

In the Garden with PreSchool



A collection of lessons and activities for the PreSchool classroom incorporating scientific investigation in the garden, including plant needs, life cycle, germination and garden critters.



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Bee Prints

Content Area

Science: Life Processes

Literacy: Vocabulary

Objectives:

The student will be able to:

- Describe the importance of bees to plants.

Materials

- Yellow and black finger paint
- White and yellow construction paper
- Glue
- Scissors
- Black marker
- Pipe cleaners

Background Knowledge

Honeybees live in hives, whether natural or manmade. Bees have many jobs from the queen bee, to drones, to workers. The workers collect pollen and nectar from flowers. They take the pollen and nectar back to the hive to feed the baby bees. The bee food made from nectar is called honey. Beekeepers collect the honey from the hive and replace it with sugar water for the bees to eat instead.

Bees play a very important role in plant reproduction, and thus, in agriculture. Insects such as bees are needed to pollinate a variety of fruits, vegetables, and legumes. Common products include tomatoes, onions, blueberries, cherries, pears, sunflowers, pumpkins, broccoli, carrots, squash, cucumbers, lettuce, oranges, lemons, limes, mustard seed, vanilla, sugar, almonds, watermelon, and apples. In fact, about one-third of the human diet is derived directly or indirectly from insect-pollinated plants. About 80% of these are pollinated by bees. Within Virginia, about 80 of Virginia's most popular crops, valued at about \$80 million, rely on pollinators. Without pollinators, these plants would not bear fruit.

When bees fly from one flower to the next some of the pollen from one flower mixes onto another flower. This is called pollination and allows the plants to grow healthy blooms and then fruits and vegetables for us to eat. The bee collects nectar from a variety of other plants which produce nuts, herbs, and spices.

Procedure

1. Paint the palm of the student's hand with yellow and black stripes and then press firmly, with fingers closed, to a piece of construction paper. Let dry and then cut out and glue onto a piece of construction paper to form the bee's body.
2. Cut a circle out of a piece of yellow construction paper and glue to the paper to form the bee's head. Use a marker to add eyes and a mouth.
3. Cut out wings from a piece of white construction paper (or wax paper) and glue to bee.
4. Lastly add a pipe cleaner antenna.



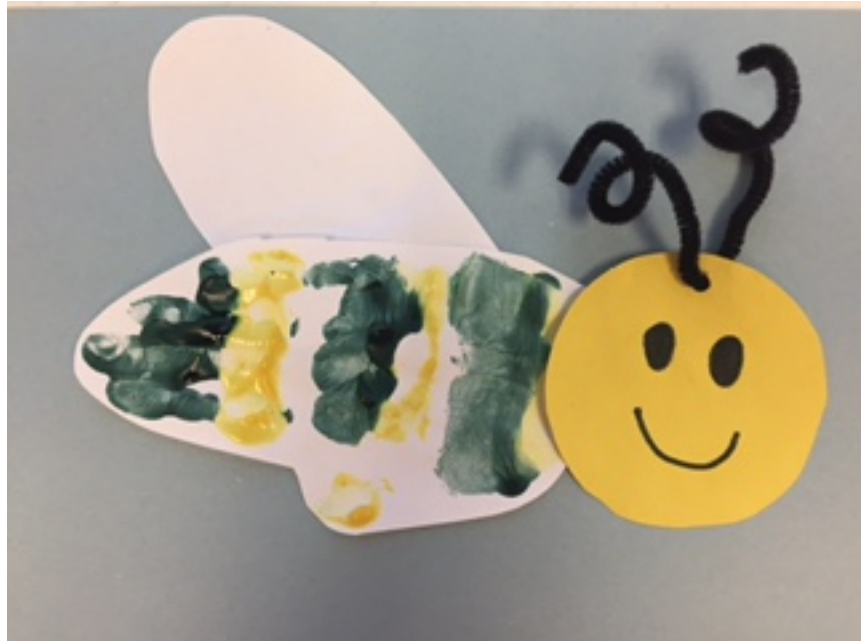
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Bee

BUZZ! goes the bee,
Hour after hour,
BUZZ! goes the bee
From flower to flower.

Sucking out the nectar
Flying it home.
Storing up the nectar
In the honeycomb

BUZZ! goes the bee,
Making honey so sweet.
Bee makes the honey
That I love to eat!



What Do You Suppose

What do you suppose?
A bee sat on my nose.

Then what do you think?
He gave me a wink.

And said, "I beg your pardon,
I thought you were a garden."

I'm A Little Honeybee (I'm a Little Tea Pot)

I'm a little honeybee
Yellow and black
See me gather
Pollen on my back
What the queen bee tells me
I must do
So I can make sweet honey for you!

Do You Like To Buzz? ("Do Your Ears Hang Low?")

Do you like to buzz,
Are you covered all in fuzz?
Do you call a hive a home
In the Garden where you roam?
Do you know how to make honey,



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Are your stripes a little funny?
Do you like to buzz?

Bees

Here is the beehive. Where are the bees?
Hidden away where nobody sees.
Soon they will come, creeping out from the hive;
One, two , three, four, five.

Five Busy Bees

Five busy bees on a lovely spring day.
(hold up fingers)
This one said, "Let's fly away.'
(indicate each bee in turn)
This one said "We'll drink some nectar sweet."
This one said, "Let's get pollen on our feet."
This one said "And then we'll make some honey."
This one said "Good thing it's warm and sunny."
So the five busy bees went flying along
(fly hand around while wiggling fingers)
Singing a happy honeybee song.
Bzzzzzzzzzz!
(Fly your hand behind your back)

Bees That Buzz

Bees that buzz
At my elbows and knees --
No sir, I'm not
Fond of these.

But bees that buzz
Near flowers and stem,
Making honey --
I like them.
Mmmmm!



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Build a Greenhouse

Content Area

Science: Life Processes

Fine Motor: Manipulative Movement

Literacy: Vocabulary

Objective

The student will germinate a seed.

Materials

- potting soil
- two small clear plastic cups
- seeds
- water
- spray bottle
- tape

Background Knowledge

The basic things a seed needs are light, food and water. Light is supplied by the sun or an artificial lighting system. Light provides the plant energy to perform photosynthesis, the process that the plant uses to make its own food. The seeds have a built-in food supply. The inside of a seed is the food supply once the seed has germinated, or sprouted. Once the plant reaches a certain age, it will start to take in nutrients from the soil through its roots to help with photosynthesis. Water is essential to all living creatures. Plants are no exception. They get water through the roots and through tubes, often called veins, in the stems and leaves. They get the water from the soil surrounding the plants. When the area their roots are in becomes dry, some plants will grow roots out to find a new source of water.

Procedure

1. Place soil in one of the cups about halfway.
2. Plant 3 seeds in the cup near the side of the cup. Plant seeds approximately $\frac{1}{4}$ to $\frac{1}{2}$ inch deep in soil. Seed packs will provide exact depth of planting.
3. Add a small amount of water until soil is moist but no water is floating. Water bottles work well for this.
4. Invert second plastic cup over first and tape together forming a dome or mini greenhouse.
5. Place greenhouse in an area that is warm with light.
6. When plant grows to the top of the greenhouse, transplant into a larger container with additional soil.

Extension

Plant different seed within the greenhouse to showcase multiple plants.

References

This lesson was adapted from North Carolina Agriculture in the Classroom.



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Buzzy Bees

Content Area

Gross motor: Locomotor, Skilled Movement

Fine motor: Locomotor, Skilled/Manipulative Movement

Science: Life Processes

Literacy: Print/Book Awareness, Vocabulary

Materials

Sponges (small oval sponge per child)

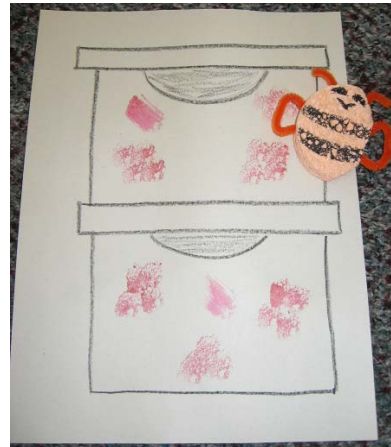
Black markers

Pipe cleaners

Bee keepers hive painting pages, attached

Tempera paints

Small paper plates with flower designs



Background Knowledge

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When bees fly from one flower to the next some of the pollen from one flower mixes onto another flower. This is called pollination and allows the plants to grow healthy blooms and then fruits and vegetables for us to eat. Bees pollinate fruit plants and trees like apples, berries, grapes, peaches, pears, and melons. Bees also pollinate vegetables such as pumpkins, broccoli, squash, cauliflower, lima beans, cucumbers, and greens. The bee collects nectar from a variety of other plants which produce nuts, herbs, and spices.

