

# Weather & Climate #7



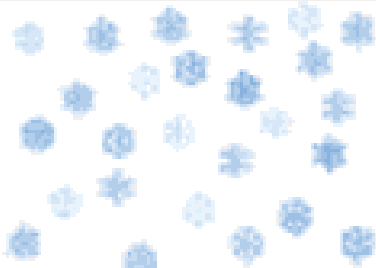

I can identify weather conditions associated with cold fronts and warm fronts.

## Review/Previous Knowledge:

- Cold air is more dense and sinks, Warm air is less dense so it rises.
- A high pressure system pulls air down towards the surface and creates clear skies.
- A low pressure system pulls air up away from the surface and creates cloudy skies with a high chance of precipitation.

# Types of Air Masses:

- Air masses are classified by **temperature** and **humidity**.

|      | Wet  | Dry   |
|------|--|---|
| Warm | <br>Marine tropical | <br>Continental tropical |
| Cool | <br>Marine polar   | <br>Continental polar   |



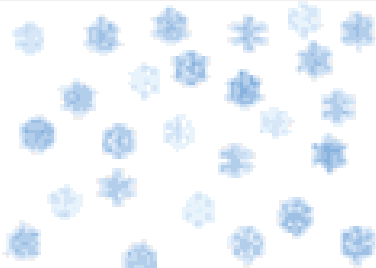

# 4 Types of Air Masses:

tropical = warm air

Polar = cold air

Maritime = form over oceans, very humid air

Continental = form over land, dry air due to less exposure to water

|      | Wet  | Dry   |
|------|--|---|
| Warm | <br>Marine tropical | <br>Continental tropical |
| Cool | <br>Marine polar   | <br>Continental polar   |

## North American Air Masses

**Maritime polar air masses** from the Pacific Ocean bring cool, humid air to the West Coast.

**Continental polar air masses** from central and northern Canada bring cold air to the central and eastern United States.

**Maritime polar air masses** from the Atlantic Ocean are often pushed out to sea by westerly winds.

**Maritime tropical air masses** from the Pacific Ocean bring warm, humid air to California and the West Coast.

**Continental tropical air masses** from the South bring hot, dry air to the southern plains.

**Maritime tropical air masses** from the Gulf of Mexico bring warm, humid air to the eastern United States.

# How Air Masses Move

- In the U.S., air masses are commonly moved by the prevailing westerlies and jet streams.
- Air masses are generally pushed from the West to the East, so major storms usually move from West to East.

## Vocabulary:

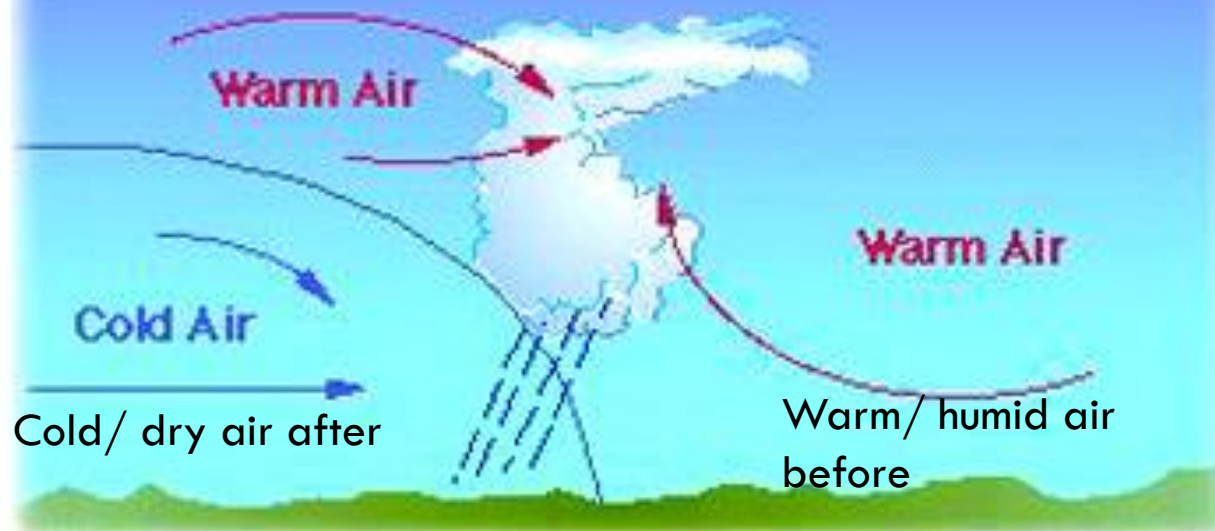
- Prevailing westerlies: the major wind belts over the continental United States which generally push air masses from west to east.
- Jet Streams: Are embedded in the prevailing westerlies; they are high-speed winds about 10 km above Earth's surface.

