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One major goal of Florida’s Federation of Garden Clubs is to educate youth about home gardening. With this goal in mind, the Navarre Garden Club developed a series of instructional programs for Florida Garden Club members to use in a Junior Garden Club Program.

The programs were designed to be used with students in 3rd through 5th grade. They can also be appropriate for middle school children with the addition of more in-depth material or additional activities. The programs have been designed to meet many Science Sunshine State Standards, although they are not directed towards any specific science curriculum. Language Arts and other areas of education are also included.

Each program can be used as a step-by-step guide if needed, or as a resource for those who choose to approach these topics in a different manner. Moreover, each can be used as an aid or supplement to a school curriculum. Each program consists of step-by-step instructional material with a hands-on activity, visual aids, student guided note sheets, a reinforcement activity for students, and a science based writing activity. The student materials can be kept in a student journal.

Joanne Connor
ACKNOWLEDGEMENT

The Navarre Garden Club had conducted some Junior Garden Club programs in previous years. In 2004, as the new Junior Garden Club Committee Chairman I decided to use my teaching experience to conduct programs with a gardening and science education approach. I wrote the programs that we presented at a local school with the help of my committee. The intent was to write these programs in such a way as to make it easier for our Garden Club members to conduct these programs in future years. The plans also aided us in preparing an organized and well thought out program for the students.

Several members of the Navarre Jr. Garden Club Committee met each month to help plan and prepare for each of the monthly programs we presented. Their contribution was essential to the development of these programs. In particular, the Navarre Garden Club wants to thank specific committee members for their contribution. Judith Begue, A Santa Rosa County Master Gardener, was a wealth of knowledge for us. Kay Zilka brought professional instruction expertise to our group. Sharon Johnson helped us incorporate entertaining instruction. Barbara Dillon and Barbara Jones were great student assistants and helped us see the program from the students’ viewpoint. Other contributors aided us in developing our programs. Betty Lawson provided us with information for our Bird Program. Linda Henderson provided floral design experience for our Floral Design Program.
STARTING A JR. GARDEN CLUB

There are many different ways to conduct a Jr. Garden Club Program. It can be an after school program, a library program, a church group, or as we have chosen to do, an in school program. I feel that we can reach some children who would not otherwise have access to our programs by conducting them in the local school.

The most important thing to remember for a Jr. Garden Club is Planning and Preparation! You should have a plan of what you would like to do before approaching the administrator of your chosen facility. There is an excellent detailed article about how to approach an administrator and present your program in the National Garden Clubs, Inc.’s Quarterly Publication, November-January 2007-2008, “President’s School Garden Project” by Bonni Dinneen, Chairman.

Briefly, there are 9 points in this article, below highlights some of them;

• Making an appointment with a principal with concise information.
• Be professional in your appearance and approach
• Have printed information about your program
• Conduct relevant conversation.
• Follow-up with a thank you note
• Request an appointment with teachers involved
• If not successful try elsewhere.

Do not take on too big a project! You and your committee’s experience of conducting programs and working with large groups of children will help you determine how many programs you can comfortably do the first year. It is important to do a quality program or a few quality programs so you will be successful and will be welcomed back the following year.

Inquire about some things the school/facility could assist you with. Visual aids are very important. Schools should have an overhead projector or power point projector. Depending on their budget they may be able to print many of the written materials used by the students. The school/facility may even be willing to have students take home a “wish list” of consumable supplies for your program.

Schools and many other facilities require background checks on any person coming in contact with children. This may take some time and should be taken into consideration for your planning. You should also be aware that photos taken of your program that have children in them may not be printed or published without written permission of the parent.
Planning and Preparation are the most important part of any program. It is the key to success. Visual aids, student interaction and hands-on activities are important to this program. This helps to hold students’ attention and facilitate learning.

When following the programs in this series it is important to thoroughly go over and even rehearse the program until you are comfortable with the presentation. It may be helpful and more interesting to students to have different committee members conduct different parts of the program.

Whenever possible have enough materials for each student to do an activity. Some things can be done as partners or in small groups (normally no more than 4). This helps to maintain students’ attention, aid their learning, and promote a sense of accomplishment. Note that the materials that will be used in our programs are divided into individual numbers or amounts prior to the program. For example our committee uses baggies to pre-measure individual amounts of soil and baggies for individual amounts charcoal for each student’s terrarium. The coffee filters are also precut to fit the containers. We also have 4-5 spray bottles to moisten the terrarium soil so that students do not have to wait. We have several committee members distribute materials to students to lessen the time. Any lapse of time spent giving out materials during a presentation will cause the loss of students’ attention and take unnecessary time from the presentation. Time and effort will be needed to regain the students’ attention.

Another distraction to the students is materials that are given out before they are needed. Their attention is drawn to these materials and not to the information being presented. Some people feel it is helpful for students to have everything they need ahead of time but it is actually very distracting.

A TEACHER OR ADMINISTRATOR SHOULD BE PRESENT AT ALL TIMES DURING A PRESENTATION. This is a legal requirement. Please have all discipline issues handled by the teacher or administrator.

You will have the respect and attention of the students if you convey that you expect it from them. An interesting and well-planned program will be your best asset!
OBJECTIVES
Learn the importance of plants for butterflies
Learn the metamorphosis of the butterfly/moth
Know the difference between a butterfly and a moth
Learn the importance of butterflies
Learn the parts of a butterfly
Learn the meaning of Symmetry

MATERIALS:
Transparencies:
- Butterfly and Moth (T-1)
- Butterfly VS Moth (T-2)
- Metamorphis/Monarch (T-3)
- Completed guided note sheet (T-GN)

Craft Materials (for each student):
- paint stick
- butterfly body (black construction paper)
- markers/crayons
- scissors
- staplers for assistants
- Clear Acetate sheet (smooth transparency–erasable)
- Blank sheet of paper (cover transparency to reveal only desired information)
- Butterfly vs Moth worksheet (1 per student)
- Student Butterfly guided note sheet (1 per student)
- Crossword Puzzle (1 per student)
- Writing Prompt (1 per student)

INTRODUCTION – if first class meeting
Pass out Journals – Students place name on front of Journal if first meeting

Program:
1. “Why are butterflies important to gardeners?”
   (Ans: Pollinators, environment indicators, enjoyment)

Pass Out Butterfly vs Moth worksheet
2. Butterfly vs Moth - (T-1)
   “One is a butterfly and one is a Moth. How can we tell the difference?”
   “Fill in the blanks as we discuss the differences”
   (T -2) Use clear, smooth transparency (acetate sheet) over T-2 transparency to write in with erasable marker as students give answers (optional – write answers on board)
   (Ans:)
   1.) B: fly - Daytime – M: fly - mostly night time
   2.) B: antennae – smooth with knobs M: antennae - feathery/hairy
   3.) B: resting - flat over back M: resting - roof shape
   4.) B: body - straight & smooth M: body - thick and hairy
   5.) B: color - bright & colorful M: color - mostly dull
3. Metamorphosis – (T-3) (T-GN)

“Butterflies go through complete physical changes from egg to adult. > Metamorphosis. Unlike many animals and humans that look exactly like the adult but in miniature.”

Stages (changes)
A) Egg Stage - female butterfly lays an egg on a specific kind of plant – Host Plant
B) Caterpillar or Larval stage (T-GN) - emerges from the egg, eats and grows on certain plants Host Plant (T-GN) (very picky).
   May shed their skin 4-6 times while growing
   Fully grown - attaches to a firm support and sheds for last time
C) Chrysalis or Pupa Stage - inside chrysalis it turns into “cellular soup” to form adult butterfly (like a chicken egg)
   Forces it way out of chrysalis when formed (T-4)
D) Adult Stage - upon emerging wings are damp and wrinkled.
   When dry, flies to look for food – Nectar Plant
   Nectar Plant (T-GN) - “uses it’s probe to get nectar” (sugary substance)
   Lives about 2 weeks – eats, mates and lays eggs
E) Cycle repeats or Metamorphosis repeats
   Some species produce multiple generations every year - some, just one

4. Habitat requirements - “Besides Host and Nectar plants what else do butterflies need?”
   (Ans: Water and Warmth/Sun)

Water – “Very shallow water (Puddling) Place pebbles or sand in container to keep feet dry.”
Warmth/Sun - “A flat rock to heat their body.”

5. Common Area Butterflies
   A) Transparency of butterflies common to this area. (T-3, T-5, T-6, T-7, T-8)
      “Monarch is seen from Mexico to the northern US. Common to almost all the US”
      Other Butterflies common in our area
   B) Transparency of particular caterpillars and their appearance as an adult butterfly (T-8)
      Note: “Markings on caterpillars do not necessarily match adult markings”
   C) (T-9) -“Markings of caterpillars help keep predators away” (false eyes, learn awful taste, camouflage) “Also some butterflies have defensive markings.”

6. Butterfly Body Parts -
   A) Segmented Body – (separate sections) Head, Thorax (chest) Abdomen (lower body)
      Humans have a segmented body
   B) Wings – 2 pairs –“What do butterflies use their wings for?” (Ans: Fly, Camouflage)
      Made up of Thousands of Overlapping Scales (color, iridescent) (T-4)
   C Antennas – “What do you think the knobs on the antennae are for?” (Taste, Smell)
   D) Legs - 3 pairs of jointed legs – for tasting, landing /finding food, hang upside down
   E) Compound Eyes – Many hexagonal lenses (6)- similar to looking through a kaleidoscope
7. **Insect (T-GN) - “What kind of animal is a Butterfly?”** (Ans: Insect)
   - Insect = segmented body
   - 3 pairs of jointed legs
   - Antennae (a few species do not have antennae)
   - Wings (some are flightless insects)
   
   **“Does the Butterfly fit the requirements to be an Insect?”** (Ans: Yes)
   
   Note: Caterpillar is part of the Butterfly growth stage and is therefore an Insect

8. **Symmetry (T-GN)**
   
   Monarch transparency – **“Look at the left and right wing, What do you notice?”**
   
   (Ans: same on both sides)
   
   **Mirror Image = Symmetry**, explain, give other ex. (human body, human face, fireplace mantel decor, traditional house)

   Other butterfly transparencies – note Symmetry

9. **Craft/ Review – “We are going to make butterflies with symmetrical wings.”**
   
   Pass Out- tracing paper, butterfly wing pattern, pencil, markers for each student
   
   A) Trace pattern on to tracing paper. Create a butterfly in any color or pattern they choose
   
   **Must Be SYMMETRICAL**
   
   Students cut out the wings.

   Pass Out twist tie, optional additional 3 ties, segmented body and paint stick

   B) Knob Antennae –when students have completed the wings
   
   **“What is at the end of the antennae?”** (Ans: Knobs)
   
   Students roll end of twist tie and bend in half to create 2 antennae

   **“How many legs do butterfly’s have?”** (3 pairs of jointed legs)
   
   Students bend 3 ties in half to form 3 pairs of legs and bend at knees

   C) Assembly – Show the Body form to students
   
   **“What type of body does the butterfly have?”** (Ans: segmented)
   
   Explain the attachment of body and antennae to paint stick. (legs attach at thorax)
   
   As students are completing work and arranging parts, aides/teacher staple body, antennae, legs and tracing paper butterfly to paint stick.

   D) Fly butterflies – As students finish have one table/group at a time show other their butterflies
   
   Congratulate students on their decorative and symmetrical butterflies

10. **Reinforcement** – As student finish craft:
   
   **Pass Out:**
   
   1. “Butterfly Crossword Puzzle”
   
   2. Writing Prompt
source: unlabeled photos from Birds and Bloom

BUTTERFLY PROGRAM MEETS THE FOLLOWING SUNSHINE STATE STANDARDS
Science - Grades 3-5
   Processes of Life - Standard 1: The student describes patterns of structure and function in living things (SC.F.1.2)
   SC.F.1.2(3),(4)
   How Living Things Interact with Their Environment – Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment. (SC.G.1.2)
   SC.G.1.2(1),(2),(5),(7)

Language Arts – Grades 3-5
   Language – Standard 2: The student writes to communicate ideas and information effectively.
   (LA.B.2.2)
   LA.B.2.2(1)
BUTTERFLY

Metamorphosis

Larva stage

Chrysalis

Host plant

Nectar plant

Symmetry

Insect
Is it a Butterfly or a Moth?

