

ACTIVITIES

The following activities will help your students understand concepts and issues surrounding the topic of endangered species, as well as increase their awareness about their role in global conservation of endangered species. The majority of the activities included here are appropriate for students in grades 5-12. In the first section, “Activities for Grades K-4,” we have included several activities that can be conducted with younger grades. These activities are designed to give younger students an introduction to biodiversity, endangered species at the zoo and how individuals can make conservation a part of their everyday lives. The heading for each activity is organized in the following manner:

Title of the Activity

Grade Level; Subject Codes

Italicized background information for teachers.

Materials needed for the activity

We have suggested appropriate grade levels for each activity, but we encourage you to adapt activities for the level of your class. The subject codes list the different core subjects covered by the activity. These codes are based on core subjects outlined in the Essential Academic Learning Requirements (EALRs). Codes are as follows:

A = arts

C = communication

E = social studies - economics

F = health and fitness

G = social studies - geography

H = social studies - history

M = math

R = reading

S = science

V = social studies - civics

W = writing

If a certain part of an activity addresses a very specific component or components under one of the Essential Learnings, the component(s) will be listed in parentheses following that part of the activity. For example, if one section of an activity targets the third component under Essential Learning 2 in the core subject of mathematics, (Math 2.3) would be listed after that section of the activity. (Refer to the Washington State Essential Academic Learning Requirements for listings of the Essential Learnings and components at <http://www.k12.wa.us>.)

ACTIVITIES FOR GRADES K-4

Endangered Species Scavenger Hunt

Grades 1-4; R, S

Materials: “Endangered Species Riddles” list included in this packet (one per group), pens or pencils

- Before a trip to Woodland Park Zoo, discuss with your students the various causes of the loss of biodiversity (see the section on “What Is Causing the Loss of Biodiversity?” in this packet).
- At the zoo, organize your students into small groups with one chaperone for every six students. Hand out a copy of “Endangered Species Riddles” to each group.
- Instruct the chaperones to read the riddles aloud to their group of students, or have students take turns reading. If the students know answers to some of the riddles right away, they should write down the names of the animal next to the riddles.
- If there are riddles to which the students don’t know the answers, they should be able to find the answers by reading signs (or having the chaperones read the signs) as they visit exhibits throughout the zoo.
- When the students see each animal or find its exhibit at the zoo, they can check off the corresponding riddle.

Extension: Students can find an animal not described in one of the above riddles. Individually or in groups, instruct students to make up a riddle about this animal. The riddle should include a few words about the animal’s habitat and one of the reasons the species has become endangered.

Answers to Riddles:

Tropical Rain Forest

Riddle 1 = western lowland gorilla

Riddle 2 = jaguar

Riddle 3 = orchid

Riddle 4 = golden lion tamarin

Riddle 5 = red ruffed lemur

Tropical Asia

Riddle 6 = Malayan tapir

Riddle 7 = African elephants

Day Exhibits

Riddle 8 = West African dwarf crocodile

Riddle 9 = yellow-spotted side-necked turtle
(also in Tropical Rain Forest)

Near Day and Night Exhibits

Riddle 10 = Humboldt penguin

Trail of Adaptations

Riddle 11 = Malayan sun bear

Riddle 12 = snow leopard (near Australasia)

Riddle 13 = clouded leopard

Raptor Center

Riddle 14 = barred owl

Temperate Forest

Riddle 15 = red panda

Endangered Species Riddles

WOODLAND PARK ZOO

TROPICAL RAIN FOREST

Riddle 1:

"I live in a troop and beat my chest.
When I want to sleep I crawl into my nest.
I love the trees that make my home,
But now most of the trees are gone."

Riddle 2:

"I am a large cat from the forests
of Central and South America.
You know that my habitat is shrinking fast.
I have also been hunted for my spotted coat.
That is why I am endangered,
though I wish I were not."

Riddle 3:

"Some call me an 'epiphyte'
because I grow on other plants.
My flowers bloom in the rain forest
where there are leaf-cutter ants.
People cut down the trees. I don't know why they did.
Now you don't see many of me. I'm an _____."

Riddle 4:

"I am a tiny primate with a silky, golden mane
My kids ride on their father's back, even in the rain!
I live in the rain forests of Brazil
which are getting smaller and smaller
For me, it would be best if the trees
grew taller and taller."

Riddle 5:

"I'm not a dog, but they call me 'ruffed.'
If you saw my tail, you'd say it was fluffed.
The trees that I climb on my island are mostly gone.
As for me, some say it won't be long."

TROPICAL ASIA

Riddle 6:

"I'm black and white from head to tail,
But I'm not a zebra or quail.
My habitat may disappear
And I may too, I fear.
You might not read about me in the paper,
I live in Malaysia and I'm a _____."

Riddle 7:

"Our noses are long and we have big ears.
People have hunted us for many years.
They want our tusks to sell away.
There aren't many of us left, I hate to say."

DAY EXHIBIT

Riddle 8:

"You might find me resting in the water.
I live in West Africa, where the temperature is hotter.
If people didn't hunt me, my species might survive,
Let's hope that in a thousand years, we will still be alive."

Riddle 9:

"I live in the tropical rain forest,
but I'm not an amphibian, fish, mammal or bird.
If I get scared I can tuck my head under my shell,
I live with others of my kind, but we're not called a herd.
People hunt me for meat and eat my eggs.
If you want to help protect me, say the word!"

NEAR DAY AND NIGHT EXHIBITS

Riddle 10:

"My back is black and my stomach is white.
I fly through the water by day and sleep at night."
I hunt for anchovies off the desert coast,
They are what I like to eat most.
Humans have taken most of my anchovies away,
Which is why I am endangered today."

TRAIL OF ADAPTATIONS

Riddle 11:

"I am the smallest bear alive,
I love to eat honey straight from the hive.
I suffer from hunting and habitat loss,
What would you do for me if you were the boss?"

Riddle 12:

"My home is in the mountains
high in Asia, so remote,
I'm in danger of extinction
Since I'm hunted for my coat."

Riddle 13:

"The spots on my coat look like
dark clouds in the sky,
But people often hunt my species,
and my beautiful coat is why.
Where I live in the forests of Asia,
the spots help me blend in,
If you don't buy fur coats,
you can help me and my kin."

RAPTOR CENTER

Riddle 14:

“Old growth forest shelters me
I’m dark brown, spotted white,
My eyes are dark with mystery
I call “whoo-hoo” at night.”

TEMPERATE FOREST

Riddle 15:

“In temperate forests of Asia I climb in the trees,
I eat a few bugs, but I eat a lot of bamboo leaves.
I look like a raccoon but most of my fur is red.
And I have white patches of fur on my head.
My species is endangered because
many of the forests we grew up in are gone.
People are now living where I used to make my home.”

Domestic Animals and Technology Game

Grades K-4; H, A

Materials: drawing/painting materials, paper

In preparation for the activity, assign one of the animals, machines or products listed below to each student or pair of students, depending on the size of your class. Have each student draw his/her object on a half-sheet of paper. The students, or the teacher, can label each object in large letters at the bottom of the page.

Chickens

Horses

Cattle

Dogs

Goats

Pigs

Oxen

Sheep

Cats

Animal manure

Pesticides

Tractors

Landfills

Traps

Chemical fertilizers

Herbicides

Mowers

Polar fleece

Rat poison

Security alarms

- In the Family Farm area at Woodland Park Zoo, or in your classroom, discuss with your students the importance of domestic breeds of animals and how many of them are disappearing. Ask the students if they can think of reasons why domestic breeds may be disappearing. One of the reasons, which you may choose to highlight for this game, is the replacement of animals with machines or other modern technologies to perform many functions on the farm. (History 3.3)
- At the zoo or in the classroom have students stand in a large circle. One at a time, have students who drew domestic animals hold up their drawings. Ask the students who drew machines or other nonliving things to raise their hands if any of their pictures of modern machines or products perform the same function the animals used to perform. (ex. sheep-mowers).
- If your class is at the zoo, after completing all the matching, find animals in the Family Farm that were discussed during the game. See if the class can find the signs in the Family Farm that indicate what breeds of farm animals are kept at the zoo. While observing each animal, ask the students if they can remember what functions the animals perform on family farms.

TEACHER KEY

The following list shows domestic animals matched with modern conveniences:

Draft horses and oxen — tractors

Poultry and pigs (eat insect plant pests and weeds) — pesticides/herbicides

Grazing species — mowers

Poultry, goats and pigs (eat garbage) — landfills

Sheep for wool and other fibers — plastics and synthetics, polar fleece

Watch dogs — security alarms

Animal manure — chemical fertilizers

Cats and dogs (hunt rodents) — rat poison and traps

Re-Use It Projects

Grades K - 4; A

Materials: items gathered from home that can be “re-created,” such as toilet paper tubes, small boxes, yogurt/salsa containers, old magazines, film containers, etc.

- Have your students invent ways to make used products into practical objects. These items can also be used to create art projects, instead of using new, expensive materials; however, a practical object may have a longer “second-life” than an art project. The following are several suggestions:
 - ◆ Three toilet paper tubes and/or used juice cans glued together and stood on end can serve as pen and pencil holders.
 - ◆ Decorate empty soup cans with paper and use to hold scissors, pens, pencils and other arts and crafts supplies.
 - ◆ Cover a used cereal box, with the top flaps removed, with decorative paper or brown paper and add your own designs. Use the box to keep paper that has been used on one side; then students can use the clean side of the paper to sketch, write drafts or make lists.
 - ◆ Used milk cartons can be made into hanging bird feeders.
 - ◆ Cut the bottom two inches off of a used plastic milk jug to make a “scooper.” Using a soft ball or crumpled piece of scrap paper, use the scoopers to play “scoopball.”

Re-Use It Project: Endangered Species Mobiles

Grades K - 4; A, S

In this activity, students create mobiles illustrating an endangered species, its habitat, what the species eats and/or what eats it, and threats the species faces in the wild.

Materials: wire coat hangers, used cardboard (cereal boxes or the like), short lengths of yarn or string, used animal/nature magazines

- Have each student cut the cardboard into five 2”x2” squares, (or you can cut them out in advance).
- On one card, students should draw a picture of an endangered species. Older students can write down its common and scientific name. If the cardboard is not blank, draw pictures on paper and then glue them onto the cardboard.
- On the other cards students should write or illustrate 1) the species’ native habitat, 2) reasons the species has become endangered, 3) what the species eats or what eats it, 4) how humans are hurting and/or helping the species. (Science 1.3)
- On the backsides of the card, older students can include interesting facts about the species that they found out while researching. Younger students can cut and paste pictures of the animal or it’s habitat from magazines.
- When the cards are complete, students should hang them, using different lengths of yarn or string, from the wire hangers. Mobiles can be displayed in the classroom or other rooms in the school building.

Oregon Silverspot Butterfly Habitat Mural

Grades K-4; A, S

Materials: early blue violet, yarrow and Scot's broom coloring pages (included in this packet); orange and brown tissue paper (cut into butterfly shapes, approximately four inches wide, several per student), black pipe cleaners (bent in half, one per student), thick green pipe cleaners (1 inch-long pieces, two per student), wiggly eyes

- Copy and distribute one of each of the three coloring pages to each student. Using the coloring guides on the back of the page, have students color in the plants as accurately as possible.
- Give each student several layers of orange and brown tissue paper butterflies. Step 1: Instruct the students to insert the butterflies into the folded pipe cleaner and (step 2) twist the free ends of the pipe cleaner together to create antennae (see diagram). Students can make caterpillars out of their green pipe cleaners by curving them or gluing on wiggly eyes.
- After they have colored the plants and made butterflies and caterpillars, use the following natural history information to introduce your students to the Oregon silverspot butterfly, a species listed as endangered in Washington state and as threatened under the ESA, and its habitat requirements. You may want to emphasize the life cycle of butterflies and the importance of different plants in different stages of the butterflies' lives.

The Oregon silverspot butterfly¹ lives in dunes along the coast in Washington state. These butterflies only lay their eggs on plants called early blue violets². When the caterpillars hatch, they eat the leaves of these plants and grow bigger and bigger. Eventually, the caterpillars go through metamorphosis, when they change from caterpillars into adult butterflies. Instead of chewing on leaves for food, butterflies drink nectar from flowers. Some of the flowers Oregon silverspot butterflies visit to get nectar are called yarrow³, Canada goldenrod⁴ and Douglas aster⁵. These plants grow along the coast in Washington. In Washington state, there are not very many Oregon silverspot butterflies left. Chemicals that people use can get into water and onto plants and hurt animals such as caterpillars and butterflies. In some places, weedy plants that come from other parts of the world have grown over areas where the plants that Oregon silverspot butterflies and caterpillars need to survive used to grow. One of these weedy, exotic (or foreign) plants is called Scot's broom. People can help Oregon silverspot butterflies and other species by reducing their use of chemicals in their homes and yards. Some people are also helping these butterflies by removing the weeds such as Scot's broom, growing early blue violets and planting them in the dunes where many of them used to grow. This provides plenty of food for the caterpillars, which only eat this kind of plant.

