What Deer Goes Where?

(A Modified Project WILD Activity)

Objectives

Students will: 1) identify the five species of the deer family that live in Idaho and their habitats; and 2) generalize that animals have adapted to live in their habitats.

Method

Students construct posters of five different habitats.

Materials

Pictures of the five species of the deer family that live in Idaho; five large sheets of paper with the outline of one species on each, labeled; construction paper; pencils; scissors; glue

Background

Deer are mammals that belong to the family Cervidae. Worldwide there are 40 species in the deer family. In North America and Idaho, there are five species. The deer family consists of large, herbivorous, hoofed animals. They are members of Order Artiodactyla, the even-toed ungulates. Males in this family grow antlers, while females do not. Caribou are the exception; both males and females grow antlers. Antlers are shed annually and consist of tissue similar to bone. In the spring when antlers are growing, they are covered by skin called "velvet". The skin has many large blood vessels which allow nutrients to be carried to the growing antlers. Antlers grow very fast. By late summer to early fall, they reach the maximum size, and the outer skin begins to die. The males then rub their antlers on trees and shrubs "shedding" the dead skin and "polishing" their antlers.

Grade Level: K-4
Subject Areas: Science, Environmental Education, Expressive Arts
Duration: one 30-minute session
Group Size: five groups of three to six students each; increase groups as necessary for class size
Setting: indoors
Conceptual Framework Topic Reference: CAIIA, CAIIA1a
Key Terms: alike, different, adapt, survive, habitat
Appendices: Early Childhood

All members of the deer family have a four chambered stomach. Having a four chambered stomach allows deer to quickly eat and fill the first chamber. Then they can go to a safer location to fully eat and digest their meal, avoiding predators.

MULE DEER: Mule deer have large ears that move independently and almost constantly, like a mule's. Male mule deer, bucks, will sometimes fight over a female, or doe. During these fights, each buck tries to force down the other buck's head with its antlers. Even in such battles, the bucks are rarely injured; usually the loser just gives up. However, if the antlers become locked together, both bucks will starve to death. In Idaho, mule deer prefer rocky, brushy areas, open meadows, open pine forests, and burned areas.

WHITE-TAILED DEER: White-tailed deer are the smallest deer species in Idaho. A white-tailed buck is a smart fellow. Living in the wild for many years takes a knack for survival. A lucky white-tailed deer may live up to 10 years in the wild, but most old-timers will be six to seven years old. In Idaho, white-tailed deer prefer low to intermediate elevations with dense forests and brush. They also like to be near water and marshy areas.

ELK: Native American Shawnee first called elk "Wapita" meaning white or pale deer, probably referring to their light-colored rump. The name "elk" was given to the large deer by early English colonists, ignoring the fact that the name had long been used for the European moose. Elk live in various habitats. They eat in open, grassy meadows, marshy meadows, clearcuts and river flats close to aspen and coniferous forests for hiding. Studies in Idaho have shown that some elk live year-round in sagebrush deserts and use grass-shrub areas for feeding and tall shrub or timbered areas for resting.

MOOSE: If you see a moose, you won't soon forget it; moose are the largest member of the deer family. Males, bulls, can weigh 1,000 pounds, and females, cows, may reach 800 pounds. Bulls have huge, flat, palm-shaped antlers. Large antlers can span six feet from tip to tip. One thing you can bet: if it's mossy, it's moose-y. Moose spend most of their time in shrubby or forested areas near lakes, marshes, wet meadows and bogs. A moose's diet is made up of underwater vegetation, willow and succulent tree twigs. Despite their size, moose are great swimmers.

CARIBOU: Caribou are the rarest mammal in Idaho. They are only found in northern Idaho close to the Canadian border. This is the only member of the deer family where both the male and the female grow antlers. The antlers of the female are smaller than those of the male, but they are carried for a longer period of time. Caribou start growing their antlers each spring and are normally done with the process by August. Male caribou shed their antlers in November or December after mating. Females will often carry their antlers until June, after they have given birth. In Idaho, caribou are found at high elevation open forests in winter. They have large, round, concave hooves that help them walk on top of the snow. They move to mature timber stands for spring calving and move to lower, thicker elevation forests for the summer and fall. Caribou eat the leaves, buds and bark of trees, grasses and mushrooms. Lichens growing on trees are the caribou's most important food during the winter.