Procedure

1. Read a bee book to the class. *Buzz-Buzz Busy Bees* by Dawn Bently is a good choice.
2. Provide each child with an oval shaped sponge.
3. Allow children to color stripes on the sponge to create a bee.
4. Insert pipe cleaner pieces into the head to form antennae and the side to create wings. The pipe cleaner will stick into the side of the sponge easily.
5. Give each child a bee hive page.
6. Talk to children about bees flying from flower to flower taking nectar to make honey and bringing it back to the bee hive.
7. Use paper plates with a flower design or draw flowers on paper plates.
8. Scatter 3-4 paper plates around the room and add paint to each.
9. Instruct children to get paint from a flower and paint their bee hive. This simulates the bee collecting nectar from flowers and returning to the hive. The result is a sponge painted bee hive.
10. Sing the Bee Songs
11. Share the Bee Poems



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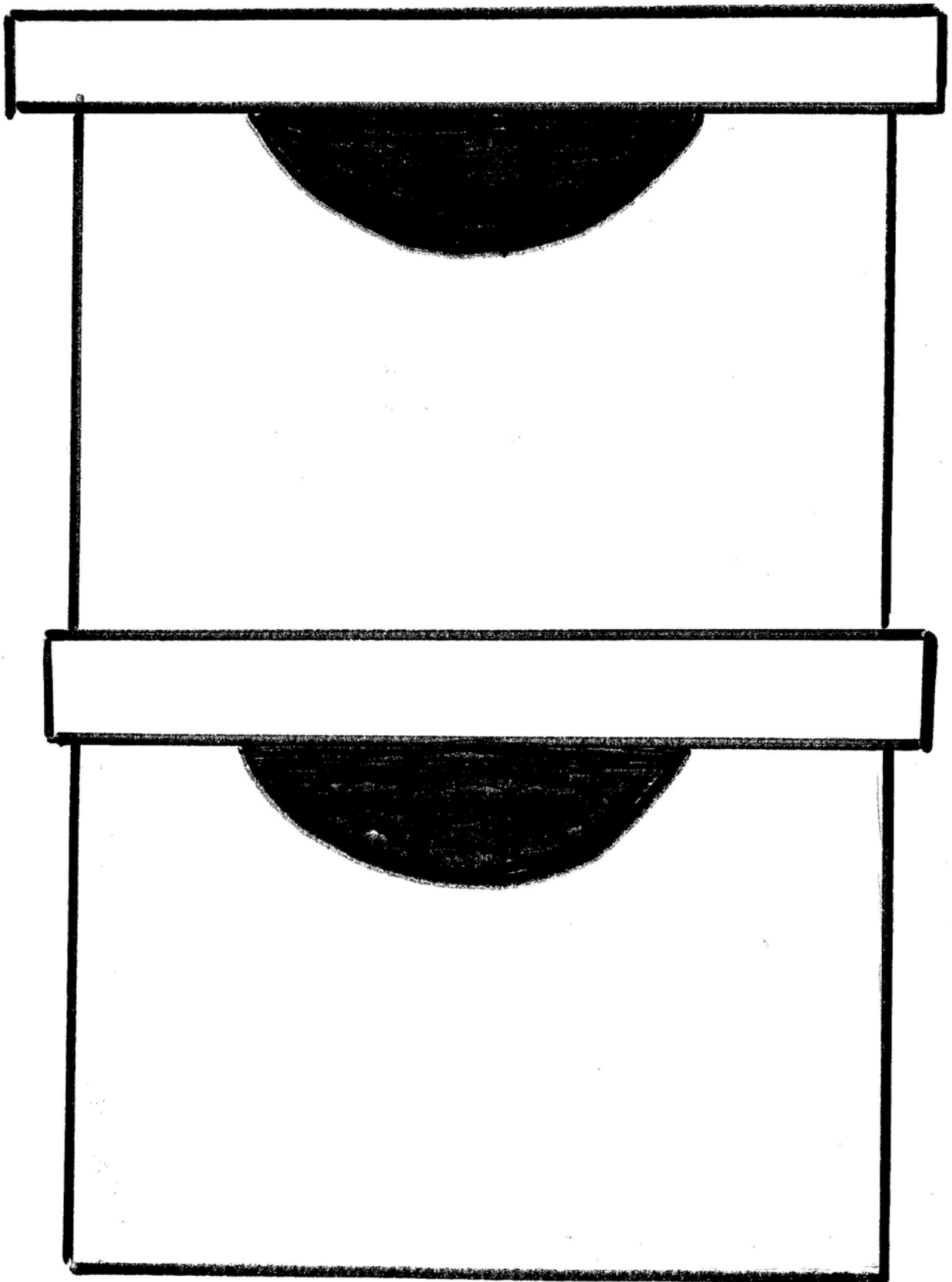
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Corn Prints

Content Areas

Language Arts: Vocabulary
Gross and Fine Motor Skills

Objective

The student will be able to:

- Create an ear of corn using hand prints
- Use gross and fine motor skills for painting

Materials

- Yellow construction paper
- Green construction paper
- Finger paint
- Glue
- Scissors

Background Knowledge

Called “maize” by the Native Americans, corn was a completely new food for the colonists, as it is native only to the Americas. In fact, in the early 1600s the Native Americans introduced the settlers to this crop and taught them how to grow and prepare it. Similar to today, the colonists ate corn both as a vegetable as well as ground it up into a grain. Thus, corn was a very important crop and appeared in multiple ways on many colonial tables. Benjamin Franklin even called it “one of the most agreeable and wholesome grains in the world.”

Today, corn for grain or silage (a mixture of grains that is fed to animals) is raised in nearly every Virginia county. Virginia farmers harvest about 340,000 acres of corn for grain each year! This type of corn, called field or dent corn, is different from what you buy at the grocery store, which is sweet corn. Field corn is grown for animal feed and harvested by large combines. The corn is ground into feed which is fed to cows, chickens, and other animals. Some field corn is also chopped up into silage for cows. Sweet corn is grown for people. There is more sugar in this corn which makes it tasty to eat. This is the type of corn grown in gardens, sold at vegetable stands, or in the market.

While we often think of corn kernels as being white or yellow, the Native Americans grew several different types. Colors included red, white, blue, and black. There are many varieties of corn. Some are better suited for people to eat while others are best for animals. Discuss the types children are familiar with.

Procedure

1. Trace students’ hands (fingers closed) once on a piece of yellow construction paper and twice on a piece of green construction paper. Cut out.
2. Arrange the two green leaves at the base of the yellow corn to form the husk and glue together.
3. Add the “kernels” by dipping your fingers into the paint and stamping onto the cob. *You may also use Q-tips to dab and paint the kernels.*

Extension

Glue real Indian corn seeds to the “corn cob.”



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Create several large corn stalks on the bulletin board and attach each child's ear of corn to form a display.



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Fabulous Flowers

Content Areas

Science: Life Processes, Earth Patterns, Investigation

Mathematics: Data Collection, Patterns

Social Studies: Descriptive Words

Literacy: Vocabulary, Oral Expression

Objective

Students will learn parts of a plant, investigate various flowers while working well with others, and sort flowers based on certain characteristics.

Materials

- Broccoli, cauliflower
- Various types of non-edible flowers (rose, daisy, sunflower, daffodil, marigold, violet)
- Vase
- Vegetable Dip
- Chart paper
- Plates

Background Knowledge

Flowers are the reproductive parts of plants. Most flowers produce seeds. Some flowers have colorful petals and fragrances which attract pollinators such as bees and flies. Seeds develop in the ovary of the fertilized flower and when planted in the proper environment, grow into new plants. The ripened ovary becomes the fruit. Flowers of some plants are edible. Flowers are the reproductive parts of plants. Flowers of some plants are edible. Examples include broccoli, cauliflower and artichokes. Broccoli and cauliflower flowers are called “heads” and are usually eaten along with their stems. Artichokes are actually the buds of flowers. Zucchini and orchid flowers are considered a delicacy in some parts of the world. Other edible flowers include pansy, rose nasturtium, rosemary & lavender. Students should be warned that some flowers are poisonous. They should never eat anything they are not sure of, unless it is approved by responsible adults.

Procedure

1. Review the functions of flowers. Ask your students to describe characteristics of flowers.
2. Have various flowers around the room for the students to explore and describe with you and as a group. You can then come together as a group and sort the flowers by different characteristics (use the chart paper).
3. Arrange broccoli and cauliflower in a vase of water. Tell your students that you received a beautiful bouquet of flowers. Show them your bouquet. Discuss that broccoli and cauliflower are flowers that humans can eat.
4. Cut the broccoli and cauliflower into bite-sized pieces. Distribute the vegetables and vegetable dip. Have students taste the flowers.

Extension

- Have the students make a graph displaying their favorite flower or of the different ways they have sorted the flowers.
- Have the students make prints with an artichoke. Cut the artichoke in half lengthwise, dip the artichoke in paint and then press it on construction paper. Complete other artichoke activities available from the Virginia Advisory Board.
- Invite a flower farmer into your classroom. Have him/her discuss flower operation. Contact your county Farm Bureau for possible guest speakers.
- Place broccoli in water so students can see it “bloom”.



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Fantastic Fruits

Content Areas

Science: Investigation

Social Studies: Descriptive Words

Literacy: Vocabulary, Oral Expression

Objective

Students will learn parts of a plant, investigate various fruits while working well with others, and sort fruits based on certain characteristics.

Materials

- Various fruits for students to explore (strawberries, apples, bananas, oranges, berries, pineapples, kiwis)
- Chart paper
- Knife
- Fruit dip
- Plates

Background Knowledge

The fruit of a plant generally surrounds the seeds of a plant (the strawberry is the only fruit with the seeds on the outside). The fruit protects the seeds and attracts animals and insects. The fruit is the edible part of the plant.

