

# VANISHING ACTS: TREES UNDER THREAT



## Purpose of this Guide

- To help teachers guide their grade 3 - 5 students through the Vanishing Acts exhibit.

## How to Use This Guide

- In this guide you will find lesson plans, worksheets, activities, and guided exhibit viewing questions specifically designed to help upper elementary students understand and appreciate the Vanishing Acts exhibit.
- Below is a list of the activities for students in 3<sup>rd</sup> – 5<sup>th</sup> grades.
- Next to the title of the activity is a recommendation for when this activity might be most beneficial for your students in relation to their visit to the Vanishing Acts exhibit.

## Included In This Guide

- |                                       |                    |
|---------------------------------------|--------------------|
| • Tree-mendous Trees Lesson Plan      | Pre-visit          |
| • Ideas for Related Activities        | Pre- or Post-visit |
| • Scavenger Hunt List                 | Pre-visit          |
| • Guided Exhibit Viewing Questions    | During visit       |
| • Vanishing Acts Discussion Questions | Post-visit         |
| • Anagram Handout                     | Post-visit         |
| • Crossword Puzzle                    | Post-visit         |
| • Anagram and Crossword Answer Page   | Post-visit         |

## National Science Content Standards Addressed

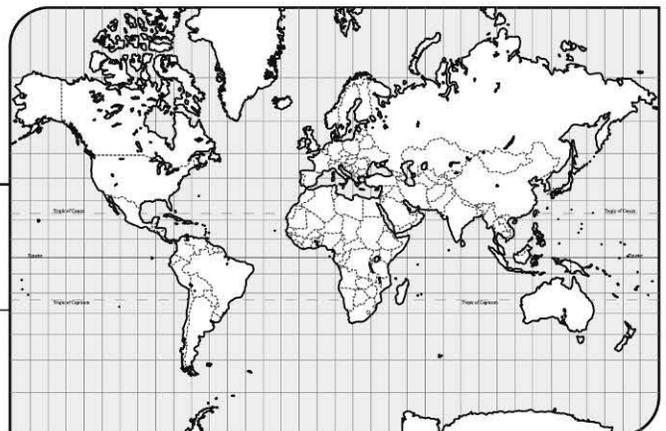
- Life Science (K-4): Organisms and environments
- Science in Personal and Social Perspectives (K-4): Types of resources
- Life Science (5-8): Populations and ecosystems
- Science in Personal and Social Perspectives (5-8): Populations, resources, and environments

## Time

- One 45 minute pre-visit class period
- One 15-20 minute post-visit class period

## Teacher's Guide

## Grades 3-5



# VANISHING ACTS: TREES UNDER THREAT



## **Lesson Plan Summary**

Before you visit the Vanishing Acts exhibit, discuss the many different purposes of trees. Through this scavenger hunt and discussion, begin to discuss the issues related to tree conservation. There are follow up questions to address with the students after they visit the exhibit. Through these lessons, help students understand that trees are tree-mendous!

## **Key Messages**

- Many every-day objects come from trees.
- Humans depend on trees. Trees depend on humans.

## **Guided Inquiry Questions:**

Use these questions to guide inquiry before and during the lesson:

- Why are trees important to humans?
- Why are trees important in the environment?
- What can humans do to help trees?

# VANISHING ACTS: TREES UNDER THREAT



## TREE-MENDOUS TREES LESSON PLAN

### PART ONE: TREE PRODUCTS (:45 MINUTES)

#### Supplied Needed

- Scavenger Hunt List (copies for students)
- Items from student homework (Scavenger Hunt List)
- Vanishing Acts Discussion Questions (copies for students)

#### Step 1: Pre-Activity Homework

Distribute scavenger hunt lists to students (see “Scavenger Hunt List”) a few days before you plan to complete this activity. You can either have the students find all the items on the list, or divide the list up into sections and have students find just a few of the items. Some items may be challenging to bring into the classroom. Have students bring pictures clipped from magazines or from the Internet.

