

# **It's Not Easy Being Green: Plant Studies for Active Learners 2001-2002\***

**Using computer technology to  
enhance plant studies  
with young children.**

Swift River School  
201 Wendell Road  
New Salem, Massachusetts  
01060  
978.544.6926

<http://www.swiftriver.k14.mass.edu/>

Janet DuCharme ([jaducharme@rcn.com](mailto:jaducharme@rcn.com))  
Carolyn Croteau ([ccroteau@rcn.com](mailto:ccroteau@rcn.com))  
Victoria Munroe ([vitolio@excite.com](mailto:vitolio@excite.com))  
Carol S. Holzberg, PhD ([carolh@anthro.umass.edu](mailto:carolh@anthro.umass.edu))

\*Awarded a Lighthouse Technology Grant (Massachusetts, Department of Education),  
2001-02

## Project Summary:

This innovative technology-rich curriculum improves an existing, 10-week FOSS (Full Option Science System) Life Science plant curriculum. Three multi-age classes of first/second graders (about 40 students) engage in several inquiry-based, real-world science activities focusing on plant diversity, growth, life cycle, and anatomy. Teachers integrate field trips and guest speakers to maximize interest and broaden educational experience. Projects include hands-on experiments, written observations, data analyses, math applications, Spanish-language vocabulary instruction, and artwork. Age-appropriate computer activities emphasize systematic investigation, comparison, and classification.



Integrating technology improves student learning in several areas. Students use computers, digital cameras, and microscopes to reinforce and extend science concepts introduced in class. They take advantage of Internet Web sites to explore several regions around the country, comparing and contrasting plants in these geographic areas with plants growing in their local community. They team up with their 5<sup>th</sup>/6<sup>th</sup> grade reading buddies to participate in the Web-based ***Journey North International Tulip Study*** involving students from across the country. They share information with peers, teachers, and community members through oral presentations (in class and at school-wide assemblies), staged performances, and art projects. As youngsters engage in real-world science using computer-compatible microscopes and other technology tools to obtain plant information, they begin to think of themselves as real scientists and learn to appreciate the work that scientists do. They also begin to make thoughtful, informed decisions about science processes, biological diversity, and environmental protection.

Content revolves around Science and Language Arts activities integrating technology, math, social science/history, foreign language acquisition, and visual arts. It aligns with Massachusetts Science and Technology Standards for Inquiry; Domains of Science (Life Science); Technology; and,



Science, Technology and Human Affairs. It also addresses National Science Education Standards regarding the structure and function of living organisms and scientific inquiry. In addition, it supports the school's curriculum objectives for 1<sup>st</sup> and 2<sup>nd</sup> grades, building literacy skills, incorporating Spanish words and phrases, measuring, graphing, expressing ideas and feelings through art, and exploring U.S. regional geography.

Activities align with several Massachusetts Curriculum Frameworks, including: 1) *Science and Technology* teaching the scientific method for hypothesis building and testing, and developing skills enabling students to observe, group, sequence, and classify scientific data; 2) *English Language Arts* encouraging children to write and speak clearly, and to read and listen for information from both fiction and non-fiction sources; 3) *Foreign Languages* teaching Spanish words for plants, plant parts, colors, and numbers; 4) *Mathematics* teaching counting, measuring,

and graphing skills to facilitate data comparisons and analyses; 5) *Arts* using creativity software to explore and express ideas and feelings, perceive visual, spatial, and aesthetic characteristics, and demonstrate observation, abstraction, and invention; and 6) *History and Social Science* teaching U.S. geography by introducing plants in different regions and exploring how Native American groups around the country used different plants for food, clothing, and shelter.

Students benefit from the following technology resources:

- Internet access to: a) investigate plants in different regions around the country (e.g., deserts, grasslands, Pacific Northwest), b) investigate the effects of climate, weather, temperature, and sea level on plant growth, c) take advantage of up-to-date Web-based maps, and d) participate in a global study of seasonal change to proclaim the official arrival of spring in their own community;
- Broderbund's *Kid Pix Studio* to a) produce a combination text and picture photo journal of the life of a Brassica plant (broccoli and cauliflower are close relatives), and b) create a dictionary of plant words and original plant drawings showing mastery of different plant parts;
- Digital photos of local plants, scanned pictures of 3D plant samples, and downloaded images of Georgia O'Keeffe flowers to serve as models for their own images manipulated in *Adobe Photoshop*;
- Sunburst's *Learn About Life Science: Plants* for information about plant parts, plant growth, and how plants make their food;
- Electronic graphing tools in The Graph Club (Tom Snyder Productions) to represent plant characteristics, growth sequences, and size in chart format;
- Knowledge Adventure's *JumpStart Spanish* to learn Spanish vocabulary for plant parts, colors, and numbers.



