Lab Framework

Text: Cord Applied Mathematics

Unit number and title: 9 Using Ratios and Proportions

Short Description: Inverse proportion: Temperature variations

Developed by: Denise Copeland

Contact Information: YV-Tech, Yakima, WA 509-573-5004

Date:January 19, 2008

Lab Title

Melting Marshmallows

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

  Students will observe that as the temperature of the oven increases, the length of time needed to melt a marshmallow will decrease

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

  Read and follow directions
  Data collection skills
  Use of stop watch
  Ratio
  Proportions

- **Vocabulary**

  Melting point
  Inverse proportion

- **Materials List**

  Cooking Lab with multiple ovens/ toaster ovens/ or microwaves

- **GLEs (State Standards) addressed**

  Math: 1.1.4 Understand the concept of inverse proportion and apply direct and inverse

  Reading: 1.3.2 Interpret vocabulary critical to the meaning of the text
  2.4.1 Extend information beyond the text, make generalizations, draw conclusions, apply information,

  Writing: Write to communicate ideas effectively

- **Leadership Skills**

  Work in groups of 3 or 4 to collect data; Discuss data and ways to present information on a graph., Discuss conclusions

- **SCAN Skills/Workplace Skills**

  Be on task; work cooperatively with team members; complete the task in the time allotted;

- **Set-up information**

  Arrange for lab setting for a class period; Turn 6 ovens on to varying temperatures: 300, 325, 350, 375, 400, 425. Ideally, each oven would have been checked for accuracy:

Get supplies: marshmallows, foil squares, graph paper, stop watches
Copy data collection sheet;

- **Lab organization**(-Grouping/leadership opportunities/cooperative learning expectations;

Divide class into groups of 3 students: Assign each student to the following temperatures: 300 and 425, 325 and 400; 350 and 375 degrees. Each student will take a marshmallow on a foil square to an oven of a different temperature . When the oven is preheated, place the foil on the middle rack of the oven. Using the stop watch, record the time in seconds until the marshmallow stops expanding and starts to melt. Carefully remove the foil and discard. Repeat with the second oven temperature.

- -**Timeline required)**

1 hour

- **Teacher Assessment of student learning** (scoring guide, rubric)

Data collection sheet and Line graph of findings with conclusions

- **Summary of learning** (to be finished after student completes lab)

-discuss real world application of learning from lab
-opportunity for students to share/present learning

- **Optional activities**
- **Career Applications**

Transportation, Food Preparation, Engineers, Mechanics

LAB TITLE:_____
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
  Understand the concept of Inverse Proportions and what that looks like on a line graph

- **Grouping instructions and roles**
  Divide class into groups of 3 students: Assign each student to the following temperatures: 300 and 425, 325 and 400; 350 and 375 degrees

- **Procedures** – steps to follow/instructions
  . Each student will take a marshmallow on a foil square to an oven of a different temperature . When the oven is preheated, place the foil on the middle rack of the oven. Using the stop watch, record the time in seconds until the marshmallow stops expanding and starts to melt. Carefully remove the foil and discard. Repeat with the second oven temperature
  Working in your group, share information about temperatures and time.
  Discuss the design of a line graph: title? Labels? Units used?
  Each student construct their own graph on graph paper and label appropriately.
  Compare graphs and discuss any differences.
  Discuss what you have observed from this lab.

Write a conclusion about what you have learned from this lab

Lab Data Collection

Student: _____ **Date:** _____

Unit: Inverse Proportions

Lab Title: Melting Marshmallows

Criteria: Write the problem/objective in statement form

Students will observe the time it takes for marshmallows to melt in ovens at different temperature.

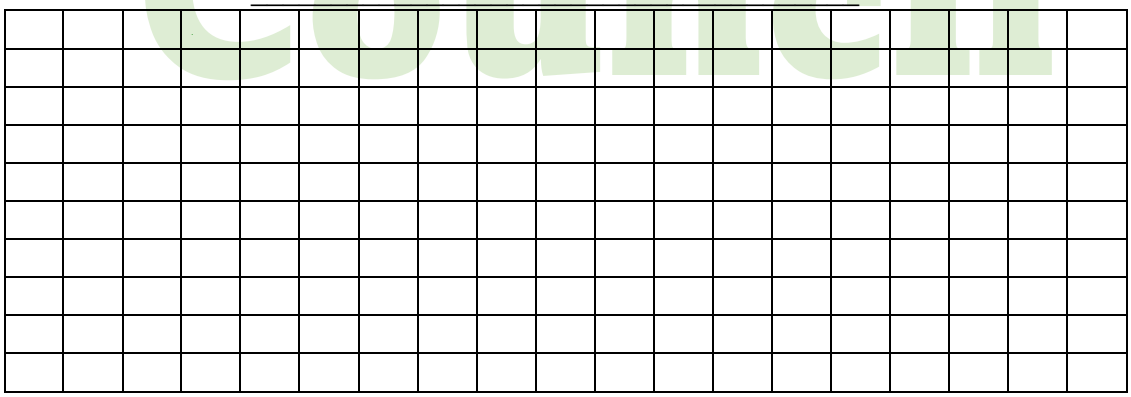
Data Collection: Record the collected/given data

Oven Temperature	Seconds to Melt down
300	
325	
350	
375	
400	
425	

Calculations: Complete the given calculations to solve for an answer(s)

Accurately record the time the marshmallow is in the oven until it puffs to a maximum and then collapses. Time will be considered As soon as it reaches the breaking point,

Use the grid below to draw a line graph of your data.



Summary Statement: Write a conclusion about what you have learned from about inverse proportions?

Other Assessment(s)