Procedure

1. Show the students pictures of the five species of deer found in North America. Name the five deer. Ask them to discuss the similarities and differences between the deer.
2. Ask the students to imagine the place where each deer lives. Talk about the similarities and differences of each deer habitat. Ask the students to think about how each deer looks and whether its features help it to live where it lives. Talk about the different adaptations of each of the deer species.
3. Distribute five large sheets of paper. Draw an outline of one of the deer species in the center of each sheet and label it accordingly. (A photo of each ungulate will serve just as well.)

NOTE: The outline of each deer can be projected onto a chalkboard or a large piece of paper taped to the wall. Adjust the projected image until the deer's shoulder height is life size. The deer's outline then can be drawn by tracing the projected image.

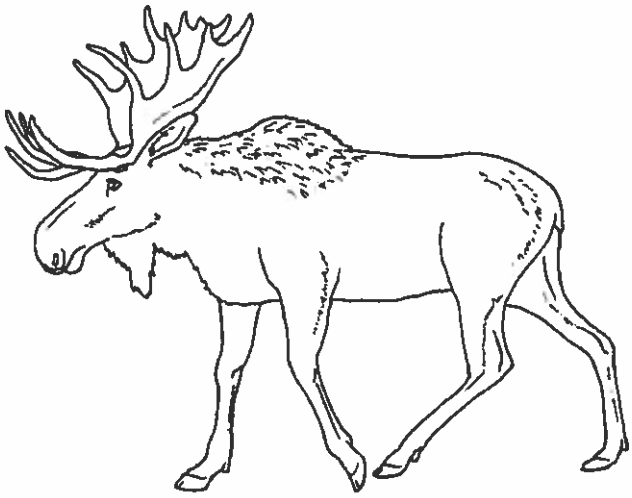
4. Divide the students into five groups. Give each group one of the sheets of paper with the outline of a deer species and a supply of construction paper, pencils and scissors.
5. Have each group draw and cut out elements of the habitat of their deer and glue these elements around the picture of their deer. (Make sure that examples of all major habitat needs are included: food, water, shelter and space in which to live.)
6. Display the finished posters and ask the students what they have learned about deer and their habitats. Discuss how each environment has characteristic life forms, adapted to its climate, kinds of available food, etc. Emphasize that all animals are adapted to survive in their environment.

Aquatic Extensions

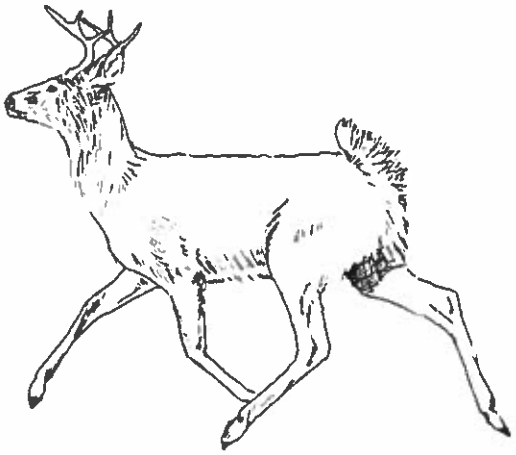
1. Look at pictures of three different species of fish. Talk about the similarities and differences among the fish. Imagine the place where each fish lives. Draw the fish in its habitat.
2. Find out more about the adaptations of different kinds of fish that make it possible for them to live in certain environments. See the Project WILD Aquatic activity "Fashion a Fish."
3. Help make a bulletin board that shows, "What Fish Goes Where?" Show fish that live in ponds, fish that live in lakes, fish that live in streams, fish that live in rivers and fish that live in oceans. Include a picture of the appropriate habitat along with a picture of the fish. See the Project WILD Aquatic activity "Fishy Who's Who."