#### Step 2: Sorting Activity

Have students work in pairs or small groups to discuss their items. Give the students 5-10 minutes to divide their items into two categories – items that are tree products and items that are not tree products.

#### Step 3: Tree Products

Step two was a bit of a trick...all of the items on the scavenger hunt list are tree products! To understand the whole process, we are going to break our items into categories.

1. Have the students divide out WOOD PRODUCTS.

- a. Wood products are easy to see...trees are cut, sometimes treated with chemicals to keep them from decomposing, and then products are made.
- b. Items in this category would be hammer handles, pencils, etc.
- c. What other products can the students think of that are made from wood? (The list is endless, but in a classroom you might see doors, tables, desks, etc.)
- d. Explain to students that wood is made of tiny fibers called cellulose and a natural glue that holds them together, called lignin. We will be exploring the uses of cellulose and lignin in just a few minutes!

# VANISHING ACTS: TREES UNDER THREAT



- e. In the Vanishing Acts exhibit, the *Pau brasil* and *Swietenia macrophylla* (Big-Leaf Mahogany) are described as providing important wood products. Have students explore the importance of these trees when they visit the exhibit.

## 2. Have the students divide out FOOD PRODUCTS.

- f. This can be very easy at a glance...but can get more complicated as you look closely. Almonds, fruit from trees, and vanilla extract (made from the vanilla bean) from are clearly from trees. Maple syrup is boiled sap from sugar maple trees...but chewing gum is made from the sap of trees as well!
- g. What other food products can the students think of that are from trees?
- h. In the Vanishing Acts exhibit, there is a section on the *Malus sieversii* (Wild apple). Encourage students to explore this section in-depth when they visit the exhibit.

## 3. Have the students divide out BARK PRODUCTS.

- i. Some bark products are very obvious, like cork bulletin boards. Cork is the outer layer of bark on a tree. The Cork oak is the primary source of most cork products sold around the world due to its large layer of cork.
- j. Many different types of bark are made into medicines. Bark from the *Taxus brevifolia* (Pacific Yew) is made into the cancer treatment medication Taxol (this is explained in the Vanishing Acts exhibit). Other medicines have also been made from the bark of trees, such as Quinine, derived from the bark of the cinchona tree to treat malaria before synthetic varieties were created. (Other parts of trees, such as roots, leaves and wood, have also been used as medicines.)
- k. In the Vanishing Acts exhibit, the section about the *Magnolia officinalis* and *Prunus africana* (Pygeum) explains how they are used as medicine. Have students pay attention to the explanation on this part of the exhibit.

## 4. Have the students divide out PAPER PRODUCTS made from CELLULOSE.

- l. Cellulose is a compound in plants that gives plants support. It is the main compound in wood. Paper mills use cellulose from different sources, including recycled paper, wood chips, and sawdust from wood mills. Wood chips and other sources of cellulose are "cooked" with chemicals to create a thick pulp. The pulp is then washed and filtered. Clean pulp is divided out and pressed onto screens where the water drains off. Different chemical processes and flattening methods are used to refine the pulp into different paper products, such as coffee filters, computer paper, and cardboard.
- m. Items in this category would be paper towels, notebooks, toilet paper, wrapping paper, etc.

# VANISHING ACTS: TREES UNDER THREAT



n. What other paper products can the students think of that are made from cellulose?

5. Have the students divide out other CELLULOSE PRODUCTS.

- o. Paper products made from cellulose are, like wood, fairly easy to see. But cellulose is used to make a wide variety of different products. It can be mixed with different chemicals to make fibers for carpets and wigs, and rayon for clothes and furniture! It is used to make cellophane, shatterproof glass, plastic for eyeglasses, thickeners for shampoo and toothpaste, and sausage casings.
- p. Items in this category would include anything not in the categories above, such as camera film, suntan lotion, crayons and sponges, toilet seats, tool handles not made of wood, etc.

