## Spanning the Gap

## **Why Leaves Change Color**



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Spanning the Gap
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Prior to dropping their leaves, deciduous trees provide an awe-inspiring display of color, from the first red maple leaf in historic Millbrook Village, to the blaze of color filling the entire mountainside in the Water Gap. Most of the colorful pigments of autumn leaves are present in the leaves throughout the summer, but are masked by the dominant green color of chlorophyll pigments.

The chlorophylls have a vital function: they capture some of the sun's energy and utilize it to manufacture the plant's food, simple sugars. In turn, humans and other animals obtain their food directly or indirectly from plants, and are dependent on the plant's ability to convert the sun's energy into food energy.

As autumn approaches, the veins that carry fluids into and out of the leaf are gradually closed off as a layer of special cork cells forms at the base of each leaf. During this time the chlorophylls in the plant are being used up faster than they can be produced. Initiated by the changing period of daylight, this dwindling amount of chlorophyll allows the other pigments in the leaf to show through.

The yellows, browns, and oranges that show up in the hickory, ash, maple, birch, aspen, and yellow poplar are the *carotenoid* pigments. They are present in the leaf throughout the summer. The reds and purples of maple, oak, and dogwood come from another group of pigments called *anthocyanins*. These pigments are not present in the leaf throughout the growing season, but develop in late



(Photo courtesy of Narleen Jacobs)



(Above) Mt Minsi PA. (Below) (Photo courtesy of Narleen Jacobs)

summer in the sap of the leaf cells. The brighter the daylight during this period, the more brilliant will be the resulting color display. When the days of autumn are bright and cool, and the nights chilly (but not freezing), the brightest colorations usually develop.

The changing and falling of the leaves seems to signify the end. Yet, encased in the moisture-conserving scales of the buds are the neatly miniaturized leaves for next year, the promise that this brilliant color display will recur.



Coventry Pond near Millbrook Village NJ.