Evaluation

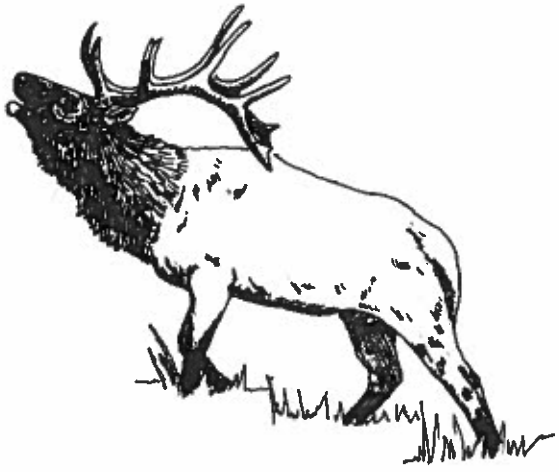
1. Describe the five species of deer, what they eat, where they live and what each species looks like.
2. If someone took caribou to Yellowstone National Park in Wyoming and took mule deer to the tundra of Alaska, do you think the deer species would be able to live in their new homes? Why or why not?



Moose

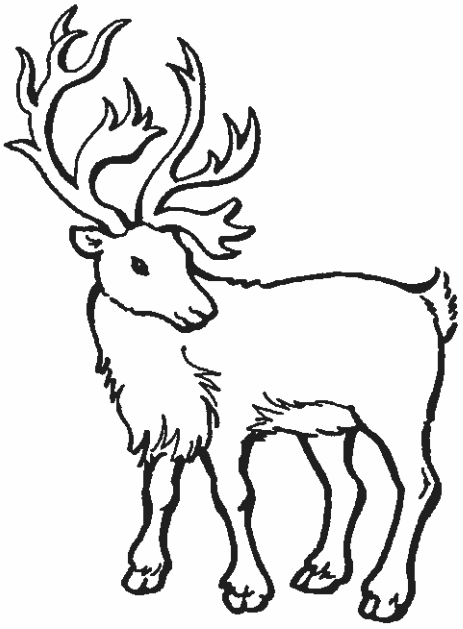


White-tailed Deer

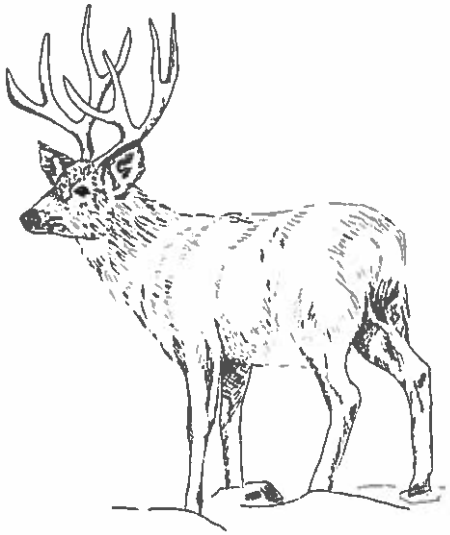


Elk

Caribou



Mule Deer



Oh Deer!

Objectives

Students will: 1) identify and describe food, water and shelter as three essential components of habitat; 2) describe factors that influence carrying capacity; 3) define "limiting factors" and give examples; and 4) recognize that some fluctuations in wildlife populations are natural as ecological systems undergo constant change.

Method

Students portray deer and habitat components in a physical activity.

Materials

An area—either indoors or outdoors—large enough for students to run (e.g., playing field); chalkboard or flip chart; writing materials

Grade Level: 5-8

Subject Areas: Science, Environmental Education, Math, Expressive Arts

Duration: one 30- to 45-minute session

Group Size: 15 and larger recommended

Setting: indoors or outdoors; large area for running needed

Conceptual Framework Topic Reference: WPIIA, WPIIA2, WPIIA2a, WPIIA2a1), WPIIA2a2)b), WPIIA2a2)c)i, WPIIA2a2)c)ii

Key Terms: habitat, limiting factors, predator, prey, population, balance of nature, ecosystem

Appendices: Simulations, Ecosystem, Early Childhood

Background

Carrying capacity refers to the dynamic balance between the availability of habitat components and the number of animals the habitat can support. A variety of factors related to carrying capacity affect the ability of wildlife to successfully reproduce and to maintain their populations over time. The most fundamental of life's necessities for any animal are food, water, shelter and space in a suitable arrangement. Without these essential components, animals cannot survive.

