

<b>Grade 4</b>	<b>Lesson: 1-6 Plant Survival</b>	<b>Reference to English</b>
<b>Standard(s): 1.OA.1</b>		<b>Domain:</b>
<b>Content Objective(s):</b>		<b>Language Objective(s):</b>
Cite examples of physical features that allow particular plants and animals to live in specific environments.		
<b>Essential Understanding:</b>		<b>Academic Vocabulary for Word Wall:</b> 仙人掌、刺、沙漠、保护、芦荟、厚叶片、浅根、储存、保护、预防 <b>Listen:</b> 仙人掌、刺、沙漠、保护、芦荟、厚叶片、浅根、储存、保护、预防 <b>Read:</b> <b>Write:</b> <b>Speak:</b> 仙人掌、刺、沙漠、保护、芦荟、厚叶片、浅根、储存、保护、预防
<b>Materials:</b> <input type="checkbox"/> "My Environments Book" <input type="checkbox"/> Paper (1 piece per student) <input type="checkbox"/> Squares of colored paper; blue, yellow, and green (2 per student) <input type="checkbox"/> Aloe Vera Plant <input type="checkbox"/> Leafy Plant (house plant) <input type="checkbox"/> Desert Plant (cactus) <input type="checkbox"/> 2 Sandwich bags <input type="checkbox"/> 2 Twist Ties or String <input type="checkbox"/> 2 Sponges <input type="checkbox"/> Vaseline <input type="checkbox"/> Plastic Plate <input type="checkbox"/> Sock <input type="checkbox"/> Stuffing or Scrap Paper <input type="checkbox"/> Pipe Cleaners <input type="checkbox"/> Fuzzy Cloth		<b>Additional Lesson Vocabulary:</b>  <b>Sentence Frames:</b>
<b>Lesson: Plant Survival</b>		<b>Instructional Time:</b>

### Opening: (10 minutes)

T: Let's play "Tree Cookie Combat!" 我们来玩"树饼(年轮)对战"

T: First, we need to create a tree cookie or cross section of a tree trunk. 首先,我们要先创做出一个树饼(年轮)或是树干的交叉部分。

□ Give each student a piece of paper. Have them draw and cut out a large circle.

□ Inside the cut out, draw concentric circles to represent the tree's rings. Be sure to have the students draw the circles in varying widths to show fertile years (plenty of water, nutrients, and sunlight) and challenging years (drought or other shortages).

T: What do trees need to grow? (water, sunlight, and nutrients) 树需要什么才可以长大?(水、阳光、养分)

T: We will use squares of colored paper to represent these needs; blue for water, yellow for sunlight, and green for nutrients. Mix all the squares together. 我们用方形色纸来表示这些树木所需的东西。蓝色代表水,黄色代表阳光,绿色代表养分。将这些色纸混在一起。

□ Have the students select a spot in the room. Place the tree cookie on the floor and step on it with one foot. This foot will represent the tap root and must stay connected to their tree cookie at all times.

T: Trees cannot move, so the tree cookie must stay in the same place on the floor (no sliding!) 树不会动,所以树饼(年轮)必须停留在地上相同处(也不可以滑动)。

□ Once the students are in position, walk around the room scattering the squares of colored paper near and around them.

□ Remind students of a tree's needs: water, sunlight, and nutrients. On your signal, they are to reach with their branches (arms and free leg) to try and collect at least two of each colored square while staying rooted to their spot.

T: Ready, set, go! Give the students a few minutes to collect as many squares as possible. 准备好,开始。给学生一些时间去收集色纸,越多越好。

□ When all the cards have been retrieved, stop and compare. Were you able to successfully gather your needs? Why or why not? What trees did not get the squares they needed? Which colors are missing? What will happen to those trees? Did any trees get more than they needed? What will happen to them? Is there such a thing as too much water, sun, or nutrients?

### Introduction to New Material (Direct Instruction): (7 minutes)

Plant Adaptations:

T: Think about the environments we have been studying. What kinds of needs do they provide or lack for their plants?想想看我们要研究的环境。他们对当地的植物可以提供什么,又缺乏什么。

□ Wetlands – lots of water – perhaps too much for some plants

□ Forests – dense vegetation – lacking some sunlight – higher elevation and colder temperatures

□ Deserts – extreme heat – lots of sunlight – little water

### Guided Practice: (10 minutes)

Aloe Vera Leaf and Roots:

□ Divide the students into small groups. Give each group an Aloe Vera plant leaf so the students can see the inside of the leaf and have the students write down their observations in their "My Environments Book."