Child's Name: \_\_\_\_\_

Date: \_\_\_\_\_

**New Plants**  
**Rubric for Assessment**

<b>4</b>	<p>Student shows a curiosity and interest in plants as living things shown through making initiatives on his/her own to observe, comment and extend activities.</p> <p>Student masters all skills listed in stage 3.</p>
<b>3</b>	<p>Student observes and describes the changes that occur as plants grow and develop through accurate and complete drawings, recordings, projects and/or verbal communication. (journals, interviews, group discussions using new vocabulary).</p> <p>Student shows familiarity with the structures of flowering plants (root, stem, leaf, bud, flower, seed) through labels on drawings and oral descriptions. Much evidence of new vocabulary seen.</p> <p>Student identifies various (3-4) ways that new plants can develop from mature plants. (seeds, some stems, parts of roots, bulbs).</p>
<b>2</b>	<p>Student shows a curiosity and interest in plants as living things when prompted during classroom directed activities. He/she observes, makes comments and participates in classroom discussions giving some accurate but incomplete information through drawings, recordings, and/or verbal communication.</p> <p>Student shows some familiarity with the structures of flowering plants (root, stem, leaf, bud, flower, seed) by providing incomplete but accurate information when labeling drawings and giving oral descriptions. Some evidence of new vocabulary seen.</p> <p>Student identifies two ways in which new plants can develop from mature plants. (seeds, stems, parts of roots, bulbs).</p>
<b>1</b>	<p>Student shows little curiosity and interest in leaning about plants and needs much prompting to complete the activities.</p> <p>Student shows inaccurate and incomplete information about the structures of flowering plants (root, stem, leaf, bud, flower, seed) as seen through his/her drawings and oral presentations. Little evidence of new vocabulary seen.</p> <p>Student unable to identify more than one way that new plants can develop from mature plants. (seeds, stems, parts of roots, bulbs).</p>

# **Journey North International Tulip Study**

Join schools across North America by participating in this international science project. Plant a Journey North Tulip Garden and proclaim the official arrival of spring in your community. Students investigate the relationship between geography, temperature and the arrival of spring. They share observations over the Internet and follow the wave of spring as it moves northward.



Schools participating in this study, plant Red Emperor tulips following the same guidelines. They register their garden in Journey North's official Tulip Garden Registry. When the tulips bloom in the spring, the news is shared with classmates across North America.



For more information about the study visit:

<http://www.learner.org/jnorth/fall1998/tulip/HowTo.html>

# Sobaheg

## A Native American Stew (counting book)



*After reading information about foods typical of Native Americans of the Northeast Woodlands during the time of the Pilgrims, children used Kid Pix to create a page of the counting book. Children applied their knowledge of plants and learning from their social studies unit to their work in this book.*

*We brainstormed ideas for the fruits and vegetables we would include. We wrote them down on file cards. We wrote down numbers 1-10 on separate file cards.*

*Each child picked one vegetable/fruit and one number. Using Kid Pix, children illustrated their page.*

*Pages were put together to form a number book.*



# Plant Dictionary

## Purpose:

- To acquire the vocabulary associated with the structures of plants.
- To provide a unit resource for children to use during writing activities.
- To integrate computer based activities that encourage language and science learning.



## Materials:

- Kid Pix Studio Deluxe (Broderbund, <http://www.kidpix.com/>)
- Computer
- Beginning dictionaries
- Book making supplies (laminator, book binder, etc.)

## Activity:

Children or teachers choose a word related to the unit of plants. Children look up the word in a beginning dictionary. In their own words, children explain the meaning of the word or use it in a sentence. Using Kid Pix Studio Deluxe, children create an original plant drawing showing. They write a sentence that describes the meaning or defines the word. Work from each student is collected and organized alphabetically. Pages are collated into a classroom dictionary for use by all students. Additional pages can be added as appropriate.

## Evaluation:

Student's understanding of the vocabulary is evaluated through their drawings and writing about the words. The use of the book during classroom writing times indicates the value of this type of word resource.



## The Pumpkin Project 1/2 Grade

This project was done during my moth time but integrated all subject areas and lasted about two weeks. We were studying graphing in math. I decided to do this project to help give purpose to the graphing the children were learning.