## **Step 4: Vanishing Acts Exhibit Visit**

Visit the exhibit. There are guided questions to help students view the exhibit. Some of these questions will relate to the activity they completed in step three. However, pointing out different parts of the exhibit listed in step three while they are visiting the exhibit will help them with the discussion questions in step five.

## **PART TWO: POST VISIT DISCUSSION (:20 MINUTES)**

Distribute copies of the “Vanishing Acts Discussion Questions.” For younger learners, discuss each question before asking students to write their answers. For older learners, have students write their answers and then have a discussion about each question.

## **IDEAS FOR RELATED ACTIVITIES**

- Have students draw and label the different parts of a tree cross section. Be sure to include inner bark, outer bark, cambium, heartwood, and sapwood.
- Students can do research about local endangered plants and animals. Most states have a department of natural resources or department of conservation which will have this information on their website. This is a great, simple research activity for beginning Internet research projects!
- Turn the discussion questions from the post-visit discussion into an essay project. Each student can write an essay based on one of the discussion questions.

# VANISHING ACTS: TREES UNDER THREAT



## SCAVENGER HUNT LIST

Look around your house and find as many of the following items as you can. Put these items in a paper bag and bring them all in to school. As you gather your items, try to determine if they come from trees.

\* Some items may be very hard to find or too large to fit into a bag. For those items, find a picture from a magazine or the Internet and put the picture in your bag.

- |  |   |
|--|---|
| <input type="checkbox"/> Paper towels          | <input type="checkbox"/> Toilet paper             |
| <input type="checkbox"/> ALMONDS               | <input type="checkbox"/> WRAPPING PAPER           |
| <input type="checkbox"/> RUBBER BAND           | <input type="checkbox"/> CHOP STICKS              |
| <input type="checkbox"/> PENCIL                | <input type="checkbox"/> VANILLA EXTRACT          |
| <input type="checkbox"/> NEWSPAPER             | <input type="checkbox"/> Taxol (anticancer drug)* |
| <input type="checkbox"/> BASEBALL BAT          | <input type="checkbox"/> Linoleum*                |
| <input type="checkbox"/> CHEWING GUM           | <input type="checkbox"/> Electrical tape          |
| <input type="checkbox"/> SUNTAN LOTION         | <input type="checkbox"/> Popsicle stick           |
| <input type="checkbox"/> SHAMPOO               | <input type="checkbox"/> Sponge (synthetic)       |
| <input type="checkbox"/> NOTEBOOK PAPER        | <input type="checkbox"/> Plywood                  |
| <input type="checkbox"/> BOOK                  | <input type="checkbox"/> Tools or tool handles    |
| <input type="checkbox"/> CORK BULLETIN BOARD * | <input type="checkbox"/> Kitchen cabinets*        |
| <input type="checkbox"/> MAPLE SYRUP           | <input type="checkbox"/> Car or bike tire*        |
| <input type="checkbox"/> CRAYON                | <input type="checkbox"/> Camera film              |
| <input type="checkbox"/> RAYON CLOTHES         | <input type="checkbox"/> Toothpaste               |
| <input type="checkbox"/> CARPET                | <input type="checkbox"/> Fruit                    |

# VANISHING ACTS: TREES UNDER THREAT



## GUIDED EXHIBIT VIEWING QUESTIONS

**Name:** \_\_\_\_\_

Below are questions to answer while you are viewing the Vanishing Acts exhibit.

1. What are three reasons we should value threatened and endangered trees?
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
2. How many known tree species are threatened with extinction? \_\_\_\_\_
3. What tree has been used to create a medicine that helps treat cancer? \_\_\_\_\_
4. What is the name of the oldest living thing on earth? What type of tree is it?  
\_\_\_\_\_
5. List three threats that can endanger trees.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
6. Why are Fraser Fir trees, the most popular species of Christmas tree, threatened?  
\_\_\_\_\_
7. Why do scientists think that the Monkey Puzzle tree evolved to have spiny, scale-like leaves?  
\_\_\_\_\_
8. Which tree is used to make top quality violin, viola, and cello bows? \_\_\_\_\_