- On a wall of the classroom or school hallway, have your students use the pictures they colored and butterflies and caterpillars they made to create a mural of Oregon silverspot butterfly habitat. Include both the native plants and the nonnative Scot's broom.
- As a class or individually, write short paragraphs about Oregon silverspot butterflies, their habitat, why they are endangered and what people are doing to help them. The paragraph (or paragraphs) can be posted alongside the mural for other students and teachers to read.

TEACHER INFORMATION

Common Name	Scientific Name
Oregon silverspot butterfly ¹	<i>Speyeria zerene hippolyta</i>
early blue violets ²	<i>Viola adunca</i>
yarrow ³	<i>Achillea millefolium</i>
Canada goldenrod ⁴	<i>Solidago canadensis</i>
Douglas aster ⁵	<i>Aster subspicatus</i>

ACTIVITIES FOR GRADES 5–12

Conservation Starts At Home! Be A Consumer for Conservation!

Grades 5-12; G, S

Materials: scrap paper, pens or pencils

- Have your students make lists of things they can do at home to practice wise use of resources upon which both humans and wildlife depend. In addition, have your students think of ways they can be conservation-minded consumers. Ask your students how wise-use and conservation-minded actions might change the impact of humans on the environment. (Geography 3.1, Science 1.3)
- After creating a long list as a class, have each student write a conservation pledge, choosing five things from the list that they will try to do at home or at the store. (Many of these can also be practiced in the classroom.) Encourage students to involve their families in their efforts. Keep a calendar or chart in the classroom for students to evaluate how they are doing with their conservation pledges — they can draw a star or other symbol on the days they do something that helps to fulfill their pledge.

The following list includes several ideas of how to use less and promote a clean environment for all species.

- ◆ Recycle every product that won't be reused; this includes newspapers, cardboard, paper, tin cans, steel, aluminum, glass and motor oil.
- ◆ Avoid the use of paper products where reusable products can be substituted. For example, use cloth napkins, towels, tablecloths, placemats and handkerchiefs; and use ceramic plates and bowls or use sturdy plastic that can be washed and reused. Use old clothes for cleaning rags as they can easily be washed and used over and over.
- ◆ Use a lunchbox rather than disposable bags, and pack lunches in reusable containers. Use (and reuse) a sturdy glass or plastic bottle to bring your favorite drink for lunch instead of buying soda or juice in cans or bottles.
- ◆ Practice using less water. (For example, turn off the water while you are brushing your teeth.)
- ◆ When helping with chores, be sure that washing machines and dishwashers are completely full before running them. This saves water.
- ◆ Conserve electricity, particularly during peak hours of 5:00-7:00 p.m. Turn lights off whenever not in use.
- ◆ Ride your bike or walk to school, the library or a friends' house instead of asking your parents to drive.
- ◆ Help your parents pull weeds in the garden so they won't have to use chemicals.
- ◆ Offer to wear more layers in the house if your parents will turn down the heat.
- ◆ Help your parents to be conservation-wise consumers by searching out products made of or packaged in recycled and recyclable materials when you are at the store.
- ◆ Buy foods in large packages and then pack them in reusable containers for snacks or lunches—this reduces wasted packaging.

Grades 9-12; W, G

Materials: scrap paper, pens or pencils

- Complete the listing activity as written above for grades 5-12. Then, instruct your students to write a short informational paragraph or fictional story describing the relationship between one of the conservation actions (or failure to do one of the actions) listed above (or from the list created by the class) and plants or animals. For example, a fictional story could follow a chemical spilled in the backyard to a local stream where salmon live. An informational paragraph could describe the process of mining bauxite, an ore found in tropical soils that is used to produce aluminum, and how using fewer cans and recycling as many as possible could save tropical rainforests and the species that live there.
- If your students need more information in order to complete their paragraphs or stories, you can encourage them to do some research in the library or on the Internet.

Conservation In Your Community

Grades 5-12; V, C, G

Materials: scrap paper, pencils or pens

- Have your students brainstorm, research and list ways they can participate in and increase awareness of conservation of endangered species by being active in their own communities. Encourage students to learn about endangered and threatened species and share their knowledge with others, emphasizing how human choices and activities have significant impacts on our environment. (Geography 3.1)
- Have each student write up a conservation pledge, listing two activities from the list they created that they will try to do in their community. Be sure to emphasize that working together with other students, their families or other members of the community may help students to accomplish their conservation pledges. (Communication 3.2)
- After one month, or at the end of every month, ask students to share with the class how they are doing with their conservation pledge. Which activities are easy to do? Which ones are more difficult? What would make some of the activities easier to accomplish? Can students make conservation a part of their everyday lives?

The following is a list of several ways students can practice and be involved in conservation in their communities.

- ◆ Be informed about wildlife and conservation issues in your area. Find information in newsletters of local conservation organizations, local newspapers or on web sites of conservation organizations or the Washington Department of Fish and Wildlife (www.wafw.gov/wdfw). Share this information with classmates and/or your family.
- ◆ Visit zoos, aquariums, nature centers and wildlife refuges near you to learn more about wildlife and the issues which threaten the survival of wild species.
- ◆ Pick up trash when you are walking in your neighborhood or near your school, when you are out hiking, and when you visit parks or beaches. Recycle any items you find that are recyclable.
- ◆ Support, volunteer for, or join conservation organizations. Many organizations have “adopt-an-animal,” “adopt-an-acre” and other similar programs. These organizations can also provide information on endangered species (see “Conservation Organizations” in the “Resources” section of this packet).
- ◆ Participate in stewardship programs to save or restore local habitat.
- ◆ Plant native plants in your backyard or at school. Better yet, create your own backyard wildlife sanctuary using native plants (see the resources section in this packet for more information).
- ◆ Educate your friends and family — spread the word! Write an article for your school newspaper about local wildlife or conservation issues or design a poster to hang in your school hallway.
- ◆ Be politically aware and active. Write to your congressional representatives and express your opinion about conservation issues. (See “Tell It Like It Is: Writing Letters to Legislators” in this Activities section.) (Civics 4.3)

Re-Use It Project: Slug Catchers

Grades 5-7; S

In this activity, students use plastic soda bottles to make slug traps which can be used in schoolyard habitats or gardens at home to control slugs. As an introduction to this activity, you may want to discuss the issue of introduced species with your students. In the Pacific Northwest we have many native slugs which mainly inhabit temperate forests. However, the vast majority of slugs in our backyards are species introduced from Europe. In the absence of their native predators, these slugs can exist in large numbers and damage plants in backyard or schoolyard gardens. Many gardeners resort to chemical methods of ridding their gardens of slugs. By making slug traps, students can help their families avoid the use of chemicals, which can enter local watersheds, in their yards. You may want to show your students pictures of banana slugs so they know what this native species looks like, though the chances of this species being in a backyard or schoolyard are slim.

Materials: used plastic soda bottles (small or large), scissors

- To make a slug trap, remove and discard the top from the soda bottle. Cut the top third off of the bottle. Invert the top and fit it into the bottom two-thirds of the bottle.
- To attract slugs, pour a handful of dry cat or dog food or other food scraps into the bottle and add a bit of water to moisten the food. Place the bottle upright in a shallow hole in the garden, so that the lip of the bottle is approximately level with the surface of the ground. You can also lay the bottle on its side on the surface of the ground.

- Slugs will be attracted to the food and will crawl down into the bottle, but will not be able to escape. Live slugs can then be collected for use in classroom observations. Alternatively, non-native slugs can be left and allowed to die so they will not damage garden plants.
- Students can use this opportunity to explain to their parents the importance of finding alternatives to chemicals for controlling pests and weeds in the garden.

Tell It Like It Is: Writing Letters to Legislators

Grades 6-12; W, V

Through writing letters to their legislators, students will become familiar with writing formal letters firmly stating their opinions. Students will gain a more thorough understanding of current issues involving endangered species and will understand the role that each citizen plays in the United States government.

Materials: newspapers, magazines and/or Internet access; typewriter/computer for letter-writing

- Individually, have your students research current issues involving endangered species, either locally or globally. Newspapers or the Internet may be used for finding up-to-date information.
- Each student should choose one current issue or proposed legislation related to endangered species that they feel strongly about. To search for current bills related to endangered species, access thomas.loc.gov/home/thomas.html and type “endangered” into the keyword box. Depending on whether the issue is a local one or a national/international one, have each student choose a state or U.S. representative and compose a letter to him/her. To find your U.S. congresspeople (Senators and Representatives) you can access congress.org and enter your ZIP+4 Code. To find your state legislators you can access dfind.leg.wa.gov and enter your ZIP+4 Code. (If you don’t know your ZIP+4 Code, access <http://zip4.usps.com/zip4/welcome.jsp> to find out what it is.)
- Students should use the following formats when writing letters to legislators:

For U.S. Senators the address and greeting should read as follows:

First and Last Name
The Honorable
United States Senate
Washington, DC 20510

Dear Senator _____,
(Last Name)

For any member of the State Senate:
The Honorable First and Last Name
PO Box 40482
Olympia, WA 98504-0482

Dear Mr. or Ms. _____,
(Last Name)

For U.S. Representatives the address and greeting should read as follows:

First and Last Name
The Honorable
United States House of Representatives
Washington, DC 20515

Dear Mr. or Ms. _____,
(Last Name)

For any member of the State House of Representatives:
The Honorable First and Last Name
PO Box 40600
Olympia, WA 98504-0600

Dear Mr. or Ms. _____,
(Last Name)

- The layout of the letter should follow a business letter format:

<p>First and Last Name The Honorable United States Senate Washington, DC 20510</p> <p>Dear Senator _____, Last Name</p> <p>Wiakasdlawi akje8i dfnkima k eimns'gi akdiw aksienm idie skig akisekawi iwmfk,gnc,a ksdi</p> <p>w vlksdaisenf asdjasidfa sdiasd ai fnlai fnal;ielaiepqw' alkf fidiaweasl fieia</p> <p>Sincerely yours,</p> <p>(your signature here)</p> <p>Your First and Last Name Your Address Your City, State, ZIP Your Phone Number</p>
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- *Note to students:* Letters to legislators should state clearly and concisely the issue that concerns you and what your stand is on the issue. Letters should include concrete statements about why you feel the way you do about the bill or issue.
 1. In the first sentence of the letter, state your concern. Be sure to refer to House Bills by their number or popular title so that the legislator will know to which bill you are referring.
 2. In the next several sentences, provide specific examples that support your stand on the issue. You may want to include information on how the bill or issue affects you and your community. It is important for legislators to hear your own experiences and observations, rather than form letters or excerpts of other letters on the same topic.
 3. Revise your letter before typing or printing it out and sending it. Try to keep your letter to a single page — short, concise letters stand a better chance of being read. Firmly state your opinions, but avoid writing angry or threatening letters.
- After sending their letters, students may choose to make follow-up phone calls. The U.S. House of Representatives switchboard number is (202) 225-3121 and the Senate's main number is (202) 224-3121. To contact Washington state legislators, call the state legislation hotline at 1-800-562-6000. When calling U.S. congresspeople, ask to be directed to the office of your congressperson. The staff member who takes your call will take notes and pass them on to your congressperson.
- Students should continue to follow their bill or issue in the media and on the Internet. Set aside a few minutes each week for students to report any new developments concerning the bills or issues to the class.

Wild Animals Do Not Make Good Pets

Grades 5-9; E

This activity allows students to make informed choices about pets and to realize that, although habitat destruction is the primary cause for species endangerment, there are other contributing factors, including the pet trade.

Materials: pamphlets included in this packet

- Based on the information provided in the section “Exotic Pets and Plants...Why Not?” in this packet, discuss with your students the pros and cons of domestic pets, pets taken from the wild and exotic pets. Can your students describe the differences between wild animals and exotic pets? What does it mean when an animal is “captive bred”? Students may need to look up definitions in the dictionary to help with this discussion.
- To avoid supporting the harmful trade of animals, have students brainstorm things they can do (use the following suggestions to aid the discussion):
 - ◆ Buy only domestic pets such as dogs, cats, guinea pigs or rabbits. Most wild animals have a difficult time adjusting to life in captivity and soon die.
 - ◆ Never take animals from the wild as pets.
 - ◆ If you are interested in buying a bird or reptile, make sure that the animal is captive bred. Choices for captive bird species include: budgerigars (parakeets), canaries or cockatiels. Ask shop owners for documentation proving that the animals were born in captivity.
- What suggestions can students come up with to avoid contributing to the problem of introduced species? Use the following suggestion to aid the discussion.
 - ◆ Never release pets, such as reptiles, fish, amphibians or insects into the wild.
- Discuss with your students the concepts of supply and demand. What do they think would happen if everyone in the world stopped buying exotic pets taken from the wild? What changes might owners of exotic pet stores make in the way they run their shops? Do the students think that their economic choices might affect the decisions of shop owners? How would populations of some endangered animals be affected? What would happen if a certain species of reptile, which was not easily bred in captivity, became popular as a pet and the demand for it increased? How might shop owners address the increased demand for that reptile? How might populations of the reptile be affected? (Economics 1.1)

Extension: Have students visit pet stores in their neighborhoods and talk with the owners about the native habitats of the animals that are in the store. If the animals are exotic, were they captive bred? Do the shop owners have documentation showing that the animals were born in captivity? Encourage students to also do their own research to find information on the native habitats of animals they see in the pet stores in order to crosscheck the information they obtain from the shop owners. Students can report their findings to the class.

