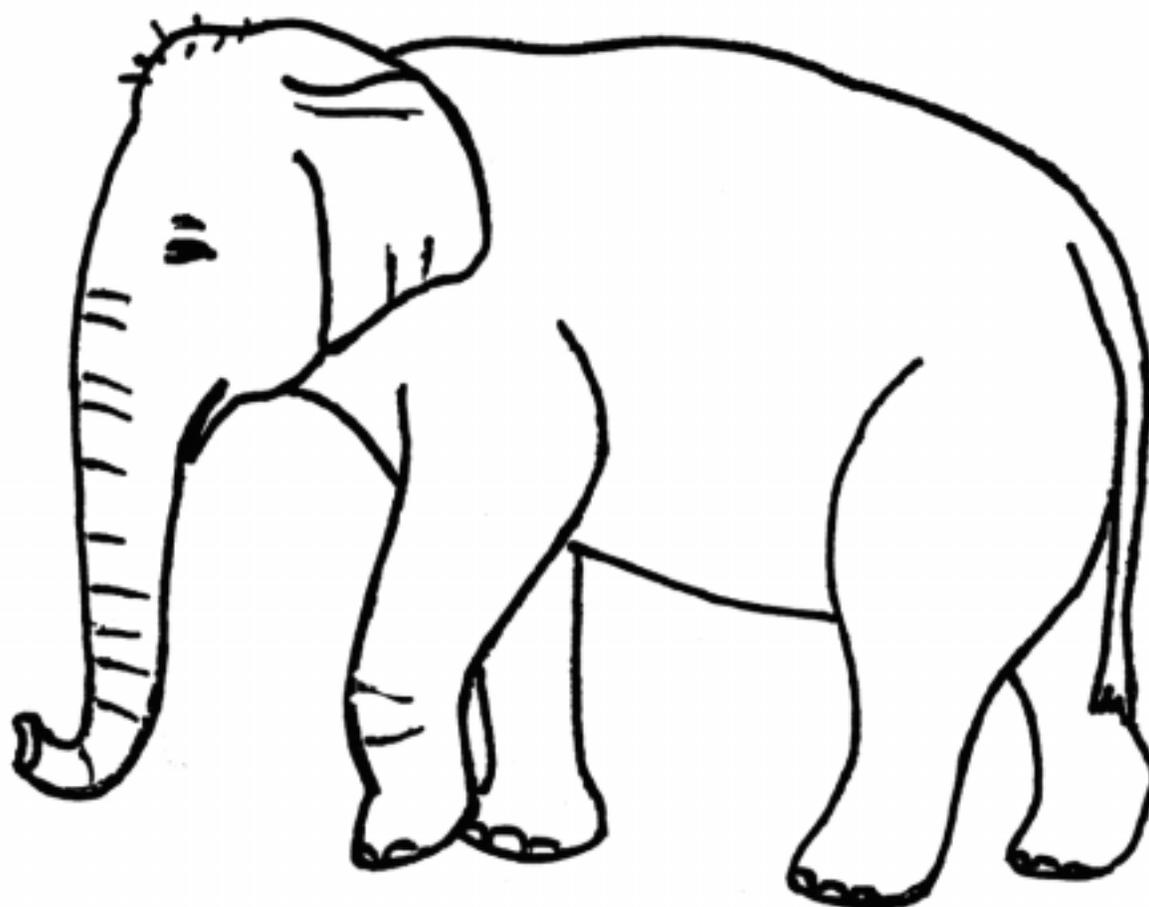


Discovering Elephants

Classroom Materials for Teachers
From the Elephant Sanctuary

Grades K-3



The Elephant Sanctuary
Hohenwald, Tennessee

J. Jones 1997

Discovering Elephants: Classroom Materials for Teachers from the Elephant Sanctuary in Hohenwald, Tennessee



Materials developed by J. L. Jones, Elephant Sanctuary Education Chair, in cooperation with Carol Buckley and Scott Blais, Founders/Co-directors of the Elephant Sanctuary.

Many thanks to Judi Hayes for assistance with proofreading and editing.

These materials are intended for use with students in formal and/or informal settings. Any of the activities may be copied and adapted to fit the individual needs of students and/or curriculum requirements.

The information contained in Teacher Background sections is current and accurate as of 1998; however, continuing research on Asian elephants could necessitate changes/up-dates in the future.

The author and the Sanctuary directors appreciate any comments or suggestions from teachers, youth leaders, and others who use or review the materials. Please direct comments to:

Judy Jones
629 Long Hunter Court
Nashville, TN 37217

or

Carol Buckley
The Elephant Sanctuary
P. O. Box 393
Hohenwald, TN 37462
931-796-6500
1-800-TRUNK

The Elephant Sanctuary



The Elephant Sanctuary is located 65 miles southwest of Nashville, near Hohenwald, Tennessee. It was founded in 1995 by Carol Buckley and Scott Blais to provide a natural habitat refuge for old, sick, and needy Asian elephants. Elephants no longer needed or valued by circuses or zoos.

The first resident to move into the Sanctuary's 112 acres was Tarra, an Asian elephant born in Burma in 1974. Tarra came to the United States as a calf and Carol took care of her and trained her. Later, Carol purchased Tarra and the two spent many years performing in circuses, zoos, for films and television, and in Las Vegas. Tarra even learned to roller skate during her "show business" career, but she happily gave up her skates and the spotlight to retire to Hohenwald.

In April 1996, Tarra was joined by Barbara. Born in 1969, Barbara had spent her life in circuses and breeding facilities. When she arrived at the Sanctuary, Barbara weighed only 4,000 pounds, a ton (2,000 lbs.) less than normal for her height. She was so emaciated that her skull showed through the hollows of her face.

Apparently, Barbara had not been fed enough to keep her weight up to normal. Poor/inadequate diet also meant that her teeth had not been worn down and shed in the normal manner. (Elephants have one molar on each side of the upper and lower jaw. Barbara's upper molars cover the entire roof of her mouth. In effect, she has a mouthful of teeth that make chewing difficult and contribute to her weight problem.

Since her arrival, Barbara has been on a special diet that is both easy to chew and super nutritious and she has gained weight steadily. In the future, when she is stronger, her overgrown teeth will be surgically removed.

In September 1996, a third elephant, named Jenny, came to the Sanctuary. Jenny was born in 1970 and, like Barbara, spent her life traveling with circuses. After sustaining an injury to one leg that left her with a noticeable limp, Jenny was abandoned at an animal shelter outside Las Vegas. Crippled and severely underweight, Jenny lived with the cats and dogs at the shelter until the necessary funds could be raised to get her to Hohenwald.

Since her arrival, regular medical care, a healthy diet, a new therapeutic treatment for her arthritis, and a lot of loving care from Carol and Scott have given Jenny a new lease on life. Despite the fact that some of her injuries are permanent, Jenny is active, playful, and obviously happy to be in the company of other elephants in the Sanctuary pastures and barn.

These elephants spend their days grazing, exploring, and socializing in a secure pasture away from cheering/jeering crowds; much the way elephants live in the wild. But there are many other needy elephants waiting to join Tarra, Barbara, and Jenny. The completion of a new 12-elephant barn in early 1998 will allow the Sanctuary to take in additional animals as funds can be raised to cover food and medical care.

The Sanctuary has also launched a campaign to educate the public about this very endangered species. By focusing media attention on the Sanctuary and providing educational materials to schools, the Sanctuary's founders and supporters hope to improve the lives of all Asian elephants and save this magnificent species for future generations.

Individuals or groups interested in helping the Elephant Sanctuary can do so by becoming members, purchasing Sanctuary T-shirts or paintings by Tarra, or through the "Feed an Elephant for a Day Program."

For more information, contact the Sanctuary at
P. O. Box 393
Hohenwald, TN 37462
931-796-6500

Electronic Fieldtrips



Project DIANE

(Diversified Information and Assistance Network)

Project DIANE is a multimedia teleconference consortium supporting education, community service, and economic development in the mid-state area.

Project DIANE offers unique opportunities for distance learning and tutoring, interactive remote field trips, mentoring, library reference services, outreach, workshops, counseling, training, and much, much more.

The Elephant Sanctuary joined with Project DIANE because interactive video and multimedia teleconferencing technologies provide an effective, yet non-invasive, opportunity for schools and the general public to visit the Sanctuary and experience the elephants “live” as they pursue their daily routine.

Project DIANE technology allows us to fulfill our dual missions of providing a safe, secure habitat for the elephants and educating the public.

For more about Project DIANE, visit the website at: www.diane.tnstate.edu

For more about elephants and the Sanctuary, visit our website at: www.elephants.com

Teacher Background for “Discovering Elephants”

Introduction

Elephant! You need only say the word to spark interest, imagination and awe. Elephants are not the largest animals to ever live on earth or even the prettiest, but they capture our attention more readily than any other animal. Whether it is a circus performance, a zoo visit, or a favorite childhood story about Babar or Dumbo, nearly everyone has an “elephant memory.” For most of us those are fond memories of creatures who, though big enough to terrify, have a reputation for gentleness.

But these creatures we find so engaging are in serious trouble. In the wild, elephant populations are dwindling at an alarming rate. In captivity, some elephants, particularly older animals or those in poor health, suffer abuse and neglect.

The Elephant Sanctuary in Hohenwald, Tennessee, was founded in 1995 to provide “a natural-habitat refuge where sick, old and needy” Asian elephants can live out their lives in peace. The Elephant Sanctuary’s secondary goal is to increase public awareness about elephants.

*In the end, we will conserve only what we love.
We will love only what we understand.
We will understand only what we have been taught.*
Baba Dioum, Senegal

These words from an African conservationist remind us that the only hope for the long-term survival of elephants, or any species, is through education. Because we believe this to be true, the Elephant Sanctuary is making the “Discovering Elephants” resource packets available to educators.

We invite you to use the materials in this packet to help your students understand and love elephants. Please feel free to use all of the materials, or select those that fit your curriculum, and adapt the activities to meet the needs of your students. We welcome any comments on these activities and suggestions for future materials.

Note: The following pages contain information about elephants to give you some background. The terms in **bold** type are defined in the **Elephant Glossary**. Titles in () refer to activities included in the “Discovering Elephants” packet.

Elephant Beginnings

The ancestors of modern elephants first appear in the fossil record during the Eocene Period, or about 45 to 55 million years ago. Like the earliest ancestors of many other animals, the first elephant — Moeritherium (meer-uh-THEER-ee-um) — was quite different from today's elephant. It was about 2 feet tall and had no trunk.

Gradually, possibly in response to the earth's cooling temperatures, the descendants of Moeritherium grew larger in size and developed the nose-upper lip combination that makes elephants so unique today. The arrangement of **trunk** and **tusks** took several forms over the generations, many quite different from today's modern elephant. Biologists believe the trunk may have developed to allow the large animals with very short necks to reach food and water easily. To date, more than 150 different **species** of elephants have been catalogued, including the hairy **mammoths** and **mastodons**. (*Elephants and Their Kin: Classifying, Walk Softly and Carry a Big Trunk*)

The modern world has two surviving elephant species: the Asian elephant (*Elephas maximus*), and the African elephant (*Loxodonta africana*). Among Asian elephants there are 4 subspecies — Indian, Ceylon, Sumatran, and Malaysian. These are distinguished by physical traits related to their geographic location. For example, Ceylon (Sri Lanka) elephants tend to have larger ears which are useful for regulating body temperature in the hotter climate of Sri Lanka. (*Walk Softly and Carry a Big Trunk*)

Two Separate Species

There are several **anatomical** and **behavioral** differences between Asian and African elephants and many similarities. (*Elephant Parts, Walk Softly and Carry a Big Trunk*) Most noticeable is the difference in ears. Africans have huge ears shaped much like the continent of Africa. (One ear from a bull African elephant weighs more than 100 pounds.) Asians, who live in cooler forest areas, have smaller ears. Asians have rounded backs and relatively smooth skin. Africans display a sway back and very wrinkled skin.

