

## Activity: Twig Growth Graphing

**Grade Level:** 5

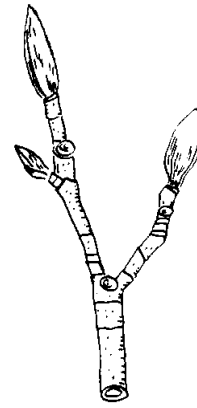
**Major Emphasis:** Data Collection and Graphing

**Major Curriculum Area:** Math and Science

**Related Curriculum Area:**

Refer to Outdoor Education Curriculum Matrix 3-5:

Science  
Mathematics  
Language Arts  
Human Relations



### Program Indicator:

The students will demonstrate their ability to collect, organize and display data and will interpret information obtained from displays.

**Student Outcomes:** The student will:

1. label the major parts of a woody stem.
2. examine and compare the external parts of woody stems by completing a sketch.
3. interpret and construct a graph of the annual growth data of several woody stems using collected data.

### Readiness: (DL2)

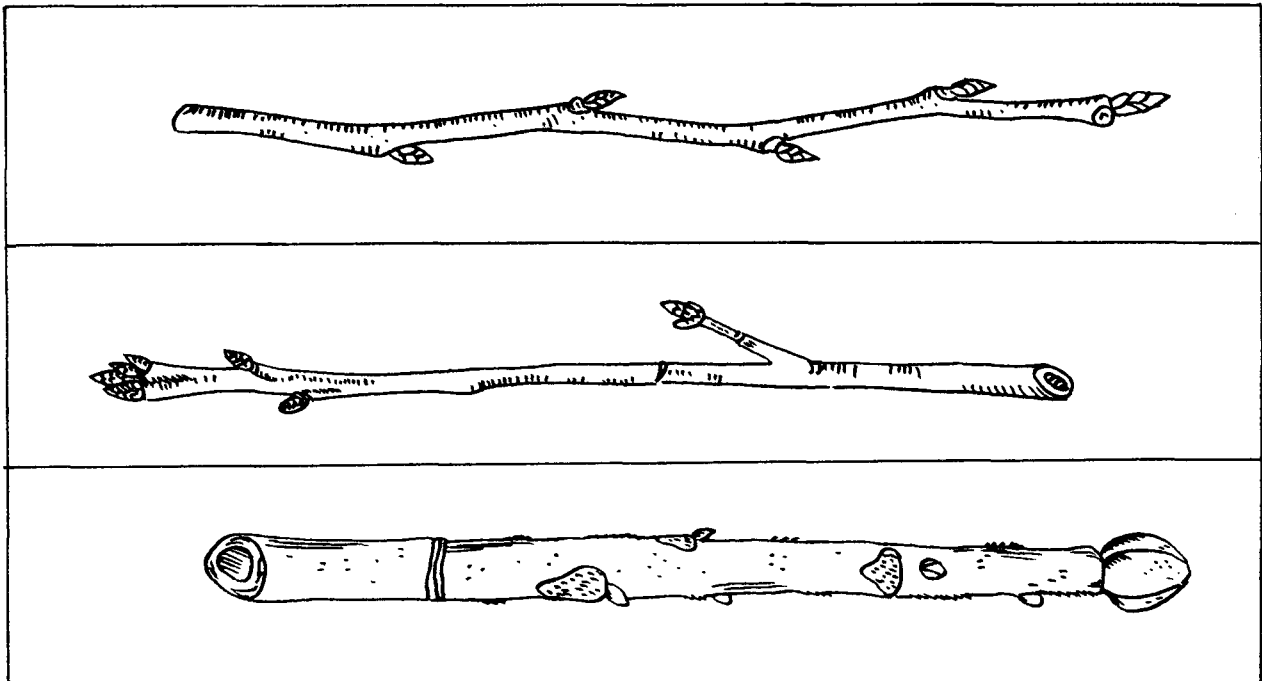
1. Complete the fifth grade Unified Science Unit - Green Plants.
2. Introduce vocabulary:  
deciduous tree      leaf scar      evergreen tree      vein scar  
woody stems      bud scale scar      lenticel      pore  
side bud      terminal bud/end bud
3. During the Unified Science Unit on Green Plants, plant green bean seeds. Once the plants have sprouted, assist student in marking reference points at end of stem to observe growth patterns.
4. Discuss differences between deciduous and evergreen trees.

### Materials:

|                                  |   |
|----------------------------------|---|
| cloth or plastic measuring tapes | poster board/100 square paper               |
| hand lenses                      | scissors                                    |
| crayons or magic markers         | various colors of construction paper strips |
| <u>Leaf Key of Maryland</u>      | (about 1-12" wide)                          |
| Set of laminated leaf specimens  | Supplements A, B, C & D                     |
| Set of sample twigs              | Twig Parts Poster                           |
| glue                             |   |



6. On Supplement D, have students make drawings of a stem of each of the tagged trees. Label the main parts of each stem; name the kind of stem. (Refer to Figure 1)



**Fig. 1: Sample drawings of Stems**

7. In small groups, graph the growth of the tagged trees. Use a different color construction paper strip for each year, counting backwards from the current year. Use the information from the chart on Supplement C. Strips will be cut to the appropriate length and used to make a bar graph for each type of tree observed. (Refer to Figure 2) (DL4)

