Develop and use a model to

1. Climate and Latitude: A GLOBE Data Exploration (MS-ESS2-5, MS-ESS2-6, MS-ESS3-5)
2. Modeling the Reason for Seasonal Change (MS-ESS2-6)
3. How do Seasonal Temperature Patterns Vary Among Different Regions of the World? (MS-ESS2-6)
4. What are Some Factors That Affect Seasonal Patterns? (MS-ESS2-5, MS-ESS2-6)
5. GC1: Your Regional to Global Connection - (MS-ESS2-5, MS-ESS2-6)
6. Learning to Use Visualizations (All)
7. Draw Your Own Visualization (All)

Guiding Question(s):

1. How can satellite data combined with ground truth observations be used to identify trends and patterns associated with interactions that occur between the atmosphere and other Earth systems?
2. How are regional climates determined by patterns of atmospheric and oceanic circulation? What causes these patterns to occur?
3. Based on evidence that has been collected what factors are associated with the rise in global temperatures over the past century? Which of these factors can be attributed to human impacts? To natural hazards?

### GLOBE Learning Activities:

- Climate and Latitude: A GLOBE Data Exploration (MS-ESS2-5, MS-ESS2-6, MS-ESS3-5)
- Modeling the Reason for Seasonal Change (MS-ESS2-6)
- How do Seasonal Temperature Patterns Vary Among Different Regions of the World? (MS-ESS2-6)
- What are Some Factors That Affect Seasonal Patterns? (MS-ESS2-5, MS-ESS2-6)
- GC1: Your Regional to Global Connection - (MS-ESS2-5, MS-ESS2-6)
- Learning to Use Visualizations (All)
- Draw Your Own Visualization (All)

### Atmosphere Protocols:

- Air Temperature
- Clouds
- Surface Temperature
- Precipitation

### Data Investigation Sheets:

- Atmosphere Investigation Integrated T-Day
- Atmosphere Investigation Clouds T-Day
- Atmosphere Investigation Surface Temperature

### Extension Learning Activities/Resources:

- NASA Climate Change Educational Modules
- NASA Earth Observatory World Maps
- NASA Wavelength 6-8 List of Learning Resources
- MY NASA DATA-GLOBE Digital Earth System Poster

### NASA Resources:

- NASA Data Live Access Server Data Visualization Tool: Earth System Data Explorer
- My NASA Data Variables to Explore:
  - Air Temperature: Monthly Near-Surface Air Temperature (SSTCP)
  - Clouds: Monthly Cloud Cover (CERES TERRA)
  - Surface Temperature: Monthly Surface Skin Temperature (CERES)
  - Precipitation: Monthly Precipitation (GPCP)

### MY NASA DATA Lessons/Activities:

- Comparing Temperature and Solar Radiation for Common Latitudes
- Season Science: Building Claims from Evidence (MS-ESS2-6)
- Using Vegetation and Precipitation to Study Climate Zones (MS-ESS2-5, MS-ESS3-5)
- How Does the Earth’s Energy Budget Relate to Polar Ice? (MS-ESS3-5)