Among Asian elephants only males grow long incisor teeth called tusks, and not all males have them. (This is why ivory **poaching** has not been a tremendous problem for Asian elephants.) African elephants of both sexes generally (but not always) exhibit tusks.

The trunks are also slightly different. Asian elephants have one small finger-like projection at the end of the trunk. African elephants have two "fingers." These "fingers" are very sensitive and make it possible for these huge animals to pick up very small objects. The more than 100,000 muscles in the trunk make it very flexible and strong enough to lift whole trees. (*Walk Softly and carry a Big Trunk*)

A similarity is in feeding habits. Both species are **herbivores**; they consume only plant material. The elephants of the African savanna eat mostly grasses, turning to leaves, twigs, bark, flowers, and fruits when the grasses are not available. Asians consume a similar range of plants, including large amounts of bamboo (a fast growing grass.)

Within an ecosystem, different species survive by avoiding competition for food. In any area, different animals eat specific things or feed at different times than their neighbors and therefore do not waste precious energy fighting for food. Because elephants developed after (or at the same time as) the perissodactyls (horses) and the ruminants (antelope/giraffe), they had to develop different feeding habits to survive. Elephants, therefore, developed the ability to eat a wide variety of plant materials in addition to grass. This includes the twigs and bark that horses and antelope do not generally eat. There isn't much nutrition in such woody material, but it is available year round and within the elephants' extended reach.

Though they can consume foods other animals usually don't eat, neither species of elephant has an efficient digestive system. Elephants must consume huge amounts of food each day because half of it passes through virtually undigested. (*If an Elephant Followed Me Home*) This means that both species must move about constantly in search of food and both are finding less and less space open to them. (*Population Pressure*)

Both species of elephants are **herd** animals with very definite social structure. Herds are led by a **matriarch**, usually the oldest female, and are made up of her daughters, sisters, and their offspring. Once they reach puberty, male calves leave the mother's herd and join other young males in bachelor groups. Older males tend to be solitary.

Finally, both Asian and African elephants are highly intelligent and peaceful animals whose continued existence is threatened.

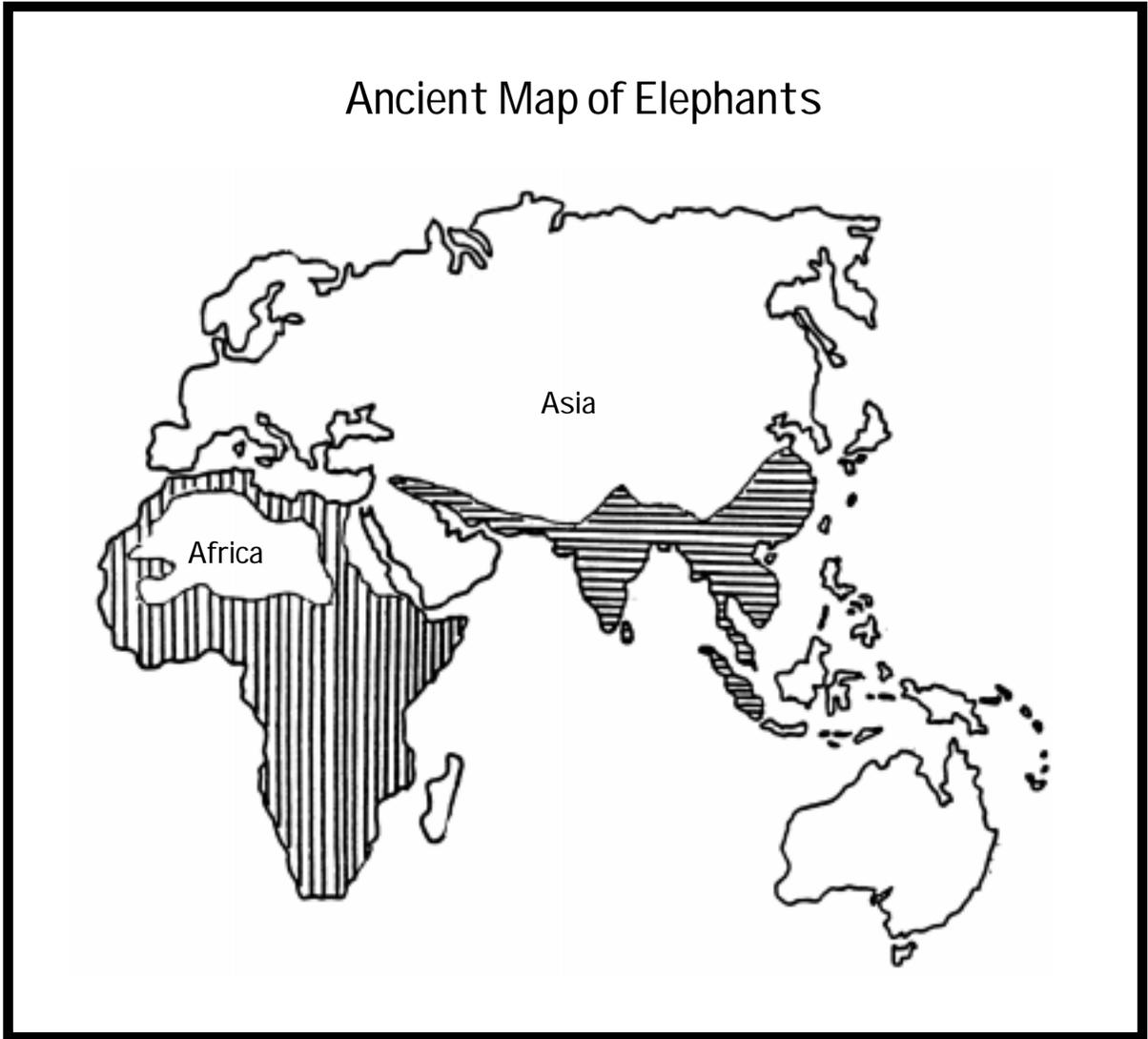
Elephant Habitat

In ancient times, elephants were found in all areas of Africa, except the Sahara Desert which covered a much smaller area, and in Asia from present-day Syria east to China and south to Sumatra.

At the beginning of this century, Africa's elephant **population** was probably between 5 and 10 million. (No one knows for sure — there were too many to count.) At the same time Asian elephants numbered about 200,000. Today, there are perhaps a million African elephants and between 35,000 and 50,000 Asian elephants in the wild. Because they need the same things humans need (land, food, and water) and because human populations in Africa and Asia are growing, elephants are being pushed into smaller and smaller areas. Some biologists worry that elephants will not survive in small, fragmented **habitats**. If elephants do not survive, many other species will also perish. Elephants are what scientists call a "keystone species." This means that elephants need a large habitat, but they share that habitat with many other species who are not so visible. If the elephant habitat and elephants disappear, the other species will be lost as well. (**Disappearing Elephants: Information from Maps**)

Wildlife managers and **conservationists** from around the world hope to set aside enough protected areas to give elephants a chance, but with Asia's population expected to double in the next 50 years the competition for space will be intense. (**Population Pressure: Using Charts and Graphs**)

Ancient Map of Elephants



Elephants and People

Another difference between Asian and African elephants is their relationship with people. In ancient Africa where the land was vast and the population small and very clustered, elephants and people had few close contacts.

In Asia the situation was far different. Archaeologists working in the Indus River Valley have found evidence that elephants were used as **domestic** animals more than 4,000 years ago. From these early times to the present, elephants have provided transportation, helped clear forests, pulled heavy loads, and chased away tigers. At the same time they became important figures in the Hindu and Buddhist religions.

War elephants, outfitted with armor and swords on their tusks, were the ancient equivalent of tanks. Alexander the Great brought elephants to Europe from his Asian conquests. Hannibal crossed the Alps with elephants to attack ancient Rome, and the Romans featured elephants in their bloody gladiator spectacles so often that some African subspecies became **extinct**. Elephants were used in war right into the 20th century in World War II and in Vietnam.

The cyclops, a giant one-eyed figure from ancient folklore, may have been inspired by an elephant's skull. Probably, someone who had never seen a living elephant came upon an elephant skull. The size would make anyone think of a giant; and without seeing an elephant with its trunk, it would be easy to guess the hole in the front of the skull was for a single eye. Actually, an elephant's eyes are at the side of the head and the large opening at the front of the skull is where the nose (trunk) attaches. (*Folklore and Nature, Explanation and Description*)

Because Asian elephants are easy to train, they were imported into Renaissance Europe as attractions in zoological gardens or as pets for royalty. The emperor Charlemagne had a pet elephant who travelled with him regularly.

The first elephant in America was an Asian calf brought by a sailing ship captain in 1796. The little animal created quite a sensation as she was exhibited in barns and village commons from New England to Georgia. Eventually, she visited all 13 states, and some reports claim that even President George Washington came to see her. Elephants later became a fixture in animal shows, circuses, and zoological parks across the continent.

Over the years these highly intelligent creatures have been taught, or learned on their own, to do hundreds of "tricks" from standing on their heads to roller skating. In circuses, on television, and in films, elephants have been entertaining people for centuries. Now they need our help.

Elephant Conservation

Population growth, economic pressures, and warfare have all taken a terrible toll on elephant habitat in Asia. Adding to the problem is the fact that the areas still available to elephants are too fragmented, leaving herds isolated in dwindling pockets of forest.

In the past, elephant populations not only traveled great distances each day in search of food, they also **migrated** according to the season and the cycle of rains and growth. Forest clearing, agriculture, plantations of teak and rubber trees, hydroelectric dams, and irrigation projects have now cut off most of the elephant's traditional migration routes. (*Disappearing Elephants*)

Some herds are effectively stranded in habitat areas that may or may not be able to support them. Thus isolated, herds not only become crop raiders, but they lose genetic diversity and become more susceptible to disease, particularly cattle diseases for which they have no immunity.

Biologists, conservationists, and some government officials are beginning to realize that just setting aside small "preserves" for wildlife is not enough. To ensure the future of wildlife populations requires preserves and national parks with connecting corridors that allow animals to move from area to area.

In Asia, the International Union for the Conservation of Nature and Natural Resources (IUCN), the Convention on the International Trade in Endangered Species (CITES), the World Wildlife Fund (WWF), Wildlife Conservation International. And other government and private agencies are working to provide connected preserves. These organizations have also recognized the need to educate local people about the wildlife and enlist their help in conservation. A growing number of Asians are now earning a living by protecting wildlife and encouraging tourists to visit their areas.

These efforts are helping save not only elephants, but tigers, rhinos, and many other species threatened with extinction, but the future is not entirely rosy. Asia must still deal with a growing population and the economic pressures of the modern world. Such economic pressures have resulted in serious **poaching** problems among the elephants of southern India and Sri Lanka. The ban on the ivory trade that has benefitted the African elephant, has caused some ivory merchants to encourage illegal hunting of Asian males for their tusks. The removal mature males further reduces the genetic diversity of populations and can have disastrous results.

