**High School Division**

**Environmental Systems and Societies**

**Part 1: Layers of the Atmosphere**

Materials:

White paper

Pencil

Colored pencils, crayons

Circle patterns

Procedure:

1. Obtain a piece of white paper.

2. Draw the Earth (smallest circle=radius 2 cm)

a. Use a pencil to trace the smallest circle in the middle of the paper.

b. Color Earth blue and green to represent oceans and continents.

3. Draw the troposphere.

The first layer of Earth's atmosphere, the troposphere, extends 16 km above Earth.

a. Trace the next larger circle with a radius of 3.6 cm.

b. Label the inside of this circle 'troposphere.'

c. Color this area orange.

d. Draw pictures to indicate that this is the area in which airplanes fly and weather happens.

4. Draw the stratosphere.

The second atmospheric layer, the stratosphere, extends 48 km above Earth's surface.

a. Trace the next largest circle with a radius of 6.8 cm.

b. Label this layer 'stratosphere.'

c. Color this area yellow.

d. The jet stream occurs between the troposphere and the stratosphere, so draw arrows to represent this fast moving current of air on the borderline between the two layers.

5. Draw the mesosphere.

The third layer of the atmosphere, the mesosphere, extends 80 km from Earth's surface.

a. Trace the last circle with a radius of 10 cm.

b. Label this layer ‘mesosphere’.

c. Color this area blue.

d. This is the coldest layer, so draw a thermometer to represent the very cold weather.

6. Label the ozone. The ozone is not a main layer of Earth’s atmosphere, but it plays a very important role in the atmosphere.

a. The ozone is between the stratosphere and mesosphere.

b. Ozone is made of three atoms of oxygen.

c. Along the border of the stratosphere and mesosphere, draw molecules of ozone in red - 3 connected dots - leaving a tiny area empty to represent the 'hole' in the ozone layer.

7. Draw the thermosphere.

The fourth layer of atmosphere, the thermosphere, extends 480 km above Earth's surface.

a. Label this next layer ‘thermosphere’.

b. Color the remaining part of your paper green.

8. Label the ionosphere.

a. A thin region in the thermosphere, called the ionosphere, contains charged atoms.

b. Label the ionosphere and draw + and - signs to represent those atoms. (Remember, this is not a layer, just a region in the thermosphere.)

When meteoroids enter Earth's atmosphere, they enter the thermosphere, which is extremely hot. Because of the heat and friction with molecules in the atmosphere, most meteoroids burn up. A meteoroid falling through Earth's atmosphere is called a meteor.

9. Draw and label a meteor entering Earth’s atmosphere.

10. Add a scale to the lower right corner 1 mm= 1 km.

Extracted from: <http://www.wpunj.edu/dotAsset/165232.pdf>