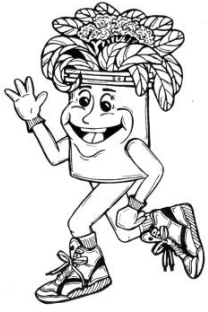


CYLINDER GARDENING

For Young Gardeners on the Move

Optional Activities and Worksheet



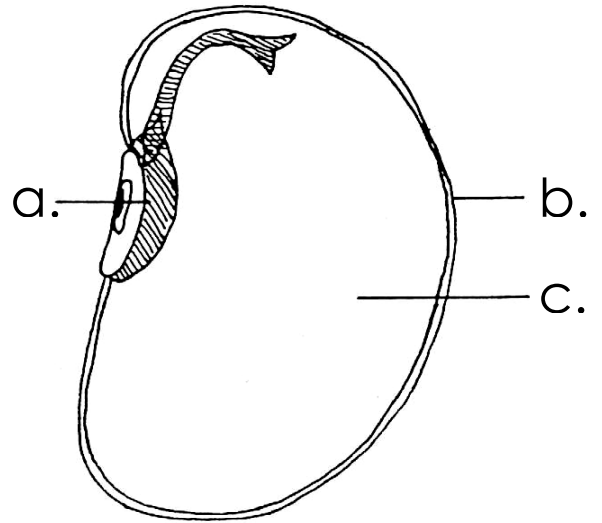


CYLINDER GARDEN PRE-TEST

Name _____

Label the parts of a bean seed.

- a. _____
- b. _____
- c. _____



2. What do plants need to grow?

a. _____

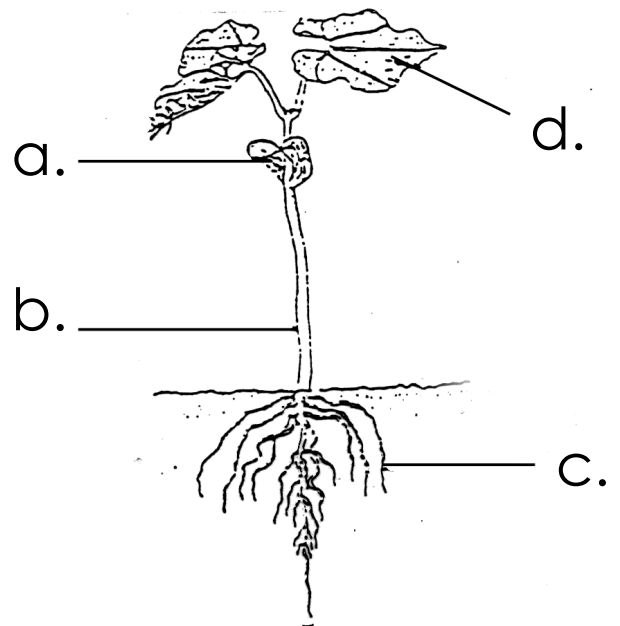
b. _____

c. _____

d. _____

e. _____

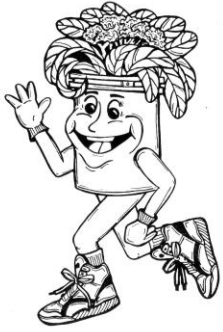
f. _____



3. Label the parts of a young bean plant.

- a. _____
- b. _____
- c. _____
- d. _____

4. _____ is the process plants use to make their own food.
5. Insect pests or 'bad bugs', are usually sucking or _____ type insects.
6. An example of a beneficial insect or "Good Bug" is _____.
7. The _____ consists of many tiny straws that transport water and nutrients from the roots to the leaves.
8. The _____ gather moisture and nutrients from the soil and send it to the rest of the plant.
9. The area around the garden must be kept clean and free of weeds to help prevent _____ and _____.
10. You must add _____ to the soil to provide needed nutrients to help the plants grow.

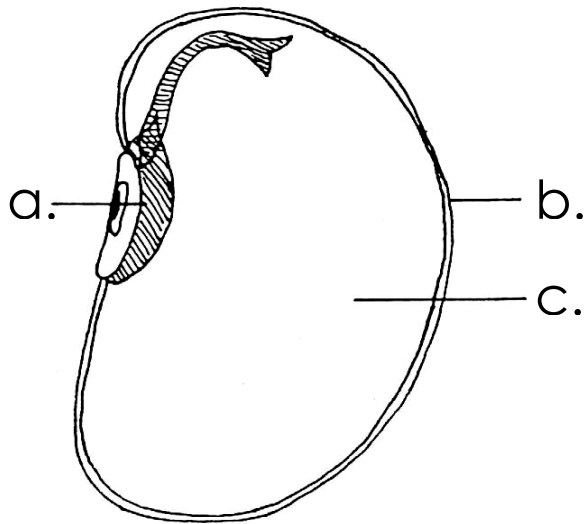


CYLINDER GARDEN POST-TEST

Name _____

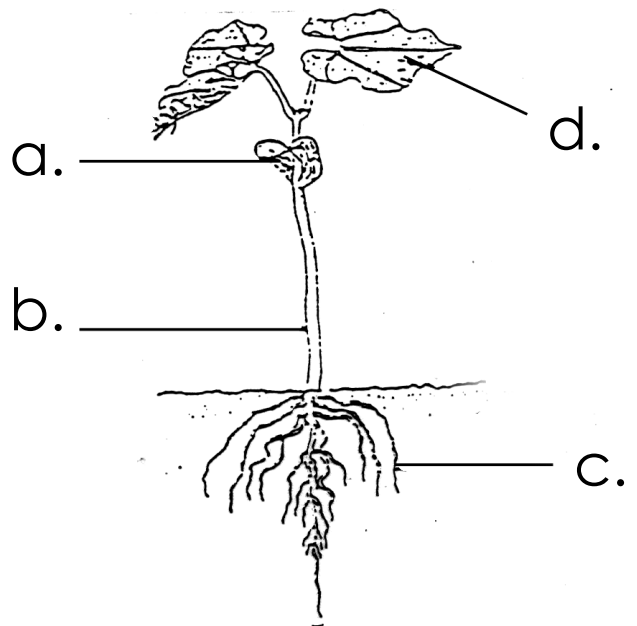
1. Label the parts of a bean seed.

- a. _____
- b. _____
- c. _____



2. What do plants need to grow?

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____



3. Label the parts of a young bean plant.

a. _____

b. _____

c. _____

d. _____

4. _____ is the process plants use to make their own food.

5. Insect pests or 'bad bugs', are usually sucking or _____ type insects.

6. An example of a beneficial insect or "Good Bug" is _____.

7. The _____ consists of many tiny straws that transport water and nutrients from the roots to the leaves.

8. The _____ gather moisture and nutrients from the soil and send it to the rest of the plant.

9. The area around the garden must be kept clean and free of weeds to help prevent _____ and _____.

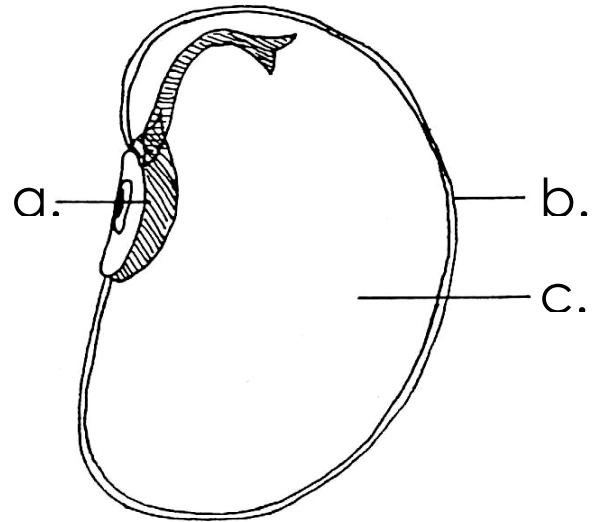
10. You must add _____ to the soil to provide needed nutrients to help the plants grow.



CYLINDER GARDENING PRE-TEST POST-TEST KEY

1. Label the parts of a bean seed.

- a. embryo
- b. seed coat
- c. seed leaves

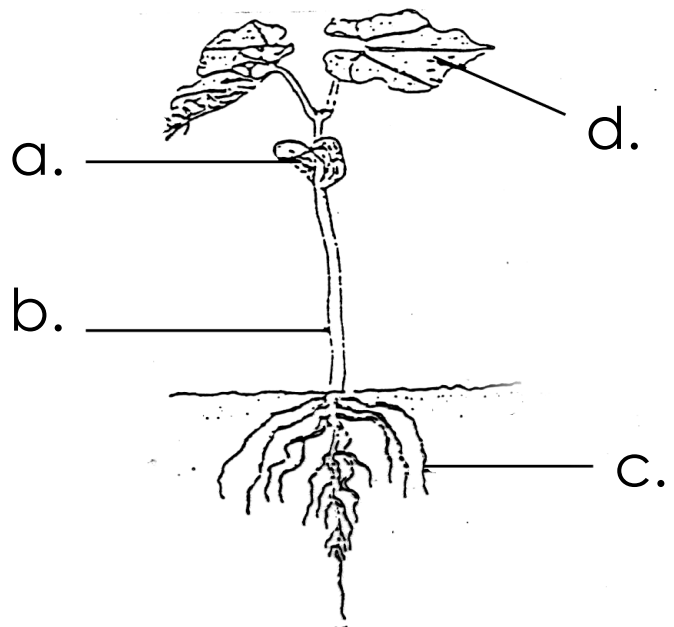


2. What do plants need to grow?

- a. Place (pot, container etc.)
- b. Light
- c. Air
- d. Nutrients
- e. Water
- f. Soil

3. Label the parts of a young bean plant.

- a. Seed leaf
- b. Stem
- c. Root
- d. Leaf



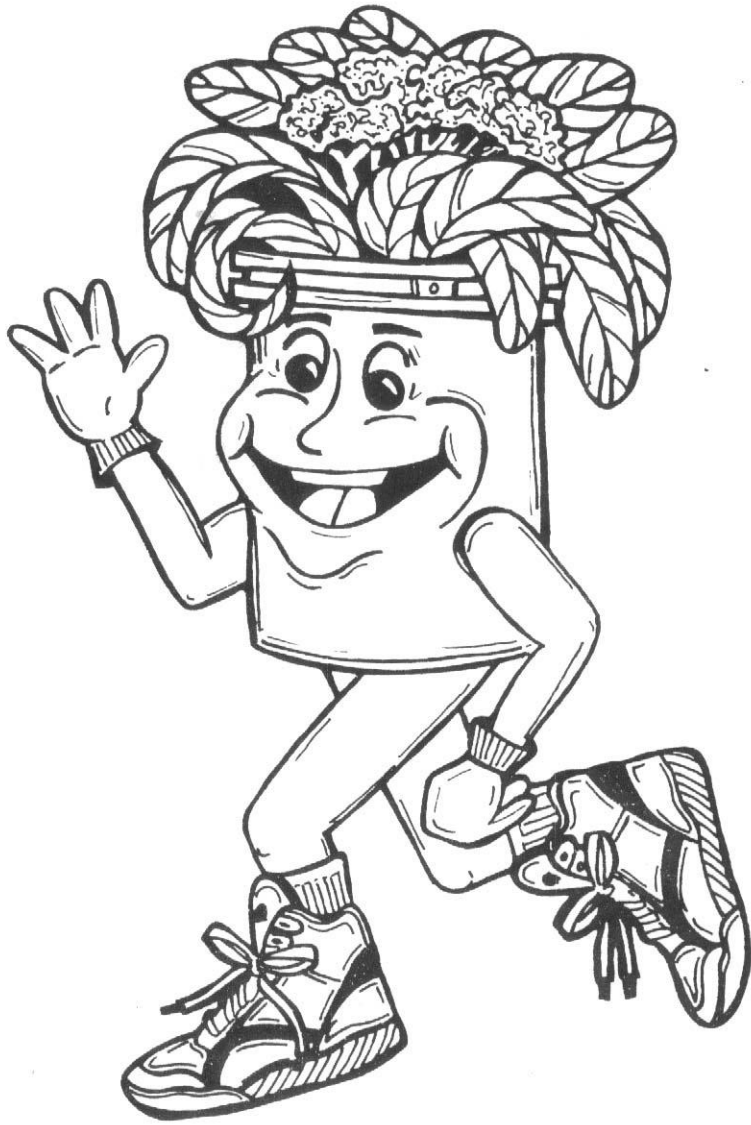
4. Photosynthesis is the process plants use to make their own food.
5. Insect pests or 'bad bugs', are usually sucking or Chewing type insects.
6. An example of a beneficial insect or "Good Bug" is Lady Bug, Praying Mantis, Bee etc.
7. The Stem (Xylem) consists of many tiny straws that transport water and nutrients from the roots to the leaves.
8. The Roots gather moisture and nutrients from the soil and send it to the rest of the plant.
9. The area around the garden must be kept clean and free of weeds to help prevent insects and diseases.
10. You must add fertilizer to the soil to provide needed nutrients to help the plants grow.