In teaching graphing with young children, I break the steps down to these.

1. Collect the information.
2. Make the picture.
3. Read the results

### How Many Lines Are On Your Pumpkin?

The children were asked to count the lines on their pumpkin. They were given a permanent marker and a small square of paper. They used the marker to keep track of their counting on the actual pumpkin and then wrote their total number of lines on their paper. The class came to our meeting area with their information and we discussed how we could graph the information. I started out with a blank piece of paper so the children could be part of the whole process. I used *Interactive Writing* to write the title and other information we needed. We arranged the papers they had in different ways on our graph to show our information. We decided on a final way and the children glued their papers on the graph.

### Faces and Journals:

I let the children draw faces on their pumpkins and then had them write in their journals about their pumpkins. I gave them the writing prompt \*My pumpkin is They worked on finishing the sentence and drawing a picture.

### What is the Circumference of My Pumpkin?

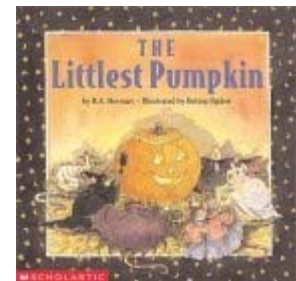
The children used string to wrap around their pumpkins to measure the circumference of their pumpkins. When the were done, we met again as a class to make a graph of our information. The children taped each string on and then spent time analyzing the results. I asked questions like: Which string is the longest? What does that mean? Who had the thinnest pumpkin? Who had the widest pumpkin? Were any the some size?

### How Tall Is My Pumpkin?

The children used strips of paper to measure how tall their pumpkins were. I gave them rulers to hold across the top of their pumpkin, so they would be able to measure the height more accurately. When they were done we created a graph to show the information we had gathered.

### Poems and Stories:

During the two weeks we did this project, I read many poems and stories that had to do with pumpkins. We were studying about plants in science. Most of these stories made nice connections to our science



concepts. We were also studying Native Americans. Pumpkins were used in many ways with Native Americans. Poems: *My Little Pumpkin* by Valerie Worth; Books: *The Pumpkin Book* by Gail Gibbons, *The Littlest Pumpkin* by R. A. Herman, *The Pumpkin Patch* by Elizabeth King, *Big Pumpkin* by Erica Silverman, *Grow a Pumpkin Pie* by Jane E. Gerver; and *The Pumpkin Fair* by Eve Bunting.

### Counting the Seeds!

The children estimated how many seeds they thought were in their pumpkins. They wrote their estimates on a chart and left a column for their accurate counts. I bought pumpkin cutting knives that were safe for the children to use and let them cut the tops off of their pumpkins. They scooped out all of the seeds and put them in a large cup. This took one whole lesson time and was very exciting. The next day, we started counting the seeds. We discussed many different ways that they could count them. I had small plastic cups available for children to group seeds in. Many children decided to count by tens, putting ten seeds in each cup. Some counted by 1s, 5s, and 20s. Most of those children switched to tens when they were having a hard time. We spent three days counting seeds. The children worked very hard finishing their seeds as well as helping others. One child finished counting his and decided to stock ten of his cups to make a hundred. The rest of the class caught on quickly and did the same. When each child got their final total they wrote it on our estimate chart. We gathered together all of the cups as a class and did a count of all of our seeds counting by tens and grouping hundreds. The children used a 300 chart to help them count by tens after one hundred. It was easier for them when they grouped them by hundreds. We set the cups up and used place value concepts to write how many we had as a class.



### Our Book:

I took digital photographs of each activity that we did with the pumpkins. The second graders in my class helped write a book about our project using the photographs. Each student had a page and described what we did for each activity. They also added their own drawings.

### Other Activity Ideas:

- Toast pumpkin seeds
- Carve pumpkins
- Write a list of adjectives that describe the pumpkins
- Plan a field trip to get pumpkins
- Dry pumpkin
- Make a list of things made from pumpkins

# Plant Take Home Project

2001

First and Second Grade

We have been studying "New Plants" in science. This year we are sending home a "Take Home Project" about this unit. We have many reasons for doing this, but the most important is to encourage families to take an active role in their child's learning. This is a wonderful opportunity to see what your child is learning and to be a part of their education. It will be easy to want your child's project to look perfect. The hard part is letting them be in charge with you as a guide or helper. We don't expect perfection. We want to be able to see what your child has learned.

We started this project in school. The children have created a computerized picture, using Kid Pix, of a make-believe or real plant. Each picture is the child's plan that will be used to create the plant for this project. We don't expect the plants to look exactly like their drawing, but the drawings should be used as a guide.

