

Adaptations



Janice Roberts

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Kentucky Core Content

Life Science IV Diversity and Adaptation of Organisms.

3.4.1 Unique characteristics and biological adaptation

3.4.2 Extinction and adaptation

Materials used:

Dinosaurs to Do Dos, Don Lessem, Scholastic Inc., 0-590-31685-0

HORSE- the Complete Guide, Mary Watson, ISBN 0-7607-1720-6

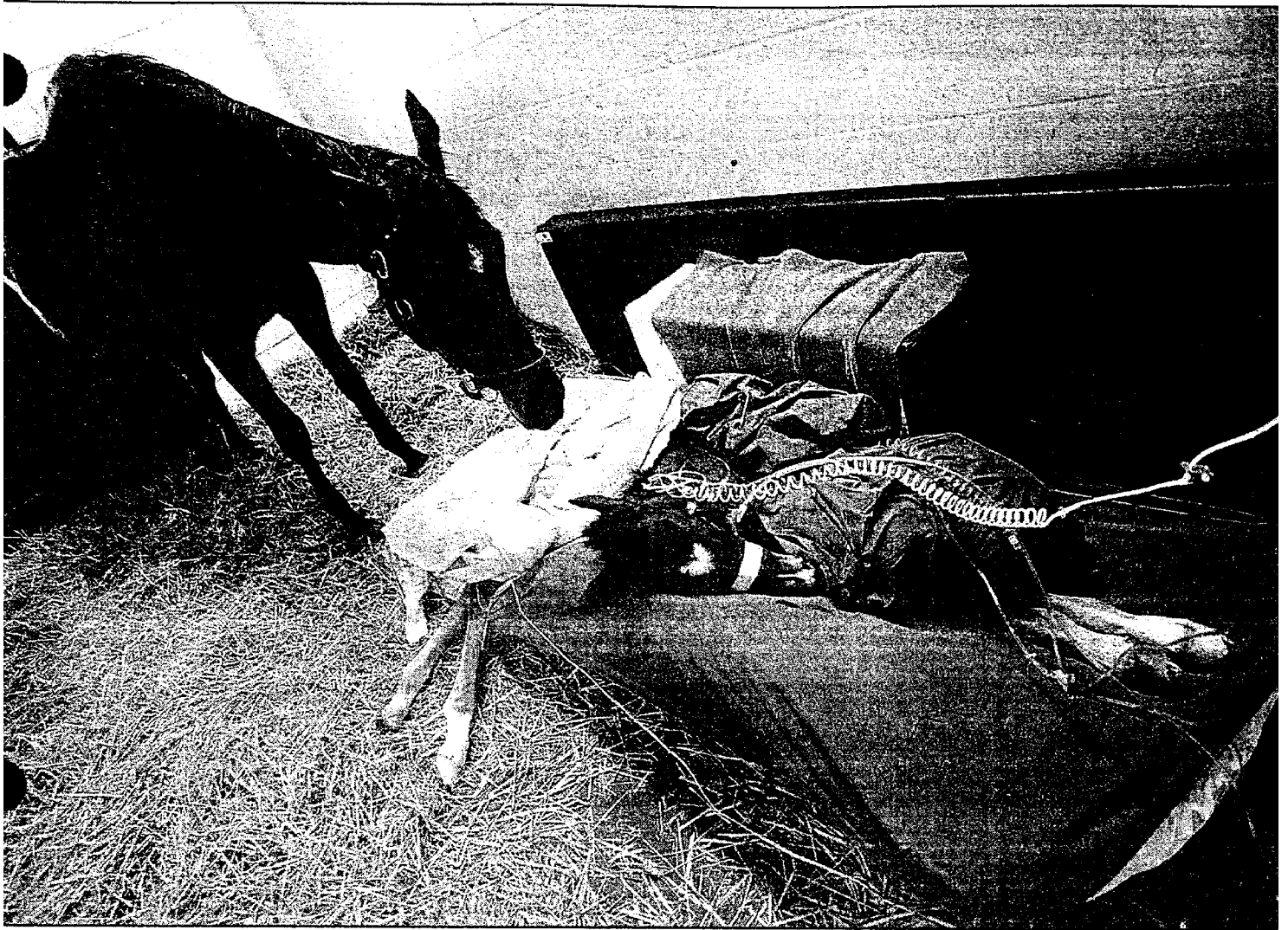
"Kentucky Living," April, 2000

Life Science , Steck-Vaughn ISBN 0-8172-3845-X

' Smithsonian Magazine,' March 1999 & Nov.2000

INDEX

HOW ORGANISMS ADAPT	Page 1
HORSES THROUGH TIME	Pages 2-8
ELEPHANT STORY	Page 9
RHINOCEROSSES STORY	Page 10
PLANTS and ANIMALS ADAPT	Pages 11-12
FOSSILIZATION GAME	Pages 13-16
SURVIVAL	Page 17
NATURAL TOOLS	Page 18
HOW BIRDS ADAPT TO EATING	Pages 19-20
BEST FOOT FORWARD	Page 22
HOUSE PLANS	Page 23
WHY BIRDS FLY	Page 24
ADAPTATIONS	Pages 25-38
EXTINCTION	Pages 39-41
DYING FOALS	Pages 42-43
HERE TODAY.....GONE TOMORROW	Page 44
RAREST OF THE RARE	Pages 45-46
CATAHOULA DOG	Page 47
TRACKING AMERICAS FIRST DOG	Pages 48-49
ACTIVITIES and QUESTIONS	Pages 51-56



Associated Press

are looks over her sick foal at the Rood and Riddle Equine Hospital last Friday in Lexington. Foals are dying and mares are losing babies at a staggering rate on central Kentucky horse farms. Scientists have a name for the mysterious condition — Mare Reproductive

Loss Syndrome — but no concrete reasons why foals are dying and mares are aborting their early-term pregnancies at an alarming rate. The foals have to rest on foam beds to prevent pressure sores as they are too sick to stand.

DYING FOALS

Steve Bailey
Associated Press

VERSAILLES

By sunrise, equine veterinarian Chet Blackey already is well into what eventually turn out to be another 18-day.

Used to being busy from early through June, the top thoroughbred breeding operation across Kentucky. This, however, sleep has come at a premium as a silent killer has reaped the region's foals.

determine why.

Mares have suffered late-term miscarriages or delivered foals that were stillborn or born weak and survived only a few days. Other mares appeared to be pregnant at between 40 and 60 days, but later ultrasound tests revealed a dead fetus or empty womb.

