

Teacher Sheet 1

CRITICAL THINKING ACTIVITY: MODELING EARTH'S ATMOSPHERIC LAYERS



OBJECTIVE: Students will:

- make a model of Earth's atmospheric layers;
- graph where aircraft, satellites, and spacecraft operate;
- interpret which objects operate in which layers of the atmosphere
- infer conclusions about why the objects operate where they do in the atmospheric layers.

MATERIALS:

- 3 square foot pieces of butcher/chart paper
- Sheets of graphics for atmospheric layers
- Colored pencils or markers
- Metric ruler
- Glue

PROCEDURE:

1. Divide class into groups of 2-3 students.
 2. Post the instructions below on the board or chart paper for students to refer to or hand out copies.
- ✓ Start with a large piece of paper. You can use legal paper or 3 sq. ft of butcher/chart paper.
 - ✓ Draw the **Earth**.
 - Use coloring utensils to draw an Earth at the bottom of the paper. Be sure to leave space to draw above it.
 - Color the Earth blue and green to represent the continents and oceans.
 - ✓ Draw the **troposphere**, which is the first layer of the atmosphere. The troposphere extends 12 km above Earth.
 - Use the following scale -1 mm = 1 km. Draw a line 12 mm from the Earth's surface.
 - Label it the troposphere.
 - Color it yellow.
 - Draw pictures to help indicate what happens in this layer. You can add airplanes, people, weather occurrences, bad ozone.

Teacher Sheet 2

- ✓ Draw the **stratosphere**, which is the second layer of the atmosphere. It extends 12-50km above the Earth's surface.
 - Measure and draw a line 50 mm from Earth's surface.
 - Label it stratosphere.
 - Color it orange.
 - Draw or glue pictures to help indicate what happens here.

 - ✓ Draw the **ozone layer**. This is not a main layer of the atmosphere, but plays an important role in how it works. This is also where the ozone is found, which absorbs ultraviolet radiation.

 - ✓ The ozone is between the stratosphere and the mesosphere. Its symbol is O_3 because it is made of three oxygen atoms.
 - Color a thin, purple line to represent the ozone.
 - Make a small section of the line dotted (----) to represent the "hole" in the ozone layer.

 - ✓ Draw the **mesosphere**, which extends 50km-80km from the Earth's surface.
 - Measure and draw a line 80 mm from the Earth's surface.
 - Label this layer mesosphere. Color it red.
 - Draw pictures to help show characteristics.

 - ✓ Draw the **ionosphere**. This is the fourth layer of the atmosphere. It extends 80km-400km from the surface.
 - Label it the ionosphere and color it pink.
 - Draw pictures to help show characteristics. The ionosphere is very hot and contains light "shows" called auroras.

 - ✓ Beyond the ionosphere is the **exosphere**. It starts at 400km above the Earth's surface. And extend out to outer space.
 - Color this gray and label it exosphere.
 - Draw and label a meteor entering Earth's atmosphere.

 - ✓ When you have completed your model.
 - Turn the paper over and draw or cut out the pictures from the hand-out **ATMOSPHERIC LAYER IMAGES**
 - You will glue each picture in its appropriate layer.
 - You do not have to use each picture but make sure each layer is sufficiently represented.
10. When students have finished their chart, they should answer the **COMPREHENSION QUESTIONS**.

ATMOSPHERIC LAYER IMAGES







