

# LEARNING IN PLACE

## A BAKE DAY SCATTER PLOT

Grade 8 Math

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

In the video, you saw how the Miksch family's oven was used to produce baked goods, and you learned about the use of statistics in understanding baking for the community of Salem during the 18<sup>th</sup> century.

Using what you learned, as well as what you know about statistics, complete the tasks below.

### Task 1: Identifying Variables with Positive and Negative Associations

Henrietta Miksch needs to produce loaves of bread quickly, having just learned that many visitors are coming to Salem today.

1. From the list of variables below, circle the ones that have a **positive association** with the rate at which bread can be produced.

- The number of visitors arriving
- The temperature of the air
- The cost of wheat
- The amount of yeast in the dough

2. From the list of variables below, circle the ones that have a **negative association** with the rate at which bread can be produced.

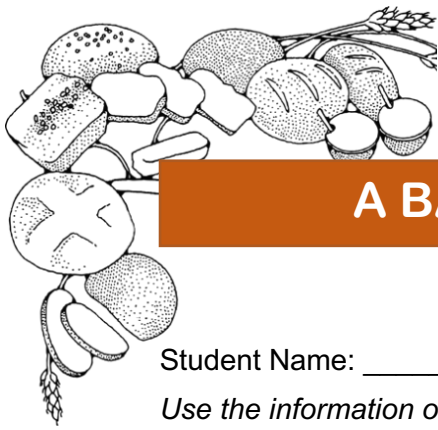
- The percent of humidity in the air
- The temperature of the air
- The amount of liquid in the dough
- The amount of yeast in the dough

### Task 2: Ordering and Calculating Data Sets

The time it takes for a bake oven to heat up depends on the type of wood used to fire the oven. The table below is actual data about heat and wood type.

(See <https://forestry.usu.edu/forest-products/wood-heating> for more details.)

Species	Green Weight (lbs./Cord)	Dry Weight (lbs./Cord)	Heat per Cord (Million BTUs)
Apple	4850	3888	27.0
Birch	4312	2992	20.8
Cherry	3696	2928	20.4
Douglas-fir	3319	2970	20.7
Maple, Silver	3904	2752	19.0
Oak, White	5573	4200	29.1
Osage-orange	5120	4728	32.9
Pine, Ponderosa	3600	2336	16.2
Spruce	2800	2240	15.5
Sycamore	5096	2808	19.5
Walnut, Black	4584	3192	22.2
Willow	4320	2540	17.6



**LEARNING IN PLACE**

**A BAKE DAY SCATTER PLOT, page 2**

Grade 8 Math

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Use the information on the previous page to order each species of tree from least to greatest heat per cord in the table below.

Fill in the number of BTUs for each of the tree species.

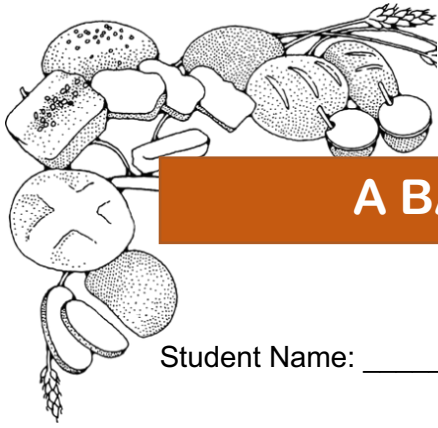
Find the ratio of green weight to dry weight for each species and record it (to the nearest hundredth) in the third column.

SPECIES OF TREE	HEAT PER CORD (MILLIONS OF BTUs)	RATIO OF GREEN WEIGHT : DRY WEIGHT

**Task 3: Construct a Scatter Plot**

The town of Salem has access to many of the species of trees listed above but does not want to use lots of labor to move the heavy loads of wood. Before chopping down trees to use in firing the bake oven, the town leaders want to determine if there is a relationship between the weight of newly chopped trees (green wood), the weight of that same wood dried, and the amount of heat produced. You are asked to investigate possible associations.

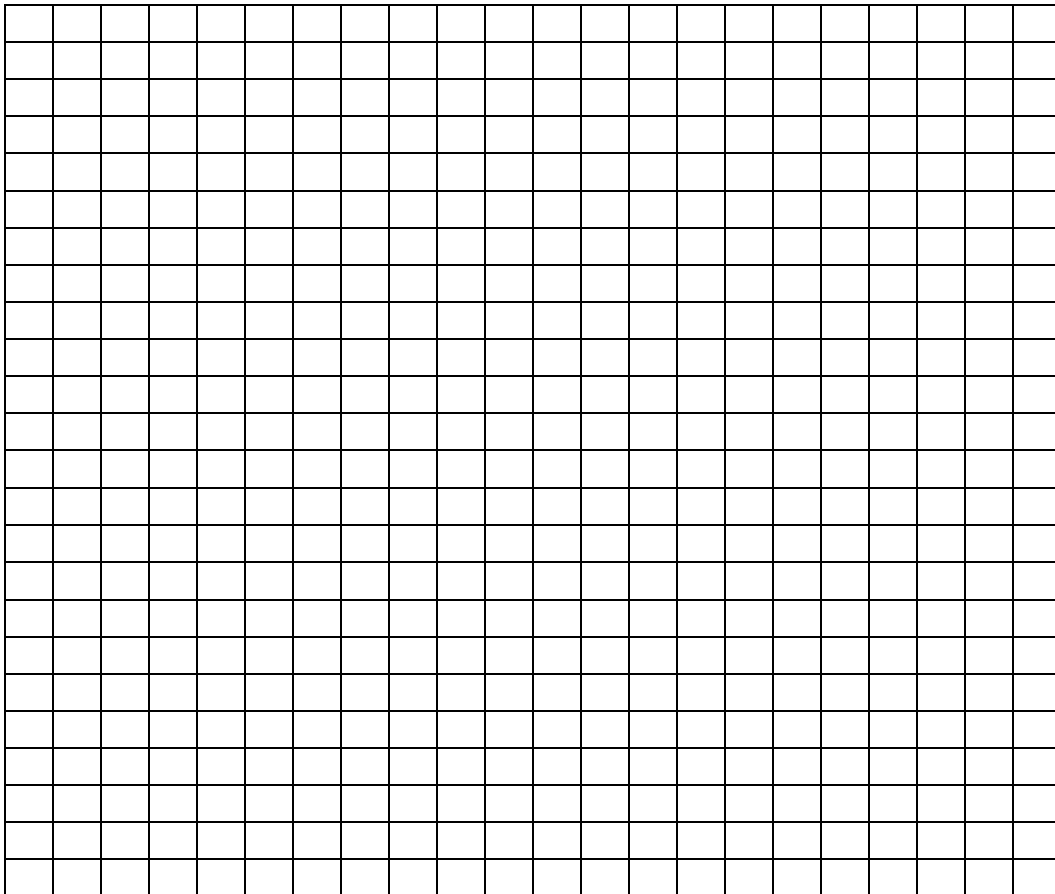
Using the ratio of green weight to dry weight and heat per cord, construct a scatter plot on the next page. Be sure to label each axis, listing the units of measure. Also remember to give your scatter plot a title. Do not connect the dots – just plot them.



# A BAKE DAY SCATTER PLOT, page 3

Grade 8 Math

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_



After constructing the scatter plot, answer these questions:

1. Does there appear to be an association between the ratio of green to dry wood and heat per cord? If so, is it positive or negative? \_\_\_\_\_
2. Do you see evidence of a linear association? \_\_\_\_\_ If so, draw a trend line that passes through or near as many data points as possible.
3. Circle any outliers.