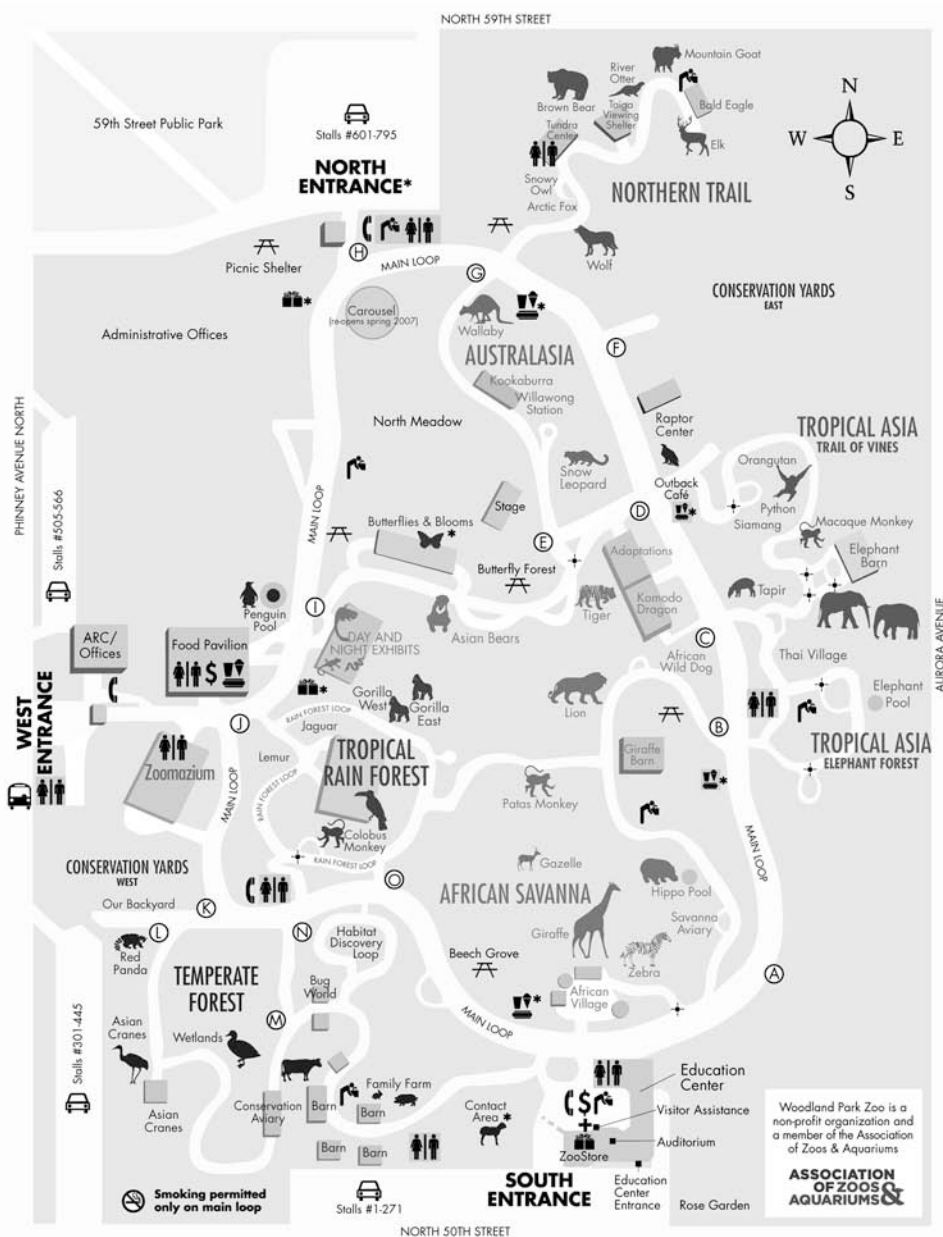
Endangered Species: Observations At the Zoo

Grades 5-8; S, A

Materials: “Endangered Species Observations At the Zoo” activity sheet included in this packet (one copy per student), “Animal Behavior Observations and Research” activity sheet included in this packet (one copy per student), list of “Endangered Species at Woodland Park Zoo” included in this packet, pencils, animal fact sheets included in this packet, zoo map, clipboard (or stiff cardboard with clip), stopwatches or wristwatches

- In the classroom: Review the list of endangered species at the zoo with students before their visit. Ask each student to pick one endangered species to observe when the class goes to the zoo. Students may want to gather some background information on their animals, such as habitat and diet, before going to the zoo.
- Use the zoo map to determine where the chosen animals are exhibited on the zoo grounds. In preparation for the zoo visit, separate students into small groups. (Keep in mind that at the zoo, you are required to have one chaperone for every six students.) The groups can be determined by the locations of the species that the students have selected so that there is time to visit each of the students’ animals.
- At the zoo: In their chaperoned groups, have students find their selected animals on zoo grounds. On the “Endangered Species Observations At the Zoo” activity sheet, have the students carefully draw pictures of the selected endangered species and answer the questions on the activity sheet. Signs posted at exhibits and other locations around the zoo may also help students to answer the questions and gather more information.

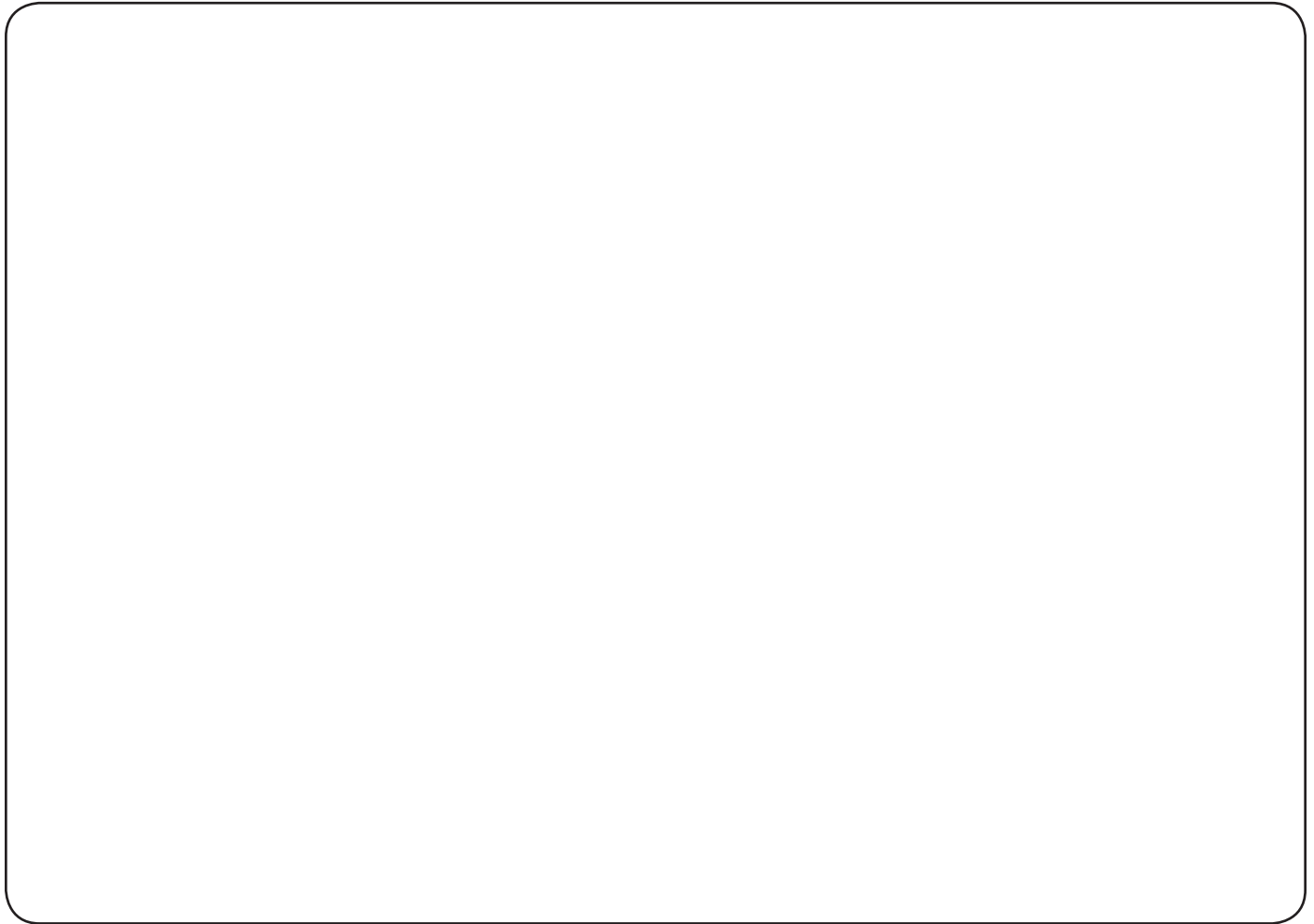
Extension: After completing the “Endangered Species Observations” sheet, have each group of students conduct further observations on one of the endangered animals they just visited. Have each group complete one “Animal Behavior Observations and Research” sheet. Back in the classroom, ask your students to pretend that they are a team of animal behavior scientists. Using the information they gathered and their initial observations, have each student write down three questions about the animal they observed for the “Behavior Observations and Research” sheet. The questions should be ones that the students could potentially answer by conducting long-term observations of the animals in the zoo or in the wild (Science 2.1). The questions should be simple enough to be answered through observation, measurable (for example, “How much time do the penguins spend in the water?” as opposed to “Do the penguins like being in the water more than being on the rocks?”), and interesting to the students. If they wish, students can share their questions with the class and describe how they might conduct observations in order to answer the questions.



Endangered Species Observations at the Zoo

Instructions: Use the back of this sheet if necessary to complete your answers.

Draw a picture of an endangered species at the zoo. Be sure to include its natural habitat in the background, any other animals sharing its enclosure, and a sign indicating its status in the wild.



This is a _____.

This animal's habitat is _____ where the weather is usually

_____.

_____ are endangered because

_____.

The zoo is helping to save this species by _____

_____.

Animal Behavior

OBSERVATIONS AND RESEARCH

Researcher's Name _____

Date _____ Time _____ Location _____

Species Name _____ Number of animals _____

Description of Animal _____

Description of Habitat (exhibit) _____

Behavior Chart: Watch the animal(s) for several minutes. During each minute, put a mark under the behavior you observe. You can make comments at the bottom of the page.

Minutes	Sleeping	Inactive Awake	Eating	Grooming (licking/touching)	Caring for young	Active/ play	Other
1							
2							
3							
4							
5							

Behavior Notes: If you see any behaviors you think are interesting or noteworthy, write them down. Use the backside of this page for additional notes if necessary.

Endangered Primate Behavior Observations

Grades 5-6; S, W, C

Materials: pencils, clipboard (or stiff cardboard with clip), scrap paper, stopwatches, clear plastic bags (to cover clipboards if it rains), “Primate Behavior Observation Stations: Grades 5-6” list in this packet (one per group of students),

- Before visiting the zoo, ask each student to come up with a list of behaviors he/she expects to see while watching primates at the zoo. Students should bring these lists with them on the zoo trip.
- At the zoo, divide students into chaperoned groups, with one adult for every six students. Students must stay with their chaperones at all times.
- Have each group start at one of the 10 observation stations on the “Primate Behavior Observation Stations” list included in this packet. Each group should choose four of the ten possible stations to visit.
- The chaperone can read aloud the question(s) posed for that station to the students. At each station, students will observe the animals for three to 10 minutes (depending on the age of the students). Students can record their observations of the animals, the animal behaviors and the exhibits by writing and/or drawing. It is possible that at some stations, animals will not be visible. If this is the case, students can write and/or draw quick descriptions of the animals’ enclosures. This information might also help to answer the questions posed for each observation station.
- After observing and recording their observations, each group should decide upon an answer (or answers) to the question(s) posed at the station. The questions at most of the stations would require hours of observation in order to be answered with statistical accuracy, however, short observations can provide some preliminary ideas. After answering the question, each group moves to another station.
- Back in the classroom, have each student write a short paragraph comparing and contrasting the primate behaviors they expected to see and the behaviors they actually observed at the zoo. Students should formulate questions that arise from these comparisons. Have the students write whether or not they think they could answer these questions through continued observation at the zoo. Could they answer the questions through observation of primates in the wild? (Science 2.1)
- Have each group of students present their answers to the questions for the stations they visited. This could be an oral presentation or a poster to be displayed in the classroom. Students may want to create visual ways of presenting the data they gathered while on zoo grounds and the answers to the questions on the “Primate Behavior Observation” sheet.

