

Plant Investigations: Leaf Structures (5E lesson format)

Objectives:

Students will

- Describe the attributes of a leaf by identifying patterns in veins and leaf margins
- Compare leaves to identify the parts of a leaf that are present in all leaves
- Identify questions that will lead to additional investigations of leaf properties

ENGAGE: (students complete this activity of the lesson individually at their table)

1. LEAVES

What do you know about a leaf? Explain what you know about leaves using pictures and words on the cover of your Leaf journal.

2. Gather students into a circle on the rug with their journals. Ask students to:

Share one item from your cover page with the group. Round Robin, everyone has a turn.
Try not to repeat what someone already shared.

EXPLORE: (students complete this activity in small groups at tables)

Distribute small bags with leaf samples. Ask students to suggest the tools they may need for exploring the leaves.

1. Leaf or not a leaf?

Sort the items in the bag into 2 groups – Think about what you know to determine which group your item belongs. (all leaves, but include samples of different types such as needle type leaves, small flat leaves, broad flat leaves, waxy leaves, etc.)

2. Encourage students during the exploration and sorting stage by asking:

How do you know something is a leaf?

What makes a leaf?

How many different ways can you measure a leaf? Measure and record.

3. After sorting ask students to share how they defined their groups and share examples with the large group.

4. Students end the lesson by adding something new or making a modification to something they recorded on the cover of their leaf journal at the beginning of the lesson.

EXPLAIN: (students in circle on the rug)

1. Begin by reading any one of the following science tradebooks:

Eyewitness Books TREE (ISBN: 0-394-89617-3)

Vegetables We Eat (ISBN: 978-0-8234-2153-4)

Trees, Leaves, and Bark (ISBN: 1-55971-628-2)

Leaves and Trees (ISBN: 1-56711-474-1)

Ask students to share a new learning or idea and a connection to something they included already in their journal.

2. Students are asked to sort again using a new attribute. How are the leaves similar and different? Decide how you will sort your leaf samples and sort them into 2 groups.
3. Students record the sort in the science journal.
4. Ask students to share sorting attributes or ask students to walk around and notice how students sorted the leaves. Ask questions and encourage students to ask questions of each other to begin to identify future questions for investigation.

What did you notice about the leaves when you were sorting them?

What is the purpose of a leaf?

Does the size or shape of a leaf to the plant or tree?

ELABORATE: (small group or science center focus)

1. Investigate questions students generated during their explorations of different leaves. Provide materials for students to use to conduct their investigations.

Are all leaves on a plant, bush, tree the same size?

Do plants with big leaves grow faster or slower than plants with smaller leaves?

Where do new leaves on a plant grow?

Do all leaves grow at the same rate?

EVALUATE: (choose 1-2 of the following)

1. Use the rubric sample or identify the concept or skill you would like to measure such as
 - a. Observation skills
 - b. Measuring skills
 - c. Collaborative skills
 - d. Written communication
 - e. Questioning
 - f. Communicates how leaves are similar and different and explains why
 - g. Describes the structures of a leaf; stem, margins, veins

Sample

NOT YET	EMERGING	MASTERED
Student not participating in observing samples , measuring, or recording data	Student starts to observe samples , measure or record data (may include parts of each stage)	Student engaged in observing all samples , measuring in multiple ways, and recording data

Materials:

Small bags containing leaf samples (1 bag per student pair)

Rulers, measuring tape, balances, non-standard measures

Science trade books to enhance learning before, during, after lesson

Sample journal pages or other science notebook for student use during science investigations

Pencils, markers, colored pencils