We can help elephants and other species even though we are far from Asia. By refusing to buy products made from threatened or endangered species of animals or plants, by using our own resources wisely, and by becoming educated about wildlife and environmental problems we can make a difference for the future of all life on this planet.

A Few Elephant Facts

Travellers to elephant-populated areas are advised not to carry citrus fruits. Elephants coming to watering holes may smell the fruits and try to find them in tents, backpacks, etc.

Elephants are not afraid of mice. Several experiments have placed elephants and mice in the same enclosures, and the elephants merely stepped on any that happened to get underfoot. One researcher did find, however, that dachshunds and rabbits tended to make the subject elephants nervous.

Elephants belong to the pachyderm family. The word comes from the Greek and means "thick skinned." Elephant skin is about 1.5 inches thick but is very sensitive. Elephants will leave a good feeding area if there are too many mosquitoes. They do not have a layer of fat to protect them from temperatures below freezing, and they have few sweat glands. Elephants get rid of excess heat by fanning their ears, taking baths and by rolling in mud.

Elephants can reach speeds of more than 25 mph, but they cannot jump. So a ditch too wide to step across and too steep to climb is an impenetrable barrier.

The location of their eyes and their enormous size mean elephants cannot see behind them without turning around. They also cannot see directly below them, but they use their trunks and feet to locate obstacles (and small calves).

Elephants are very good swimmers. They regulate buoyancy by swallowing air and use their trunks as snorkels.

An elephant's brain weighs about 13 pounds (human brain about 3.3 pounds) and has far more folds in the temporal lobe than human brains, an indication that elephants really do have a tremendous memory.

Elephants are not clumsy. They can step on a coconut just hard enough to crack the shell without damaging the meat. The feet of an elephant have a combined surface area of 3.5 sq. feet, so their weight is evenly distributed. A lady's high heel has greater pressure per square inch than an elephant's foot.

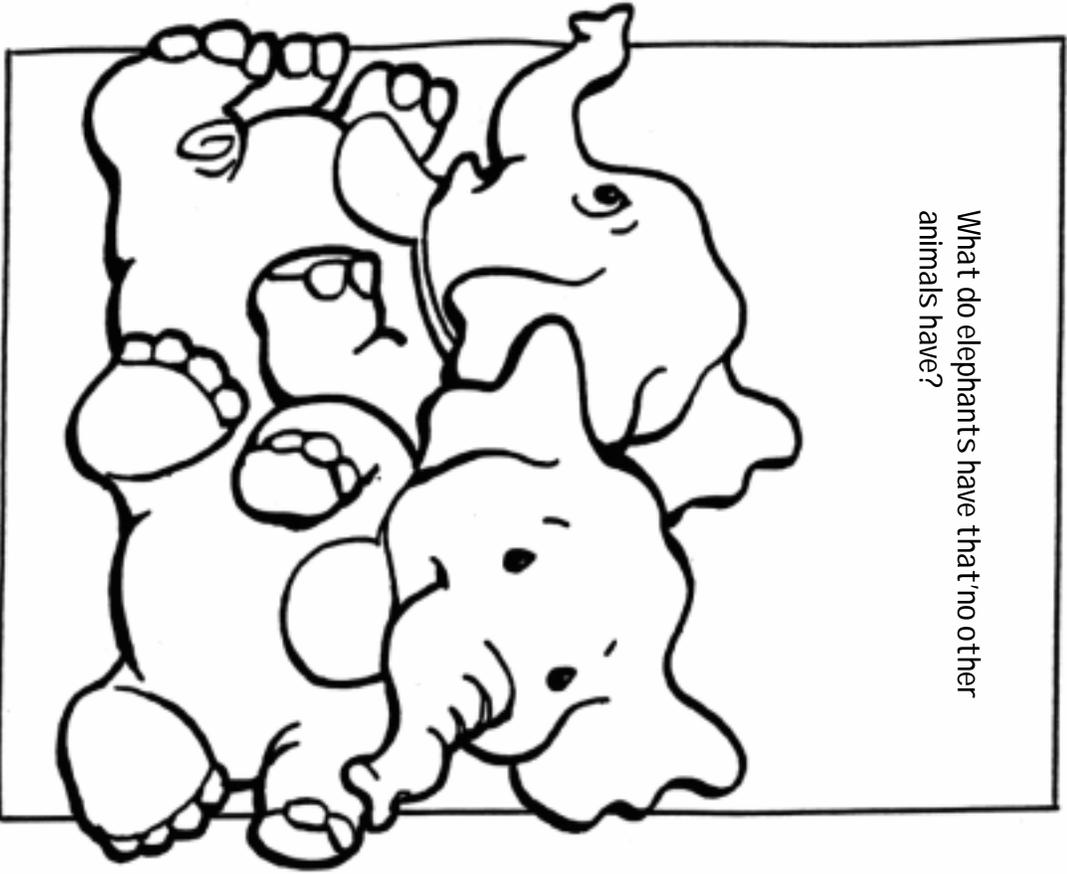
In 1982 an attendant at the zoo in Prague reported that he had gotten some bad stains on his shirt. He sent the shirt to the laundry, but the stains were still visible when he got the shirt back. He wore the shirt to work and, on a very hot day, took it off and laid it aside. An elephant grabbed the shirt and gulped it down before the attendant could get it back. When the shirt reappeared at the other end of the elephant a day or two later, it was still intact; and the stains were gone!

Connect-the-Dots

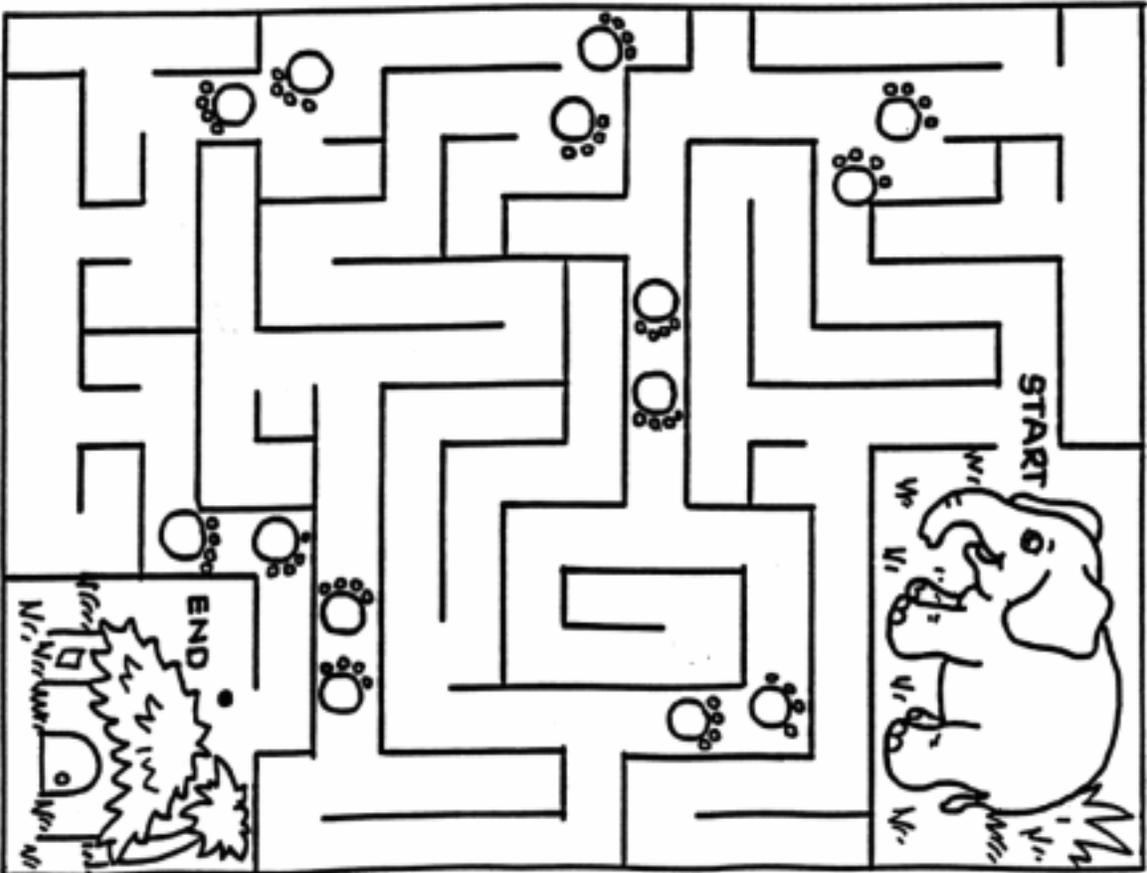


Elephant Funnies

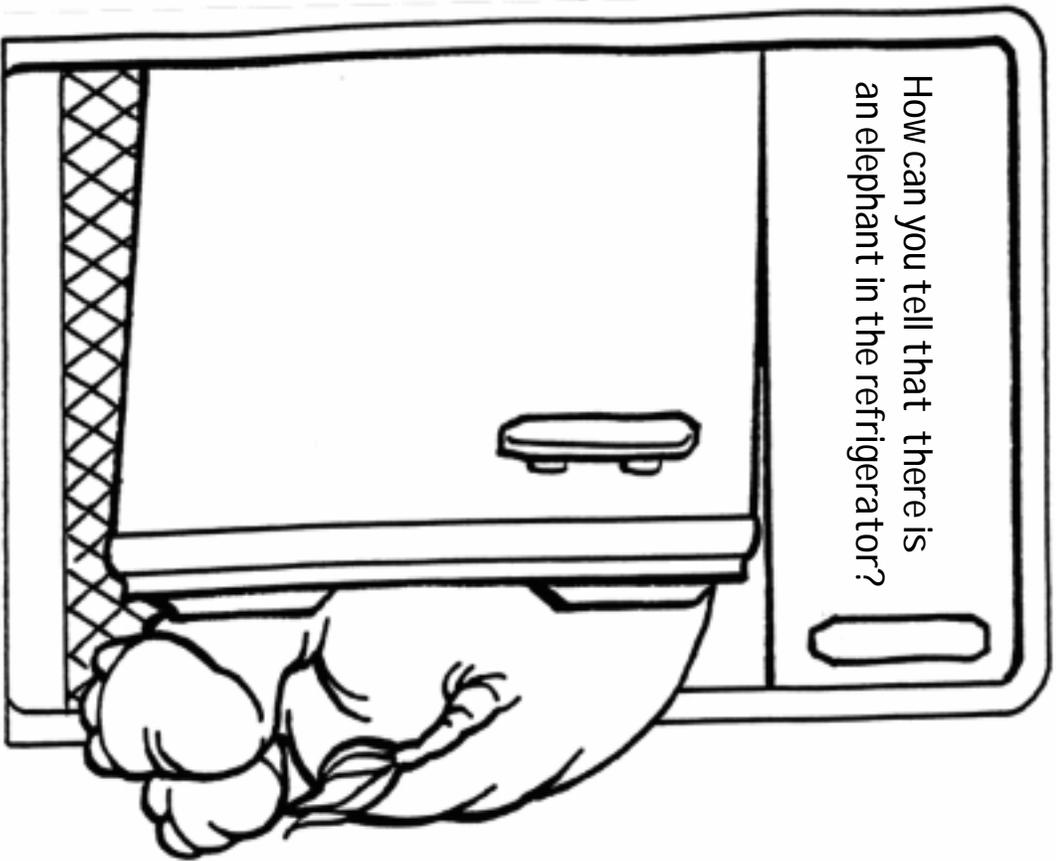
What do elephants have that no other animals have?



