

TYPES OF SNOW

Snow crystals are born in the clouds when water vapor freezes on a particle of dust, a floating bit of bacteria, or some other solid material. The type of snowflake that is falling can tell you a lot about the weather. In this activity, we'll teach you how to look at the shape of the individual snowflakes, and learn what each shape means. When cloud temperatures are at or below freezing point, and there is enough moisture in the air, ice crystals form around a core particle. As water vapor condenses and freezes, the complex pattern of a snowflake is born, one molecule at a time. A snowflake's hexagonal shape is born at the atomic level, where the first water molecules form initial bonds. Snowflakes can be classified into six basic patterns; needles, columns, plates, columns capped with plates, dendrites, and stars. Each type is the result of different atmospheric and temperature conditions within the cloud.

Supplies Needed:

- Dark/black piece of construction paper or felt
- Freezer
- Magnifying glass
- The paper/felt needs to be cold for this activity, so be sure to store it outside in a garage or in the freezer before the activity

Activity:

- Review the types of snowflakes at the bottom of this sheet
- Remove paper/felt from the freezer
- Bundle up and head outside
- Collect either actively falling snow or very softly scoop up a few flakes of recently fallen snow from the ground
- Immediately look at the flakes with your magnifying glass, and draw them in your snow observation journal or on a separate sheet of paper
- Back inside, compare what you saw with the types of snowflakes and their descriptions on the bottom of this sheet

Types Of Snowflakes



Star Shape – star crystals are born at temperatures near -15°C , and are among the most common types of snowflakes. They are very delicate, and superstars are rare because large flakes tend to be broken by wind and mid-air collisions. However, under ideal conditions several stars may join together to form a larger superstar snowflake. The largest snowflake on record from Bratsk, Siberia in 1971, and measured 8" x 12," just larger than this sheet of paper!



Dendrite Shape – dendrites are stars with attitude. They are three dimensional star crystals with branches that grow on more than one plane. These branches connect randomly to a central structure. They form under extremely cold temperatures (-20 to -25°C) when high levels of atmospheric moisture are present.



Column capped with plates – Capped columns are composite flakes that form when the snowflake passes through different temperature and moisture zones as it falls to the ground. The columns form first in the higher and dryer regions of the cloud, and then combine with star flakes as they fall through the lower, wetter cloud elevations.



Plate Shape – Plates form in a similar environment as stars when there is very little moisture in the air. They form at temperatures around -10 to -20°C in conditions where there isn't enough moisture available for the snowflake to form the delicate branches of the classic star snowflake.



Column Shape – Columns are produced when the air is dryer. They are generally smaller, have a higher density than star crystals, and form over a wide range of temperatures (15 to -25°C).



Needle Shape – Needles are formed at the upper end of the temperature spectrum, usually when ground temperatures are at or near the freezing point. To grow, these crystals need an air temperature in the range of -5 to -10°C . Needles tend to produce a dense, stiff snow pack which can produce an avalanche.