

Atmosphere Virtual Lab

Reference Website: http://www.glencoe.com/sites/common_assets/science/virtual_labs/ES14/ES14.html

Problem: How does temperature of the atmosphere differ at various altitudes?

Objectives:

- Describe the structure of Earth's atmosphere
- Investigate temperature, density and pressure changes in the layers of Earth's atmosphere
- Identify the meteorological and astronomical phenomena (special events) that occur in layers of Earth's atmosphere

Background: The Sun is the source of most of the energy on Earth. Before it reaches Earth's surface, energy from the Sun must pass through the atmosphere. Because some layers contain gases that easily absorb the Sun's energy while others do not, the various layers have different temperatures.

Hypothesis:

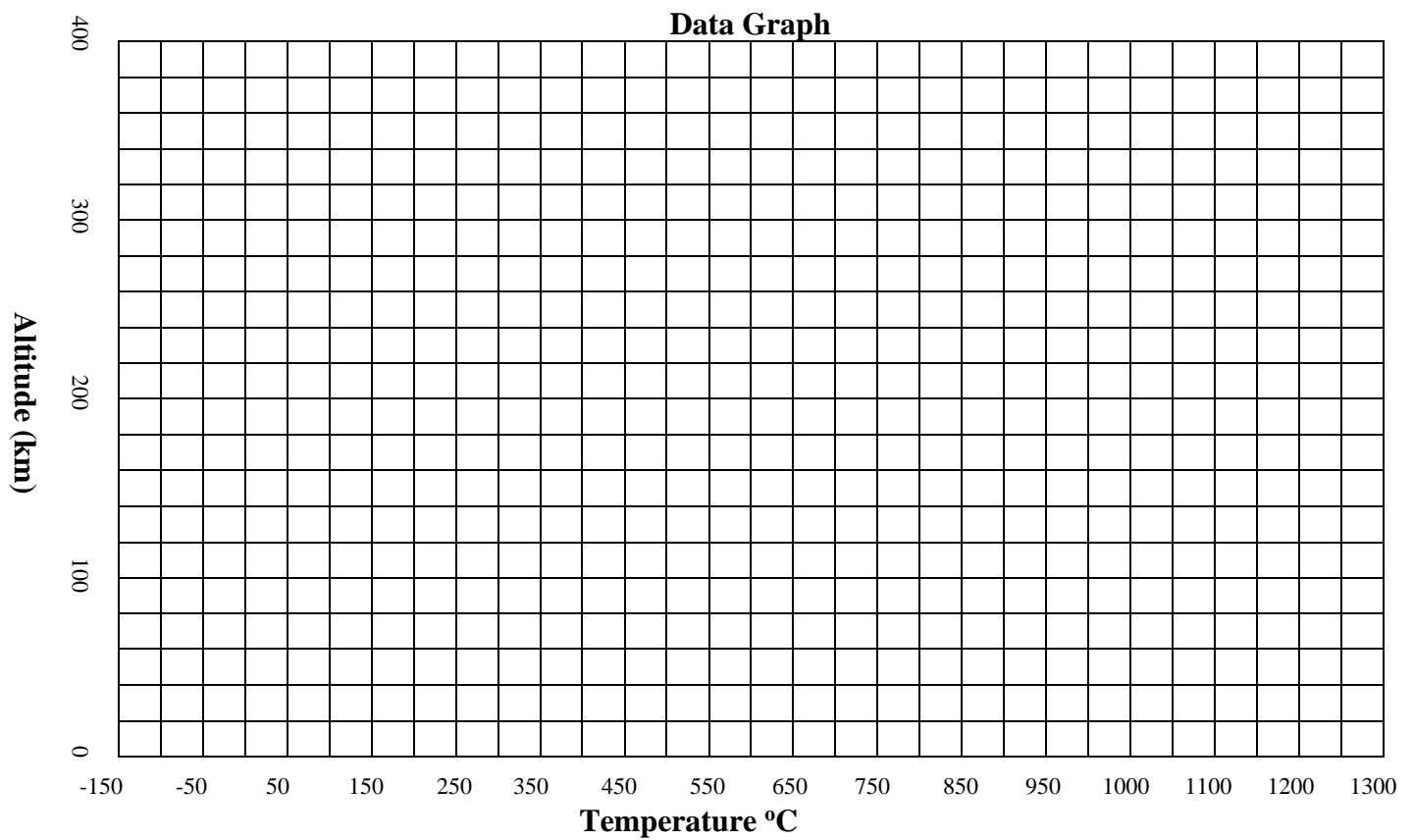
Materials: Atmosphere virtual lab and graph paper

Procedure:

1. Select an altitude for which to collect data.
2. Launch the weather balloon/rocket to collect data.
3. Record the density, pressure and temperature data for each altitude.
4. The "Show Phenomenon" button becomes highlighted when an astronomical or meteorological phenomenon (special event) is present; record in data table.
5. Create a line graph of the temperature vs altitude data collected. Make sure to label the axes and include a title.

Data Table:

Altitude (km)	Density (% of Sea Level Density)	Pressure (Pa)	Pressure (lb/in ²) Pa x 0.000145038	Temperature (°C)	Special Event (if present)
0					
5					
10					
25					
50					
60					
75					
100					
150					
200					
400					



Conclusion

1. Which layer of the atmosphere do you live in?
2. What kinds of meteorological phenomena can be found in the layer identified in the previous question?
3. A rocket was launched to an altitude of 210 km; identify the layer the rocket reached.
4. What kinds of phenomena might the rocket encounter at the altitude of 210 km?
5. What is the ozone layer?
6. The ozone is found in what layer?
7. What is the importance of the ozone layer?
8. What happens to air density as you go up in the layers of the atmosphere?
9. What happens to air pressure as you go up in the layers of the atmosphere?
10. Why do the temperature changes follow this unique pattern?