However, some naturally caused and culturally induced limiting factors serve to prevent wildlife populations from reproducing in numbers greater than their habitat can support. Disease, predator/prey relationships, varying impacts of weather conditions from season to season (e.g., early freezing, heavy snows, flooding, drought), accidents, environmental pollution and habitat destruction and degradation are among these factors. An excess of such limiting factors leads to threatening, endangering and eliminating whole species of animals.

This activity illustrates that:

- good habitat is the key to wildlife survival;
- a population will continue to increase in size until some limiting factors are imposed;
- limiting factors contribute to fluctuations in wildlife populations; and
- nature is never in "balance," but constantly is changing.

Wildlife populations are not static. They continuously fluctuate in response to a variety of stimulating and limiting factors. We tend to speak of limiting factors as applying to a single species, although one factor may affect many species.

Carrying capacity limitations can result in competition between and among domestic animals, wildlife and humans.

Natural limiting factors, or those modeled after factors in natural systems, tend to maintain populations of species at levels within predictable ranges. This kind of "balance in nature" is not static but is more like a teeter-totter than a balance. Some species fluctuate or cycle annually. Quail, for example, may start with a population of 100 pairs in early spring, grow to a population of 1,200 birds by late spring and decline slowly to a winter population of 100 pairs again. This cycle appears to be almost totally controlled by the habitat components of food, water, shelter and space, which are also limiting factors. Habitat components are the most fundamental and the most critical of limiting factors in most natural settings.

This activity is a simple but powerful way for students to grasp some basic concepts: first, that everything in natural systems is interrelated; second, that populations of organisms are continuously affected by elements of their environment; and third that populations of animals continually are changing in a process of maintaining dynamic equilibrium in natural systems.

Procedure

1. Tell students they will be participating in an activity that emphasizes the most essential things animals need in order to survive. Review the essential components of habitat with the students: food, water, shelter and space in a suitable arrangement. This activity emphasizes three of those habitat components—food, water and shelter—but the students should not forget the importance of the animals having sufficient space in which to live, and that all the components must be in a suitable arrangement for wildlife populations to reach their maximun size.
2. Ask the students to count off in fours. Have all the ones go to one area; all twos, threes and fours go together to another area. Mark two parallel lines on the ground or floor 10 to 20 yards apart. Have the ones line up behind one line; the rest of the students line up behind the other line, facing the ones.
3. The ones become "deer." All deer need good habitat in order to survive. Again ask the students what the essential components of habitat are: food, water, shelter and space in a suitable arrangement. For the purposes of this activity, assume that the deer have enough space in which to live. The deer (the ones) need to find food, water and shelter in order to survive. When a deer is looking for food, it should clamp its "hooves" over its stomach. When it is looking for water, it puts its "hooves" over its mouth. When it is looking for shelter, it holds its "hooves" together over its head. A deer can choose to look for any one of its needs during each round or segment of the activity; the deer cannot, however, change what it is looking for (e.g., when it sees what is available during that round). It can change what it is looking for in the next round, if it survives.
4. The twos, threes and fours are food, water and shelter—components of habitat. Each student is allowed to choose at the beginning of each round which component he or she will be during that round. The students depict which component they are in the same way the deer show what they are looking for; that is, hands on stomach for food, etc.
5. The activity starts with all players lined up behind their respective lines (deer on one side, habitat components on the other side)—and with their backs facing the students along the other line.
6. Begin the first round by asking all of the students to make their signs—each deer deciding what it is looking for, each habitat component deciding what it is. Give the students a few moments to put their hands in place—over stomachs, mouths or over their heads. (The two lines of students normally will display a lot of variety—with some students portraying water, some food and some shelter. As the activity proceeds, sometimes the students confer with each other and all

continued

make the same sign. That's okay, although don't encourage it. For example, all the students in habitat might decide to be shelter. That could represent a drought year with no available food or water.)

NOTE: Switching symbols in the middle of a round can be avoided by having stacks of three different tokens, or pieces of colored paper, to represent food, water and shelter at both the habitat and deer ends of the field. At the start of each round, players choose one of the symbols before turning around to face the other group.

7. When the students are ready, say: "Oh Deer!" Each deer and each habitat component turn to face the opposite group, continuing to hold their signs clearly.