Cylinder Gardening

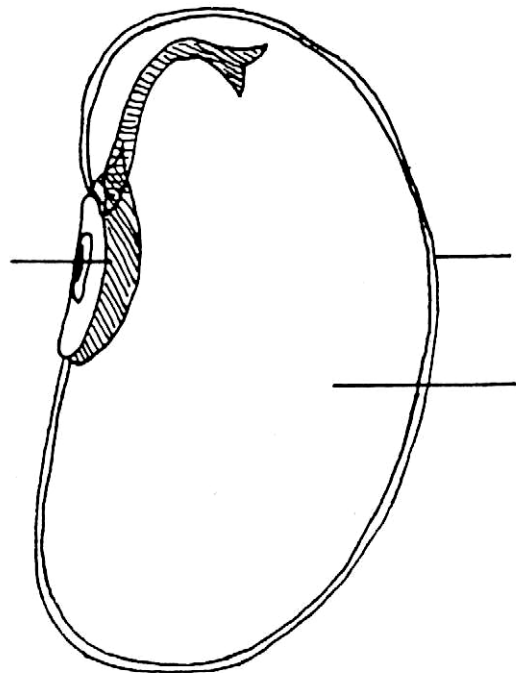
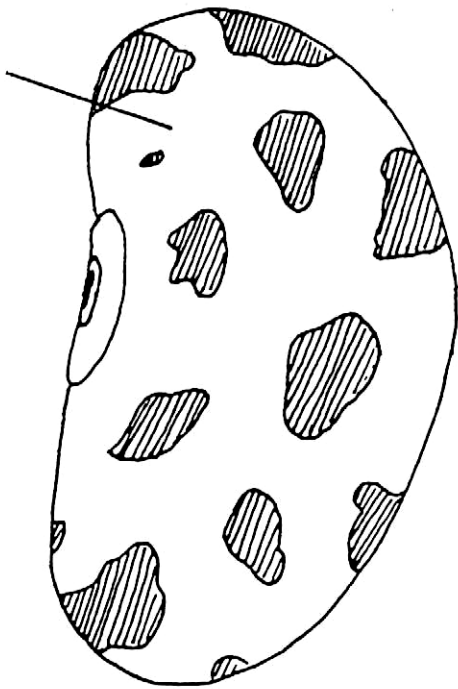
Lesson 1

Introduction to Seeds

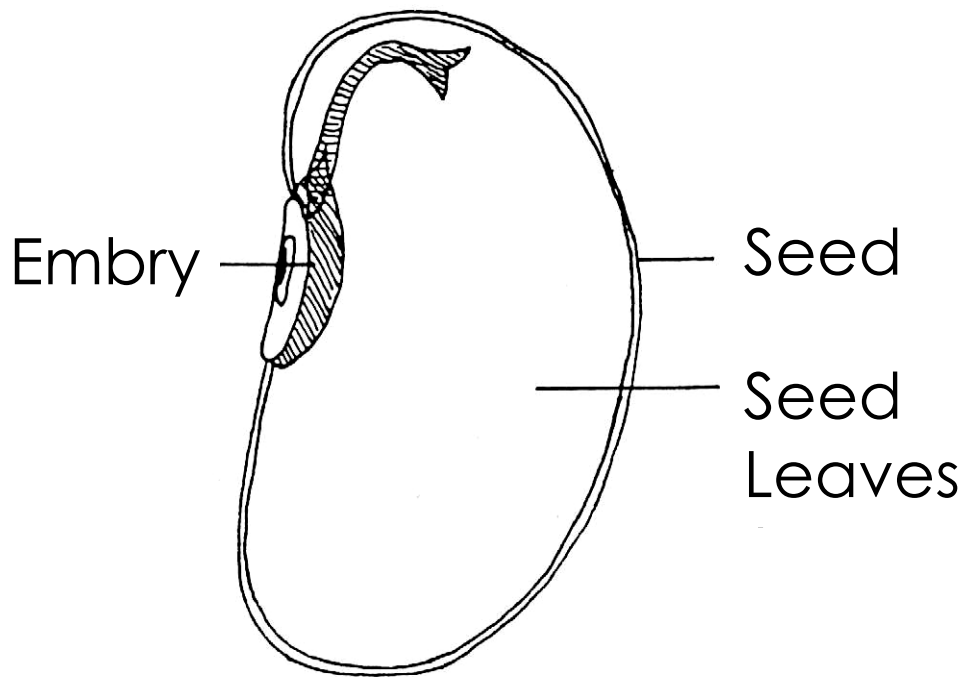
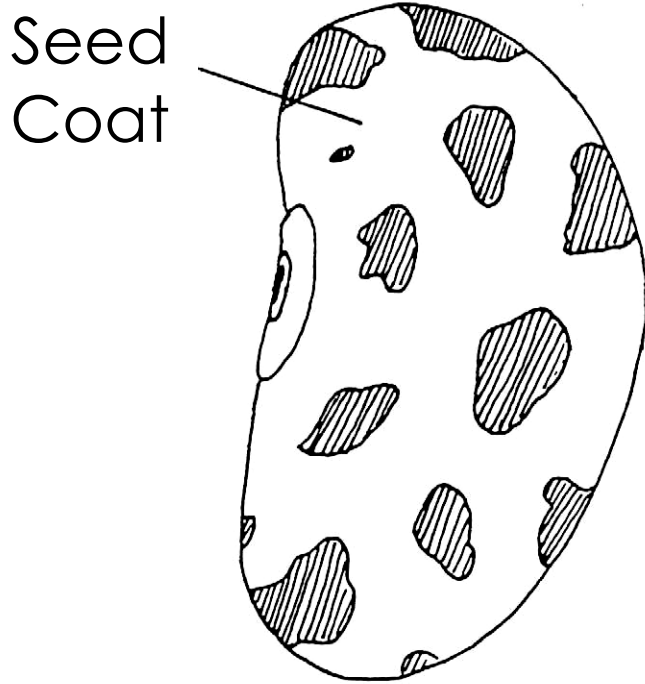
Worksheets & Optional Activities



Parts of a Seed



Parts of a Seed - Key



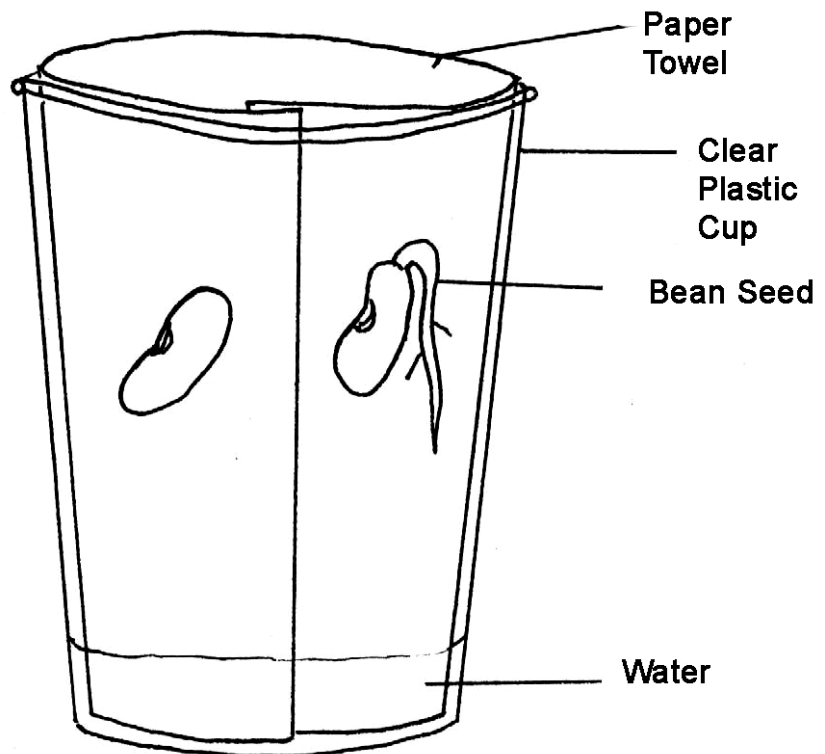
Seed Growth Viewing

MATERIALS NEEDED:

- 3 Glass pint jars or drinking glasses
- Seeds
- Paper Towels

DIRECTIONS:

1. Line jars with several layers of paper toweling.
2. Put about 1 inch of water in the bottom of the glass and watch the paper soak up the water.
3. Place seeds between the moist paper and the glass.
4. Stuff crumpled paper towels into the center of the jar to keep seed pressed against the side of the glass.
5. Refill water as needed to keep about 1" of water in the bottom of the glass.
6. Place one in a window, one on a shelf or desk in regular light but not in direct sun, and one in a cabinet.
7. Watch as the seeds germinate – you can actually see the root emerge!
8. Observe the differences in growth in those placed in light, shade and dark.



Plant People

MATERIALS NEEDED:

- Potting Soil
 - Rye Grass Seed
 - Construction Paper
 - Scissors
 - Moveable Eyes
 - Container
 - Soluble Fertilizer
 - Knee-high Panty Hose
 - Paint Pens
 - Glue
 - Tape
 - Buttons, Plastic beads, or jewels,
 - Water
-

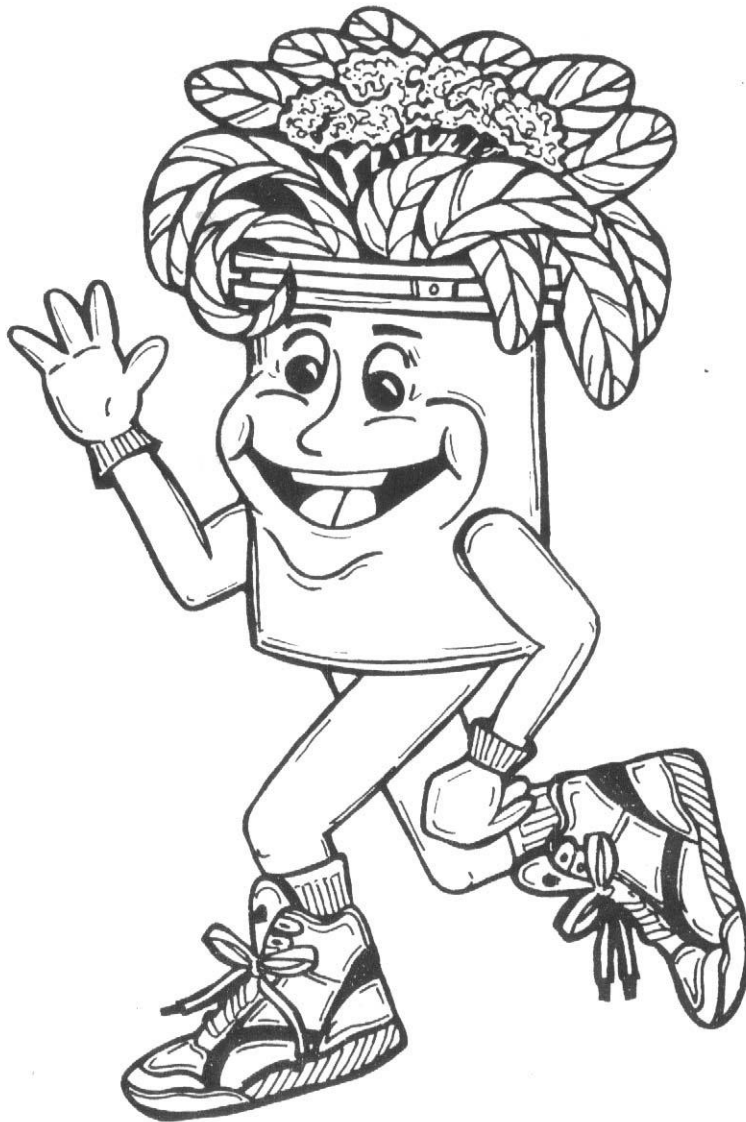
DIRECTIONS:

1. Put approximately 1 tablespoon of rye grass seed into the toe of the knee-high panty hose.
2. Pour approximately 1 cup of potting soil into the hose on top of the rye grass seed. Tie the panty hose in and knot. It should be approximately the size of a baseball/softball – depending on the size of your container.
3. (**Note:** DON'T cut off the remaining part of the hose as it will act as a wick to pull water up out of the container.)
4. Use paint pens to paint faces on your head. You can use moveable eyes, buttons, and other accessories to decorate your face.
5. Allow paint and other items to fully dry before watering your 'chia' head. Water until the 'chia' head is thoroughly saturated. Set the 'chia' head aside and begin decorating the container.
6. Use construction paper and other decorative items to cover the container. This container will serve as the body of your 'chia' head. You can make clothes, arms, legs and other accessories to personalize your creation.
7. Fill the container with water and a diluted solution of soluble fertilizer. Place the 'chia' head on top of the container. Check water level daily so that 'chia' head does not dry out.
8. Place container in a sunny location in your home such as a kitchen window.
9. Your personalized 'chia' head should have a full head of hair in approximately 4-7 days. Your 'chia' head's hair can be cut and trimmed into various styles!!!

