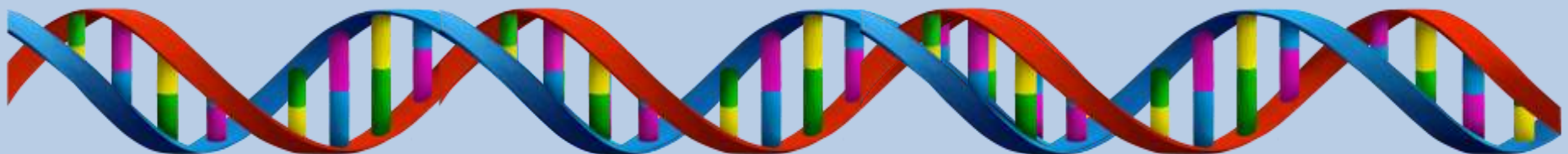


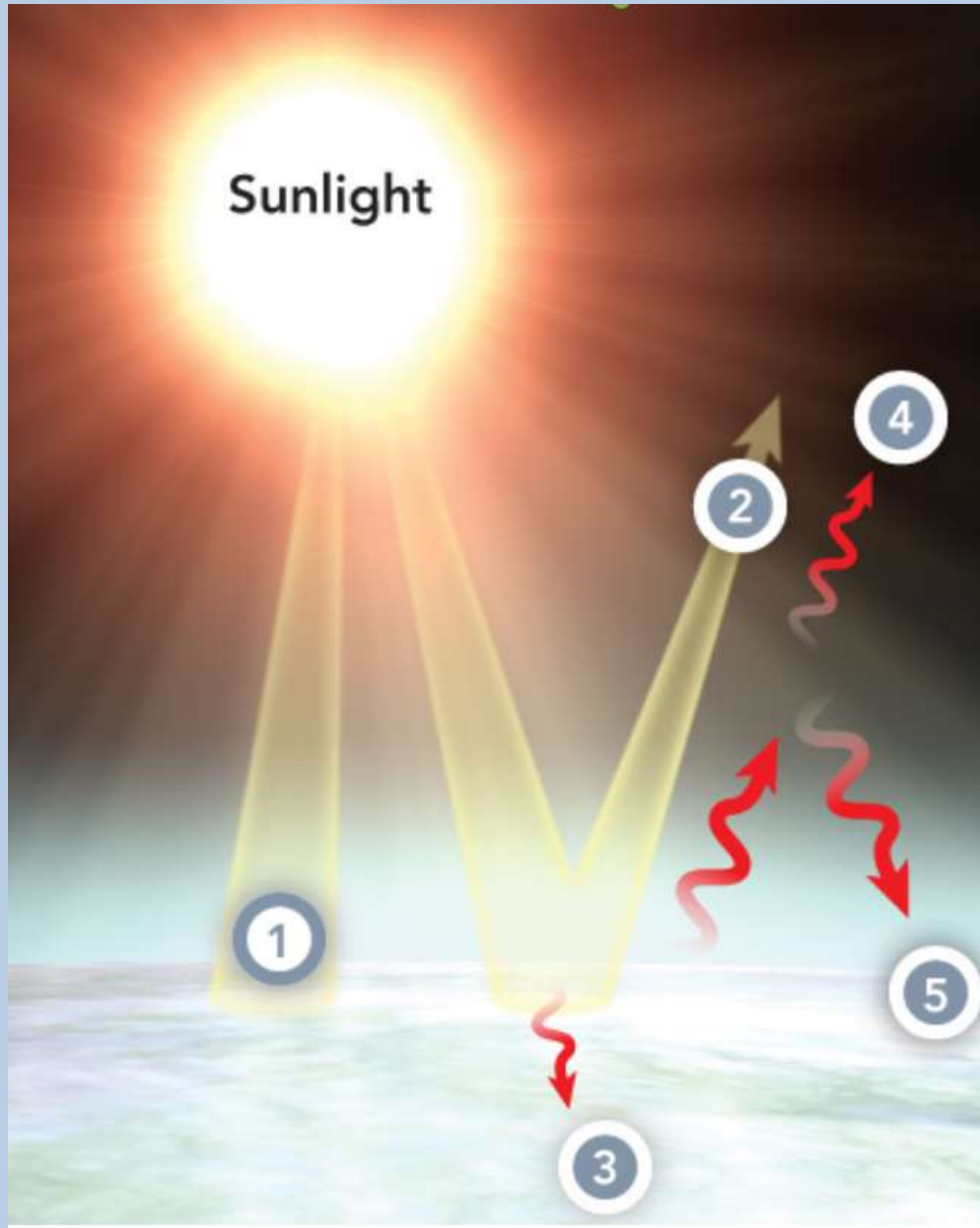
- 1. What is sustainability?**
- 2. Explain the greenhouse effect.**
- 3. How are humans contributing to the greenhouse effect?**
- 4. What human impacts are caused by greenhouse gases?**