## Vocabulary:

- Front: the boundary where unlike air masses meet
- Cold front: a fast-moving cold air mass overtakes a warm air mass; the warm air is pushed upward.
- Warm front: a warm air mass overtakes a slow-moving cold air mass; warm air moves over the cold air.



## Cold Front



## Warm Front



# Cold Fronts

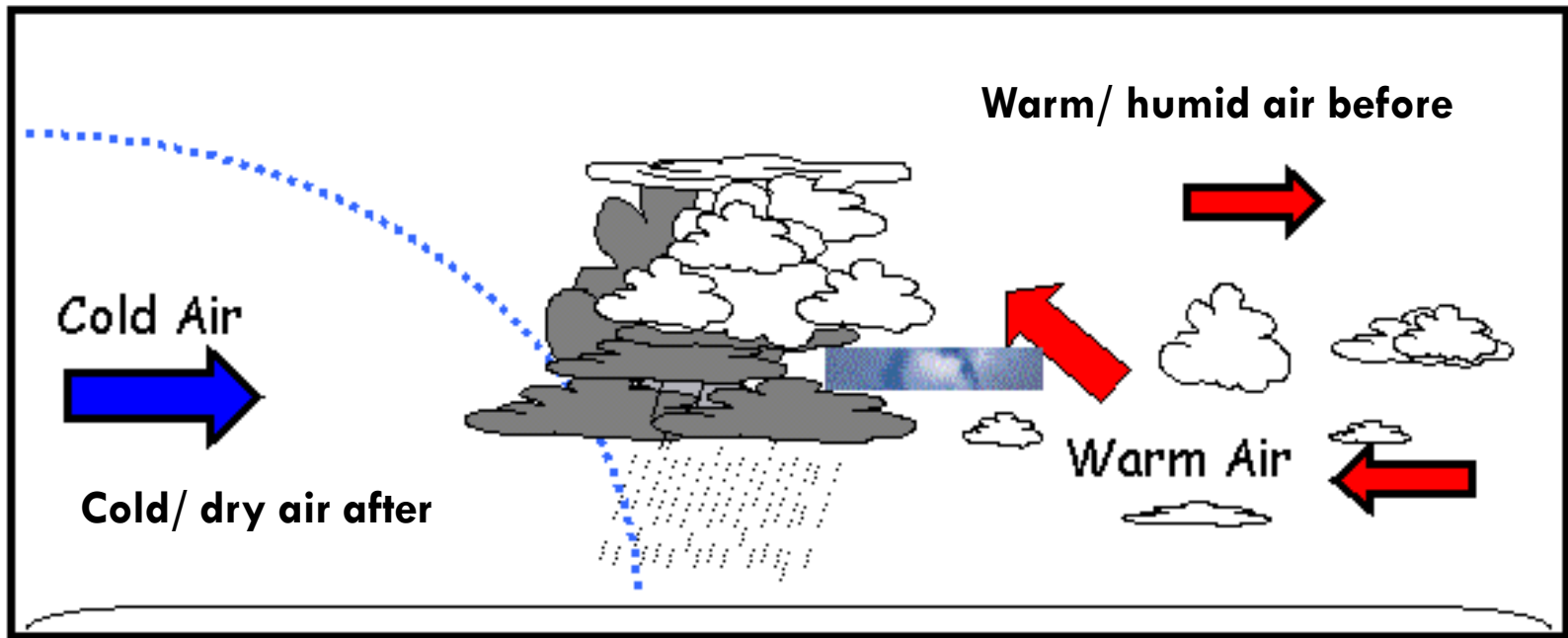
- Since cold fronts move quickly they can cause abrupt weather changes, including severe thunderstorms and sometimes F4 and F5 tornadoes.

