Student's Name: **Teacher's Name:**

OVERVIEW: To help students have an understanding of energy in food by measuring the energy in calories.

OBJECTIVES: Students will be able to :

1.   Explain what a calorie is.
2.   Determine if one food may have more calories than another.
3.   Explain how calories in food will relate to the amount of energy they will get from food.

RESOURCES/MATERIALS:
1.   Ring stand or other type of hanger support.
2.   aluminum can.
3.   aluminum foil
4.   clay
5.   straight pins
6.   peanuts, mini-marshmallows
7.   graduated cylinder
8.   Celsius thermometer
9.   matches
10. water
11. paper for charts and calculations by, pencils

ACTIVITIES:
1.   Use ring stand with a hook to hold can put can on hook with tab or other hanger with bottom of can about 6 cm. above ring stand base.

2.   Wrap the ring stand with aluminum foil. Leave an opening to slide clay in under can.

3.   Measure 100 milliliters of water and place it in the can.

4.   Take the temperature of the water. Record your measurement on the worksheet. To find out how many calories are stored in the peanut, we will burn it and use the heat produced to warm some water. Then, knowing how many grams of water were warmed and how many degrees the temperature of the water rose, we can calculate the calories.

5.   Place the head of a pin in a hunk of clay. Place half a shelled peanut on the point. Light the peanut with a match. As soon as it starts to burn on its own, place it under the can in the calorimeter, and allow it to burn.

6. If the peanut sputters and goes out before it looks all burned up, get a new half peanut and freshwater, and start over. When the peanut looks all burned up and goes out, take the temperature of the water again. Record the temperature on your worksheet.

7. Calculate the Calories using the following formula.
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    *Amount of water used = (___milliliters = ___grams)
    *Temperature of water in degrees C before burning
    *Temperature of water in degrees C after burning
    *Difference in temperature
    *calories = (mass of water in grams) x
              (temp.   change in degree C)

    Example:
    10 grams of water are heated 15 degree C;
    calories = (10 grams of water) x (15 degree C)
    calories = 150 calories.

    This calculation is in small calories.  There are
    a thousand calories in a food Calorie, or large
    Calorie.  To convert calories to Calories, divide
    the number of small calories by 1000.

    *food Calories or large Calories =
                              small calories / 1000
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8. Repeat the procedure with a marshmallow, or other food item as directed.