Procedure

1. Review the functions of fruits. Ask your students to describe characteristics of fruits.
2. Have various fruits around the room for the students to explore and describe with you and as a group. You can then come together as a group and sort the flowers by different characteristics (use the chart paper). Talk about similarities and differences between them. Cut the fruits in half so the students can see the inside of the fruits.
3. Let them know that there are many products made from fruit by-products. Show samples of items made partially from fruit, including perfume, facial cleansers and fish filters.
4. Pass out some fruit dip and enjoy the fruit with your students. Make sure to wash them first and express the importance of washing foods when they have been handled by so many people because it stops the spread of germs.

Extension

- Prior to the lesson, brainstorm ideas of what the class should do with the fruit used in the activity.
- Examine pictures of fruit from magazines and seed catalogs, and identify the parts.
- Visit a fruit packing plant. Learn how fruit is graded and packed.
- Conduct a class cooking lesson with fruits.
- Discuss the nutritional value of fruit. Read the nutrition labels!
- Have the students research a particular fruit and create a book in the shape of their fruit.
- Make a collage using the seeds from the fruit.
- Sample and compare dried fruit and fresh fruits.



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Garden Imagery

Content Areas

Science: Life Processes

Literacy: Written Expression, Vocabulary, Oral Expression

Social Studies: Descriptive Words

Fine Motor: Manipulative Movement

Objective

The student will be able to:

- Use a variety of words to describe a given topic.
- Participate in a group discussion.
- Create an illustration for a given topic.

Materials

- Flip chart with markers
- Wallpaper sample books (taken apart)
- Construction paper or card stock
- Glue sticks
- Scissors

Background Knowledge

Many students may not know that gardens vary greatly in the way they look, the size they are, and the things they produce or grow. Some people prefer to have gardens full of flowers, which can be annual or perennial. Annual means they grow to full maturity and die in one year. Perennial means that flowers go through a cycle of maturity and wilting in 3-5 years. Other people prefer to have gardens that grow vegetables like tomatoes, carrots, lettuce, and broccoli, which are all different examples of plant parts and the parts we eat. Gardens can be something small that people have around their house or they can be much bigger, such as those found on farms. Take students for a garden walk, read a garden book, or watch a video about gardens to provide students with an idea of how gardens differ in appearance. Share garden pictures from personal or area gardens or even from magazine pictures.

Procedure

1. Place the flip chart at the front of the room. Write your theme at the top of the page, such as "Gardens," "Flowers," "Trees," etc.
2. Ask all students to give you a word or phrase relating to the topic. This should be random, but all should participate.
3. After all have given their input and the words are written on the chart, post it at the front of the room for all to see.
4. Read the words back to the students. They have created a free-form poem about the topic.
5. Now, ask the students to create illustrations to go with the poem for the bulletin board on a piece of construction paper or cardstock. Give students a set amount of time to create simple, paper cut-out illustrations. One-half hour is ample. The illustrations can be as simple as one object, a variety of things or some type of scene. It's up to the student. Let their creativity flow.
6. Provide a variety of paper scraps; wallpaper sample books are great for this. Papers with patterns and textures work much better than papers with actual images on them. This allows the students to be creative and not just cut-out images and paste them on the paper.



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7. Students may cut or tear the paper to form the desired parts of their illustration. Use glue sticks to attach the cut-outs to the construction paper or cardstock.
8. As students finish their illustrations, they should bring them forward to be placed on the bulletin board.

Extension

1. Use a computer to type in the words as students give them to you and project the words on the screen. Print the words and give them to each student.
2. Photograph or scan all images and print them along with the poem to make a book.
3. For older students, have them write a garden story, including all of the words given by the class. Their illustration should reflect their story.

References

www.darhosta.com



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Garden Obstacle Course

Content Area

Gross motor: Locomotor Skills

Literacy: Vocabulary

Social Studies: Location, Descriptive Words

Objective

Students will:

- identify and learn about elements of the garden
- follow directional words and actions.

Materials

- Garden implements such as a hose, rake, stool, bucket, gloves
- Create a teepee by wrapping an easel with a sheet
- Create tool shed from sheets and chairs or table
- Create garden rows from jump ropes

Background Knowledge

There are many different types of gardens; some may have flowers, some vegetables, and some both. Regardless of their type, all gardens require tools for planting and upkeep. This lesson will introduce students to gardens and the work done in them.

Procedure

1. Read a book about gardens to a group of children.
2. Talk to children about what is in a garden. Be sure to bring up items such as rows of plants, a storage shed for tools, a teepee to grow beans, and garden tools such as a stool to sit on when picking vegetables, a vegetable bucket, a water hose, and a tool such as a rake.
3. Design a make believe obstacle course and explain each item to the children.
4. Lead children through the obstacle course providing directions.

Sample directions:

Walk between the row of beans and the row of carrots.

Crawl into the tool shed.

Jump over the water hose

Gallop around the teepee

Walk in a circle around the stool.

Look under the bucket.

5. This activity can be adapted to the set up and items available in many settings.

Recommended Books

Ann Plants a Garden by Susan Blackaby

How Groundhog's Garden Grew by Lynne Cherry

In the Garden by Scholastic



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Handy Plants

Content Area

Science: Life Processes

Fine Motor: Manipulative Movement

Literacy: Vocabulary

Objective

The student will:

- Investigate the parts of a plant and create a plant using hand prints.

Materials

- Construction paper – brown, green and then various colors for the flower
- Crayons/markers
- Scissors
- Glue sticks

Background Knowledge

We eat all plant parts, but not all parts of every plant. Here's a list of some favorite edible plant parts that can be grown in a Virginia garden:

- roots – carrots, beets, radishes, turnips, sweet potatoes
- stems – asparagus, kohlrabi, potatoes (tubers)
- leaves – lettuce, spinach, cabbage, Swiss chard, collards, kale, mustard, onions (bulb)
- flowers – broccoli, cauliflower, nasturtiums, violas
- fruits – tomatoes, peppers, cucumbers, squash, beans and peas (in the pod), eggplant, melons, pumpkins
- seeds – beans and peas (shelled), corn, sunflower

Procedure

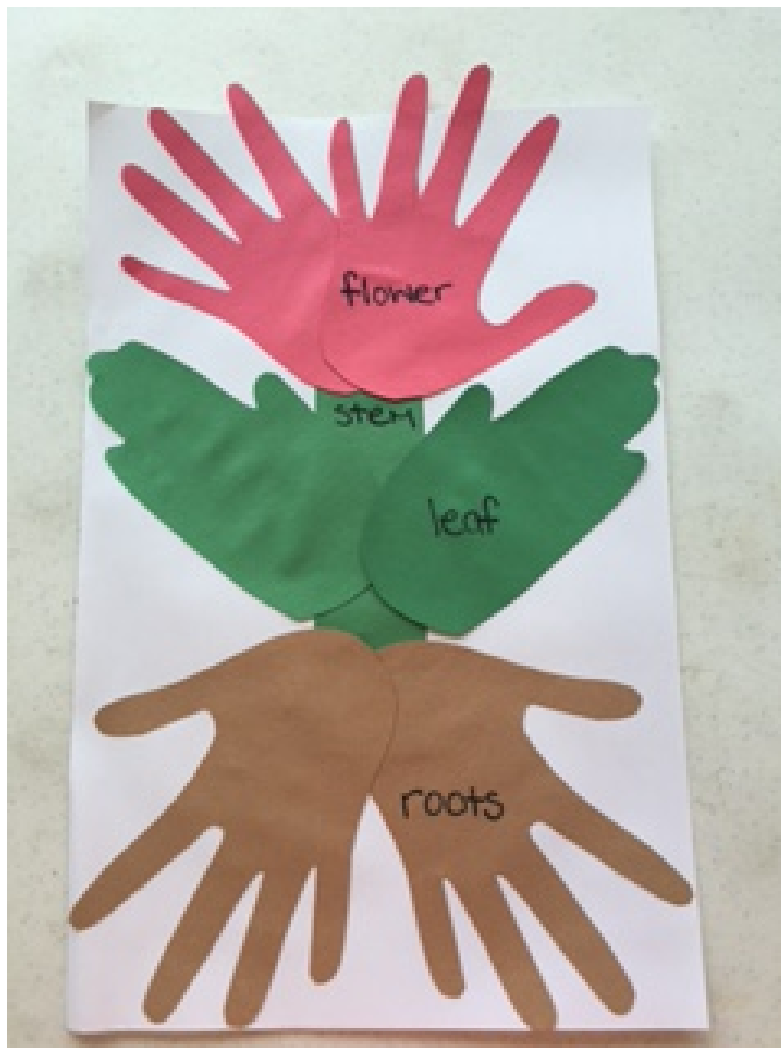
1. Begin by gluing a green rectangle vertically in the middle of a sheet of paper, this will be the stem.
2. Next trace students' hand twice (fingers open) on a piece of brown construction paper. Cut out and glue the hand prints up-side-down at the bottom of the stem to form the roots.
3. Trace students' hands twice (fingers closed) on a piece of green construction paper. Cut out and glue to the sides of the stem to form the leaves.
4. Trace students' hands twice (fingers open) on the colored construction paper. Cut out and glue to the top of the stem to form the flower.
5. Label the parts of the plant.

Extension

Set up a plant part salad bar. Include several items from each category along with some favorite salad dressings. Encourage students to taste at least one item from each category. Label all items and tell what plant part it is. After eating, ask students to draw their salad bowl, including the plant parts they ate. Label all plant parts.



