

Module 11: Meteorology

Topic 3 Content: Types of Fronts Notes

Introduction

Types of Fronts

Cold **Warm** **Stationary** **Occluded**

Introduction

The boundary between two different air masses is called a front. When two air masses collide, weather changes can be quick and dramatic and often include precipitation and sometimes much stronger storms. The four types of fronts are warm, cold, stationary, and occluded. Each type of front is represented by a symbol on a weather map. In this interactivity, click on each of the folder tabs to view information about the four front types.

Warm

Cold

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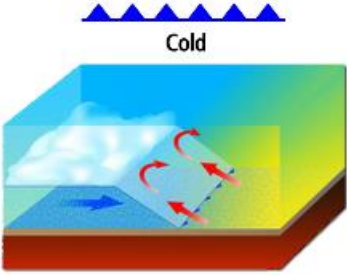
Cold

Types of Fronts

- Cold
- Warm
- Stationary
- Occluded

Cold

A cold front occurs when an air mass containing colder air moves in and forces the air from a warmer air mass upwards. As warm air is pushed upwards, it cools and condenses, resulting in rain, thunderstorms, and cloudy weather. The term "cold" is relative. The cold air mass is only colder than the warm air mass, and the temperature of both air masses may be warm. The larger the difference in temperature between the air masses, the more extreme the weather is likely to be. On a weather map, a cold front is identified by a blue line with triangles pointing in the direction the front is moving.



The diagram illustrates a cold front. A blue line with triangles pointing to the right is labeled 'Cold'. Below it, a 3D cross-section shows a blue air mass (cold) moving from left to right, pushing under a yellow air mass (warm). The warm air is forced upwards, where it cools and condenses into clouds and rain. Red arrows indicate the upward movement of the warm air, and blue arrows show the cold air mass advancing.

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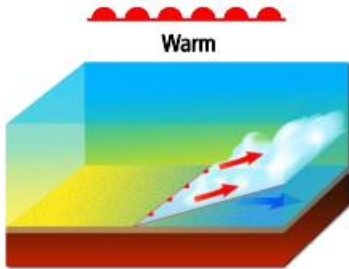
Warm

Types of Fronts

- Cold
- Warm**
- Stationary
- Occluded

Warm

A warm front occurs when warmer air displaces a colder air mass, causing cloudy weather and precipitation. On a weather map, a warm front is identified by a red line with red semicircles pointing in the direction the front is moving. Generally, warm fronts produce longer rain events.



The diagram illustrates a warm front. It shows a cross-section of the atmosphere. On the left, a blue air mass (cold air) is being pushed under a red air mass (warm air) on the right. The warm air is shown rising over the cold air, creating a wedge-shaped cloud system. The clouds are depicted as white and grey, with red arrows indicating the direction of the warm air's movement. Above the clouds, a red line with red semicircles is shown, representing the front's symbol on a weather map. The word 'Warm' is written below the diagram.

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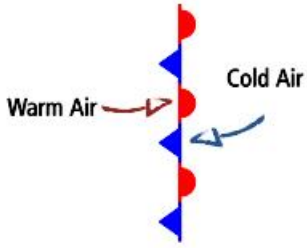
Stationary

Types of Fronts

Cold Warm **Stationary** Occluded

Stationary

When two different air masses meet, but neither takes over the space of the other, a stationary front forms. A stationary front often occurs when the temperature and pressure differences between the two fronts are small. A stationary front may bring some clouds and lighter precipitation, but not the heavy storms common with cold fronts. A stationary front is identified as a blue line with red semicircles and blue triangles that indicate the location of the warmer air mass and the colder air mass.



Warm Air Cold Air

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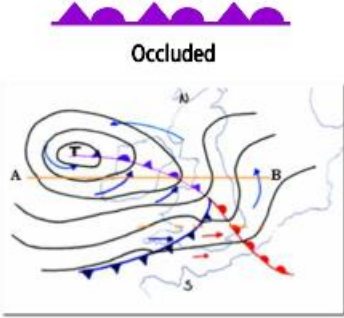
Occluded

Types of Fronts

Cold Warm Stationary Occluded

Occluded

An occluded front occurs when a cold front moves quickly enough that it completely displaces a warm front. Warm air is forced upwards as the colder air mass pushes in and meets another colder air mass. Precipitation is coming with occluded fronts. An occluded front is marked on a weather map by a purple line with alternating triangles and semicircles that point in the direction of movement. On the map, you can see the symbols for a warm front, a cold front, and an occluded front. The black lines, called isobars, represent areas of equal pressure. As the cold front advances on the warm front, air between the two fronts rises. This rising of air creates the occluded front represented in purple.



The diagram illustrates the formation of an occluded front. It shows a low-pressure system (L) with a cold front (red line with triangles) and a warm front (red line with semicircles) meeting at a purple line representing the occluded front. Arrows indicate the direction of air flow, showing the cold front advancing and lifting the warm front. A purple line with alternating triangles and semicircles is shown above the diagram, labeled 'Occluded'.

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