

# ACTIVITY 3 SNOW AS A SYSTEM

Snowstorms are part of large systems of weather that form in the atmosphere. As the Earth rotates and revolves around the Sun, large swirls of air move and shift with it. These air masses change as they move. They get warmer and colder. They rise and they fall. They crash into each other. They cross over mountains and oceans. They collect moisture, and they release that moisture as snow and other forms of precipitation.

## PART 1: LAKE-EFFECT SNOW

Lake-effect snow is a very special type of snow system that causes huge localized blizzards in certain regions. This type of storm needs three very specific conditions. Read about lake-effect snow below and study the diagram. Then unscramble what these conditions are:

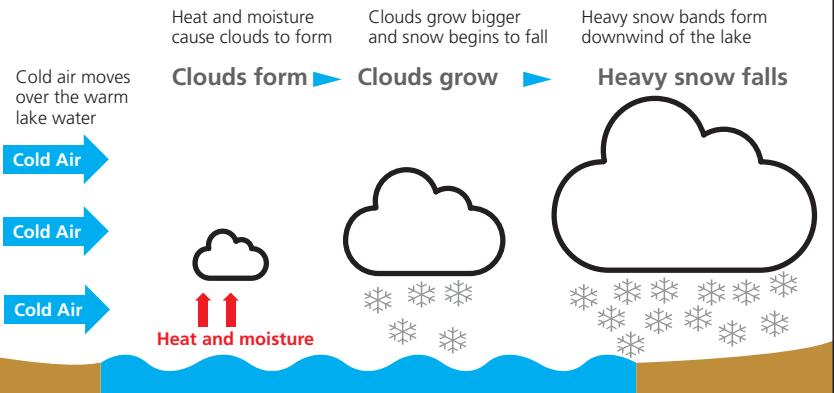
1. L C D O I R A

2. R M A W T W R E A

3. R E L G A A S F E U C R

When cold air moves across a large body of warmer water, like a large lake, it picks up a lot of moisture, or water vapor, and heat. Clouds form. As the cold air continues to move across the water's surface, the amount of moisture grows, generating snowflakes (dendrites), and the clouds also grow bigger and bigger. When the snowflakes get big enough, gravity pulls them out of the clouds. This causes a quick, intense blizzard in a small band around the lake, and a much smaller amount of snow in neighboring areas. Since the process takes time, you need a large surface area of water (approximately 100 square miles/259 square kilometers) for lake-effect snow to form.

Lake-effect snow forms when **cold air** moves over **warm water**



## PART 2: MEASURING THE LAKE EFFECT

The Great Lakes in North America are a perfect setting for lake-effect snow. The lakes face cold, Arctic winds that come down from Canada. The lakes are wide and long, so when the Arctic winds blow at the right angle, they pass over a lot of surface area for picking up moisture. The weather maps below show the amounts of snowfall around Buffalo, New York (BUF) from two separate lake-effect snowstorms over Lake Erie. Draw arrows to show the direction that the cold Arctic winds traveled for each one.