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Hive Homes

Content Areas

Physical: Manipulative Skills

Cognitive: Literacy: Print and Book Awareness

Cognitive: Science: Life Processes

Social: Self-Control

Objective

Students will:

- Make a bee hive with various materials
- Take turns
- Follow directions
- Talk about bees

Materials

- Brown tissue paper
- Black construction paper
- Wire
- Glue
- Small paper cups
- Book about bees, such as *Beekeepers* by Linda High, *The Bumblebee Queen* by April Sayre or *Down on the Farm: Bees* by Sally Morgan
- Craft bees

Background Knowledge

Bee facts:

Maximum number of eggs laid daily by the queen: 3,000

Average number of trips a worker bee makes outside the hive each day: 10 trips

Average speed of a worker bee in flight: 15 miles per hour

Average distance from hive a worker bee travels in one trip: 1-1/2 miles

Average life of a worker bee in the summer: 45 days

At such a young age, students are usually afraid of bees and are not aware of the things they can provide for them. In this lesson students learn something about bees, while creating the home of a bee. They also learn to work with many different materials that they may not normally use in other activities.

Procedure

1. Have your materials ready to use. Read a book about bees and talk with the students about what they see in the book. Write down some characteristics they mention about bees.
2. Explain to the students what they are going to do, but you will have a few at a time while the others play in centers.
3. When you get your group to the table explain the activity to them again and model.
4. Students take the brown tissue paper and roll them up into long pieces.
5. They then put glue all over a small paper cup and start wrapping the cup in the rolls of tissues. (the cup should be upside down)
6. Once the entire cup is covered, the student cuts out a small oval from the black construction paper and glue it right above the bottom rim of the cup for a door.
7. A piece of wire is then connected to the cup by stapling or other means and a bee is attached to the other end of the wire so that it looks like it is surrounding the hive.



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How Does Your Garden Grow?

Content Area

Science: Life Processes

Objective

Students will:

- Identify water, sunlight, and soil as necessary to plant growth

Materials

- paper plates
- yarn
- scissors
- stapler
- tape
- crayons
- glue sticks
- template, attached

Background Knowledge

While they may differ in the specific amounts and type, all plants need the same basic conditions in order to grow and thrive – sunlight, soil, and water. Sunlight provides green plants with the energy plants needed for photosynthesis, which is the process plants use to convert carbon dioxide, water, and certain nutrients into carbohydrates that plants use for the energy to grow. Photosynthesis also generates oxygen. Soil contains healthy nutrients for the plant. They absorb these nutrients through their roots. Lastly, water is essential for a healthy plant cell to function.

Procedure

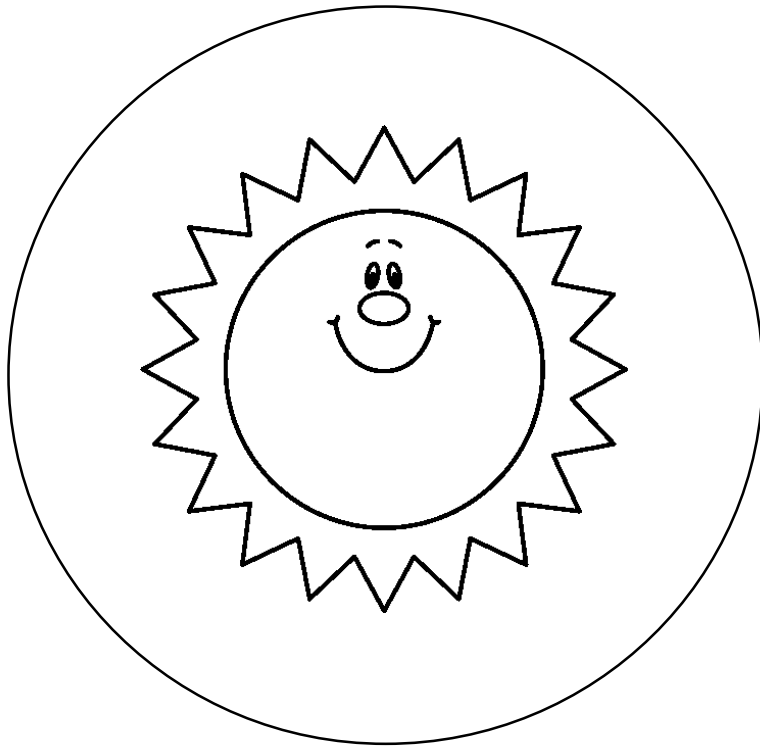
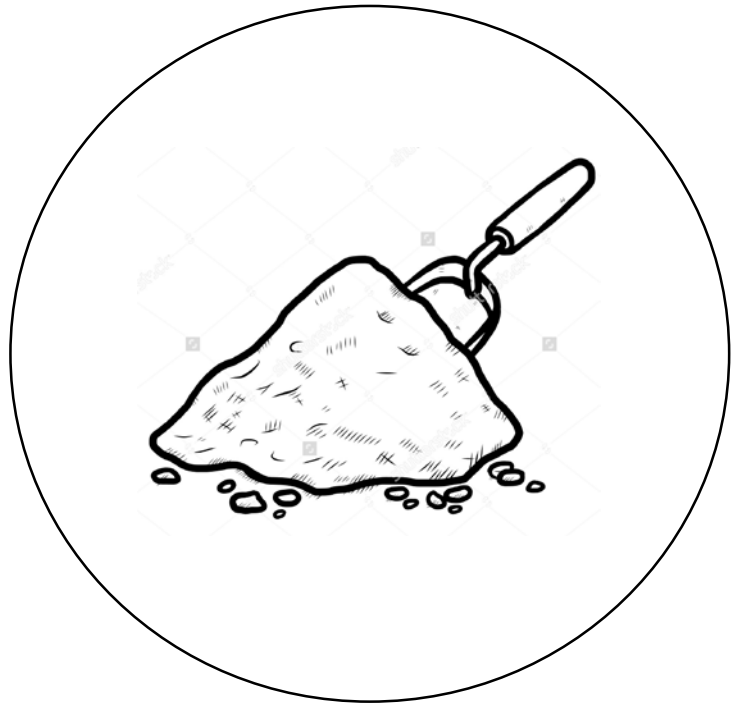
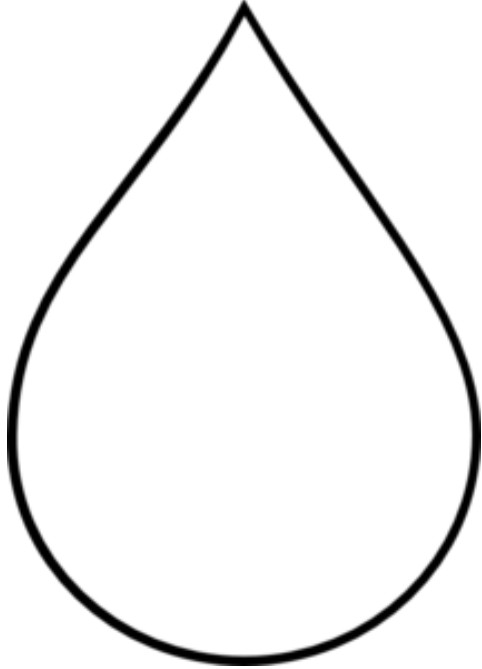
1. Cut a paper plate in half and staple together to form a semi-circle pocket, leaving the straight edge un-stapled.
2. Cut out (or have students cut) and color the elements for plant growth as well as the picture of the garden.
3. Glue the garden to the outside of the paper plate pocket. Identify the plants in the garden.
4. Next have students identify the pictures of the sun, water, soil as things that plants need in order to grow. Attach the three pictures to a piece of yarn using tape and attach the yarn to the paper plate.
5. The sun, water, and soil chain can go inside pocket and students can take turns pulling the chain out and identifying the conditions necessary for plant growth.

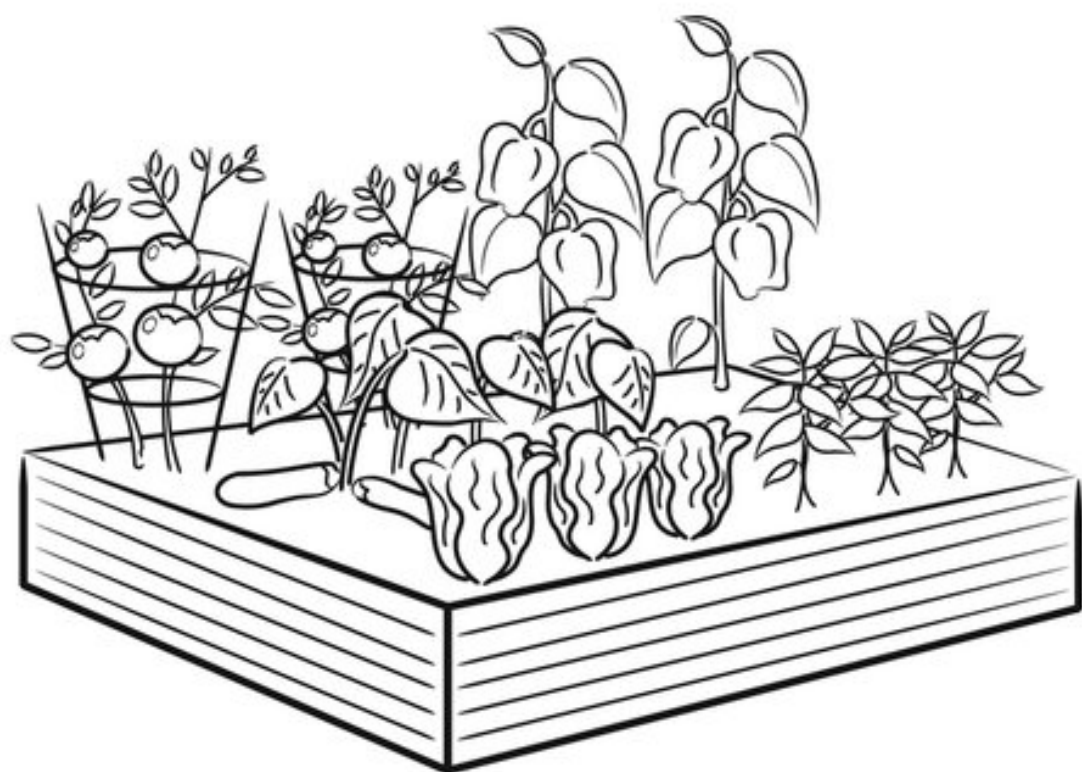


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My Plant Life Cycle Book

Content Areas

Science: Life Processes; Earth Patterns, Cycles, and Change

Literacy: Vocabulary

Objective

Students will:

