

CLIMATE CONNECTIONS

Canada's climates are world famous. What are they, where are they, and how do they happen?

Activity A:

On the second regional outline map, draw the borders of the climate regions of Canada, using Figure 13-12 on p.154 in the text (*Making Connections 2nd edition*). Label and colour the regions.

Activity B:

Read pp.145-153 and study the photographs, diagrams, maps, and charts on these pages. Answer these questions from p.153 to explain *L O W E R Near water*.

| | | |
|------------|-----|---|
| L | #1 | |
| O | #3 | |
| W | #4 | |
| E | #7 | |
| R | #11 | |
| Near water | #2 | also complete #8 (difference between climate and weather) |

Activity C:

Using the information on pages 145-153 and class information, complete the following precipitation summary notes by filling in the missing words and diagrams.

Activity D:

Read p.154 and study the climate graphs on p.157. Complete the summary chart on p.155.

Activity E:

Complete Climate Graph worksheets.

Precipitation

Our understanding of precipitation, based on the hydrologic cycle, is clearer when we remember that air cools as it _____, and that as air cools water vapour _____ more than it evaporates.

There are three causes of air rising:

1. to cross an area of _____; this causes **relief precipitation** (also called _____ **precipitation**).
2. because it has absorbed _____ from the earth's surface; this causes **convective precipitation**, most common in the summer months.
3. because a cooler, denser air mass flowing beneath it forces it _____; this causes **cyclonic precipitation** (also called **frontal precipitation**).

Relief Precipitation

Mountain barriers create relief precipitation. As moist air rises up the _____ side of slopes, the pressure on the air decreases, causing the air to expand and _____. The cooling of the air causes water vapour to _____, leading to precipitation. Once over the top, the pressure on the air _____ as the air falls, causing the air to become warmer. More evaporation than condensation occurs, creating a very dry climate or _____ on the _____ slope of a mountain range.

Diagram of Relief Precipitation

Convective Precipitation

Convective precipitation is very common in _____ in continental locations such as the _____ provinces, Ontario, and _____. As the ground heats up it warms the air, causing the air to rise. The rising air expands and cools, causing the water vapour to condense into clouds. These clouds develop vertically throughout the day. Extreme convection can cause _____ to develop in these storm clouds.

Diagram of Convective Precipitation

Cyclonic Precipitation

An air mass is an area with similar _____ and _____. Different air masses do not mix easily. Between two air masses, a boundary or _____ forms. This is where cyclonic precipitation develops. Warm and cold air masses collide, often just under the polar-front _____. A cyclonic storm is a large, _____ system that forms when a warm air mass and a cold air mass collide. The leading edge of the warm air is the _____ front, and the leading edge of the cold air is the _____ front. In North America these low-pressure storm systems move from _____ to _____ throughout the year. They account for most of the precipitation in the Prairies, Ontario, Quebec, and Atlantic Canada, especially in _____ when heating is minimal. Even the _____ precipitation of the West Coast develops out of _____ storms that blow in from the Pacific Ocean.

Diagram of Cyclonic Precipitation