

## Climate Changes

- Earth is constantly \_\_\_\_\_, including the \_\_\_\_\_.
- There are two causes of climate change:
  - Natural processes include
    - \_\_\_\_\_ eruptions,
    - ocean \_\_\_\_\_,
    - \_\_\_\_\_ activity,
    - Earth \_\_\_\_\_
  - Human impacts include
    - the \_\_\_\_\_
    - \_\_\_\_\_
    - \_\_\_\_\_

### Volcanic eruptions

- Volcanoes -> large amounts of ash and \_\_\_\_\_
- Clouds can block out the sun's \_\_\_\_\_ and cause a \_\_\_\_\_ of Earth (Year With No Summer)
- Climate changes are \_\_\_\_\_.

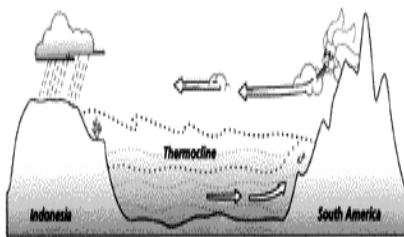


### El Niño

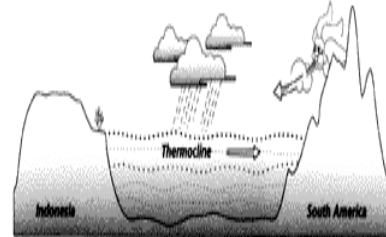
- *El Niño* (*Southern Oscillation*) - unusual \_\_\_\_\_ of the \_\_\_\_\_ Pacific Ocean.
- High- and low-pressure systems \_\_\_\_\_ between the eastern tropical Pacific and the western tropical Pacific.
- Occurs around \_\_\_\_\_ time and is named for the "The Boy" (in reference to "Christ Child").

### Weather Conditions

- Normal weather patterns include strong \_\_\_\_\_ winds and \_\_\_\_\_ along the South America coast.
- During El Niño, weather patterns do not have the strong westerly winds, causing the upwelling to \_\_\_\_\_.



Normal Conditions



El Niño Conditions

### Weather Changes

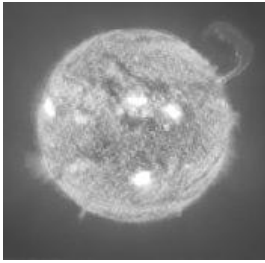
- Indonesia and Australia - normally have large amounts of rain, go into a \_\_\_\_\_ during El Niño.
- North and South Americas - normally dry, have a lot of \_\_\_\_\_ and \_\_\_\_\_.
- El Niño can also cause severe and extreme weather \_\_\_\_\_, such as typhoons and tornadoes in \_\_\_\_\_ locations.
- The Southern states - \_\_\_\_\_ than normal temperatures.
  - The number of hurricanes hitting the Caribbean and North America is \_\_\_\_\_
- The Western states (especially California) - most severe weather impacts, such as \_\_\_\_\_ rains, flooding, and mudslides.
- Alaska, the Northeast, and the Pacific Northwest - \_\_\_\_\_ than normal.

### Weather Changes in the United States

- Western and Southern states - \_\_\_\_\_ normal rainfall. (continue on the next column)

### La Niña

- *La Niña* ("The Girl" - opposite of "The Boy") - \_\_\_\_\_ than normal temperatures in the \_\_\_\_\_ Pacific Ocean.
- In the United States - winters tend to be \_\_\_\_\_, summers tend to be \_\_\_\_\_ than normal

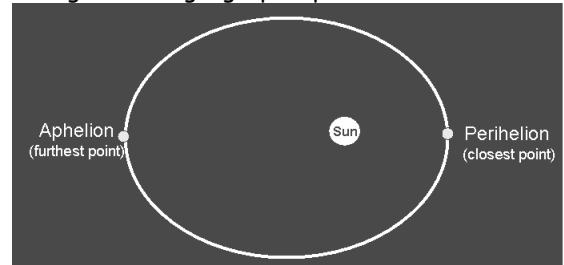


### Solar Activity

- When the sun is most active - contains \_\_\_\_\_ (dark spots) on the sun (more solar radiation)
- Increase in number of sun spots - temperatures in North America and Europe \_\_\_\_\_
- No evidence of \_\_\_\_\_ climate changes

