Layers of Earth’s Atmosphere Foldable Instructions

\*\*\*It is very important that you read and follow all directions *very carefully* for this activity.\*\*\*

This is a MAJOR grade! Do your best work!

Part 1: Create the Foldable

* Fold your paper to the edge of the inside chart so that the graph is on the cover.
* Carefully fold the right edge to meet the left edge of the paper.
* This will create a small folded section on the right side of your foldable.

Part 2: Complete the graph on the cover.

The atmosphere can be categorized into 5 different layers, based on significant changes in temperature that occur at certain heights above the Earth’s surface. If you were to move upward through the atmosphere, you would notice a certain trend in air temperature, but you would notice that this trend reverses several times as you continue upward. Each time the trend reverses, you have passed into a new layer of atmosphere. The layers of the atmosphere are, in order from lowest altitude to highest; the troposphere, stratosphere, mesosphere, thermosphere, and exosphere.

1. The data table below contains the average temperature reading at different altitudes in the Earth’s atmosphere. You will be using this data to complete the graph of altitude versus temperature. As you construct your graph, your focus is to recognize the trends in temperature that occur as elevation increases, and also to determine where each atmospheric layer is found.

* Plot this data on the graph and connect each of the points as you plot them. Be careful to plot the negative temperatures correctly.

|  |  |  |  |
| --- | --- | --- | --- |
| **Temp (C)** | **Altitude (km)** | **Temp (C)** | **Altitude (km)** |
| **1**. 15 | 0 | **15.** -33 | 65 |
| **2.** -18 | 5 | **16.** -54 | 70 |
| **3**. -49 | 10 | **17.** -65 | 75 |
| **4.** -56 | 12 | **18.** -79 | 80 |
| **5.** -56 | 20 | **19.** -86 | 84 |
| **6.** -51 | 25 | **20.** -86 | 92 |
| **7.** -46 | 30 | **21.** -81 | 95 |
| **8.** -37 | 35 | **22.** -72 | 100 |
| **9.** -22 | 40 | **23.** -40 | 110 |
| **10.** -8 | 45 | **24.** 0 | 115 |
| **11.** -2 | 48 | **25.** 30 | 120 |
| **12.** -2 | 52 | **26.** 500 | 300 |
| **13.** -7 | 55 | **27.** 500 | 400 |
| **14**. -17 | 60 | **28.** 700 | 700 |

1. Use a ruler to draw horizontal lines across the graph at:

* 20 km
* 50 km
* 85 km
* 600 km

1. Label the layers of the atmosphere on the graph and color them as described. Do not color too dark. Make sure the graph is readable through the color.

* Troposphere - Yellow
* Stratosphere - Orange
* Mesosphere - Blue
* Thermosphere – Green
* Exosphere – Gray

1. Find the general location of the ozone layer (at 40 km).

* Shade the location of the ozone layer across the graph in red.
* Label the ozone layer.

1. Find the general location of the Ionosphere

* Draw a purple dashed line at 300 km and label this region Ionosphere.

6. Extend the lines that you drew at 20km, 50km, 85km and 600km on your graph all the way to the right edge of your foldable across the small folded section.

Part 3: Air Molecules Density Model

* You are now going to create a model that shows the density of air molecules on the 3cm right hand section of your cover.
  + Starting at the bottom of your page and going up to around 10km, draw small circles (to represent gas molecules) as closely packed together as possible.
  + Between 10 and 20km, begin to have some gaps between the molecules.
  + As you go upwards, draw fewer and fewer molecules, further and further apart until you have just a couple above your 600km line.
* Write “gas molecule density” along the far right edge of your foldable.

Part 4: Inside the foldable

* Complete the chart inside your foldable. (Be sure to include as one of your important characteristics…the Ozone layer in the Stratosphere and the Ionosphere in the thermosphere) Use your model and your Tour of Earth’s Atmosphere article/notes.
* Draw pictures that illustrate all of the traits of each layer.
* Write your name and class period on the back.