

Name: _____ Science: _____ Date: _____

Modeling Earth's Atmospheric Layers

1. Start with a white piece of paper
2. Draw the earth in the left lower corner of your paper (use a protractor or a round item to make a circle). Color the Earth blue and green to represent the continents and oceans.
3. Draw the **troposphere**, which is the first layer of the atmosphere. The troposphere extends 16 km above Earth.
 - a. Use the following scale – 1 mm = 1 km. Place a series of dots around Earth, 16 mm from the Earth's surface.
 - b. Connect the dots and label it the troposphere. Color it yellow. Draw pictures to help indicate what happens in this layer. You can add airplanes, people, weather occurrences, ozone O₃ (this ozone is dangerous for us, it can damage our lungs. It develops on hot summer days because of air pollution.)
4. Draw the **stratosphere**, which is the second layer of the atmosphere. It extends 16 km – 50 km above the Earth's surface.
 - a. Measure and draw a circle 50 mm from Earth's surface. Be careful- do not draw it starting from the troposphere, remember to start measuring from Earth's surface.
 - b. Connect the dots and label it stratosphere. Color it orange.
 - c. Draw pictures to help indicate what happens here. Jet streams occur here, which are fast moving currents of air between the 2 layers. This is also where the **ozone layer** is found, which absorbs ultraviolet radiation and protects us from the sun's rays.
5. Draw the **mesosphere**, which extends 50 km – 90 km from the Earth's surface.
 - a. Measure and draw a circle 90 mm from the Earth's surface.
 - b. Label this layer mesosphere. Color it red.
 - c. Draw pictures to help show characteristics. It is the coldest layer of the atmosphere. Radio waves are reflected to Earth and meteors burn up in this layer.
6. Label the **ozone layer**. The ozone layer plays an important role in how it works.
 - a. The ozone layer is between the stratosphere and the mesosphere. Its symbol is O₃ because it is made of three oxygen atoms.
 - b. Color a thin, blue line to represent the ozone layer. Make a small section of the line dotted (-----) to represent the "hole" in the ozone layer.
7. Draw the **thermosphere**. This is the fourth layer of the atmosphere. It extends 90 km – 300 km from the Earth's surface. This layer is too thick to fit on the paper. Make a zigzag-line, to represent that this layer is thicker than your diagram and just draw a zigzag line at 200 mm.
 - a. Label it the thermosphere and color it green.
 - b. Draw pictures to help show characteristics. The thermosphere is very hot and contains light "shows" called auroras.
8. Beyond the thermosphere is the **exosphere**. It extends 300 km – 600 km.
 - a. Color this gray and label it exosphere.
 - b. When meteoroids enter Earth's atmosphere, they enter through the thermosphere, which is extremely hot. Because of the heat, most meteoroids burn up. Draw and label a meteor entering Earth's atmosphere.