

## **ATMOSPHERIC OPTICS**

What is white light?

What is the difference between reflection and scattering?

Why is the sky blue?

Why are sunsets/sunrises often red?

How do rainbows form?

What is refraction of light?

Where would a rainbow be located relative at sunrise? at sunset?

## **PRESSURE AND FORCES**

What force is usually responsible for the initiation of wind?

What is an isobar?

What is a 500 mb height map?

The average 500 mb height decreases from the tropics to the poles. Why?

What is the pressure gradient force? How is it directed with respect to high and low pressure?

What causes the coriolis force?

What will happen to a moving object if there is no net force on the object?

What factors determine the strength of the coriolis force?

Why does the wind not blow directly from high pressure areas to low pressure areas?

What is the centripetal force?

What direction does the wind flow around high and low pressures in the N. Hemisphere?

Why do winds near the surface tend to be directed across the isobars?

## **LOCAL WIND SYSTEMS**

How is the size of atmospheric circulations related to their lifetimes?

What is a westerly wind?

Do ocean currents cause the winds? Or do the atmospheric winds cause the ocean currents?

What is meant by "prevailing wind"? How is this related to the orientation of airport runways?

How is the force exerted by a wind related to the wind speed?

What is an "onshore" and "offshore" wind?

Why might wind change direction as it moves over a large lake?

Why are Santa Ana winds warm? and dry (low relative humidity)?

How is the wind at the surface directed in a sea breeze circulation? in a land breeze?

How long does a sea breeze circulation last? (hourly, daily, monthly or longer??)

At the surface, how is convergence (or divergence) related to air movement in the vertical direction?

What can cause clear-air turbulence and eddies?

What causes the sea-breeze circulation?

What causes the monsoon circulation in Southern Asia?

How are the winds oriented (onshore or offshore) during the summer monsoon in Asia? Is the summer monsoon a period of wet or dry weather? Why?

## **GLOBAL WIND SYSTEMS and AIR MASSES**

What is the typical surface wind direction in the mid-latitudes (30-60°)

When do the semi-permanent high pressure regions reach their maximum and minimum intensities?

Why are the world's major deserts located near 30° latitude?

Where is the Intertropical Convergence Zone (ITCZ) located?

How does the Pacific High influence weather along the U.S. Pacific coast? How does the Bermuda High influence weather along the U.S. Atlantic coast?

What causes the polar front jet to form?

Where are the Hadley Cells found? How does air move within these cells (where is it rising/sinking)?

What are the tradewinds? Where are they located?

What is a jet streak?

What is meant by divergence?

How will convergence of air aloft affect the surface pressure?

What is a cold front? How does the cold and warm air interact near the cold front?

## **EL NINO**

What does "anomaly" mean?

During an El Nino event, how do weaker than normal tradewinds impact the SST in the Eastern Tropical Pacific Ocean (near Peru)?

During an El Nino event, how and where does the SST change?

During an El Nino event, how are precipitation anomalies related to SST anomalies in the tropical Pacific Ocean?

How can El Nino events in the tropical Pacific Ocean affect weather in California?