**PAESTA Podcast Series -- You Asked, We Answered!**

**Episode 24 – How Do snowflakes form?**

Amber Smith, undergraduate student, Penn State Brandywine

Hi. My name is Amber Smith. I am 20 years old, and a junior at Penn State Brandywine. Throughout this podcast, I will be explaining to you today about snowflakes and how they form into unique designs every winter. Sometimes we don’t take the time to stop and think about these things. Usually when we hear the word “snow” we think of numerous things. One being “will we have school?” or “Are the roads bad?” What if once in a while we stopped to think and ponder? Imagine this. You are sitting in a coffee shop looking out of the window in late December. It is one of the coldest days of the year. As you are sipping that hot, refreshing cup of coffee you look outside at the window sill thinking deeply about how beautifully covered it is in white crystal snow. Today's podcast will reflect on something we don’t often think about. Do you ever think about how these snowflakes form? How they stick to these objects that make outside so beautiful when it snows? Snowflake formation depends on the temperature, as well as the humidity in the atmosphere.   Precipitation transforms into to snow only when the temperature in the air is below two degrees Celsius, and while there is moisture in the air. The Snowflakes begin to stimulate their form when water vapor sticks to a microscopic dust particle in the atmosphere.

[1] Something that is really interesting that not a lot of people know is that snow rises before it falls, weird right? The first stage in the foundation of a snowflake is the climbing of a droplet. That droplet is then carried higher into the atmosphere, followed by the freezing of the droplet into a six sided prism. Ice grows fastest around the edges of the snowflakes and the corners of the particle produce quickly. This causes six branches to grow off of the snowflake. During this process, the snowflake creates its unique interior lines we all admire. At 10.4 degrees Fahrenheit, the branches of the snowflake start to mature and become wider. Afterwards, the new growth begins on the snowflake but the growth is narrower. This must be why the branches look like a triangle. When the snowflake is heavy enough to take on the force of the air lifting it up, that is where it begins to fall. [2] The formation of a snowflake is called aggregation. Aggregation is defined as the process by “which ice crystals collide and form a larger ice particle.” Two crystals will wind up sticking together because of the shape and size of the crystals. The snowflakes shape is set by the temperature that is in the atmosphere. Snowflakes come in all shapes and sizes and though snowflakes can sometimes reach three or four inches in size, the "record size" snowflake was actually 15 inches in diameter. [3] Sometimes, when it snows, we all get super excited, until we need to shovel all of that snow, right? And then we all wait for it to melt, well, when does the snow melt after it sticks to the ground. The answer is simple. The snow begins to melt immediately after the temperature rises above freezing. And while this snow is falling, our family and friends all get so excited to go play in it and go sledding and make igloos. How can we determine if this snow will be fun and playful or wet and nasty? The difference between dry, playful, and difficult to shovel wet snow, is that when the temperature is somewhat warmer than freezing, the snowflakes melt around the edges which causes them to stick together and become heavy snowflakes. When the air is cool and dry, the snow will be powdery so that the snowflakes do not stick together. At dry, cold temperatures, the snowflakes are simple and not complex. When the temperature is higher, the snowflakes are more complex because there are more ice crystals. This makes the snowflake more unique. [4] I hope this podcast has helped you in a way to look at things differently and to take some time and think about how unique something so simple can be. Thank you.

*(This audio file was recorded by Amber Smith undergraduate student, Penn State Brandywine, on April 6, 2016.)*

  **Works Cited**

[1] How does Snow Form | Actforlibraries.org. (2016). Retrieved March 5, 2016, from http://www.actforlibraries.org/how-does-snow-form-4

[2] How do snowflakes form? Get the science behind snow | National Oceanic and Atmospheric Administration. (2015, January 30). Retrieved March 5, 2016, from http://www.noaa.gov/stories/how-do-snowflakes-form-science-behind-snow

 [3] Editor, W. G. (2012, March 5). How do large snowflakes form? | The Weather Guys [The Weather Guys]. Retrieved from http://wxguys.ssec.wisc.edu/2012/03/05/how-do-large-snowflakes-form/

 [4] How is snow formed? - Met Office. (n.d.). Retrieved April 13, 2016, from http://www.metoffice.gov.uk/learning/snow/how-is-snow-formed