So, here is the project. Your children will create a model of a plant. This model will be a three dimensional representation of a plant that shows the real parts of the plant.

### **Criteria for the Project**

- Have as much fun as possible! Be creative and think outside of the box.
- The plant must include these parts:
  - \_\_\_\_\_ stem
  - \_\_\_\_\_ leaves
  - \_\_\_\_\_ roots
  - \_\_\_\_\_ flowers
  - \_\_\_\_\_ bud(s)
  - \_\_\_\_\_ pods
  - \_\_\_\_\_ seeds
- The plant should be more that 1 foot long or wide, but no more than two feet long or wide.
- Use the computerized picture, that your child has made in school, as a guide for plant.
- Work on the project a little bit each day to help your child understand how to budget their time. This will be helpful for future work they will face in school.
- Try to make the plant out of recycled materials, so you don't have to spend much money.

### **Suggested Materials List:**

- Glue
- Tape
- Markers
- Crayons
- Scissors
- Paint
- Colored paper
- String
- Tissue paper

**Recycled Materials Ideas:**

- Container
- Covers
- Toilet paper rolls
- Twisty ties
- Cereal boxes
- Old material
- Plastic bottles
- Old wrapping paper

**These are our objectives for this project:**

- To have children experience pride and self-confidence in their work.
- To have children show what they are learning through a fun, hands-on project.
- To involve families in their child's learning.
- To have children experience working on a project over an extended period of time.
- To have children experience the process of creating a three-dimensional (3D) object from a two-dimensional object
- To use the final project as a piece of assessment for our *New Plants* unit.
- To have the children present their project to other children in the school.
- To have children evaluate their own work.

When the children bring their projects to school we will be using them in various ways. We will videotape your child talking about how they made their plant. We will have a day for other children in the school, staff and families to visit. Each child will have a Comment Book with a picture of their plant to bring home. The comment book will also include a self-evaluation done by each child.

This project will be due on Monday,  
October 22nd, Visiting day will be  
Wednesday. October 24th from  
9:00-10:00.


If you have any questions, please call the school (978-544-6926) to talk to your child's teacher.

Thank you for your support,  
Victoria Munroe  
Janet DuCharme  
Carolyn Croteau

**Name:** \_\_\_\_\_ **Take-Home Plant Project Homework**

**Use pictures and words to answer these questions about your plant.**

**What does your plant look like right now?**



---

---

---

---

**What materials have you used so far?**



---

---

---

---

## Growing Grass and Alfalfa



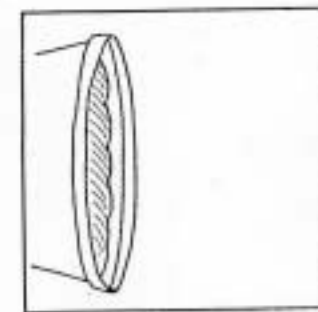
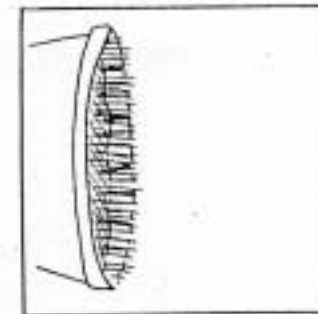
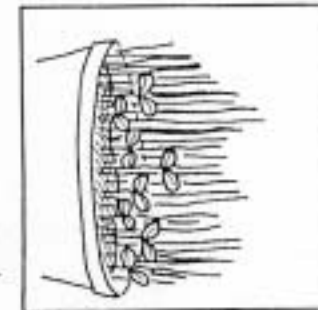
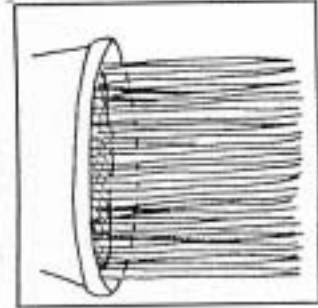
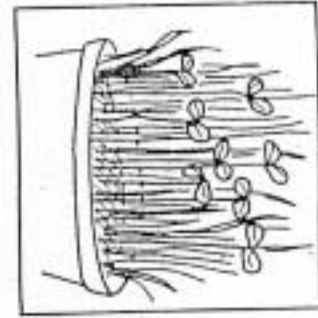
The students planted alfalfa and rye grass seeds in a small cup of dirt. We observed them over a couple of days. Next, the children cut the plants to the level of the dirt and then waited a few more days. When we checked the plants again, the grass grew back but the alfalfa hadn't. We learned that some plants can keep growing after they have been cut, but some can't. The children cut out paper pictures of the grass experiment and had to arrange them in the correct sequence. We later brought this concept to the computer by drawing our own pictures with Kid Pix Studio Deluxe.



