FLORIDA PUBLIC ARCHAEOLOGY NETWORK

Wild Plant Technology

Students learn how the Timucua utilized wild plant as foods, clothing, tools, and medicines.

STUDENT LEARNING GOALS:
Students will understand how the Timucua utilized wild plants as food, clothing, tools, and medicines.

SUNSHINE STATE STANDARDS ASSESSED:

Science

- SC.7.L.17.2 Compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism.
- SC.8.N.2.2 Discuss what characterizes science and its methods.
- SS.8.A.2.7 Describe the contributions of key groups (Africans, Native Americans, women, and children) to the society and culture of colonial America.

Social Studies

- SS.8.G.5.1 Describe human dependence on the physical environment and natural resources to satisfy basic needs in local environments in the United States.
- SC.8.P.9.2 Differentiate between physical changes and chemical changes.

Language Arts

- LA.7.1.6.2 The student will listen to, read, and discuss familiar and conceptually challenging text.
- LA.7.4.2.2 The student will record information (e.g., observations, notes, lists, charts, legends) related to a topic, including visual aids to organize and record information, as appropriate, and attribute sources of information.
- LA.8.1.6.2 The student will listen to, read, and discuss familiar and conceptually challenging text.
- LA.8.4.2.2 The student will record information (e.g., observations, notes, lists, charts, legends) related to a topic, including visual aids to organize and record information, as appropriate, and attribute sources of information.

Mathematics

- MA.7.A.1.1 Distinguish between situations that are proportional or not proportional, and use proportions to solve problems.

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De Bry Engraving of Caring for the Sick http://fcit.usf.edu/florida/photos/native/lemoyne/lemoyne0/photos/lemoy019.jpg
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Fishing Net, from *The Timucua Indians – A Native American Detective Story*, reprinted with permission from the University Press of Florida

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Grapevine Basket, from *The Timucua Indians – A Native American Detective Story*, reprinted with permission from the University Press of Florida

Hickory Nuts http://upload.wikimedia.org/wikipedia/commons/thumb/9/90/Hickory_nuts_6060.JPG/222px-Hickory_nuts_6060.JPG

Passionflower http://upload.wikimedia.org/wikipedia/commons/thumb/3/35/Bildtankstelle_1_090.jpg/220px-Bildtankstelle_1_090.jpg

Sassafras: http://upload.wikimedia.org/wikipedia/commons/thumb/a/a8/Sassafras7.jpg/220px-Sassafras7.jpg

Saw Palmetto http://upload.wikimedia.org/wikipedia/commons/thumb/5/56/Serenoa_repens_USDA1.jpg/220px-Serenoa_repens_USDA1.jpg

Waxmyrtle http://upload.wikimedia.org/wikipedia/commons/thumb/c/c2/Starr_031108-0155_Morella_cerifera.jpg/220px-Starr_031108-0155_Morella_cerifera.jpg

Wild Garlic http://upload.wikimedia.org/wikipedia/commons/thumb/2/21/Allium_canadense.jpg/220px-Allium_canadense.jpg

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Woodpecker Painting http://upload.wikimedia.org/wikipedia/commons/thumb/4/43/WoodPanelBird.jpg/123px-WoodPanelBird.jpg

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MATERIALS LIST FOR "Rope Weaving" ACTIVITY: For class: A bag of raffia found in art stores or in the arts and craft section of superstores. A bag of approximately 10"x5"x 2" holds115 cubic inches of raffia. This contains more than enough material for this activity. Be sure to save your ropes so that you can use them in the natural dyes activity.

MATERIALS LIST FOR "Natural Dyes" ACTIVITY: *This activity is completed at home by the students. The teacher may complete his or her own dye project in the classroom using a crock pot to eliminate the need for a stove. Here's a list of other potential dye sources, not included in the student materials. They did not perform well in testing, but are mentioned repeatedly online if you wish to expand your options. Green: spinach, grass clippings. Purple: red grapes, crushed, or ½ head of cabbage, chopped. Yellow: saffron, turmeric. Orange: Carrots.*
Per Student: 1 raffia rope, 1 pot, water to boil, one item from the list of pigmented plant materials, one strainer, one bowl with a watertight lid, plastic bag to bring rope to class.

