

Name _____ Date _____ Period _____

How High is Space?

Part 1

Procedure

1. Tape the six pages numbered sea level to 790 km. Tape these pages together end-to-end like a banner, using clear tape. When you have completed this step, you will have created a scale model of the atmosphere.
2. Fold the pages accordion-style into a stack.
3. Using the information from your information sheet, draw a line across the chart to indicate the top of each atmospheric layer. Draw an arrow from the bottom to the top of each layer. Label each layer.

How High is it?

In lab groups you will compare the heights of layers of Earth's atmosphere to the top of the mesosphere, which is "**astronaut altitude**," the distance from the Earth at which one officially becomes an astronaut. Although still within the atmosphere the astronaut altitude is considered to be the beginning of "space". Above this altitude, planes cannot fly because there is not enough air to provide the lift necessary to allow planes to operate.

4. Add the things listed in the table below to your scale model of the atmosphere.

Table 1: How high is it?

	Altitude Above Sea Level (km)
Peak of Mt. Everest	9 km
Typical Clouds	1 – 10 km
Airplanes	8.5 – 11 km
Highest Clouds*	15 km
Astronaut Altitude	80 km (50 miles)
Space Shuttle	320-390 km
International Space Station	390 km
Lowest CINDI (C/NOFS) altitude	375 km
Average CINDI (C/NOFS) altitude	563 km
Highest CINDI (C/NOFS) altitude	750 km

*Thunderheads can "dent" stratosphere

Part 2

Procedure: Your lab group will now research the characteristics of each layer of the atmosphere. Look for typical temperatures or changes in temperature in layers or layer boundaries, as well as presence and density of gases such as ozone and oxygen.

Questions

1. List, in order from the Earth's surface, the layers of the atmosphere.
2. How many layers are there?
3. Which is the lowest layer? Highest?
4. Which layer is the narrowest? Widest?
5. What layer do we live in?
6. Which layer(s) do commercial airplanes use?
7. What layer do the space shuttle and space station orbit in?

8. Mount Everest is how tall? In what layer of the atmosphere would you find its peak?

9. How high are the highest normal cloud tops on Earth? What types of weather do you think produce these clouds?

10. CINDI/CNOFS is located in what atmospheric layer?

11. Which objects in Table 1 are in space and as well as in the Earth's atmosphere?