**Evaporation Experiment**

**All Grades**

**Background:** Through the evaporation process, two percent sugar sap is transformed to approximately 66% sugar syrup. As the sap changes to syrup, the color, taste, texture, and other physical characteristics change. This exercise is designed to observe and document these changes.

**Procedure:**

1. Collect sap from your buckets, and refrigerate until there is approximately 5 gallons.
2. Pass sap through the pre-filter.
3. Fill the evaporator (electric pot) with sap to about an inch below the edge; make initial observations on corresponding grade-level work sheet.
4. Run the evaporator at a temperature so that the sap is consistently boiling.

-The sap will evaporate about 8 cups of liquid per hour at a full boil, you will need to add sap approximately every 4 hours.

1. Make another set of observations around mid-day; add more sap to the evaporator.
2. Make a final set of observations at the end of the day and turn off the evaporator and store the product.
3. Repeat this for as many days as you would like or until you reach syrup.

**Syrup is achieved when your sap boils at 7°F above the boiling point of water on that given day. The specific temperature of syrup can change, but is normally around 219°F.**

1. Compile all the observations to understand the overall trends.

**NOTE: The sap may begin to foam as it boils. To settle the foam, add a small amount of fat, either butter pat or small amount of cooking oil. The process of evaporation, by nature, creates a lot of steam; setting up the evaporator near some type of ventilation is advised.**

**Trouble Shooting:** The most common problem encountered is overcooking the sap. If you burn the sap, there is little to do besides clean the pot and try again. If you overcook the sap and it hardens upon cooling, you have successfully made maple candy. You can go ahead and eat it as is, or dissolve the hardened sugar into water and the sap again. This round of syrup may be a little darker than other batches because it has spent more time over the heat, but it will still be maple syrup.

**Educational Tips:**

-For younger grades, this is a good time to have children work on their use of adjectives, especially for the color and texture observations.

-Younger students may only want to do a single observation for each day.

-Older students can implement a set measurement, such as how quickly the syrup drips from a spoon or the Brix content. This will get a more consistent, detailed set of data.