

the Naturalist's Notebook

for K-5 Educators

Young Naturalist's Notebook: Winter Photography

Each season, students learn skills in art and writing that help them become better observers of plant life. Keeping a collection of their work helps them build understanding of the variety of plant life in the Piedmont and around the world.

The winter landscape is a study in contrast: red cardinals in white snow, evergreen hollies in gray fog, black tree trunks in a frosty silver lawn. Winter photography highlights these contrasts and focuses attention on composition, without the distractions of other seasons. It also encourages students to observe the persistence of life in a seemingly lifeless season.

If a digital camera is available, each student can take multiple photos and choose the best one. Single-use cameras also work well and can be used by individuals or shared by groups. A class discussion of photographs helps students determine which compositions are the most artistically pleasing and scientifically informative. Photographs can be accompanied by an artist's statement. Many practicing artists employ this concept when they make detailed descriptions to accompany their work. Statements include information on the location, special techniques employed, and conditions that inspired them.



Reading a Twig

We can learn a lot about a deciduous tree, even after it has lost its leaves. Choose a twig to examine.

Leaf scars - A leaf that falls off leaves a scar. Usually, the scar has a triangular or shield shape. How many leaves have grown on the twig?

Dormant buds - Most deciduous trees produce leaf and/or flower buds for the next season's growth by the end of the fall. Flower buds are often rounded; leaf buds are slender and pointed. How many leaves and flowers will grow on the twig next year?

Lenticels - The small dots and slash marks on twigs are the lenticels, openings through which carbon dioxide enters and oxygen exits the twig. How many lenticels can you see on the twig?

Branch scars - Each band represents a year of growth. How old is the twig?

A Young Naturalist's Notebook
sample entry

Naturalist's Notebook for K-5 educators, a quarterly publication of Reynolda Gardens of Wake Forest University, enriches teachers' understanding of plant life of the Piedmont and around the world. Lesson plans designed by teachers to accompany each issue integrate plant science, art, and writing.



As the Twig is Bent: Tree Shapes

In winter, the shapes of deciduous trees are more apparent than in other seasons, when their trunks and branches are obscured by leaves. Sometimes the growth patterns seem very odd, until we understand how they developed. Like all living things, trees respond to environmental forces that surround them. In trees, these responses cause visible changes in tree growth.

Competition for Sunlight

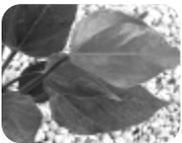
Several years ago, storms toppled several large hardwood trees in the woods of Reynolda Gardens. Suddenly, sunlight was cast on plants below, which had been shaded by the canopy of leaves these trees had created. Tree species that thrive in the shade, like dogwood and redbud, languished or even died. Those that thrive in sunlight, like the tulip tree, began to grow rapidly. Some of the slower growing trees, like sourwood and red maple, grew in strange configurations, reaching first one way and then another in their search for sunlight as the trees around them grew at different rates.

Mechanical Damage

During the storms, some large trees fell across smaller trees but did not kill them. As the damaged trees continued to grow, they stretched new limbs around the fallen trees. Because there was so much pressure from the weight of the fallen trees, the damaged trees that survived will retain the shape that resulted from the damage even after the tree that caused the damage is removed or decays.

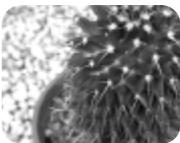
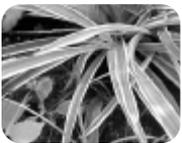
Plants for the Classroom

Winter is the best time to enjoy and learn about plants from other parts of the world. The plants recommended here should grow well in light levels normally present in a classroom with windows. Fluorescent light systems can be purchased inexpensively for classrooms without windows.



SPIDER PLANT / Lily family
Scientific name: *Chlorophytum comosum*
Native to South Africa

BUTTERFLY PALM / Palm family
Scientific name: *Chrysalidocarpus lutescens*
Native to Madagascar



BURN PLANT / Lily family
Scientific name: *Aloe vera*
Native to South Africa

PIGTAIL PLANT / Arum family
Scientific name: *Anthurium* species
Native to Central and South America

WEEPING FIG / Mulberry family
Scientific name: *Ficus benjamina*
Native to Asia and South Pacific

CACTUS / Cactus family
Scientific name: many species available
Native to North and South America

Throughout the Piedmont, there are woods, meadows, and wetlands like those at Reynolda Gardens. They're in parks, playgrounds, and lawns. Plants from all parts of the world grow in the formal gardens and greenhouses at Reynolda Gardens, just as they grow in home and school gardens and on home and classroom windowsills. The places and plants of Reynolda Gardens serve as examples that help us observe and learn about the plants we see every day.

Understanding Plant Care

Many common houseplants are long-lived perennials. Understanding their life cycles and the environment in which they originated helps us grow them successfully.

water...

Why do watering requirements change throughout the year?

Most plants have periods of active growth, followed by a resting stage and dormancy. Water needs vary according to the life cycle of the plant.

How do I know where a plant is in its life cycle?

When a plant is entering rest or dormancy, flowering slows down, new growth and flowering are sparse or absent, and soil begins to dry out slowly between waterings. As it emerges from this period, new growth appears, and soil gradually begins to dry out more quickly.

How do I determine the moisture content of the soil?

Feel the soil about an inch below the surface.

What happens if a plant receives too much water during a period of rest or dormancy?

Since plant roots are able to absorb very little water at this time, they may become waterlogged. Leaves may appear to wilt or develop rotted spots on their surface, and the plant may die.