(use the human impact table we filled out on Friday)

- 5. Give examples of ecosystem services.**



# Greenhouse Effect



# Ecosystem Services

## Services Provided and Examples

### Purifying water

Wetlands and intact forests along rivers and around reservoirs filter and clean groundwater. Preserving buffer zones that perform these natural processes is significantly cheaper than building water-purification plants.



### Buffering effects of weather

Mangrove forests protect tropical shorelines from erosion by storm waves and runoff. Dune grasses and salt marsh grasses do the same in temperate regions.



### Pollinating

Bees, flies, and butterflies pollinate crop plants, including fruit trees and vegetables. Beetles, bats, and hummingbirds pollinate many other important plants.



### Food production

Highly productive ocean areas provide large fishes, such as tuna, with food and space to thrive. Many wild plants may also produce food for humans.



### Nutrient cycling

Healthy, actively growing forests remove carbon dioxide from the atmosphere. Bacteria and fungi also take up nitrogen and fix it into organic compounds.



### Maintaining soil structure

Detritivores and other soil organisms aerate soil and prevent it from becoming too compacted. Bacteria and fungi in soil as well as leaf litter microbiomes produce humus.



### Regulating pests

Many species of birds and bats eat insects like mosquitoes that can spread disease. These and other predators also eat crop-damaging insects.



# Logistics

- **Unit 3 Assessment**
  - **November 22nd**
  - **So far we have covered objectives 1-11**
  - **By the end of today we have covered everything**

# Climate Change

- **What is climate change? (*What is really changing?*)**

# Climate Change

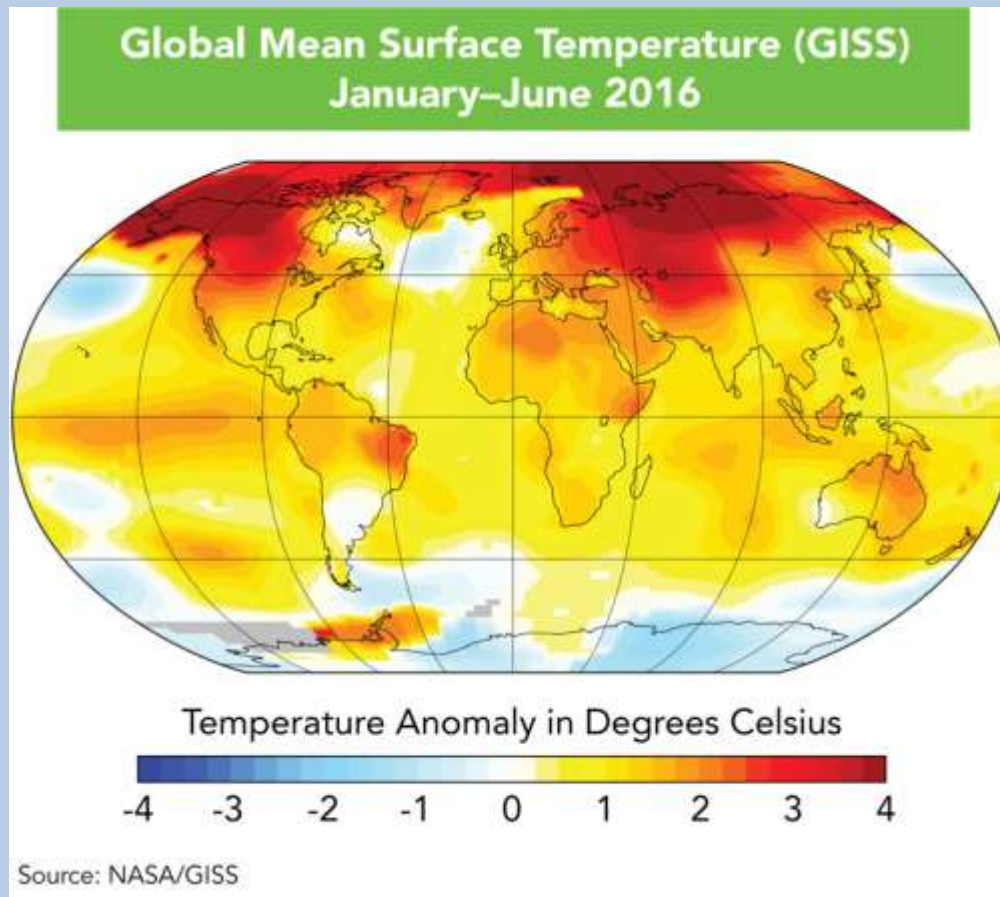
- **What is climate change? (*What is really changing?*)**
  - **Temperature**
  - **Clouds**
  - **Winds**
  - **Precipitation**
  - **The frequency and severity of extreme weather events**

