From Buds To Leaves

Nº. 5

PRIMARY

Science | Fine Arts

LESSON SUMMARY

To give students the opportunity to discover and observe how buds grow into leaves.

FORESTS ONTARIO

Focus on Forests

Activity Information

Grade Level: Primary

Estimated Duration: Observations over several days.

Materials: Container of water, two or three deciduous tree or shrub branches with buds, X-acto knife, magnifying glasses, drawing paper, camera (optional).

Setting: Indoors

Key Vocabulary: Leaf scar, bud scale, lateral bud, opposite, alternate.

Teacher Background

Buds are an adaptation to allow trees to survive cold winters. In the fall of the year, cooler temperatures and shorter days trigger a change in the cells at the base of deciduous leaves. The cells die and form a barrier to the movement of water into and out of the leaves The leaves eventually fall off, leaving a leaf scar. The buds at the base of the leaf scar contain the embryonic leaves of next year's growth. Temperature is the stimulation that causes buds to begin to open. The critical temperature for most deciduous trees is 6 degrees Celsius (43 degrees Fahrenheit). When springtime temperatures go above this point the tree begins to become active. It takes several days of these temperatures to cause most buds to begin to open. This slow process protects the tree against nighttime frosts. The flowers of the tree are contained in the buds.

ACTIVITY

Step 1 In late winter or early spring, cut a few healthy, small branches from a deciduous tree or shrub. Forsythia works well (if available). Try to select species with large buds. Have the students observe and discuss what they see. Draw their attention to the leaf scars left by the previous years leaves. Note the location of the buds. Distinguish between the terminal bud and lateral buds lateral buds produce only new leaves, the terminal bud also provides for growth of the branch). Have the students examine the outside of the buds with magnifying glasses. Discuss the terms opposite and alternate for the arrangement of the lateral buds.

Step 2 Have the teacher or another adult use the X-acto knife to slice open a terminal bud from top to bottom. Lay open the two halves and have the students observe them with magnifying glasses. Note the bud scales, leaves and growing tip. Have students draw diagrams of what they see.

Step 3 Place the remaining branches in a container of water. Observe the changes which occur over a period of several days. Have the students draw pictures of the changes each day or use the camera to take a photo each day. Discuss what factors caused the buds to swell and open (water and heat).

Extensions

Bring in a branch from a coniferous tree. These too have buds, which are clustered at the top of the branch. Repeat the experiment of placing the branches in water and observing them for several days.

Invite a local tree grower, farmer or researcher into the classroom to discuss the topic of grafting.

Try to get your branches to root. Placing some branches such as forsythia in water also stimulates the branch to produce rootlets. Once this process has begun, plant the branch in a flowerpot. Care for it as you would any potted plant.