- Identify the stages in the plant life cycle

Materials

- Construction paper, folded or cut in half length-wise
- Finger paint – brown, green, yellow, orange
- Crayons

Background Knowledge

Plants undergo a series of changes from the time the seed is planted to the time that the plant reaches full maturity. First, the seed must germinate, or sprout. To do this, the seed requires moisture, warmth, air, and space. While the seed does not need soil to sprout, it does need the soil's nutrients in order to grow to maturity. After germination, the seed will grow roots down into the ground and shoots will begin to poke out of the ground. This is the seedling stage. Next, leaves and blossoms will appear on the young plant. After the blossom is pollinated, the plant will bear fruit. This process is the same whether the plant is growing in the wild, in a backyard, or on the farm. On the farm, after the plant bears its fruit, it is time to be harvested. Common plants which are planted and harvested yearly on Virginia farms include corn, soybeans, cotton, tomatoes, and wheat. Across the commonwealth farmers markets and produce stands are commonly found throughout the summer. Locally grown produce found at these markets include a wide variety of fruits and vegetables as well as local honey, jams, and pickles.

Procedure

1. Cut a piece of construction paper in half, length-wise. Then fold back-and-forth three times like an accordion. There should be four rectangles.
2. *You may choose to copy the attached template onto construction paper for students prior to the lesson to help with labeling.*
3. In the first rectangle have the student place a brown thumbprint. Label this as the "seed."
4. In the second rectangle draw a vertical green line. Have the student place a green thumbprint on each side of the line. Label this as the "sprout"
5. In the third rectangle draw a small circle in the middle. Have the student place yellow thumbprints around the circle. Label this as the "blossom."
6. In the fourth rectangle draw an outline of a pumpkin. Have the student finger paint the inside of the pumpkin orange. Label the pumpkin.

Note: You may choose to do other plants such as a tomato or squash.



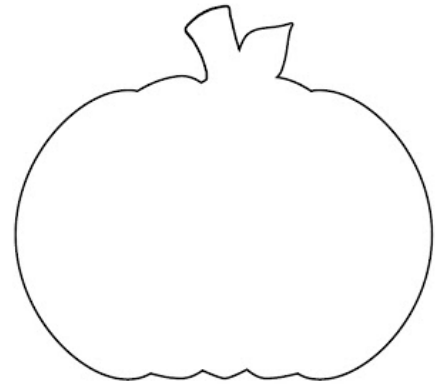
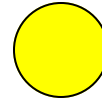
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seed

sprout

blossom

pumpkin



Fold or cut along the solid line.

Fold along the dotted lines.

Over in the Garden

Content Area

Literacy: Vocabulary, Print/Book Awareness

Science: Life Processes, Earth Patterns

Mathematics: Number and Number Sense

Objective

The student will be able to:

- Count to 5
- Identify steps in life cycle of a plant

Materials

- 1 cotton glove (green or brown)
- 1 large seed
- 1 one inch cotton pom pom (tan or brown)
- 3 inches yarn
- 2 small googly eyes
- 1 small piece red felt (for the gardener's smile)
- 2 small green leaves (fabric, silk, foam, or plastic)
- 3 small flowers (fabric, silk, foam, or plastic)
- 9 small circles or tiny fruits and vegetables (fabric, silk, foam, or plastic)
- 5 small rectangles of brown felt
- 1 small bee (fabric, silk, foam, or plastic)
- Scissors
- Craft glue

Background Knowledge

Introduce the concepts for plant growth and survival. Share the process of plant growth from seed to fruit.

Procedure

1. Create a glove to illustrate finger play.
2. Work with the glove palm side up.
3. Assemble the gardeners head on the thumb.
4. Glue the sprouts (2 small leaves) on the pointer finger.
5. Glue the blooms (3 small flowers) on the middle finger.
6. Glue the fruit (4 small colored circles or mini-fruits/vegetables) on the ring finger.
7. Glue a bee at the tip of the pinky finger.
8. Glue 5 brown felt rectangles up the side of the hand (bushel baskets) and glue colored circles or mini-fruits/vegetables at the tops of baskets.
9. Share the poem "Over in the Garden" with children emphasizing counting and the plant life cycle.

References

Lesson written by North Carolina Agriculture in the Classroom



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Over in the Garden

Over in the garden in the bright, bright sun
Stood a happy gardener
And his little seed one.
“Sprout,” said the gardener.
“I will sprout,” said the one.
And it sprouted all day in the bright, bright sun.

Over in the garden with the sky so blue
Stood a happy gardener
And his little sprouts two.
“Grow,” said the gardener.
“We will grow,” said the two.
And they grew all day with the sky so blue.

Over in the garden by the old oak tree
Stood a happy gardener
And his little plants three.
“Bloom,” said the gardener.
“We will bloom,” said the three.
And they bloomed all day by the old oak tree.

Over in the garden as the rain did pour
Stood a happy gardener
And his little bloomers four.
“Bear fruit,” said the gardener.
“We will bear,” said the four.
And they bore their fruit
As the rain did pour.

Over in the garden by the “buzzy” bee hive
Stood a happy gardener
And his bushel baskets five.
“Fill up,” said the gardener.
“We are full,” said the five.
And he/she carried the harvest past the “buzzy” bee hive.



Paper Bag Pumpkin Patch

Content Area

Science: Life Processes

Physical and Motor Development: Skilled Movement; Movement Principles

Objective

Students will:

- Learn how pumpkins are grown

Materials

- Paper lunch bags
- Green pipe cleaners
- Green construction paper
- Crayons/paint

Background Knowledge

A perennial fall favorite, pumpkins are grown in many different places in Virginia and are harvested from September to November. To ensure a fall harvest, seeds are planted from mid-June to July. Most Virginia pumpkins are used as fall decorations, while others may be used in pies, breads, soups, or stews. Although 90% water, they are high in potassium and vitamin A.

Many Virginia pumpkin farmers sell their pumpkins directly to the public in the fall and allow people to come pick their own pumpkins. Oftentimes they will also offer hayrides and corn mazes. To find a pick-your-own pumpkin farm near you, you can visit VirginiaGrown.com.

Procedure

1. Begin by reading a book about pumpkins. *See suggestions in the Literacy Corner.* Point out how and where pumpkins are grown.
2. Have students color or paint the top 2-3 inches of a paper lunch bag green or brown to represent the stem.
3. Color or paint the remainder of the bag orange.
4. Stuff the bag with scrap paper or old newspapers.
5. Twist the top of the bag closed.
6. Wrap a green pipe cleaner around the stem to secure it.
7. Cut out leaves from green construction paper and hole punch each.
8. Thread the leaves onto the pipe cleaner.
9. Curl the remainder of the pipe cleaner using your finger or a pencil to finish the vine.
10. Plant a pumpkin patch by placing completed pumpkins down on the floor in rows to create a pumpkin patch.
11. Have students line up and call out directions for them, such as “skip between the pumpkin rows” or “count while hopping to each pumpkin.”

Extension

Bring in roasted pumpkin seeds for students to taste or roast them together in as a class.



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Peek-a-Boo Flowerpot

Content Area

Science: Life Processes

Literacy: Vocabulary

Objective

The student will:

- Germinate a seed.

Materials

- Flowerpot template, attached
- Sandwich sized plastic baggie
- Cotton balls
- Water
- Seeds
- Tape
- Markers/crayons

Background Knowledge

The basic things a seed needs are light, food and water. Light is supplied by the sun or an artificial lighting system. Light provides the plant energy to perform photosynthesis, the process that the plant uses to make its own food. The seeds have a built-in food supply. The inside of a seed is the food supply once the seed has germinated, or sprouted. Once the plant reaches a certain age, it will start to take in nutrients from the soil through its roots to help with photosynthesis. Water is essential to all living creatures. Plants are no exception. They get water through the roots and through tubes, often called veins, in the stems and leaves. They get the water from the soil surrounding the plants. When the area their roots are in becomes dry, some plants will grow roots out to find a new source of water.

Ornamental plants and flowers, such as the type typically found in pots and containers are a part of the horticulture industry, which is an important part of agriculture. Horticulture encompasses cut flowers, landscaping plants and turf grass.

