HANDOUT

Vertical Structure of the Atmosphere

Based on composition

1) Homosphere - 0-80 km (0-50 mi); proportion of gases is nearly uniform throughout except for the ozone layer between 19-50 km (12-31 mi)

2) Heterosphere - 80-480 km (50-300 mi); gases are not evenly mixed but are distributed in layers that are sorted by gravity according to their atomic weight

Based on temperature

1) Troposphere - 0-8 km (5 mi) above the poles, 12 km (8 mi) above the mid-latitudes & 18 km (11 mi) above the equator; temperature decreases with height at an average of 6.4°C/km (3.5°F/1000 ft), i.e. normal lapse rate

a) Tropopause - upper boundary

2) Stratosphere - from tropopause to 50 km (31 mi); temperatures increase with altitude from -57°C (-70°F) to 0°C (32°F)

b) Stratopause - 50 km (31 mi)

3) Mesosphere - 50-80 km (31-50 mi); temperatures decrease from 0°C (32°F) to -90°C (-130°F)

c) Mesopause - 80 km (50 mi)

4) Thermosphere- 80-480 km (50-300 mi); temperatures rise to 1200°C (2200°F)

d) Thermopause - 480 km (300 mi)

5) Exosphere - beyond 480 km (300 mi); blends into interplanetary space

Based on Function

1) Ozonosphere (ozone Layer) - located in the stratosphere; absorbs UV & reradiates it as IR thereby converting the harmful UV

2) Ionosphere - extends from the mesosphere to the thermosphere; absorbs cosmic rays, y-rays, X-rays & UV