PROCEDURE

1. Measure the mass of a 250 mL beaker. Record the mass in your data table.
2. Add a small amount of vegetable oil to the beaker to coat the bottom of it. Measure the mass of the beaker and oil. Record the mass in your data table.
3. Add 20 kernels of brand A popcorn to the beaker. Shake the beaker gently to coat the kernels with oil. Measure the mass of the beaker, oil, and popcorn. Record the mass in your data table.
4. Subtract the mass found in step 2 from the mass found in step 3 to obtain the mass of 20 unpopped kernels. Record the mass in your data table.
5. Cover the beaker loosely with the aluminum foil. Punch a few small holes in the aluminum foil to let moisture escape. These holes should not be large enough to let the popping corn pass through.
6. Heat the popcorn until the majority of the kernels have popped. The popcorn pops more efficiently if the beaker is held firmly with tongs and gently shaken side to side on the wire gauze.
7. Remove the aluminum foil from the beaker and allow the beaker to cool for 10 minutes. Then, measure the mass of the beaker, oil, and popped corn. Record the mass in your data table.
8. Subtract the mass in step 7 from the mass in step 3 to obtain the mass of water that escaped when the corn popped. Record the mass in your data table.
9. Calculate the percentage of water in the popcorn.
10. Dispose of the popcorn in the designated container. Remove the aluminum foil, and set it aside. Clean the beaker, and dry it well. Alternatively, if your teacher approves, use a different 250 mL beaker.
11. Repeat steps 1–10 for brand B popcorn.
12. Repeat steps 1–10 for brand C popcorn.

CLEANUP AND DISPOSAL

13. Dispose of popped popcorn and aluminum foil in containers as directed by your instructor. Do not eat the popcorn.
14. Clean beakers. Return beakers and other equipment to the proper place.
15. Clean all work surfaces and personal protective equipment as directed by your instructor.
16. Wash your hands thoroughly before leaving the laboratory.

ANALYSIS AND INTERPRETATION

1. **Applying Ideas:** Determine the mass of the 20 unpopped kernels of popcorn for each brand of popcorn.
2. **Applying Ideas:** Determine the mass of the 20 popped kernels of popcorn for each brand of popcorn.
3. **Applying Ideas:** Determine the mass of the water that was lost when the popcorn popped for each brand.

CONCLUSIONS

1. **Analyzing Data:** Determine the percentage by mass of water in each brand of popcorn.
2. **Inferring Relationships:** Do all brands of popcorn contain the same percentage water?

EXTENSIONS

1. **Designing Experiments:** What are some likely areas of imprecision in this experiment?
2. **Designing Experiments:** Do you think that the volume of popped corn depends on the percentage of water in the unpopped corn? Design an experiment to find the answer.