T: Observe the roots of the Aloe Vera plants. 观察芦荟的根。

T: What kind of root does this plant have? (shallow root) 这植物有什么样的根。(浅根)

T: How does this root help the plant survive in the pot? (Allows the plant to absorb water quickly.) 芦荟的根如何帮助它生存。

T: How does this plant relate to a desert plant, such as a cactus? (Both plants have thick leaves and shallow roots. The plant stores water into its leaves and uses it when there is no water available. Both roots absorb water quickly.) 这个植物和沙漠植物,如仙人掌,有和相关处。(两者都有厚叶片和浅根。这种植物将水分储存在叶子上,然后再没有水的时候就可以使用叶子上的水分。它们的根部也可以很快吸收水分。)

□ Have the students record what they observed about the root system in their "My Environments Book."

Leaves:

□ Bring in a leafy plant example and a desert plant (cactus).

□ Observe the plants and discuss their similarities and differences. Record the information in their "My Environments Book."

T: Place a sandwich bag over some of the leaves on the green leafy plant and the cactus leaf and tie the bag down with a twist tie or string. 用袋子将树叶茂密的植物的叶子及仙人掌的叶子套住,并用绳子在袋子尾端绑紧。

□ Place both plants into the sun. Let the students make daily observations and record the information.

T: In a few days, the leafy plant will lose water through its leaves. The evidence will be water droplets on the bag. The cactus will store the water in the leaves and use the water as needed. Few water droplets should

□ Discuss the difference between the green leafy plant and a light green desert plant (cactus).  
T: Why does one plant have lighter color leaves than the other one? (The lighter leaves will reflect light.) 为何有些植物的叶子颜色比其他植物的叶子颜色深?(浅色叶子会反射光线。)  
T: How will this help the plants survive in the desert? (Since the light is reflected then the leaves won't dry out so quickly, less transpiration.) 颜色如何帮忙植物在沙漠中生存?(颜色浅的叶子会反射阳光所以树叶不会很快干掉，减少蒸发。)

### Independent Practice: (6 minutes)

Waxy Covering:

□ Take two sponges and soak them in water until they can no longer hold any more. Explain that these sponges represents leaves and water contained in them.

T: Take one of the sponges and spread Vaseline over the surface, covering the sponge completely. The Vaseline represents the waxy covering that most desert plants have on their leaves. 拿出一块海绵，在表面上涂上凡士林，要完全覆盖。凡士林用来表示大部分沙漠植物叶子上的蜡。

T: Place both sponges on a plastic plate and leave them alone for two to three days. 将两块海绵都放置在塑料盘上两到三天。

□ Observe daily and record the information in their "My Environments Book."

T: After a few days, one sponge should be dried. The dry sponge represents plants that need water every day like plants in the forest. 几天后，一块海绵应会干掉。干掉的海绵表示植物每天都需要水分，如森林里的植物。

T: The other sponge will still be moist. The Vaseline (waxy covering over the leaves) prevents water from leaving the plant. Thus, desert plants can store water and use it later when no water is available. 另一块海绵会保持潮湿。因为凡士林(覆盖在树叶上的蜡)可以防止水分流失。因此，沙漠植物可以储存水分并在往后需要时使用水分。

Protection:

T: Some desert plants use a different method to protect themselves. 有些沙漠植物用不同的方法保护自己。

□ Discuss with students what ways they think a desert plant (cactus) uses to protect itself. (spines)

T: Make your own cactus by filling a sock with stuffing or scrap paper and attaching pieces of pipe cleaners to the outside. This represents leaves with spines (prickly pear cactus). 用碎纸片或填充物将袜子塞满，并在外面贴上毛根来制做自己的仙人掌。毛根表示带刺的叶子(刺梨仙人掌)。

T: How do the spines help this plant? (protects from animals and provide shade which creates less evaporation) (刺可以怎么保护植物?(可以预防动物及制造阴影减少蒸发)

□ Show the students a piece of fuzzy cloth to represent sagebrush leaves.

T: How does this plant protect itself from the sun? (The hairs on the leaves provide less evaporation from happening.) 这种植物如何保护自己，防阻太阳?(叶子上的细毛可以减少蒸发的发生)

□ Have the students record what they learned about how desert plants protect themselves in their "My Environments Book."

### Closing: (4 minutes)

□ Have the students summarize in their "My Environments Book" what they have learned about how desert plants are able to survive.

### Assessment:
