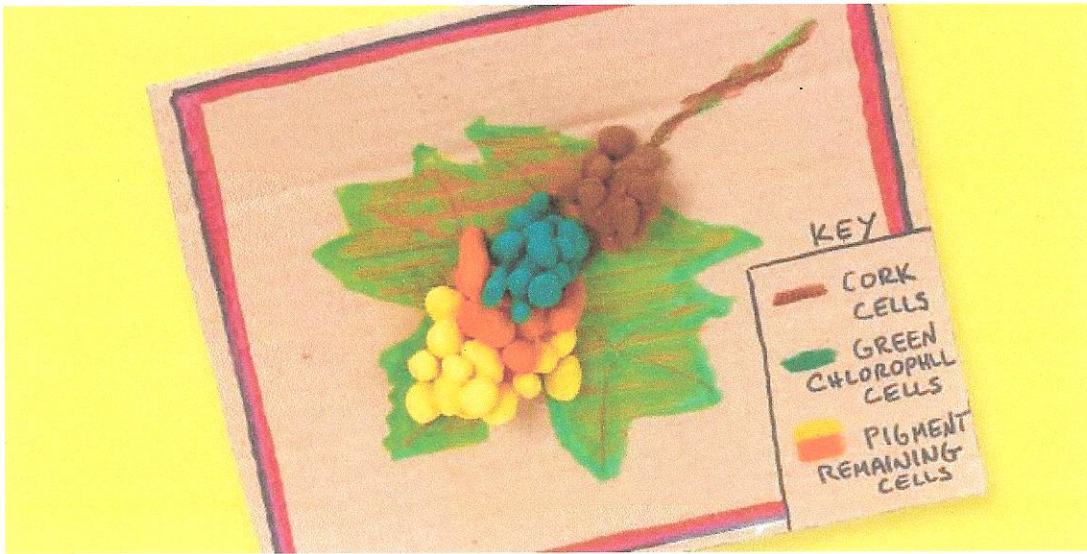


Color-Changing Cells



Crayola Supplies

Gel Markers
Model Magic®
No-Run School Glue

Household Supplies

recycled cardboard

Why?

Leaves are just doing what comes naturally when they change colors and fall from trees. Find out more about this process and display your knowledge in a naturally colorful way.

Steps

1. Autumn is a time for the beauty of the turning leaves. What causes that transformation? As the length of days and nights change (photoperiodism) and the amount of available daylight decreases, a plant's ability to produce chlorophyll (photosynthetic pigment) is reduced. Senescence, the process of aging and death of plant part (leaf) begins to occur. Nutrients return to the stems and roots of the plant, abandoning the leaves. When the green chlorophyll is gone, yellow and orange carotinoids that have been always present are left.
2. Learn more about cells that form where the leaf and stem connect. After

you understand the chemical processes, decide how to depict your knowledge in a three-dimensional exhibit. Here's one way to show it.

3. Draw a leaf on cardboard with Crayola® Gel Markers.

4. Form leaf cells with Crayola Model Magic. To create your own colors, cover white Model Magic with the marker color. Knead to blend in the color. Air-dry your leaf cells.

5. Use Crayola School Glue to hold cells in their proper places on the cardboard drawing. Air-dry the construction.

6. Label a key with matching colors and explanations of the color-change process. Add borders or other enhancements to your project before presenting the information to other students.

Adaptations

Look up any technical terms. Rephrase definitions and add the words to your spelling list.

Learn more about the effects that chemicals such as anthocyanin and tannin have on different species of plant leaves. Create accompanying models of these findings.

Mask parts of leaves on a tree as senescence begins. Graph the effect of sunlight on the process. Find out what happens at the stem site where the leaf falls off.

Assessment: Ask students to check each other's models for accuracy and clarity of presentation.

Benefits

Students gather information about photoperiodism and senescence.

Students visually represent their understanding about these processes in a 3-dimensional model.

Students graphically distinguish between colors in a key.

Grades

Grades 4 to 6

Grades 7 to 12

Subjects

Science
Visual Arts

Time

30 to 60 minutes
Multiple Sessions

Curriculum Standards Links

US: [Research U.S. Standards](#)

UK: [Research UK Standards](#)

Canada: [Research Canada Standards](#)


Safety Guidelines

Crayola Modeling Materials including Crayola Model Magic®, Model Magic Fusion™, Crayola Air-Dry Clay, and Crayola Dough With Small Parts— WARNING: CHOKING HAZARD—

Keep away from open flames. Do not use to make candleholders, hot plates, trivets, or other similar objects that will be used or placed near fire and other heat sources.

Do not put in an oven, microwave, or kiln.

Do not make into vessels/containers that will hold unpackaged food.

If the arts & crafts project involves making small objects, follow the small parts/choking hazards standards:  **WARNING: CHOKING HAZARD—** Small parts. Not for children under 3 years."

The use of modeling material to make items that look like food is discouraged for children younger than age 5 to avoid their confusion with real food.

Unless sealed with a water-resistant glaze, do not make projects exposed to or immersed in water, such as boats or outdoor bird feeders. They would disintegrate when exposed to moisture.

Crayola Dough—contains gluten (wheat flour) as an ingredient. Crayola Air-Dry Clay, Crayola Model Magic, and Model Magic Fusion are gluten-free. However, they are produced on the same machinery as Crayola Dough which does contain gluten. Although the machines are cleaned prior to the start of each production run, there is a slight possibility that trace amounts of gluten from Crayola Dough may be present in the other modeling compound products. For information regarding specific ingredients or allergic concerns, please call our Consumer Affairs department at 1-800-272-9652 weekdays

between 9 AM and 4 PM Eastern Standard Time.

Small Parts— **WARNING: CHOKING HAZARD—**Small parts. Not for children under 3 years.

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