Endangered Primate Behavior Observations

Grades 7-12; S, W, C

Materials: pencils, clipboard (or stiff cardboard with clip), scrap paper, stopwatches or wristwatches, clear plastic bags (to cover clipboards if it rains), “Primate Behavior Observation Stations” list in this packet (one per group of students), camera (optional)

- Prior to the zoo field trip, have each student create a list of primate behaviors he/she expects to see while observing primates at the zoo. Students should bring these lists with them to the zoo. In addition, each student should formulate a question relating to primate behavior that they can attempt to answer while making observations at the zoo. For example: I expect to see primates grooming one another. Do primates often switch between being the “groomer” and the “groomee”? Or does the groomer always groom and the groomee always get groomed? (Science 2.1) Note: Prepare students for the fact that they may not observe behaviors related to their question. Scientific researchers often reformulate their questions after initial observations. Students may also need to reformulate their questions after some initial observation.
- At the zoo, divide students into chaperoned groups, with one adult for every six students. Students must stay with their chaperones at all times.
- Have each group start at a different primate exhibit (refer to “Primate Behavior Observation Stations: Grades 7-12”). Each group should choose four stations from the list to visit. The number of stations visited may vary depending on which animals are visible and on the students’ questions.
- At each station, students will observe the animals for five to 10 minutes. Students should record their observations of the primates, their behavior and the exhibits by writing and/or drawing. It is possible that at some stations, animals will not be visible. If this is the case, students can write and/or draw quick descriptions of the animals’ enclosure. This information might also help to answer the questions the students formulated.
- If possible, students can take photographs of the animals to use in their presentations back in the classroom.
- After recording their observations, the students move on to another exhibit.
- Back in the classroom, have each student write a short paper about the question he/she formulated before the zoo visit. Why did the student choose that question? Was he/she able to make observations at the zoo that helped to answer the question? If so, the student should describe the observations and explain how he/she answered the question. If not, the student should use his/her observations to formulate a new question (related or unrelated to the old question) that could be answered through observation at the zoo. What kind of observation or research would the student need to do in order to answer the original question?
- Have each student present his or her observations. This could be an oral presentation or a poster to be displayed in the classroom. Each presentation should include comparisons of behaviors the student expected to see and behaviors the student actually observed while at the zoo.

Primate Behavior Observation Stations

WOODLAND PARK ZOO

Grades 5-6

TEACHER KEY

Note: Depending on the students' observations, their answers to the questions may vary. As this is mainly an exercise in observation, there are no wrong answers. The following information may aid the teacher in leading a follow-up discussion of the activity.

Station #1: black and white colobus monkeys (Tropical Rain Forest outdoor exhibit)

Do black and white colobus monkeys move over the tops of the branches and jump from branch to branch or do they swing underneath the branches? Do black and white colobus monkeys sit on top of the branches or do they sit on the ground?

Colobus monkeys, like other monkeys, generally move about by walking over the tops of branches and often leap from branch to branch. This is different from apes, such as siamangs, which generally move about by swinging underneath the branches. Colobus monkeys are tree-dwellers, and will most often be found sitting on top of the branches.

When black and white colobus monkeys groom one another, which part of the body is most often groomed: head, arms, back, stomach, legs, tail?

The answers to this question will be based on the students' observations.

Station #2: red-ruffed lemurs (Tropical Rain Forest outdoor exhibit)

Can you observe (with your eyes or your ears) ways in which lemurs communicate with one another? Might they communicate in ways that you cannot see or hear?

Lemurs communicate in a number of ways. Students may hear lemurs call, or they may find the button on the sign near the lemur exhibit which plays a recording of lemur calls. Lemurs may communicate with one another visually by crouching or bending in different positions. A method of communication students may not be able to observe is olfactory. Lemurs have many scent glands in various places on the body, such as forearms and the base of the tail. These glands leave scent marks, which can serve to attract mates or advertise territory. Students may observe lemurs rubbing parts of their bodies against branches or rocks in their exhibit, or they may observe lemurs sniffing at objects that have been previously scent-marked.

Station #3: golden-lion tamarins (Tropical Rain Forest indoor exhibit)

Are you able to determine whether there are tamarins of different ages and sexes in the exhibit? If so, how? If not, why not? How many individual tamarins did you observe?

As Woodland Park Zoo breeds these endangered primates, students may observe an older male and female with offspring. It is difficult to distinguish between male and female golden lion tamarins. This is true for many species and can therefore make field observations a challenge for researchers. The number of tamarins observed can vary.

Station #4: gorillas (either of the two groups — Tropical Rain Forest outdoor exhibit)

Which gorillas spend the most time close to or touching each other? Which gorilla or gorillas spend most of the time apart from the other gorillas?

These answers will depend on students' observations. There are informative signs posted and there may be docents in the area to help students determine the relationships of the gorillas in the troops.

Station #5: patas monkeys (African Savanna)

Do patas monkeys climb trees or run on the ground and hide in the grass?

Patas monkeys are ground-dwelling primates and will most often be seen moving through or hiding in the grass. However, one member of the troop will often be "on the lookout" and may climb up into a pile of branches in order to gain a better perspective.

Station #6: pygmy marmosets (Trail of Adaptations)

Do pygmy marmosets move around a lot or sit still for long periods?

The answers will depend on students' observations. However, in comparison to other species the students may have observed, such as reptiles or some felines, the marmosets will probably be more active.

Station #7: orangutans (Trail of Vines)

Which orangutans spend the most time close to or touching each other? Which orangutan or orangutans spend most of the time apart from the other orangutans?

The answers will depend on students' observations. If students also complete observations at Station #5 (gorillas) they can compare their observations from these two stations. Students can use identification signs at the exhibit to aid them in telling the orangutans apart.

Station #8: siamangs (Trail of Vines)

In which parts of their exhibit do each of the siamangs spend the most time in? What factors can you observe that may affect their location in their exhibit?

The answers will depend on students' observations. Factors that may affect the siamangs' locations in their exhibit include food, number of visitors and visitor behavior, presence of keepers, etc.

Station #9: lion-tailed macaques (Trail of Vines)

How do lion-tailed macaques move around in their exhibit and in what types of habitats might they be found in the wild?

Lion-tailed macaques are monkeys, so they generally move over the tops of the branches. From signs at the exhibit, students can learn that lion-tailed macaques live in tropical forests of India.

Primate Behavior Observation Stations

WOODLAND PARK ZOO

Grades 5-6

Station #1: black and white colobus monkeys (Tropical Rain Forest outdoor exhibit)

Do black and white colobus monkeys move over the tops of the branches and jump from branch to branch or do they swing underneath the branches? Do black and white colobus monkeys sit on top of the branches or do they sit on the ground?

When black and white colobus monkeys groom one another, which part of the body is most often groomed: head, arms, back, stomach, legs, tail?

Station #2: red-ruffed lemurs (Tropical Rain Forest outdoor exhibit)

Can you observe (with your eyes or your ears) ways in which lemurs communicate with one another? Might they communicate in ways that you cannot see or hear?

Station #3: golden-lion tamarins (Tropical Rain Forest indoor exhibit)

Are you able to determine whether there are tamarins of different ages and sexes in the exhibit? If so, how? If not, why not? How many individual tamarins did you observe?

Station #4: gorillas (either of the two groups — Tropical Rain Forest outdoor exhibit)

Which gorillas spend the most time close to or touching each other? Which gorilla or gorillas spend most of the time apart from the other gorillas?

Station #5: patas monkeys (African Savanna)

Do patas monkeys climb trees or run on the ground and hide in the grass?

Station #6: pygmy marmosets (Trail of Adaptations)

Do pygmy marmosets and/or Goeldi's monkeys move around a lot or sit still for long periods?

Station #7: orangutans (Trail of Vines)

Which orangutans spend the most time close to or touching each other? Which orangutan or orangutans spend most of the time apart from the other orangutans?

Station #8: siamangs (Trail of Vines)

In which parts of their exhibit do each of the siamangs spend the most time in? What factors can you observe that may affect their location in their exhibit?

Station #9: lion-tailed macaques (Trail of Vines)

How do lion-tailed macaques move around in their exhibit and in what types of habitats might they be found in the wild?

Primate Behavior Observation Stations

Woodland Park Zoo

Grades 7-12

Station #1: black and white colobus monkeys (Tropical Rain Forest outdoor exhibit)

Station #2: red-ruffed lemurs (west of Tropical Rain Forest outdoor exhibit)

Station #3: golden-lion tamarins (Tropical Rain Forest indoor exhibit)

Station #4: gorillas (either of the two groups — Tropical Rain Forest outdoor exhibit)

Station #5: patas monkeys (African Savanna)

Station #6: pygmy marmosets (Trail of Adaptations)

Station #7: orangutans (Trail of Vines)

Station #8: siamangs (Trail of Vines)

Station #9: lion-tailed macaques (Trail of Vines)

Zoos: Hope for the Future

Grades 5-8; S

Students will gain insight into zoos as centers for captive wildlife management, breeding of endangered species and public education by searching for information about these conservation efforts throughout the bioclimatic zones at Woodland Park Zoo.

Zoos exist to promote wildlife conservation through captive breeding, research, education and support of field conservation programs. Woodland Park Zoo maintains a successful breeding program for many endangered animals. These programs are supported by behavioral research which improves captive management. To achieve successful captive breeding, Woodland Park Zoo has:

- 1. created habitats that simulate the animals' wild habitat,*
- 2. reduced the number of species in its collection to achieve the best possible management of each species,*
- 3. kept animals in appropriate social groups, and*
- 4. cooperated with other zoos in captive management programs (Species Survival Plans).*

Mixed species exhibits, groups of animals in spacious exhibits, and naturalistic exhibits are all indications of the zoo's commitment to conservation and captive breeding. Offspring born to endangered species on exhibit are good evidence that a breeding program is effective and that the animals' needs are being met. Sometimes viewing is restricted or exhibits are closed to afford privacy to a mother and baby, or a mother-to-be. Of course, babies of many species are born or hatched only in some seasons, so absence of young does not necessarily mean a lack of a good breeding program. Instead, a keen viewer might look for more subtle clues, such as courtship behavior, availability of nesting material, eggs, nests, breeding dens, or special areas suited for young animals.

Education is an important part of the zoo's mission. Zoos work hard at providing people with an understanding of the animal's behavior and role in nature. Zoos carefully design signs and labels for this purpose. Zoo signs give information on the animal's distribution, status in the wild, reasons why it is endangered, rare or threatened, or what conservation measures are being planned.

Zoo educators, zookeepers and zoo volunteers provide information to visitors through tours, lectures, or demonstrations giving the zoo visitor a special, personal experience. Interactive exhibits, landscape immersion and naturalistic exhibits all contribute to the zoo visitor's discovery of wildlife. One of the most important challenges for the zoo is to create a caring public response toward all wild species and empower the zoo visitor to make a difference for wildlife survival.

Materials: "Zoos: Hope for the Future" student activity sheet included in this packet (one per student), clipboards or stiff cardboard, pens or pencils

- Review with students the role of modern zoos as outlined above and the information in the "Conservation Programs at Zoos, Aquariums and Botanical Gardens" section of this packet.
- At the zoo, the student activity sheet will be used somewhat like a scavenger hunt. Give students the list of things to look for and have them check them off as they tour the zoo. The intent of this activity is to make students more aware of the role of zoos as conservation organizations.
- For the zoo visit, divide your students into small groups. Keep in mind that the zoo requires a ratio of one chaperone for every six students. Students must remain with their chaperones at all times.
- Back in the classroom, students can share their observations with their classmates. What comments do the students have about breeding programs at the zoo? In what ways are zoos important for conservation? Why is educating the public important for conservation?

Zoos: Hope for the Future

Instructions:

As you tour the zoo, study the exhibits carefully to find evidence of the zoo's efforts to help endangered species and educate the public. Use the indicators listed below to help you. Add others that you may find. Place a check next to each indicator when you find it. Then note the exhibit or area in which it was found. Write any additional comments in the space provided, or on the back.