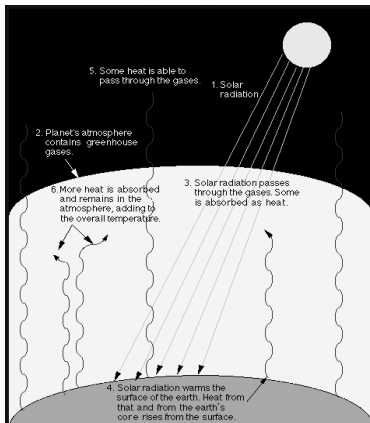
### Earth Motions

- Plate tectonic movement - \_\_\_\_\_ climate changes by changing size, location, and shape of water basins and changes in the geographic position.
- Changes in the \_\_\_\_\_ of Earth's orbit and the \_\_\_\_\_ of Earth on its axis - short-term and long-term changes.
  - \_\_\_\_\_ → push Earth farther from the sun
  - \_\_\_\_\_ → bring Earth closer to the sun
  - The changes in the tilt of Earth's axis - controls the \_\_\_\_\_.



### Greenhouse Effect

- Water vapor and carbon dioxide - major greenhouse gases
- Water vapor and carbon dioxide - trap \_\_\_\_\_ in our atmosphere that would normally be radiated back into space
- Without the greenhouse gases, Earth would be too \_\_\_\_\_ to live on
- Humans impact the greenhouse effect
  - increasing the amount of carbon dioxide which causes temperatures to increase \_\_\_\_\_ the normal amounts



### Global Warming

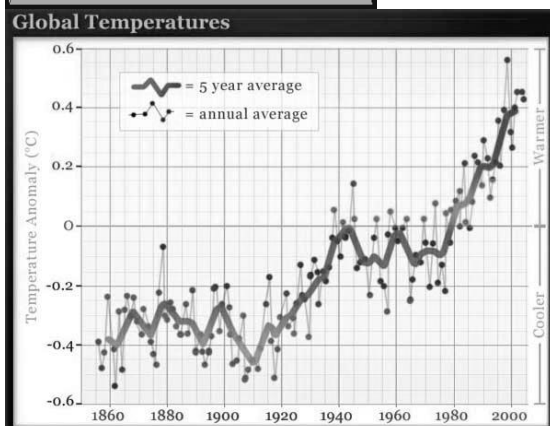
- Global warming - increase in \_\_\_\_\_ temperatures from an increase in carbon dioxide
- Average global temperatures have increased 0.6°C in the \_\_\_\_\_th Century; are expected to increase by 1.4-5.8°C by the year \_\_\_\_\_.
- Will lead to the melting of the \_\_\_\_\_, higher \_\_\_\_\_ water levels, increased \_\_\_\_\_ rates.

- These events lead to lower \_\_\_\_\_ → even higher temperatures

Increases in number and intensity of \_\_\_\_\_, more intense \_\_\_\_\_ waves and \_\_\_\_\_, and many more

### Assignment

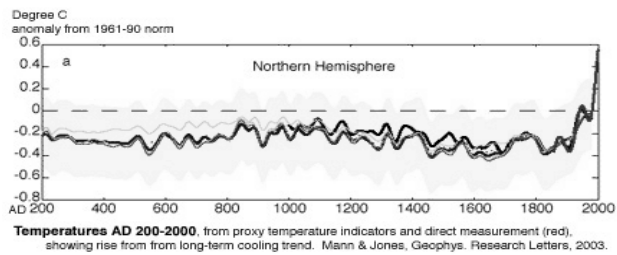
- Investigating Weather Maps
- Answer the following questions



### Earth's Temperatures

- Temperatures in the Northern Hemisphere from 200 A.D. - 2000 A.D.
- At the start of the \_\_\_\_\_ -

temperatures began to rise and have continued



1. What is climate?
2. What was the "Year With No Summer?"
3. What is upwelling?
4. Where does El Niño occur?
5. What are sunspots?
6. How do plate tectonics affect the climate?
7. What causes Earth's weather seasons?
8. What years are included in the 20<sup>th</sup> Century?
9. What is albedo?
10. When did global warming begin?
11. Have temperature increases stopped?