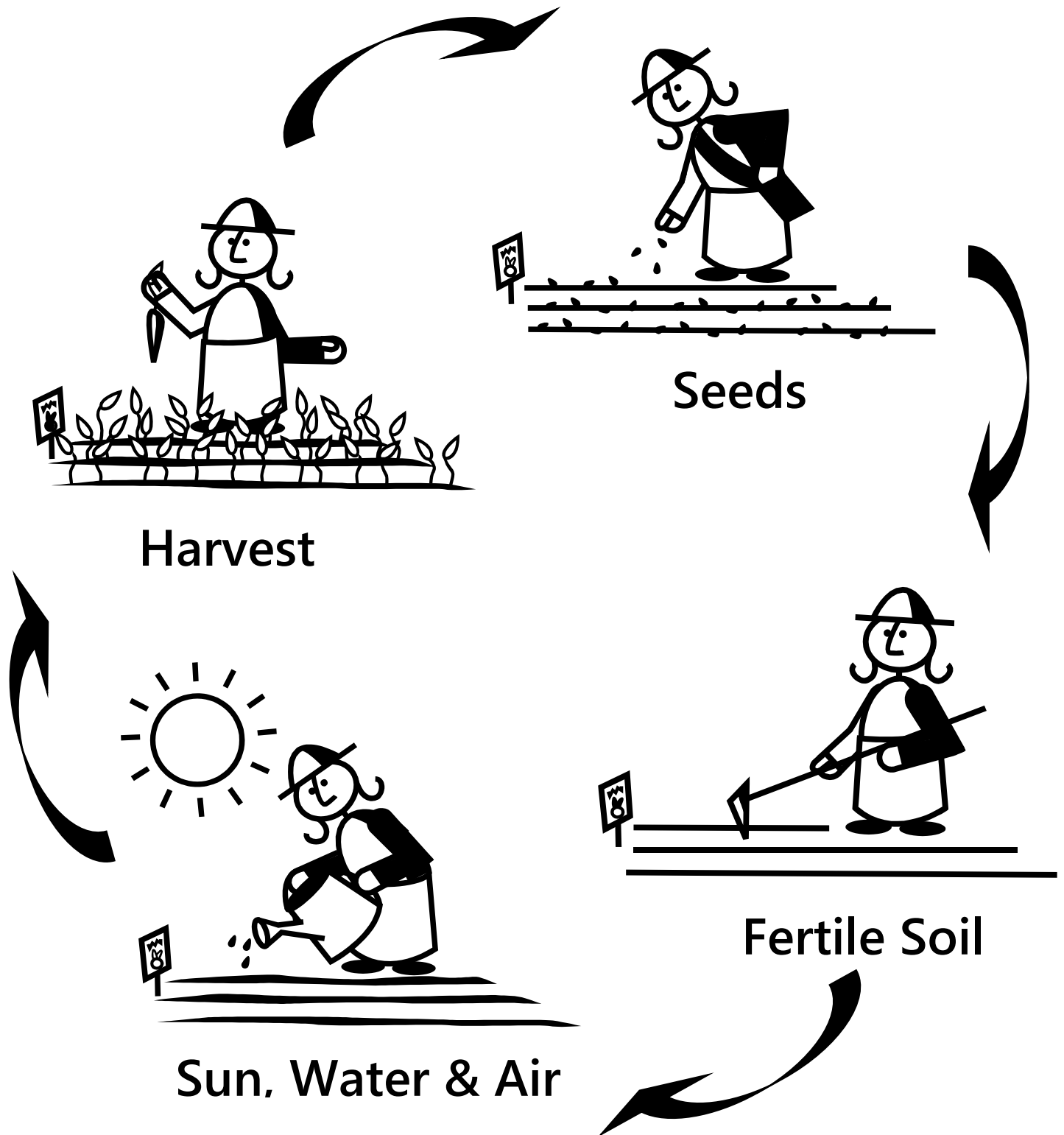
Cylinder Gardening

Lesson 2 What Plants Need

Worksheets & Optional Activities



Stages of Plant Growth & Development

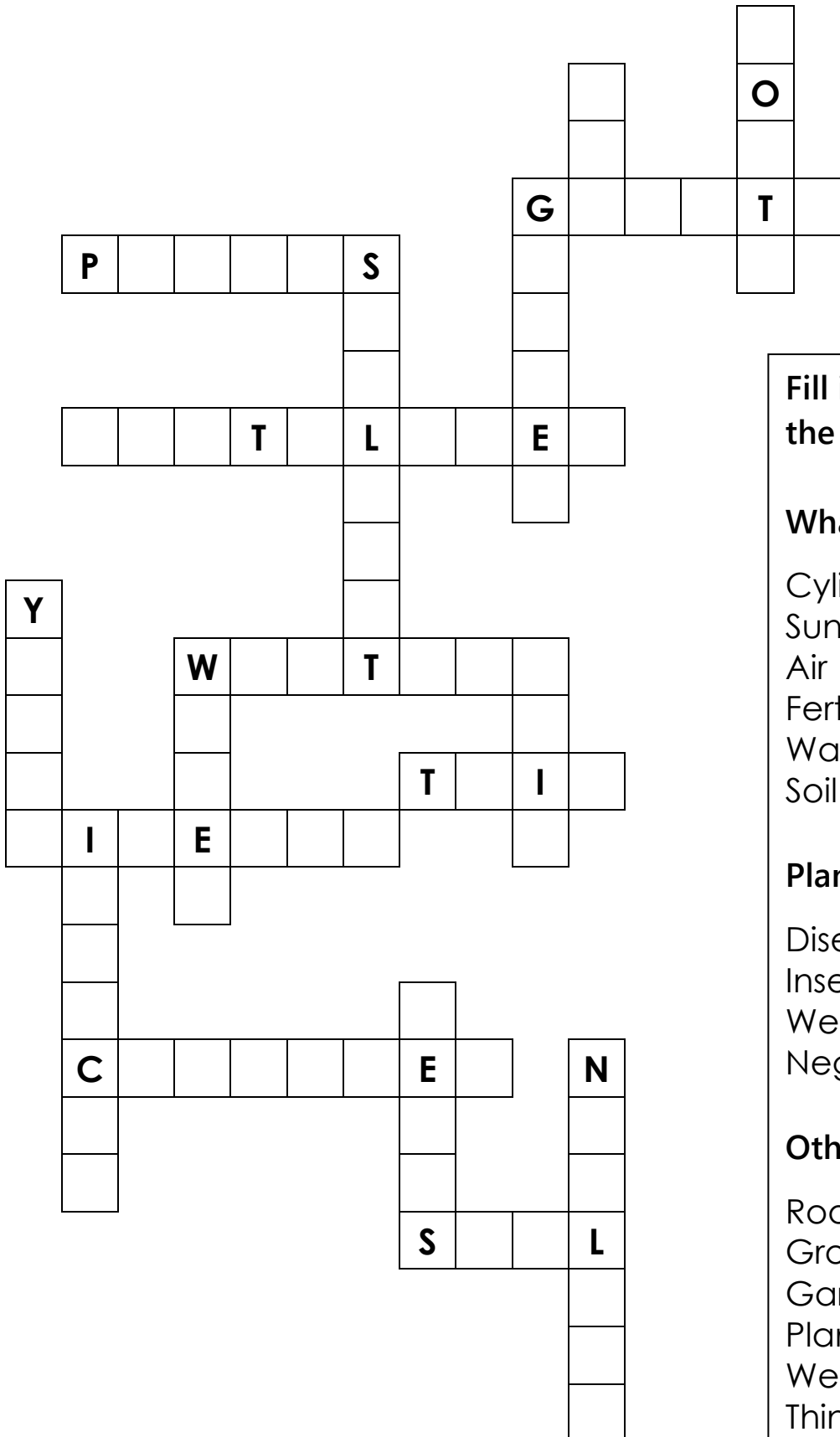
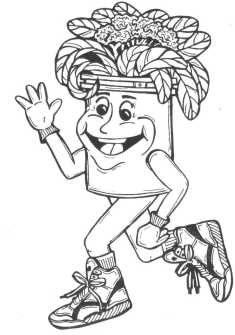


What Do Plants Need to Grow?

- P** Place – pot, cylinder, container
- L** Light – sun
- A** Air – oxygen, carbon dioxide
- N** Nutrients – nitrogen, phosphorous, potassium
- T** Thirsty – water
- S** Soil – potting soil, flowerbed



Plant Word Puzzle



Fill in the puzzle with the words listed below:

What Plants Need:

- Cylinder
- Sunlight
- Air
- Fertilizer
- Water/Rain
- Soil

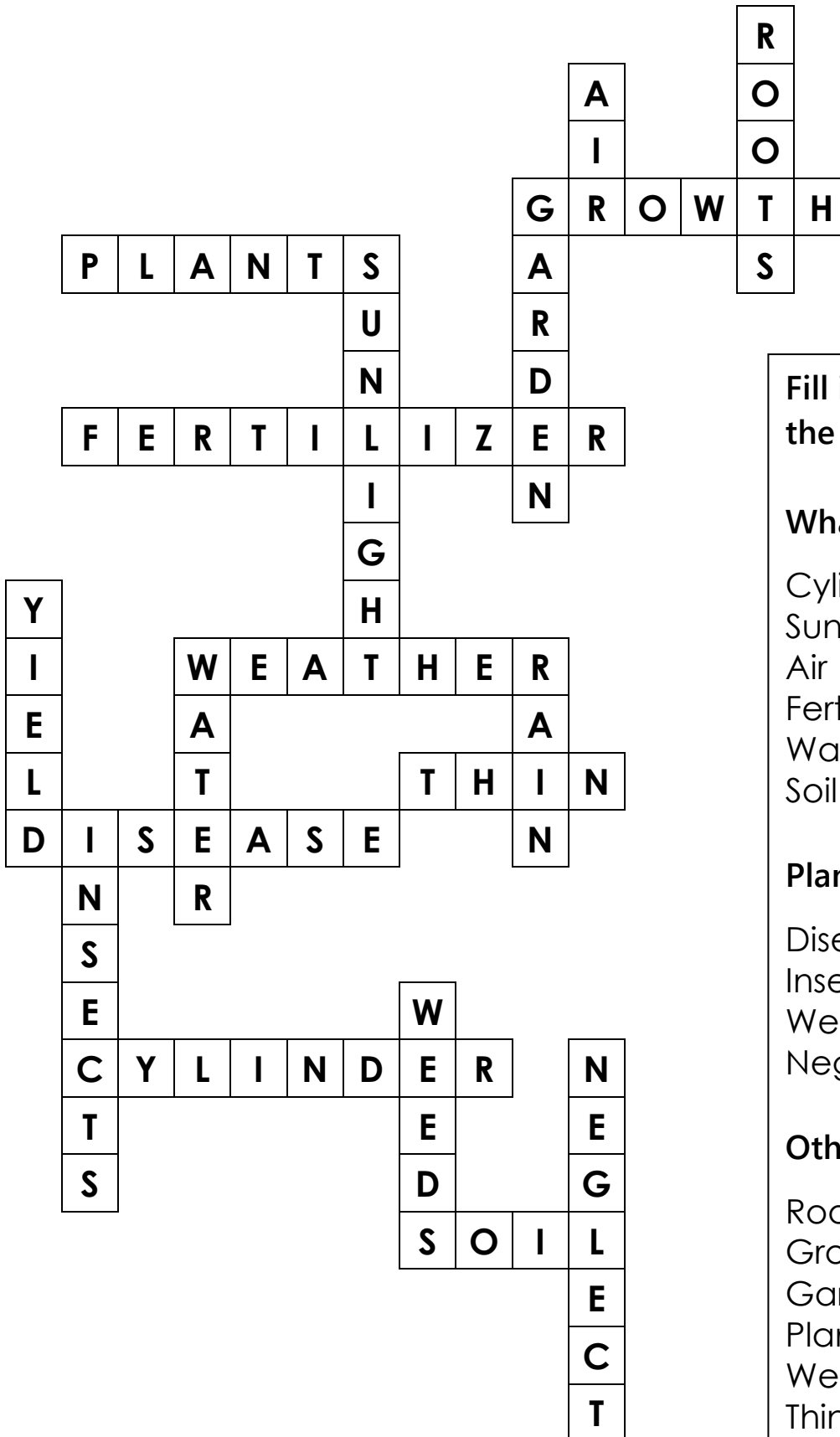
Plant Problems:

- Disease
- Insects
- Weeds
- Neglect

Other Garden Words:

- Roots
- Growth
- Garden
- Plants
- Weather
- Thin

Plant Word Puzzle - Key



Fill in the puzzle with the words listed below:

What Plants Need:

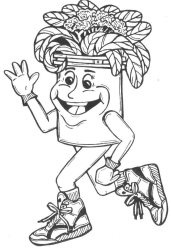
- Cylinder
- Sunlight
- Air
- Fertilizer
- Water/Rain
- Soil

Plant Problems:

- Disease
- Insects
- Weeds
- Neglect

Other Garden Words:

- Roots
- Growth
- Garden
- Plants
- Weather
- Thin



Keeping a Plant Journal

Record Keeping is an important part of any scientific study and can be a fun part of cylinder gardening.

WHAT TO WRITE ABOUT:

- How the seeds sprout and grow.
- When you water and fertilize.
- Number of leaves and flowers.
- Changes that occur.
- Plant height.
- Disease and insect problems.
- Taste.

