



SUNY-ESF Environmental Information Series

## Why Leaves Change Color

...as featured on weather.com Text prepared by Carl E. Palm, Jr.



### The Splendor of Autumn

Every autumn we revel in the beauty of the fall colors. The mixture of red, purple, orange and yellow is the result of chemical processes that take place in the tree as the seasons change from summer to winter.

During the spring and summer the leaves have served as factories where most of the foods necessary for the tree's growth are manufactured. This food-making process takes place in the leaf in numerous cells containing chlorophyll, which gives the leaf its green color. This extraordinary chemical absorbs from sunlight the energy that is used in transforming carbon dioxide and water to carbohydrates, such as sugars and starch.

Along with the green pigment are yellow to orange pigments, carotenes and xanthophyll pigments which, for example, give the orange color to a carrot. Most of the year these colors are masked by great amounts of green coloring.

### Chlorophyll Breaks Down

But in the fall, because of changes in the length of daylight and changes in temperature, the leaves stop their food-making process. The chlorophyll breaks down, the green color disappears, and the yellow to orange colors become visible and give the leaves part of their fall splendor.

At the same time other chemical changes may occur, which form additional colors through the development of red anthocyanin pigments. Some mixtures give rise to the reddish and purplish fall colors of trees such as dogwoods and sumacs, while others give the sugar maple its brilliant orange.

The autumn foliage of some trees show only yellow colors. Others, like many oaks, display mostly browns. All these colors are due to the mixing of varying amounts of the chlorophyll residue and other pigments in the leaf during the fall season.

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### Upcoming Learning Opportunities

**Fall Harvest Fest**  
Sandstone Ranch House,  
Nov 5, 2011  
303-774-4692

**Animal Emotions  
and Wild Justice**  
Longmont Public Library,  
Nov 11, 2011  
303-651-8470

**Taste of Therapy  
Wellness Fair**  
Izaak Walton Clubhouse,  
Nov 12, 2011  
303-651-8404

**Free Homeownership Class**  
Boulder County Housing &  
Human Services  
Nov 19, 2011  
720-564-2279

### We're Interested in Hearing From You

Let us know how you're able to spread positive lifelong learning information in your community. As a way to inspire your fellow Learning Ambassadors, we'll include results and your good ideas in upcoming issues! Send your experience and results to Karen Roney at [karen.roney@ci.longmont.co.us](mailto:karen.roney@ci.longmont.co.us), or call 303-651-8633.

**Other Changes Take Place**

As the fall colors appear, other changes are taking place. At the point where the stem of the leaf is attached to the tree, a special layer of cells develops and gradually severs the tissues that support the leaf. At the same time, the tree seals the cut, so that when the leaf is finally blown off by the wind or falls from its own weight, it leaves behind a leaf scar.

Most of the broad-leaved trees in the North shed their leaves in the fall. However, the dead brown leaves of the oaks and a few other species may stay on the tree until growth starts again in the spring. In the South, where the winters are mild, some of the broad-leaved trees are evergreen; that is, the leaves stay on the trees during winter and keep their green color.

**Only Some Trees Lose Leaves**

Most of the conifers - pines, spruces, firs, hemlocks, cedars, etc. - are evergreen in both the North and South. The needle- or scale-like leaves remain green or greenish the year round, and individual leaves may stay on for two to four or more years.

**Weather Affects Color Intensity**

Temperature, light, and water supply have an influence on the degree and the duration of fall color. Low temperatures above freezing will favor anthocyanin formation producing bright reds in maples. However, early frost will weaken the brilliant red color. Rainy and/or overcast days tend to increase the intensity of fall colors. The best time to enjoy the autumn color would be on a clear, dry, and cool (not freezing) day.

Enjoy the color, it only occurs for a brief period each fall.

**Halloween Trivia & Fun Facts**

[www.halloween-website.com](http://www.halloween-website.com)



Because of the unknown, Halloween is the one of the most captivating holidays, often celebrated by both adults and children. The element of surprise makes it fun and unpredictable. Enlighten yourself with Halloween trivia and fun facts to enjoy the holiday even more. Take the trivia and make a quiz for your next party!