Indicators		Exhibit(s) or Area(s)	Notes
Naturalistic exhibit			
Social animals exhibited in groups			
Babies on exhibit			
Viewing restricted or exhibit closed due to birth or expectant female			
Courtship or mating behavior			
Presence of nesting material			
Presence of eggs or nest			
Presence of breeding dens or closed-circuit monitors			

Male/female breeding pairs or herds			
Adults separated for breeding			
Information on off-site breeding areas			
Information on Species Survival Plans or other captive management program			
Presence of interpretive signs, labels or graphics			
Informative and interesting text on signs			
Availability of lectures, tours demonstrations, or programs			
Availability of brochures or maps			
Special interpretive areas with participatory devices			
Other			

(Adapted from W.I.Z.E: Module 2 Survival Strategies with permission from the New York Zoological Society)

Endangered Species Around the World

Grades 5-7; R, W, G

In this activity, students will learn about endangered species from different parts of the world as well as geographical and cultural information about those parts of the world. Alternatively, this activity could focus on endangered species of Washington state, in which case, have each student choose an endangered species in Washington state (see the “Species of Concern in Washington State” list in this packet) and complete the same worksheet (you may need to alter several of the row headings).

Materials: books about endangered species, world reference books, Plant and Animal Fact Sheets included in this packet, old magazines (to cut), world map included in this packet (one copy per student), “Endangered Species Around the World” chart in this packet (one copy per student), Internet access (optional), colored pencils or crayons

- Copy and hand out to each student the world map worksheet. From a list of endangered species (you can use the list included in this packet of “Endangered Species at Woodland Park Zoo”), have each student choose one or two endangered species to research.
- Have each student draw pictures of his/her chosen species or cut out pictures from magazines (students can also make photocopies of pictures from books). Have the students glue the pictures of their species along the edges of the world map worksheet. Each student should find out what continent, or countries, their species inhabits and use colored pencils or crayons to indicate on the world map the range of their species (Geography 1.1).
- If your class is able to take a field trip to the zoo, much of the information needed to fill out the chart can be found by carefully reading the signs located at or near exhibits.
- Students can use books in the classroom or library, as well as magazines and the Internet to research information about their species to complete the “Endangered Species Around the World” chart. Students may also want to consult local newspapers and current wildlife magazines, as well as television and radio news reports, to gather information on environmental issues and conservation legislation concerning their species. Completed charts can be posted in the classroom or the hallway for other students to see.

Extension: Have each student write a short story, using the complete writing process (prewrite, draft, revise, edit, publish), about traveling to one of the regions of the world inhabited by one of their species. (Writing 2.2 and 3.1 - 3.5) The story should include an encounter with or sighting of an endangered species that lives in that region of the world. The story could also incorporate other information gathered on the student’s “Endangered Species Around the World” chart.



Endangered Species Around the World

Endangered Species #1

Endangered Species #2

Common name of endangered species		
Continent or country the species inhabits		
Habitats and/or climate of the region		
Threats to the species in the wild		
Other animals that inhabit the region		
Languages spoken by people in the region		
Foods eaten by people of the region		
Interesting notes about the species, people or region		

Endangered Species Detectives

Grades 5 -12; R, G, S

This activity is based on the Endangered Species School Program offered for grades 5 and up at Woodland Park Zoo. If your class is planning to come to the zoo and participate in the Endangered Species School Program, please do not complete this activity in your classroom.

In this activity, students act as “environmental detectives,” examining clues and deducing the causes behind the endangerment of a species of plant or animal. At the conclusion of the program, students become aware of the fact that species throughout the world suffer from common threats which can cause them to become endangered.

Materials: “Endangered Species Clue Sheet” included in this packet, pencils or pens

In preparation for the activity:

- Choose (or have the class choose) one endangered species of plant or animal to be the focus of the mystery. You may want to choose an animal that your students are not very familiar with so that they don’t already know the solution to the mystery. Depending on the grade level and abilities of your students, you can divide them into three or four groups and have each group design their own mystery for the rest of the class to solve. Each group should choose their own endangered plant or animal. To conduct the activity as a class, you or an assistant can do the following steps to create a mystery.
- Through research, have each group find out what has caused the plant or animal to become endangered. There are many factors which can cause the endangerment of species, but the major reasons include habitat loss, introduced species, pet/product trade, overhunting/overharvesting, and pollution which are all directly related to human population growth.
- Once each group is familiar with the history of the decline of the species, have students in each group design and make “clues” which relate to the causes of the species’ decline. For example, if you were to use the bald eagle as a focus, clues might include a broken egg, a fake can of pesticide, a picture of a clear cut or a polluted river, etc. If need be, make descriptive tags for the clues.
- Have each group set out their clues on a table.

Conducting the activity:

- Introduce the game to your students by asking them what they know about endangered species. Do they think it matters if species disappear? Why or why not?
- Lead your class in a discussion of human population growth. Do they think that the world population of humans is increasing at a fast rate? If you wish to include a short video which illustrates the speed of human population growth in recent times, contact Population Connection. See the “Resources” section in this packet for contact information.
- Explain to your students that they are going to be environmental detectives. Tell them about the endangered species you (or they) have chosen and explain to them its status in the wild (how it is listed under the federal Endangered Species Act and/or your state endangered species list).
- Using the same groups used for the preparations above, pass out one Endangered Species checklist to each group. One student should be the recorder and reporter for the group. Have each group visit one table (not their own) for about 10 minutes. Instruct the students to examine the “clues” and mark the boxes on their clue sheet according to which of the common causes of endangerment the clue is related. For example, in the bald eagle case, the students might check the box under pollution for the fake can of pesticide.
- Once each group has finished examining the clues at their table, have the reporters tell the rest of the class their group’s results. Which factors received the most checks? Ask the class if they think that any of the factors are interrelated. What kinds of effects do increasing human populations have on each of the causes of species endangerment? (Science 1.3, Geography 3.1) The group that designed the mystery can then explain to the class what they learned about the species and its status while they were creating the mystery.
- As a class, make a list of ways that individuals or groups can become a part of conservation solutions. Relate actions directly to the common causes of endangerment: habitat loss, introduced species, pet/product trade, overhunting/overharvesting, and pollution. For example, not using chemicals in the garden prevents pollution and getting together with a community group to remove exotic plants at a local park helps to control introduced species. What kinds of things are already being done to address these problems? How can students support organizations that are working for conservation of biodiversity?

Endangered Species Clue Sheet



	Hunting/ Harvesting (Pet and product trade)	Pollution	Introduced Species	Habitat Destruction	Related to human population?
Clue #1					
Clue #2					
Clue #3					
Clue #4					
Clue #5					
Clue #6					
Clue #7					
Clue #8					
Clue #9					
Clue #10					

History of Zoos and Conservation

Grades 7-12; H, S, R

Through an exploration of the history of zoos, students will understand the origin of conservation ideas in society, how these ideas have been shaped and changed over time, and how these ideas and technological developments have influenced the survival of endangered species. (History 3.2 - 3.3)

Materials: Suggested resources include:

- Croke, Vicki. *The Modern Ark — The Story of Zoos: Past, Present and Future*. New York: Scribner, 1997.
- Goddard, Donald, ed. *Saving Wildlife: A Century of Conservation*. New York: Harry N. Abrams, Inc., in association with the Wildlife Conservation Society, 1995.
- Koebner, Linda. *Zoo Book: The Evolution of Wildlife Conservation Centers*. New York: Tom Doherty Associates, Inc., 1994.
- Wiese, Robert J. and Michael Hutchins. *Species Survival Plans: Strategies for Wildlife Conservation*. Wheeling, WV: American Zoo and Aquarium Association, 1994.
- Worster, D. *Nature's Economy: A History of Ecological Ideas*. 2nd ed. Cambridge, England: Cambridge Press, 1994.

- Using the suggested resources or others that are appropriate, have your students create chronological timelines documenting significant events in the history of zoos.
- Ask your students to write short essays describing the changes in attitudes towards nature and parallel developments in the design and purpose of zoos over time.
- As the final component of the project, have each student research a modern technology that has been employed in conservation in zoos or in the field. In a short presentation to the class, students should describe when the technology became incorporated into conservation, how it works and what are the implications of the common use of this technology for endangered species. Topic ideas include radiotelemetry (tracking animals using radio collars and receivers), DNA fingerprinting (a method of identifying an individual by analyzing DNA), artificial insemination, computer database records of populations of animals (International Species Inventory System), and embryo transfer. (Science 3.2)

Conservation Careers

Grades 7-12; R, W, S

Materials: books, magazine articles and Web sites containing information about people who have been involved in the conservation of endangered species

- Have students write either:
 1. a short biography of a person who has been involved in the conservation of endangered species or habitats in some way (Writing 2.2) or,
 2. a short essay focusing on a conservation topic (such as primates, tropical forests, etc.) that includes biographies of several scientists or other people who have contributed to the conservation of the animals, plants or habitat. (Writing 2.2)
- The biographies should include information about the profession (or professions) that the people were involved with (such as field research scientist, photographer, writer, etc.) and the technologies and skills that were used for conservation work in each profession. (Science 3.2)

Habitat and Human Population

The following two activities may be conducted independently of one another. However, when completed in conjunction with one another, students will have the opportunity to connect the rapid loss and fragmentation of habitat with increasing population pressures on our ecosystems.

1) WHAT HAPPENED TO MY HABITAT?

Grades 5 - 12; S

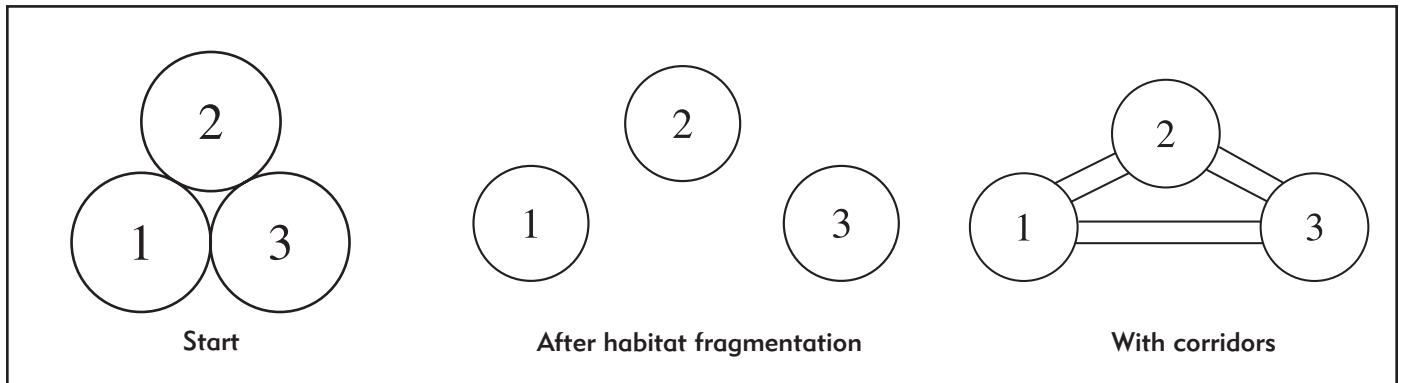
One of the major problems facing many animal species presently is the loss of habitat. The area of quality habitat available for animals shrinks, or is broken into small pieces (habitat fragmentation), when surrounding areas are developed. This affects the animals' abilities to fulfill their basic needs (food, air, water, shelter, space), find mates and raise young. In addition, isolated populations of animals may face genetic problems due to inbreeding and/or decimation due to disease, which can spread quickly through populations in restricted areas. Natural disasters can also have major impact on small populations located in isolated areas.

Materials: three long lengths of twine or string (30" to 45" long), six shorter lengths of twine or string (6" to 10" long), paper squares of four different colors (equal numbers of each color, enough for one card per student — female leopards, male leopards, prey and water. If your class is not divisible by four, make extra prey and water cards.)