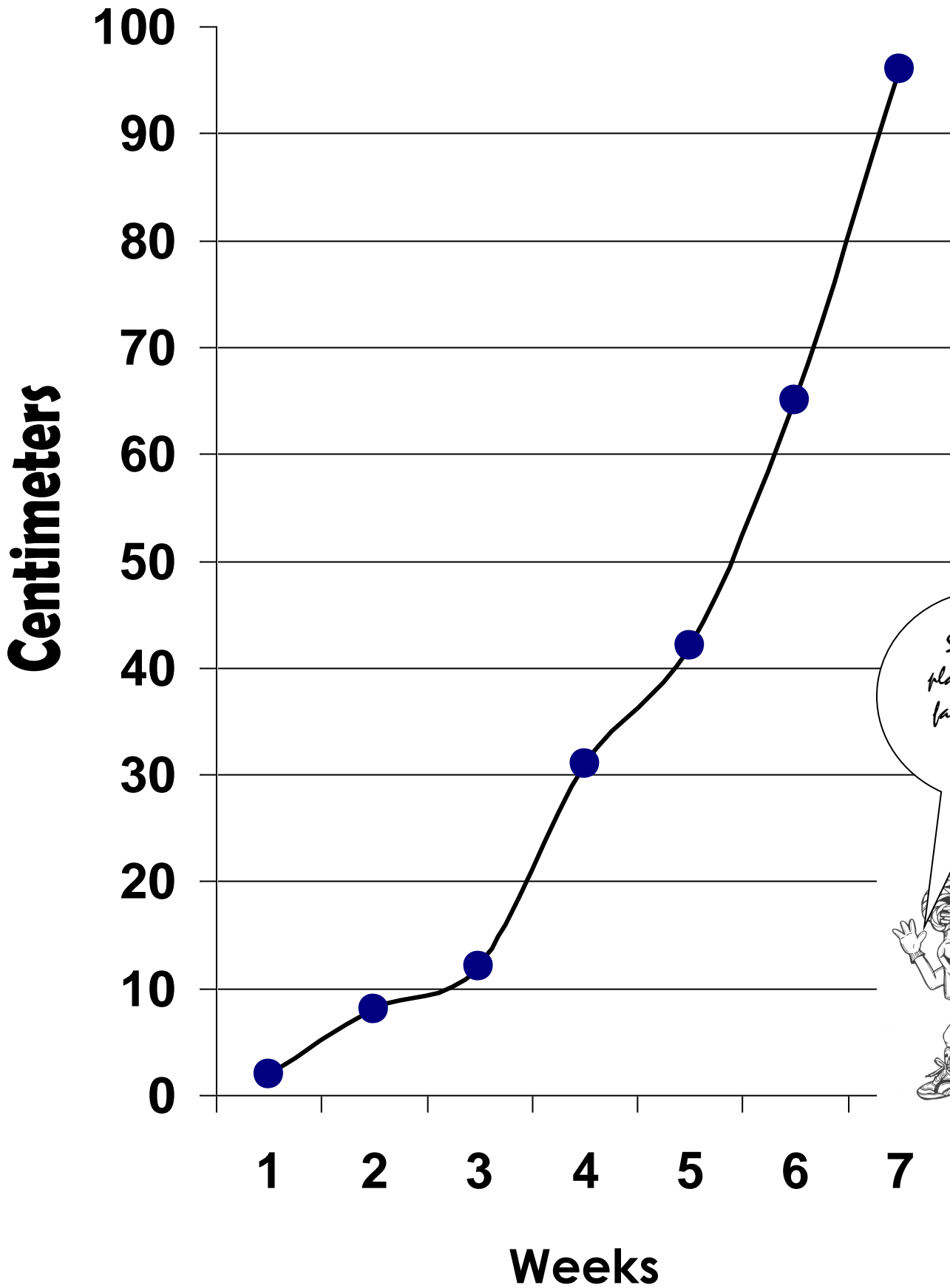
DATE & TIME	NOTES	SKETCHES
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DATE & TIME	NOTES	SKETCHES
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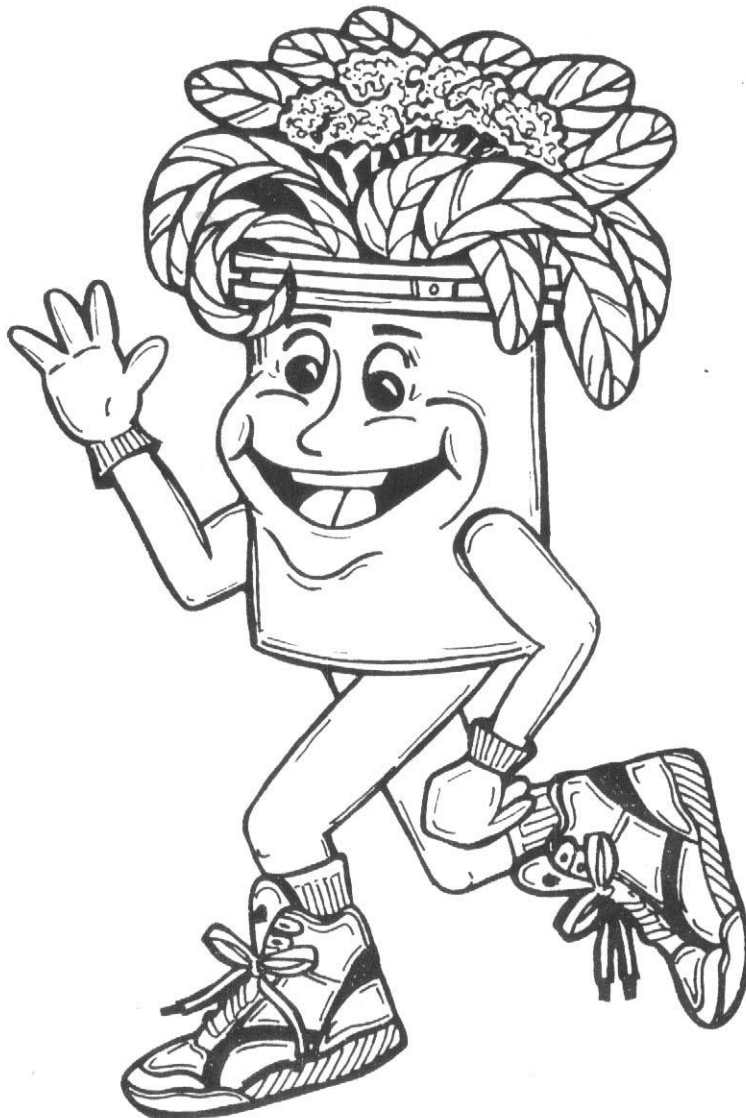
Plant Growth Chart