1. It Flies during the ____?
2. Its antennae are ____?
3. When resting its wings are ____?
4. Its body texture is ____?
5. Its colors are ____?

Butterfly

Moth
GROWING GOOD TIMES

Date: _______________________________________

Topic: _______________________________________

What we did: _________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

What I learned: _______________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

What I liked: _________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

ACROSS
1. A butterfly common in our area as well as many other states.
10. Caterpillars feed on ________ plant.
21. The changes a butterfly goes through from egg to adult.
44. Butterflies feed on _______ plants.

DOWN
6. The egg laid by a butterfly hatches into a ________.
9. A caterpillar forms a __________ where it changes into a butterfly.
15. When one wing is a mirror image of the other, it is an example of ________.

WORD BANK
Symmetry  Nectar  Flowers
Cocoon  Caterpillar  Host
Chrysalis  Pupa
Monarch  Metamorphosis
Butterfly Craft

Wing pattern (heavy paper) to be traced by each student on tracing paper. Make body out of black construction paper for each student.

Legs under wings

Paint stick
TRANSPARENCIES
Is it a Butterfly or a Moth?

1. It Flies during the ____?
2. Its antennae are ____?
3. When resting its wings are ____?
4. Its body texture is ____?
5. Its colors are ____?
Is it a Butterfly or a Moth?

Butterfly
- Day
- Have Knobs
- Folded Tent-like
- Smooth
- Usually Bright

Moth
- Mostly at night
- Usually Feather-like

1. It Flies during the ____?
2. Its antennae are ____?
3. When resting its wings are ____?
4. Its body texture is ____?
5. Its colors are ____?
AN AMAZING TRANSFORMATION. Although monarch caterpillars feast on milkweed, the adults (below) flock to a variety of flower nectar. Above from left, monarch eggs are tiny—that's a single egg next to a dime... a caterpillar begins to curl into a chrysalis... a smooth green sheath protects the developing butterfly... the chrysalis turns clear just before the adult emerges.
TIMING IS EVERYTHING. "I happened to be in just the right place at just the right time when this beautiful Cecropia moth emerged from its cocoon right in my backyard," relates Joe Nowak of South Holland, Illinois. "Its size and bold coloring were truly remarkable."

A CLOSE LOOK at a giant swallowtail’s wings reveals thousands of overlapping scales that produce its beautiful colors. Some are pigmented for color and others produce a metallic, iridescent flash.
source: Wikimedia Commons;  GULF FRITILLARY

source: fcps.edu/islandcreekes/ecology/easternblackswallowtail.htm; EASTERN BLACK SWALLOWTAIL
CLOUDLESS SULFUR

source: Drees, Agri LIFE Extension
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<td>Metamorphosis</td>
<td>complete physical changes from egg to adult</td>
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<td>Larva stage</td>
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<td>Chrysalis</td>
<td>or Pupa stage, inside the caterpillar turns into soupy/egg mixture to form an adult butterfly</td>
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<tr>
<td>Host plant</td>
<td>a plant that the butterfly lays it’s eggs on and the caterpillar chews and eats for food</td>
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<td>Nectar plant</td>
<td>has a sugary substance in it’s flower for food for the adult butterfly</td>
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<td>a specific type of animal that has a segmented body, 3 pairs of jointed legs, and usually antennae and wings</td>
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BUTTERFLY GARDEN PROGRAM

OBJECTIVES
Learn what is needed for a successful Butterfly Garden
Learn that both host and nectar plants are needed for a Butterfly Garden
Identify 5 host and nectar plants in the Butterfly Garden
Name some plants needed for a Butterfly Garden

MATERIALS
Party favor blow tube horn
Live Host and Nectar plant examples
Garden that contains:
  host and nectar plants  puddling station  flat rock
Garden Activity
  Plant sticks marked “host” or “nectar” for the number of plants in each garden section –
    (One extra marker for each group – 9 plants to identify, give 10 markers to students)
  Rope/string to divide garden into sections for each team
  Notes for guides about the plants in the part of the garden in order to assist the students
Student Butterfly Garden guided note sheet (1 per student)
Transparency
  Completed guided Notes (T-GN)
Big Idea page (1 per student)
Optional: host and nectar plants to be planted in the garden

PREPARATION
Garden weeded and prepared for planting or preplanted
Section off the garden for each group (same minimum number of each host and nectar plants in each section of the garden)
Determine the number of students in each group (preferably no more than 6)
Guides need to know name and category of plants in their garden section

PROGRAM
1. Review --
   A. Garden Requirements – “What is needed to be able to have a Butterfly Garden”
      (Ans: water, sun, soil (good or amended), and plants)
   B. Plants:
      1) Host Plants – “What are plants called that are food for the caterpillar?”
      (Ans: Host)
         a) Show examples of Host Plants (ex. dill, passion vine, parsley, honeysuckle)
         b) Milkweed – VIP Plant --“Monarch caterpillars will only eat Milkweed plants”
            “Picky Eaters”, Monarch Butterflies only lay their egg on these plants
         c) Show an example of a Milkweed plant
      2) Nectar Plants – “What are plants called that are food for Butterflies?”
      (Ans: Nectar)
      3) Proboscis (T-GN) (rolled tongue) to suck the nectar from plants
         Show examples of Nectar Plants (ex. verbena, butterfly bush, lantana, yarrow, honeysuckle)
**BUTTERFLY GARDEN PROGRAM**

Probiscus -- Tubular flowers for the proboscis (butterfly bush, honeysuckle)

**Blow into party favor blow roll-up tube to illustrate a probiscus Landing Platform** of flower heads (verbena, lantana)

C. Water:
   1) Puddling – “**Butterflies do not like wet feet. They need shallow water in sand or pebbles. This is called Puddling.**”

D. Sun:
   1) Sunny location – butterflies prefer plants that require sun – they like warmth
   2) **Flat Rock** – “**needed to warm the butterfly so it can fly.**” (circulate fluid into its wings)

E. Summary – “**What is needed for a successful Butterfly Garden?**” (T-GN)
   (Ans: Sunny location, host and nectar plants, puddling station and flat rock)

2. **Garden Groups** – (3 min.)
   A. Divide students into groups
      1) Students pick a spokesman/leader
      2) Students decide on a group name
      3) Assign one adult to each group
   B. Student Leader with Adult Guide go to the Butterfly Garden

3. **Garden Activity** --
   Optional – students plant host and nectar plants in their section of the garden (could divide tasks to digging a hole, planting and filling in by different students to give each student an opportunity to participate)

   A. Garden – “**Look at our garden. Does it have all the things necessary for a successful garden?**”
      “**Show me these things in our garden**” (Ans: sun, host and nectar plants, puddling station and a flat rock)

   B. Garden Sections –
      1) Assign groups to a section of the garden
      2) Observation - “**Look at the plants in your section.**” Allow observation time (couple of minutes).
         (aides help students with plant names)
         “**Do you see host and nectar plants?**” (Ans: Yes)
         “**Do you see anything else?**” (Ans. possibly caterpillars, and butterflies)

4. **Garden Game** – “**We are going to play a game. The Rules are:**”
   A. Rules: Each group should identify the plants in it’s section as host or nectar plants
      Plant markers given to each student (marked host or nectar) for plant ID
      5 points given to the group for each correct ID
      Group Leader is the final decision maker
      Bonus point given for correct name of plant
      5-7 minutes (depending on number of plants)
      Group leader is the spokesperson for the group

   B. Procedure: After Game is explained
      1) Group decides the category and plant name (aides assist students with names by asking questions - not direct information if possible)
BUTTERFLY GARDEN PROGRAM

2) Markers are placed at each plant in the group’s section (1 extra host or nectar marker is left over)

C. Judging:
1) After allotted time the Judge asks the group leader to name and give the category of each plant and name of the plant as the group has decided
2) Judge awards points (5/category, 1/plant name) as the leader reports its findings
3) Judge announces group winner/winners

Return to room --

Reinforcement:

Pass out “Big Idea” page
1. Big Idea about Butterflies – Students express 3 ideas about Butterflies and Butterfly Gardens by drawing or writing

EVALUATION

BUTTERFLY GARDEN PROGRAM MEETS THE FOLLOWING SUNSHINE STATE STANDARDS

Science – Grades 3-5
How Living Things Interact with Their Environment –
   Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment.
   (SC.G.1.2) (1), (2), (5), (7)

Language Arts – Grades 3-5
Language
   Standard 2: The student writes to communicate ideas and information effectively
   (LA.B.2.2) (2)
Examples of Butterfly Garden Activity

Identification of Butterfly Garden Plants per Quadrant

**Quadrant 1:** Five plants to identify; 2 Host, 3 nectar

- **Passion Vine** — Host
- **Dill** — Host
- **Butterfly Bush** — Nectar
- **Lantana** — Nectar
- **Cigar Plant** — Nectar

**Quadrant 2:** Five plants to identify; 2 Host, 3 nectar

- **Milkweed** — Host
- **Parsley** — Host
- **Lantana** — Nectar
- **Liatrus** — Nectar
- **Butterfly Bush** — Nectar

**Quadrant 3:** Five plants to identify; 2 Host, 3 nectar

- **Passion Vine** — Host
- **Parsley** — Host
- **Butterfly Bash** — Nectar
- **Penta** — Nectar
- **Mexican Petunia** — Nectar

**Quadrant 4:** Five plants to identify; 2 Host, 3 nectar

- **Bronze Fennel** — Host
- **Parsley** — Host
- **Penta** — Nectar
- **Cigar Plant** — Nectar
- **Liatrus** — Nectar

**EACH GROUP OF STUDENTS WILL RECEIVE SIX STICKS; 3 MARKED ‘HOST’ AND 3 MARKED ‘NECTAR’**
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THE BIG IDEA

ABOUT BUTTERFLIES & BUTTERFLY GARDENS
**BUTTERFLY GARDEN**

**Proboscis**
- butterfly’s tongue that unrolls to suck in flower nectar

**Butterfly Garden**
- should be in a sunny location, and have host and nectar plants, a puddling station and a flat rock

**Host Plant**
- food for caterpillar

**Nectar Plant**
- sugar, water and food for butterfly
Wildflowers
WILDFLOWER PROGRAM

OBJECTIVE:
- Identify three wildflowers
- Define Native plants
- Know rules of picking wildflowers
- Know the State Wildflower
- Plant a wildflower garden

MATERIALS:
Transparencies:
- Completed guided note sheet (T-GN)
- State Flower (T-1),
- State Bird (T-2), and
- Coreopsis (T-3)
- Walt Germination (T-4)
Wildflower seeds for each student and 1 packet to take home
Wildflower posters for each student, “Wildflowers of Florida”
Wildflower seeds adhered to paper (one per group of students)
Live Wildflowers for examples
Containers of water (sprinkling cans, 1 per 3-4 students)
Small containers of sand
Blanket Flower Coloring page (1 per student)
Student Wildflowers guided note sheet (1 per student)
Wildflower writing prompts, (1 per student)
Crossword puzzle (1 per student)
Preparation of Wildflower Garden – garden equipment - depending on condition of garden

PROGRAM:
1. “What is a Wildflower?” (T-GN) (Ans; Flower/plant that grows without human help)
   “There are Two types of Wildflowers”:
   - Native plant (T-GN) - growing in Fl/area since first settlers (1500AD)
   - Naturalized – grows w/o human help
   “Do Wildflowers do anything besides look pretty in natural areas and some gardens?”
     (Ans: Stop erosion, clear ground water emptying into streams, rivers and the sound)
   “Who/What plants Wildflowers?” (Ans; Wind, birds, animals (fur, droppings)
     (Less than 70 mi. from body of water anywhere in Fla. - warm moist heat)

2. “What happened to Wildflowers after the hurricane?” (Ans: Live through, or regrow from seeds)
   Are suited or adapted to adverse weather
   Seeds are frost tolerant, plants take heat, dry sand, soil etc.
   “Why are Wildflowers disappearing?” (Ans: Land development)
   Help by planting – plant between Sept. and Jan. in our area
3. **Pass Out** – to each group - seeds adhered to paper.
   “Notice that seeds of different WILDFLOWERS are all different.”
   “Different types of flowers have different types of seeds.”
   (T-GN)“A seed is a box containing a plant”

4. **What is the Florida State Flower?** (T-GN) – (Ans: Orange Blossom) – (T –1)
   “What is the Florida State Bird?” (T-GN) – (Ans: Northern Mocking Bird) – (T- 2)

**Pass Out or (T-3) -- pamphlet (Coreopsis)**

5. Pamphlet Activity:
   “Why do you think it is the State wildflower? It grows in most of Fl.” (Ans: Coreopsis)
   Map Skills: “Which Coreopsis ..........”
   Common in your area?, Grows in most of FL?, Different coloration?, etc.