"I've never seen anything like this — nobody has," says Blackey, who has spent the last 17 years taking care of broodmares and their babies across central Kentucky.

"I went through a stretch

where a pregnant mare I examined turned up empty. Disheartening doesn't begin to describe it."

Blackey starts his day at 4:30 a.m., walking on his treadmill while shuffling through paperwork to try to organize another hectic day. He spends from 6 a.m. until nearly 10 p.m. bouncing from farm to farm to check newborn foals and examine pregnant mares.

In a typical year, Blackey would work 10- to 12-hour days, telling most farm managers that their foals are strong and healthy

has been typical.

Blackey insists the sleep deprivation doesn't bother him. It's the look of sadness and disappointment in his clients' faces as he tells them the grim news, a routine he's had to perform far too many times this spring.

"Everybody has a deep emotional investment in their animals," says Blackey. "You can only tell so many people that their foals probably aren't going to make it or that their mares, for some reason I can't explain to them, are no longer pregnant

Foals: Condition is known as Mare Reproductive Loss Syndrome

From Page 1D

Scientists have a name for the mysterious condition — Mare Reproductive Loss Syndrome — but no concrete reasons why foals are dying and mares are aborting their early-term pregnancies at an alarming rate.

Between April 28 and noon Monday, the University of Kentucky's Livestock Disease Diagnostic Center had received 442 dead foals and late-term fetuses for testing.

Last season, the center received fewer than 70 during the same period. In addition, as much as 25 percent of the region's mares in the early stages of pregnancy have spontaneously aborted.

Researchers theorize that a warm, dry spring followed by hard freezes and subsequent drought-like conditions spawned a fungus or toxin in the pasture grasses eaten by horses. But until they can say with certainty that is the cause, nothing has been ruled out.

Although it is too early to determine the blow to Kentucky's billion-dollar thoroughbred industry, the numbers indicate that as much as 6 percent of this year's foal crop and up to 21 percent of next year's foal crop might be lost.