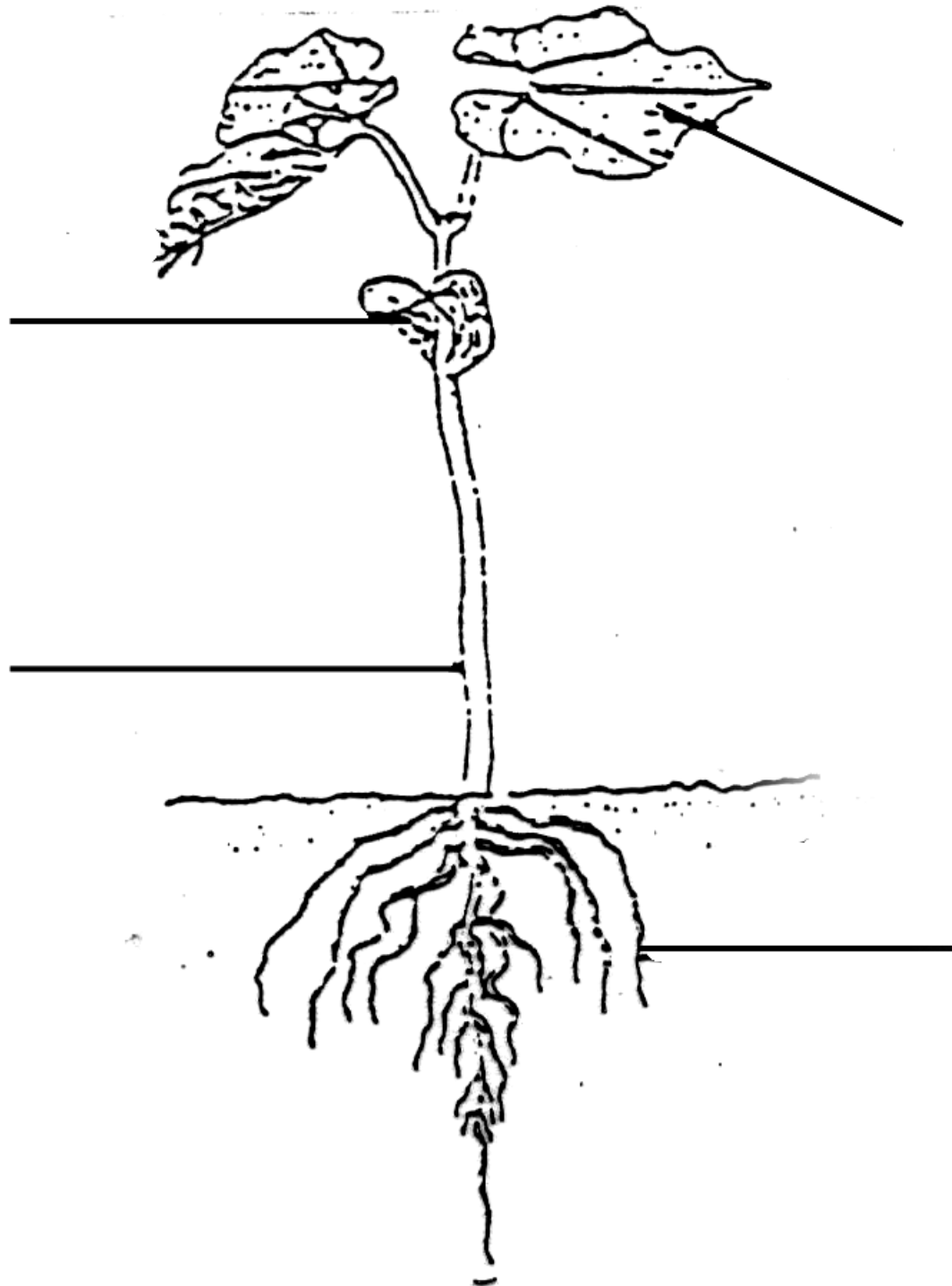
Cylinder Gardening

Lesson 3 How Plants Grow

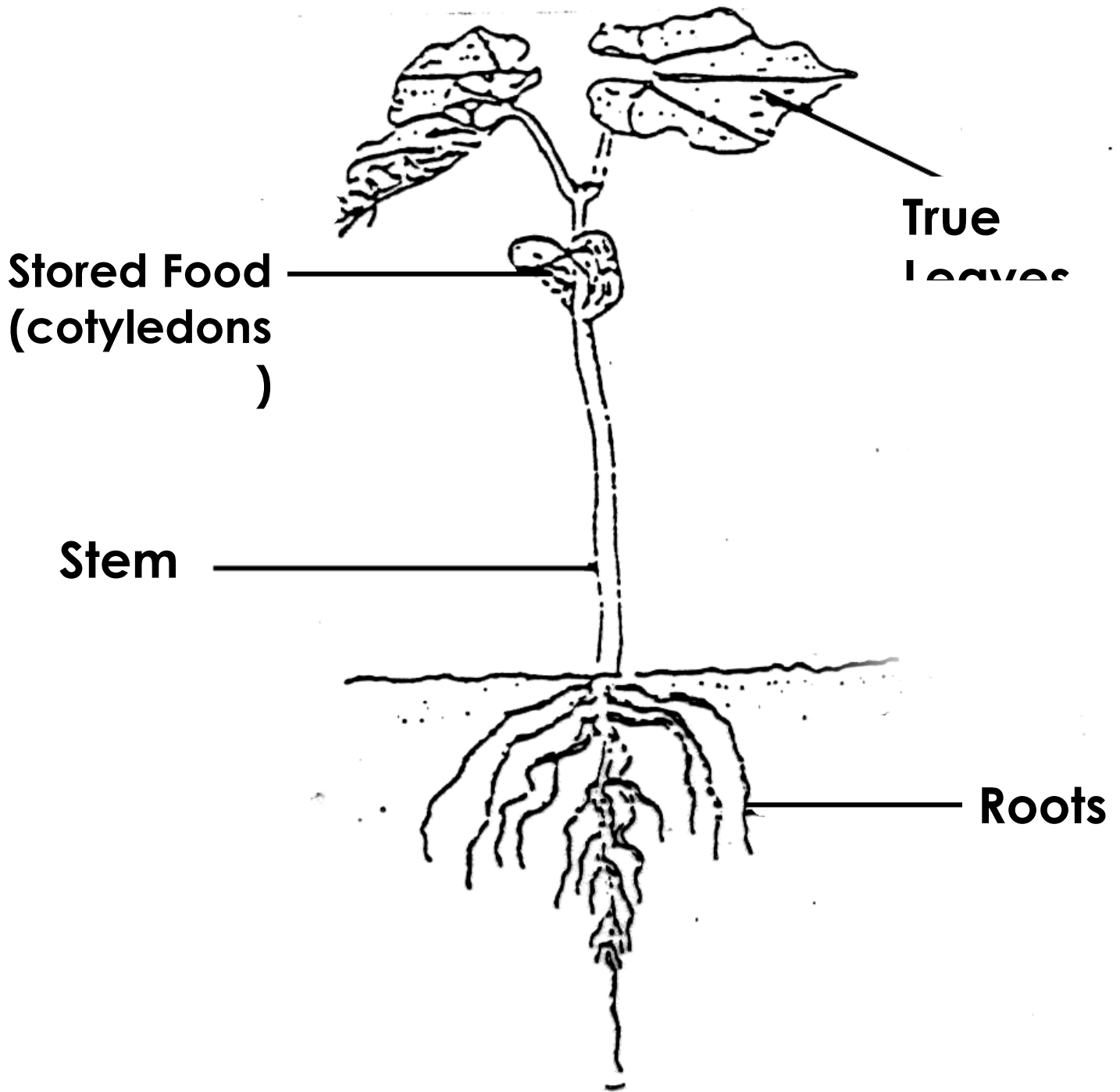
Worksheets & Optional Activities



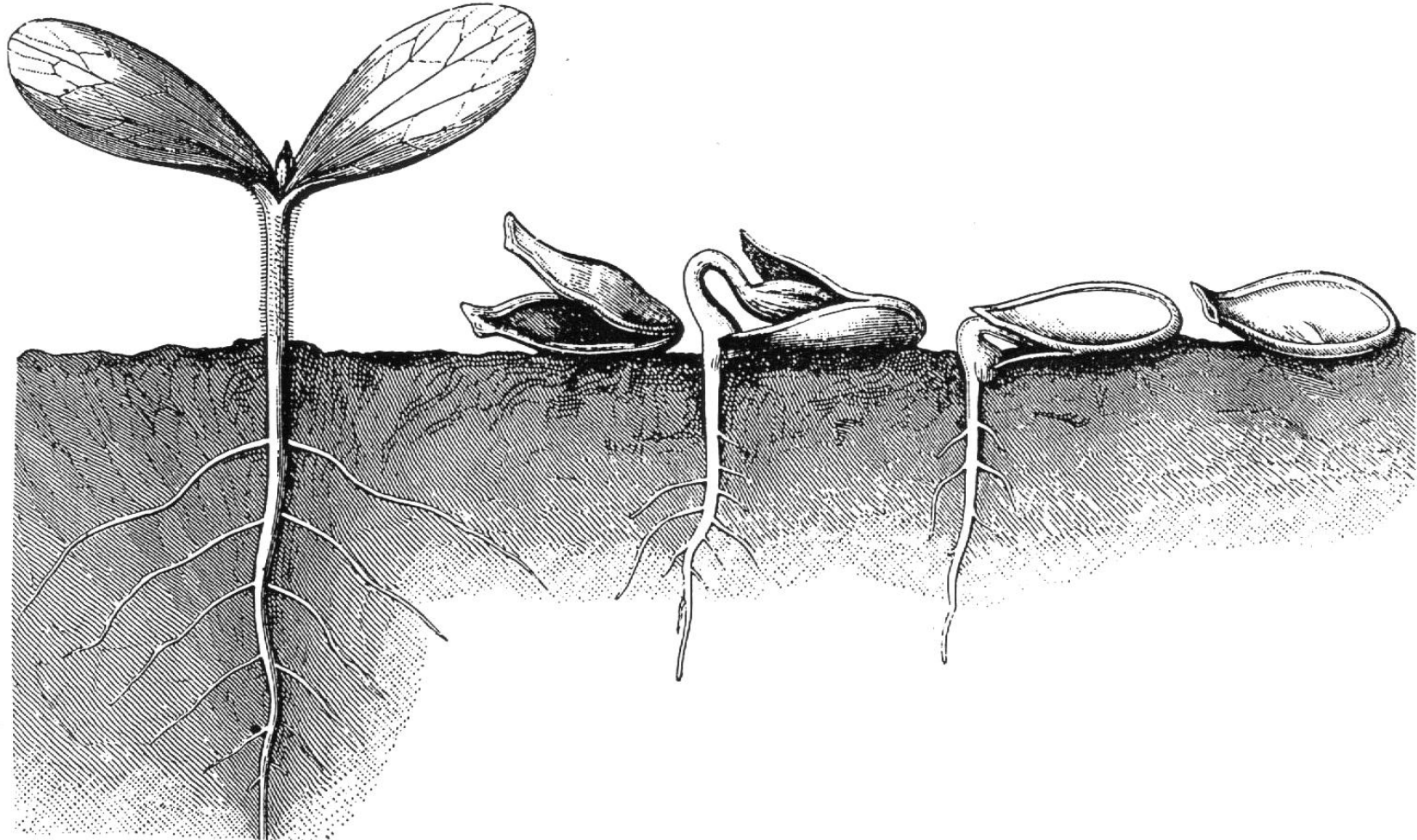
Parts of a Bean Plant



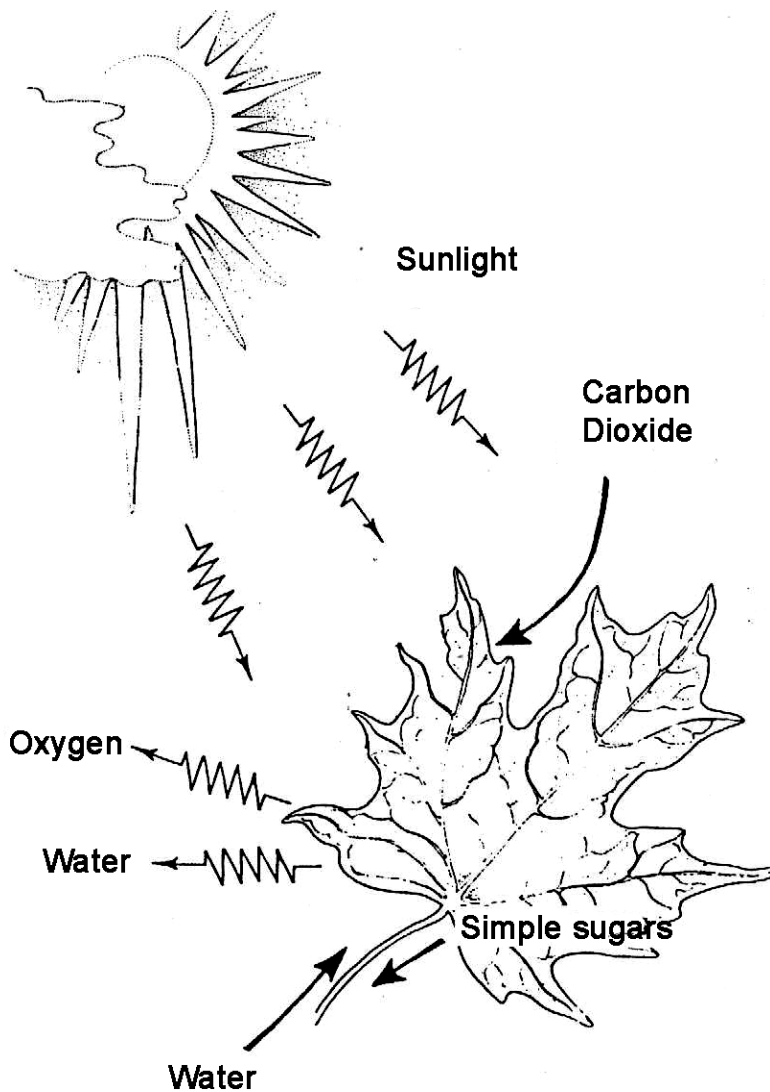
Parts of a Bean Plant - Key



GERMINATION OF A SEED



What is Photosynthesis

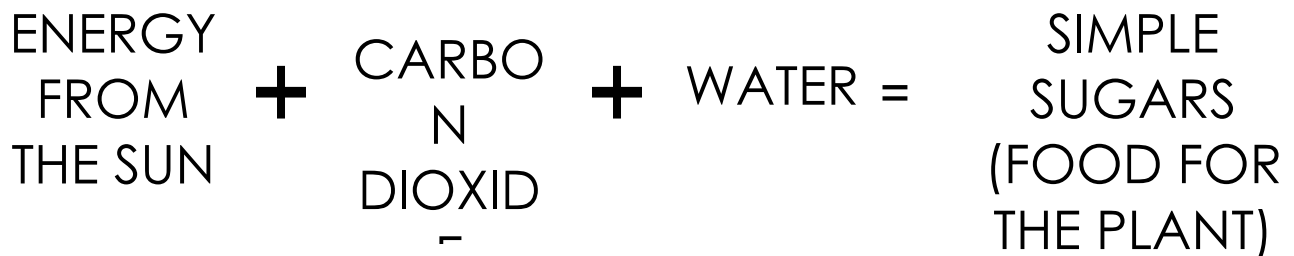


Photosynthesis is what happens when light hits the green parts of the plants.

Photosynthesis takes place in the chlorophyll. Chlorophyll is what makes plants green.

Photosynthesis uses energy from the sun to change water and carbon dioxide into sugars used by the plant to make