- Find a large area (field or multipurpose room) and set out the long lengths of twine to create three large circles which all touch but do not overlap each other (see diagram). Divide the class into three equal groups and have each group stand in one of the circles.
- Mix up the paper squares and randomly pass them out, one per student. Tell the students what the paper squares represent. For example, red squares are female leopards, purple squares are male leopards, yellow squares are prey, blue squares are water. In order to be a complete "survival group" the students must form groups that include one female leopard, one male leopard, and at least one prey and one water. (There can be more than one prey and water in each group.)
- Give the students 30 seconds to wander among the circles and find "survival groups" by standing next to other students. The students may not even need to leave their circles in order to find the other students they need to make a "survival group." (To avoid any conflicts, make it clear to the students that once a person is standing next to other students in their "survival group" they cannot move or be taken away from that group.)
- Record the number of leopards (both male and female) that did not form a complete "survival group". Collect the paper squares from all of the students and mix them thoroughly. Run two more trials in this manner, recording the number of leopards that did not form complete "survival groups" each time.
- Introduce the concept of habitat destruction and describe or have the students think of different human activities that may make habitat undesirable for leopards. Now tighten each of the circles by several feet making sure they no longer touch and explain that the habitat now in between the circles has been developed or destroyed. Leopards can neither live in, nor move through the destroyed habitat areas.
- Ask the students what problems the leopards may face in their shrinking habitat that is now isolated from other populations of leopards. Can they reach leopards (potential mates) from other areas? Can they reach the water or prey species found in another area?
- Distribute the cards from the pile to the students in the circles. Give the students 30 seconds to try to form "survival groups." Remind them that they cannot move out of their own circle. Record the number of leopards that did not form complete "survival groups." Run two more trials in this manner, recording the number of leopards that did not survive each time.
- Individually or as a class, calculate the average number of leopards that did not survive the first three trials and the average number of leopards that did not survive the three trials that were run after the habitat was fragmented. As a class, discuss the results. Ask the students to brainstorm what could have been done to address the problems that occurred when their habitat was destroyed and fragmented. (Students might think of different ways of allowing travel between circles of intact habitat. Corridors could be illustrated by laying down short lengths of twine between the circles and allowing individual leopards to move through the corridors from one piece of habitat to another. Your class could run three more trials of the game with the corridors in place, allowing leopards to move between circles.) You may want to limit the number of students allowed in a corridor at a time.
- With older students, you may get into the topic of genetic diversity and how corridors would allow genetic "mixing," which ensures a wide variety of genes within each population. Students can brainstorm reasons that this genetic mixing is important. ***Note:** If your students have completed, or will complete, the "Making Matches: SSP Coordination" activity in this packet, you can relate the two activities. Through Species Survival Plans (SSPs),

people attempt to facilitate optimal genetic mixing within populations of captive animals that are essentially isolated from one another. When wild populations of animals are isolated from one another, there are limited opportunities for genetic mixing. Do your students think humans should get involved in this situation? How could humans be involved?

Extension: After completing the above activity, have your students research different species that have been affected by habitat loss or fragmentation. Topics to be covered could include what kinds of human activities or natural occurrences caused the habitat destruction, how has the animal’s population changed with increases in human activity, what efforts are being made to stop or reverse the problem, what would their suggestions to address the problem be? The last question could include creating a budget to implement a conservation program for the animal.



2) POPULATION GROWTH MATH

Grades 5-12; M, E, S

In this activity, students will compute projected populations of several countries around the world and think about the impact of human population growth on habitats and species. While discussing the results of calculations with your students, it is important to remember that population density alone does not determine impact on the environment: the effects of population on an ecosystem are multiplied by lifestyle habits, particularly consumption.

Materials: calculators, pencils, “World Population Data” chart in this packet (updated information can be found at www.pbr.org.)

- Using information from the “World Population Data” chart included in this packet, have your students calculate what the populations of the countries on the chart will be in the year 2012 (assuming the populations continue to grow at the current rate). Students may use calculators to find their answers.
- Older students should be able to determine the steps to follow to complete these calculations. Provide younger students with the following steps:
 - Step 1: multiply the 2006 population by the percent annual increase (remember to convert the percentage to a decimal),
 - Step 2: add the result of the first calculation to the 2006 population to obtain the 2007 population,
 - Step 3: repeat using each consecutive year’s population to calculate the next year’s population.
- Next, have your students calculate the current population density of the countries and the population density of the countries in 2012 if the population keeps growing at the current rate. *(Divide the population by the land area to obtain population per square mile. Be sure students use proper decimal placement to obtain people/square mile as opposed to millions of people/square mile.) (Math 1.1)*
- Ask your students to share their ideas about the increasing loss of wildlife habitat as human populations grow. **Note:** *Be sure you discuss with your students the relationship between population, consumption and impact on the environment. Consumption habits multiply the effects of population on ecosystems.*
- Students should ponder the different lifestyles and consumption habits in different areas of the world — how do consumption habits affect the ecological impact of populations in different parts of the world? Do the students think that curbing the growth of human population would make a difference? What other social, cultural, and economic changes (i.e. changes in consumption habits) could be made in order to prevent the loss of biodiversity? (Geography 3.1, Science 1.3, Economics 1.1)
- Ask your students how they think this exercise relates to the topic of endangered species. If they have done the “What Happened to My Habitat” activity, ask your students how this exercise is related to that activity.

Teacher Key

Country	Projected population in 2012* (millions)	Population per sq. mile, 2006	Projected population per sq. mile, 2012
Mali	16.6	29	34.6
Malawi	14.8	279	323.5
United States	309.9	80	83.3
Paraguay	6.9	40	44.2
India	1,236.2	884	973.9
Singapore	4.7	18,652	19,506.3
Ireland	4.4	156	162.2

*projected population based on current rate of natural increase.

Information from: World Population Data Sheet. Washington, DC: Population Reference Bureau, 2006.

World Population Data

STUDENT ACTIVITY CHART

Country	Continent	Population mid-2006 (millions)	Births per 1,000 Population	Deaths per 1,000 Population	Rate of Natural Increase (annual %)	Projected Population in 2012* (millions)	Land Area (sq. miles)	Population per sq. mile 2006	Projected population per sq. mile 2012
Mali	Africa	13.9	50	18	3.2		478,838		
Malawi	Africa	12.8	44	18	2.6		45,745		
United States	North America	299.1	14	8	0.6		3,717,796		
Paraguay	South America	6.3	22	5	1.7		157,046		
India	Asia	1,121.8	24	8	1.7		1,269,340		
Singapore	Asia	4.5	10	4	0.6		239		
Ireland	Europe	4.2	15	7	0.8		27 ,135		

*projected population based on current rate of natural increase.

Information from: World Population Data Sheet. Washington, DC: Population Reference Bureau, 2004. www.pbr.org

3) TOUCH THE EARTH... POPULATION GROWTH AND HABITAT LOSS CALCULATIONS

Grades 6-12; M

This activity is designed to precede a visit to Woodland Park Zoo where the “Touch the earth...” display can be seen just inside the South Gate. The display illustrates the current growth rate of the earth’s human population and relates human population growth to habitat and species loss worldwide.

Materials: calculators, pencils, paper

- Have your students calculate the population of the earth on the day your class will visit the zoo. Starting with 5,847,000,000 people as of August 1, 1997, add 236 thousand people per day to the world’s population. (This is based on an increase of 2.73 people per second according to the Population Reference Bureau, July/August 1997.) (Math 1.1)
- Have your students calculate acres of habitat lost from August 1, 1997, to the day you will visit the zoo. Starting with 17,500,000,000 acres of remaining wild habitat as of August 1, 1997, subtract 101 thousand acres of habitat per day. (The acres of remaining wild habitat include land area [excludes oceans and lakes] under no or low impact from humans, excluding solid ice, rock, high-mountaintop and desert, according to World Resources Institute. Estimation of habitat loss includes only the loss of forests at 1.17 acres per second, according to American Public Information on the Environment.) (Math 1.1)
- At the zoo, find the “Touch the earth...” display inside the South Gate and have your students compare their calculations with the counters.

**Note: Students’ calculations will vary somewhat from the actual displays on the counters of “Touch the earth...” However, this activity and a visit to the display can provide a good springboard for discussion of endangered species, importance of habitat, and effects of increasing human populations on habitats and species. These points can be re-emphasized while touring zoo grounds and seeing endangered species.*

Making Matches: Species Survival Plan Coordination

Grades 8-12; S, M

When coordinating Species Survival Plans, zoo staff carefully match animals according to their genetic ancestry. In order to sustain genetically sound captive populations, SSP coordinators make suggestions as to which individuals of a species should be bred together. In this activity, students will deduce from tables which animals are least closely related in order to determine which animals should be bred together to ensure a healthy captive population. Refer to the background information for a further discussion of Species Survival Plans.

Materials: pencils, paper

If necessary, in order to become familiar with drawing family trees to determine genetic relatedness, proceed through Problem #1 step-by-step with your students.

PROBLEM 1:

Step #1: From the Generation #1 table write the father/mother pairs across the top of a blank piece of paper. Draw squares around the males and circles around the females. Connect the pairs that mated and produced offspring with a single line.

Step #2: Draw straight lines down from the lines connecting the pairs and write the ID number(s) of the resulting offspring (from the first column of Generation #1 table) at the end of the line, drawing the appropriate symbol around the ID number to indicate the gender.

Step #3: From the Generation #2 table, determine which pairs of penguins already on your chart mated and produced offspring. Draw lines connecting the pairs that mated.

Step #4: From the lines connecting the new pairs, draw lines straight down and write the ID number(s) of the resulting offspring (from the first column of Generation #2 table) at the end of the line, drawing the appropriate symbol around the ID number to indicate the gender of the penguin.

Step #5: Analyze the connections you have made. Which pair of male and female penguins from the first column of the Generation #2 table would be the ideal pair to mate because they share no common genes?

Problem 1: Teacher Key

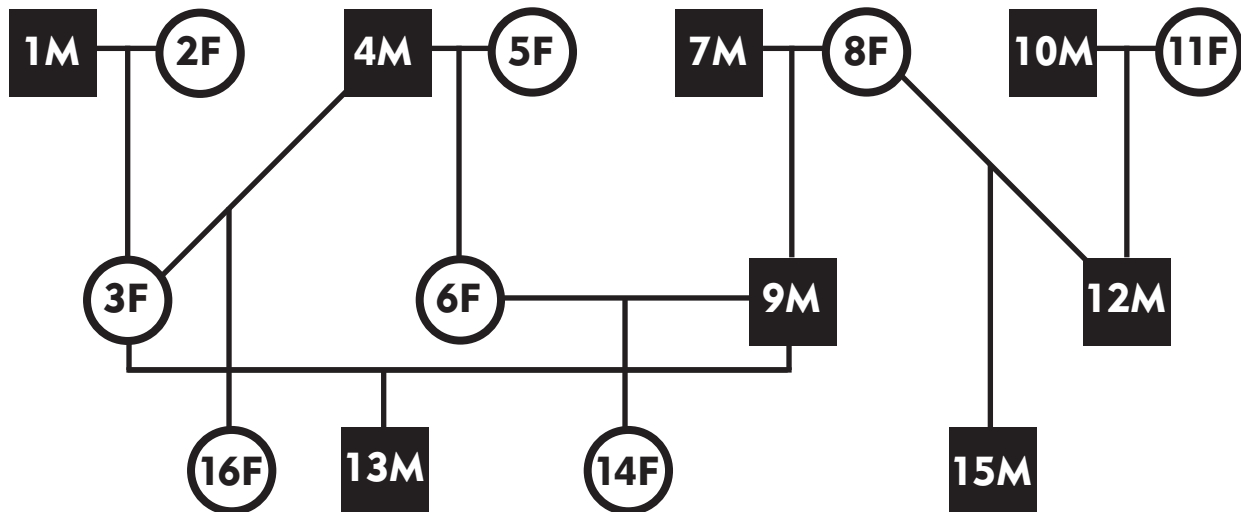
GENERATION #1:

ID # and Gender of Penguin	ID # of Father	ID # of Mother
3F	1M	2F
6F	4M	5F
9M	7M	8F
12M	10M	11F

GENERATION #2:

ID # and Gender of Penguin	ID # of Father	ID # of Mother
13M	9M	3F
14F	9M	6F
15M	12M	8F
16F	4M	3F

Answer: Penguins #15M and #16F should be mated. Penguin #13M has the same mother as penguin #16F and the same father as penguin #14F. Penguin #14F is the granddaughter of penguin #8F and penguin #15M is the son of penguin #8F.



PROBLEM 2:

Using information from the following tables, have students work individually to determine which two of the five tigers in the first column of the Generation #2 table should be bred together to produce the most genetically diverse offspring.

Hints:

- Individuals may breed with more than one other individual.
- Assume that each tiger in the table has only desirable (no deleterious, or harmful) genes.
- There are two possible correct combinations.

Problem 2: Teacher Key

GENERATION #1:

ID # and Gender of Tiger	ID # of Sire (father)	ID # of Dam (mother)
564F	228M	135F
537F	312M	316F
496M	234M	227F
495M	234M	227F

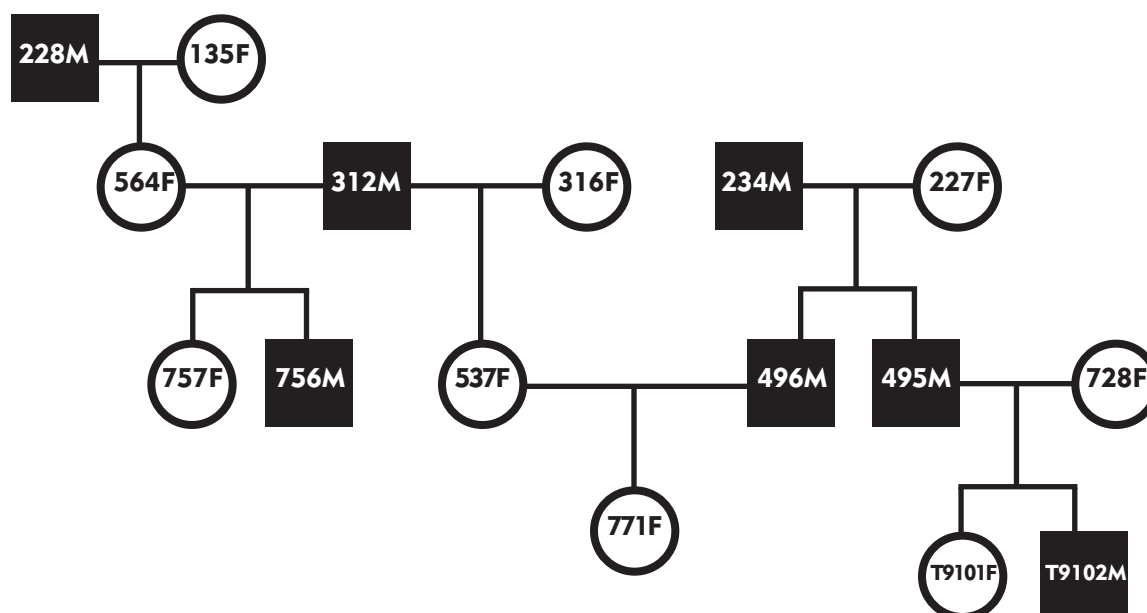
GENERATION #2:

ID # and Gender of Tiger	ID # of Sire (father)	ID # of Dam (mother)
756M	312M	564F
757F	312M	564F
771F	496M	537F
T9101F	495M	728F
T9102M	495M	728F

Information from: Brady, Gerald L., AZA Sumatran Tiger Coordinator, ed. *Sumatran Tiger Studbook* 1996.

