

Juliette Brand Foods

Product Development Division – 2994 Effington Lane – Thornton, NE 68181

August 15

Director of Research
CheMystery Labs, Inc.
920 N. Capital
Mitchell, SD 57301

Dear Director of Research:

Juliette Brand Foods is preparing to enter the rapidly expanding home popcorn market with a new popcorn product. As you may know, the key to making popcorn pop is the amount of water contained within the kernel.

Thus far, the product development division has created three different production techniques for the popcorn, each of which creates popcorn with differing amounts of water. We need an independent lab such as yours to measure the percentage of water contained in each sample and to determine which technique produces the best-popping popcorn.

I've enclosed samples from each of the three techniques, labeled "technique beta," "technique gamma," and "technique delta." Please bill us when the work is complete. We would appreciate your efforts in keeping costs low.

Sincerely,

Mary Biedenbecker

Mary Biedenbecker
Director
Product Development Division

Memorandum

CheMystery Labs, Inc.
920 N. Capital
Mitchell, SD 57301

Date: August 20

To: Chem Teams

From: President Kiewel

Your team needs to design a procedure for determining the percentage of water in three samples of popcorn. Some of the popcorn was damaged in mailing, so each team will only have 80 kernels of popcorn per technique. You should perform at least three trials on each type of popcorn so be sure to use your samples carefully!

Popcorn pops when the water inside the kernel turns to steam and expands. The steam escapes and the water is lost. We can calculate the percentage of water in the popcorn by dividing the mass of water lost by the original weight of the popcorn (then x 100).

When finished, I will expect the following:

- A letter addressed to Ms. Biedenbecker at Juliette Brand Foods. The letter should briefly describe your analysis procedure and should summarize your findings and suggestions.
- A lab report. The report should include a detailed procedure, data tables, and a bar graph comparing the average water content in the three types of popcorn.
- A line-item invoice. Use the list below to develop an easy to follow bill that can be sent to Juliette. Remember, keeping our costs low may help us to attract more business in the future.

Material Costs:

Lab Space	\$15,000/day
Disposal Fee	\$2,000/gram
Oil	\$500/ml
Aluminum Foil	\$100/cm ²
Cleaning materials	\$1,000
Balance	\$5,000
Beaker tongs	\$1,000
Bunsen burner	\$10,000
Beaker/Flask	\$1,000 each
Graduated Cylinder	\$1,000
Safety Fines	\$20,000/incident

Popcorn Rubric

1. Letter
- 5pt - Professional and complete
 - 4pt – Professional with some missing info.
 - 3pt - Hand-written and complete
 - 2pt - Professional but poorly done
Hand-written with some missing info.
 - 1pt - Hand-written and poorly done

2. Report: Procedure: 1 to 5 points same as letter

- Tables:
- 5pt – Professional with correct values, includes calculations
 - 4pt – Professional with correct values, missing some calculations
Hand-written with correct values, includes calculations
 - 3pt – Professional with some incorrect values
Hand-written with correct values, missing some calculations
 - 2pt - Hand written with some incorrect values
 - 1pt - Poorly done

- Graph:
- 5pt – Professional
 - 3pt - Hand-written but nicely done
 - 1pt - Poorly done

3. Invoice:
- 5 pt - Professional with correct values
 - 3 pt - Professional with some incorrect values
Hand-written with correct values
 - 1 pt - Poorly done

Lab Points (10) = _____

Report Points (25) = _____

Total (35) = _____