PHOTOSYNTHESIS

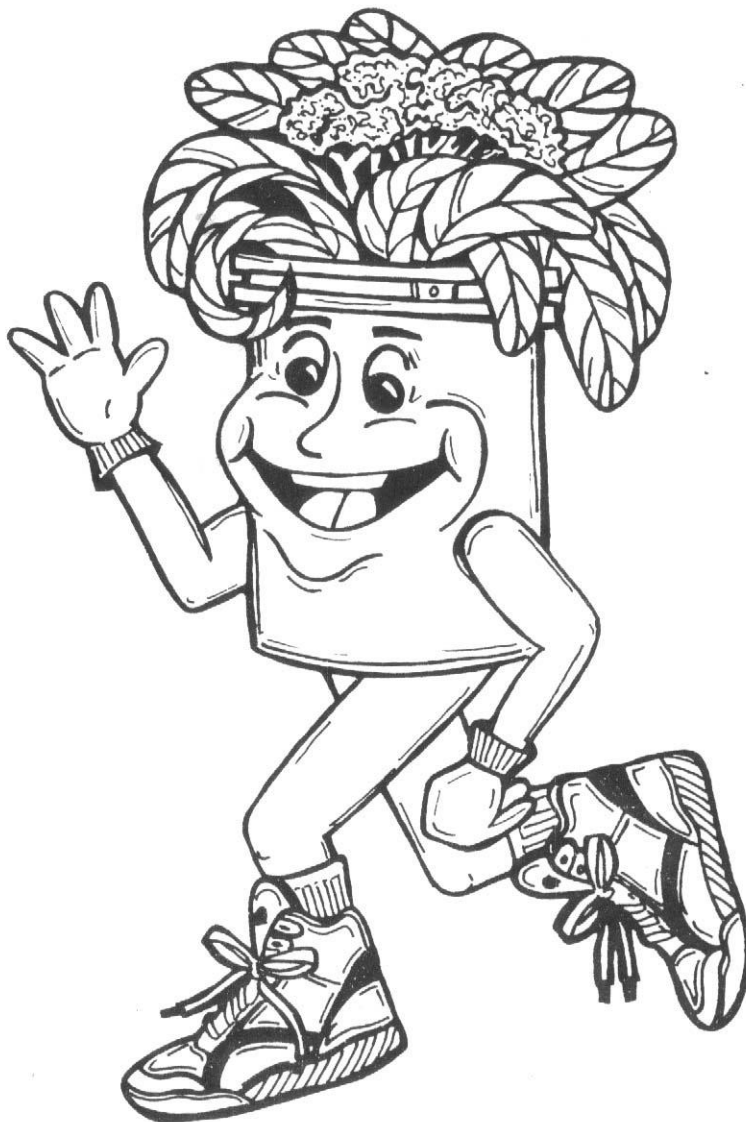


Cylinder Gardening

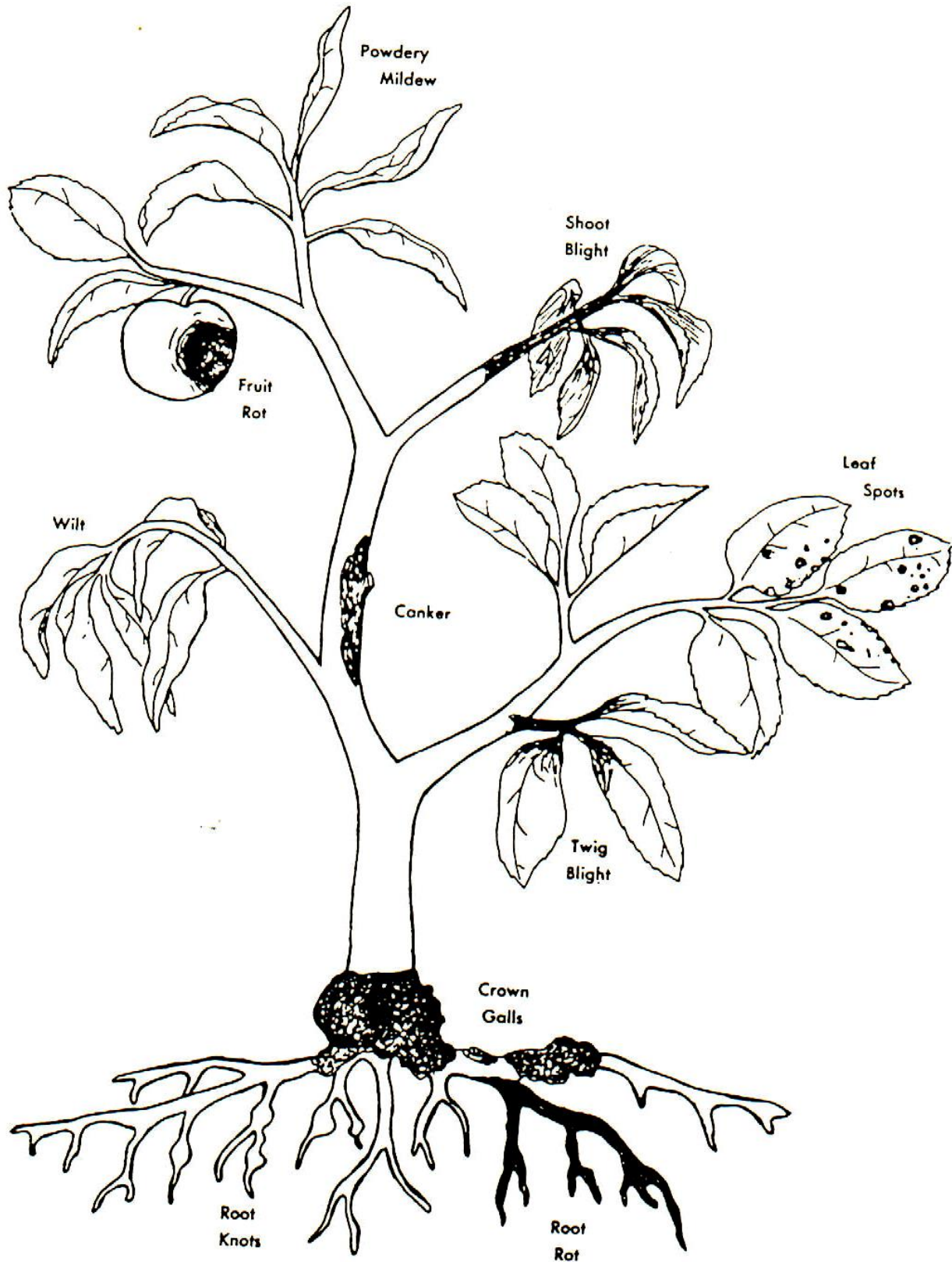
Lesson 4

Biological Control of Insects and Diseases

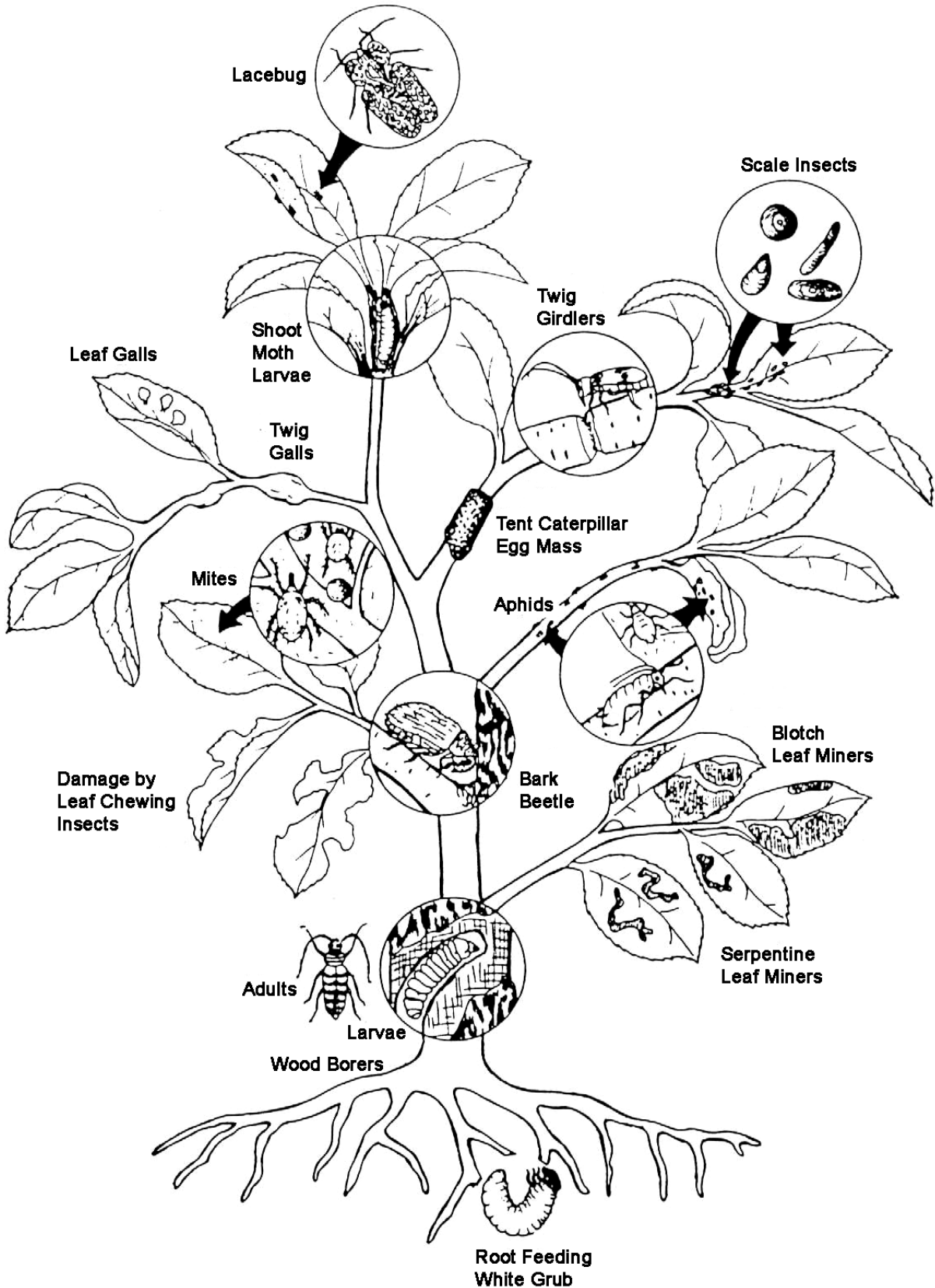
Worksheets & Optional Activities

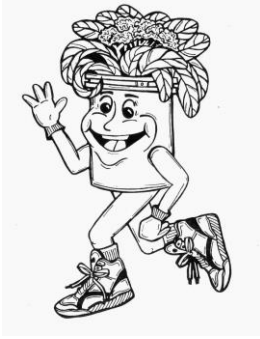


Disease Symptoms



Insect Damage





WHO AM I? (An Insect Identification Game)

Materials Needed:

- Activity Sheet: “Good Guys/Bad Guys – Who Am I?”
- Tape or Pins

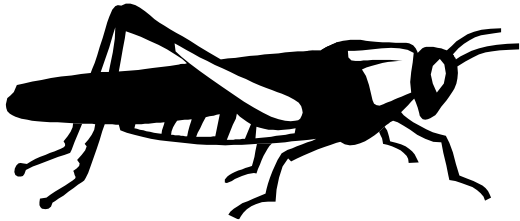
Instructions:

1. Cut out picture/information squares for each insect – one square per student. Have students line up and attach one square to each student’s back. Student should not know the identity of the insect on his/her back.
2. Students circulate around the room talking with other students trying to discover which insect is on his/her back. They may not ask the other students directly, but may ask questions such as “Am I a Good Guy or Bad Guy?” and “What kind of damage can I do?” Other students may give clues from the information on the picture square.
3. Game is over when everyone in the room has correctly guessed the name of the insect on his/her back.



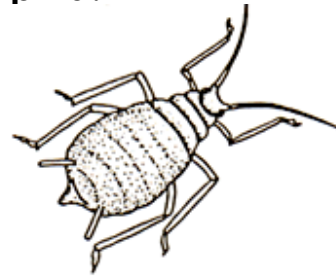
BAD GUYS – WHO AM I? GAME

- I feed on leaves.
- Watch out – I can spit a tobacco-like juice.
- I have large back legs to help me jump.
- I'm a grasshopper!



I'm a bad guy.

- I'm green or yellow or sometimes black.
- I'm small, like the size of a pin head.
- I suck the juices out of the plants.
- I'm an aphid.



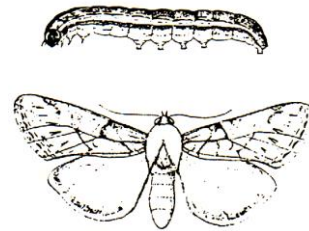
I'm a bad guy.

- My soft body is easy to smush.
- I leave a slimy trail wherever I go.
- I carry my home on my back.
- My home is called a shell.
- I am a snail!



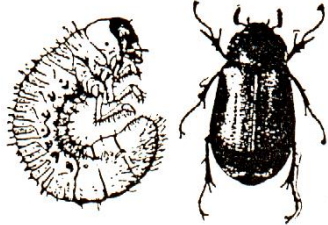
I'm a bad guy.

- Sometimes I'm fuzzy, sometimes I'm not.
- I eat plant's leaves.
- I change into a butterfly or moth when I grow up.
- I'm a caterpillar!



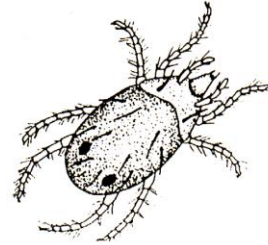
I'm a bad guy.

- I live in the soil.
- I feed on the roots of plants.
- I'm white with a rusty colored head.
- When I grow up I change into a beetle.
- I'm a grub worm!



I'm a bad guy.

- I'm very tiny; you need a microscope to see me.
- I have eight legs so I'm not an insect.
- I suck juices out of plants.
- I'm a spider mite!



I'm a bad guy.

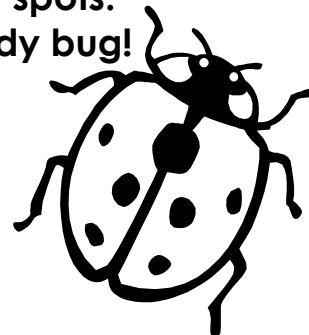
GOOD GUYS – WHO AM I? GAME

- I'm black or brown and hairy.
- I fly at night.
- I eat small insects.
- I'm a flying mammal.
- I hang upside down when I sleep.
- I'm a bat!



I'm a good guy.

- I have a hard shell to protect me.
- I feed on small insects.
- I'm red with black spots or black with red spots.
- I'm a lady bug!



I'm a good guy.

- I live in the soil.
- I eat compost and mulch.
- I help keep the soil loose and fluffy.
- I'm long and shiny like a snake.
- I'm an earthworm!



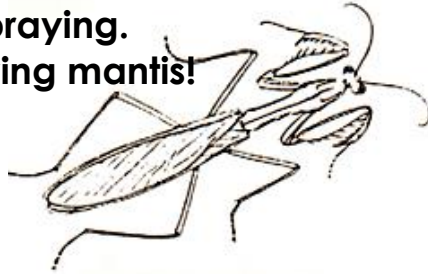
I'm a good guy.

- I have insects for breakfast, lunch and dinner.
- I build a trap to snare my prey.
- My trap is built out of silken threads.
- I have eight legs.
- I'm a spider!



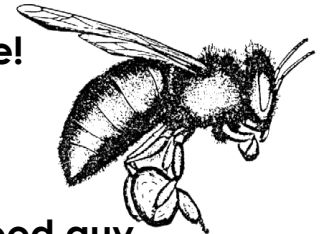
I'm a good guy.

- I'm shaped like a stick.
- I sit on a leaf and wait for other insects to come by.
- I catch them with large front legs.
- When I sit on a leaf some people think I'm praying.
- I'm a praying mantis!



I'm a good guy.

- I spend my day traveling from flower to flower.
- I feed on nectar and pollen.
- Watch out – I have a stinger to protect myself.
- I live with my friends in a home called a hive.
- I'm a honey bee!



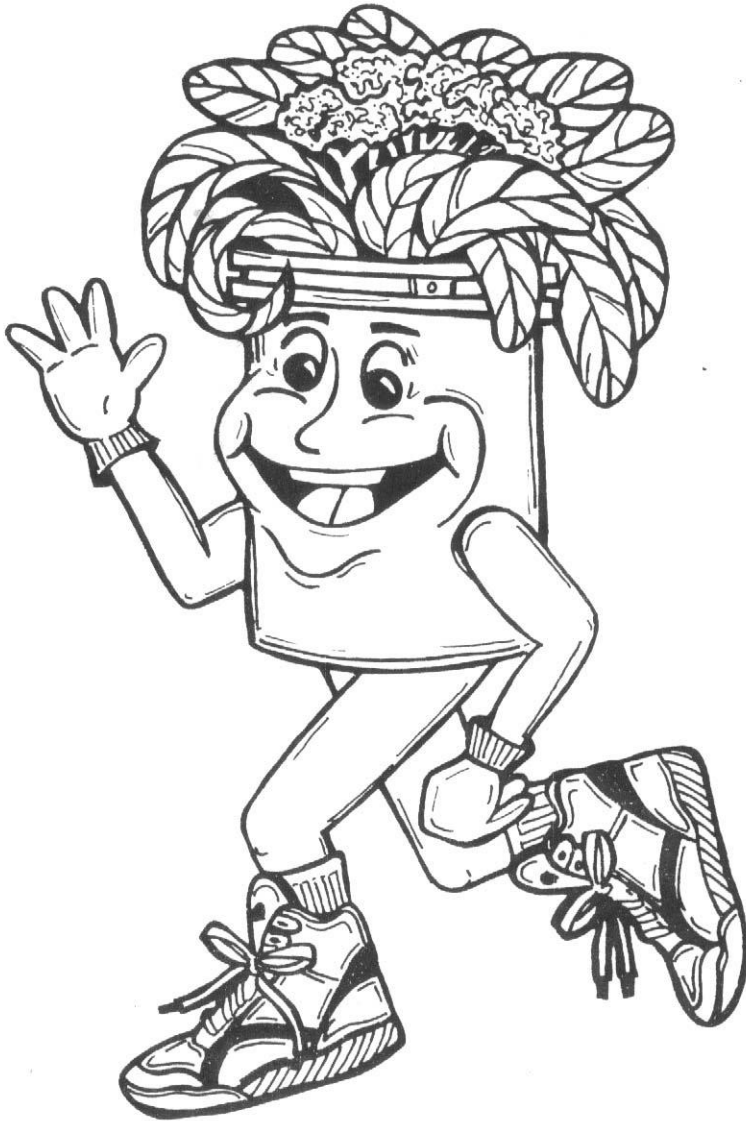
I'm a good guy.

