# Activity 3

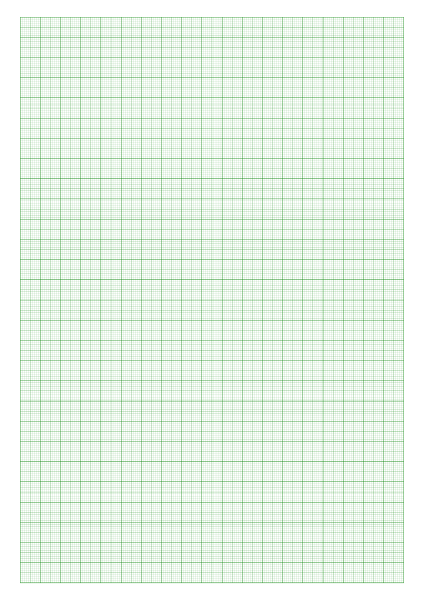
Structure of the Atmosphere

# Level 2

<http://www.uni.edu/storm/activities/level2/index.shtml>

**National Science Education Standards**: As a result of activities in grades 5-8, all students should develop an understanding of: abilities necessary to do scientific inquiry, properties and changes of properties in matter, understandings about science and technology, and structure of the earth system.

**Materials**: construction paper, metric ruler, scissors, glue, graph (coordinate) paper, STORM website [http://www.uni.edu/storm/activities/level2/act3.shtml.](http://www.uni.edu/storm/activities/level2/act3.shtml)



Structure of the Atmosphere Student Sheet

# Engage:

Look at a picture of Mt. Everest. As you look at the picture reflect on the following questions.

1. Why is there always snow on the top of very high mountains like Mt. Everest?
2. What are some factors that prevent the average person from climbing to the top of Mt. Everest?
3. Why do your ears pop when you change elevation, such as when traveling in hilly terrain or riding an elevator in a tall building?

# Explore:

At the activity website, <http://www.uni.edu/storm/activities/level2/>,obtain weather balloon (radiosonde) data for a location near you. Create a graph showing temperature vs. altitude. If you are plotting by hand use every 5th value then connect all the data points. Using your graph, answer the following questions.

1. Describe the general trend of the plotted points (is there a change in slope anywhere?).
2. How do the temperature changes at the bottom of you plot compare to the temperature changes at the top of your plot?

# Explain:

Complete the following atmospheric model on a blank sheet of paper during your discussion as directed by your teacher.

Model Procedure:

Use different colors of construction paper to denote each layer of the atmosphere. Glue the strips together as you discuss each layer. Measure the thickness of the strips so that they will reflect actual measurements.

* 1. Troposphere – 15 mm
  2. Stratosphere – 45 mm
  3. Mesosphere – 35 mm
  4. Thermosphere – 89.5 mm

# Extend:

At the activity website, [http://www.uni.edu/storm/activities/level2/,](http://www.uni.edu/storm/activities/level2/) access the current radiosonde data again. Find the altitude of the tropopause for the following cities.

CITY ALTITUDE

1. Miami, FL m
2. Minneapolis, MN m
3. Anchorage, AK m

Compare the altitudes of the tropopause for each of the cities and answer the following questions.

1. Make an analysis of the data for your geographic area compared to the cities above.
2. What pattern do you observe occurring in the tropopause altitudes?
3. What atmospheric factors could create these patterns?
4. What effect would a change in the season have on these patterns?
5. What effect would the time of day have on the altitude of the tropopause?
6. Hypothesize if the same reading would result if they were taken at corresponding latitudes in the southern hemisphere. Explain your results.