Procedure

1. Cut on the circle in the middle of the flowerpot to reveal a window for your seed.
2. Wet a cotton ball (it should be thoroughly wet, but not dripping).
3. Place 2-3 seeds on the cotton ball and then put inside the plastic bag.
4. Zip the bag closed and then tape behind the flowerpot window.
5. Students can then color and decorate their flowerpots.
6. Tape peek-a-boo flowerpots to the window so that students can observe their seeds' germination and growth.

Extension

After your seeds begin to sprout you may remove them from the plastic bags (do not pull the seedling from the cotton ball as the roots may rip) and replant in a container. Seeds/plants best suited for this are flowers such as daisies, marigolds, or zinnias or vegetables such as radishes, beets, or peppers. Herbs like rosemary, parsley, basil or cilantro are also an excellent idea for preschool container gardens.



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Use the space above the pot to draw what your plant will look like after it grows.




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Use the space above the pot to draw what your plant will look like after it grows.



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Planting a Pattern

Content Areas

Math: Patterns

Objective

The student will be able to:

- Separate and sort seeds based on certain characteristics (texture, size, color, design)
- Recognize and complete a pattern

Materials

- Brown construction paper
- Liquid glue
- Scarecrow template, attached
- Craft sticks (optional)
- At least 2 different types of seeds

Background Knowledge

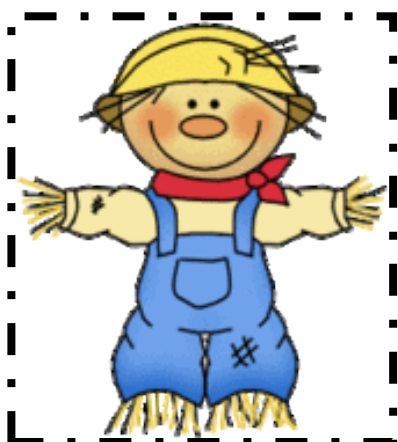
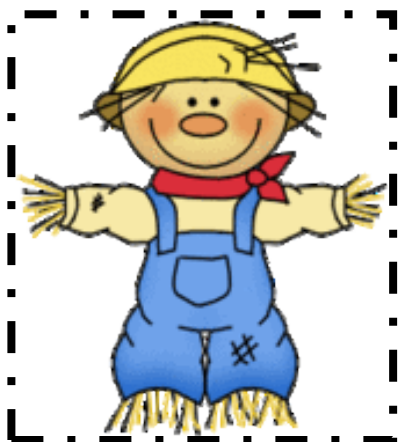
Seeds come in many different sizes, shapes, colors, patterns, and textures, which is an important step in realizing that plants come from seeds and there are many different plants that grow from seeds. Not only are seeds important as the first step in germinating a plant, but sometimes they are edible themselves. Seeds that we eat include corn, peas, peanuts, and beans. Oftentimes birds like to eat seeds too, so backyard gardeners have traditionally used scarecrows to deter garden pests.

Procedure

1. Give each student a strip of brown construction paper. Glue the scarecrow to either the left or right side (you may also choose to put the scarecrow on a wooden craft stick and attach to the paper).
2. Give students at least 2 different types of seeds. Have them sort them into piles.
3. Demonstrate a pattern and have students mimic that pattern at their tables.
4. Place a line of glue on the construction paper. Have students either replicate and continue the demonstrated pattern or create their own pattern by gluing the seeds down.



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Pumpkin Discovery

Content Area

Science: Investigation

Fine Motor: Manipulative Movement

Objective

Students will:

- Explore the insides of a pumpkin
- Identify seeds

Materials

- Orange paper plates
- Glue
- Yellow, gold, or orange yarn
- Pumpkin seeds
- Pumpkin

Background Knowledge

A perennial fall favorite, pumpkins are grown in many different places in Virginia and are harvested from September to November. To ensure a fall harvest, seeds are planted from mid-June to July.

Some pumpkins are used as fall decorations, while others may be used in pies, breads, soups, or stews. Although 90% water, they are high in potassium and vitamin A.

Procedure

1. Bring in a pumpkin and slice off the top. Invite students to look at and feel the inside of the pumpkin. Have them describe what they see/touch.
2. Pull out a few seeds for students to see. Discuss the importance of seeds to plants.
3. Pass out an orange paper plate to each student. This is their pumpkin.
4. Glue yarn to the plate to represent the pulp on the inside of the pumpkin.
5. Next glue pumpkin seeds to the plate.

Extension

Bring in roasted pumpkin seeds for students to taste or roast them together in as a class.



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Pumpkin Life Cycle

Content Area

Science: Life Processes

Objective

Students will:

- Create a model of the life cycle of a pumpkin plant

Materials

- Orange paper plates
- White construction paper circles
- Glue
- Pumpkin seeds
- Green pipe cleaners
- Yellow tissue paper
- Green construction paper

Background Knowledge

There are flowering/non-flowering plants and edible/non-edible plants that are grown in Virginia. The pumpkin plant serves as both a flowering and edible plant, which is important for your students to know when categorizing. A pumpkin plant starts with a seed, then the roots sprout underground, the leaves sprout from the soil and a vine begins to grow, the flowers blossom on the vine, and the fruit or pumpkin comes last.

Procedure

1. Glue the white circle onto the middle of the orange plate. Use a marker to divide the white circle into four segments and number 1-4.
2. In the first segment have students glue a pumpkin seed.
3. Next, in the second segment, take a 2 inch segment of green pipe cleaner, bend to look like a sprout and glue.
4. In the third segment take another segment of green pipe cleaner and twist around your finger or pencil and glue down to be the vine.
5. In the fourth segment take a small piece of yellow tissue paper, pinch and glue to look like a blossom.
6. Lastly, add a green construction paper rectangle to the top of the orange plate to be the stem. Optionally, you may add another green pipe cleaner to the top to be the vine.



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Savvy Sorting

Standards of Learning

Science: Investigations, Matter

Mathematics: Data Collection, Patterns

Literacy: Oral Expression, Vocabulary

Social Studies: Descriptive Words

Objective

The student will be able to:

- use a variety of fruits and vegetables to practice describing and sorting items by identifying and using various characteristic properties.
- use these vegetable manipulatives to work with physical Venn diagrams.

Materials

- Plant material with a variety of colors, textures, and shapes – fruits and vegetables
- Rings – such as large embroidery hoops, small hula hoops, metal wreath rings

Background Knowledge

Elementary students need to learn the skills of observing, describing, sorting, and classifying. Using agricultural materials as manipulatives works well since they have a huge variety of colors, textures, and shapes; are easily obtainable from the grocery store or farmer's market and are non toxic. In addition, they are high interest – students love food!

This activity can be used with students of all ages and skills. It is easily modified for practice with concepts from the simple to the complex and encourages higher level thinking. Venn diagrams are often used with students in English, social studies, science and math. They are taught in many study skills units. Introducing students to Venn diagrams in a very physical, concrete way helps young students more easily transfer this skill to paper and pencil.

Procedure

1. Divide the class into small groups of 3-4 students each.
2. Give each group a selection of 8 – 10 pieces of vegetables, fruits, gourds, or seeds. Each group should also get two rings – embroidery hoops, small hula hoops, wreath hoops. (You could also do this as a class if you think the students would not be able to do it on their own).
3. The teacher can direct the activity starting as simply as needed, depending on the age of the students by calling out the following directions. These were used with gourds, but can be modified depending on the agricultural materials utilized. The activities could require students to evaluate the items based on color, shape, texture, relative sizes, uses, parts of plants, etc.
 - Hold up a vegetable with some orange on it.
 - Hold up a fruit which is the same shape as a cucumber.
 - Find a vegetable which is bumpy.
 - Hold up two which are similar. WHY DID YOU DECIDE ON THOSE TWO? (Introduce the concept of a CHARACTERISTIC.)
 - Take 1 ring. Put all the round fruits in the ring.
 - Now use 2 rings. Put all the big ones in one ring and the small fruits in the other ring. You decide what is big and small.



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- Use 2 rings. Put the yellow ones in one ring and the odd shaped ones in the other ring. Two problems arise – some gourds do not fit either characteristic (these are EXCLUSIONS – and are part of the null set) and some fruits have both characteristics (show students how to overlap rings – these belong in the INTERSECTION)

Extension

1. With students who are readers, the teacher can begin the lesson by making up a list of traits which can be written on cards and drawn out of a box by the groups. The students can organize the produce using these traits. Example of traits which can be used with fruits and vegetables include: red, yellow, green, multi-colored, round, oblong, irregular shape, edible skin, smooth skin, round skin, grows under ground, contains seeds. An interesting example would be to use “yellow” and “red” as the traits. See if students would interpret the intersection of those traits as “orange”.
2. Encourage students to come up with categories on their own. Within the group one student can list two characteristics and the other students can work together to complete the Venn diagram.
3. With older students, move from the physical rings to paper rings and the actual vegetables to just words.



Sensory Seeds

Content Areas

Science: Matter

Math: Patterns

Language Arts: Vocabulary

Social Studies: Descriptive Words

Objective

The student will be able to:

- Separate and group seeds based on texture, size, and color
- Use utensils and measuring devices

Materials

- plastic box with snap on lid (size of a shoebox or larger)
- 2 variety of seeds
- spoons
- plastic cups
- plastic bowls
- pictures of crops representing each type of seed

Background Knowledge

Seeds come in many different sizes, shapes, colors, patterns, and textures, which is an important step in realizing that plants come from seeds and there are many different plants that grow from seeds.