Cylinder Gardening

Lesson 5

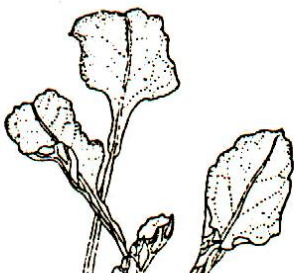
Parts of the Plant

Worksheets & Optional Activities

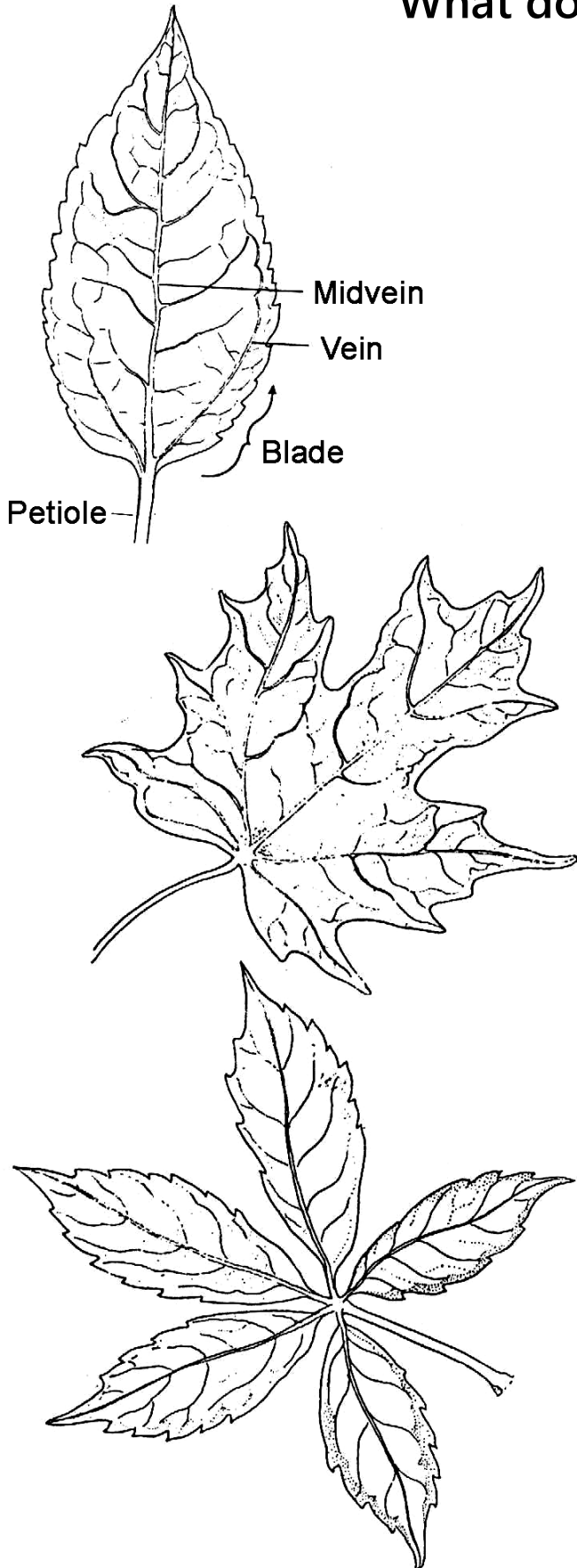


- Roots are the below ground portion of the plant that helps anchor the plant and keep it from falling over.
- Roots take in water and minerals.
- Some plants use the roots to store food like carrots and radishes.

What do Roots Do?

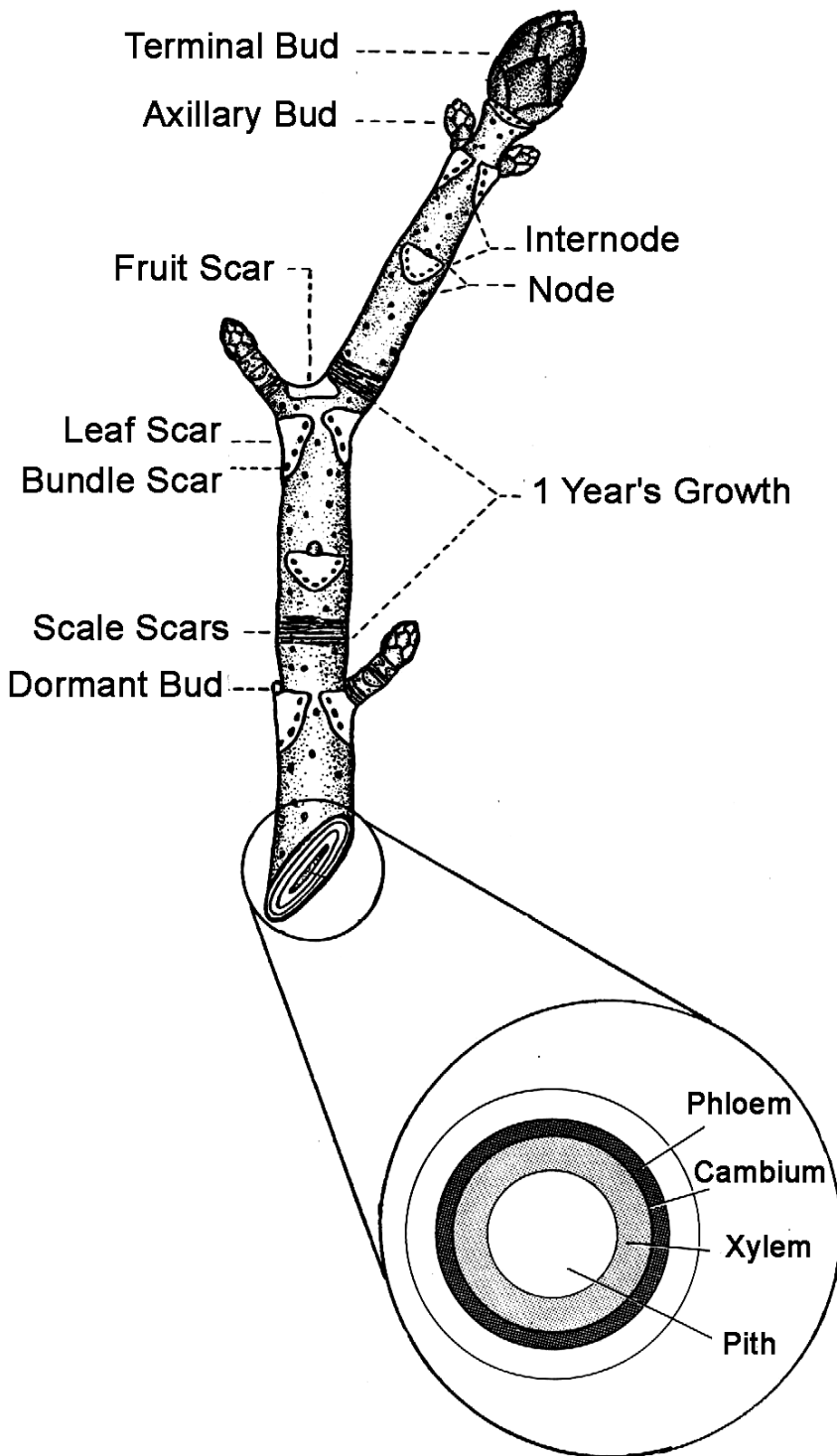


What do Leaves Do?



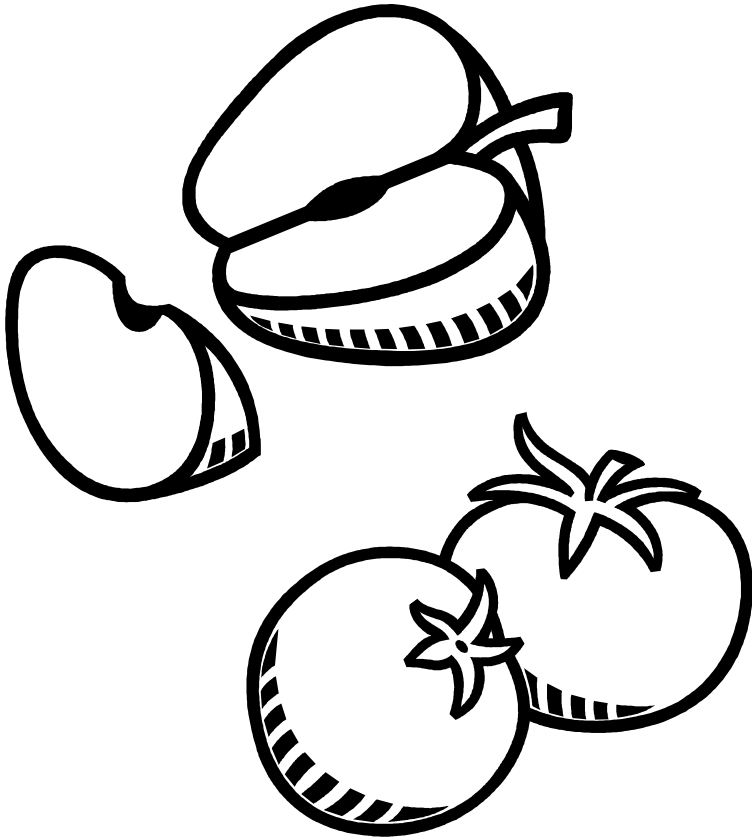
- Most of the food the plant needs is made in the leaves.
- Leaves are like factories changing energy from the sun plus water and carbon dioxide into sugars used by the plant to make proteins and carbohydrates needed for plant growth. This process is called photosynthesis.
- Leaves release

What do Stems Do?

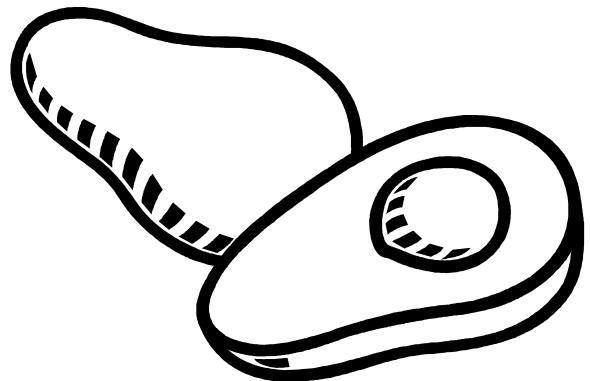
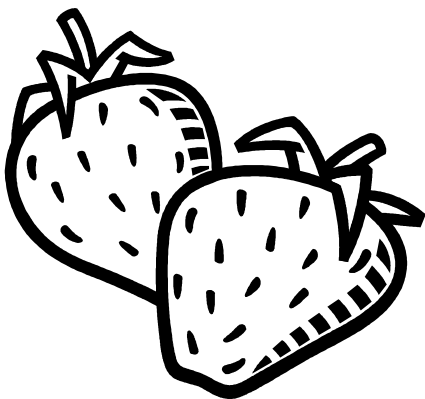
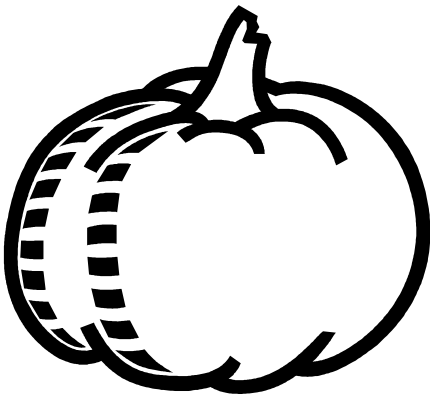


- Stems are the above ground portion of the plant that supports the leaves, buds and flowers.
- Stems have the xylem and phloem that carry the water, minerals and food from place to place. The xylem and phloem are like little straws or tubes that these materials flow through. Xylem carries the water and

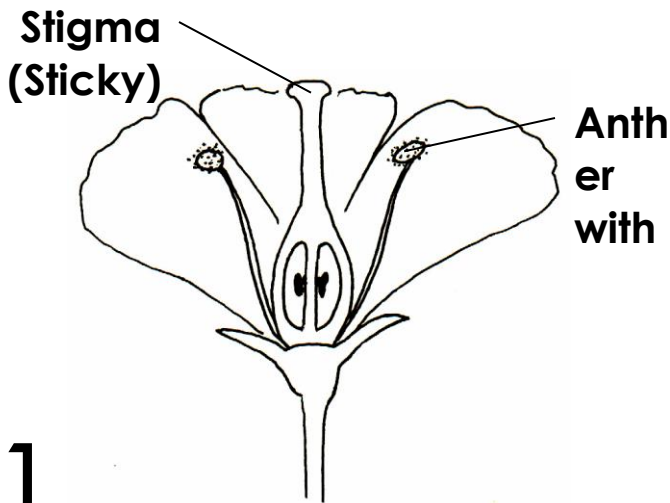
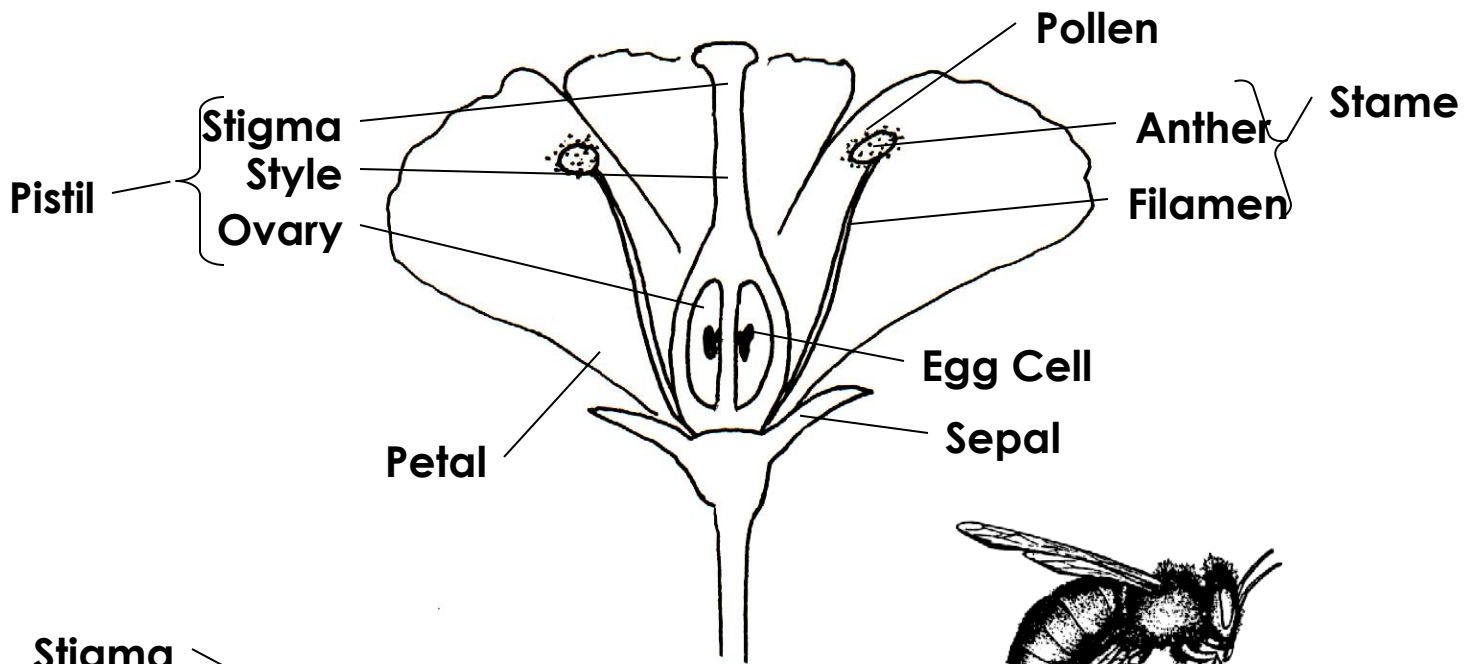
What do Fruit Do?



