**White vs. Yellow Popcorn**

With Junior Beavers, only work with length, mass, and time. Do not use percentages, but do make comparisons such as “greater than”, “less than”, “equal/same”.

**OBJECTIVE:**

Learn/practice measurements of popcorn in order to make comparisons.

**TERMS TO GO OVER:**

Length

Centimeter

Millimeters

Mass

Grams

Volume

Milliliters

Seconds

Percentage

**PRE-LAB DEMONSTRATION MATERIALS:**

* Beaker
* Balloon
* Hot plate
* Water
* Bin
* White and yellow popcorn kernels (unpopped)
* Razor

**PRE-LAB DEMONSTRATION PROCEDURE:**

1. Boil water in a beaker
2. Place balloon over the mouth of the beaker
3. Remove beaker from hot plate and place partially submerged in a bin of cold water
4. Explain expansion and condensation process of water to cause balloon to invert
5. Cut open kernel and show inside, pointing out the shell compared to inside
6. Say how it pops: small amount of water turns into steam when exposed to high temperatures, causing the shell to pop and the kernel to turn inside out.
7. Have students within their own table color group form partners of 1 or 2 other people.

**LAB MATERIALS:**

* Yellow and white popcorn
* Cups/bowls
* Small bags (enough for each group)
* Permanent marker
* Ruler
* Calculator
* Funnel
* Scale
* Graduated cylinder
* Timer
* Popcorn popper

**GROUP LEADER/VOLUNTEER/TLC ROLE**

Distribute bags and write students’ initials on them once they have 100 popcorn kernels, help students use their measurements properly, make-up a data table on the chalkboard for students to write their measurements upon (*Figure 1)*, and assist with popping of popcorn.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Color | Team Initials | Seed length (mm) | Average length | 100 seed mass (g) | 100 kernel volume (mL) | 100 popped volume (mL) | Popping time (s) | Percentage popped |
| [of popcorn] | [A. B., C. D.] |  |  |  |  |  |  |  |

**SETUP PROCEDURE**

1. Create data table on board
2. Set out a few calculators beside board
3. Set out rulers, funnels, scales, and graduated cylinders on students’ workspaces
4. Set out popcorn popper and timer on separate table (to lessen distraction)
5. Set out cups of white/yellow popcorn (separate) at each table
6. Warm-up popper

**LAB PROCEDURE**

1. Count out 100 popcorn kernels of one color
2. Have teacher to give them a bag and write their initials on it
3. Measure out the length 5-10 randomly-chosen kernels
4. Use the calculator to average the lengths of the kernels
5. Measure all 100 kernels on scale at once
6. Measure volume
7. Go to popping station and have teacher pop the kernels while student(s) time (Have students stop timer when there is a 5-second gap between the pops, and then subtract 5 seconds from the total time.)
8. Measure volume of popped corn
9. Count the number of popcorn remained unpopped and calculate the number of popped. Then find the percentage of popped popcorn.
10. As a class, compare the white popcorn to the yellow popcorn.