Baby Elephants!

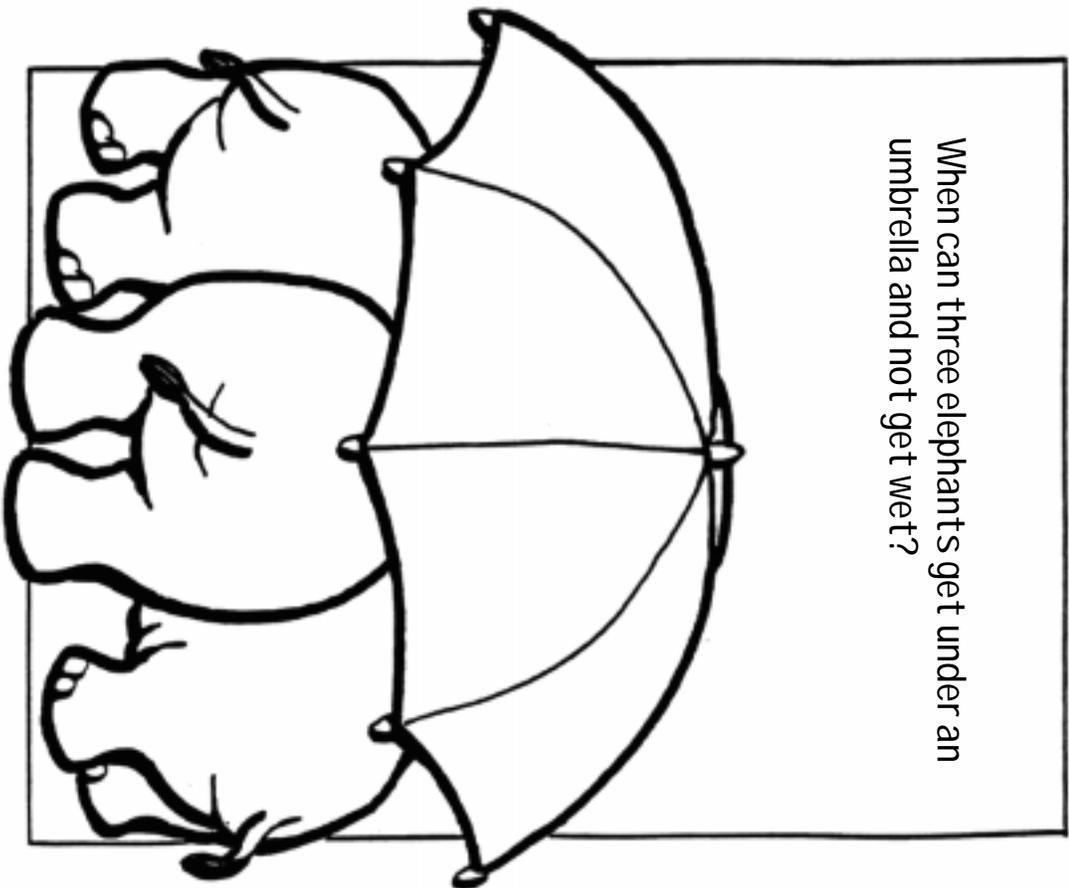


How can you tell that there is an elephant in the refrigerator?



The door won't shut.

When can three elephants get under an umbrella and not get wet?



When it isn't raining.

Elephant Words

A cow is a big animal that lives in pastures and barns. Cows eat grass.

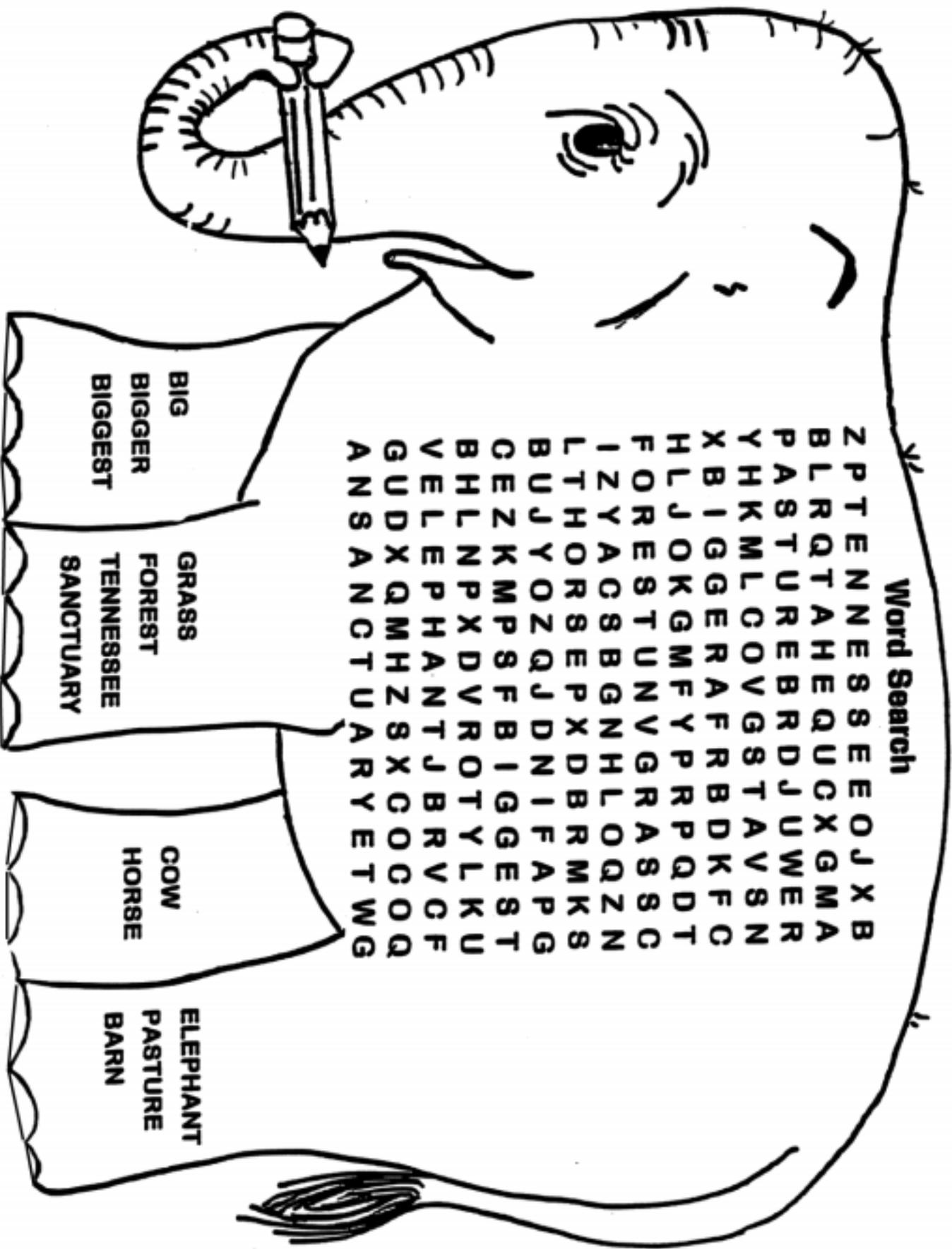
A horse is a bigger animal. Horses also live in pastures and barns. Horses like to eat grass, too.

An elephant is the biggest animal that lives on the land. In Asia, elephants live in the forest.

In Tennessee there is a place where elephants live in a pasture and a barn and eat grass. This place is called The Elephant Sanctuary.

The elephants that live at the Sanctuary are retired from the circus and zoos. They have come to Tennessee to rest.

Can you find the underlined words in the elephant puzzle?



Word Search

Z P T E N N E S S E E O J X B
B L R Q T A H E Q U C X G M A
P A S T U R E B R D J U W E R
Y H K M L C O V G S T A V S N
X B I G G E R A F R B D K F C
H L J O K G M F Y P R P Q D T
F O R E S T U N V G R A S S C
I Z Y A C S B G N H L O Q Z N
L T H O R S E P X D B R M K S
B U J Y O Z Q J D N I F A P G
C E Z K M P S F B I G G E S T
B H L N P X D V R O T Y L K U
V E L E P H A N T J B R V C F
G U D X Q M H Z S X C O O Q
A N S A N C T U A R Y E T W G

BIG
BIGGER
BIGGEST

GRASS
FOREST
TENNESSEE
SANCTUARY

COW
HORSE

ELEPHANT
PASTURE
BARN

A Colorful Snack

For the Teacher

Colors, Nutrition

Elephants are the largest animals that live on land. A full-grown adult may weigh as much as 10,000 pounds. But elephants don't eat any of the fattening things people like so much. Elephants are **herbivores**; they only eat plant material.

A **balanced diet** for an elephant includes grass, leaves, roots, fruits, vegetables, and grains. In the wild, elephants eat several kinds of grasses and their seeds (grain), fruits and leaves from the trees, berries and flowers from shrubs, and roots and vegetables they dig out of the ground. To find all of these things, elephants may have to walk 30 or 40 miles each day.

At **The Elephant Sanctuary** in Hohenwald, Tennessee, the elephants don't have to walk so far to get a balanced diet. The Sanctuary elephants eat grass and leaves from their **pasture**; but they also get hay, fresh fruits and vegetables, corn, and wheat bran. They also eat elephant chow which is a mixture of grains, grasses, and vitamins and minerals processed into bite-size chunks.

Tarra, one of the Sanctuary elephants, eats the following every day:

- 130 pounds of hay and other vegetation
- 5 pounds of elephant chow
- 1 pound of rolled oats
- 1/2 pound of wheat bran
- 10 pounds of fruit and vegetables

This diet keeps Tarra healthy and happy, and it keeps the staff busy bringing her food.

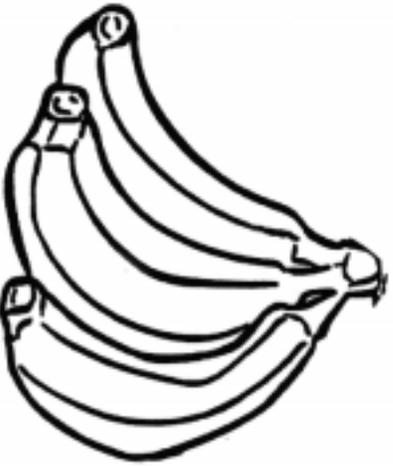
In this activity the students can help feed an elephant her morning snack by coloring the foods the right color, then cutting out the elephant and her foods and gluing them on a sheet of construction paper.

Class Project Idea

For a \$25 donation to The Elephant Sanctuary, the class can feed one of the elephants for one day. The students can choose to feed Tarra, Jenny, or Barbara; and the class will receive a certificate and photo of the elephant chosen. For more information, contact The Elephant Sanctuary at **615-796-6500** or check the Internet at **www.elephants.com**.

A Colorful Snack

Tarra, the elephant, is hungry. She is waiting for her snack. Before she can eat, you must color her food.



Colors

apple	red
bananas	yellow
grass	green
grapes	purple
carrots	orange
berries	blue



How Much Hay Can an Elephant Eat?