**Pass out -- posters (Wildflowers of Fl.)**

A. Partner Activity – 1 student places poster flower side up, 1 student places poster name side up
   1) Direct students to look for flowers you have seen before and find out what its name is.
      Give time to look at flowers.
   2) Ask some students to tell # and name of a flower they have seen to the entire class

B. **Hold up** actual live (picked) wildflowers and **ask** students to find out its’ name from the poster.

6. **Picking Wildflowers --**

   A. **“Can You Pick Wildflowers?”** (T-GN) (Ans: YES - IF meeting these conditions)
      1. Do Not Trespass (Signs (No Hunting, Beware of Dog, etc.)
      2. Ask owner’s permission
      3. Do not pick unless 10 or more of the same kind available
      4. Only take up to half– WHY?
         Needed to produce seeds for new plants
      5. Wear proper clothing- (shoes)

   B. **“How do you pick a Wildflower?”** (Ans: Snap off, do not remove roots, leave some leaves.)

7. **How to plant WILDFLOWERS?** Like Mother Nature,
   1) **“How Deep?”** On top of ground (from wind and animals)
      Cover with a little amt. of soil (dust and plant debris)
   2) **“Anything else needed?”** (Ans: Water (rain))
      Sprinkle lightly–over-watering will wash them away

8. **Germination --**

   A. **“When will seeds start to grow?”** (Ans: right conditions – temp of soil, (sun), enough water)
      “What do we call it when the seed starts to send out its’ roots and first leaf?” (Ans: Germinate)
   B. Germination Transparency – (T-4) and (T-GN)
      W (water), A (air), L (light), T (temperature)
Wild Flower Garden: *(Outside Garden)*
Give students a packet of seeds to plant – Instruct them not to plant until they are directed to do so.
Direct students stand in front of an area that they are to plant their seeds

1. **“Can you point out and identify any existing wildflowers in the wildflower garden?”**
   Identify other wildflowers for students.

2. **“How are you going to plant the seeds?”** *(Ans: Sprinkle on top of the ground)
   Cover with a small amount of soil
   Sprinkle lightly with water)*

   Students plant seeds as each step is directed (sprinkle seeds, sprinkle sand, sprinkle water).

**Return to room**

**Reinforcement**–
1. Blanket Flower coloring page – **“What colors will you be using to color the Blanket Flower?”**
   *(Ans: Red edges with yellow centers)*

**Pass Out:**
1. Crossword puzzle
2. Writing Prompt on Wild Flowers
WILDFLOWER PROGRAM

EVALUATION:

Pamphlets:
“The Wildflowers of Florida”, by Florida Dept. of Agriculture and Consumer Services (P189G-05)
“Coreopsis- A Guide to Identifying and Enjoying Florida’s State Wildflower” by U of Fl, IFAS
(ENH867)

Wildflower Program meets the following Sunshine State Standards:

Science - Grades 3-5
   How Living Things Interact with Their Environment –
      Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment.
      (SC.G.1.2) (2), (7)
      Standard 2: The student understands the consequences of using limited natural resources
      (SC.G.2.2) (1), (2), (3)
   Processes of Life –
      Standard 2: The student understands the process and importance of genetic diversity
      (SC.F.2.2)

Social Studies – 3-5
   Time, Continuity, and Change
      Standard 6: The student understands the history of Florida and its people
      (SS.A.6.2) (2)

Language Arts – Grades 3-5
   Language
      Standard 2: The student writes to communicate ideas and information effectively
      (LA.B.2.2) (1)
Example of SEED page. Seeds adhered to paper by a spray adhesive. Enclose page in a “sheet protector”.
WILDFLOWERS

Wildflower

Native Plant

State Wildflower

Seed

Germinate

Pick a wildflower if

1. _______________________________________________________________________
2. _______________________________________________________________________
3. _______________________________________________________________________
4. _______________________________________________________________________
5. _______________________________________________________________________

‘Walt Germinate’

W A L T

_________________________  _________________________
GROWING GOOD TIMES

ACROSS
4. When a seed has the right conditions to start sending out its roots
23. Native plant seeds do not die when it is cold because they are _______-tolerant

DOWN
1. When you are looking for wildflowers, it is important that you do not _____ on private property
2. Do not pick a ______ flower if there is only a couple of them growing in one area.
3. Plants that have been growing in Fl. since early settlers first came here are called _____ plants.

WORD BANK
cold germinate naturalized
sprout wild frost
trespass native
Indian Blanket or Blanket Flower

Native to the western states, now widely established in Florida where blooms appear over a long period of spring through summer.
source: Wikimedia Commons

ORANGE BLOSSOM -- Floriada State Flower
source: Wikimedia Commons

NORTHERN MOCKINGBIRD
Hi, I’m WALT Germination and I make seeds sprout
Wildflower  A flowering plant that grows without any human assistance.

Native Plant  A plant that has grown in Florida since the first setters arrived (1500AD).

State Wildflower  Coreopsis. Many different varieties in Florida

Seed  A box containing a plant.

Germinate  When a seed sends out its’ roots and first leaf

Pick a wildflower if
1. you Do Not Trespass
2. you receive owners’ permission
3. 10 or more of the same flower are growing in the area
4. only pick less than half of the flowers
5. wear proper clothing and shoes

‘Walt Germinate’

W A L T

water  air  light  temperature
Trees
TREE PROGRAM

OBJECTIVES:
- Learn the definition of a tree
- Learn the importance of trees
- Learn the 2 main types of trees
- Learn what growth rings are
- Learn how to tell the life history of a tree
- Learn the effects of the environment on a tree

MATERIALS:
- Transparencies:
  - Fla. State Tree-Sabal Palm, T-1
  - Growth Ring History, T-2, T-2a, T-2b
  - Completed Trees guided note sheet, T-GN
  - Giant Sequoia T-5
- Blank sheet of paper (use as cover sheet)
- Slices of tree trunk (one per student group)
- Seedling (example)
- Sapling (example)
- Tree seeds (acorn, pine cone, etc.)
- Reading the Rings worksheet (1 per student)
- Student Trees guided note sheet (1 per student)
- Word Search puzzle (1 per student)
- Writing prompt (1 per student)

PROGRAM:
Pass out Guided Notes

Completed guided note transparency (uncover, with blank paper, term meanings as discussed)
1. “What is a Tree?” (T-GN) – (Ans: Single elongated stem (trunk) and the main trunk has few or no branches.)

2. “Do you know what the State Tree (T-GN) is?” (Ans: Sabal Palm (Cabbage Palm or Palmetto) – (T-1)
   “Tallest Trees in Sequoia Nat’l Park, CA., Giant Sequoia (T-5), Cutting the whole greatly damaged the tree. It is not possible to drive through the tree anymore.”

3. “Two types of trees – What do you think they are? It has something to do with the way they look or what they do during the year.”
   A. Deciduous (T-GN) - loses all its leaves at the same time, usually in the fall, and replaces them in the spring.
      **Reason**: Animals get ready for winter by adding more fat and growing thicker fur to keep warm. Trees get ready for winter by dropping their leaves to keep from dying of thirst. When the ground is frozen the roots can not draw water up through its roots. It must survive on stored water in it’s trunk and branches.
   1) **Turn color** - “Why do leaves have different colors in the fall?”
      **Reason**: During the spring and summer a substance called Chlorophyll (T-GN) uses energy from the sun to help make food for the plant. Chlorophyll is also what makes leaves green. There are other colors in leaves too. It is just that during the growing season, there is so much
broad green Chlorophyll that you can’t see the other colors. The hidden colors are yellow, orange, red, brown and purple.

Leaves recycle themselves (become nutrients)

B. **Evergreen** (T-GN) - loses leaves all year long, but replaces them as they fall off. They always have leaves

4. **Forests** - 1/4 of earth’s land is forest
   A. **Benefits:** “Why are trees important?”
      Oxygen – 1 large tree supplies 1 day of oxygen for 4 people
      Clean the air -leaves trap dust, ash and pollen
      Soil Erosion prevention
      Shelter - for wildlife.
      Provide good climate - shade, lower temp. by water evaporation from leaves,
      increase humidity in dry area, slow down forceful winds,
      Lowers noise pollution
      Food for humans - Ex. Bananas, oranges, lemons lime apples, nuts,
      Wood for human use -building material, fire (heat)
      1) “What things can you Identify in the classroom that come from a tree?” (T-GN)
         (Ans: desk, Kleenex, paper, etc. Many products from cellulose, a tree byproduct)

5. **Life Cycle:** similar to other plants
   A. **seedling** - when it first sprouts – **Show** example tree seeds
   B. **sapling** - mature produce seeds – **Show** example of a sapling

6. **Growth:** (T-2)
   A. **Growth Rings** (T-GN) – Trees add new layers of wood each spring and summer.
      Spring - grows fast and the wood cells are large and causes the **light color**
      Summer - growth is slower and the wood cells are smaller and are **darker**
      Count the dark rings for **tree age.** – Oldest tree: Western Juniper in Stanislaus Nat’l Forest, CA , over 4,000 yrs. old
      1) **New growth occurs** – in outer layers where food and water are transported.
         Important not to damage outer layers with string trimmers, lawn mower, etc.

7. **Life history of a tree:**
   A. Give the history of the tree on the transparency. (T-2), (T-2a), (T-2b)
      “What can you tell about the last years of the tree?”
      (Ans: undisturbed growth (even rings)
      “Can you List the things that alter the normal growth pattern of a tree?” (T-GN)
      (Ans: insects, fire, overcrowded, drought, physical damage)
   B. **Pass out Reading the Rings worksheet**
      Reading the Rings worksheet – students complete
      Go over worksheet with students
   C. **Group Activity** - (students seated in groups of 4-5 each)
      **Pass Out** tree slices to each group of students
      1) Direct Groups to pick a spokesman
2) Ask groups to determine the following:
   * How old is the tree that this slice came from?
   * What can you tell about the tree from this slice of the tree?
3) Allow groups time to come to conclusions on the two items
4) Ask each group spokesperson to report to the entire class their findings about their findings.
5) Congratulate students on their findings

8. Reinforcement --
Pass Out
1. Writing Prompt
2. Word Search Puzzle

EVALUATION:

Tree Program meets the following Sunshine State Standards:

Science - Grades 3-5
Process of Life
   Standard 1: The student describes patterns of structure and function in living things.
      (SC.F.1.2) (2)
   Standard 2: The student understands the process and importance of genetic diversity.
      (SC.F.2.2) (1)
How Living Things Interact with Their Environment
   Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment.
      (SC.G.1.2) (1), (2), (3), (7)
The Nature of Science
   Standard 1: The student uses the scientific processes and habits of mind to solve problems.
      (SC.H.1.2) (2), (3)
   Standard 3: The student understands that science, technology, and society are interwoven and interdependent.
      (SC.H.3.2) (2)

Language Arts – Grades 3-5
Language
   Standard 2: The student writes to communicate ideas and information effectively.
      (LA.B.2.2) (1)
### Trees

<table>
<thead>
<tr>
<th>Tree</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>State Tree</td>
<td></td>
</tr>
<tr>
<td>Deciduous</td>
<td></td>
</tr>
<tr>
<td>Evergreen tree</td>
<td></td>
</tr>
<tr>
<td>Chlorophyll</td>
<td></td>
</tr>
</tbody>
</table>

#### List classroom items from trees:

1. [ ]
2. [ ]
3. [ ]

#### Growth rings

1. [ ]

#### List items that alter the normal growth of a tree:

1. [ ]
2. [ ]
3. [ ]
A. 

1. Fallen tree

B. 

2. Fire

3. Drought

C. 

4. Insect attack

D. 

