LESSON 3
LEVERAGING LEAVES FOR LEARNING

"Nature will bear the closest inspection. She invites us to lay our eye level with her smallest leaf, and take an insect view of its plain."

- Henry David Thoreau

California Science Standard 2nd Grade – Investigation and Experimentation
4.c. Compare and sort common objects according to two or more physical attributes (e.g. color, shape, texture, size, weight).

California Science Standard 3rd Grade—Life Sciences
3.a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

California Science Standard 4th Grade – Investigation and Experimentation
6.b. Measure and estimate the weight, length, or volume of objects.

California Science Standard 5th Grade – Investigation and Experimentation
6.a. Classify objects (e.g. rocks, plants, leaves) in accordance with appropriate criteria.

6.f. Select appropriate tools and make quantitative observations.

National Science Standards Life Science Content Standard C K-4
Each plant or animal has different structures that serve different functions in growth survival, and reproduction.

Lesson Plan: Categorizing Plants

Objective
This lesson teaches students the characteristics botanists use to categorize leaves. Another important objective of the lesson is to show students that having a common language and criteria list makes it easier to share detailed information.

Key Vocabulary: leaf, venation, margin, shape, characteristics, observe, coloration, palmate, pinnate, alternate, opposite, lanceolate

Materials: Leaves, magnifying glasses, Leaf Characteristics Chart, My Leaf Worksheet

Anticipatory Set
Have children bring leaves from home, or gather them from around the school. The more diverse a sampling, the better. The following activity can be done in partners or groups of three or four. Each group should have several leaves to examine.
Tell students they are to examine the leaves very closely using magnifying glasses. They will be sharing their discoveries with the whole class. Tell them to note colors, patterns, size, texture, unique features or common characteristics in their leaves.

Distribute magnifying glasses to pairs or small groups of students. Have them closely examine their leaves for a few minutes. If the students need more guidance, ask them to find a characteristic that all the leaves have or something that makes each leaf distinct. After a few minutes have students share their findings. As students describe their leaves, take a mental note of the words they use to describe shape, venation or margins. Part of this lesson is teaching students that scientists must share a common language and criteria for describing things in order to clearly communicate information.

Lesson

Tell the students that botanists must be able to identify all sorts of plants and occasionally classify new species they discover. One important means of distinguishing plant species is by examining their leaves. Today the students will get a handy reference sheet to help them describe and organize their leaf collection, based on three important criteria; shape, margin and venation. By using the same reference sheet, students (and scientists) are better able to share discoveries and describe distinctions.

Teacher Tip: Placing the reference sheet on an overhead projector might help students understand the sheet while the teacher is describing it.

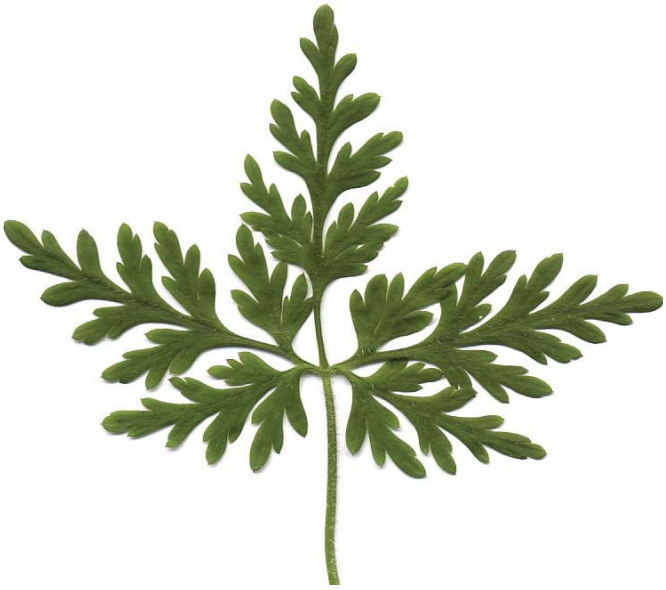
Define each characteristic for the students:
Shape - describes the general shape of the leaf
Margin - describes the edges of the leaf
Veins - describe the network of vascular bundles of xylem and phloem tissue in the leaf through which nutrients and water are transported.
Venation - describes the pattern created by the veins of the leaf.