ANSWER KEY FOR "NATURAL DYES" ACTIVITY:

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Teacher Tips: *If you do your own project in the classroom, bring your raffia rope, plant material, and water to a boil (or as warm as it will get in the crock pot). Allow it to boil for 15 minutes. Follow student directions from here on.*

1) Even when two of us used the same dye material (walnut shells), one turned out lighter than the other. Reasons: Maybe one was left in the water longer and got darker. Maybe one dye bath used more shells than the other and got darker.
2) Beets and red cabbage both dyed the water they were boiled in a really dark red. But beets dyed the rope, and red cabbage did not. Maybe some dyes, like the liquid from red cabbage, do not bond well without a mordant. Also, onion skins make a lighter brown, while walnut shells make a darker brown. Maybe these colors are made by different chemicals in these plants.
3) Like all humans, the Timucua expressed their creativity through art. The French explorers wrote that the Timucua paintings on animal hides rivaled anything they'd seen in France.

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STUDENT ARTICLES, EXPERIMENTS, & ACTIVITIES:

1) What is Wild Plant Technology?
2) Food Plants
3) Medicines
4) Insect Repellent
5) Textiles (Woven Materials)
6) ACTIVITY: Rope Weaving
7) ACTIVITY: Using Natural Dyes

NEW TERMINOLOGY:

Aristotelian science, chemical change, cordage, correlation, cyanide, diameter, dye, essential oils, fermented, fibers, ingest, leach, mordant, ochre, oxidized, physical change, pigment, ply, raffia, sifted, textiles

ASSESSMENT OPTIONS:

Writing Prompt #1: Floridians use items made from plant materials every day. Think about the different ways you use things made from plants. Write to explain how you use three different items made from plants.

Writing Prompt #2: Today, if someone wants a new backpack, outfit, or game, they simply buy these items at the store. Think about how much more difficult it was to get a backpack,

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outfit, or a game when the Timucua Indians lived in Florida in 1564. Write to explain how they might have acquired these items in the days before stores.

Assessment #1: Based on your reading of the article titled, "Food Plants," explain how a single plant can be both poisonous and edible.

Assessment #2: Based on the article titled, "Food Plants," explain how some plants use chemical toxins to protect themselves.

Assessment #3: Based on your reading of the articles titled, "Textiles – Woven Materials" and "Activity - Rope Weaving," list four different plant parts used in the weaving process.

This engraving by Theodore de Bry depicts healing practices of the Timucua. The woman in the background may be carrying medicinal herbs. The man lying on the right is inhaling medicinal steam from boiling herbs.

Student Learning Enhancement

Questions to Generate Evidence of Application

- How will you *connect this to…*
- How does _____ affect _____?
- Describe the actions we could take to stop _____ from happening.

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Student Learning Enhancement

After gaining familiarity with the **New Terminology**, review with students the differences between a physical and a chemical change. Then, students will assign each word in the **New Terminology** to one of the following three categories. They should explain their reasoning with a follow-up statement.

1- This word is related to a Chemical Change.
2- This word is related to a Physical Change.
3- This word is not related to a Chemical or Physical Change.
4- This word is related to both Chemical and Physical Changes.

For example:

- When coontie palm is **fermented**, this is a chemical change because bacteria cause the cyanide in the plant to be released as a gas. The cyanide molecules are no longer bonded to the plant.
- The making of **cordage** is a physical change. Thin strands are woven into extremely strong rope. No chemical bonds are changed.
- **Aristotelian Science** is not related to a chemical or a physical change. It's just a type of observational science. OR it is related to both because you can observe and learn from observing both kinds of change in nature.

REVIEW:

A **physical change** is one in which a substance is basically the same before and after the change. It may change state (water boiling and turning to steam), be transformed into smaller pieces (a branch being carved into wood chips), or dehydrate (wet, squishy clay being dried into clay powder).

A **chemical change** is one in which a new substance is formed and chemical bonds are broken or created. Energy is often added or created in the process. Boiling an egg is a chemical change. When heat is added, it breaks covalent bonds, then allows them to reconnect in a different pattern. Burning wood chips into ash is a chemical change because combustion breaks the bonds in cellulose, releasing

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carbon and water (along with other chemicals). When pottery is fired, chemical bonds in the raw clay break. Water molecules are released. Alumina and silica molecules bond tightly to one another. The clay becomes a completely new, permanently hard substance called a ceramic.

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