The ARNOLD ARBORETUM of HARVARD UNIVERSITY

Self-Guided Field Trip

Plant Parts | Grades 2 - 3

Learn about plant parts and their functions while investigating mature trees in the landscape. Students observe, measure and record discoveries about roots, trunks, leaves, flowers, fruits and seeds. They learn that plants use specialized parts to meet their needs for survival and reproduction, and many attract animals to aid in pollination.

Standards: 1-LS1-1, 2-LS2-3(MA); 3-LS1-1

What's Included

Self-guided field trip program overview including tips on how to navigate the arboretum, pre/post-visit activities, teacher background information and suggested resources for continued learning.

A **guiding map** with suggested locations, guiding questions and timing. Print one per chaperone or group. You are welcome to explore any part of the Arboretum.

A **Know Before You Go** sheet with Arboretum rules and detailed landscape map. Print one for all chaperones.

Plant Parts student recording sheet*. Print one per student to fill out when investigating each plant part. *Best printed on legal sized paper - 8.5" x 14" Print double-sided on the short edge to form into a booklet.

Navigating the Arboretum

Pathways – This visit can be done completely by staying on the main paved roads labeled Meadow Road and Bussey Hill Road on your map. There are mulch and gravel paths off this main road that you are welcome to use. Please note that the mulch and gravel are not accessible for wheelchair users and can be difficult for strollers. Plan your path accordingly.

Timing – The Arboretum is a big place, it takes time to walk from spot to spot. Each stop on the guiding map includes suggested time frames for investigation.

Bathrooms & Water Fountains – There are bathrooms inside the Visitor Center in the Hunnewell Building. There are portable restrooms in a few places throughout the landscape, they are labeled on your map. Water fountains are placed in various locations, though they are shut down by the city mid-October through mid-April.

The ARNOLD ARBORETUM of HARVARD UNIVERSITY

Self-Guided Field Trip

Plant Parts
Gr 2 - 3

Pre-Visit

Guiding Questions:

- What is a seed and how does it grow?
- What is the job of each plant part?

Activity:
Germinate pea or bean seeds in moist paper towels to observe what comes out of a seed, then transplant the seedlings into cups of soil to further observe growth. Wisconsin Fast Plants® are ideal for observing the full 35–40-day life cycle as they flower in just 14 days and students can easily hand pollinate them to observe fruit growth and eventually harvest new seeds. Students can make daily observations, measure growth with rulers, count and record individual plant parts and use hand lenses to create detailed labeled observational drawings.

Post-Visit

Wrap Up Question:

- How many plant parts did you eat yesterday?
- How much of your diet comes from plants?

Activity:
Children draw the foods they ate for breakfast, lunch and dinner the day before on paper plates. Then they identify how much of their food came from plants, and specifically what plant part. For example: apple is a fruit; lettuce is a leaf; carrots are roots; pasta came from seeds of wheat; juice came from a fruit; nuts are seeds; etc.

Help children put together a Plant Part Salad to share as a snack in the classroom.

The ARNOLD ARBORETUM of HARVARD UNIVERSITY

Self-Guided Field Trip

Plant Parts
Gr 2 - 3

Teacher Background Information

Content

Every part of a plant has a special job or function that helps the plant stay alive, grow, and reproduce.

1. **Roots: Anchors and Straws**
   - **Job**: They hold the plant firmly in place.
   - **Function**: They absorb water and nutrients from the soil and send them up to the rest of the plant.

2. **Stem/Trunk: Elevator**
   - **Job**: It holds the plant up tall so the leaves can reach the sunlight.
   - **Function**: It carries water from the roots up to the leaves and carries food from the leaves down to the roots.

3. **Leaves: Kitchen**
   - **Job**: Leaves act like solar panels to catch sunlight
   - **Function**: They use sunlight's energy to transform air (carbon dioxide) and water into sugars (carbohydrates) that the plant uses to grow new plant parts. This is called photosynthesis.

4. **Flowers: Seed Makers**
   - **Job**: They attract pollinators like bees, butterflies, and birds.
   - **Function**: They make seeds and fruit so that new plants can grow in the future. Pollinators move pollen from male parts (stamen) to female parts (pistil) so seeds can be made.

