

**KNME K-5 LESSON PLAN**  
**APS @Home**  
**APS Curriculum and Instruction TLN**  
**Sandia Mountain Natural History Center**

<b>Title of Lesson:</b> Leaf adaptations & characteristics	<b>Submitted by:</b> Vince Case & Steven Henley
<b>Content Area:</b> Science, grades 4-5	
<b>Materials Needed:</b> paper and pencil; crayons, colored pencils, book, something heavy	
<b>Handouts Attached:</b> None	
<b>Standard Addressed:</b> NGSS 5-LS2 Ecosystems: Interactions, Energy & Dynamics (see attached NGSS standards sheet for full information)	
<b>Skill to be Maintained:</b> Understanding the adaptations of plants, especially leaves. Leaf collection activity, leaf rubbings, leaf characteristics identification.	
<b>Essential Question:</b> How do plants adapt to an ecosystem in order to survive?	
<b>Academic Vocabulary/Word Wall words:</b> photosynthesis, deciduous, coniferous, adaptation, characteristics, traits	
<p><b>Basic Lesson Description and Procedure:</b></p> <ol style="list-style-type: none"> <li>1. Students watch the video at the SMNHC.</li> <li>2. Students review producers (plants) and consumers (animals).</li> <li>3. Students think about what producers provide to the rest of the ecosystem.</li> <li>4. Students observe different kinds of producers in the Sandia Mountains.</li> <li>5. Students learn about trees at the SMNHC and their leaf-like characteristics (leaves, needles, or scales).</li> <li>6. Students learn about the functions of leaves – as the place where photosynthesis occurs – absorbing the sun’s energy and converting it into glucose so the plants can grow.</li> <li>7. Students learn about coniferous and deciduous trees and their specific characteristics as adaptations to an ecosystem’s habitat and climate.</li> <li>8. Students make observations of different deciduous leaves – focusing on their parts (leaf blade, petiole, leaf node, vein); arrangement (simple or complex); edge formation (smooth, wavy, lobes, jagged); shape (circular, triangular, heart-shaped, lance-like); color; and texture.</li> <li>9. Students learn how to preserve the leaves they’ve collected</li> <li>10. Students learn how to make leaf rubbings.</li> <li>11. Students collect a variety of leaves, preserve them, and make leaf rubbings of them using crayons, colored pencils, or a regular pencil with an adult’s permission.</li> <li>12. Students identify different parts, characteristics, and traits of the leaves (leaf type, leaf parts, leaf edge, leaf shape, color, texture, etc.).</li> <li>13. Students create a leaf booklet of their leaves with leaf rubbings or drawings, leaves collected, and identification of leaf parts and characteristics. They can be as creative as they would like to be.</li> </ol>	
<b>Observation activity:</b> With permission of a grown-up, go outside, collect as many leaves as	

possible from trees, the ground, indoor plants, etc.

**Lesson Conclusion/Potential Practice at Home:** Students share their leaf booklets and discoveries with family and others they live with.

**Accommodations-Modifications:** Just about any grade level can do this lesson and activity

## Plant Adaptations

### Outdoor-Follow-up Activity

#### Directions:

1. With permission of a grown-up, go outside; collect as many leaves as possible from trees, the ground, indoor plants, etc.
2. Preserve the leaves you collect using folded sheets of paper, a notebook, or some other book, and something heavy like a rock or can of food.
3. Make a leaf rubbing of each leaf collected using crayons, colored pencils, or pencils on paper. Or students can draw each leaf they have collected if a leaf rubbing doesn't work.
4. Tape or glue the leaf on the back of the leaf rubbing or drawing.
5. Identify whether the leaf is deciduous or from a coniferous tree/plant (most will be deciduous).
6. Identify and label the major leaf parts – leaf blade, petiole, node, veins.
7. Identify the leaf edge type, the leaf shape, whether it is simple or compound, color, texture, etc.

### 5-LS2 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

**5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.** [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]

The performance expectations above were developed using [the following elements from the NRC document \*A Framework for K-12 Science Education\*](#):

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<b>Developing and Using Models</b> Modeling in 3–5 builds on K–2 models and progresses to building and revising simple models and using models to represent events and design solutions. <ul style="list-style-type: none"><li>• Develop a model to describe phenomena. (5-LS2-1)</li></ul>	<b>LS2.A: Interdependent Relationships in Ecosystems</b> <ul style="list-style-type: none"><li>• The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some</li></ul>	<b>Systems and System Models</b> <ul style="list-style-type: none"><li>• A system can be described in terms of its components and their interactions. (5-LS2-1)</li></ul>

<p><b>Connections to the Nature of Science</b></p> <p><b>Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena</b></p> <ul style="list-style-type: none"> <li>Science explanations describe the mechanisms for natural events. (5-LS2-1)</li> </ul>	<p>organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)</p> <p><b>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</b></p> <ul style="list-style-type: none"> <li>Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)</li> </ul>	
<p><b>Connections to other DCIs in fifth grade:</b>  <b>5.ESS2.A</b> (5-LS2-1); <b>5.PS1.A</b> (5-LS2-1)</p>		
<p><b>Articulation of DCIs across grade-levels:</b>  <b>2.PS1.A</b> (5-LS2-1); <b>2.LS4.D</b> (5-LS2-1); <b>4.ESS2.E</b> (5-LS2-1); <b>MS.PS3.D</b> (5-LS2-1); <b>MS.LS1.C</b> (5-LS2-1); <b>MS.LS2.A</b> (5-LS2-1); <b>MS.LS2.B</b> (5-LS2-1)</p>		
<p><b>Common Core State Standards Connections:</b></p> <p><b>ELA/Literacy -</b></p> <p><b>RI.5.7</b> Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2-1)</p> <p><b>SL.5.5</b> Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-LS2-1)</p> <p><b>Mathematics -</b></p> <p><b>MP.2</b> Reason abstractly and quantitatively. (5-LS2-1)</p> <p><b>MP.4</b> Model with mathematics. (5-LS2-1)</p>		