TEACHER KEY — FAMILY TREE

There are two possible correct combinations — #757F + #T9102M and #756M + #T9101F.



Making Matches: Species Survival Plan Coordination

STUDENT WORKSHEET

GENERATION #1:

ID # and Gender of Tiger	ID # of Sire (father)	ID # of Dam (mother)
564F	228M	135F
537F	312M	316F
496M	234M	227F
495M	234M	227F

GENERATION #2:

ID # and Gender of Tiger	ID # of Sire (father)	ID # of Dam (mother)
756M	312M	564F
757F	312M	564F
771F	496M	537F
T9101F	495M	728F
T9102M	495M	728F

Extension: Through role-playing, have your students explore the issues involved when the Species Survival Plan coordinator recommends that animals be moved from one zoo to another for breeding purposes. Use the following scenario as a basis for the role-play:

The tiger SSP coordinator has recommended that tiger #757 be moved from Zoo A to Zoo B so that it can breed with tiger #T9101. The other two tigers at Zoo A will remain at Zoo A. Tiger #757 was born and raised at Zoo A and both the staff and visitors at Zoo A feel significant ties to the tiger. At Zoo B, tiger #T9101 has reached the age where she can begin breeding, but Zoo B does not currently have an appropriate match for her. The staff at Zoo B feel that the matching of tiger #757 with tiger #T9101 will produce great benefits for the captive population of Sumatran tigers.

Designate students to play the roles of: Director of Zoo A, tiger keeper at Zoo A, community members who visit Zoo A, the Tiger SSP Coordinator, the Director of Zoo B, tiger keeper at Zoo B, and community members who visit Zoo B.

Can the students, through role playing, come to any conclusions about what should be done? What are the arguments for the move? What are the arguments against the move? What are some alternative actions that could be taken?

Tracking Trends: Endangered Species Numbers

Grades 5-6; M

Materials: graph paper, pencils

- Using the following chart of endangered and threatened species of the United States and foreign countries, have your students design ways to graph the information. You may want to instruct them to make bar graphs of the information. The graphs should clearly display the information so that other students in the school can easily understand it. The graphs can be displayed in school hallways to increase the awareness of other students about endangered species.
- After they have completed graphs done by hand, if your students have access to computers with graphing programs, have them enter the data into tables and design their own graphs that they think best display the information.

Summary of Listed Species Listed Populations ¹ and Recovery Plans ² as of 11/14/2006								
Group	United States			Foreign			Total Listings (US and Foreign)	Listings with Recovery Plans
	Endangered	Threatened	Total Listings	Endangered	Threatened	Total Listing		
Mammals	69	13	82	255	20	275	357	52
Birds	76	15	91	175	6	181	272	71
Reptiles	14	23	37	65	16	81	118	34
Amphibians	13	10	23	8	1	9	32	16
Fishes	75	62	137	11	1	12	149	98
Clams	62	8	70	2	0	2	72	69
Snails	24	12	36	1	0	1	37	30
Insects	47	10	57	4	0	4	61	34
Arachnids	12	0	12	0	0	0	12	5
Crustaceans	19	3	22	0	0	0	22	17
Animal Subtotal	411	156	567	521	44	565	1132	426
Flowering Plants	570	143	713	1	0	1	714	569
Conifers and Cycads	2	1	3	0	2	2	5	3
Ferns and Allies	24	2	26	0	0	0	26	26
Lichens	2	0	2	0	0	0	2	2
Plant Subtotal	598	146	744	1	2	3	747	600
Grand Total	1009	302	1311	522	46	568	1879	1026

Information from: http://ecos.fws.gov/tess_public/Boxscore.do . Accessed 11/14/2006.

(This Web page, which has current information on listed endangered species, is updated monthly.)

Illustrating Endangered Species Through the Arts

The following are three suggestions for giving your students the opportunity to express their knowledge and perspectives on endangered species and conservation issues through various arts: visual arts, dramatic arts and documentary video.

1) VISUAL ART PROJECT

Grades 5-12; A, W

Materials: old wildlife magazines (to cut), construction paper, scissors, glue sticks, paints and other art media

- As individual projects, students can design and create collages or posters. For group projects, students can design and create large murals.
- Have your students work individually or in groups to visually illustrate an endangered habitat or an issue related to endangered species. Endangered habitats described in this packet include coral reefs, tropical forests and wetlands, but students may choose other habitats.
- Collages, posters or murals should include characteristic vegetation and wildlife of each habitat and representations of prominent topographical or climatic features. The artwork should include symbols or representations of current threats to the habitat (such as pollution, deforestation, illegal hunting, etc.). Students may wish to include images of traditional cultures that inhabit the region depicted. (Arts 1.2 and 4.2)
- Students can choose whether to depict realistic images or abstract representations of the habitats and the plants and animals found there.
- For each collage, poster, or mural have students (individually or in their groups) write descriptive text that explains the whole scene and each of the components of the scene. The text should include common and scientific names of plants and animals, as well as descriptions of the interconnections between species, such as how they benefit from or depend upon one another and the impact of different cultural beliefs, if they chose to include cultural images. (Writing 2.2)

2) SKITS

Grades 5-12; A

Materials: necessary props as determined by students

- As a whole class, or in two to four groups, have your students write, prepare and present skits or role-plays that illustrate the plight of an endangered or threatened plant, animal or habitat.
- The skits should engagingly present background information in order to educate the audience about the species or the habitat and some of the factors that have caused the species to become endangered or that threaten the integrity of the habitat. (Arts 3.1 and 4.2)
- The skits should include several characters who illustrate different perspectives on conservation issues affecting the species or habitat. These may include landowners, government wildlife officers, outdoor enthusiasts, and business owners. Students may wish to give the animals and plants involved in the situations voices in their skits so that the students can express their perceptions of the “perspectives” of the plants and animals.
- Skits can conclude with presentations of solutions that are currently being implemented or their own solutions to some of the problems involved. Students may wish to include a creative and strong conservation message to leave an impression on their classmates.

3) VIDEO PROJECT

Grades 7-12; A

Materials: video equipment, necessary props as determined by students

- Students can produce videos including some of the same elements described above for skits. (Arts 1.1) The videos could be short films of the skits or could be presented as fictional news reports.
- If possible, students can choose local issues and visit actual habitats of endangered plants or animals and interview government employees and/or community members about the species or habitat. If this is not possible, students can use props and sets to recreate habitats and students can act out roles of people involved with the species or habitat. (Arts 4.2)
- Videos should also conclude with current solutions or with the students’ own ideas of ways to address the problems. Students may wish to include a creative and strong conservation message to leave an impression on their classmates.

Pollution Game

Grades 5-12; S, F

*This activity gives your students a simplified, yet clear, demonstration of **bioaccumulation**, how pesticides and other toxins are stored in the fatty tissues of animals that inadvertently consume them and are passed up the food chain in higher and higher concentrations. This activity will help your students to make the connection between pollution, the health of the environment and the health of humans.*

Materials: clear plastic bags or brown paper bags (one per student), 250 1-inch square scraps of white construction paper, 125 1-inch square scraps of red construction paper (you can also use cereal with two colors of cereal pieces)

- Find a relatively large, open play area such as a field, gym or classroom with tables and chairs pushed aside.
- Divide your class into three groups: half the class will be mussels, three-quarters of the rest of the class will be fish, and the remaining small group of students will be bald eagles. (So, for a class of 30, 15 students will be mussels, 11 students will be fish and 4 students will be eagles.)
- Give each student a paper or plastic bag, which represents his or her stomach and other body tissues.
- Mix up all the scraps of paper and sprinkle them out across the play area.
- Give the mussels 15-30 seconds (depending on the size of the area) to run around and pick up as many paper scraps or scraps of paper they can find. The color of the chips or paper they pick up does not matter — they should try to get as many chips/scraps as possible.
- Each mussel should tally the paper scraps in his/her bag (how many of each color). Have one student record these numbers on a piece of paper or whiteboard. Have the class calculate the average number of white and red pieces of paper in the mussels.
- Next, have the mussels and fish spread themselves out on the playing area. Give the fish 15-30 seconds to run around trying to tag (eat) the mussels. The mussels can run around and try to escape. When a mussel is tagged, the mussel freezes and the fish empties the mussel's paper scraps into his/her own bag (this symbolizes the fish eating the mussel). Mussels who are caught must go sit on the sidelines after the fish have taken their scraps.
- When the time is up, have the fish report the numbers of white and red chips or paper scraps in their bags to the rest of the class. Record these numbers and calculate the average number of white and red scraps in the fishes' bags.
- Have the mussels who are still "alive" go sit on the sidelines with the "eaten" mussels.
- Give the eagles 15-30 seconds to tag (eat) the fish. Again, the bag contents of the fish go into the bags of the eagles once the fish are caught. Fish who have been caught must go sit on the sidelines.
- When the time is up, have the eagles report the numbers of white and red paper scraps in their bags to the rest of the class. Record these numbers and calculate the average number of scraps in the eagles' bags.
- Gather the class together and tell the students that the white pieces represent uncontaminated food that the mussels filtered out of the water and the red pieces represent food contaminated with toxic chemicals. The chemicals are stored in the fat deposits of any animal that ingests them and in this way get passed from animal to animal, in higher and higher concentrations at each step of the food chain (bioaccumulation). Have the students compare the numbers recorded each of the three times. Students may want to create a simple bar graph to show the average numbers of red and white scraps in 1) the mussels, 2) the fish after eating mussels and 3) the eagles after eating the fish.
- What do the students notice about the average numbers of white to red paper scraps when they compare animals higher and lower on the food chain? What do they think the effects of this concentration of chemicals at the top of the food chain might be? *(Some animals may die due to the chemicals, or the chemicals can affect life process of animals, such as reproduction. The thin eggshells of birds of prey, such as eagles, due to DDT concentration is an example of chemical interference with reproduction.)*
- Ask your students to think of different foods that they eat and where humans fit into the food chain. *(Humans sometimes eat low on the food chain and sometimes eat high on the food chain. When we eat certain types of fish, such as swordfish, tuna or shark, we eat high on the food chain.)* Do they think that humans, too, might be susceptible to bioaccumulation? In what ways might this problem be avoided and/or addressed? *(The students may come up with many solutions, some of which address the root of the problem, such as reducing our outputs of pollution, and some of which may address the immediate problems for humans, such as wider testing of food for contaminants harmful to humans or eating lower on the food chain.)*

ACTIVITIES THAT RELATE TO THE SUITCASE FOR SURVIVAL:

Take a Trip: Tourist Traps

This activity works well as a preface to a lesson on endangered species using the Suitcase for Survival. In this way, you can get an idea of the students' level of awareness regarding trade in wildlife products.

Grades 5-12; G, E

Materials: *Suitcase for Survival* (if you are unable to borrow the Suitcase from Woodland Park Zoo, have students draw pictures of products made from animals and of alternatives to these products or clip pictures from magazines.)

- Arrange the classroom like an international marketplace with tables around the perimeter of the room. Assign five to 10 students to be shopkeepers at the marketplace. Using items from the Suitcase for Survival (or wildlife items drawn by students), help the shopkeepers set up their shops. Different shops can sell fur items, jewelry, leather products, etc.
- Explain to the class that they have gone on a class trip to a foreign country. They have come to the marketplace to buy souvenirs to take home. The shopkeepers will try to encourage the tourists to buy their items. The tourists should attempt to make conservation-wise purchases.
- What might the shopkeepers say to make the tourists buy their wares? What kinds of questions might the tourists ask before buying any items?
- Have the students role play for 10 minutes.
- What items did the tourists buy or not buy? Why or why not? How might their decision affect endangered species and the environment? (Geography 3.1) How might the decisions of the tourists affect the way the shopkeepers run their businesses?

