How does snow, hail and sleet form?

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We all associate snow and hail with wintery and stormy conditions. But how exactly does hail and snow form? What’s the difference between them? Why can it sometimes be very cold but yet it doesn’t snow? Forecasting snow is a tricky thing to do and I’m going to explain exactly why.

Snow is classed as a solid precipitation which occurs in a variety of minute ice crystals at temperatures well below 0 °C. We get larger snowflakes at temperatures nearer to 0 °C. Snow forms when tiny ice crystals in clouds stick together to become snowflakes. These ice crystals have to have something to hold onto in order to form. This is called a condensation nucleus and is usually a grain of sand or dirt. Once the ice crystal has something to hold onto it can become heavy enough to fall to the ground. Snowflakes that fall through wet air that is slightly warmer then 0°C will melt around the edges and stick together to produce large flakes. Snowflakes that fall through cold, dry air produce powdery snow that doesn’t stick together. When wind is combined with heavy snow it can create blizzards and drifts.

But what about sleet? Is that similar to snow? Sleet is also known as ice pellets. Ice pellets form in stratus clouds when snowflakes start to melt as they fall from the cloud. As they fall through sub-freezing air they refreeze into grain like particles. Ice pellets are usually smaller than hail stones and will bounce when they hit the ground. How is hail different to sleet then? Hail is a shower of round or irregularly shaped pieces of ice that form inside a cumulonimbus cloud. They start off as small ice particles or frozen raindrops that are caught in the updraught of air inside the cloud. As they ascend they grow by gathering water on their surface. How big they grow depends on how strong and extensive the updraught is and how much water is in the cloud. In vigorous clouds the hailstones may go up and down a number of times, adding a layer of ice each time. Eventually they become so heavy that they can no longer be supported by the updraught and will fall to the ground. Some hailstones can be as big as 6 inches in diameter and can damage property and crops.

So next time you’re stuck in a hailstorm or messing around in the snow, have a think about where it came from high above you in the clouds.