8. When deer see the habitat component they need, they are to run to it. Each deer must hold the sign of what it is looking for until getting to the habitat component student with the same sign. Each deer that reaches its necessary habitat component takes the "food," "water" or "shelter" back to the deer side of the line. "Capturing" a component represents the deer successfully meeting its needs and successfully reproducing as a result. Any deer that fails to find its food, water or shelter dies and becomes part of the habitat. That is, any deer that died will be a habitat component in the next round and so is available as food, water or shelter to the deer that are still alive.

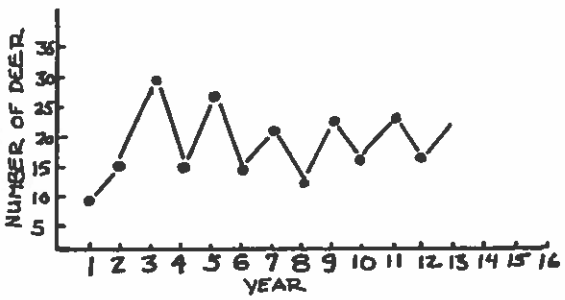
NOTE: When more than one deer reaches a habitat component, the student who arrives there first survives. Habitat components stay in place until a deer chooses them. If no deer needs a particular habitat component during a round, the habitat component just stays where it is in the habitat. The habitat component can, however, change which component it is from round to round.

9. Record the number of deer at the beginning of the activity and at the end of each round. Continue the activity for approximately 15 rounds.

10. At the end of the 15 rounds, gather the students together to discuss the activity. Encourage them to talk about what they experienced and saw. For example, they saw a small herd of deer (seven students in a class size of 28) begin by finding more than enough of its habitat needs. However, because the population of deer expanded over two to three rounds of the activity until it exceeded the carrying capacity of the habitat, there was not sufficient food, water and shelter for all the members of the herd. At that point, deer starved or died of thirst or lack of shelter, and they returned as part of the habitat. Such things happen in nature also.

NOTE: In real life, large mammal populations might also experience higher infant mortality and lower reproductive rates.

11. Using an overhead projector, a flip chart pad or an available chalkboard, post the data recorded during the activity. The number of deer at the beginning of the activity and at the end of each round represents the number of deer in a series of years. That is, the beginning of the activity is year one; each round is an additional year. Deer can be posted by fives for convenience. For example:



The students will see this visual reminder of what they experienced during the activity: the deer population fluctuated over a period of years. This process is natural as long as the factors that limit the population do not become excessive, to the point where the animals cannot successfully reproduce. The wildlife populations will tend to peak, decline and rebuild; peak, decline and rebuild—as long as there is good

habitat and sufficient numbers of animals to reproduce successfully.

12. What is realistic and unrealistic about this simulation? (Deer that don't survive do become recycled as nutrients but it is not instantaneous. Deer need all habitat components to survive. Poor habitat usually results in a weakened individual that sussumbs to disease, etc., not instant death.)

13. In discussion, ask the students to summarize some of the things they learned from this activity. What do animals need to survive? How do these components influence carrying capacity? What are some "limiting factors" that affect the survival of animals? How do factors limiting carrying capacity affect the health, numbers and distribution of animals? How do these factors affect competition within a species? Why is good habitat important for animals? Are wildlife populations static, or do they tend to fluctuate as part of an overall "balance" of nature? Is nature ever really in "balance" or are ecological systems involved in a process of constant change?

Variations

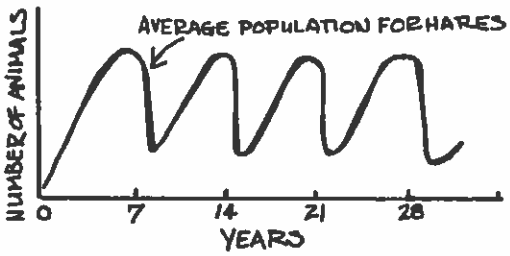
1. After the students have played several rounds of "Oh Deer!," introduce a predator such as a mountain lion or wolf into the simulation. The predator starts in a designated "predator den" area off to the side. The predator has to skip or hop. This impediment reduces the possibility of violent collisions between deer and predators. The predators can tag deer only when they are going towards the habitat and are between the habitat and deer lines. Once a deer is tagged, the predator escorts the deer back to the predator den. The time it takes to escort the deer simulates the time it takes to eat. The "eaten" deer is now a predator. Predators that fail to tag someone die and become habitat. That is, in the next round the predators that died join the habitat line. They will become available to surviving deer as food, water or shelter. During each round, keep track of the number of predators as well as the number of deer. Incorporate these data into the graphs.