"Everybody in the industry is going to feel this, whether it's immediate with a dead foal or next year when there's not as many foals," says Tom Evans, co-owner and farm manager of Trackside Farm in Versailles.

"There won't be as many horses to buy or sell at auction. Maybe farmers won't need to buy as much feed as they have in the past, or maybe they won't have as many jobs available. It's going to trickle down until it hits everybody."

Evans began hearing the unset-

ting talk about the growing number of dead foals and early term miscarriages the week before the Kentucky Derby.

By May 6, the day after Monarchs sprinted into the record books at Churchill Downs, Evans had two foals born dead and another taken to the hospital that died within 48 hours.

"When you rush a foal to the hospital and hear it was one of 17 or 18 admitted that same night, that certainly wakes you up," says Evans, who manages about 100 mares on three central Kentucky farms.

The following Monday, Evans had Blackey begin using ultrasound scans to check his pregnant mares. He found about 75 percent of the mares bred in February and past 60 days of gestation had aborted their fetuses. Another 50 percent of those bred in the first half of March also came up empty.

"It's extremely disappointing with those mares that were supposed to be in foal," Evans says. "You think when they pass 60 days that you're done with them until they deliver the following spring.

"It's just a sickening feeling to put that much work into something and then, in the time it takes to do an ultrasound, you realize you're late in the season and back to square one."

Evans says some of the mares who miscarried their early term pregnancies, including one bred to 2000 Kentucky Derby winner Fusachi Pegasus, are back in heat and may be able to be bred again before the season ends. Many, however, will have to wait until next year.

"All you can do is keep working and push on," he says.

The tiny chestnut foal has first-

lessly on its side on a makeshift foam bed in its stall at Lexington's Rood and Riddle Equine Hospital while its mother hovers protectively nearby.

Intravenous feeding tubes from a machine outside the pen snake their way through the bars and into the nostrils of the sickly colt, whose short, labored breaths punctuate his battle to survive.

Every few minutes, the mare bends down and nudges her baby with her muzzle. Upon getting no reaction, she circles and returns to her position as guard.

It's a scene Dr. Bill Barnard has become all too familiar with since owners and farm managers began delivering foals to the facility en masse the last week of April.

"We were getting 15 to 20 a day the first few days," says Barnard, the hospital's internal medicine specialist. "All of them were extremely weak and dehydrated. Many of the ones in that first wave didn't make it."

"In a typical year, we'd maybe get four or five coming in on the same day. It was obvious we had a huge problem on our hands."

By Derby day, the hospital's intensive care unit was beyond capacity and nearly 80 stalls were filled with other foals that were too ill to remain on the farm.

Like the veterinarians in the field, Barnard and the rest of the hospital staff also are working 12 to 16 hours a day, forsaking sleep and their families to slow the body count.

"This has been the most trying period in my 16 years of practice," Barnard says. "It's frustrating to see the anxiety and fear in the faces of worried owners and farm managers and not be able to say to them,

this is how we're going to fix it."

By Saturday, the number of foals coming into the hospital had slowed to between three and six a day.

"You just continue working hard to keep these foals alive and hope you've seen the worst of it," Barnard says.

Evans can't suppress a smile as he speaks about the two most recent additions at Trackside: a filly and a colt born before daybreak Saturday.

In the hours after birth, Blackey finds both to be in good shape, healthy and strong with no signs of being affected by the syndrome.

"This filly's mother, Lite Light, won the Kentucky Oaks in 1991 and her father is Deputy Minister," Evans says as he helps steady her so Blackey can take a blood sample. "The colt's mother is Darby Shuffle, a graded stakes winner that finished second in the 1988 Breeders' Cup Juvenile Fillies, and his father is Grand Slam.

"After what we went through last weekend, this is a very welcome sight."

After nearly two hours at the farm, Blackey has checked nearly two dozen mares and found nothing out of the ordinary. Those who were supposed to be pregnant are pregnant, and several mares who lost early term fetuses appear to be in heat again, ready for another try at breeding.

He pauses as he gets into his truck to move on to the next farm.

