**Modeling Earth’s Atmospheric Layers**

**Objective:** Students will be able to describe the layers of Earth’s atmosphere and the characteristics of each.

**Materials:**

* 1m narrow white paper
* Metric ruler
* Pencil
* Colored pencils
* A round object such as a jar lid or compass

**Procedure:**

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| **Check task** **as completed Task** |
|  | 1. Draw the Earth. * Create an Earth by drawing a half circle at the bottom of the paper.
* Color the Earth blue and green to represent the continents and oceans.
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|  | 2. Draw and label the Troposphere, which is the first layer of the atmosphere. The troposphere extends up to 20 km above Earth.* Use the following scale – 1cm=10km. Measure and draw a curved line 2.0 cm **from the Earth’s surface**. (Remember the Earth is round so you will need to make sure all of your lines are measured equally from the Earth.)
* Label this layer the troposphere. Color it yellow.
* In this layer write “Weather Zone” since weather happens in this location.
* Draw pictures to help indicate that this is the area in which weather happens.
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|  | 3. Draw and label the Stratosphere, which is the second layer of the atmosphere. It extends from the Troposphere to 50km above the Earth’s surface.* Measure and draw a circle 5.0 cm **from the Earth’s surface**.
* Label this layer stratosphere and color it orange.
* This layer is relatively stable and many jet planes fly there. Draw an airplane.
* The jet stream occurs between the troposphere and the stratosphere, draw arrows pointing to the right to represent this fast moving current of air along the border between the two layers.
* 99% of the molecules in the atmosphere are found below 32km. Draw a bold blue line at approximately 32km to represent this change in density.
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|  | 4. The ozone layer. The ozone is not a main layer of the atmosphere, but plays an important role in absorbing harmful radiation from the sun.* The ozone layer is about two-thirds of the way up in the Stratosphere. Write Ozone Layer 40 km (4.0cm) **from the Earth’s surface** in red.
* Ozone is made of three atoms of oxygen. Draw molecules of ozone in red. (3 connected dots).
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|  | 5. Draw the Mesosphere, which extends from the Stratosphere up to 85 km from the Earth’s surface.* Measure and draw a semi-circle 8.5 cm **from the Earth’s surface**.
* Label this layer Mesosphere. Color it blue.
* Meteors and rock fragments burn up here. Draw a picture to indicate that.
* This is the coldest layer so draw a frozen thermometer to represent the extreme cold.
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|  | 6. Draw the Thermosphere. It extends from the Mesosphere out to approximately 600 km (60.0cm) **from the Earth’s surface.*** Label it the Thermosphere.
* Short wave radio waves are reflected back to Earth in this layer. Draw radio waves in this region.
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|  | 7. The Ionosphere is not a main layer of the atmosphere. It is important because it is made of electrically charged gas particles (ionized particles). * Draw a dashed line at 300 km (30.0 cm) and label this region Ionosphere.
* Draw pictures to show the light “shows” called auroras. These should be colorful.
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|  | 8. The outer layer of the atmosphere is the Exosphere and extends from 600km until it merges with space at well over 1000 km, even as much as 10,000km.* Label this layer the Exosphere and color this layer light gray.
* Satellites and spacecraft orbit in this layer. Draw at least one of each.
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