For the Teacher

Counting, Days of the Week

Elephants are very big animals, and they eat a lot of food. Some of the foods elephants eat are also people foods. Elephants like apples, potatoes, carrots, watermelon, and other fruits and vegetables. But most of an elephant's diet is grass.

Tarra is one of the elephants that live at The Elephant Sanctuary in Hohenwald, Tennessee. In warm weather, Tarra can go out to the pasture and find lots of grass and leaves to eat. When the weather is cold and the grass is brown, Tarra eats hay. Hay is a kind of grass farmers grow, cut and tie into bales.

Each day, Tarra eats about 3 bales of hay (or the equivalent in grass).

In this activity the students will make a calendar to keep track of how many bales of hay Tarra will eat in four weeks.

Each student should have a copy of **Tarra's Hay Calendar** and 1 sheet of "hay bales" (extra bales included.) The students should color and cut out the stacks of hay bales and glue one stack of 3 bales in each square on the calendar.

Then count the number of bales in one week. In two weeks. In three weeks. And the number of bales eaten in four weeks.

Variations/Additions

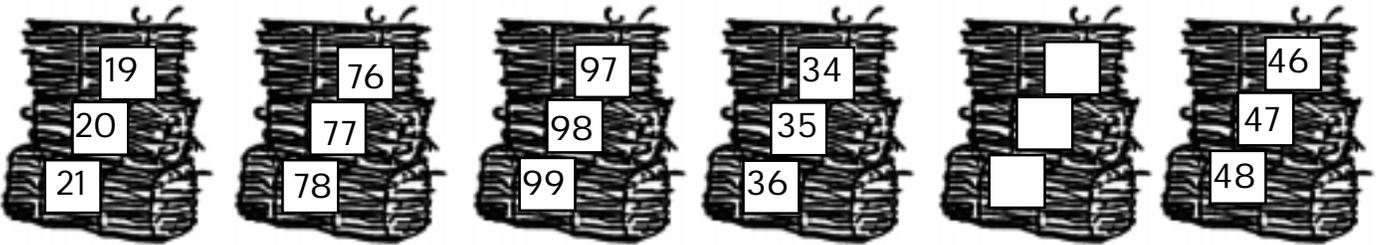
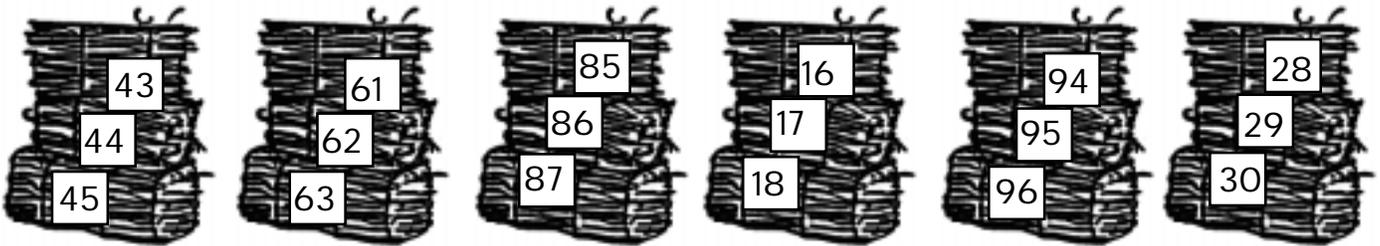
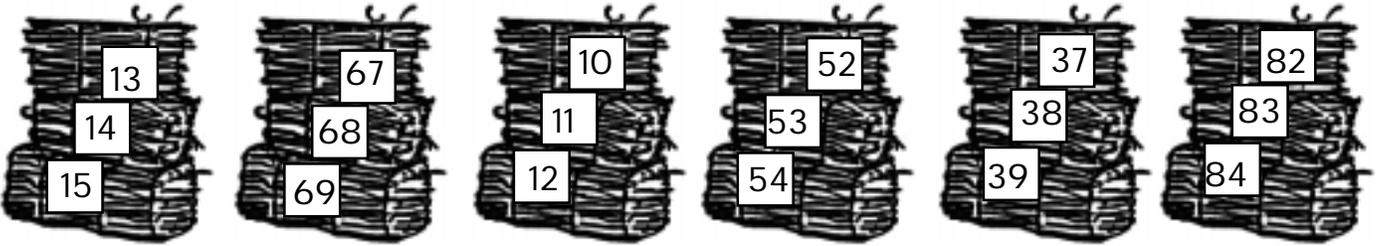
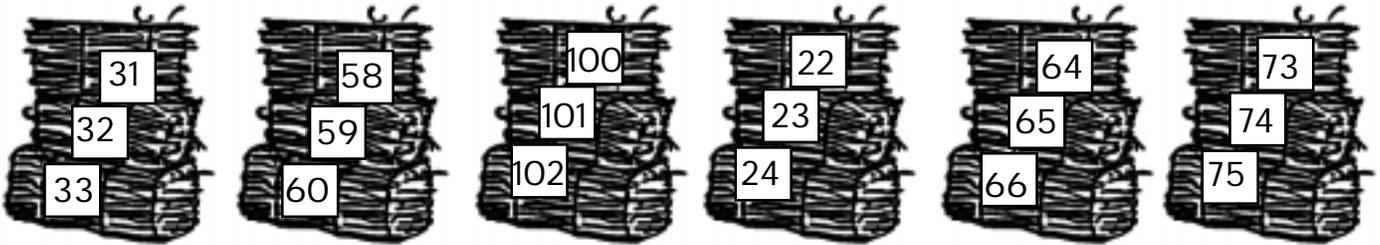
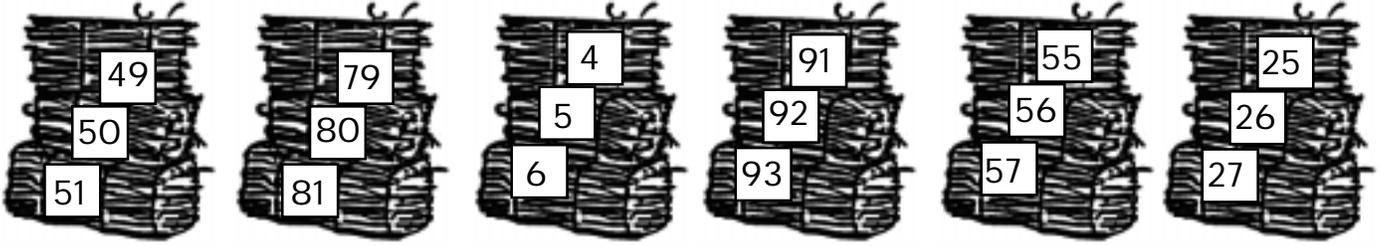
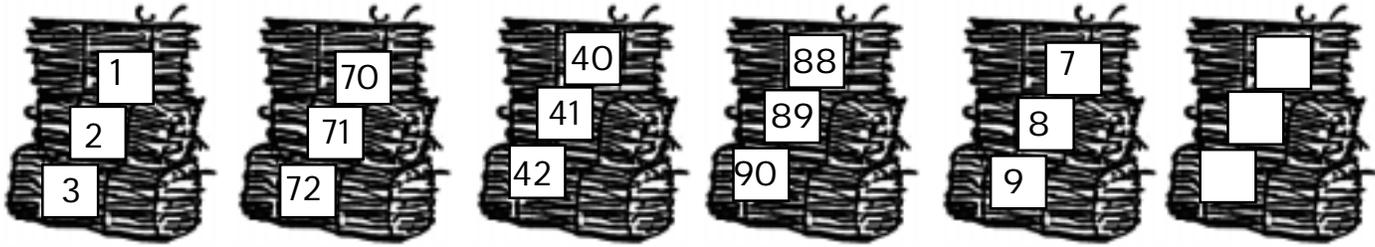
Give the students the hay bale sheets with the numbered bales and have them glue the bales on the calendar in the correct sequence (extra bales included).

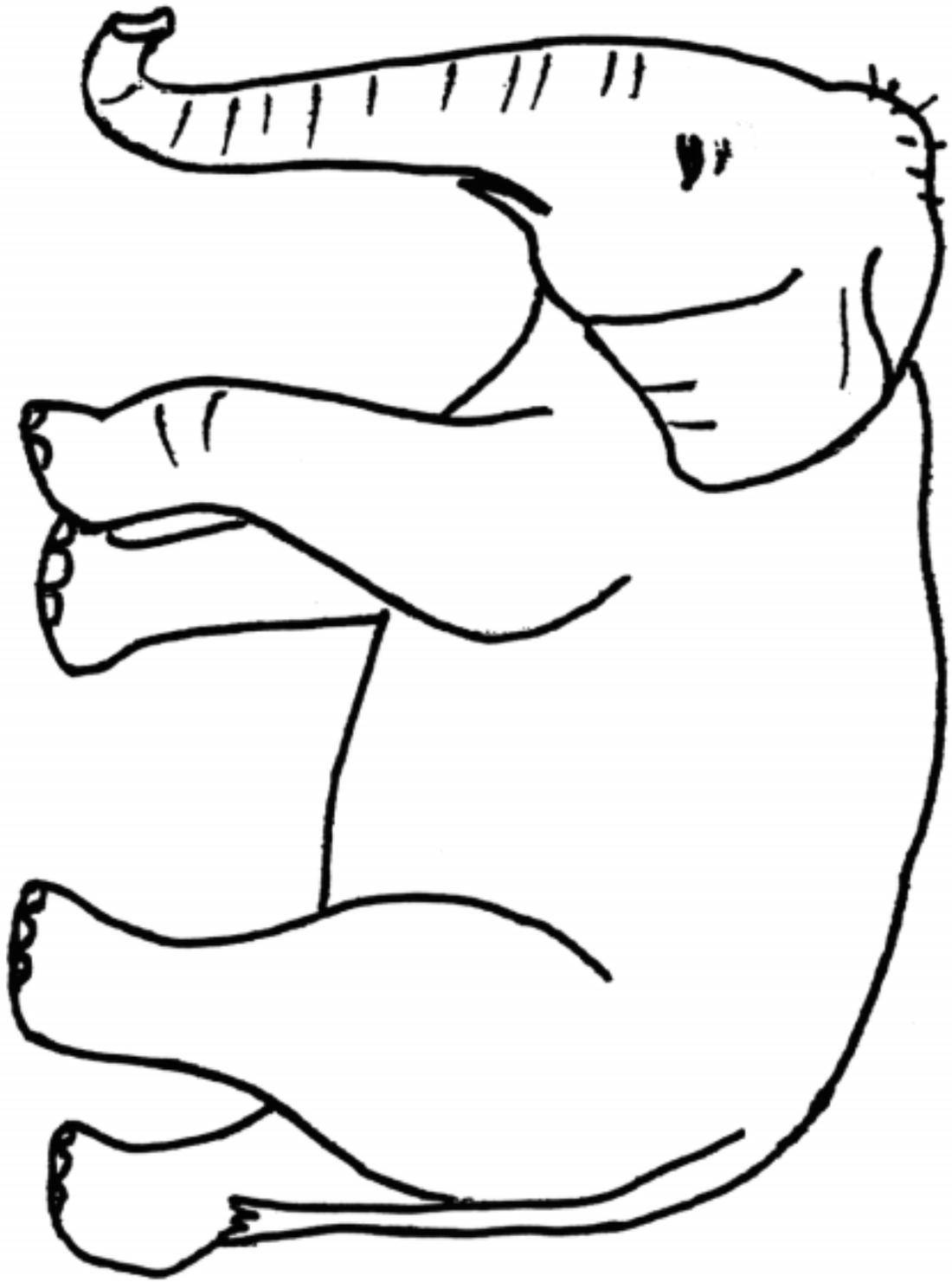
Give each student a copy of Tarra's picture to color and cut out. Then glue Tarra and her hay calendar to a sheet of construction paper.

