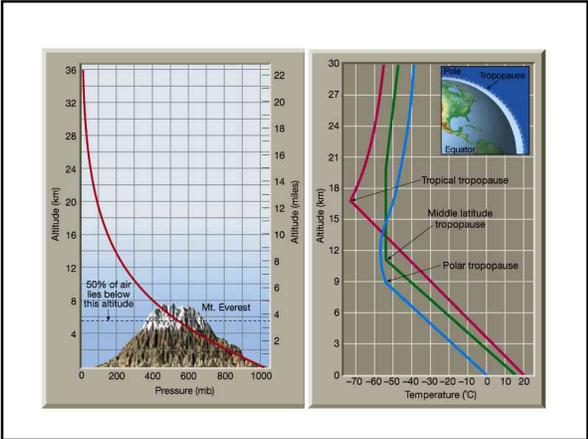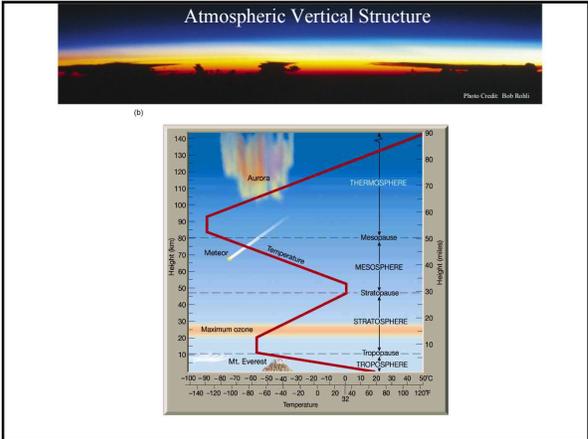# How is our atmosphere structured?

Atmospheric Vertical Structure

What do clouds look like from Earth above and below?

Name that Cloud!

STRATOCUMULUS

Stable layers in the atmosphere slow vertical development. Rounded masses larger than altocumulus. Often appear near sunset as the spreading remains of larger cumulus clouds.
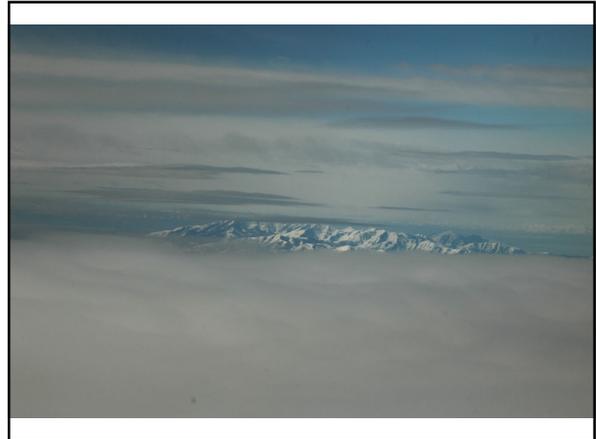
Name that Cloud!

STRATUS

A uniform grayish cloud that often covers the entire sky. Resembles fog that does not reach the ground. Layer of air cooled to the saturation point. Featureless with ill defined top and bottom.

Name that Cloud!

ALTOCUMULUS

Forms in unstable layer bounded by an upper stable layer. Possible marker of PM t-storms when seen in the AM with greater vertical development. Gray, puffy masses.

Name that Cloud!

NIMBOSTRATUS

A clouds producing continuous precipitation (light to moderate). Thick mass of cloud with no well defined base, dark gray in color, usually covering most of the sky.

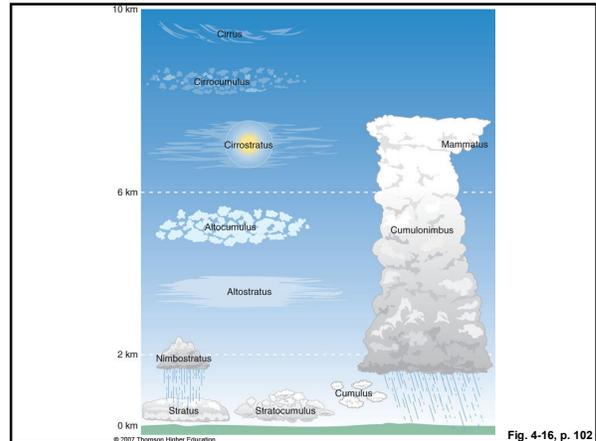# Name that Cloud!

