1. What does each layer of ice in an ice core represent?
   1. A different atmospheric gas
   2. A different year of weather and snow
   3. A different glacier
2. Where does ice exist naturally in tropical regions?
   1. Nowhere-ice only exists naturally near the poles
   2. In the ocean as sea ice
   3. High in the mountains
   4. Buried underground
3. Which of the following substances can be found inside ice cores? Choose all that apply
   1. Dust
   2. Gas bubbles
   3. Pollen
   4. Bacteria
4. How old is the ice sheet the National Science Foundation is examining in Antarctica?
5. Which of the following is considered “light” oxygen?
   1. Oxygen 16
   2. Oxygen 17
   3. Oxygen 18
6. How does temperature influence oxygen isotopes in precipitation?
   1. Increase in temperature leads to a decrease in oxygen isotope values
   2. Increase in temperature leads to an increase in oxygen isotope values
   3. Oxygen isotope values are the same at all temperatures
   4. There is not a linear relationship between temperature and oxygen isotopes
7. Which isotope of oxygen is most abundant in the oceans during an ice age?
   1. Oxygen 16
   2. Oxygen 17
   3. Oxygen 18
   4. Both Oxygen 16 and Oxygen 18 are present in equal proportions