Class Project Ideas

As you can see, feeding elephants is no small task; and hay for several elephants can become expensive. For a \$25 donation to The Elephant Sanctuary, your class or school can feed one of the elephants for one day. The students may choose which elephant(s) to feed, and they will receive a certificate and photo. For more information, contact The Elephant Sanctuary at **615-796-6500** or check the Internet at **www.elephants.com**.







How to Feed an Elephant

For the Teacher

Primary, Health

Elephants are like people in many ways. Both people and elephants need air to breathe, water to drink, a place to live, and food to eat. People and elephants need a **balanced diet** to stay healthy, but the foods that make up a balanced diet for people and a balanced diet for elephants are a little different.

Review with students the requirements for a balanced diet for people.

Elephants are **herbivores**. This means they eat only plant material. A balanced diet for an elephant includes lots of grass, fruits and vegetables, and grains. In the wild, elephants eat several kinds of grasses and their seeds (grain), fruit and leaves from the trees, and vegetables and roots they dig out of the ground. To find all of these things, elephants may have to walk 30 or 40 miles each day!

At **The Elephant Sanctuary** in Hohenwald, Tennessee, the elephants don't have to walk so far to get a balanced diet. The Sanctuary elephants eat grass and leaves from their **pasture**, but they also get **hay**, fresh fruits and vegetables, corn, oats, wheat, bran, and elephant chow. Elephant chow is a mixture of grains, grasses, vitamins, and minerals squashed into bite-sized pieces.

The following list is what one elephant named Tarra eats every day.

- 130 pounds of hay and other vegetation
- 5 pounds of elephant chow
- 1 pound of rolled oats
- 1/2 pound of wheat bran
- 10 pounds of fruit and vegetables

Activity

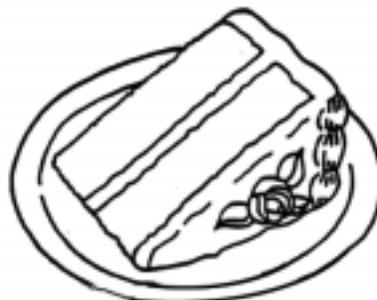
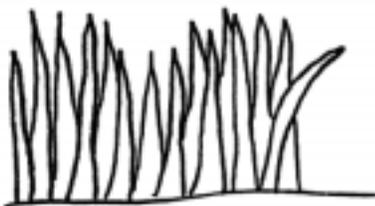
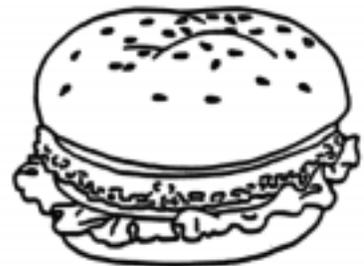
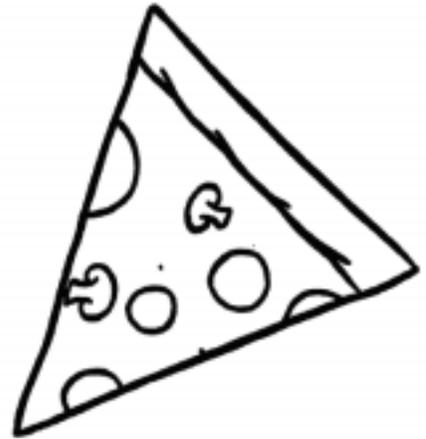
Color the picture of Tarra and color the foods that are part of a balanced elephant diet. Cut out Tarra and the colored foods and glue them to a sheet of construction paper. (*The foods colored: bananas, apple, celery, watermelon, potato, carrots, grass, and corn. Elephants do not eat pepperoni pizza, ice cream, hamburgers, or cake.*)

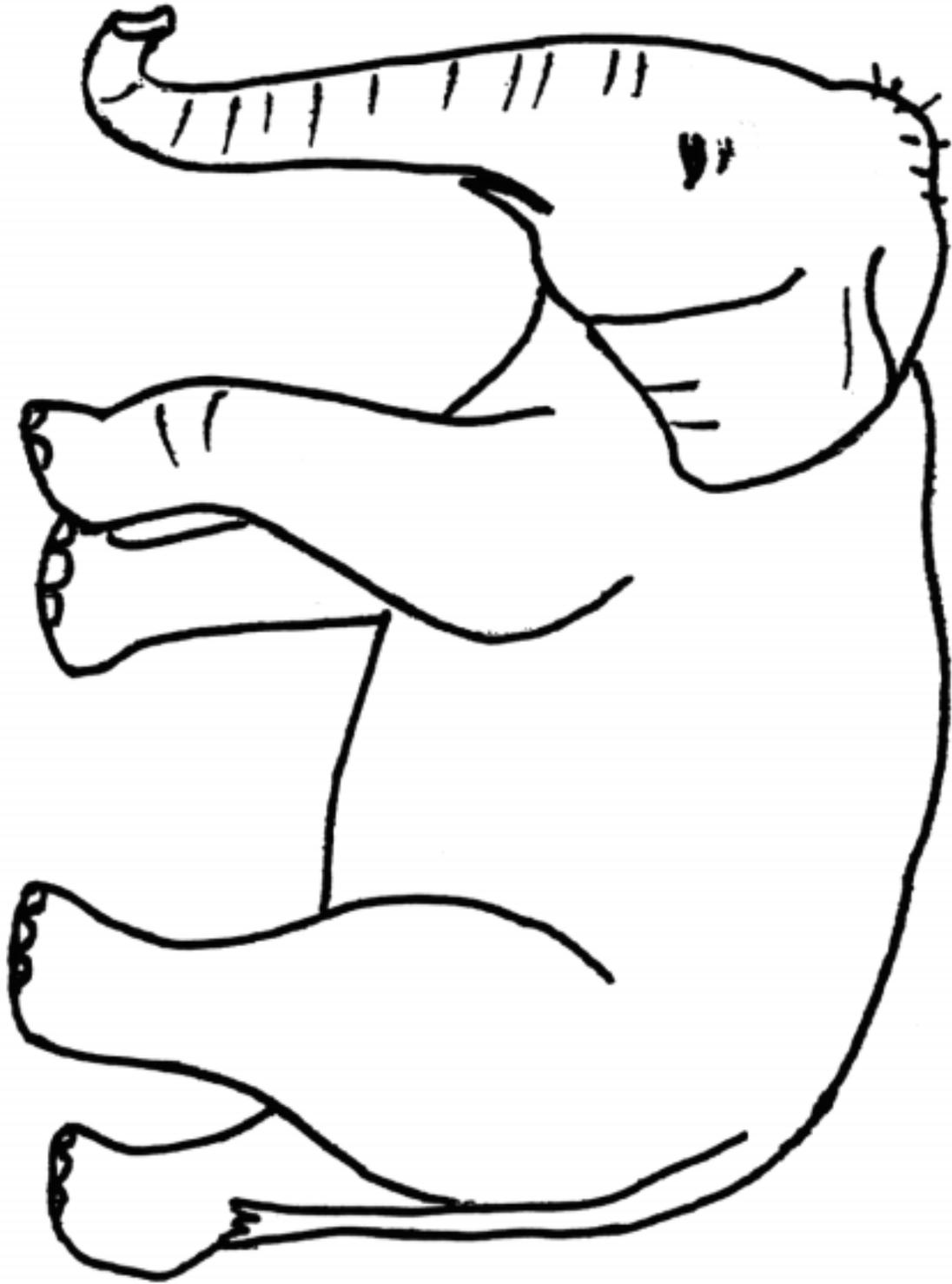
Talk about the foods not colored and why they are not part of an elephant's diet. Are any of those foods part of a balanced diet for people?

Class Project Idea

For a \$25 donation to **The Elephant Sanctuary**, your class or school can feed one elephant for one day. The students may choose which elephant(s) they want to feed, and they will receive a certificate and photo. For more information, call **The Elephant Sanctuary** at 615-796-6500 or visit the website at <http://www.elephants.com>.

Color the foods that are part of an elephant's balanced diet.





Big, Bigger, Biggest

For the Teacher

Primary
Measurement, Comparison

Big, little, large, small, medium, jumbo — we use these words, and others, every day to describe things. But how big IS big? What makes something “jumbo” or “deluxe” size? It is a matter of comparison.

In this activity, students compare animals of different sizes and rank them from smallest to largest.

Distribute the *How Big?* sheet and have students color and cut according to the directions. You may want them to glue the boxes to a strip of construction paper.

Extension

Use masking tape or construction paper to make a measuring stick on the wall and place the animal markers below at the correct height.

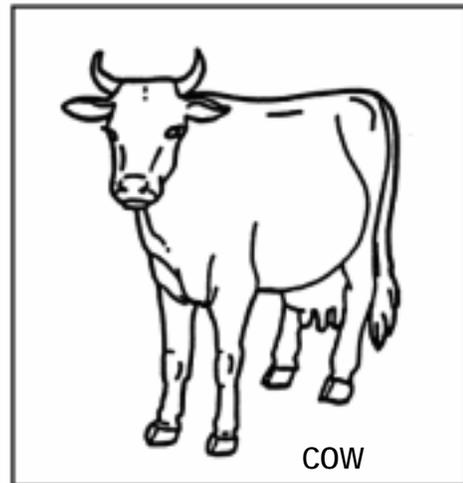
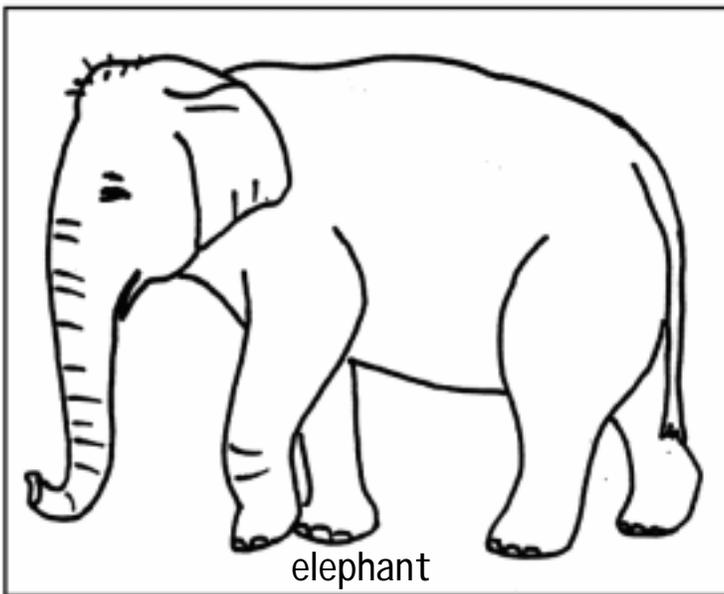
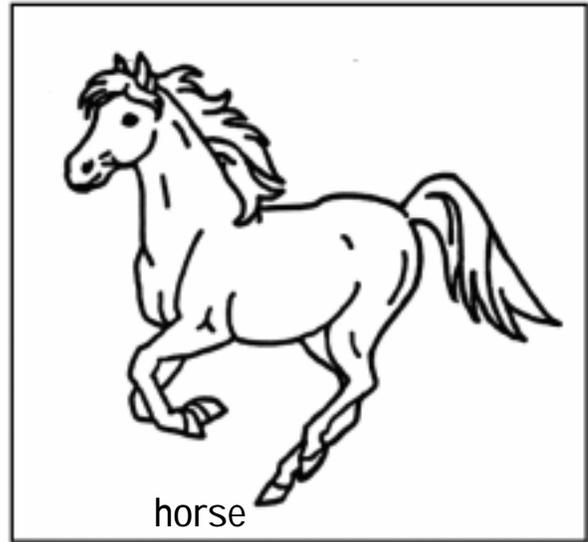
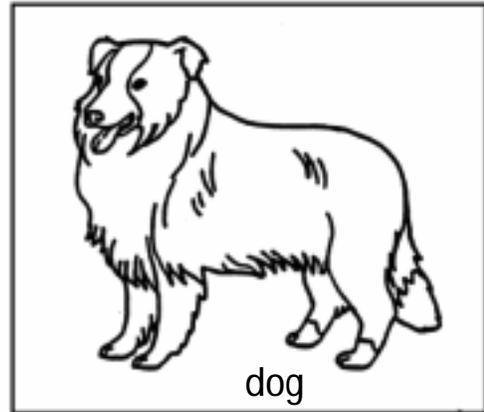
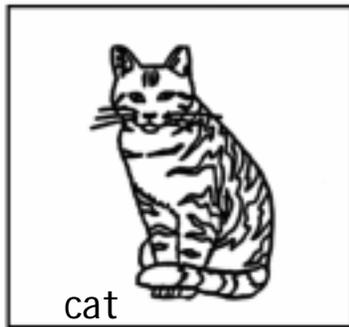
Measure the students and allow them to compare their size to the animal sizes.