# Climate Change

- **What evidence is there for climate change?**

# Climate Change

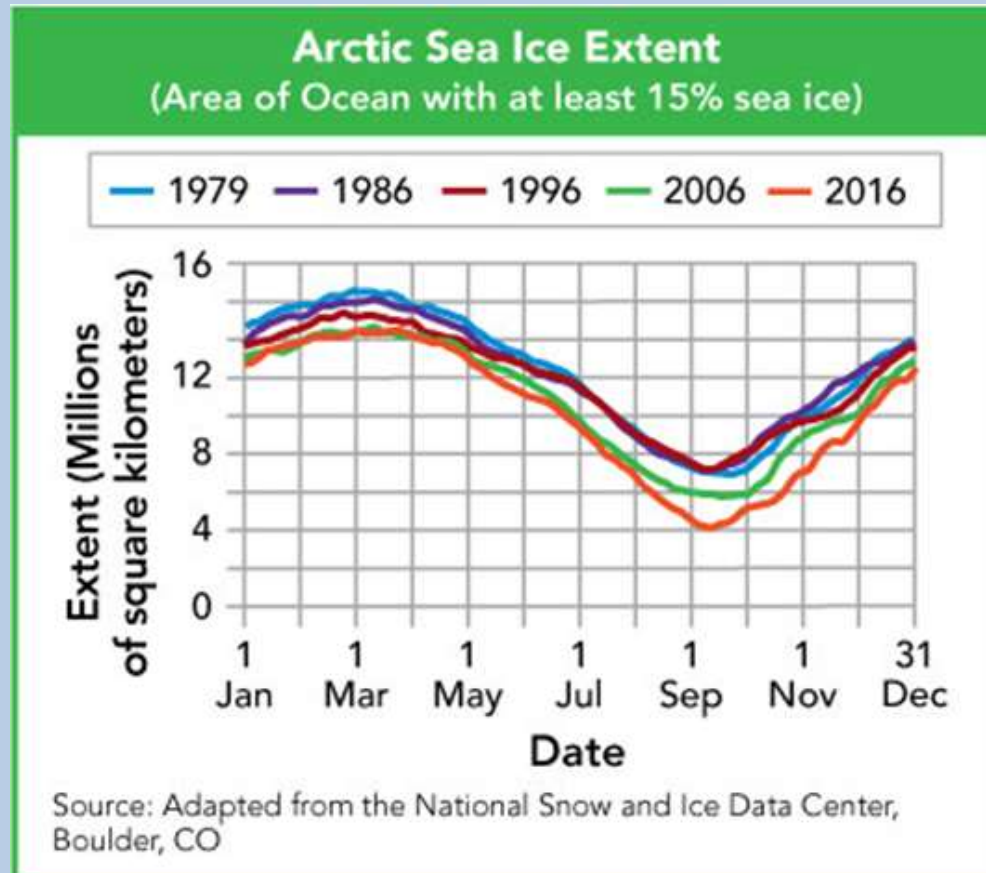
- What evidence is there for climate change?





