

FAIRCHILD TROPICAL BOTANIC GARDEN

Garden Math Measuring and Graphing Leaves

Leaves come in all shapes and sizes. Take a walk through the garden and notice how many different shapes and sizes you will see.

The main purpose of leaves is to create food for the plant through the process of photosynthesis. In order for plants to make food, they must collect lots of solar energy in the form of sunlight.

How do you think shape and size affect the amount of light a leaf can collect? How can we measure the amount of surface a leaf has to collect sunlight?

Materials needed:

Leaves

Tape or Tracing paper and pencil

Small objects of same kind and size, such as dried beans (lima beans work well)

Ruler (optional for extension activity)

String (optional for extension activity)

1. Select a leaf that fits onto a piece of paper. Either tape the actual leaf to the piece of paper or trace the outline of the leaf onto the paper.
2. Look at one of the objects that is the measuring unit, and try to guess, or estimate, how many it will take to fill the entire leaf area.
3. Place measuring units (beans) side by side inside the area of the leaf. Once there are 10 beans placed inside the area, pause to re-evaluate if the first estimate was realistic, or if it should be revised.
4. Continue filling in the leaf area until it is covered with a flat layer of beans.
5. Count the beans. You may count in groups of 10's, 5's and 1's.

How many beans did it take? How close were the estimates?

Extension Activities:

- Trace the leaf onto graph paper. Learn to count units on the graph paper.
- Use a ruler to calculate how big the squares are on the graph paper grid, and convert to actual centimeters or inches of leaf area.
- Use string to measure the perimeter of the leaves.
- Create a graph of all of the leaf areas and perimeters measured by the entire class and identify the smallest, the largest and the average leaf area.