## Brassica Journal

The students planted Brassica seeds. We used journals to keep track of our observations as the plants grew.





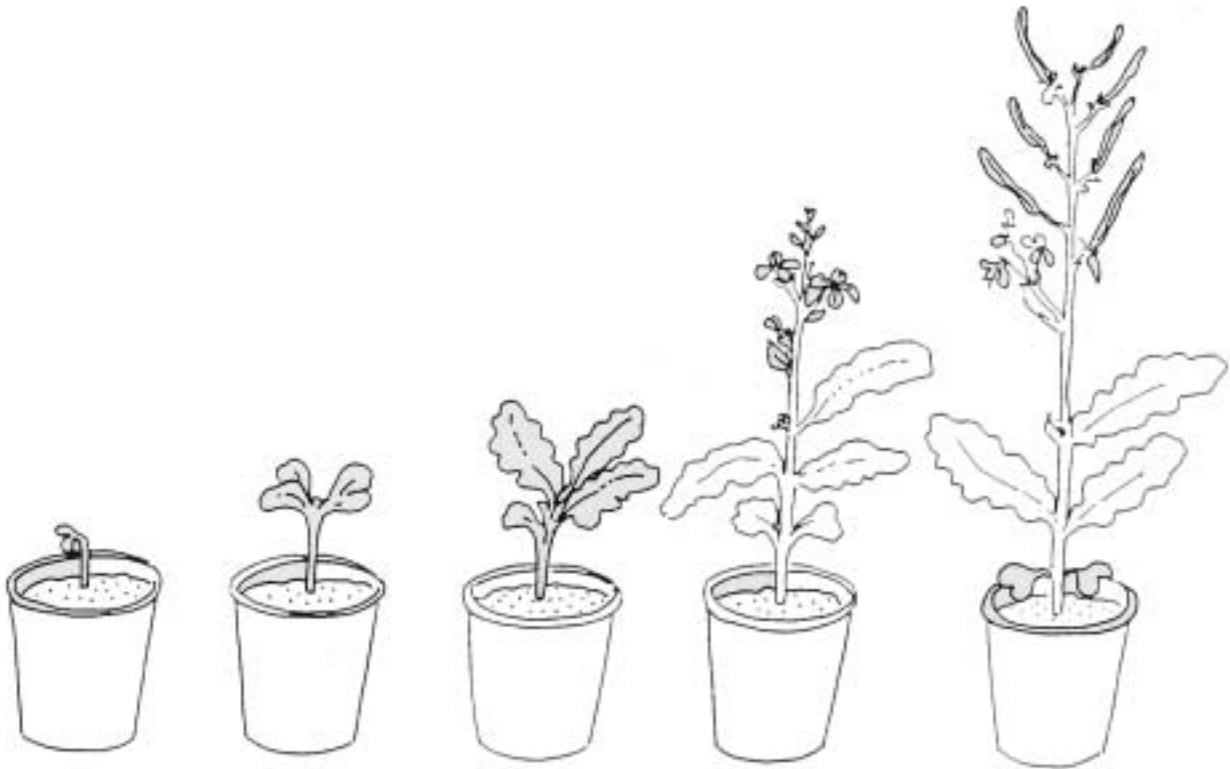
These pictures are in the wrong order. Cut them out and put them in the correct order below.

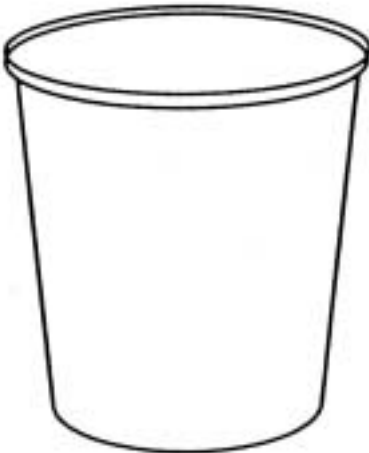
-----  
This is what happened when I planted my lawn.  
-----