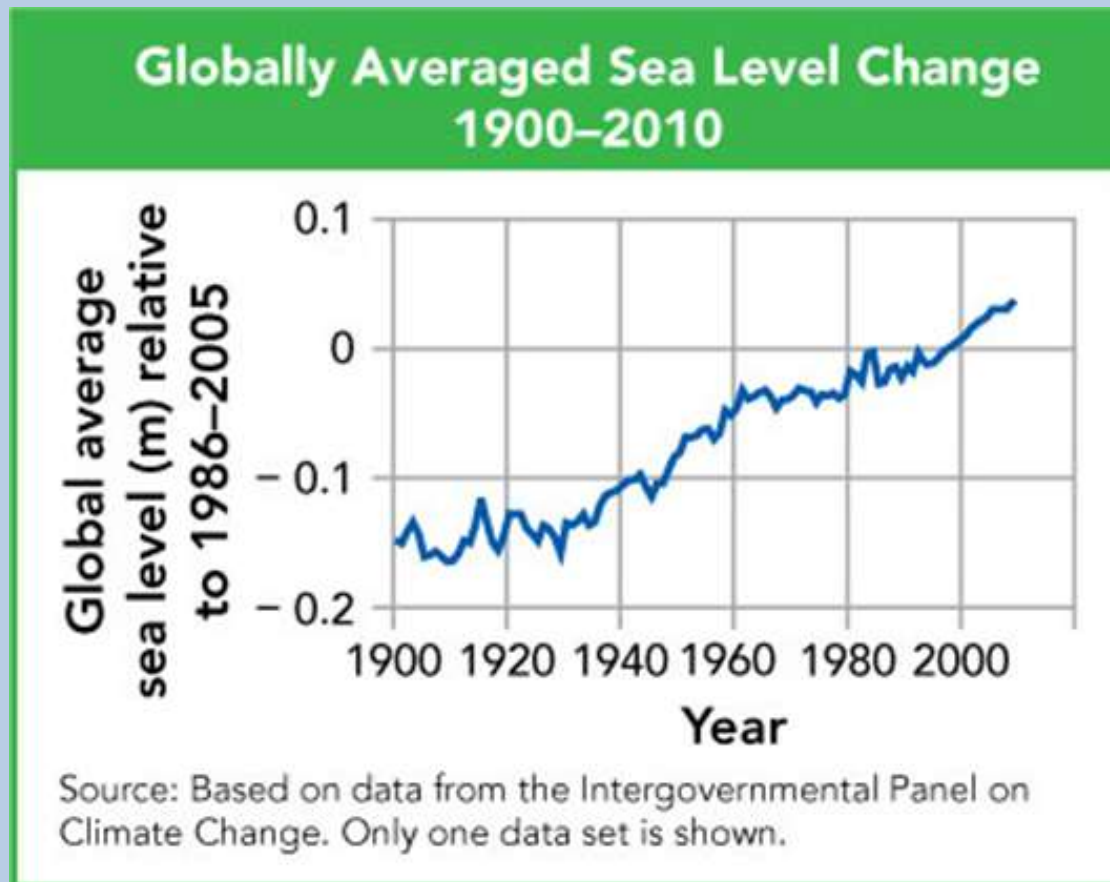
# Climate Change

- What evidence is there for climate change?