5. Construction

6. Growing on slope

7. Dead branch
GROWING GOOD TIMES

Date: ___________________________________________________________

Topic: __________________________________________________________

What we did: ____________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

What I learned: _________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

What I liked: ___________________________________________________
FIND THE ITEMS MADE FROM TREES

NEWSPAPER
ENVELOPE
FLOORING
DESK
SLED
CLOTHING
MAGAZINE
TISSUE
PAPER
GUITAR
PENCIL
HOUSE
BOOK
SAILBOAT
BIRDHOUSE
DIAPER
CHAIR
MULCH
TOOTHPASTE
NOTEBOOK
CORK

WORD LIST
Tree  A single elongated stem (trunk) with few or no branches

State Tree  Sabal Palm (sometimes called Cabbage Palm or Palmetto Palm)

Deciduous  It loses all its’ leaves at the same time, usually in the fall and replaces them in the spring.

Evergreen tree  It loses leaves all year long, but replaces them as they fall off. They always have leaves.

Chlorophyll  It gives plants their green coloring. It uses energy from the sun to help make food for the plant.

List classroom items from trees:  
Desks, chairs, pencils, tissues, etc.

Growth rings  They are made of new layers of wood. Spring wood layers are light colored due to fast growth. Summer wood layers are dark due to slow growth.

List items that alter the normal growth of a tree:  
Fire — insects — overcrowding — drought — physical damage
This tree is 62 years old. It’s been through fire and drought, plague and plenty. And all of this is recorded in its rings.

Each spring and summer a tree adds new layers of wood to its trunk. The wood formed in spring grows fast, and is lighter because it consists of large cells. In summer, growth is slower; the wood has smaller cells and is darker. So when the tree is cut, the layers appear as alternating rings of light and dark wood.

Count the dark rings, and you know the tree’s age. Study the rings and you can learn much more. Many things affect the way the tree grows and thus alter the shape, thickness, color and evenness of the rings.

1904
The tree — a loblolly pine — is born.

1909
The tree grows rapidly with no disturbance. There is abundant rainfall and sunshine in the spring and summer. The rings are relatively broad and evenly spaced.
(3) 1914
When the tree is 6 years old, something pushed against it, making it lean. The rings are now wider on the lower side as the tree builds ‘reaction wood’ to help support it.

(4) 1924
The tree is growing straight again. But its neighbors are growing too, and their crowns are root systems take much of the water and sunshine the tree needs.

(5) 1927
The surrounding trees are harvested. The larger trees are removed and there is once again ample nourishment and sunlight. The tree can now grow rapidly again.

(6) 1930
A fire sweeps through the forest. Fortunately, the tree is only scarred and year by year more and more of the scar is covered by newly formed wood.

(7) 1942
These narrow rings may have been caused by a prolonged dry spell. One or two dry summers would not have dried the ground enough to slow the tree’s growth this much.

(8) 1957
Another series of narrow rings may have been caused by an insect like the larva of a sawfly. It eats the leaves and leaf buds of many kinds of coniferous trees.
Trees and products made from trees contribute to many aspects of our daily lives. Not only do they provide clean air, clean water, soil conservation and provisions for wildlife but they also provide a multitude of products consumers use every day. Everything from toothpaste to ping pong balls & paddles, to writing stationery, pencils and even the adhesive glue on an envelope and stamp. Forest products are found everywhere you look and even in places you “wood” not.

How can this be?  
When a tree is cut, nothing goes to waste. All parts, big and small, are used in one form or another. The bark for gardening mulch; limbs and trunks for building materials and to make wood pulp found in a variety of products, derivatives from the manufacturing process for perfumes, toiletries and industrial products; sawdust and wood chips for energy in mills; tree sap for syrups and turpentine; and roots for medicines, spices and teas. Scientists estimate that the average American consumes the equivalent of a 100-foot tree each year to fulfill wood and paper needs -- not surprising when you look at the forest products within your own home.

A quick inventory will reveal thousands of forest products, not to mention the biggest one of all -- your home. Just a few items include:

**Bathroom:** toilet seats, liquid soap, bathroom cleansers, rayon curtains, hooks and towel racks, disposable diapers, toilet paper, toothpaste, toothbrush, makeup, antacids, aspirin and other pharmaceuticals, hair spray, nail polish, shampoo and conditioners, combs and brushes.
- Cosmetic companies use tall oil, a byproduct of the pulping process, in Perfumes and cellulose Derivatives in Lipstick. This enables lipstick to stay on your lips and on a cheek or two.

**Kitchen:** linoleum floor, vinegar, tea bags, coffee filters, flavorings (such as vanilla lemon, lime, peppermint, spearmint, nutmeg, lilac, violet, lily of the valley, rose), pancake mix, maple syrup, parmesan cheese, pet food, wax polish, recipe box, paper towels, beer and liquor, baking cups, cutting board, hot chocolate mix, yeast, paper plates and cups, handles for cooking utensils, rolling pins, high chair, apple cider, cellophane, candlesticks, cellulose sponges, jams & jellies.
- Trees add spice to life. Vanillin, a byproduct of the pulping process, used to make artificial flavorings and fragrances found in many Commercially baked goods and confections.

**Living area:** eyeglass frames, clocks, furniture, fireplaces, plaques, carpeting, wall paper, stairways, pianos, chairs and tables, bookshelves, playing cards, board games, paintings, photographs, bookends, billiard tables, guitars, speaker casings, baskets, toys, curtain rods, clothing, imitation leather.
- Hard impact-resistant plastics such as those used for toys or eyeglass frames are made with cellulose.

**Garage:** paint, tires, waterproofing, paint thinner, seedling pots, roofing compounds, handles for gardening tools, putty and caulking compounds, wagons, croquet balls & mallets, birdhouses, epoxy resins, mousetraps, plastic pipes, handles for screwdrivers and other tools, varnish, car bumper, enamel, wood stain, football helmets, luggage, rake, air and oil filters.
- Methylcellulose, a product made from cellulose, gives paints their thick consistency.
### A list of some products made from trees:

<table>
<thead>
<tr>
<th>Animal bedding</th>
<th>Artisanal human limbs</th>
<th>Barrels and kegs</th>
<th>Baskets</th>
<th>Billboard</th>
<th>Birdhouses</th>
<th>Boats</th>
<th>Boxes: wood, bin, corrugated</th>
<th>Bridges</th>
<th>Brooms</th>
<th>Mops</th>
<th>Cable reels</th>
<th>Caskets</th>
<th>Christmas tree stands</th>
<th>Clocks</th>
<th>Corks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decks</td>
<td>Fences</td>
<td>Flooring</td>
<td>Doghouses</td>
<td>Drumsticks</td>
<td>Excelsior</td>
<td>Fiber drums</td>
<td>Fitness benches</td>
<td>Game calls</td>
<td>Gauge sticks</td>
<td>Gazebos</td>
<td>Guitars</td>
<td>Industrial patterns</td>
<td>Ironing boards</td>
<td>Ladders</td>
<td>Landscape timbers</td>
</tr>
<tr>
<td>Log homes</td>
<td>Lumber</td>
<td>Mallets</td>
<td>Mine props</td>
<td>Mobile homes</td>
<td>Novelties</td>
<td>Paddles and oars</td>
<td>Pallets</td>
<td>Skis</td>
<td>Pencils</td>
<td>Paneling</td>
<td>Particle board</td>
<td>Piano frames and keys</td>
<td>Picture frames</td>
<td>Poles and piling</td>
<td></td>
</tr>
<tr>
<td>Planters</td>
<td>Playground</td>
<td>Equipment</td>
<td>Plywood</td>
<td>Potting soil</td>
<td>Sheds</td>
<td>Tongue depressors</td>
<td>Skis</td>
<td>Trusses</td>
<td>Sheds</td>
<td>Trailer</td>
<td>Trash bins</td>
<td>Wagon</td>
<td>Wagon</td>
<td>Wood sculpture</td>
<td>Toothpaste</td>
</tr>
</tbody>
</table>

### Chemicals and byproducts:

<table>
<thead>
<tr>
<th>Acetate</th>
<th>Acetone</th>
<th>Adhesive</th>
<th>Artificial flavorings</th>
<th>Cellophane</th>
<th>Cleaners</th>
<th>Cosmetics</th>
<th>Creosote</th>
<th>Disinfectants</th>
<th>Drilling compounds</th>
<th>Enamel</th>
<th>Foam rubber</th>
<th>Fuel</th>
<th>Gum</th>
<th>Insecticides</th>
<th>Lacquer</th>
<th>Lubricants</th>
<th>Medicines</th>
<th>Nail polish</th>
<th>Paint</th>
<th>Photographic and</th>
<th>Movie film</th>
<th>Printing ink</th>
<th>Putty and caulking</th>
<th>Rayon</th>
<th>Resins</th>
<th>Stain</th>
<th>Tanning compounds</th>
<th>Turpentine</th>
<th>Varnish</th>
<th>Vinegar</th>
<th>Wood alcohol</th>
</tr>
</thead>
</table>

### Paper products:

<table>
<thead>
<tr>
<th>Adhesive tape</th>
<th>Bags and sacks</th>
<th>Books</th>
<th>Boxes</th>
<th>Bank checks</th>
<th>Cartons</th>
<th>Confetti</th>
<th>Crepe paper</th>
<th>Copying paper</th>
<th>Cups</th>
<th>Desk pads</th>
<th>Diapers</th>
<th>Disposable clothing</th>
<th>Envelopes</th>
<th>Kites</th>
<th>Magazines</th>
<th>Maps</th>
<th>Money</th>
<th>Name tags</th>
<th>Napkins</th>
<th>Newspapers</th>
<th>Paper towels</th>
<th>Postage stamps</th>
<th>Ribbon</th>
<th>Roofing</th>
<th>Felt</th>
<th>Stationery</th>
<th>Telephone books</th>
<th>Tissues</th>
<th>Wrapping paper</th>
</tr>
</thead>
</table>

### Millwork:

<table>
<thead>
<tr>
<th>Banisters</th>
<th>Columns</th>
<th>Counter tops</th>
<th>Doors, dowels</th>
<th>Drawers</th>
<th>Lattice</th>
<th>Mantles</th>
<th>Mirror frames</th>
<th>Molding</th>
<th>Partitions</th>
<th>Picture frames</th>
<th>Plaques</th>
<th>Porch swings</th>
<th>Shelves</th>
<th>Shutters</th>
<th>Windows</th>
</tr>
</thead>
</table>

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CREATED BY JOANNE CONNOR, NAVARRE GARDEN CLUB, INC.; PROPERTY OF FFGC
### Furniture:

<table>
<thead>
<tr>
<th>Furniture</th>
<th>Furniture</th>
<th>Furniture</th>
<th>Furniture</th>
</tr>
</thead>
<tbody>
<tr>
<td>barstools</td>
<td>china cabinets</td>
<td>dressers</td>
<td>reclining chairs</td>
</tr>
<tr>
<td>beds</td>
<td>church pews and</td>
<td>entertainment centers</td>
<td>rocking chairs</td>
</tr>
<tr>
<td>box springs</td>
<td>furniture</td>
<td>gun cabinets</td>
<td>school furniture</td>
</tr>
<tr>
<td>benches</td>
<td>computer stands</td>
<td>hutches</td>
<td>speaker cabinets</td>
</tr>
<tr>
<td>bookcases</td>
<td>couches</td>
<td>kitchen cabinets</td>
<td>tables</td>
</tr>
<tr>
<td>cabinets</td>
<td>credenzas</td>
<td>lamps</td>
<td>telephone stands</td>
</tr>
<tr>
<td>cedar chests</td>
<td>desks</td>
<td>night stands</td>
<td>upholstered chairs</td>
</tr>
<tr>
<td>chairs</td>
<td>dinettes</td>
<td>office furniture</td>
<td>vanities</td>
</tr>
<tr>
<td>chests</td>
<td>dining rooms</td>
<td>picnic benches</td>
<td>work benches</td>
</tr>
</tbody>
</table>

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Prepared by the Georgia Products Commission
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Steve Shooks’s Directory of Forest Products, Wood Science and Marketing

Christian Web
Arbor Day
ARBOR DAY PROGRAM

OBJECTIVES:
- Learn the history and importance of Arbor Day
- Learn the proper tree planting procedure
- Learn 3 facts about the “Bald Cypress” tree (or other tree chosen)
- Plant a tree

MATERIALS:
- Transparency:
  - Completed guided note sheet (T-GN)
- Tree to be planted
- Tree Planting Guide (1 per student)
- Tarp
- 3 shovels
- 3 watering cans with water
- Mulch
- Sign post (short post to attach tree name and date to be determined)
- Rubber Mallet
- Student guided note sheet (1 per student)
- Writing Prompt (1 per student)

POSTER CONTEST: OPTIONAL
- Provide information about Arbor Day Poster Contest with group to submit to FL Arbor Day Poster Contest to conform to contest time table.
- Awards for winners - coupons, ribbons, etc. as desired
- Certificates for participants

PLANTING SITE PREPARATION:
- Pre-dig hole for tree and refill

PROGRAM:
- Pass out - guided notes
- Guided Notes – use blank cover sheet to uncover each term as discussed

1. Arbor Day History (T-GN) – started in 1872 in Nebraska by a journalist, J. Sterling Morton, editor of the first Nebraska newspaper he spread agriculture information. He advocated tree planting for not only for their beauty but also for windbreaks, to prevent soil erosion building materials and for shade. The first Arbor Day prizes were given for the most tree plantings. Each classroom planted a tree and students marched in a parade. Over 1million trees were planted in Nebraska the first Arbor Day. Arbor Day is celebrated in the spring for most states. In Florida, Arbor Day is celebrated in January because it is the best time to plant trees. It has spread to be celebrated in many other countries in the world.

