



LESSON/ACTIVITY

How Leaves Work

LESSON: Fall - *How Leaves Work*

Ages 5 - 11 years | Grades: K - 5

In this lesson, you'll learn:

- Identify seasonal patterns/changes
- Living things sense and respond to their environment
- Living things have life cycles adapted to their environment
- Plants and animals have observable features

What changes do you notice in Autumn that are different from summer?

In the fall, the weather shifts from hot to cold, frost covers the ground and plants in the early morning, some plants are at the end of their life cycle and begin to decay and die. Deciduous trees shed their leaves, animals collect food for winter and some prepare to hibernate. The days become shorter, the sun sets earlier, the weather is often cloudy, rainy, windy and occasionally foggy. Birds start to migrate to warmer climates and some insects will die or their offspring, the larvae will seek shelter underneath leaf litter, or decaying wood for the winter.

Why do leaves change colour in the fall?

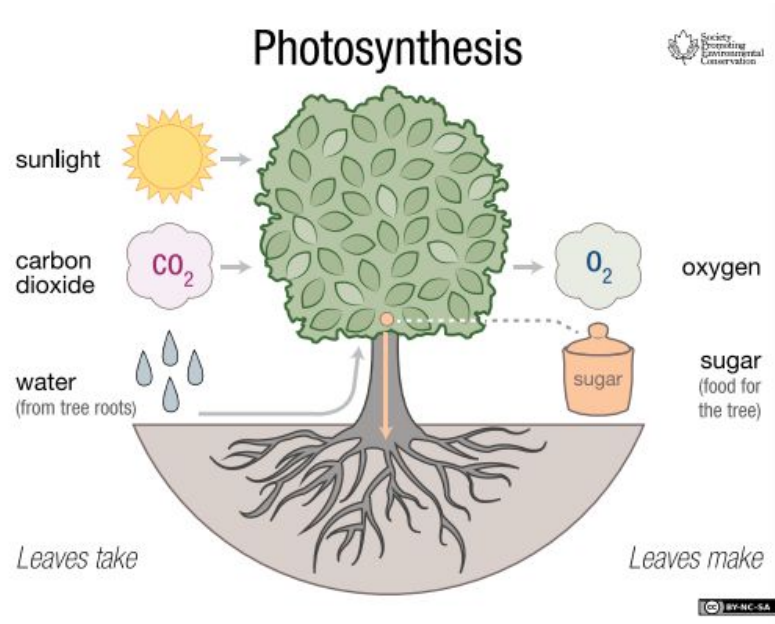


Often when we think of the fall season, we notice the physical changes in our surroundings the most like the leaves transforming from bright green to beautiful hues of deep orange, crimson red, maroon, amber yellow and musty brown.

What colours, shapes and patterns have you noticed on the changing leaves in your neighbourhood?

Leaves changing colour is a part of a process called photosynthesis.

Let's use a maple tree as an example: The main job of leaves is to create food in the form of sugars. As new buds emerge in the spring and new leaves form, they soak up the sun's energy and turn that into chemical energy through a process called ***photosynthesis.***



Photosynthesis occurs when leaves:

1) Absorb sunlight + 2) Carbon dioxide (from the air) + 3) Water (taken in from the roots of the tree)

In return the plant creates oxygen + sugars. The sugars travel through the veins of the leaves and feed the plant/tree. The oxygen is also released from the leaves for us to breathe!

Is that why leaves are green in the summer?

YES! The leaves are green through a pigment called chlorophyll which is found in the chloroplast, the plant cells. The chlorophyll absorbs the light energy from the sun. This continues into the late summer, until an internal seasonal clock

reminds the plant that the seasons are changing. It begins to slow down and chlorophyll production stops. That's when the true colour pigments in the leaves make an appearance ↓



 Images courtesy of Canva

Why do some trees shed their leaves in the fall and other trees don't?

Deciduous trees shed their leaves like maples, oak, birch, beech, and horse-chestnut. Evergreens trees like pine, fir, spruce, cedar keep their needles/scale like leaves (not actually leaves) during the winter.

The deciduous tree is preparing itself to adapt to the changing season.

- In August, the tree starts to produce a great number of seeds so the fall winds will help the seeds travel.
- In late September, the green pigment chlorophyll disappears and the true vibrant colours like red, burnt orange, lemony- yellow and dark red and purple appear. These colours were in the leaves all along. As the leaves change colour, they will be shaken off the tree by winds, and rain.

The tree is saving its energy to sleep or go into a dormant state. It can't really collect water from the roots as both the soil and ground are cold and could be frozen. The days are quite short and there is limited amount of sunlight. So the tree stores its energy and stops growing.

Take a walk in your neighbourhood to see if you can tell the difference between deciduous trees vs. evergreens. How many did you find of each?



[Leaves are nature's recyclers](#). They contain nutrients such as carbon that the soil needs as it slowly starts to decompose over the winter. Dry leaves can be used in compost bins as well.

How are fall leaves used in the garden?

Leaf mulch: Many gardener's use leaves in their garden as mulch (a protective covering). They collect and break up the leaves into smaller pieces and pile a 3 inch thick layer over their garden. This will prevent the soil from eroding from heavy fall winds, rain and snow as well as suppressing weeds.

Shelter for insects: Leaves provide shelter for insects such as lady bugs, ground nesting bees and caterpillars that will lay their eggs on the underside of leaves.

Food Source: Leaves are a food source for earthworms and some caterpillars like the banded woolly bear feast on fall leaves before they turn into moths in the late spring.

So remember, next time you see a pile of leaves, save some for the garden or leave a pile for insects and worms.



ACTIVITIES

Leaf Symmetry (Grade 3 - 6)

Leaf Types (Grades 3 - 6)

Leaf Rubbings (K - 2)

Leaf Observation Station (Margins, Shape, Venation) Grade 5 - 8

Leaf Experiments (Grade 4 - 8)

 *Leaf Symmetry Activity - Image by Sharlene Singh*

RESOURCES/VIDEOS

Green Thumbs at School: SPEC Food Garden Lesson Book Unit: How Leaves Work

[Why Do Leaves Change Colour?](#)

CHILDREN'S BOOKS

Goodbye Summer, Hello Autumn by Kenard Pak (K to 2)

We're Going on a Leaf Hunt by Steve Metzger (K to 2)

Autumn Leaves by Ken Robbins (Grade 1 - 3)

Fall Leaves: colourful and crunchy by Courtney Burdick (K to 2)

Leaves Fall Down by Lisa Bullard

Fall Leaves Fun by Martha Rustad

Summer Green to Autumn Gold by Mia Posada (Grade 3 - 5)