"I'm seeing a lot more healthy foals and normal pregnancies than I did a week ago, and that's encouraging," Blackey says. "I'm extremely confident we're going to get through this, maybe not unscathed but a lot better than a lot of people thought we would initially. Only



IT WAS A WARM, SUNNY DAY IN EARLY JULY, AND I WAS sitting as quietly as the cloud of biting gnats around my head would allow. I crouched low so the tall grass obscured my outline, which is a good thing when one is trying to observe wild animals—but in this case, I wasn't on some remote mountain, but sitting behind a low building in rural Virginia, a little more than an hour's drive from Washington, D.C., squinting through a screen of chain-link fence. Inside, across a wide gravel walkway, was a row of wire-mesh enclosures, each containing chest-high mounds of dirt pockmarked with burrows and sprouting unkempt clumps of grass.

For almost 20 minutes, nothing moved except the bugs. Then, just as I began to shift position to ease a cramping muscle, a jack-in-the-box figure popped up from a hole—a large weasel, nearly two feet long, slender as a tube sock and the color of sand. Low, round ears bracketed a face covered with a dark robber's mask; its short black legs rested against its chest as it sized me up. A second animal, a carbon copy of the first, shot up for a look, and I froze, holding my breath; but with-

THE Rarest OF THE Rare

FOR 25 YEARS, SCIENTISTS AT THE SMITHSONIAN'S CONSERVATION AND RESEARCH CENTER HAVE SNATCHED ENDANGERED CREATURES FROM THE BRINK AND REDEFINED CONSERVATION BIOLOGY

BY SCOTT WEIDENSAUL
PHOTOGRAPHS BY
CAMERON DAVIDSON

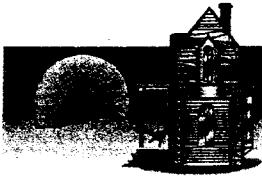
in seconds both collapsed into a rough-and-tumble wrestling match, disappearing from view.

The creatures inside the pen were black-footed ferret kits just a few months old, the rarest mammals in North America. The victims of a relentless war against prairie dogs, in whose vast colonies they live and upon which they are utterly dependent for their prey, these predators are so endangered they have been considered extinct on two separate occasions during the past century. That black-footed ferrets survive at all is testament to a conservation miracle, a momentous story not possible without the significant contributions of the scientists here at the Smithsonian's Conservation and Research Center (CRC), near Front Royal, Virginia. Even so, after 15 years of intensive captive breeding, the current ferret population numbers no more than 500 individuals. Over the past dozen years, 186 ferrets have been born at CRC.

Like most of the undertakings at CRC, the ferret breeding

Among the world's most threatened mammals currently in residence at the Smithsonian's Conservation and Research Center are (above) North America's black-footed ferret and (opposite) Przewalski's horse of Mongolia (top); Eld's deer of Southeast Asia (right); and South





Catahoula cattle dog

What do you get when you cross a German shepherd with a Doberman pinscher?

According to one legend going back to the 16th century, military leaders in Europe crossed the two breeds and what resulted came to be known as the indomitable European War Dog.

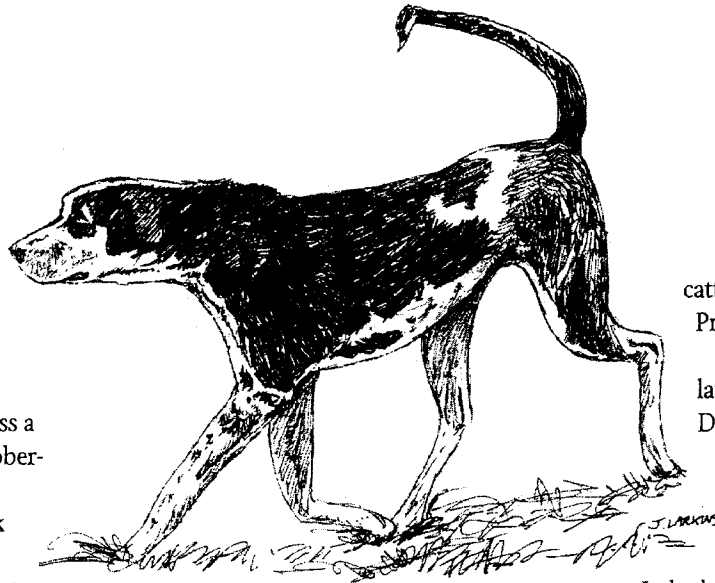
We're talking some kind of dawg. Not your everyday lap snuggler.