Extension: Have students role play the process of the tourists going through customs when they return home from their travels. What questions would the customs officials ask of the tourists? What items would customs officials allow or not allow the tourists to bring into the United States? Why or why not?

Conservation Consumers

Grades 4-12; G, E

Materials: *Suitcase for Survival* (if you are unable to borrow the Suitcase from Woodland Park Zoo, have students draw pictures of products made from animals and of alternatives to these products or clip pictures from magazines.)

- Divide your class into four groups and have four stations set out in the classroom. Each station should have several items from the *Suitcase for Survival* that are appropriate to one of the scenarios described below (e.g. set out Asian medicines and medicinal alternatives at the table for Scenario #1). Be sure to include a substitute item (aspirin, fake fur, etc.) at each table.
- Assign each group one of the four scenarios described below.
- Write the following four questions up on the board. Each group should decide on answers to each of the questions, which they will present to the rest of the class. Let your students know that in the scenarios, it is okay if they choose not to buy anything from that particular store or market.
 - ◆ Which item would you choose to buy?
 - ◆ Why did you choose that item?
 - ◆ What are other alternative choices besides those on the table?
 - ◆ How is this decision related to endangered species?

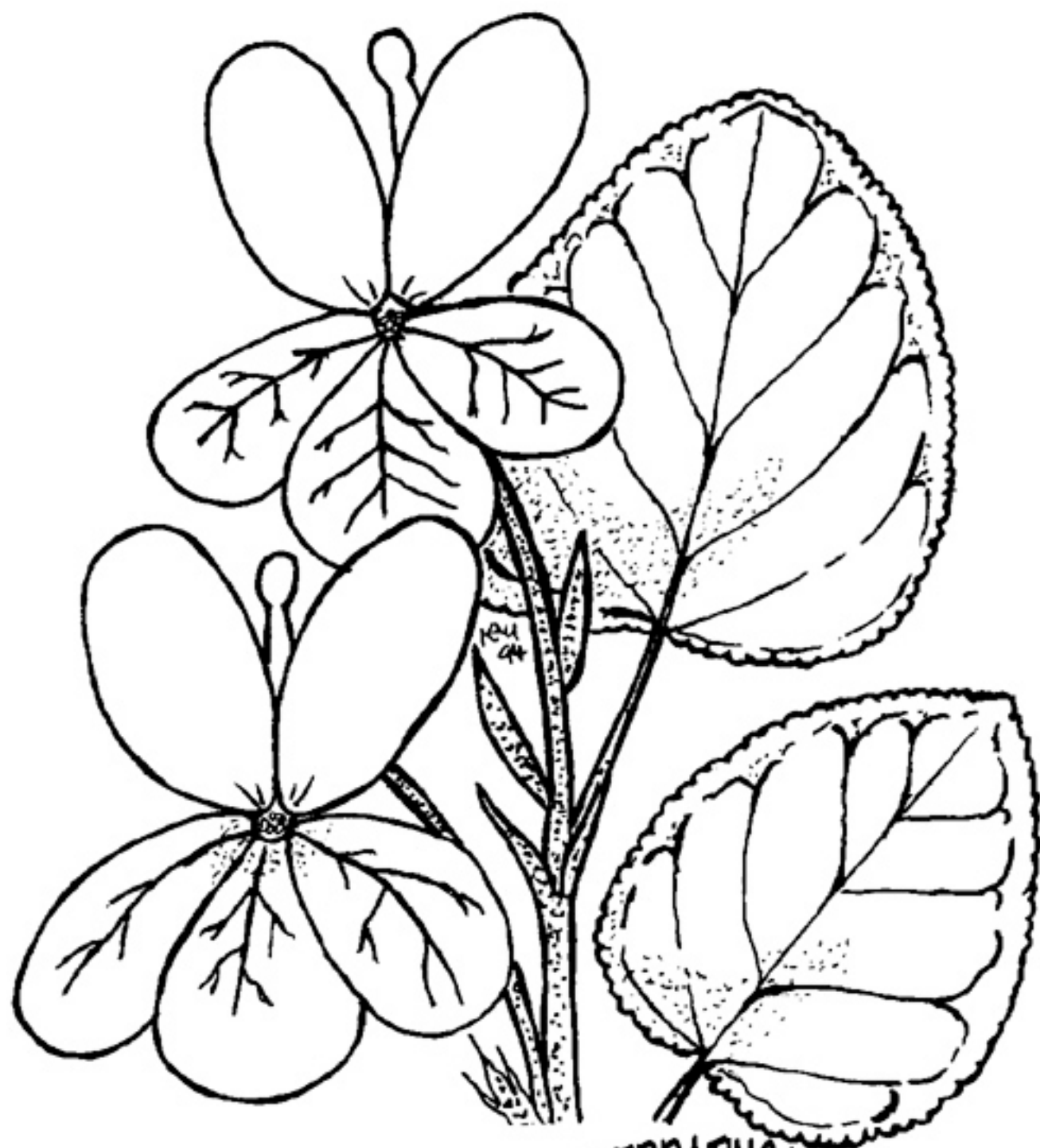
***Note:** Some of these choices and the resulting discussions may involve cultural perceptions and traditions. It is important that you help your students to conduct these discussions in a culturally sensitive manner.

Scenario #1: You and your family have taken a Saturday trip to the International District in downtown Seattle. You have done some shopping, checked out a few museums and had a quick lunch. In the afternoon, your father begins to feel ill; he has a headache and his back hurts. He says he wants to try some medicines from one of the shops down the street. In the shop, the shopkeeper shows you the medicines displayed on the table in front of you and tells you they are all good for headaches and back pain. Carefully look at the medicines.

Scenario #2: Your grandmother's birthday is coming up. You are tired of giving her soap and lotion, you want to give her something exotic and interesting — plus you have a little extra money to spend. You have narrowed your choices down to the several items on the table in front of you — wallets, boots and purses made from different kinds of leather. Examine the items.

Scenario #3: Your older sister is graduating from high school. She will be heading off to Alaska for college in the fall. As a graduation present, you want to give her something that will keep her warm during the winter but will look nice. The salesperson at the department store has helped you to pick out the items, some made from real animal fur and some made from fake fur, displayed on the table in front of you. Examine the items.

Scenario #4: You and your family are about to return home from a trip to Africa. At the market the morning before you get on the plane, you decide you want to take home one more souvenir. On the table at the market you see several items including carvings made from ivory, jewelry made from turtle shells, carvings from cow bone and jewelry made from plastic that looks like turtle shell. Examine the items on the table.

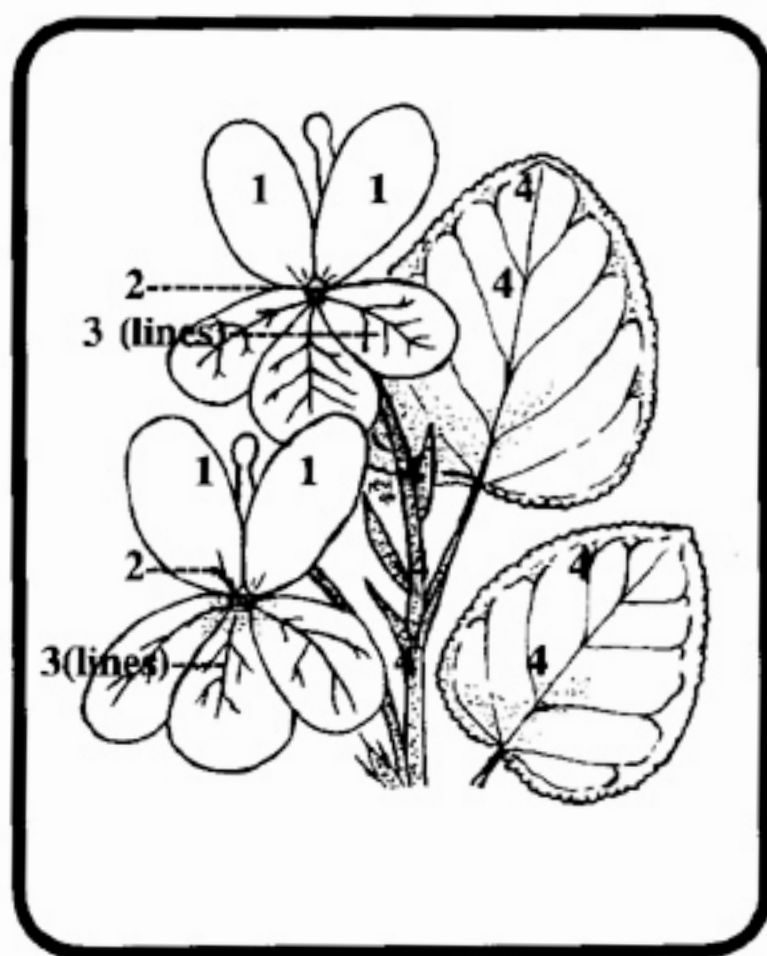


CELEBRATING WILDFLOWERS

Viola adunca
Early Blue Violet

CELEBRATING WILDFLOWERS

"Celebrating Wildflowers" is an annual event sponsored by Federal Resource Agencies (the US Forest Service, Bureau of Land Management, and the National Park Service) and their corporate, civic, and private partners to share the fascinating heritage of America's wildflowers with the public, to increase awareness of this unusual resource, and to promote its conservation.



1=Light Purple; 2= Orange;
3= Dark Purple; 4= Dark Green

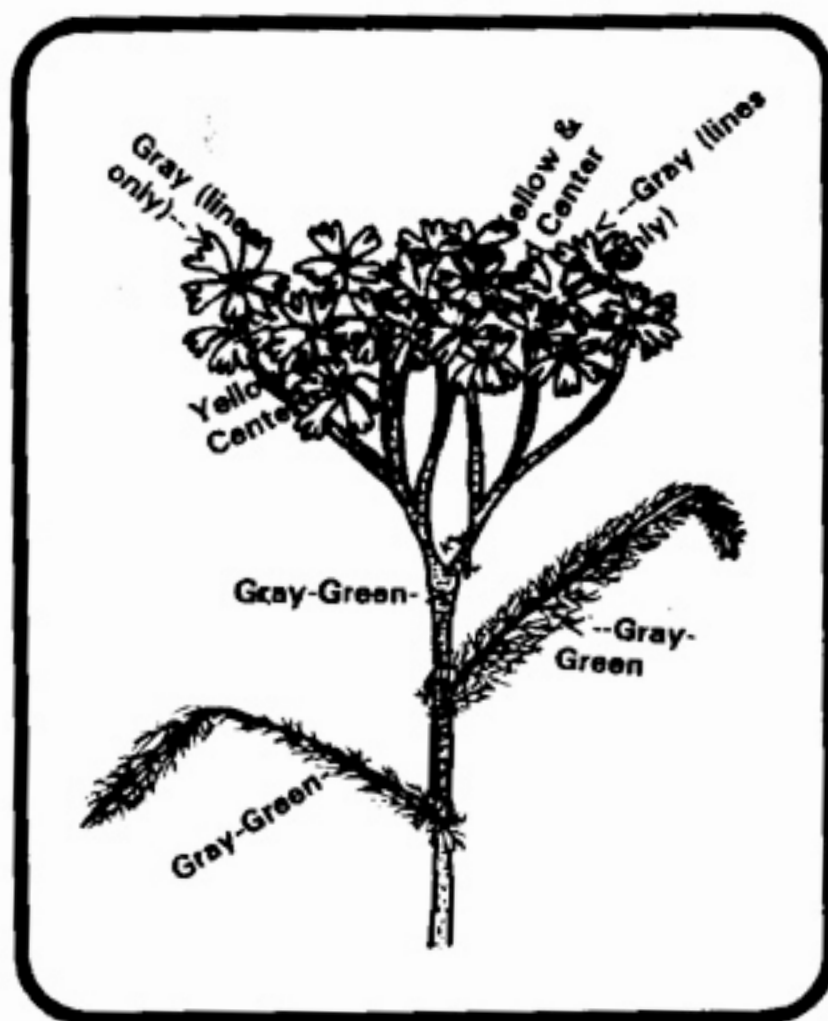


CELEBRATING WILDFLOWERS

Achillea millefolium
Western Yarrow

CELEBRATING WILDFLOWERS

"Celebrating Wildflowers" is an annual event sponsored by Federal Resource Agencies (the US Forest Service, Bureau of Land Management, and the National Park Service) and their corporate, civic, and private partners to share the fascinating heritage of America's wildflowers with the public, to increase awareness of this unusual resource, and to promote its conservation.





CELEBRATING WILDFLOWERS

Cytisus scoparius
Scot's Broom or Scotch Broom

NOXIOUS WEED

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