- How many animals are smaller?
- How many animals are larger?
- How many students would you have to “stack up” to equal an elephant?
- How many cats would you need to “stack up” to equal a student’s height?
- Talk about measuring and how it is used in our lives.
- How could inches and feet be more useful than words like “big” or “little”?

Elephant	11 feet
Horse	6 feet
Cow	5 feet
Dog (collie)	3 feet
Cat	1 foot
Mouse	2 inches

How Big?

Color each animal in its box. Carefully, cut out each box and line the boxes up from smallest to biggest.



Elephant Parts

For the Teacher

Primary, Intermediate
Language Arts

The following poem explains some of the ways in which Asian and African elephants are different. You may read the poem to the students or allow them to read it for themselves. Then discuss the ways the two elephants are different. Do the students know of any other differences?

Give each student a copy of the *Elephant Parts Puzzle* hand-out and allow time to color, cut out, and assemble the pieces into two elephants.

An Elephant Description

There are, in the world today,
two sorts of elephants, large and grey.

Though they share a name and the color of their skin,
there are many differences between these who are kin.

The elephant of Africa has huge ears to fan,
and creates a nice breeze wherever it stands.

The elephant of Asia's ears are smaller in size and shape,
less fanning required in deep forest glades.

The elephant of Asia has a back rounded in shape,
from neck to tail, a dome it does make.

The elephant of Africa's back has a definite sway,
a dip between shoulders and hips, about halfway.

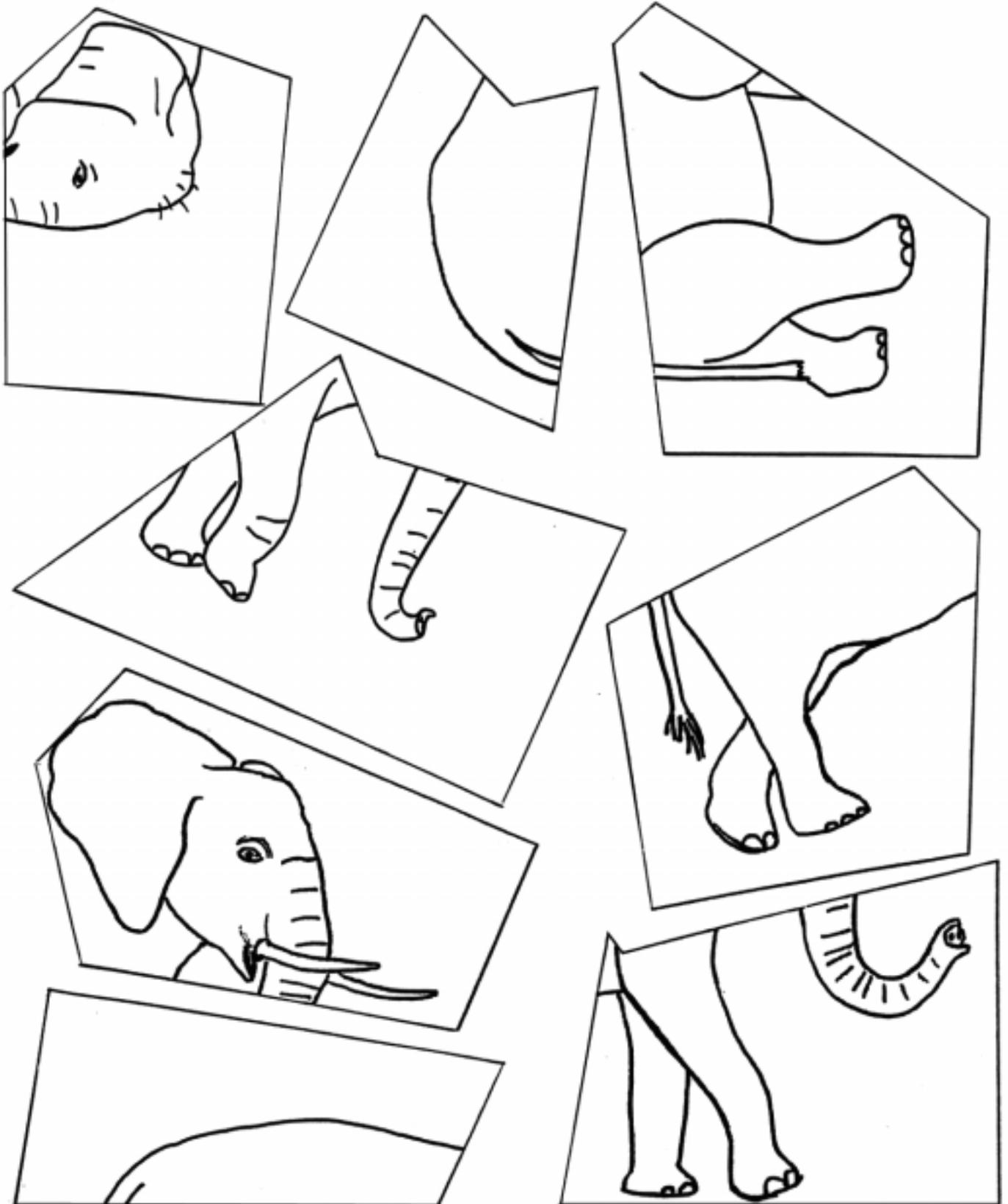
The elephant of Asia has, at the very tip of its trunk nose,
one little finger to help it feel and probe.

The elephant of Africa's trunk has one more,
two fingers with which to explore.

Finally, and check this if you can,
the elephant of Africa has more wrinkly skin.

Elephant Parts

Cut out each of the pieces below and put them together to make two elephants; one Asian and one African.



Elephant Glossary

- aardvark a large burrowing mammal from South Africa with a long, flexible tube-like snout. Not related to elephants, but a good word to begin a glossary.
- adapt to change in response to changing surroundings and conditions.
- adaptation process by which organisms change to increase their chance of survival.
- anatomy structural make-up of a plant or animal.
- ancestor one from whom an individual is descended. Grandparents and great grandparents are ancestors.
- browse to feed on young plant shoots, twigs, and foliage.
- bull an adult male elephant.
- calf a young elephant of either sex.
- carnivore an animal that eats other animals; a meat-eater.
- census a formal count of people, animals, etc. within a specific area.
- conservation the protection and careful use of wildlife and natural resources.
- cow an adult female elephant.
- DNA..... (deoxyribonucleic acid) a substance in the nucleus of each living cell that holds all the inherited characteristics of an organism.
- domestic living with or under the care of human beings; tame.
- ecosystem a community consisting of plants, animals, other organisms, and physical features considered as a unit.
- endangered species a group of living things (plants or animals) that may die out if protective measures are not taken.
- extinct a species that no longer exists anywhere on the earth. The wooley mammoth is extinct.

Elephant Glossary - continued

- generation single stage in a family history. Parents and offspring belong to different generations. Brothers, sisters, and cousins belong to the same generation.
- gestation the period of development of a mammal embryo inside the mother's womb; the time between fertilization of the egg and birth of the fetus.
- graze to eat grass and other low-growing plants.
- habitat the place where a plant grows naturally or an animal usually lives in the wild.
- habitat loss the destruction or alteration of an area that makes it unsuitable for the species that once lived there.
- herbivore any animal that feeds only on plant materials. Elephants are herbivores.
- herd a group of animals that feed and live together in the wild.
- howdah..... an elephant "saddle."
- hyrax a rabbit-sized mammal native to Africa, relative of the elephant.
- Ice Age one of several long, cold periods in the history of the earth when glaciers covered large parts of the northern hemisphere.
- incisor a sharp, chisel-shaped mammalian tooth used for biting, nibbling, and gnawing.
- infrasound sound waves with frequencies so low they are inaudible to humans.
- ivory the hard, white material which makes up the tusks of elephants, walruses, mammoths.
- mahout (MA hoot) an elephant handler.
- mammal a warm-blooded animal with a backbone. Mammals generally have body hair at some stage in their lives, have a well-developed brain, a four-chamber heart, and females feed offspring with milk from mammary glands. Humans, elephants, dogs, and cats are mammals.

Elephant Glossary - continued

- mammoth a very large, hairy elephant relative with curved tusks which became extinct about 10,000 years ago.
- manatee a large marine mammal, also called a sea cow; related to elephants and mammoths.
- matriarch oldest female in a family unit; leader of the group.
- migrate to pass from one region to another on a regular basis, usually to feed or breed.
- Moeritherium (meer-uh-THEER-ee-um) pig-sized prehistoric mammal from which elephants are descended; elephant ancestors.
- molar a tooth with a broad surface used for grinding; a back tooth.
- omnivore an animal that eats both plants and meat. Humans are omnivores.
- pachyderm any of several large, thick-skinned animals such as elephant, rhinoceros, hippopotamus.
- physiology the internal working of a living body and its parts (cells and organs).
- poaching hunting or fishing illegally.
- population the total number of members of a species living in a particular area at any one time.
- predator any animal that hunts and eats other animals (prey).
- quadruped an animal that walks on four feet.
- sanctuary a place of safety and protection.
- species a unit of classification in animals and plants. Members of the same species can mate and produce fertile offspring.
- taxonomy classification (as of animals) using a system that is usually based on relationship.
- threatened a species that is in decline and may become endangered or extinct if it is not protected.
- trunk the long, flexible combination of nose and upper lip found on elephants.