2. (?) tree – (tree to be planted)
   - Give description of tree to be planted - shape, size, deciduous/evergreen, etc.
**ARBOR DAY PROGRAM**

**Pass Out** - Tree Planting Guide

3. **Tree Planting Guide (T-GN)** – Go over each step with the group with explanations

- Look up
- Dig a wide, shallow hole
- Place tree
- Position height of tree in hole
- Find the top-most root
- Straighten tree
- Remove synthetic materials
- Water in backfill
- Stake if diameter <1.5 in.
- Tree Planting Guide – Go over each step with group with explanations

**Outside Planting Site**

1. **Plant Tree** –
   - “What was the first thing on the Tree Planting Guide?” (Ans: look up)
   - “Is this a good place to plant the tree?” (Ans: hopefully yes)
   - Select 3 students to remove dirt from pre-dug hole (place on tarp)
   - “Have we dug the proper size hole? Why?” (Ans: wide and shallow)
   - Select 2 students to put tree in hole
   - “Is the tree in the hole at the correct height?” (Ans: top-most root at soil line)
   - “Is it straight?” (Ans: hopefully yes)
   - Remove any synthetic material if needed
   - Select 3 students to backfill the hole
   - “What should we do next?” (Ans: water the backfill)
   - Select 3 students to water tree
   - “Is there anything else to do?” (Ans: mulch)
   - “Why?” (Ans: retain moisture, keep weeds away-- mowers and trimmers will not get close to tree and damage it)
   - Select 3 students to mulch tree
   - Place Plaque at tree

**Classroom** – Students return to classroom

1. **Optional Poster Contest Awards** – awards for 1-3 and 2 honorable mentions
   - Certificates for all participating students.
   - Posters to be displayed at public venue

2. **Review** -
   - A. Ask students to give name, type and growth habits of the tree planted.
   - B. Tree name – students asked for name suggestions then vote on a name for the tree planted.

**Pass Out** – worksheets

- C. Reinforcement activities:
  1. Word Search
  2. Writing Prompt.
EVALUATION:

Arbor Day Program meets the following Sunshine State Standards:

Science – Grades 3-5
   How Living Things Interact with Their Environment -
      Standard 2: The student understands the consequences of using limited natural resources.
         (SC.G.2.2) (2)

Social Studies – 3-5
   Time, Continuity, and Change -
      Standard 4: The student understands U.S. history to 1880
         (SS.A.4.2)(5)

Language Arts – Grades 3-5
   Language -
      Standard 2: The student writes to communicate ideas and information effectively.
         (LA.B.2.2) (1)
Arbor Day

J. Sterling Morton

Importance of Trees
1. 
2. 
3. 
4. 
5. 

Tree Planting Guide
1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10.
Tree Planting Guide

Start with High Quality Trees
- Select trees with a quality trunk form
- Check for kinked and/or circling roots and cut them if present.

Transportation
- Transport in an enclosed truck or cover during transit
- Do not lift the tree by the trunk. Carry or lift by the rootball.
- It is best to plant trees the day they arrive at the planting site if at all possible.

Planting Procedure
1. Look up.
   If there is anything nearby that could interfere with proper development of the tree canopy as it grows, plant elsewhere.
2. Dig a wide, shallow planting hole.
   - Shallow is better than deep
   - Prepare the hole three times as wide as the rootball and slightly less than the depth of the rootball
   - Amendments are usually not recommended

Tree Planting Guide

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   - Amendments are usually not recommended
3. Find the point where the top-most root emerges from the trunk.
   - The point where the top-most roots emerge from the trunk should be exposed and visible.
4. Place the tree carefully into the planting hole.
5. Position the point where the top-most root emerges from the trunk slightly above the surface of the landscape soil.
   - Better to plant the tree a little high than to plant it too deep.
6. Straighten the tree in the hole.
7. Remove all synthetic materials from around the trunk and root ball.
8. Slice or water in the backfill
   - Do not firmly pack backfill soil in an attempt to eliminate air pockets because this could cause too much soil compaction.
9. Cover the sides of the root ball with mulch
   - Construct a berm out of mulch at the edge of the root ball only if the tree will be watered with a hose, bucket, or other high volume method.
10. Stake the tree, if necessary
    - Staking to hold a weak trunk upright should not be necessary on trees with a trunk diameter more than about 1.5 inches.

Irrigation for Newly Planted Trees
- Establishment takes 4 months per inch trunk caliper

<table>
<thead>
<tr>
<th>Size of Nursery Stock</th>
<th>Irrigation Schedule for Vigor</th>
<th>Irrigation Schedule for Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2 inch caliper</td>
<td>Daily for 2 weeks; every other day for 2 months; weekly until established</td>
<td>Twice weekly for 2-3 months</td>
</tr>
<tr>
<td>2-4 inch caliper</td>
<td>Daily for 1 month; every other day for 3 months; weekly until established</td>
<td>Twice weekly for 3-4 months</td>
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<td>&gt;4 inch caliper</td>
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Topic: ________________________________________________

What we did: ____________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

What I learned: __________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

What I liked: ____________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________
Unscramble the words below by placing one letter in each box. Then use the numbered blocks to find the answer to the riddle at the bottom.

**YDBUD**

```
1 2
```

**KEDS**

```
5 9
```

**ENILCP**

```
8 7 3 4
```

**HCREATE**

```
10 6
```

**RIDDLE:**
What some birds do in a tree to make a home

**ANSWER:**
Arbor Day  A holiday celebrating the importance of trees with a tree planting

J. Sterling Morton  Nebraska journalist who held the 1st Arbor Day in 1872

Importance of Trees

1. Shade
2. Building materials and other wood products
3. Windbreak
4. Soil Erosion
5. Beauty

Tree Planting Guide

1. Look Up
2. Dig a wide shallow hole
3. Keep top-most root at soil line
4. Place tree carefully in the hole
5. Position height of the tree
6. Straighten tree
7. Remove synthetic materials
8. Water in backfill
9. Mulch
10. Stake if less than 1 ½ in. in diameter
Floral Design
FLORAL DESIGN PROGRAM

OBJECTIVES:
- Know that Floral Design is an art form
- Learn basic floral Design terms and their meanings:
  - depth, proportion, scale, texture and balance
- Complete a Mass Design, (Optional) Line or other simple design form
- Learn what a Flower Show is

MATERIALS:
- Transparency:
  - Completed guided note sheet (T-GN)
  - Geometric Forms (T-1)
  - Design Shapes (T-2)
  - Basic Designs (T-3)
  - Elements and Principals of Design (T-4)
  - Mass Design (T-5)
- Blank sheet of paper (cover sheet)
- Student guided note sheet (1 per student)
- “Recipe- Floral Design Cake” (1 per student)
- completed floral design (example of the design to be created)
- Plastic table covering (lg. plastic bags cut open)
- Dry oasis sample
- Design Activity: (one or group of per student)
  - Container for design (apple, most meat removed)
  - Oasis (pre soaked and taped in place)
  - Greenery (conditioned)
  - Featured Object – pencil (dependent on theme)
  - Scissors/clippers
- Ruler

Prep Tables - with plastic covering

PROGRAM:
Pass Out – Student guided note sheets (use blank cover sheet to uncover each term as discussed)

1. Floral Design:
   “Flowers and plants are grown to make arrangements as well as to make yards attractive. Called: Cutting Gardens.”
   “Why would you make an arrangement?” (Ans: special occasions-celebrations, holidays, decorate)
   “What is a Floral Design (T-GN)?” (Ans: The use of flowers and plant material in a unique, interesting, imaginative, and beautiful manner)

2. Types of Design:
   A. “Designs come in different shapes and sizes.”
      1. “3 basic geometric forms of designs.” (T-1) – Cone, Triangle and Sphere (round)
      2. “Many shapes come from these 3 geometric designs.” (T-2)
      3. “Basic designs are formed in these shapes.” (T-3)
B. “Today’s design is a Mass Design (T-GN) --A sphere/round shape” (other design selected)  
“Contains several flowers and greenery creating a 3 dimensional design without any open spaces.”

Pass Out – Cake Recipe
3. “Recipe – Floral Design Cake”  
“When making a design there are things to keep in mind.”  
Select students to read aloud the “Cake Recipe”

Show -- completed design (use as an example of Elements and Principles of Design)

A. Elements of Design: (T-4)
   Briefly go through terms and their meaning. Show on the completed design  
   Light – light in and around design  
   Line - continuous path  
   Size - size of shape, form or space  
   Space – open area in and around the design  
   Form - 3 dimensional shape  
   Pattern - outline of a design  
   Texture (T-GN) – surfaces are rough, smooth, dull, shiny etc.  
   Color - what the eye sees (white is a color)

B. Principles of Design: (T-4)
   Briefly go through terms and their meaning. Show on the completed design  
   Balance - looks stable  
   Proportion (T-GN) – how one part of the design is to another part or the whole design  
   Scale (T-GN) – parts of a design compared to other parts  
   Contrast -- unlike parts cause interest  
   Dominant – the most of or what stands out  
   Another term needed:  
   Depth (T-GN) - not flat, shows distance, more interesting

4. Design Activity:  
   *Use this approach if other theme or type of design is chosen

Show -- finished design

A. Introduction to design construction --  
   1) “Our design is for a “School Days” theme.”  
   2) Explain that students will be shown step by step how to create the design. Wait for instructions

B. Design Construction:

Pass Out - containers to each student with presoaked oasis  
   1) Show dry oasis - Explain oasis and the pre soaking - (place oasis in water, it will float then absorb water and sink to the bottom when saturated - do not push oasis down)  
   *Instruct students to wait for directions before putting anything in their design

Pass Out - greenery (fern)  
   2) Show its placement on the finished design and on a new instructional design container.  
      and on “Mass Design” transparency – (T-5)  
      Proceed with the remainder of greenery in the same manner.
Pass Out - flowers

3) **Cutting of stems**: instruct students on size of stems needed for the size of the flower head in the design
   a) “1 ½ - 2 times, the height or width (which ever is greater) of container determines the height of the tallest flower or greenery in the design.”

   (1) Ask students to measure the height of the apple and determine how high the tallest flower in the design will be. Ask individual students to tell their computation to the class.
   (there will be slight differences.)

   **Show** flower placement on the design, on instructional design, and on transparency (T-6)
   (a circle = flower placement)

**Pass Out -- filler (pittsporum)**

4) Filler is used to cover the oasis where it can be seen.

**Pass Out -- red pencil**

5) Featured Object -- Red pencil helps bring up the color of the container into the design and helps interpret the title of the design

**Show -- placement of the Featured Object for students to follow**

6) **Completion** of Designs:
   a) “**Name your design remembering that the overall theme is “School Days”.**”
   b) Students, individually, hold up their designs and give it’s name for the rest of the class to appreciate
   c) Congratulate students on their designs.