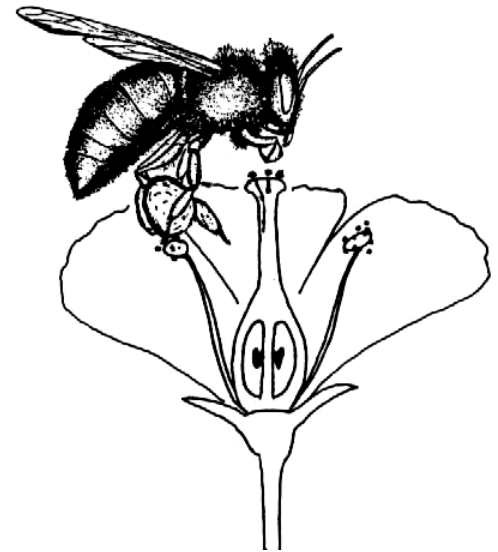
- The fruit is the reproductive part of the plant where seeds form.
- In some cases the fruit and seed are the same thing, like corn, wheat or pecans. The part of the plant we eat is often the fruit, like tomatoes, squash and peppers.



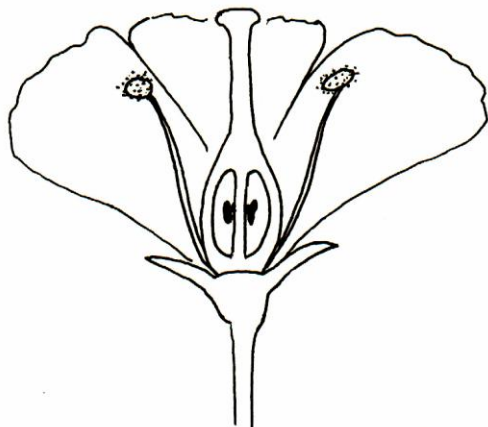
Flowering, Pollination and Fertilization



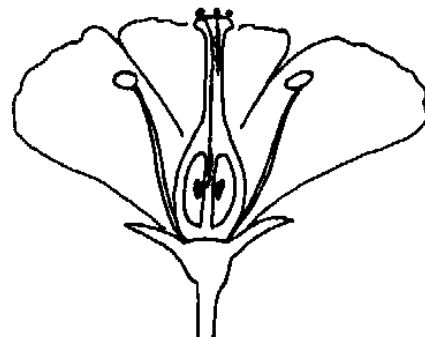
1. Bees feed on nectar and pollen



2. **Pollination** occurs when bees transfer pollen to



3. Pollen tube grows down to egg.



4. **Fertilization** occurs when egg and pollen cells unite. The ovary then enlarges and seeds form..

Dyed Celery

MATERIALS NEEDED:

- Large piece of celery with a few leaves attached.
 - Two glass beakers or jars
 - Food coloring -- two colors, preferably red and blue
 - Water
-

DIRECTIONS:

1. Take a large piece of celery and cut from the bottom up a few inches to make two legs. Put one leg in red-colored water and the other in blue or plain water. Observe the celery for the next week. This will show how a plant consumes water and distributes it throughout the rest of the plant.
2. Periodically, during the observation period, slice off the end of the celery so you can see that the "strings" in celery are actually conducting tissue.
3. Finish slicing the celery through lengthwise to make two pieces. Leave one piece in the water and take the other piece out of the water and allow it to dry out. This will demonstrate how much of a plant consists of water.

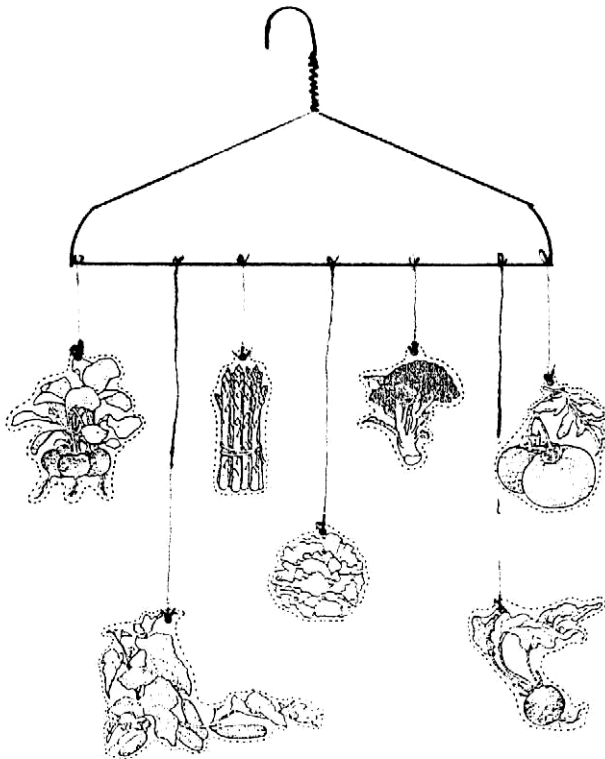
Vegetable Mobile

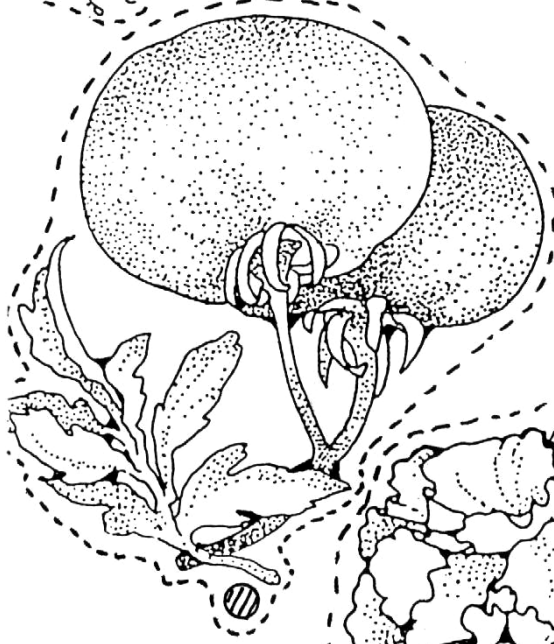
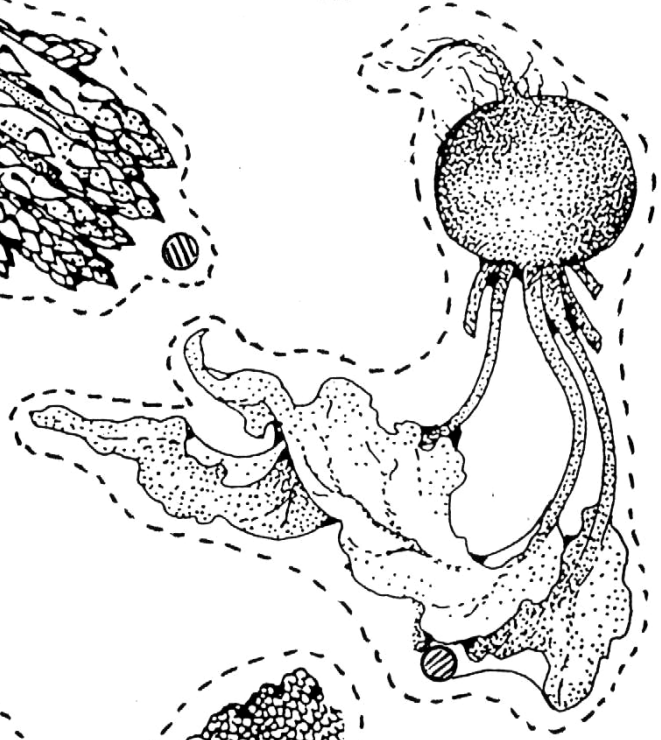
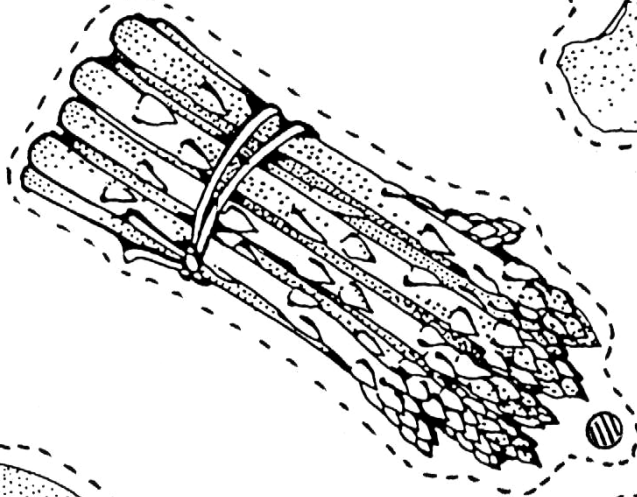
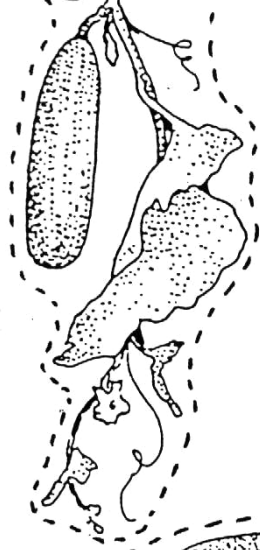
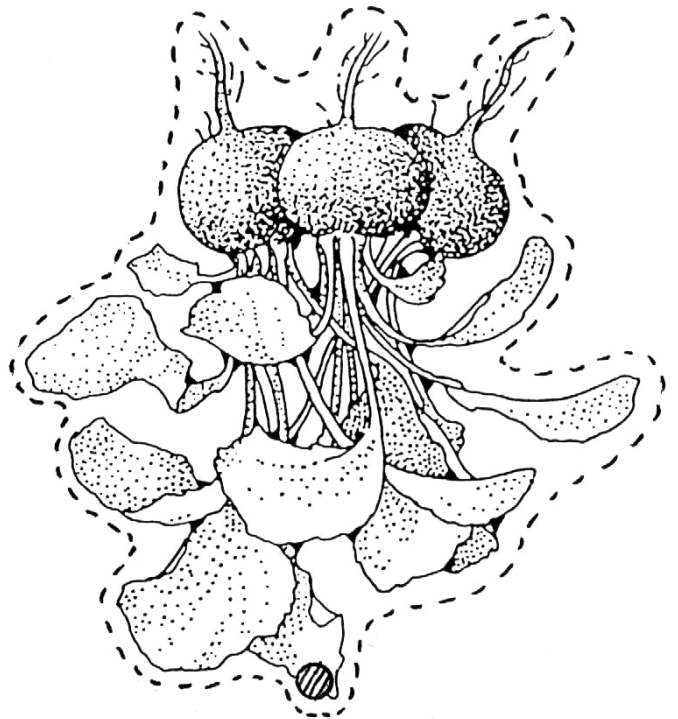
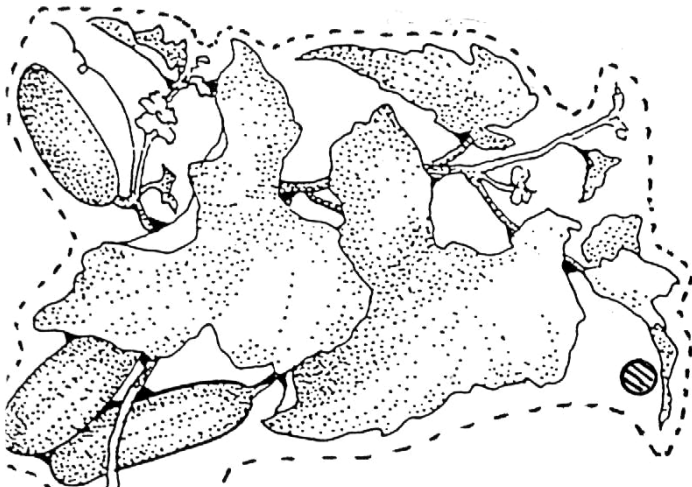
MATERIALS NEEDED:

- Cardstock
 - Scissors
 - Crayons, colored pencils, markers etc
 - Coat Hanger
 - String
 - Hole Punch
 - Vegetable Pictures (provided)
-

DIRECTIONS:

1. Copy vegetable pictures onto heavy cardstock paper.
2. Color the plant parts
3. Cut on the dotted lines.
4. Punch holes in and tie string to pictures.
5. Attach pictures to coat hanger.







Cylinder Gardening is a program of the Texas Cooperative Extension Service in Harris County. The program is made possible by through the volunteer assistance of Harris County Master Gardeners and funding is provided by the Harris County Master Gardener Association.

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