

Layers of the Atmosphere Digital Resource Teacher Support

This digital resource is found on the digital course.

Purpose Students will use this digital resource to investigate the properties and functions of the layers of the atmosphere. The properties students will investigate include the relative positions and thicknesses of the layers, as well as how air density, temperature, and pressure compare among the layers.

Class Time 30 minutes

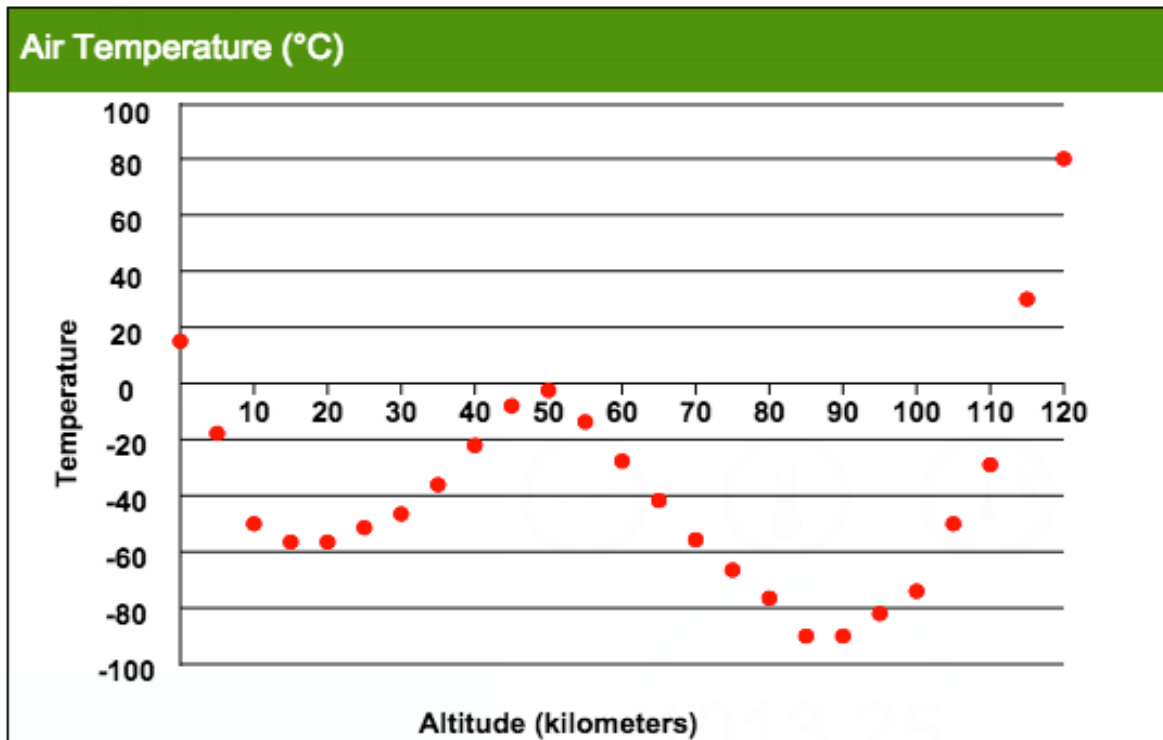
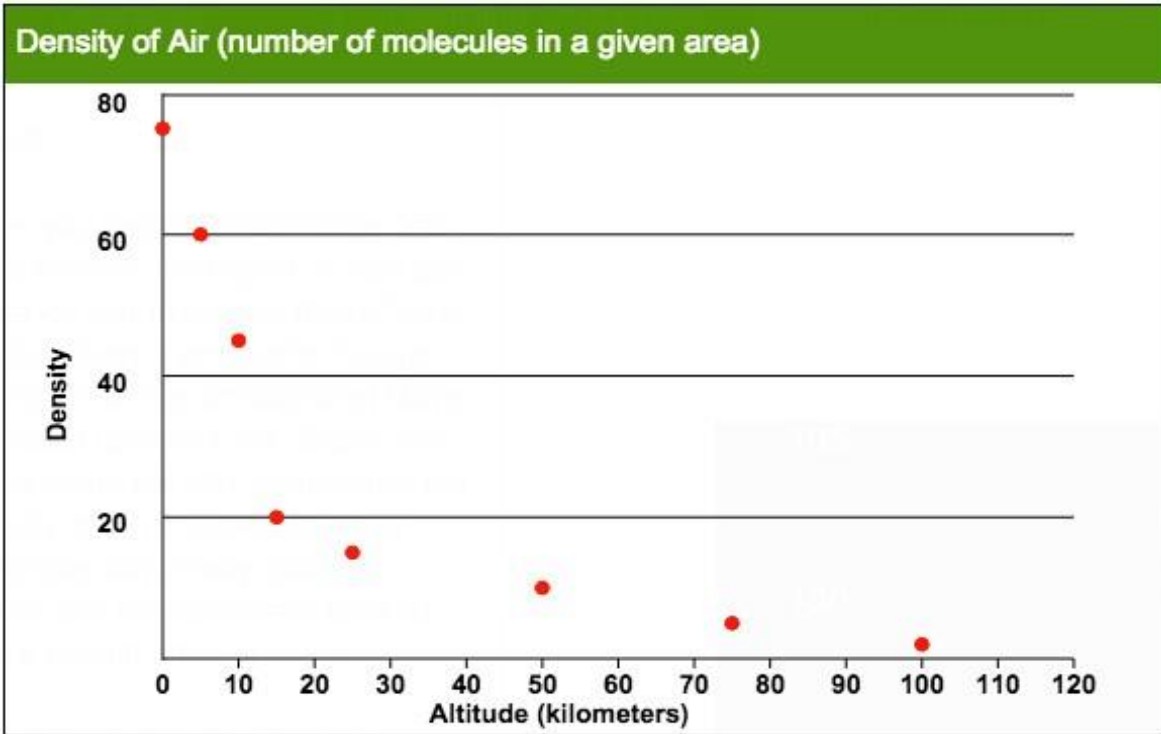
Sample Answers