5. **Flower Show (optional):**
   A. Description: It is a competition similar to a Science Fair.
      There is a topic theme –
      The designs in the show must meet all the Elements and Principles of Design
      Ribbons awarded for 1st, 2nd, 3rd place, and honorable mention
      Children’s category in flower shows.
      Our Garden Club’s Flower Show this year is ________________
      Theme this year is __________________

   B. Enter a Flower Show
      “You (students) could make designs to enter in the show!”
      “I think there are some very talented floral designers in this class”

6. **Congratulate** students on their designs -- Take photos (optional and permitted by school law)

**Reinforcement**

**Pass Out -- worksheets**
   1. Crossword Puzzle
   2. Writing Prompt

**Options:** Other line forms and themes may be substituted. (Themes such as Halloween, Valentine’s etc.) A Design can be made in a theme container without flowers. Candy, small ornaments on floral picks and chennel pipe cleaners etc. can be used instead of flowers.
FLORAL DESIGN PROGRAM

Evaluation:

Floral Design Program meets the following Sunshine State Standards:

The Arts – Grades 3-5
   Visual Arts – Skills and Techniques
      Standard 1: The student understands and applies media, techniques, and Processes.
      (VA.A.1.2) (1), (3)

Mathematics – Grades 3-5
   Measurement –
      Standard 4: The student selects and uses appropriate units and instruments for measurement to
                  achieve the degree of precision and accuracy required in real-world situations
                  (MA.B.4.2) (2)

   Geometry and Spatial Sense --
      Standard 2: The student visualizes and illustrates ways in which shapes can be combined,
                 Subdivided and changed
                  (MA.C.2.2) (1)

Language Arts – Grades 3-5
   Language – Writing
      Standard 1: The student uses writing processes effectively
                  (LA.B.1.2) (1)
FLORAL DESIGN

Floral Design

Mass Design

Texture

Proportion

Scale

Depth
Recipe
Floral Design Cake

To bake a cake, we use the ingredients of flour, sugar, eggs, butter, and chocolate (and whatever else you want to add). We mix them together and pour them in the pan to bake.

To make a floral design, we use the ingredients of light, line, size, space, form, pattern, texture, and color. (Elements of Design) We mix them together and put them in our container.

Then we bake the cake. We decorate it nicely. We hope that it will be balanced, and that the top layer will not slide off, or that the cake will not be lopsided. We try to see that there is the correct proportion of icing to cake and that the candle and other decorations are in scale with the cake. We do not color everything the same, because we hope to have pleasing contrast. To be really pleasing, something must be dominant. (Principle os Design).

Likewise, when we view our finished design, we want to be sure that it is balanced, has the right proportion of flowers to foliage, has contrast, but that something is dominant. It should be in scale with its surroundings, and elements should be in scale with each other. We now have an appealing design.

Marie Harrison
GROWING GOOD TIMES

Date: __________________________________________

Topic: __________________________________________

What we did: _______________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

What I learned: _____________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

What I liked: _______________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
GROWING GOOD TIMES

ACROSS
3. The material in the design must be in ____ to one another.
21. The first thing to consider when making a design is _____.
33. The visual path of the design is its _______.

DOWN
1. Flowers should be in _____ with the container.
2. How large or small a part of the design is _______.
15. Open areas in and around the arrangement is _______.
20. The visual path of the design is its _______.

Answers:
Across:
3. proportion
21. balance
33. line

Down:
1. contrast
2. size
15. space
20. scale
Floral Design  
The use of flowers and plant material in a unique, interesting, imaginative, and beautiful manner

Mass Design  
Contains several flowers and greenery creating a 3 dimensional design without any open spaces

Texture  
Surfaces are rough, smooth, dull, shiny, etc.

Proportion  
How one part of the design is to another part or the design or the whole design

Scale  
Parts of a design compared to other parts of the design

Depth  
Not flat but shows distance
Three basic Geometric Forms

Cylinder (Line Designs)

Cone (symmetrical and asymmetrical triangles)

Designs by Marie Harrison
Sphere (crescent, Hogarth)

Designs by Marie Harrison
BASIC DESIGNS

Horizontal

Hogarth

Vertical

Inverted T

Symmetrical Triangle

Asymmetrical Triangle

Right Angle

Crescent

Circle

Oval

Zig Zag

Spiral

Diagonal
**Elements of Design**

**Light** -- light in and around the design

**Line** -- a continuous path

**Size** – size of shape, form or space

**Space** – open area in and around the design

**Form** – 3 dimensional shape

**Pattern** – outline of a design

**Texture** – surfaces are rough, smooth, dull, shiny, etc.

**Color** – what the eye sees (white is a color)

---

**Principles of Design**

**Balance** – looks stable

**Proportion** – how one part of a design is to another part of the whole design

**Scale** – parts of a design compared to other parts

**Contrast** – unlike parts cause interest

**Dominant** – the most of, or what stands out
Mass Design

1. Greenery skirt:

2. Place center flower (upright & establish height)

3. Make a STAR (angle flowers greater than 45 degrees)

4. Place in between points of the star (about 45 degree angle)

5. Place in between points of #4 (almost upright)

6. Place filler/greenery in design

7. Cover and visible oasis with greenery
Terrarium
TERRARIUM PROGRAM

OBJECTIVES:
- Learn what a Climate is
- Learn what microclimate is
- Learn what a terrariums is and its uses
- Learn about the water cycle in a terrarium and nature
- Create a living terrarium

MATERIALS:
- Transparency:
  - Completed guided note sheet (T-GN)
  - Water Cycle (T-1)
  - Clear, smooth acetate sheet (erasable transparency)
  - Blank sheet of paper (cover sheet)
- Student guided note sheet (1 per student)
- Water Cycle worksheet (1 per student)
- Blue, Green, and Brown crayons (1 each per student)
- Plastic bags (cut open) or newspaper for student table covering
- Terrarium: (40 oz. pretzel type - one each per student)
  - Prepackage:
    - 3/4 C gravel per 40 oz. container
    - 1/8 C charcoal per 40 oz. container
    - 2 C soil per 40 oz. container
    - Semi permeable barrier (coffee filter)
  - 3 plants per container (preferably varied growth heights and medium to lose light)
  - Accessory decorations if desired for each container
  - Spray bottles of water for adult assistants (1/8C per terrarium)
- Crossword Puzzle (1 per student)
- Writing Prompt (1 per student)
- Optional: one presenter dressed as explorer with binoculars

PROGRAM:
Pass out- Guided Note Sheet, “Terrarium”
“Today we are going to be talking about Climate and the relationship with plants.”
Guided Note Sheet Transparency --uncover (blank paper) each term after student response

1. Climate (T-GN) – “Do you know what makes up a “Climate”? (Ans: temp., wind, rain, humidity, sunshine)

2. Microclimate (T-GN) – “Do you know what it means when we put the word/prefix, “micro” in front of another word, as in microscope?” (Ans: small)
   “A Microclimate is a small area that has its own special climate”

3. Terrarium – By presenter that is dressed as an explorer – looking, with binoculars, up (trees) and down (small plants)
   Show a terrarium
A. History –

“Centuries ago explorers heard of different plants and animals in far off lands. They wanted to bring these new beautiful and interesting plants home. They had long journeys by ship that took many months to get home from these far away lands.”

(Reference Pirates of the Caribbean)

“How could they keep plants alive on those long journeys with enough fresh water?” –

(Ans: Terrariums)

“The first terrariums were created for this purpose. Many plants were first brought to Europe from South America and Asia in Terrariums. Then they were glass containers. We can use decorative containers made of glass today.”

B. Microclimates –

“We create a microclimate inside a terrarium.”

“What parts of a climate can we control in this terrarium?”

(Ans: temperature, light, moisture, wind)

“Is there anything else we can control in a terrarium that would help plants be healthy”

(Ans: insects and disease)

“We will see how a little amount of water lasts a long time in a terrarium.”

4. Meeting Plant Requirements in a terrarium –

A. Requirements –

“What do plants need to grow? (sun light, temperature, moisture, food)

“How does a terrarium supply these things for plants?

1) Sunlight and Temp. – by Location (not in a sunny window)

2) Food – Photosynthesis, (T-GN) “Plants make their own food for energy. They take energy from the sunlight, carbon dioxide and water from the soil and turn them into sugar for food for the plant and oxygen is put back into the air.”

3) Respiration (T-GN) – Plants burn (energy) the sugar by using oxygen from the air and give back carbon dioxide

Pass Out - Water Cycle worksheet

4) Water Cycle – (T-GN), (T-2) color blue water drops starting at the root zone as directing the students to color their worksheet.

   Explain - “Roots absorb moisture. The moisture travels from the roots, up the stem to the leaves. Some is used by the plant and the rest is given off from it’s leaves and evaporates or spreads out into the air. When the moisture in the air touches the sides of the jar they gather together into a liquid form again and drips down the sides returning to the soil.”

   * Direct students to color the different stages of water in blue, then the stem and leaves in green, and the roots in brown

“Where does this water cycle occur besides in a terrarium?” (Ans: Nature, rain)
Pass Out - Terrariums, gravel, charcoal, coffee filter and soil

5. Construct Terrarium
   Instruct students to wait for instructions before making their terrarium.
   A. Step by Step Instruction- (state purpose of each component)
      1) Gravel – necessary for water drainage
      2) Charcoal (optional)-- to deodorize
      3) Coffee filter or stacking – prevent soil from mixing with gravel
      4) Soil – hold roots and provide nutrients

Pass out Plants to students
   Plants – Instruct students how to remove plants from their containers
   Instruct students to make a hole in soil with their finger
   Gently plant and fill soil around plant but not above the previous soil line

Spray - student terrariums with about 1/8C of water

6. Care of Terrariums:
   A. Observation– “You must help control the environment in the terrarium. It requires observation”
      1) Correct light requirements – too sunny the leaves will burn
      2) Moisture accumulation on sides of container- is good at warmest times of the day
      3) Cloudy all the time – too much moisture (open the lid for evaporation)
      4) Moisture doesn’t collect on container sides – too little water

Conclusion:
“Terrariums create what kind of environment for plants? (Ans: Microclimate)

Reinforcement:
   Pass Out: “Cross Word Puzzle”
   “Writing Prompts” for the program.
EVALUATION:

Terrarium Program meets the following Sunshine State Standards:

Science - Grades 3-5
   The Nature of Matter
      The student understands that all matter has observable, measurable properties.
      (SC.A.1.2) (2)

   Processes that Shape the Earth
      Standard 1: The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the earth.
      (SC.D.1.2) (3)

   How Living Things Interact with Their Environment
      Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment.
      (SC.G.1.2) (2),(3),(7)
      Standard 2: The student understands the consequences of using limited natural resources.
      (SC.G.2.2) (2), (3)

Language Arts – Grades 3-5
   Language
      Standard 2: The student writes to communicate ideas and information effectively.
      (LA.B.2.2) (1)
<table>
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<th>Section</th>
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<td>Climate</td>
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<td>Water cycle</td>
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GROWING GOOD TIMES

Date: ____________________________________________

Topic: __________________________________________

What we did: __________________________________________

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______________________________________________________________________________

What I learned: __________________________________________

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What I liked: __________________________________________

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GROWING GOOD TIMES

ACROSS
6. The process where plants manufacture their own food is _____.
7. _____ holds the plant roots and provides nutrients for a plant.

DOWN
1. A small area where the climate is different from the areas around it is a _______.
2. ______ is condensed and collected on the sides of a terrarium and then goes into the soil to be used by the plant.
3. An area where the temperature, rain, wind and humidly are similar is called _____.
4. The ______ of the plant absorbs moisture and nutrients for the plant to use.
5. An enclosed container that maintains a microclimate for plants to grow in is a _____.
6. _____ put oxygen into the air which is helpful for humans and animals.

