



SCIENCE

TITLE: Temperature Comparison Test

SUBJECT: Science

GRADE LEVEL: 5-8

MATERIAL(S): 16 bags of popcorn (from same source), microwave popcorn bowl, microwave oven, 2 quart measuring cup, 1 cookie sheet, ruler

OBJECTIVE(S): To determine storing temperatures for popcorn

OVERVIEW:

1. Draw out a data chart to record final results. Your control variables will be *Refrigerator Samples 1-5, Freezer Samples 1-5 and Counter Samples 1-5*. Your results will include *Volume, Number of Unpopped Kernels and Popped Kernel Size*.
2. Measure out a small sample of popcorn in each bag (i.e. 50 kernels). Place 5 of the bags in the freezer, 5 in the refrigerator, and 5 on the counter top. Use the remaining bag to test your microwave for cooking time required, described in Step 5.
3. Leave the bags in the freezer and refrigerator and at room temperature for 24 hours before beginning this experiment.
4. Preheat microwave oven by placing a cup of water inside oven and heating it for 1 minute. Remove the cup carefully before popping popcorn. Do this only for the first bag.
5. Pour the popcorn from the extra bag into the microwave popcorn bowl, place in the microwave and set on High (Full Power) for 5 minutes. When you hear the popping rate slow to 2-3 seconds between pops, stop the microwave and remove the bowl. Note the time that it took, and set the microwave for that time for each of the bags in each step.
6. Take one bag of popcorn out of the freezer, pour contents into the microwave popcorn bowl, place in the microwave, set time according to Step 5, and let it pop until the time is up.
7. Remove the bowl carefully, and wait until popping stops. Open and empty contents into the 2-Quart measuring cup. Measure the amount and record under Volume.
8. Pour the same contents onto the cookie sheet. Separate unpopped kernels from popped kernels. Record under Number of Unpopped Kernels.
9. Using a ruler, measure the size of a popcorn kernel. Record under Popped Kernel Size.
10. Repeat steps 6-9 with a bag of popcorn from the group in the refrigerator.
11. Repeat steps 6-9 with a bag of popcorn from the group on the countertop.
12. Continue to test one bag at a time, first with a freezer bag, then a refrigerator bag, then a countertop bag, until all bags are used up.
13. Compare the information for the each original group of 5 bags and note your observations on the data chart.

Questions:

- 1) Which resulted in fewer unpopped kernels: frozen, refrigerated or room temperature kernels?
- 2) Which group resulted in higher volume of popped corn?
- 3) At what temperature should popcorn be stored for maximum yield?