5. **Seeds and Fruit: Protectors of the Future**
   - **Job**: Seeds contain everything needed to start a new life. Fruits protect the seeds inside.
   - **Function**: Fruits help seeds travel in different ways so seeds can find a suitable place to germinate and grow the next generation of plants.

Key Vocabulary

Absorb: to take in.

Germinate: to begin to grow, to sprout.

Photosynthesis: the process in which green plants use sunlight to make their own food.

Pistil: the female part of a flower, found in the center; made up of stigma, style and ovary.

Pollination: the transfer of pollen from the stamen to the pistil, usually done by a pollinator, which creates the seeds that contain genetic information to produce a new plant.

Stamen: the male part of a flower that makes and contains the pollen; made up of anther and filament and found surrounding the stigma

.

The ARNOLD ARBORETUM of HARVARD UNIVERSITY

Self-Guided Field Trip

Plant Parts
Gr 2 - 3

Suggested Location 1 - 15 min
EVERYWHERE

Before venturing into the landscape, review the needs of plants and ask how plants meet their needs. Establish basic plant parts: roots, stem/trunk, leaves, flowers, fruit and seeds. Get close to a tree and see how many parts they can identify.

Suggested Location 2 - 25 min
LINDENS/CORK TREES

Find a mature tree that has roots above ground - follow them outwards. Walk until the edge of the tree canopy - take 3 giant steps away from the tree. Count toe-heel steps back to the trunk and record. Look for a cut branch or downed log to examine tree rings. What do you notice? Compare newly planted saplings to mature trees: how do trees grow?

Suggested Location 3 - 20 min
MAPLES

Examine all the variations of maple leaves in this collection. Notice the veins and count the tips. Find other shaped leaves in the trees surrounding the maple collection. Notice the variation of greens in different leaves. Use your bodies to act out photosynthesis in a sunny location. How many "kitchens" do you estimate a tree has? Why so many?

Suggested Location 4 - 20 min
AZALEA BORDER

Observe the azalea flowers carefully. Can you see the petals, stamen and pistils? Can you transfer some pollen to your finger or t-shirt sleeve? Carefully observe pollinators in action – be still and quiet to not disturb their work! What color pollen do you see on the pollen baskets?

Suggested Location 5 - 30 min
BRADLEY ROSACEOUS COLLECTION

Search the plants in this collection for fruits that are forming. Maybe you'll find cherries and crabapples just beginning to grow or some seedpods from last year still on the plants. Cut open some fruits. What's inside? How do you think this fruit travels?

Remember! Be respectful of other groups and visitors enjoying the Arboretum. Please help us take care of our plants by not stepping in plant beds, pulling leaves or flowers off of plants, and not climbing trees.

FRUITS and SEEDS:

Draw 2 different fruits and show the seeds inside.

1.

2.

Draw what happens to a seed when planted.

Fruits hold and protect the seeds inside.
Seeds make a new plant.

(Fold)

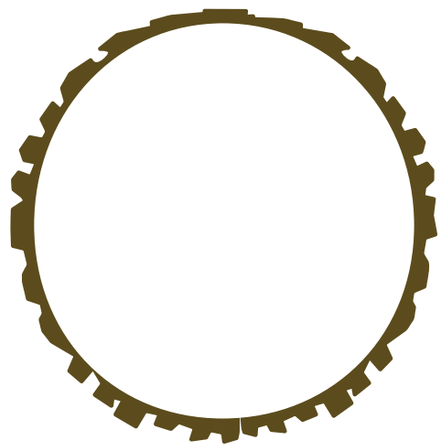
The ARNOLD ARBORETUM of HARVARD UNIVERSITY

PLANT PARTS AND WHAT THEY DO

By: _____

ROOTS and STEMS: Observe, measure, and record.

Draw tree rings to show a tree that is as old as you are.



ROOTS Distance from trunk: _____ steps

STEMS/TRUNK Circumference: _____ inches

Roots hold the plant in place and bring it water.
Stems or Trunks move water up the plant and hold leaves up to the light.

LEAVES:

Draw 4 different leaf shapes.

1.

2.

3.

4.

Leaves make sugar for the plant.

FLOWERS and POLLINATION

Draw and label the flower parts you see.
Draw a bee to show how pollination happens.

Label: Petals, Stamen, Pollen, and Pistil

Flowers make seeds when they get pollinated.