Modern historians of the breeds may dismiss this folk tale as far-fetched, so anybody with a better version is encouraged to throw it over the fence.

The way we heard it, Charles V (1500-1558), ruler of Spain and Spanish America, used these War Dogs to help drive the French out of Italy, conquer Tunis, and defeat Barbarossa, the terror of the Mediterranean.

The conquered must have had a sneaking suspicion they were up against the Hounds of Hades because the European War Dog was seldom in a mood to take prisoners.

According to the story written by the late R.T. Bonnette, a newspaper reporter near Catahoula Parish in Louisiana, there was a 19-year-old soldier in Emperor Charles' army who took several litters of European War Dogs to Peru. This was back in the time of Francisco Pizarro, conquerer of the Incan empire. The dogs played a fanged role in it and when Spain annexed Cuba (Pizarro became the first governor), the War Dogs were there too. They went



cattle and work your cattle. Problem cattle caught."

On a Sunday afternoon in late winter, it's a joy to sit with Dub and Judy surrounded by their 15 award-winning Catahoulas (not counting the litter nursing in the back room).

Judy thinks of Red Dog and sighs:

"He works so quickly and so beautifully and he's got this husky-sounding voice, and he works and makes your hair stand up on your arms."

"There ain't no pain in these dogs...there ain't no such thing as pain," says Dub, recalling Spike. "I've worked them 10 or 12 hours, all day long."

"What bonds you to these dogs?"

"Their intelligence...it makes the cattle so much easier to handle. With these dogs here it ain't no problem. I can pull a trailer right out here in the field and load up the cattle right there."

By their double glassy eyes you'll always remember the Catahoula Cur. Depth of stare. Round head. Loyalty and commitment to the notion that tough jobs require tough dogs.

Judy says, "When they look at me with those eyes, they make me feel like I'm the only thing on this earth."

Speed? The warning that hangs on the back rampart speaks volumes: "I can get to the fence in three and a half seconds. How fast can you?"

strength, cunning, and terrible speed.

In 1539, it was a short boat ride to Florida with Fernando De Soto, and the War Dogs went along. De Soto was as hungry for an empire of gold as most all dogs who dream of bone heaven. The famous explorer anchored in Tampa Bay with 600 men and about 100 War Dogs.

Two years later, De Soto finally reached the Mississippi River, crossed it, didn't find the Promised Land, was wounded in a battle with Indians, contracted a fever, and died. His men weighted his body, and dropped it into the river so that it could not be found.

As the explorers straggled south, they failed to gather up all the War Dogs. According to Cajun Bonnette, the warrior's best friend wandered in the wilderness and had the good sense to survive by obeying natural instincts.

So, what do you get when you cross a European War Dog with a wolf?

You get a Catahoula Cur, named for the Catahoula Indians in what is now Catahoula Parish, Louisiana.

Which brings us home to Alvin "Dub" and Judy Allen, consummate breeders of the Kentucky Catahoula Stock Dog in Bourbon County: "Broke dogs, puppies,



David Dick, a retired news correspondent and University of Kentucky professor emeritus, is a farmer and shepherd.

BY SCOTT WEIDENSAUL

PHOTOGRAPHS BY LYNDA RICHARDSON

Tracking America's First Dog

CAROLINA DOGS,

DISCOVERED IN THE

SOUTHEAST WOODS,


MAY PROVIDE CLUES

TO THE PROMOTIVE

DOGS THAT ARRIVED

WITH THE FIRST

HUMANS IN AMERICA



IT'S NOT OFTEN THAT a registered breed of dog starts with a castoff that even the pound didn't want and a stray plucked out of the woods. But it is even less likely that such animals would provide one of those rare "Eureka!" moments in science, drawing back the curtain on both evolution and human culture, and providing clues to the mysterious origins of the long, fruitful partnership that exists between humans and canines.

And yet, that's exactly what happened with the shy enigma of a creature known as the Carolina dog, which just may be a remnant of the first animals to accompany humans across the Bering land bridge to North America thousands of years ago. Then again, it may be nothing more than a modern mutt; no one is exactly sure, and the genetic evidence, while suggestive, is thus far inconclusive. Regardless, the Carolina dog and several

other demonstrably primitive canids, some nearing extinction, are part of a controversial reexamination of how modern dogs arose, and even more fundamental questions about the process of domestication itself.

