

A Model of Earth's Atmosphere

Purpose:

The purpose of this activity is to draw a model of the four layers of Earth's Atmosphere.

Objectives:

Students will be able to describe the four layers of Earth's atmosphere and the characteristics of each.

Materials:

- white paper
- metric ruler
- pencil
- colored pencils
- a round object such as a jar lid or compass

Procedure:

Check off each task as you do it.

1. Obtain a piece of white paper.

2. Draw the Earth

- Use a pencil to trace a round object in the middle of the paper.
- 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.

- Using a scale of 1mm for 1 km, place a series of dots around Earth, 16 mm from the planet's surface.
- Connect the dots to form a circle around Earth.
- Label the inside of this circle 'troposphere.'
- Color this area orange.
- 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.

- Measure and draw a circle 48 mm **from Earth's surface**.
- Label this layer 'stratosphere.'
- Color this area yellow.
- 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.

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5. Draw the **mesosphere**.

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

- a. Measure and draw a circle 80 mm from the Earth's surface.
- 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.

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Evaluation:

Category	Strong (5 points)	Meets Expectations (3 points)	Needs Strengthening (1 points)	Area of Concern (0 points)
Measurements	All of the layers have accurate measurements	Three of the layers have accurate measurements	Two of the layers have accurate measurements	One or less of the layers have accurate measurements
Color Coding	All of the layers are colored coded correctly.	Three of the layers are colored coded correctly.	Two of the layers are colored coded correctly.	One or less of the layers are colored coded correctly.
Labels	All of the layers and areas of the layers are correctly labeled.	Five the layers and areas of the layers are correctly labeled.	Three of the layers and areas of the layers are correctly labeled.	Two or less of the layers and areas of the layers are correctly labeled.
Symbols	All of the symbols/ drawings are accurate and are in the correct place.	Five of the symbols/ drawings are accurate and are in the correct place	Three of the symbols/ drawings are accurate and are in the correct place	Two or less of the symbols/ drawings are accurate and are in the correct place
Neatness	The drawing is neat; there are no eraser marks or draw overs. Student's name is on the back.	The drawing is neat. There are a few eraser marks or draw overs. Student's name is on the back.	There is visible evidence of many mistakes. The paper is crumpled and/or ripped. Student's name is not on the back or is missing.	The drawing looks like you have had it in your backpack for a month. There is visible evidence of many mistakes. Student's name is missing or is not on the back.