



## Weather Studies In the Rain

by Sabrina Carlson

On September 20, 2016, 45 students from the 6th grade MIGHTY Team at Sinagua Middle School made a visit to Aspen Corner to hike the Arizona Trail's

San Francisco Peaks Passage and to learn about the impact of landforms on weather and cloud formation.



Showing off their "trash bag couture" trying to stay dry.

With grey clouds overhead and drizzle coming and going throughout the morning, it was a perfect day for the topic at hand. We started the day hiking the trail and noticing the details along the way. We paused at a lover's fresh

carving on an aspen tree chiseled into the bark. We talked about the potential for viral and bacterial infection for the tree when its skin is broken, similar to infections in our own untreated wounds. We also considered the route markings that the Basque shepherders of our area had for traditional tree carving. They had no carefully maintained trails, maps or GPS devices. Rather, they followed the routes marked by those who came before them, etched onto trees to mark the path.



Preparing to be air molecules.

After our lunch break, with the rain coming harder than before, we sought partial shelter under a stand of aspens to learn about the effects of changing altitude and air pressure on the atmosphere and cloud formation. We first reviewed the difference between weather and climate and observed that the weather today was indeed very rainy. Next we performed the "dance of the molecules" in which we acted out the actions of water molecules forming ice, liquid and vapor as they heat and cool.

After our review of the states of matter, we pondered the questions, "Where do we tend to see the most clouds in Flagstaff?" and "Why do we see them where we do?" Everyone agreed that over the mountain was the most likely place for clouds. We split into groups to ponder a "concept cartoon." Concept cartoons are a popular formative assessment strategy that get the students thinking and talking, while helping the teacher identify possible misconceptions the students might have. The cartoons contained three possible explanations for the tendency of clouds to form over mountains more than other places.

After sharing their thoughts on what they thought might be happening, we acted out what happens to gasses in the air as wind pushes warm, moist air masses up a mountainside. The students played the part of gasses, while balloons served as water molecules. The “gas” students were charged with keeping the balloons in the air by hitting the balloons to other students. Each time I called out a cue they had to take three steps further away from each other causing them to lose heat and the ability to keep the water suspended. Anytime a balloon hit the ground, the other students who acted out the droplet nuclei, collected the molecules to form a raindrop. It was a fun raucous game and everyone left with a better understanding of why mountains create rain clouds.



A clever place to camouflage in the fog.

With a bit of time left before we needed to return to school, the students all played a game of “camouflage,” a favorite tag game in which some students are predatory animals trying to spot their prey, while the prey animals try to keep an eye on the predator without being detected.

While we all got a little wet, we had a great deal of fun and learned a little bit too.



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