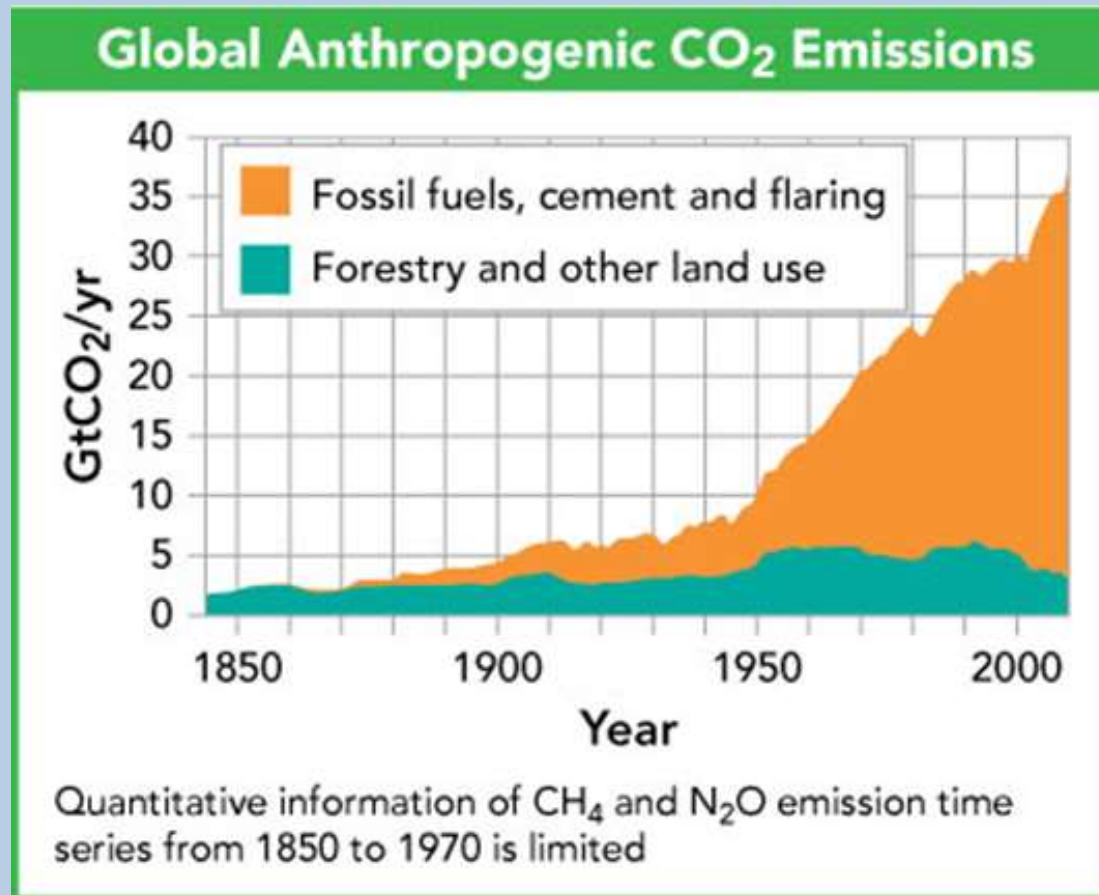
# Climate Change

- What evidence is there for climate change?



# Climate Change

- What evidence is there for climate change?



# Climate Change

- **How does climate change impact humans?**

# Climate Change

- **Humans are impacted by:**
  - **Water availability**
    - Droughts
    - Decreased snow pack
  - **Crop cycles**
    - Negative impact on crop yield
  - **Loss of land**
    - Sea level has increased 4 inches in 55 years

# Climate Change

- **What is the role of science in dealing with climate change?**

# Climate Change

- Science can help by:
  1. Recognizing that there *IS* a problem
  2. Gather data
  3. Use data to change behavior

# **Sustainable Development**

- **What does it mean to be renewable?**



# Sustainable Development

- *Renewable: can be produced or replaced by a HEALTHY ecosystem*

# **Sustainable Development**

- **What does it mean to be sustainable?**

# Sustainable Development

- *Sustainable development: using resources in ways that preserve ecosystem services*
- **MUST BE COST EFFECTIVE AND NON-HARMFUL TO THE NATURAL WORLD**

# Sustainable Development

- In response to climate change data the UN has come up with *Global Goals for Sustainable Development*



# Sustainable Development

- The goals must:
  - *Provide for human needs AND ecosystem services*



# Sustainable Development

- <https://youtu.be/cBxNgE5f7pc>
- <https://youtu.be/RpqVmvMCmp0>

# Sustainable Development

- The Anthropocene is highly unpredictable



# Sustainable Development

- If we wish to maintain Earth then resources must be used sustainably



*"Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders."*



# Sustainable Development

- If we wish to maintain Earth then resources must be used sustainably
  - We must continue to **innovate** and improve new solutions
  - Development practices must be flexible, to make urban areas more **resilient** to environmental change, stresses, and events

# Human Project

- As you work on your project keep in mind that you are studying the *culture, resources, politics, economy, and conflicts* of your country in order to *identify the biggest environmental impact of the country*

# Human Project

- You have two options for your presentation:
  1. Poster
  2. Slideshow
- It is due on JANUARY 17
- You will be presenting in small groups
- Use the rubric

# Human Project

- **Begin the human impact project**
- **YOU SHOULD AT LEAST START RESEARCHING TASK 5 BEFORE LEAVING**

# Human Project

- **Goals for your solution:**
  1. **Realistic**
    - **Explain the logistics of how you will accomplish the solution**
  2. **Takes care of human needs**
  3. **Protects the environment**

# Human Project

- **Pg. 27: Unit 3 Cover Sheet**
- **Pg. 28: 5.3 Simulation**
- **Pg. 29: Demography Notes**
- **Pg. 30: Ecological Footprint**
- **Pg. 31: Human Causes of Global Change**