# VANISHING ACTS: TREES UNDER THREAT



9. What are two things you can do to help trees?

a. \_\_\_\_\_

b. \_\_\_\_\_

10. What is the coolest new information you learned from this exhibit?

\_\_\_\_\_

## VANISHING ACTS DISCUSSION QUESTIONS

**Name:** \_\_\_\_\_

1. Why are trees important to people?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Why are trees important in the environment?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. How would our lives be different if we didn't have trees?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# VANISHING ACTS: TREES UNDER THREAT



4. What can people do to help trees?

---

---

---

# VANISHING ACTS: TREES UNDER THREAT



## ANAGRAMS

Name: \_\_\_\_\_

Unscramble the words below. Use the list of words at the bottom of the page to help. Write the letters in the grey boxes in the space provided to find out the secret message.

1. knoemy zlzupe      \_\_\_\_\_ █ \_\_\_\_\_
2. ntlisibrceoe nepi      \_\_\_\_\_ █ \_\_\_\_\_
3. upa slabri      \_\_\_\_\_ █ \_\_\_\_\_
4. texnitc      \_\_\_\_\_ █ \_\_\_\_\_
5. degenerdna      \_\_\_\_\_ █ \_\_\_\_\_
6. ndwa woddoer      \_\_\_\_\_ █ \_\_\_\_\_
7. gbi flea hgaanmyo      \_\_\_\_\_ █ \_\_\_\_\_
8. tdthreeean      \_\_\_\_\_ █ \_\_\_\_\_
9. nesihce loangami      \_\_\_\_\_ █ \_\_\_\_\_
10. fapicic wye      █ \_\_\_\_\_