- **Distribute a copy of the Leaf Characteristics sheet to each student.**
- **Pick a leaf from the class's collection and walk through the process of categorizing the leaf with them.**
- **Students are to pick two leaves and describe them in detail on a piece of paper they label "My Leaf ". This will include measuring length and width in centimeters, describing coloration and distinguishing characteristics, and of course their shape, venation and margin type. The students will also sketch and color their leaves, or alternatively, they could do leaf rubbings. Tell students that another reason they need to be very detailed is because the class will play a game later in which they try to identify a leaf based solely on its written description. Give students time to measure, draw, color and describe the leaves they chose.**

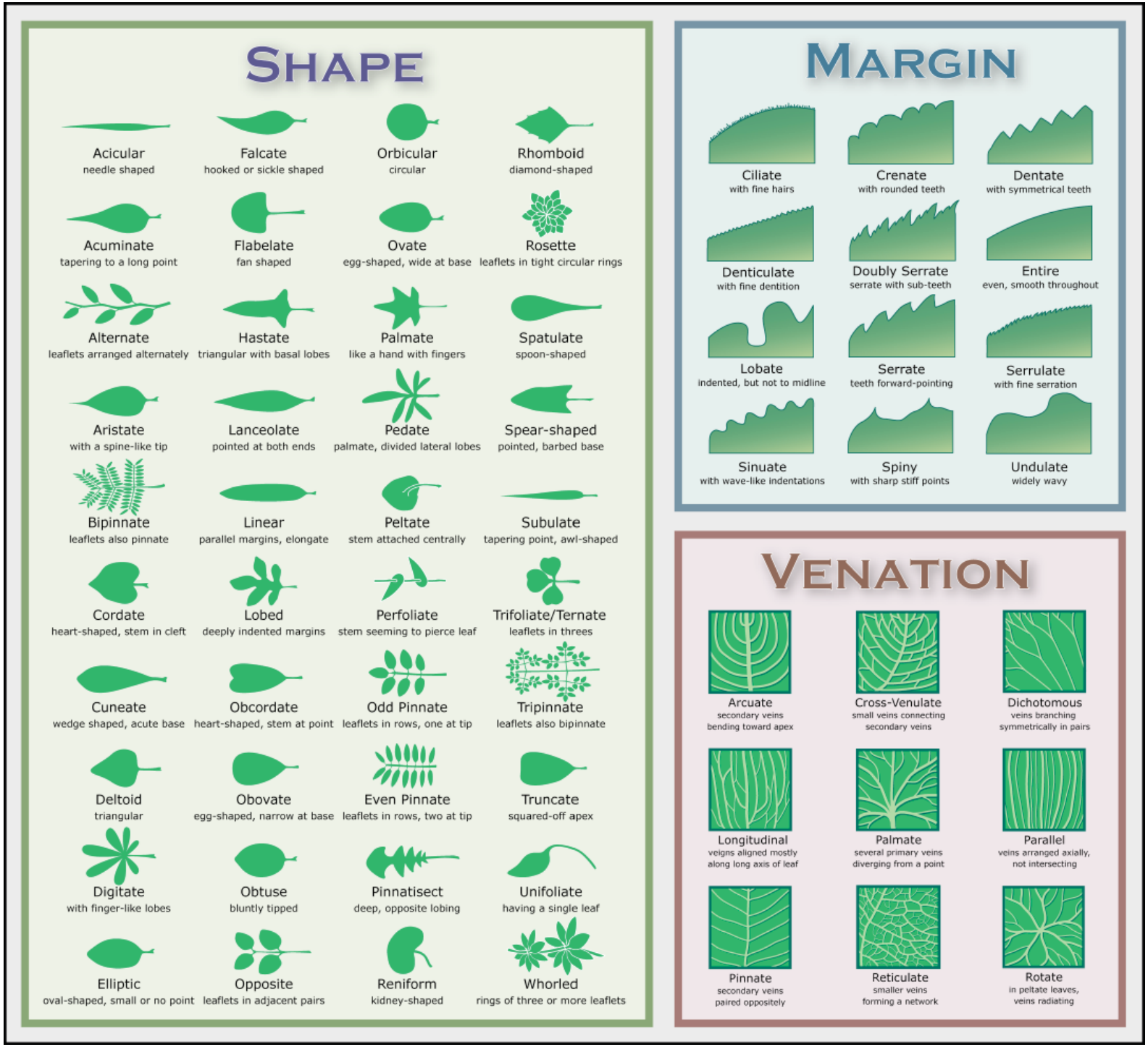
Assessment

Either during this session or in a following lesson, pick ten or so leaves and at least five matching descriptions. Display the ten leaves and tell the class they are to try and determine which leaf matches the description you choose to read. Of course you could simply pick five leaves and five matching descriptions but it would be a bit more challenging to have a few "decoys" on display.

Teacher Tip: The My Leaf worksheets and dried leaves make for a nice display. The leaves should be dried flat in a book to prevent curling and discoloration.



Leaf Characteristics Chart



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