# My Brassica Plant Journal

by: \_\_\_\_\_



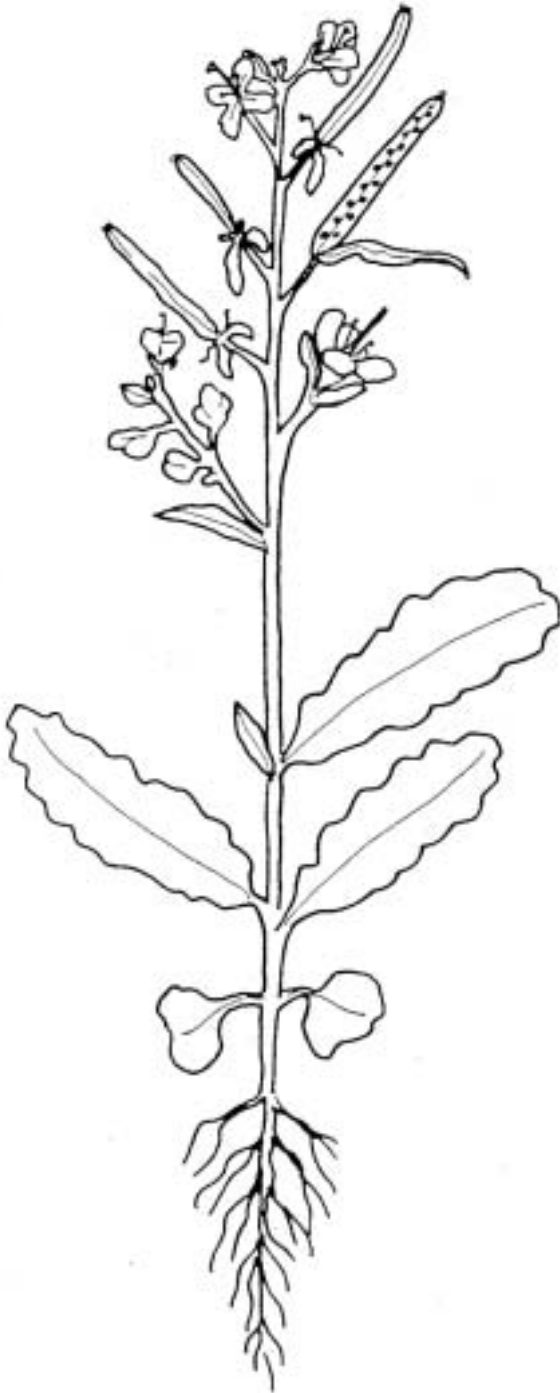


Date \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Draw lines from the words to the parts of the plant.



**bud**

**flower**

**leaf**

**pod**

**root**

**seed**

**stem**

## Technology Resources

### Software:

Sunburst, Learn About Plants (<http://www.sunburst.com/>)

Broderbund Kid Pix Studio Deluxe (<http://www.kidpix.com/>)

Tom Snyder Productions, The Graph Club (<http://www.tomsnyder.com/>)

Apple AppleWorks (<http://www.apple.com/appleworks/>)

### Web Sites:

Too often, we take the botanical world for granted, forgetting that plants provide us with food, clothing, medicine, and shelter. Plants spice up our meals and oxygenate our air (as a by-product of photosynthesis). In swamps, marshes, and other wetlands, they serve as organic filters drawing out impurities from polluted waters. Without plants, there could be no life. To learn more about the importance of plants, visit the Web sites reviewed below.

### Journey North International Tulip Study

<http://www.learner.org/jnorth/fall1998/tulip/HowTo.html>

**Penicillin** (<http://encarta.msn.com>). More than just a by-product of moldy bread, penicillin is a powerful antibiotic derived from the penicillium fungus. Visit the Encarta reference site, then type in “penicillin” in the Search field to learn how this natural “antibiotic” works and why it is so effective in curing a wide range of diseases.

**Simple Act of Planting a Tree** (<http://www.treelink.org/books/simpleact/index.htm> ) The benefits of planting trees are many. Trees attract birds, butterflies and other wildlife. They minimize storm water runoff into rivers, reduce the amount of carbon dioxide emitted into the atmosphere (see above) and improve air quality by providing a natural filtering system. Visit this site to read an online version of the community forestry classic *Simple Act of Planting a Tree: A Citizen Forester’s Guide to Healing Your Neighborhood, Your City and World* and to learn more about the benefits of urban forestation.

**The Great Plant Escape** (<http://www.urbanext.uiuc.edu/gpe/case1/c1facts2a.html>) Learn about the basic parts of plants (roots, stems, leaves, flowers, fruits, and seeds) in this fun Web quest.