Secret Message: \_\_\_\_\_

### Words to Use:

Dawn Redwood  
Monkey Puzzle  
Wollemi Pine  
Pacific Yew  
Pygeum

Pau Brasil  
Big Leaf Mahogany  
Endangered  
Fraser Fir  
Threatened

Bristlecone Pine  
Chinese Magnolia  
Anhui Elm  
Extinct

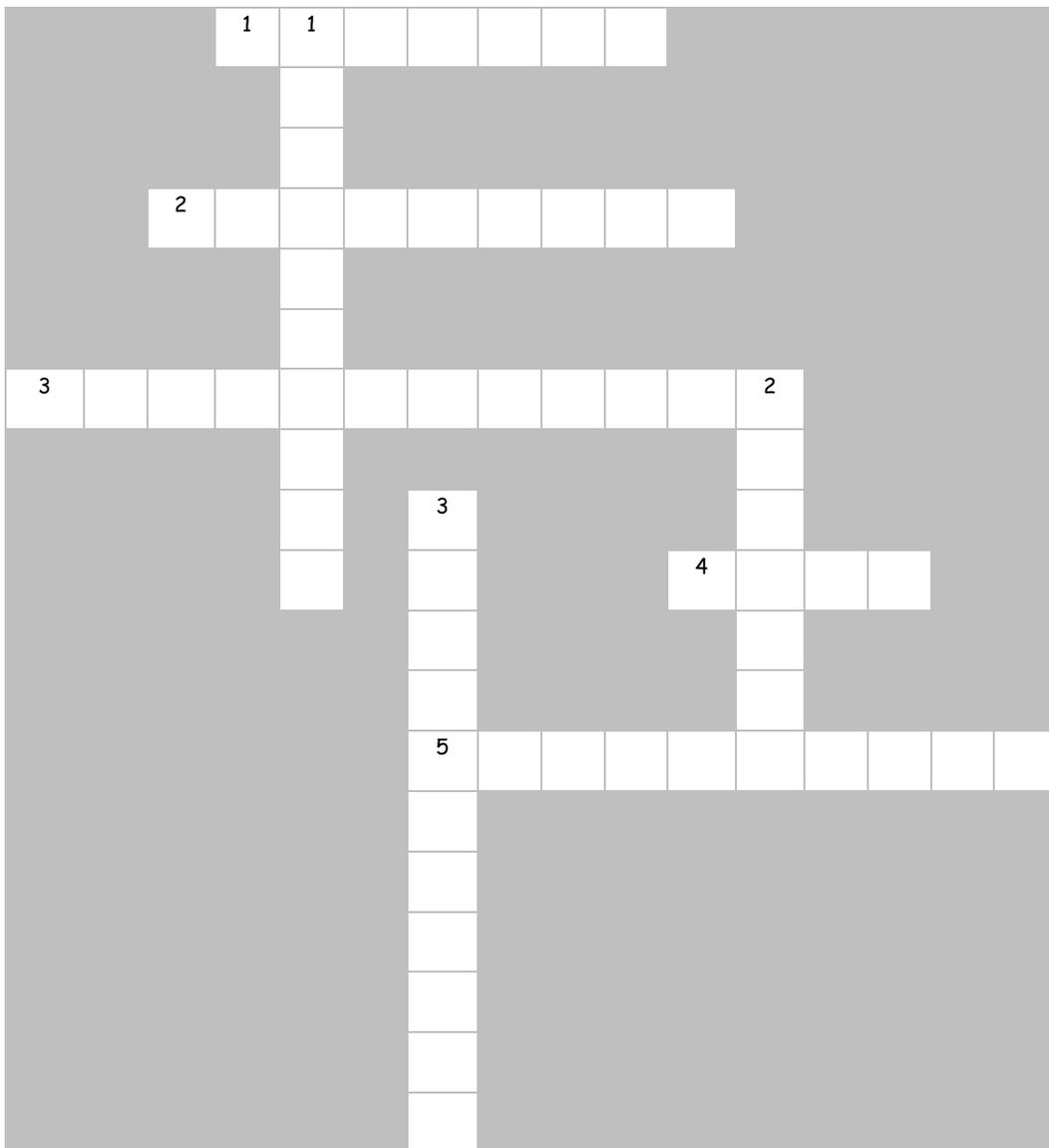
# VANISHING ACTS: TREES UNDER THREAT



## CROSSWORD PUZZLE

Name: \_\_\_\_\_

**Directions:** Use the clues below to answer the crossword puzzle. Think carefully about what you saw at the Vanishing Acts exhibit...all the answers were there!



# VANISHING ACTS: TREES UNDER THREAT



## CROSSWORD PUZZLE CLUES

### Across:

1. One way you can help trees is, instead of throwing out paper, \_\_\_\_\_ it.
2. This tree is sometimes called the "Cadillac of Christmas trees" and grows in the southern Appalachian Mountains. It is used as the White House Christmas tree more often than any other species.
3. This bizarre looking tree is unlike most conifers because it will grow south of the equator...but don't be fooled by the name, monkeys don't live near this tree.
4. Another way to help trees is to use less gas. Instead of riding in the car every day to school you could ride your \_\_\_\_\_.
5. \_\_\_\_\_ means that a tree's population is declining and is vulnerable to extinction.

### Down:

1. \_\_\_\_\_ means that the tree will soon be extinct if nothing is done.
2. \_\_\_\_\_ means that the tree has completely died out and there aren't any left of this species.
3. This type of pine tree grows in the western United States and is the oldest living thing on Earth.

# VANISHING ACTS: TREES UNDER THREAT



## ANAGRAM AND CROSSWORD ANSWER PAGE

### Anagram Answers:

1. Monkey Puzzle
  2. Bristlecone Pine
  3. Pau Brasil
  4. Extinct
  5. Endangered
  6. Dawn Redwood
  7. Big Leaf Mahogany
  8. Threatened
  9. Chinese Magnolia
  10. Pacific Yew
- Secret Message: You Can Help

### Crossword Answers:

Across:

1. Recycle
2. Fraserfir
3. Monkeypuzzle
4. Bike
5. Threatened

Down:

1. Endangered
2. Extinct
3. Bristlecone

# VANISHING ACTS: TREES UNDER THREAT



This traveling exhibit is  
made possible by a grant from:



© 2011. The Morton Arboretum