Atmosphere & Weather   Name_____

Graphing the Atmosphere

Purpose: To visualize how the atmosphere can be divided into layers based on temperature changes at different heights by making a graph.

Background Information: The atmosphere can be divided into four layers based on temperature differences. The layer closest to the Earth is called the **troposphere**. Above this layer is the **stratosphere**, followed by the **mesosphere**, then the **thermosphere**. The upper boundaries between these layers are known as the **tropopause**, the **stratopause**, and the **menopause**, in that order. The final layer is called the **exosphere**.

Temperature differences in the four layers are caused by the way solar energy (energy from the Sun) is absorbed as it moves downward through the atmosphere. The Earth's surface absorbs most of the Sun's energy. Some of this energy is bounced back out by the Earth as heat, which warms the troposphere.
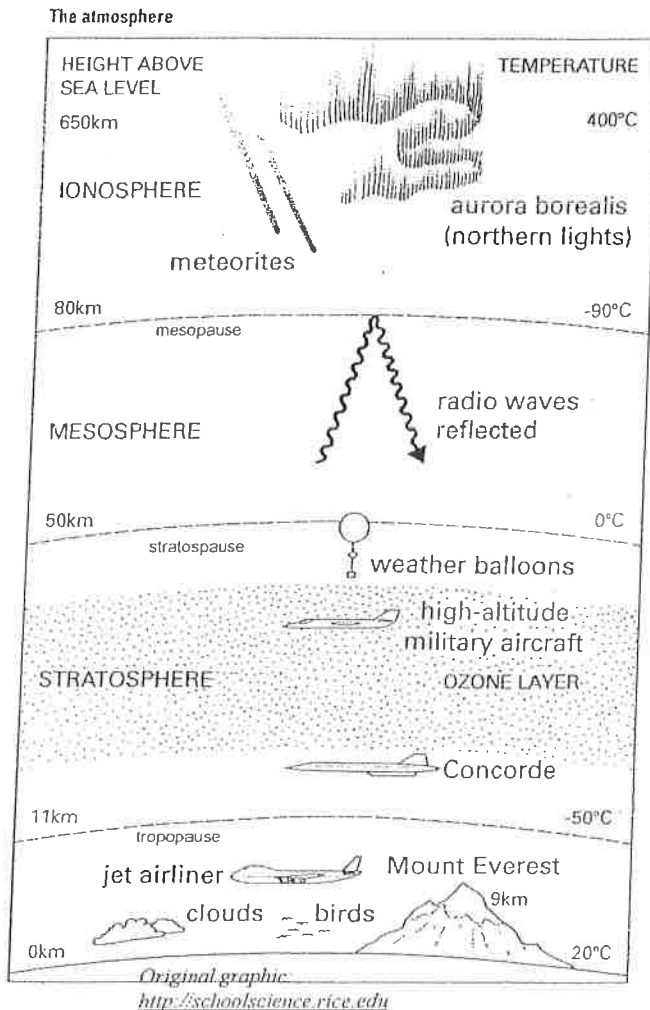
The atmosphere

At the mesopause, the temperature begins to *increase with altitude*, and this trend continues in the thermosphere. Solar energy hits the Earth's atmosphere and heats it.

The mesosphere does not absorb solar heat, so the *temperature decreases with altitude*.

The temperature begins to *increase with altitude* in the stratosphere. This warming is caused by a form of oxygen called ozone (O_3) absorbing ultraviolet radiation from the sun.

The average temperature in the troposphere rapidly *decreases with altitude* – it colder the higher you go.

Adapted from http://www.geosociety.org/educate/LessonPlans/Layers_of_Atmosphere.pdf
M. Poarch – 2006
science-class.net

Graphing the Atmosphere

Average Temperature Readings at Various Altitudes

Y   X

Altitude (km)	Temperature (C°)
0	15
5	-18
10	-49
12	-56
20	-56
25	-51
30	-46
35	-37
40	-22
45	-8
48	-2
52	-2
55	-7
60	-17
65	-33
70	-54
75	-65
80	-79
84	-86
92	-86
95	-81
100	-72

1. Graph this data using a **LINE GRAPH**.

2. Temperature → **x-axis**
   Altitude → **y-axis**

3. Plot the given points on the graph paper

4. Connect the dots to form one line

3. Label the different layers **INCLUDING THE PAUSES**
   (troposphere, tropopause, stratosphere, stratopause, etc)

4. Label where the **OZONE LAYER** would be