What if it receives too little water during a period of active growth?

Usually, it will continue to grow with reduced vigor, but plants with great water needs will die.

light...

Why do plants have different light requirements?

Plant cells and structures are adapted to the environment in which they originated. Plants that originated on the floor of a shady forest need lower light levels than those that originated on sunny deserts.

What happens if shade plants receive too much light?

Burned patches will appear on the leaves, or leaves may look bleached.

What happens if sun plants receive too little light?

They will not grow vigorously. If they have multicolored leaves, they may lose their coloration. Stems may elongate, and leaves may drop off.

nutrients...

Why do I need to provide nutrients?

Fertilizers provide essential nutrients for plant growth: nitrogen for leaf growth, phosphorous for flowering and seed production, and potassium for root growth.

How often should I fertilize them, and what precautions should I take?

Read and follow label directions carefully.



Tropicals

Most of the plants we call tropicals originated near the equator, where growing conditions are warm to hot and humid to rainy. They may have large leaves, unusual flowers, or special structures to collect water. They may be delicate foliage plants, sturdy vines, or small trees. Light requirements and watering methods vary.

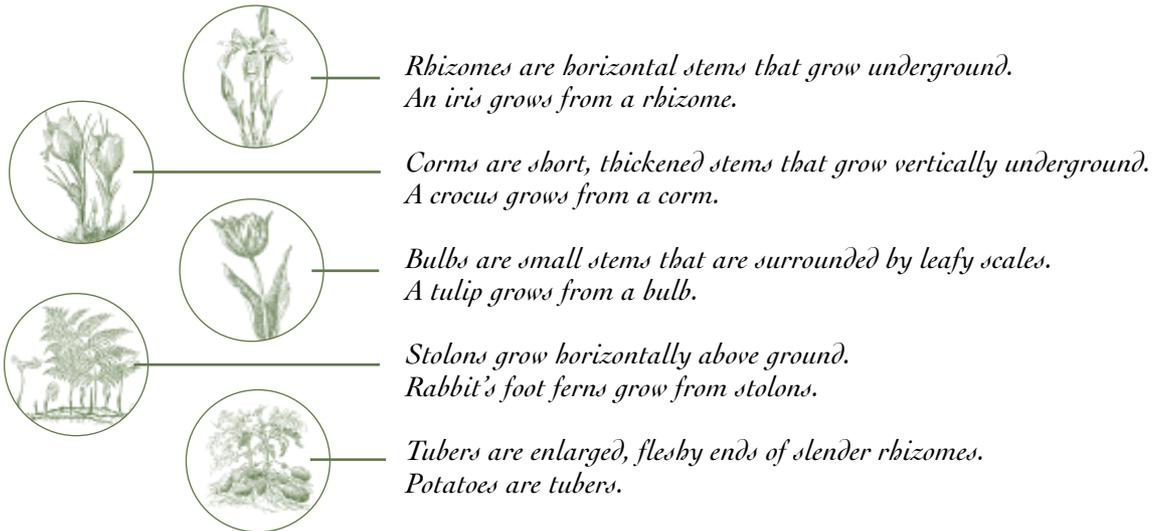


Succulents

Many succulents originated near the equator, but some are native much farther north or south, wherever conditions are dry. Succulents produce roots rapidly when water is available and conserve water in stems, leaves, and/or roots when it is not. They may also conserve water by growing close to or slightly under the ground, or producing small or rolled leaves with protective coverings.

Specialized Stems

We usually think of stems as slim and tender, like the stem of a zinnia or tulip, but there are many other types of stems. Some even grow underground.



*Rhizomes are horizontal stems that grow underground.
An iris grows from a rhizome.*

*Corms are short, thickened stems that grow vertically underground.
A crocus grows from a corm.*

*Bulbs are small stems that are surrounded by leafy scales.
A tulip grows from a bulb.*

*Stolons grow horizontally above ground.
Rabbit's foot ferns grow from stolons.*

*Tubers are enlarged, fleshy ends of slender rhizomes.
Potatoes are tubers.*

Forcing Flowers for Late Winter Bloom

What could be better in late winter than a vase of branches from a flowering shrub or a pot of blooming tulips or narcissi on the windowsill? A combination of conditions causes flowering trees, shrubs, and bulbs to break dormancy. Changes in temperature and light levels are the easiest for gardeners to control.

Twigs and Branches

To force branches of trees like cherry and dogwood and shrubs like forsythia and flowering quince: Wait until buds begin to swell, indicating that internal structures are preparing for spring growth. Then cut and place the branches in water in a warm and sunny location. The branches should bloom in about two weeks.

Bulbs

Spring flowering bulbs, such as tulips, must be pre-chilled to bloom in the winter. Bulbs can be planted in pots in late fall or early winter and left outside in a protected place. Bring them into the classroom in February or March, keep them in a warm, sunny location, and keep the soil moist.



Learning about plants through art and writing experiences; strengthening art and writing skills through science activities

Reynolda Gardens of Wake Forest University is located within the boundaries of the 1,067-acre estate that was established by Mr. and Mrs. R. J. Reynolds in the early twentieth century. Today, RGWFU consists of 125 acres of woodlands, open fields, and wetlands; four acres of formal gardens; and a greenhouse range with conservatory. Student visit times are limited. Reservations are taken only in early August for the following school year. **Call the education office (336.758.3485) for information on programs and scheduling.**