Students will also learn to sort objects by certain characteristics, count the objects in specific groups, and graph the results of their sorting.

Procedure

1. Fill see threw plastic box with seeds. I like using field corn, soybeans, and bean seeds. These seeds are larger and easier for small hands to manipulate.
2. Encourage students to play with the seeds spooning them into cups and bowls.
3. Ask students to make 2 groups of seeds and explain their reasons.
4. Ask students to make a simple ABAB pattern with 2 types of seeds.
5. Lead a discussion of what plants do we get each seed from.
6. Share pictures of plants that match each type of seed.

Extension

Have students draw seeds.
Create a seed collage.



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Sink or Float?

Content Areas

Science: Investigation, Matter

Social Studies: Descriptive Words

Literacy: Oral Expression, Vocabulary

Objective

The student will be able to:

- Define fruit – the fleshy part of the plant that holds the seeds.
- Identify many common fruits.
- Make predictions whether common fruits will sink or float based on size and density.
- Draw a bar graph and develop a conclusion regarding common fruits and their ability to sink or float.

Materials

- Large clear plastic container that will hold at least 2 gallons of water
- At least 2 gallons water
- A variety of fresh fruits (at least 20 in assorted sizes, shapes, colors, etc.) Some good examples: apple, cucumber, bell pepper, orange, grapes, cherry tomatoes, squash, small pumpkin, small melon, blueberries, pear, eggplant, strawberries, peach, lemon, lime.
- 1" square graph paper
- Crayons or markers

Background Knowledge

Familiarize students with the definition of a fruit. Show them examples of fruits. Also discuss with them why certain items sink or float.

Procedure

1. Place the large clear plastic container in front of the class at a point where all students can see it.
2. Fill container $\frac{1}{2}$ full with water.
3. As you show each fruit, have students predict if it will sink or float. Then have students come up for each fruit and drop them in the water. Have a chart made up on chart paper with sink or float and the fruits listed. As they see whether the fruit sinks or floats have them color in a box under sink or float to create a bar graph. You might want to explain in simple words why certain ones sink and why certain ones float.
4. At the conclusion of the experiment, have students tally the chart. How many fruits sink? How many fruits float? Which category has the most? Least? How many more does ____ have than ____?

Extension

At the conclusion of the experiment, cut the fruits into pieces and allow the students to sample them.



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Sorting Seeds

Content Areas

Science: Matter

Math: Number and Number Sense, Data Collection, Patterns

Language Arts: Vocabulary

Social Studies: Descriptive Words, Citizenship

Objective

The student will be able to:

- Separate and sort seeds based on certain characteristics (texture, size, color, design)
- Work well with others in a group setting

Materials

- Chart paper
- Various types of seeds
- Markers
- Tape
- Bowls

Background Knowledge

Seeds come in many different sizes, shapes, colors, patterns, and textures, which is an important step in realizing that plants come from seeds and there are many different plants that grow from seeds.

Students will also learn to sort objects by certain characteristics, count the objects in specific groups, and graph the results of their sorting.

Procedure

1. Have your students in groups where each set of students gets a variety of different seeds in a bowl. Let them take time to explore the seeds, while monitoring their work with others and their handling of the seeds.
2. Ask the students how they could sort the different seeds, and show them examples if they are not sure what you are talking about. Ask them to group the seeds based on certain things that are the same or different.
3. Next, have the students come together in one big group and sort a group of seeds with them based on some characteristic. Make a graph displaying the information by creating a bar graph where you can color in blocks for each seed in a group or tape the seeds up on the graph so the students have a great visual.
4. Talk with the students about the graph by asking them questions, such as “how many are in each group, which group has the most, which group has the least, how many more does this group have than this one?”

Extension

Have a sensory table with all of the different types of seeds so that students can explore.

Plant some of the seeds for a classroom garden.



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Soy Boy

Content Areas

Science: Life Processes, Earth Patterns

Social Studies: Location, Descriptive Words, Citizenship

Literacy: Vocabulary, Oral Expression

Objective

Students will investigate the cycle in plant growth and plant needs.

Materials

- Bean seed (soybean)
- Small baggie (jeweler size – one per student)
- Cotton balls
- String
- Hole puncher
- Water
- Labels
- Writing utensils
- Journal for data collection

Background Knowledge

Seeds vary greatly in germination rate, amount of time needed for plant maturity, and growing conditions. Some seeds, like radishes, only need 4-6 weeks to grow to maturity, while corn and soybeans require several months. The purpose of this activity is to provide students with an opportunity to observe the germination process. What does it look like when the sprout breaks through the seed coat? Is there a difference between dicot and monocot seed germination? How long will the seed take to grow? All of these questions are exciting to explore with students.

Germination is when the seed sprouts and begins to grow. It is important for your students to know that it starts right when there is a bud present from the seed. Explain to your students that their sprout will need a while to grow and that every plant is different in the amount it takes for them to get to maturity. Ask them what their plant will need to grow. All plants need water, light, temperature, time, soil (nutrients), oxygen, and space to grow to full maturity. The process that their plant is going to go through is also something that should be talked about and monitored for a few weeks. All plants go through about the same cycle of sprout, growth, flower, and fruit. However, it is important to also point out to your students what their plant parts are since they will not have flowers or fruits. The basic parts of the plant to point out are roots, leaves, stem, flower, seeds, and fruit. Make sure to point out that not all plants have every part.

Procedure

1. Define the term germination
***To sprout or begin to grow*
2. Show the class a variety of seeds and brainstorm what a seed needs to germinate.
***This list should be comprised of the children's perceptions of what a seed needs to germinate, but guide them to include the following if they don't think of them on their own: water, air, warm temperature.*
3. Instruct the children that they will be conducting an experiment to see which things from their brainstorming list a seed actually needs to germinate.



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4. Select four things from the list to use when conducting the experiment (making sure that three of the four elements are water, air, and warm temperature).
5. Set up four small jewelry bags. In each bag place three of the four elements, excluding a different element from each bag. Provide a label for each bag that shows which element has been excluded.
6. Insert at least two seeds into each bag then place the bags in a location that is easily accessible for student observation.
7. Generate hypothesis about which bag contains just the right elements that will provide the seeds what they need to germinate.
8. Over the next 3-5 days make observations and record in a science journal (observations can be recorded thru illustration or written text).
9. At the close of the 3-5 day period (or once some of the seeds have germinated), as a class, draw conclusions about which elements are needed for a seed to germinate.
10. Allow the students to make their own soy boy to care for and help germinate.
 - a. Take a small jewelry-sized Ziploc bag and punch a hole just above the Ziploc seal.
 - b. Take a cotton ball and dip it in water (squeeze out excess water so as not to drown the seeds).
 - c. Place the damp cotton ball in the Ziploc bag with two soybean seeds.
 - d. Blow a puff of air in the bag and seal shut.
 - e. Cut a piece of yarn long enough to make a necklace.
 - f. String the yarn through the hole in the bag and tie around your neck.
 - g. Place the bag under shirt collar – close to your heart.
 - h. Take the Soy Boy pledge and care for your soy boy for 3 – 5 days or until the seeds germinate.
11. Once seeds have germinated, plant in plastic cups, planters, or outside in a courtyard for further observation.

***Do not try to separate seeds from cotton ball. Plant everything in the soil so you do not break the roots of the soybean plants.*
12. Review the importance of plants and the life cycle of plants by reading *Oh Say Can You Seed: All About Flowering Plants* by Bonnie Worth

Pledge

I, (state your name), promise to care for my soy boy day and night. I will keep him close to my heart. I will carry him with me at all times.

Extension

- On a map of the US, locate where soybeans are grown. Discuss how transportation has affected the types of foods available to consumers. (Use map insert from Farm Facts.)
- Read *Why the Brown Bean Was Blue* and list the various uses of a soybean. Collect items made from soy and share with the class.



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Sunflower Sampler

Content Areas

Science: Life Processes, Earth Patterns, Matter

Literacy: Vocabulary

Fine Motor: Manipulative Movement

Objective

Students will:

- Illustrate the parts of a plant and follow directions

Materials

- Paper plates
- Markers/crayons
- Scissors
- Glue
- Ruler
- Green and brown construction paper
- Sunflower seeds
- A Seed Is Sleepy by Dianna Hutts Aston

Background Knowledge

Introduce your students to sunflowers by discussing the large variety of sunflowers available. Share pictures of several types. Discuss how easily sunflowers spread in a short period of time to take over an entire field. Turn the discussion to the parts of the plant (roots, stem, leaves, flower, seeds).

Procedure

1. Read A Seed Is Sleepy to students and discuss the parts of the sunflower shown and the cycle it goes through. Predict with students what will happen next.
2. Provide each child with a paper plate and yellow construction paper and instruct them to cut out leaves to make the petals of the sunflower. Glue these on.
3. Give each child 10-15 seeds to glue to the center of the sunflower.
4. Give students a one inch wide strip of green construction paper to use as a stem. Attach stem to back of paper plate.
5. Next have students cut out leaves from green construction paper and attach to stem.
6. Finally instruct the class to cut a square of brown construction paper and form roots. Attach to the bottom of the stem.
7. Review the parts of the sunflower.