# Warm Fronts

- Because warm fronts move slowly, the weather may be rainy or cloudy for several days.
- Precipitation during a warm front is more gradual and less severe than during a cold front.

| Type of Front: | Weather Before the front passes: | Weather while the front is over you:   | Weather After the front passes: |
|----------------|----------------------------------|--|---------------------------------|
| Cold Front     | Warm and Humid                   | Cloudy with precipitation/<br>thunderstorms<br><br>(storms can be more severe and abrupt)      | Cold and Dry                    |
| Warm Front     | Cold and Dry                     | Cloudy with precipitation/<br>thunderstorms<br><br>(precipitation is lighter and more gradual) | Warm and Humid                  |

## Cold Front Scenario

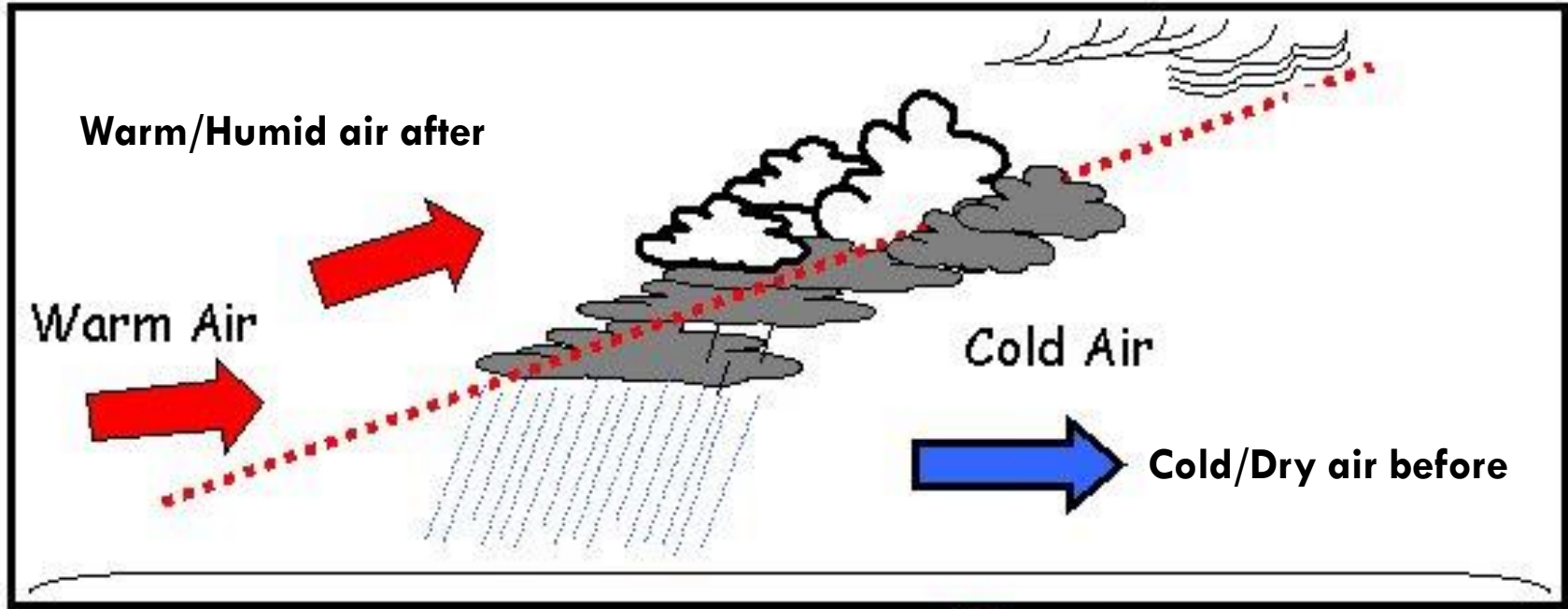


Weather Symbol for Cold Front  
(usually shown in blue)