Elephant Glossary - continued

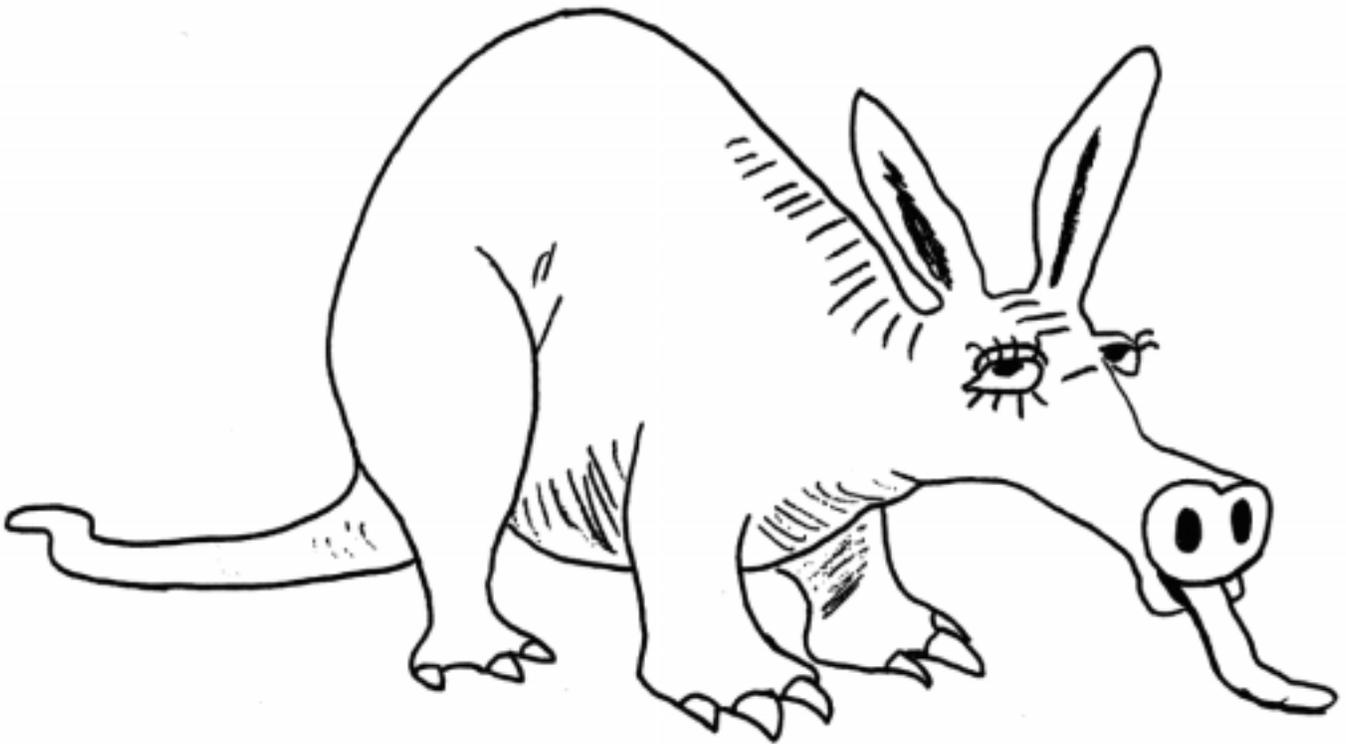
tusk..... an enlarged upper incisor that grows outside the mouth of certain animals.

ungulate a hoofed mammal such as elephant, horse, cattle, deer, etc.

vegetation..... all plant life.

vertebrate any animal that has a skeleton of bone or cartilage with a backbone, skull, and well-developed brain.

zoology scientific study of all forms of animal life.



Aardvark

Note long nose and longer tongue

Acres For Elephants

Square inch, square foot, square yard, square mile, square elephant . . . square elephant?

All living things need space. Some things, such as plants and barnacles, need very little space in which to live out their lives. Others need considerably more room, but every living thing needs some amount of space.

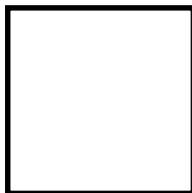
The exact amount of space any species needs is determined by a number of factors, such as — size of individuals, size of family groups, diet, and the resources within a particular habitat. For example, a 300-pound tiger living in a forest inhabited by many species of deer, antelope, monkeys, etc. will need less territory than a 150-pound Florida panther living in a cypress swamp where there are fewer and smaller animals to prey upon.

A species that feeds on specific vegetation and then migrates to a new area when that vegetation is eaten requires more space than an animal that can eat a variety of foods and therefore stay in one area.

A large animal with a big appetite needs more space than a small animal.

The only thing that is true for all is that everyone needs “space.”

ACTIVITY IDEAS AND DISCUSSION QUESTIONS



This box is 1 inch wide and 1 inch long, or a square inch. Use rulers, yardsticks, or tape measures, and masking tape to mark out a **square foot** and a **square yard** on the floor. (This can be done with chalk on the parking lot or playground.)

Think of some species (plants and animals) that could live within these spaces. (Don't forget about single-celled species.) Consult the planting directions on seed packets or in gardening books to determine how many tomato plants, corn stalks, etc. could grow in a square foot or square yard.

Why do plants need space?

Do all plants have the same space requirements?

How are animal space requirements different?

Now determine how much space you need. Work in pairs, or small groups, using rulers, yardsticks, and masking tape. While each student stands in a comfortable position his/her partner(s) use the rulers and masking tape to mark out the person's space. Remember, the person may be wider at the shoulders than at the feet and the space goes up from the floor.

(With younger students it might be necessary to use cardboard to demonstrate the 3-dimensional aspect of personal space. With older students try calculating the volume, or cubic footage, of a personal space.)

After each person in the group has a marked “space”, test the spaces to see how “livable” they are. Have each person occupy his/her space and time them to see how long they can stay within that space.

Repeat the activity but have each person sit down (or lie down) before their “space” is marked. How does this added area affect the amount of time each person can stay within his/her own space.

TALK ABOUT

- Could the students realistically live in such small spaces? Why not?
- Are some people more uncomfortable than others in small spaces? How about crowds?
- If the classroom were a country, would there be “space” for everyone in a standing position?
- How about sitting or lying down?
- Would there be any “wild” or unclaimed space left for other species?
- What do the students know about population pressures on wild species (plants as well as animals)? (See the Activity “Population Pressure” from Discovering Elephants.)

SQUARE ELEPHANTS

Using a tape measure and masking tape, lay out a rectangle on the floor that is 6 feet wide and 12 feet long. This is about the amount of space you would have marked if Tarra the Elephant had been in your group in the first part of the activity. This is how much space Tarra needs just to stand still — a **square elephant (SqE)** (trunk and tail included.) (In order for Tarra to lie down, you would need a space 9 feet wide and 14 feet long — a **sleepy square elephant.**) (SSqE)

- How many student spaces could fit into a *square elephant*? (First calculate an “average” student space.)
- How many *square elephants* could you get into the classroom, the gym, or the playground?
- Do the students think this is enough space for an elephant to live? Why not?

ELEPHANT SPACES

Elephants are herbivores, plant eaters. Specifically, elephants are grazers, they eat mostly grass with some leaves, twigs, fruits, roots and berries thrown in to balance their diets. A 7,000-pound elephant needs to eat 150 - 200 pounds of food every day to stay in shape (elephant shape). Obviously, an elephant cannot find that much food in a **elephant square**

(unless someone brings it to them), but must walk around to find grasses, leaves, vines, and so on. In the wild, elephants spend 16 to 20 hours every day walking and eating, and may walk 30 to 50 miles to find enough food.

Since elephants in the wild live in herds, and each elephant has a big appetite, you might think elephants are pretty hard on the environment. In fact, elephants are good for their environment for several reasons. First, 50% to 80% of the nutrients they consume are not fully digested and become elephant manure, which is excellent fertilizer. Second, elephants spread seeds from many plants as they eat and walk, helping to reseed their environment. Finally, the elephants' appetites keep the vegetation from becoming too overgrown.

Walking and eating over a large area is good for the elephants, too. It keeps them in shape (elephant shape), keeps their toenails and the pads of their feet worn down, and allows them to socialize with other elephants, all important for elephant survival.

The key to this mutual benefit is that elephants must have a large enough territory (space) in which they can walk and eat without overgrazing any one area. Population growth in Asia (and Africa) means humans are taking more and more of the elephants' space and wild elephants are being pushed into territories too small to meet their needs.

In the wild, Asian elephants need an area from 200 square kilometers to 1000 square kilometers in size in order to find enough food. The variation in size depends upon the availability of food. In an area where the plants are plentiful and grow quickly, the space needed is closer to 200 sq. km. In those areas where parts of the forest have been cleared, or dry periods prevent the plants from growing quickly, the elephants need much more space, up to 1000 km. A square kilometer is equal to about 247 acres (247.1).

In an area with plenty of plants, how many acres would an elephant need? (200 sq. km x 247 acres = 49,400 acres)

SQUARE ELEPHANT MATH (SqEM)

If a SqE is 6 feet x 12 feet, it equals 72 square feet or 8 square yards. One acre is then equal to 605 SqE, and 1 square mile equals 387,200 SqE. A square kilometer is equivalent to 149,495.5 SqE.

A Sleepy Square Elephant is 9 feet x 14 feet, or 126 square feet, which equals 14 square yards. So, an acre contains about 346 SSqE (345.7 to be exact.) A square mile is equal to 221,257 SSqE, and a square kilometer equals 85,422.5 SSqE.

THE ELEPHANT SANCTUARY

For most captive elephants space is a rare luxury and being able to walk and eat like wild elephants is only a dream.

The Elephant Sanctuary in Hohenwald, Tennessee is a captive elephant's dream come true. There the resident elephants spend their days peacefully walking, eating, and socializing. The current residents, Tarra, Barbara, Jenny, and Shirley have more than 100 acres of grass, trees, shrubs, wildflowers, and berry bushes to choose from. And they do move around, choosing to feed from different areas and plants at different times in the growing season. They know that some plants are more tasty and nutritious early in the growth cycle while others are better left to ripen. Tarra particularly keeps an eye on the blackberry bushes so she can (carefully) pick the ripe berries before the birds eat them.

This freedom for the elephants to roam about and feed themselves is central to the Sanctuary's mission of providing a "natural-habitat refuge where sick, old and needy elephants can once more walk the earth in peace and dignity."

ACRES FOR ELEPHANTS

The Sanctuary now has an opportunity to add nearly 100 acres to its existing property. Champion Paper has offered to sell 93 acres that adjoin the Sanctuary. These additional acres will not only ensure that the Sanctuary elephants will have plenty of space to walk and eat, but will also serve as a buffer to insulate the elephants from the outside world and maintain their peaceful existence.

(The 93 acres Champion has offered the Sanctuary equals 56,265 SqEs. (93 acres x 605 SqE per acre.)

The **Acres for Elephants** campaign goal is to raise the money to purchase these acres and build a fund to purchase additional land in the future. Individuals and groups can help us reach this goal by "purchasing" one or more **Square Elephants** for a mere \$2.00 each. Larger parcels are also available for "purchase":

<u>Categories</u>	<u>Donation</u>
Sleepy Square Elephant - - - 1 SSqE or 9 x 14 feet	\$ 3.00
Dumbo - - - 20 SqE or 1,440 square feet (house size)	35.00
Jumbo - - - 151 SqE or 1/4 acre	246.00
Mammoth - - - 1 full acre	984.00

For more information on Acres for Elephants and what you or your group can do to help, call the Elephant Sanctuary at **800-98-TRUNK** or check our website at **www.elephants.com**.