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## The Science Behind Fall's Beauty

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Fall colors seem magical, but they are more science than magic. A change in temperature signals that it is time for deciduous trees to go dormant. Like a hibernating bear, deciduous trees seal themselves off. Not in a cave, but by sealing off each leaf from its branch, cutting off water. This sealed layer is called the abscission layer. It protects the tree when the leaf falls, but the process also stops the production of chlorophyll.

Since chlorophyll is important to trees, they break it down into smaller molecules. Like a straw, the tree can suck back the molecules to save for next spring. We see chlorophyll as the color green. When the chlorophyll is removed, our eyes recognize other pigments which have always been present, just hidden from view.

These pigments belong to a group of carotenoids. The yellow pigment is called xanthophyll. This is the same pigment that gives squash and corn their yellow color. Egg yolks are yellow because of the xanthophyll in the plants given to the chicken as food.

Orange is from carotene. You can probably guess that carrots also have carotene. Anthocyanin is red, and gives apples, cranberries, and cherries their color. Anthocyanin is common in most plants, and causes stems, flowers, and leaves to look pink or purple. When you look at beautiful pink petals, you can thank anthocyanin.

Anthocyanin also helps protect plants from sunburn. For instance, the tender new growth on many roses start out red before maturing and turning green. This pigment is like sunscreen for babies.

These pigments are sensitive to light, temperature, and water. That is why the leaves may be brilliant some years and not as beautiful in others, and vary in different areas of the country. These factors not only change the pigments from year to year, but they also affect the colors of the leaves from day to day.



As you look out at nature's changing colors, take a moment to marvel at the complexity necessary to reveal such beauty.

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