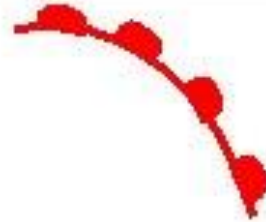


# Cold Front

## Warm Front Scenario



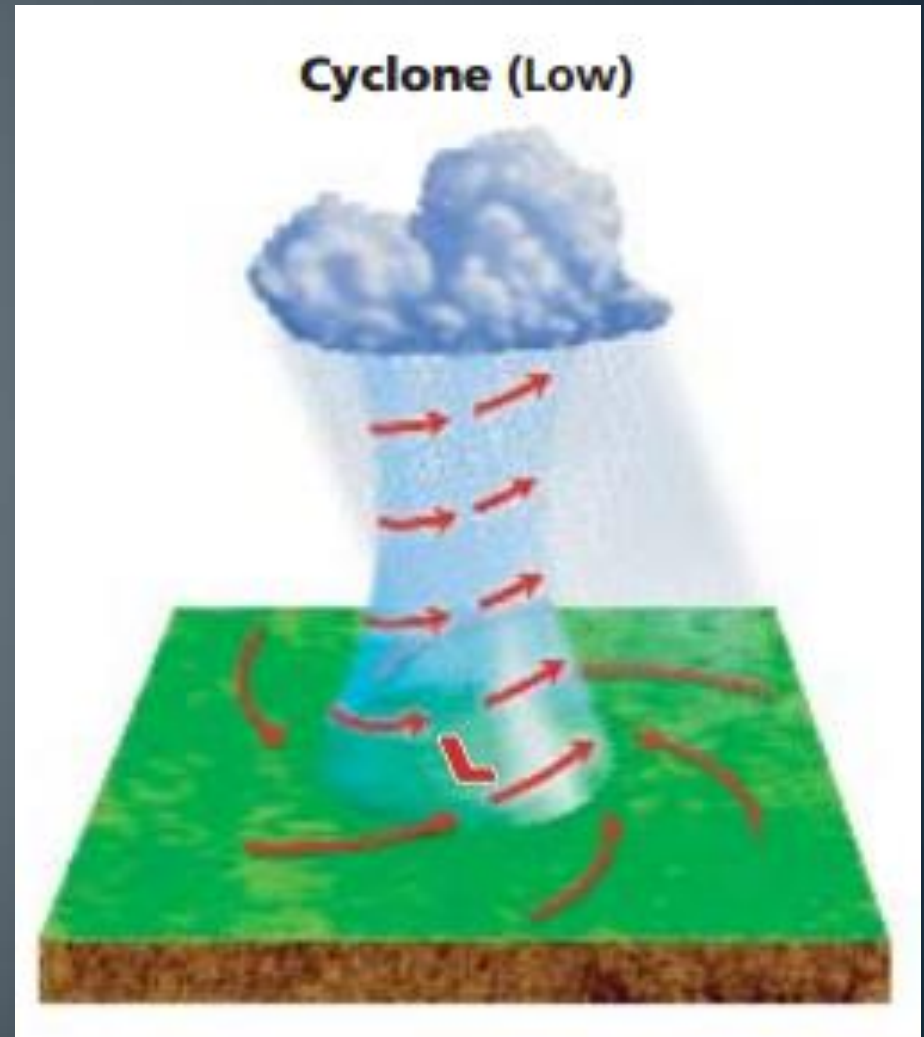
Weather Symbol for Warm Front  
(usually shown in red)



# Warm front

# Cyclones

- A cyclone is a swirling center of low pressure where air is pulled up.
- A cyclone creates clouds, wind, and precipitation.



# Anticyclone

- Anticyclones are high pressure centers of dry air where air is pulled down towards the surface.
- Anticyclones create dry clear weather.