If you passed a Carolina dog on a back road in the humid South Carolina Low Country, where stands of tall longleaf pine alternate with crop fields and cypress swamps, chances are you wouldn't spare it a glance—it would seem to be just a scrawny, medium-sized mongrel with a reddish-yellow coat, upright ears and a whiplash tail curling up over its back, what rural Southerners have long called a "yaller" dog. And for years, that's all I. Lehr Brisbin, Jr., thought they were, too.

Brisbin—"Bris" to his colleagues at the Savannah River Ecology Lab (SREL) in Aiken, South Carolina—saw these skittish feral dogs from time to time. Brisbin is a senior ecologist on the

Feathers: Have students bring in a variety of feathers from birds. Use magnifying glasses to how the bird has adapted different feather types to the needs of the organism.

Nests: After the birds have finished using the nests to raise their young collect several and record how high up in a tree they were and what type of tree it came from. Have the students observe what type of bird has been using the nest. Do bigger birds use bigger nesting materials? How have they adapted?

Beak structure: Have students bring in different items from home to represent the structures of a bird's beak. Tweezers, clothespins, pliers etc. can be used. Have a bag of mixed seeds, and allow the students to pick up as many of one type of seed in as they can in that time period with their simulated beak. Tabulate the results, and see how the bird's beaks have become adapted to eating

Seeds

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____

Match the seed in the container to the right number: ASTER, BATCHELOR BUTTON, CANTELOPE, CARNATION, CARROTS, CELOSIA, CUCUMBERS, COLEUS, MARIGOLD, OKRA, PAINTED DAISY, PEA, PETUNIA, PEPPER, PUMPKIN, SQUASH, WATERMELLON, ZINNIA

Which seed will float, catch on different material types, has the most density, holds in wet dirt? Make your own experiment.

1. Pretend you are designing a nature preserve for endangered animals. List at least 6 things you would need to know about the animal in order to provide a good home for it.
2. The number of animals on the endangered species list is increasing, what can be done to change this?
3. Think about a cactus and a parrot. Tell how one of these organisms is adapted to its environment.
4. Would tube worms growing near hydrothermal vents be likely to be members of the same genus or species as tube worms growing in other marine environments?
5. Explain this statement: "You are likely to see many more species become extinct in your lifetime."
6. List one group of people who have adapted to extreme conditions such as heat, cold, altitude or drought. Explain some of the adaptations people have developed to survive in an extreme environment.
7. What effect would placing a plant in a closed box have on its growth?
8. Why would competition among organisms increase when resources are limited?
9. Would the adaptation of a cactus help or harm the plant if it were placed in a wet environment?
10. If you were going to go camping in a desert, what are some of the need you would have to deal with?
11. What are the feet of an eagle adapted for?
12. How are the legs of a turtle different than that of a tortoise?

1. Can adaptation take place over a several day period of time?
2. Did horses roamed North America 50 million years ago?
3. Did horses once had soft padded toes, four toes on the front feet and three toes on the back feet?
4. Are there not as many endangered species now as there were 50 years ago? People are more concerned about the environment then ever before.
5. Birds sit around a lot, so they must have low metabolic rates.
6. Do traits help an animal adapt?
7. Were elephants once the size of pigs?

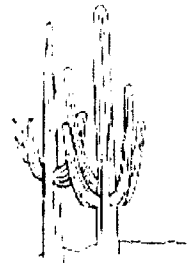
For each organism below, describe how it is adapted to its environment.



a.



b.



c.

Design an animal that would not easily become extinct. Draw a picture of what it looks like and write a paragraph to describe it.

Explain how a keen sense of sight is an adaptation for survival.

What is the relationship between how complex an animal is and the amount of care the animal gives to its young?

In the article "DYING FOAL", many horses died in the Versailles area. Was that the only area they died in or was it a national or worldwide occurrence?

Many species of hoofed mammals feed in large groups or herds. What possible advantage could this behavior have for the survival of these animals?

The government has chosen your team to decide which of the following endangered species should be saved first. Choose why and support your answer of your choice. California Condor, Florida Panther, Giant Panda, Orangutan, Tiger Salamander.

Research the hypothesis scientists have developed to explain dinosaur extinction. What evidence do they use to support their idea?