Extension

- Create a bulletin board with all the sunflowers created by the class. Emphasize the variety of colors, sizes, and heights of the flowers.
- What other plants can be used to illustrate the plant parts with these materials? (watermelon, other types of flowers, tomatoes)



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Virginia Vegetable Basket

Content Areas

Language Arts: Vocabulary, Print/Book Awareness, Following Directions

Fine Motor: Manipulative Movement

Social Studies: Sharing, Working with Others, Cutting and Gluing

Objective

The student will be able to:

- Cut and glue items
- Identify vegetables

Materials

- copies of basket page
- copies of vegetable page
- scissors
- glue
- crayons



Background Knowledge

Vegetable gardens are popular in a number of American homes. Many people like to eat a tomato fresh off the vine or a cucumber picked from their very own garden. Gardening is a new concept to young children. Planting a vegetable garden with children encourages them to eat fresh, healthy foods.

Procedure

1. Talk to children about how vegetables are picked from the garden. Read a book such as *In the Garden* by Scholastic.
2. Pretend you are picking vegetables and putting them in an imaginary basket.
3. Provide children with paper cut out basket and cut out vegetables to glue on basket.
4. Vegetable basket can be glued to a larger piece of paper or add a magnet to the back for a refrigerator magnet.
5. For older children run copies of vegetables and basket on white paper. Have the children cut out basket and vegetables to glue to basket.
6. Hint: We used colored cardstock to create a vivid basket.

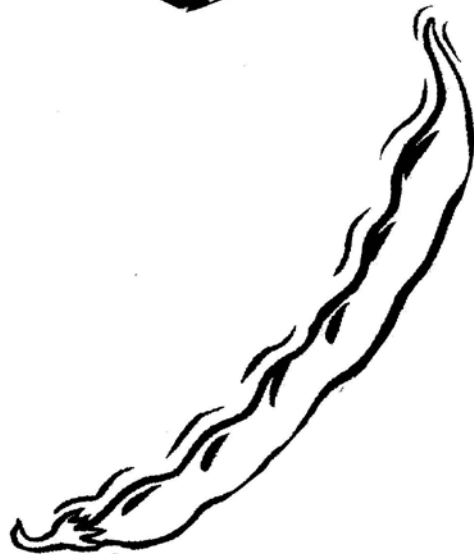
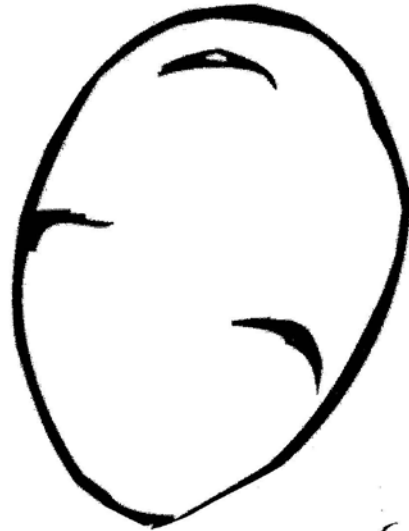
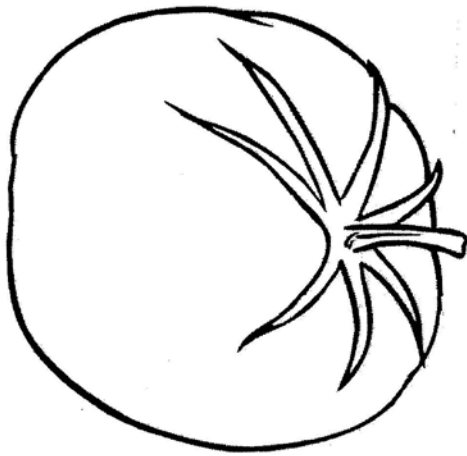
References

In the Garden by Scholastic

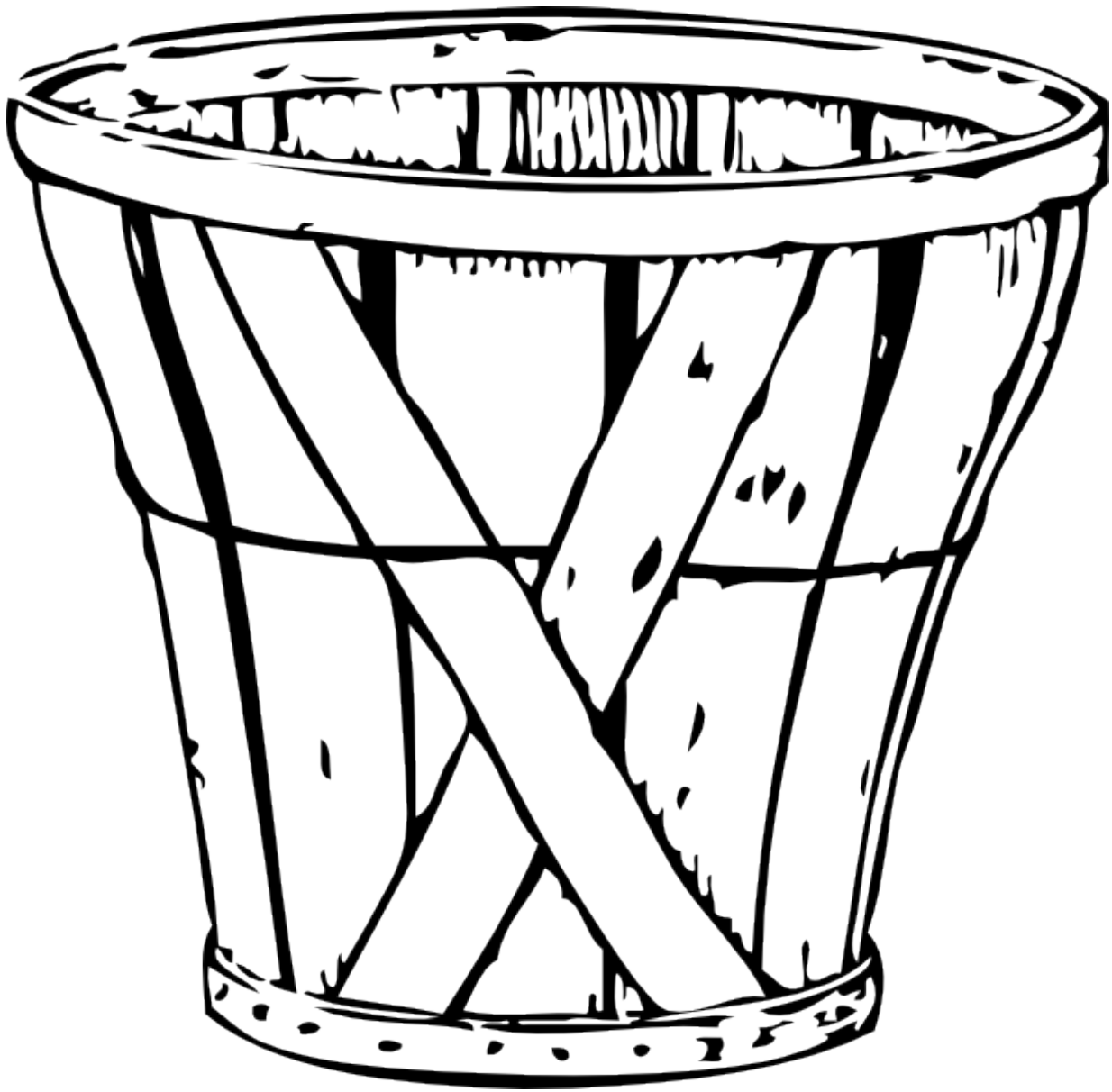
How Groundhogs Garden Grew by Lynne Cherry



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Wiggly Worms

Content Area

Fine motor: Manipulative Movement

Gross motor: Locomotor Skills

Literacy: Vocabulary, Print/Book Awareness

Science: Life Processes

Objective

Children will

- understand the job of earthworms.

Materials

- Pencil
- 2 pipe cleaners (varied colors)

Background Knowledge

Worms serve as cultivators for the earth. They wiggle or tunnel through the land breaking up the soil, allowing for a good mix of topsoil and subsoil, and allowing air into the soil. They eat decomposing material like grass and leaves and turn them into natural fertilizer. One acre of land can house as many as a million earthworms. The cold blooded animals have no arms, legs or eyes but eat their body weight in food each day. Worms live where there is food, moisture, oxygen, and warmth. Earthworm castings provide nitrogen to the soil making it great for planting.

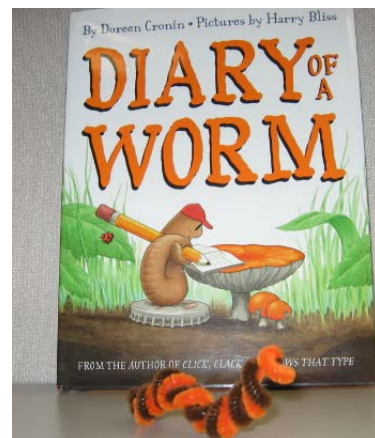
Earthworms are a friend to the farmer because they provide cultivation and fertilizer to farmland.

Procedure

1. Discuss how worms are beneficial to the soil. They are soil cultivators.
2. Have students lie down and wiggle across the room like a worm.
3. Make a worm by wrapping 2 pipe cleaners around a pencil.
4. Share a book with the group such as *Diary of a Worm* by Doreen Cronin

Extension

Create a caterpillar by taking the ends of the pipe cleaners to form antenna.



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