

Fall Lesson: Falling Leaves

1. Explain the day's activities and questions that will be asked (see below)
2. Read story (10 minutes) - I read *The Little Yellow Leaf*, but I am sure there are other fall themed, leaf-fall books.

3. Why do leaves fall from trees?

* in the garden show the children the big, bare ash tree. Have them try to find a leaf on the ground that they think fell from it. Do they remember what the tree looked like in September? What happened to the green leaves?

* The green stuff in leaves makes the tree's food. Trees love sugar, that's the kind of food they make. Recipe for sugar: air (CO₂) + water + sun = SUGAR! One of those ingredients is missing in the winter - can the kids guess which?

* Water is frozen in the winter. Pull up a weed and show the roots. Roots can absorb water and carry it up the stem to the leaves to make sugar. But can roots absorb ice cubes? No. That's why they drop their leaves. In fact, leaves are a water waster - they are constantly transpiring water (just like people breathe out water vapor). If they kept their leaves in winter, they could be in trouble from water loss.

* If kids want to know the mechanics behind leaf loss, the trees grow a layer of cells (the abscission layer) between leaf and twig that forms a physical barrier between them. Leaf drops.

4. Why do evergreens keep their leaves?

* Have kids find green pine needles. Feel and compare with a deciduous leaf. Evergreen needles are coated in a waxy substance - it feels like crayons. That helps them reduce water loss to wind. They also have stomata sunken into a groove, which helps, but which the kids don't need to know about that yet.

5. Why do leaves change color? Have the children collect green, yellow, and red leaves.

* This is a little tricky. Many kids will say that it is to look pretty. But plants were around before people - were they doing this for millions of years just waiting for us to get on the scene? Of course not! There are a few theories out there, but the best I've heard relates to deterring predators/parasites. Trees break down their chlorophyll and absorb it to conserve energy. If this was the only thing going on, the leaves would all be brown before they drop. Instead they spend energy to create yellow (carotene) and red (anthocyanin) pigments. Why?

* As an analogy, kids readily grasp the concept that boy birds have bright colors to look prettier for girl birds. The healthier the bird, the brighter the plumage. With trees, the healthier the tree, the more colorful the leaf (this varies from species to species - many oaks, beech, and hickories, for example, aren't known for their fall foliage). Some insects (engraver beetles, and weevils I think), lay their eggs under tree bark and the larvae then eat the tree's wood/cambium. Trees produce chemical deterrents. As a signal to the insects to not bother them, healthy trees make color - 'don't mess with me, I'll kill your babies with my poisons' is the message.