WORD BANK
photosynthesis plants soil microclimate roots terrarium climate water
<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
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<tbody>
<tr>
<td>Climate</td>
<td>The temperature, wind, rain, humidity, and sunshine in an area</td>
</tr>
<tr>
<td>Microclimate</td>
<td>A small area that has its own special climate</td>
</tr>
<tr>
<td>Photosynthesis</td>
<td>Plants make their own food for energy. They use sunlight, carbon dioxide and water to make sugar for food</td>
</tr>
<tr>
<td>Respiration</td>
<td>Plants burn the sugar and release oxygen into the air creating energy</td>
</tr>
<tr>
<td>Water cycle</td>
<td>Plants absorb water through their roots up to its leaves. The unused water is released into the air and returns to the soil.</td>
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</table>
Rain Cycle

- Evaporated moisture
- Condensation
- Moisture
Tomatoes
OBJECTIVES
Learn the Scientific Method
Learn the importance of plant observation
Learn proper planting method
Learn proper staking of plant
Know there are varieties of tomatoes and colors of tomatoes
Learn the history of why tomatoes are scientifically fruits but customarily called vegetables

MATERIALS:
Transparency:
Completed guided note sheet (T-GN)
Types of Tomatoes (T-1)
P L A N T (T-2)
Scientific Method worksheet (T-3)
Blank paper (cover sheet)
Farmer’s hat, lab coat, and magnifying lens for instructor
Assortment of fresh tomatoes for variety display
Assortment of tomato products (ketchup, sauce, salsa, etc.)
Stake and or cage for demonstration
4 lg. planted Tomato plants for demonstration (largest enough to need staking)
Plastic/newspaper covering for student tables (large plastic bags cut open)

Planting Activity:
Tomato plants (1 per student) Bag for transportation (1 per student)
Cotton strip to tie plant to stick (1per student) Potting soil prepackaged (1 per student)
Larger pot for up potting (1per student)
Student guided note sheet (1per student)
Scientific Method worksheet (1 per student)
Tomato Crossword puzzle (1 per student)
Writing prompt (1 per student)
Pen Pal Writing Activity

PROGRAM:
Prep tables (desks) with plastic covering
Assortment of tomatoes on display
Instructor in described attire (farmer and scientist)

1. Introduction: Today we are going to be Gardeners and Scientists -- (farmer attire)
   We are going to talk about the TOMATO

   A. Uses: Tomatoes are popular. “What do we use tomatoes for?”
      (Ans: raw-as in salads, sauces and ketchup, soup, juice, etc.)
Show -- Take each item from box below as it is mentioned by a student – finally display any unmentioned item.
1. “Tomatoes are the 2nd most important crop in the US”
2. “Florida is one of the biggest producers of fresh tomatoes”

Show – Display of variety of tomatoes
3. Types: “You can see different types of tomatoes”
   (Give names Beefsteak, Roma, Cherry, etc.)
   (T-1) Types of Tomatoes Transparency
   “There are different Sizes, Shapes and Color - not all are red some are Yellow”

B. History --
1. “Not Native to U.S. like our wildflowers. They are from S. America and Mexico
   Christopher Columbus brought tomatoes to Spain.”
2. Vegetable or Fruit: “In the grocery store, what department do we buy tomatoes?”
   “Is a tomato a Fruit or a Vegetable?” (Ans: Fruit Correct!, Vegetable Correct!)
   “How can it be both a Fruit and a Vegetable?” _
   “Scientifically it is a fruit. It has seeds and grows from the flower or bloom on the plant.
   “Customarily it is a vegetable. It is grown as a food crop and was called a vegetable to avoid a fruit tax by the government.”

Pass Out – Guided Note sheets
2. Planting of a Tomato:
   “Now we are going to be GARDENERS”
   P L A N T (T-2) -- uncover each letter of acronym as discussed

A. Requirements –
1. “We need to up pot or PLANT the tomato plant in order to have tomatoes.”
2. “A place should have full sun.” (LIGHT)
3. “The plant needs an open space for the mature plant.” (AIR)
4. “The soil should contain NUTRIENTS (T-GN) for the plant.” May need to amend or fertilize
5. “The plant will need water. It will be THIRSTY.”

B. Demonstrate planting: “We are planting _____ tomatoes today.”
1. Review removal of plant from small container.
   (finger placement on both sides of stem and invert)
2. Plant tomato in pot – “The depth of the plant is not important for tomatoes but should be at same level when planting other plants. You can trench it down to the first leaf.”
3. Water/Fertilize – moisten soil, not flood, water when dry, fertilize as directions state
4. Stake plant -- “Why do we stake tomatoes?” (Ans: less insects and prevent Rot from sitting on the ground)
   Demonstrate technique: create an “X” after wrapping around stick and before wrapping around the plant

Pass Out – A large tomato plant to each group of students
3. Group Activity: (divide students at their desks into 4 groups)
   “Each student will take a turn staking and tying plant on lg. tomato plant.” (Adult aides will supervise)

Pass Out – smaller tomato plant, a pot, and soil (1 per student)
4. Individual Up-potting of tomato plants:
   A. Planting:
      “Remember how to correctly remove the plant from its’ pot and how deep to plant it.”
      “DO NOT press soil firmly down in the pot. The roots need air and space for water.”
   B. Review staking plants:
      Instruct students again on how to stake the plant when they plant, or up pot to a much larger pot at their home or in their garden. Inform them that they will need a large stick to plant at home when plant grows larger.

Pass out bags for plants to each student

5. Scientific Method: (scientist attire-lab coat, and magnifying lens)
   “Now we are going to become SCIENTISTS. We will use the Scientific Method” (T-GN)
   The process that scientists use to obtain information that can be tested repeatedly and give the same results
   A. Steps of the Scientific Method: (T-GN)
      1. “Problem -- What is it you want to know or learn”
      2. “Hypothesis -- What we think the how, why, or result will be”
      3. “Observation -- See and write down what is observed on a regular basis”
      4. “Conclusion/Theory --What was discovered or learned about the Problem”

Pass Out: Scientific Method Observation forms

B. Scientific Method Worksheet – (T-3)
   1. Problem: “What do you think our Problem is today? (Ans. to grow tomatoes)
   2. Hypothesis: “What is our Hypothesis for our problem?”
      (Ans: Proper light, air, moisture, and nutrients will cause the plants to grow tomatoes)
   3. Observation: “The Observations is very important. “What kinds of things do you think we might observe during our tomato plant experiment?”
      (Ans: leaf wilt, insects, blooms, small tomatoes (green) etc.)
      “We have added specific questions to the form to help you with your observations”
   4. Conclusion: “Can we tell what our Conclusion/Theory will be yet?”
      (Ans: No, we have a hypothesis not a conclusion)

C. Observation Results –
   1. “Record your observations. Add any other observations you may see about your plant.”
   2. “You will make a conclusion about your Hypothesis based on your observations.”
      Your co conclusion and worksheet are due ______________.

6. Review:
   Pass out
   Tomato Crossword Puzzle
   Writing Prompt
   Pen Pal Writing Activity
EVALUATION:

“Variety of Tomato”, Better Homes And Gardens, April 2006

**Tomatoes Program meets the Sunshine State Standards:**

**Science – Grades 3-5**
- How Living Things Interact with Their Environment
  - Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment.
    (SC.G.1.2) (7)
- The Nature of Science
  - Standard 1: The student uses the scientific processes and habits of mind to solve Problems
    (SC.H.1.2) (1)

**Social Studies – Grades 3-5**
- Time, Continuity, and Change
  - Standard 1: The student understands historical chronology and the historical perspective
    (SS.A.1.2) (1)
  - Standard 5: The student understands U.S. history from 1880 to present day
    (SS.A.5.1) (7)

**Language Arts – Grades 3-5**
- Language
  - Standard 1: The student uses writing processes effectively
    (LA.B.1.2) (1), (2)
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<td>Scientific Method</td>
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<td>Hypothesis</td>
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<td>Observation</td>
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<td>Conclusion</td>
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</table>
SCIENTIFIC METHOD
TOMATOES

PROBLEM: ________________________________________________

HYPOTHESIS: ______________________________________________

OBSERVATION:

Tomato seed was planted on: ________________________________

Plant was up potted on: ____________________________________

The plant was ______________________ inches tall.

The first bloom was on (day and date): _______________________

The bloom turned into a little green tomato on _________________

The first tomato turned red and ripe on: _______________________

I picked my first tomato and ate it on: _________________________

2 weeks from the first tomato there are ____________ tomatoes on my plant.

The plant has produced ________________ tomatoes as of ________________.

CONCLUSION:

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

PLANT  LIGHT  AIR  NUTRIENTS  THIRSTY

SCIENTIFIC METHOD FORM DUE: __________________
GROWING GOOD TIMES

Date: _______________________________________________

Topic: _______________________________________________

What we did: _______________________________________________

_____________________________________________________________________

_____________________________________________________________________

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_____________________________________________________________________

_____________________________________________________________________

What I learned: _______________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

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What I liked: _______________________________________________

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_____________________________________________________________________
ACROSS
1. Tomatoes are not native to the U.S. They are originally from South America and _______.
2. Tomatoes are scientifically classified as a _________.
3. When tomatoes are ripe, they can be red or _______ in color.

DOWN
4. Hypothesis, observation and conclusion are parts of the ________ method.
5. If tomatoes are not staked, they may get insects and will _______.
6. Tomatoes grow from the _____ on the plant.
TOMATO PEN PAL ACTIVITY

Students are directed to name their tomatoes. For example, Roman tomatoes could have Italian names, Tony Tomatto.

The teacher’s tomato plant named ______ writes a letter to the students’ tomato plants. It talks about its’ experiences while growing. It inquires about how the student’s tomato plant is doing at his/her home.

The student’s tomato plant named ______ writes back to the teacher’s tomato plant about his or her experience and feelings.
Nutrient Anything that is a food for maintenance and growth

Scientific Method The process that scientists use to obtain information that can be tested repeatedly with the same results

Problem What is it that you want to know or learn

Hypothesis What you think the How, Why or Result will be (theory)

Observation See and write down what is observed on a regular basis

Conclusion What was discovered or learned about the problem
**COOK'S GARDEN >> from 124**

**TINY**

- 'Red Currant' (right): sweet/tart, all-tomato taste; vigorous plants.
- 'Yellow Currant' (above): grapelike clusters, sweet tasting.
- 'Sugar Snack' (right): high yield hybrid, long season, tasty.
- 'Rosalita' (right): pink grape tomato; tiny, sweet, abundant.

**BITE-SIZE**

- 'Galina's' (right): golden cherry from Siberia; sweet and prolific.
- 'ISIS Candy' (left): red-marbled yellow and fruity sweet.
- 'Super Snow White' (right): pale ivory; exceptionally sweet tasting.
- 'Florida Basket' (left): small plant and fruit, big tomato taste.
- 'Black Cherry' (right): juicy, complex, sweet fruit, strong plant.
- 'Sun Gold' (left): cherry shape, orange color, fruity sweet.

*Tomatoes shown actual size*

**>> on 128**

126 BETTER HOMES AND GARDENS APRIL 2008
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SCIENTIFIC METHOD
TOMATOES

PROBLEM: __________________________________________________________

HYPOTHESIS: _______________________________________________________
________________________________________________________

OBSERVATION:

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Plant was up potted on: ______________________________________________

The plant was __________________________ inches tall.

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The first tomato turned red and ripe on: ________________________________

I picked my first tomato and ate it on: _________________________________

2 weeks from the first tomato there are ____________ tomatoes on my plant.

The plant has produced ________________ tomatoes as of ________________.

CONCLUSION:

________________________________________________________
________________________________________________________
________________________________________________________
________________________________________________________

PLANT
PLANT LIGHT AIR NUTRIENTS THIRSTY

SCIENTIFIC METHOD FORM DUE: ____________
Birds
BIRDS PROGRAM

OBJECTIVES:
Learn the definition of a bird
Learn the meaning of Ornithology
Learn at least three basic Ornithology terms
Learn the requirements of a bird habitat
Learn how to attract birds to your yard
Name at least 4 birds common to our area

MATERIALS:
Transparencies:
  - Completed Guided note sheet (T-GN)
  - Flightless birds (T-1)
  - Walking and Wading birds (T-2)
  - Flight patterns (T-3)
  - Backyard Birds (T-4, T-5, T-6, T-7, T-8, T-9)
Blank sheet of paper (cover sheet)
Bird Nest as an example
Examples of different types of Bird Boxes
Examples of different types of Bird Feeders
Sunflower seeds and orange as food examples
Variety of plants that are food sources for area birds
Bird bath tray
Bird Feeder Craft:
  - Bird feeder made from a limb with peg holes and a hanger (1 per student)
  - Perches for feeders (pegs) (3 per feeder)
  - Wood glue on small paper plate -- for each group of students
  - Suet (1 pkg. per student)
  - Rubber mallet for adult aides to assist with placement of pegs
Guided Notes (1 per student)
Bird Suet Recipe (1 per student)
Writing Prompt (1 per student)
Word Scramble

PROGRAM:
Pass out Guided Note sheets (uncover, with the blank page, the defined terms as discussed)
“ We are going to talk about Ornithology today”

1. Terms–
   Ornithology (T-GN) – “What is Ornithology?” (Ans: The study of birds)
   Bird (T-GN) – “What is a Bird?” (Ans: A vertebrate (backbone) animal, lays eggs, and has wings with feathers)

A. “Do all birds Fly?” – (Ans: No)
   “What birds do not fly?” - (Ans: penguins, ostrich, etc).
1) “Flightless Birds can be grouped by habitat and feeding pattern”
   a) Walking birds are Flightless (T-1)
   b) Runners – (T-2), can fly when necessary
   c) Wading Birds - (T-2) can fly when necessary, Wade in shallow water and have long necks or reaching to feed
2) “Birds of flight by habitat and feeding patterns”
   a) Waterbirds - feed on marine life
   b) Fruit, Nectar, and Seed-Eaters-
   c) Hunters on Land and Trees -seek their prey and suddenly pounce on it
   d) Specialized Feeders - feed on animals they did not kill

B. Flight Paths (T-3) “Birds have different ways of flying or Flight Paths?”
   “Flight patterns can help identify different bird types.”
   1) Steady Flight with regular wingbeats - “Like peddling a bike steadily”
   2) Rise on a wingbeat and swoop until next wingbeat - method to conserve energy for smaller birds - “Like peddling a bike and then coasting”
   3) Bursts of strong wingbeats then level glides - method to conserve energy for larger birds. Similar to peddling a bike and then coasting.
   “Do you know what large bird we have in our area that fly over the water this way?” (Ans: pelican)

2. Importance in our Environment:
   “Why are we discussing birds? “Do birds have any importance in Nature or our Human World?”
   Answers:
   A. Culture – folk lore, art and religion- ex. (ritual garments, feather art, costumes, decorations)
   B. Economy – food, insulation and cushioning, science of flight - ex.(eggs, meat, down feathers, quill pens, airplane)
   C. Eco System – pollinators, Balance of Nature (food chain)
   D. Pleasure – Song, Colorful, Interesting Behaviors, Domesticated birds talk, Companions

Display on table top: assortment of nests and bird boxes, berries, fruit, feeders, nectar plant, bird bath (provides students with answers for “What is a habitat?”)