CUMULONIMBUS

Or "thunderstorm" cloud. Most energetic of cumulus family. Top can shoot up into lower stratosphere. Anvil cloud is forming. Heavy downpours, lightning, and hail can result.
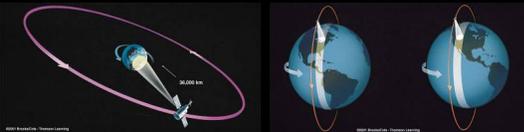
Name that Cloud!

CIRROCUMULUS
Small ripples strongly resemble the scales of a fish. Usually occur in patches and do not cover entire sky. Heaps smaller than altocumulus.


10 km — Cirrus
Cirrocumulus
Cirrostratus — Mammatus
6 km — Altocumulus — Cumulonimbus
Altostratus
2 km — Nimbostratus
Cumulus
Stratus — Stratocumulus
0 km
© 2007 Thomson Higher Education
Fig. 4-16, p. 102

Satellites

- Monitor one area constantly, as it remains stationary with respect to an observer on earth's surface

Scan from north to south
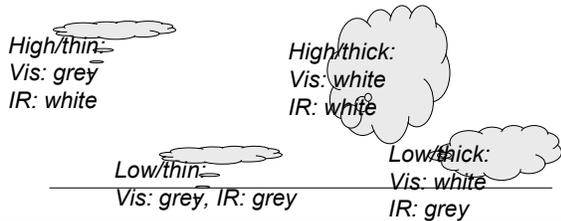
Clouds and Radiation

Colder — Warmer
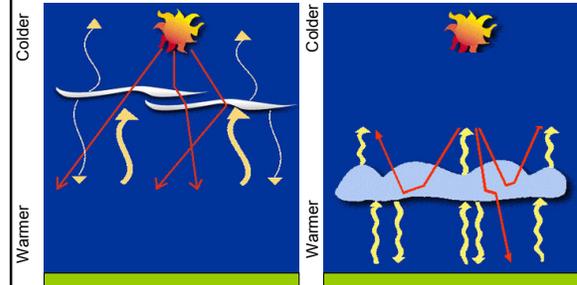
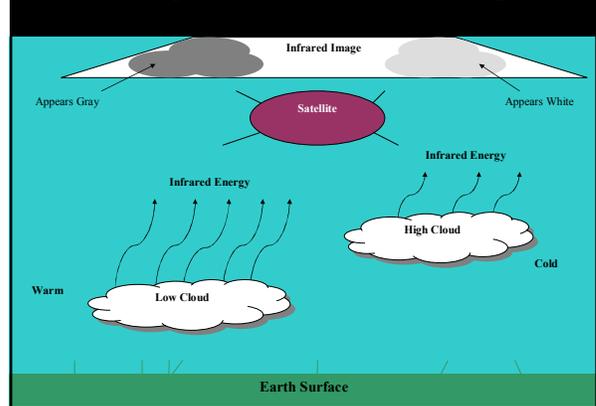Transmit more sunlight
Radiate less energy

Transmit less sunlight
Radiate more energy

Discriminating between low/high and thick/thin clouds

- Use infrared image for temperature:
  - Low clouds tend to be warm (grey in IR image)
  - High clouds tend to be cold (white in IR image)
- Use visible image for thickness
  - Thin clouds reflect less solar energy (grey in visible image)
  - Thick clouds reflect lots of solar energy (white in visible image)

High/thin:
Vis: grey
IR: white

High/thick:
Vis: white
IR: white

Low/thin:
Vis: grey, IR: grey

Low/thick:
Vis: white
IR: grey

High and Low Clouds in Infrared Image

Infrared Image

Appears Gray — Satellite — Appears White

Infrared Energy

Infrared Energy

High Cloud

Warm — Low Cloud — Cold

Earth Surface

Click here for:

Satellite loop of the United States

Are the clouds moving in your direction?

When will they reach you?

Click here for:

Infrared Satellite loop of the United States

Are the clouds moving in your direction?

When will they reach you?