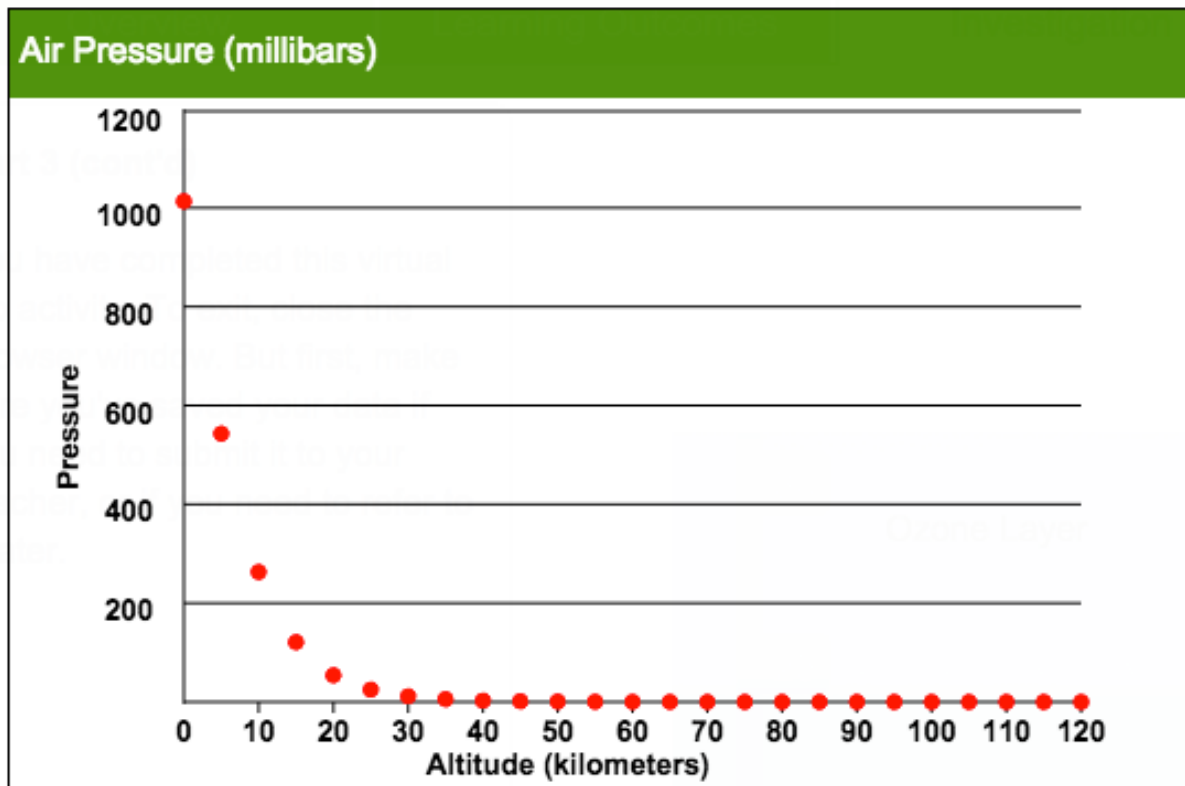
Record Data and Observations

1. *Sample table:*

Atmospheric Layer	Relative Location	Relative Thickness	Objects That Can Be Seen in Layer
Thermosphere	top layer; furthest from Earth's surface	thickest layer (no definite limit)	aurora, space shuttle, satellites, International Space Station
Mesosphere	between the thermosphere and stratosphere	2nd thinnest (about 30 km across)	meteor (shooting star)
Stratosphere	between the mesosphere and troposphere	2nd thickest (about 40 km across)	weather balloon at its highest, fighter jet
Troposphere	bottom layer; closest to Earth's surface	thinnest layer (about 12 km across)	airplane, clouds

2. Students' graphs should look similar to the following examples:





- Sample response:* The data I collected for air pressure agreed with my prediction. I predicted the air pressure would gradually decrease as altitude increased. The data I collected for air temperature did not agree with my prediction. I predicted the temperature would gradually decrease as altitude increased. Instead the temperature went up and down as altitude increased.

Analyze and Interpret Data

- They both gradually decrease as altitude increases.
- Sample response:* Yes, it makes sense that as the number of gas particles decreases, so does the air pressure. Air pressure is a measurement of the weight of a column of air pushing on an area. Air is made up of gas particles, and the pushing force air exerts on an object is caused by some of those gas particles simultaneously colliding with that object.

Conclude

- Sample response:* He would need equipment and/or special clothing that allowed him to survive and remain comfortable and thinking clearly at low temperatures (as low as -60°C). He would also need equipment that allowed him to breathe normally at pressures that are significantly lower than when he's at ground level. This breathing equipment would need to maintain proper function for the entire length of the fall, regardless of the temperature changes that are occurring. I assume the equipment was tested and improved many times before the actual fall took place.