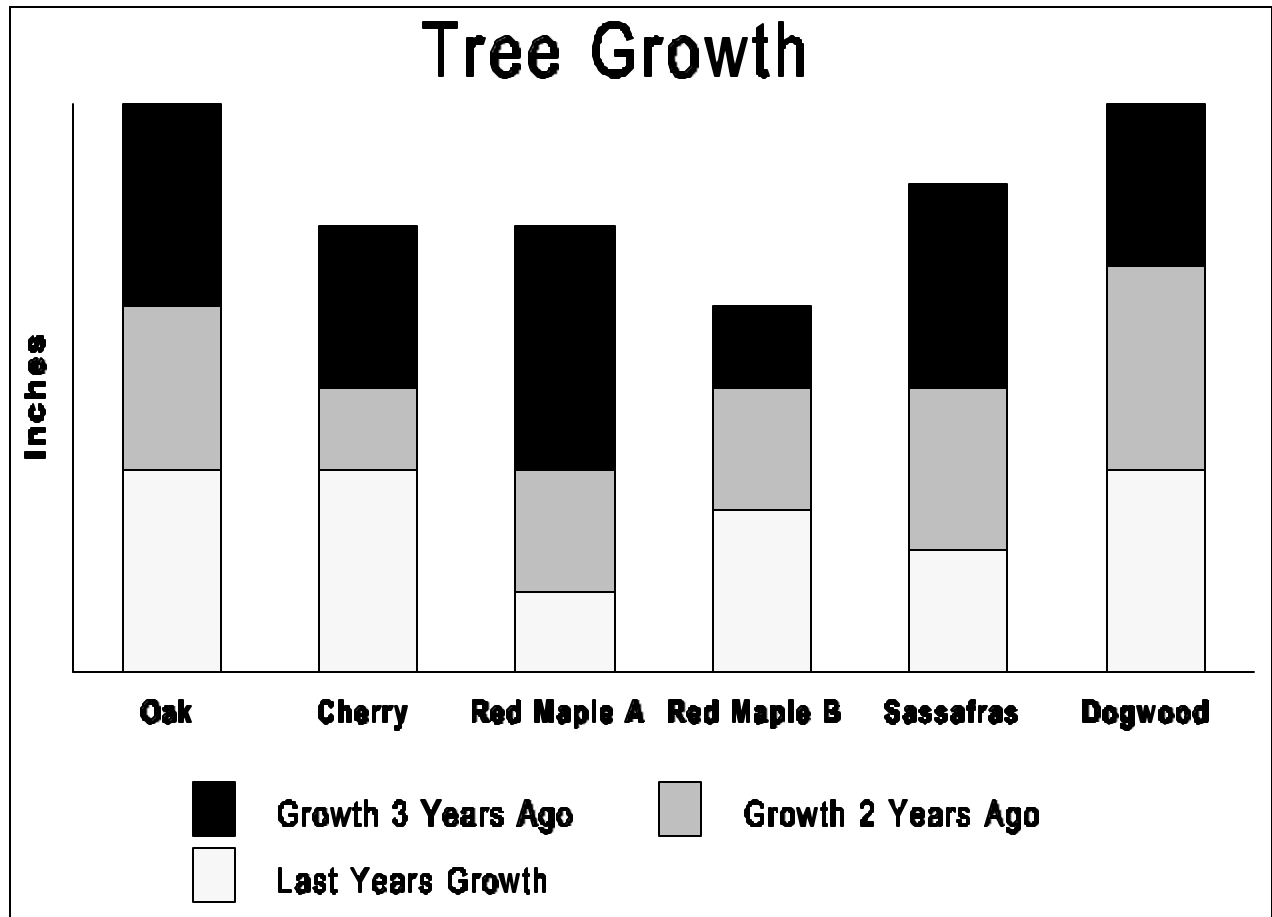


Fig. 2: Sample Bar Graph Showing Twig Growth

### Summary:

1. Which tree showed the most growth in the last three years; the least?
2. Hypothesize reasons for the difference in the amount of growth. How can you test your hypothesis?

### Follow Up:

1. Have students write a paragraph describing reasons for different growth rates of woody plants from year to year.
2. Observe growth of a particular stem of a tree on school grounds for the rest of the school year.
3. Practice using Leaf Key of Maryland with specimens at the school site.
4. Have students decide which tree they would plant at their school and give reasons why. **(DL3)**

### Extension Activities:

1. Adopt-A-Tree
  - a. List basic characteristics of a tree and make observations during an extended period of time (several months or a school year).
  - b. Write a letter to a friend 3-4 times during the year describing the adopted tree.
  - c. Draw pictures during the seasons showing what the adopted tree looks like.
2. Show filmstrip "Trees for 2001". Discuss uses and needs for trees.
3. Write a paragraph (group or individual) about the importance of trees in the environment. Illustrate.
4. View "The Lorax" by Dr. Seuss, an imaginary story about a forest that is destroyed. Read the article "Going, Going, Gone?"; a story about the problem facing South America's rain forests. (Refer to Nature Scope: Trees are Terrific!, "Disappearing Trees", pp. 52-55) **(MC)**
5. Use creative thinking, imagination, visualization and oral communications to discover the forest in which they live, including the value of urban trees. (Refer to Growing Greener Cities, "Treeless City", pp. 21-24) **(MC)**
6. Design an advertisement based on their knowledge of tree habitats. (Refer to Arbor Day Guidebook of Activities, Tree Classifieds, p. 45)
7. Have students identify the environmental values of a tree by doing "What's a Tree Worth?" (Refer to Growing Greener Cities, pp. 16-19)

### Teacher Resources:

#### Books:

- < \*Leaf Key of Maryland.
- < \*Project Learning Tree, Supplementary Activity Guide (K-6), pp. 4-6.
- < \*Learning is Out the Door, Jeanne M. Liebegott, Good Apple Activity Book, Grades K-6, pp. 4-6.
- < \*Growing Greener Cities, pp. 16-24.

Filmstrip Kit:

< \*"Trees for 2001", 634.9.

Supplementary Materials:

< \*Ranger Rick's Nature Scope: Trees are Terrific!, pp. 29,31.

< \*Arbor Day Guidebook of Activities, p. 45.