**Halloween Holiday Trivia**

- Orange and black are Halloween colors because orange is associated with the Fall harvest and black is associated with darkness and death.
- Jack o' Lanterns originated in Ireland where people placed candles in hollowed-out turnips to keep away spirits and ghosts on the Samhain holiday.
- Pumpkins also come in white, blue and green. Great for unique monster carvings!
- Halloween was brought to North America by immigrants from Europe who would celebrate the harvest around a bonfire, share

ghost stories, sing, dance and tell fortunes.

- Tootsie Rolls were the first wrapped penny candy in America.
- The ancient Celts thought that spirits and ghosts roamed the countryside on Halloween night. They began wearing masks and costumes to avoid being recognized as human.
- Halloween candy sales average about 2 billion dollars annually in the United States.
- Chocolate candy bars top the list as the most popular candy for trick-or-treaters with Snickers #1.
- Halloween is the 2nd most commercially successful holiday, with Christmas being the first.
- Bobbing for apples is thought to have originated from the roman harvest festival that honors Pomona, the goddess of fruit trees.
- Black cats were once believed to be witch's familiars who protected their powers.

**Monster Trivia & Folklore**

- Signs of a werewolf are a unibrow, hair palms, tattoos, and a long middle finger.
- Vampires are mythical beings who defy death by sucking the blood of humans.
- In 1962, The Count Dracula Society was founded by Dr. Donald A. Reed.
- To this day, there are vampire clubs and societies with people claiming to be real vampires.
- There really are so-called vampire bats, but they're not from Transylvania. They live in Central and South America and feed on the blood of cattle, horses and birds.
- Many people still believe that gargoyles were created by medieval architects and stone carvers to ward off evil spirits.

**Halloween Movie Details**

- "Halloween" was made in only 21 days in 1978 on a very limited budget.
- The movie was shot in the Spring and used fake autumn leaves.
- The mask used by Michael Meyers in the movie "Halloween" was actually William Shatner's mask painted white.

- The character Laurie Strode, played by Jamie Lee Curtis was named after John Carpenter's first girlfriend.
- While the setting for the story is in Illinois, the vehicles have California license plates.
- Halloween is on October 31st, the last day of the Celtic calendar. It was originally a pagan holiday, honoring the dead. Halloween was referred to as All Hallows Eve and dates back to over 2000 years ago.

**Creepy Tidbits**

- If you see a spider on Halloween, it is the spirit of a loved on watching over you.
- Worldwide, bats are vital natural enemies of night-flying insects.
- The common little brown bat of North America has the longest life span for a mammal it's size, with a life span averaging 32 years.
- In about 1 in 4 autopsies, a major disease is discovered that was previously undetected.
- The Ouija Board ended up outselling the game of Monopoly in its first full year at Salem. Over two million copies of the Ouija Board were shipped.

**Halloween Safety Tips**

[www.halloween-website.com](http://www.halloween-website.com)

Ghost, ghouls and monsters aren't the only things to be afraid of on Halloween. Accidents and mishaps increase dramatically when children trick-or-treat. To avoid the many dangers children face while trick or treating, use common sense. Be aware of potential Halloween hazards and take precautions to eliminate them. Consider heading for an indoor Halloween party and bypass any chaos or danger.

**Halloween Costume Safety**

- Wear flame retardant costumes.
- Make sure your Halloween costume is colorfast so the color doesn't run onto your other clothes if it rains.
- Try on costumes before Halloween to allow time for altering.
- Hem your costumes so you don't trip and fall.
- Apply reflective tape to your Halloween costumes.
- Avoid cumbersome masks. Use make-up instead.
- Use only hypoallergenic and non-toxic makeup.
- Wear comfortable, practical shoes.
- Double tie your shoelaces so you don't trip.
- Keep your costume and wig away from candles.
- Don't carry fake swords, guns, knives or similar accessories that look authentic. Make sure they're flexible and cannot harm anyone.