3. Habitat (T-GN) – The natural dwelling place of an animal
   “What 3 things are needed in a habitat?” (Ans: home/shelter, water and food)
   A. Shelter – from predators and weather
      1) Natural – build in wild, bushes and trees– Adult’s Bird’s Home
         Show – Sparrow Nest – “Never touch a nest”
      2) Man Made – Nesting Boxes or Bird Box (bird houses),
         “Used only for reproduction (eggs and young)
         Not a shelter for adults”
      Specific Bird Box Types – very choosy about their houses
      Show – Bird Box – Should open for cleaning – Clean yearly preventing bacteria, ants,mites
      Show – Different types of bird boxes
      Note: size of box,
      size of opening (deter predators)
      height of opening, (deter predators)
      perches not needed (provide access for predators)
B. Water – still and flowing water
   1) Natural - puddles, shallow streams
   2) Man Made - Bird baths – “Clean every week, (prevent algae & bacteria)”
      “Need shallow edges - backyard birds do not swim - they like to wade”

C. Food – Forage (T-GN) – Search for food
   1) Natural Sources –
      a) Native plants –
         Show examples of (berries) wax myrtle, beauty berry, pyracantha, blueberries, etc.
      b) Insects – grasshoppers, earthworms
      c) Fruits and Nuts –
      d) Nectar – from flowers (hummingbirds)
   2) Man Made Sources –
      a) Nuts – raw peanuts in shell, sunflower seeds
      b) Nectar – hummingbird feeder liquid
      c) Fruit – tomatoes, figs, oranges, apples
      d) Feeders – hummingbird nectar, seed (finch),

Show – examples of feeders
   “Place feeders away from brush and predators”
   * Woodpecker can hang upside down to eat

4. Recap – “What is meant by Habitat?” (Ans: Natural dwelling place containing food, shelter and water)
      “Name types of Food for a bird’s habitat” (Ans: berries, insects, and nuts)
      “What types of water sources should be in a bird’s habitat” (Ans: running and still, Natural and provided)
      “What are examples of shelter for a bird?” (Ans: bushes, trees, nests, and provided bird boxes)

5. Types of Birds – Many different types of birds. Large class of the Animal Kingdom
   Backyard Birds – “We are going to discuss the birds we see in our backyards”
      “6 Species of Birds Common To Our Area”
      * (Briefly discuss material on common area birds, do not go into detail unless questions)
   A) Natural Habitat Only – “Does Not Use Provided Bird Boxes”
      1) Northern Mocking Bird (T-4) – Florida State Bird
         Food – Fruits and Insects
         Behavior – Forages on ground and perches, picks fruit while perched, hover for some fruit
         Nest Type – “Open cup of dead twigs lined with grasses, rootlets, and dead leaves, Placed low in shrubs and trees, 3-10 ft. high”
      2) Hummingbird (T-5)
         Food – flower nectar, small insects and tree sap, Feeders
         “Does Anyone remember the name of a nectar plant from our Butterfly Garden?”
         (Ans: butterfly bush, firecracker, cigar plant, etc.)
         Behavior – Forages: “Hovers at flowers and feeders, sap wells, catches insects in flight, from leaves, and spiders from web “Beneficial or not? Why?”
         (Ans: some insects are harmful)
         Nest Type – Open cup on top of small tree branch made of dandelion down, spider web and covered with lichens. Placed on average 10-20 ft. high
3) Cardinal (T-6)
   Food – seeds, fruits, buds, and insects
   Behavior – Forages: common at bird feeders, especially at dawn and dusk
   Nest Type – Open bowl of weed stems and twigs, leaves, grapevine bark, lined with grass, often paper, plastic on outside
   Placed in thick vines or twigs in shrub/small tree 3-20 ft. high, av.10 ft

4) Red Bellied Woodpecker (T-7)
   Food – insects, seeds, fruit, sap, occasionally lizards, tree frogs, small fish, nesting birds and eggs
   Behavior – Foraging: “Forages for insects from tree bark, hawks for flying insects, can hang upside down for berries and insects.”
   Nest Type – “It makes a nesthole in dead tree. Eggs are laid on wood chips left from excavation.”

B) Natural Nesting or Man Made Nesting Boxes “You can attract these birds to your yards by providing a home for the young”

1) Eastern Bluebird – (T-8)
   Food – insects, small fruits and Suet
   Behavior – Forages: hunts from perch, drops to groung to catch prey, some flycatching
   Nest Type – woven grasses or pine needles lined with fine grass, hair, feathers

2) Carolina Chickadee – (T-9)
   Food – insects, spiders, seeds, and fruits
   Behavior – Foraging: insects from foliage and tree bark, “Chickadee also often hangs upside down to feed.” Often uses feeders
   Nest Type – in holes in dead trees made of moss lined with fur

6. Review: “How can you attract birds to your yard?”
   (Ans: provide a bird habitat of food, water and shelter)
   “Give 1 example of each” (Ans: from above material)

7. Craft Activity: Suet Bird Feeder:
Pass Out – Wood feeders, wood perches (pegs)
   Small paper plate, and place a dab of glue onto each plate for each group
   1. Mount Perches – Instruct students to roll ends of the pegs/perches in glue and place in holes in the feeder.
   2. Explain How to place suet into feeders when at home.
Pass Out – suet and suet recipes

8. Reinforcement:
   Pass Out Writing Prompt
   Word Scramble
BIRDS PROGRAM

EVALUATION:

Reference and illustration: **Birds of The World** by Colin Harrison and Alan Greensmith; Dorling Kindersley Inc. publisher

**Additional Activity**

**Providing Nesting Materials**

Use a large pine cone, tie string around pine cone to hang from a fence or tree branch (12” long) Students use variety of materials and embed them in the pine cone for a bird to build its nest. Use of bright colors will help student find the nest when used by the birds. Items for nesting: pine straw, dryer lint, string, colored yarn, animal fur, strips of colored paper

**Bird Program meets the following Sunshine State Standards:**

Science - Grades 3-5

Process of Life –

Standard 1: The student describes patterns of structure and function in living things. (SC.F.1.2) (2), (3)

How Living Things Interact with Their Environment –

Standard 1: The student understands the competitive, interdependent, cyclic nature of living things in the environment. (SC.G.1.2) (1), (2), (5)

Standard 2: The student understands the consequences of using limited natural resources. (SC.G.2.2) (1), (3)
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Navarre Garden Club Bird Suet  
Judith Begue

1 ½ C crunchy peanut butter  
1 ½ C shortening  
2C yellow cornmeal  
1C flour  
2C quick-cook uncooked oatmeal

1 Cup of peanut hearts or sunflower meats can be added. Do Not use regular sunflower seeds or wild bird seed in this mix.

Melt peanut butter and shortening in microwave for one (1) minute. Stir well. Gradually add in the rest of the ingredients. Chill in refrigerator for one (1) hour. Seal in container or cut into small pieces and wrap in clear plastic wrap.

This suet will attract woodpeckers, wrens, cardinals, thrashers, titmice, mockingbirds and many others including SQUIRRELS!
GROWING GOOD TIMES

Date: ____________________________________________

Topic: ____________________________________________

What we did: _________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

What I learned: _______________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

What I liked: _________________________________________________________

_____________________________________________________________________

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_____________________________________________________________________
WORD SCRAMBLE

1. The study of Birds Is ___________________.          RNHLGOITOYO

2. Birds are animals with _____________________.      SHEFTRAS

3. The natural dwelling place of an animal is ___________. BAHITTA

4. Birds provide food and feathers for our _____________. NECOYOM

5. The Florida State Bird is the Northern _____________. NMKCGOI IRDB

6. By having sugar water feeders in out yards we can attract _____________________. BUIHDMIRMNG

7. Like people many birds eat ________________
   and _________________________.            UIFRT SUNT

8. Not all birds will use man-made ________________.   STINGEN OXB
WORD SCRAMBLE

1. The study of Birds Is ___(Ornithology)____.  
   RNHLGOITOYO

2. Birds are animals with __(Feathers)_____.  
   SHEFTRAS

3. The natural dwelling place of an animal is ___(Habitat)__.  
   BAHITTA

4. Birds provide food and feathers for our ___(Economy)____.  
   NECOYOM

5. The Florida State Bird is the Northern ___(Mockingbird)__.  
   NMKCGOI IRDB

6. By having sugar water feeders in out yards we can attract ___(Hummingbird)_____.  
   BUIHDMIRMNG

7. Like people many birds eat ___(Fruit)_____
   and ___(Nuts)____.  
   UIFRT SUNT

8. Not all birds will use man-made ___(Nesting Box)____.  
   STINGEN OXB
Bird Feeder Craft

Large eye screw

Routed out hole for suet

Hole for peg perch
### Ornithology

**The study of birds**

### Bird

A vertebrate (backbone) animal that lays eggs, has wings and feathers

### Habitat

The natural dwelling place of an animal. It contains food, water, and shelter.

### Forage

To search for food

### Bird Box

Man made bird house for shelter and nesting
WALKING AND WADING BIRDS

LARGE FLIGHTLESS BIRDS

- Ostrich 39
- Rhea 38
- Emperor Penguin 44

SMALLER FLIGHTLESS BIRDS

- Kiwi 42t
- Smaller Penguins 45–46t
IDENTIFYING BIRDS IN FLIGHT

Flight is a helpful identification feature for many birds. Some whole groups of species can be recognized by their flight patterns. During courtship, many birds perform special display flights, and these, too, can help in identification. As soon as a bird takes off or opens its wings, the markings it reveals may provide crucial clues as to what species you are looking at.

Steady flight with regular wingbeats, along a direct path, is typical of a very large number of species. These range from crows (above) to geese, pigeons, and many smaller birds.

Some small birds, such as finches (above), conserve energy by rising on a wingbeat, then closing the wings to the body, and swooping until the next wingbeat.

Some large birds (right) have an energy-saving style of flight in which bursts of strong wingbeats alternate with long, level glides.

Source: Birds Of The World; C. Harrison and A. Greensmith; Dorling Kindersley Inc.
source: Wikimedia Commons

NORTHERN MOCKINGBIRD
RUBY-THROATED HUMMINGBIRD - female

RUBY-THROATED HUMMINGBIRD - male

source: Wikimedia Commons
NORTHERN CARDINAL - female

source: Wikimedia Commons

source: Wikimedia Commons
NORTHERN CARDINAL – male

source: Wikimedia Commons

RED-BELLIED WOODPECKER
source: Wikimedia Commons
EASTERN BLUEBIRD – female

source: Wikimedia Commons;  EASTERN BLUEBIRD - male