**Trick-or-Treating Tips**

- Plan your route ahead of time.
- Trick or treat in familiar neighborhoods.
- Carry a flashlight with fresh batteries after dark.
- Take along money for a phone call.
- Wear identification that's easy to read.
- Always trick or treat in groups, accompanied by an adult.
- Follow a curfew and take a watch with a backlight.
- Stay on the sidewalks and out of the streets. Cross only at intersections and designated crosswalks.
- Walk. No running.
- Don't trample through flower beds and gardens.



- Watch out for open flames in jack-o-Lanterns.
- Walk with your head up and be aware of your surroundings.
- Only visit well lit houses. Don't stop at dark houses.
- Don't enter any houses unless you know the people.
- Carry a spare Halloween bag, in case yours breaks or you fill your original one.
- Don't approach unfamiliar pets and animals.
- Don't cut across yards and stay out of backyards.
- Follow traffic signals and don't jaywalk.
- Always watch for cars backing up or turning.
- Review the "stop, drop and roll" procedure in case your costume catches on fire.
- Never accept rides from strangers.
- Respect other people and their property.
- Be polite and say "thank you."
- Don't eat any candy until it's inspected for tampering under bright lights.
- Avoid candy that has loose wrappings, is unwrapped, has puncture holes, or is homemade.
- Small children should not be allowed hard candy they may choke on.
- Report any suspicious or criminal activity to an adult or the police.
- Consider having a party instead of Trick or Treating.



## They Say You Learn Something New Every Day...

Now your library can help you make that happen. Longmont Public Library has just subscribed to a dynamic new product called UniversalClass.

UniversalClass offers over 500 online non-credit classes that you can take from the comfort of your own computer. Want to become a better photographer? UniversalClass will help you to do that. Perhaps you need help in starting your own business; you can take a class to do that too. Cooking, psychology, history, and religion are just a few of the subject areas you can explore using this service.

UniversalClass allows you to enroll in up to five classes and each one has a real instructor who you may communicate with using email. You can work through the selected course at your own pace though the coursework needs to be completed in six months.

Best of all, these personal enrichment classes are free to our library members, all you need is a current library card. Go to our library homepage, select the Library 24/7 bar and then select the Learn Something New icon. You will need to register and after that, begin having fun as you pore through over 500 continuing education options. Select your area of interest and then take the class.



Or register here at

<http://longmontco.universalclass.com/register.htm>

**One of the 500+ classes available to you for FREE from UniversalClass:**

## How to Improve Your Memory

### Course Description

Memory is one of the most basic and important functions of the human brain. In fact, without memory we can't learn. Most people think of memory as how we recall past events, but it is also the building blocks for almost everything we do in the present and future. Our memories provide us with a sense of our own personality and give us the information we need to function properly in the everyday world. Communication, problem solving and relationships all rely to some extent on memories that we use to inform us as we take action.

Of course, our brains can't remember everything. Brains simply don't have the capacity; if they tried to remember everything we experienced, there wouldn't be room for anything else. Involuntary muscle function, thought processes, the senses and numerous other activities would be crowded out. There are dozens of variables that affect how much we remember, how long we retain it and whether we can recall it. Fortunately, we can learn ways to improve how much we remember and enhance how long we remember it.

**This course will explain how memory works, and will also cover these topics:**

- Strategies to improve Memory
- Peg Memory Systems
- The Loci Method
- Memorizing Numbers
- Mnemonics
- SCAD: Learning to Become an 'Expert Witness'
- Faces and Names
- Powerful Public Speaking
- Everyday Memory Aids



The class is self-paced and you can take it when it fits your schedule. So why not join and learn how to maintain a healthy memory and learn some memory improvement strategies!

## About LifeLongmontLearning

LifeLongmontLearning is a community-based, City-sponsored movement to increase access to learning opportunities available in our area. It is the vision of this effort's leadership—which represents government, education, community and business—to ensure that all children enter school ready to learn; for all students to acquire the education and skills to be successful in the 21st century; for all working adults to improve their employability in a changing world; and for retired adults to continually enrich their lives. For more information, visit [www.LifeLongmontLearning.com](http://www.LifeLongmontLearning.com).