2. Instead of drawing the line graph for students as described in Step 11, have the students create their own graphs. Provide them with the years and numbers of deer.

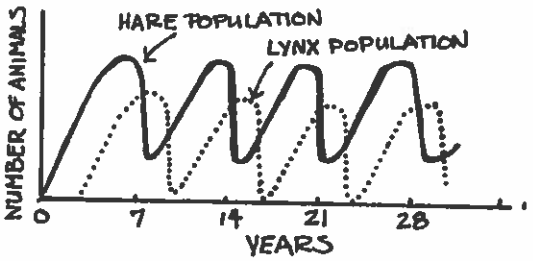
Extensions

1. When the students have finished tabulating and discussing the graph data, ask them if they have ever heard of the Hudson Bay trappers in American history. Tell them briefly who they were.

   There are a hundred years or more of records of the activities of these trappers. In those records are some interesting data. These data refer to pelts shipped from America to Europe, particularly the pelts of snowshoe hares and lynx. Researchers have found that snowshoe hare populations seem to peak about every seven to nine years and then crash, repeating the process over each comparable time period. A snowshoe hare population graph would look like this:



   It also has been discovered that lynx populations do the same thing—except that they do it one year behind the hare populations. The combined graph would look like this:



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Plot both sets of data on a graph, adding first the hares and then the lynx. Ask the students:

- Which animal is the predator? Which prey?
- Are predators controlling the prey, or are prey controlling the predators? (The number of prey animals available is an indicator of how many predators can live in the area.)
- How is this graph similar to the one created in the deer habitat activity? Who controls the population fluctuations? (Sometimes the habitat—when the deer population is not too large; sometimes the deer—when the deer population destroys the vegetative food and cover.)

2. Some recent research has added a new dimension to the story of the snowshoe hares and the lynx.

   It has been found that a major winter food of the hare is a small willow. As the hare population grows, the use of the willow plants grows too. However, when the willow plant has been "hedged" or eaten back so far, the plant generates a toxin (poison) so the hare can't eat it. That is when the hare population crashes, followed by the crash of the lynx population about a year later. Then the willow is able to grow again. The hare population begins to grow in response, and last of all, within a year or so, the lynx population follows. And the cycle has begun again—over and over—every seven to nine years.

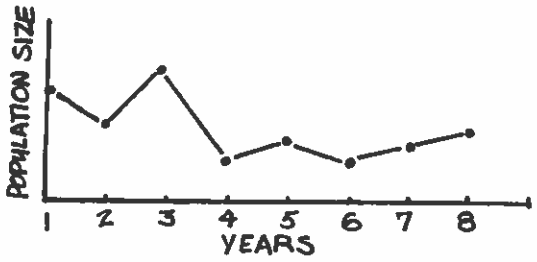
3. Discuss the "balance" of nature. Is it ever in "balance?"

Aquatic Extension

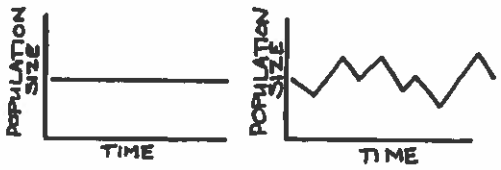
Do the activity in exactly the same fashion, except substitute an aquatic species of wildlife. The essentials are the same. In this case, rather than assuming all the necessary space is available, assume all the water is available but space is needed, as is food and shelter. Hands on stomach is food, hands together over head is shelter—and arms out to the side is space. Otherwise, conduct the activity in the same fashion. The objective remains the same, except that now food, shelter and space are the three essential components of habitat. Examples of possible aquatic species: manatee, salmon, frog.

Evaluation

1. Identify three essential components of habitat.
2. Define "limiting factors." Identify three examples.
3. Examine the graph below. What factors may have caused the following population changes:
   a. between years 1 and 2?
   b. between years 3 and 4?
   c. between years 5 and 6?
   d. between years 7 and 8?



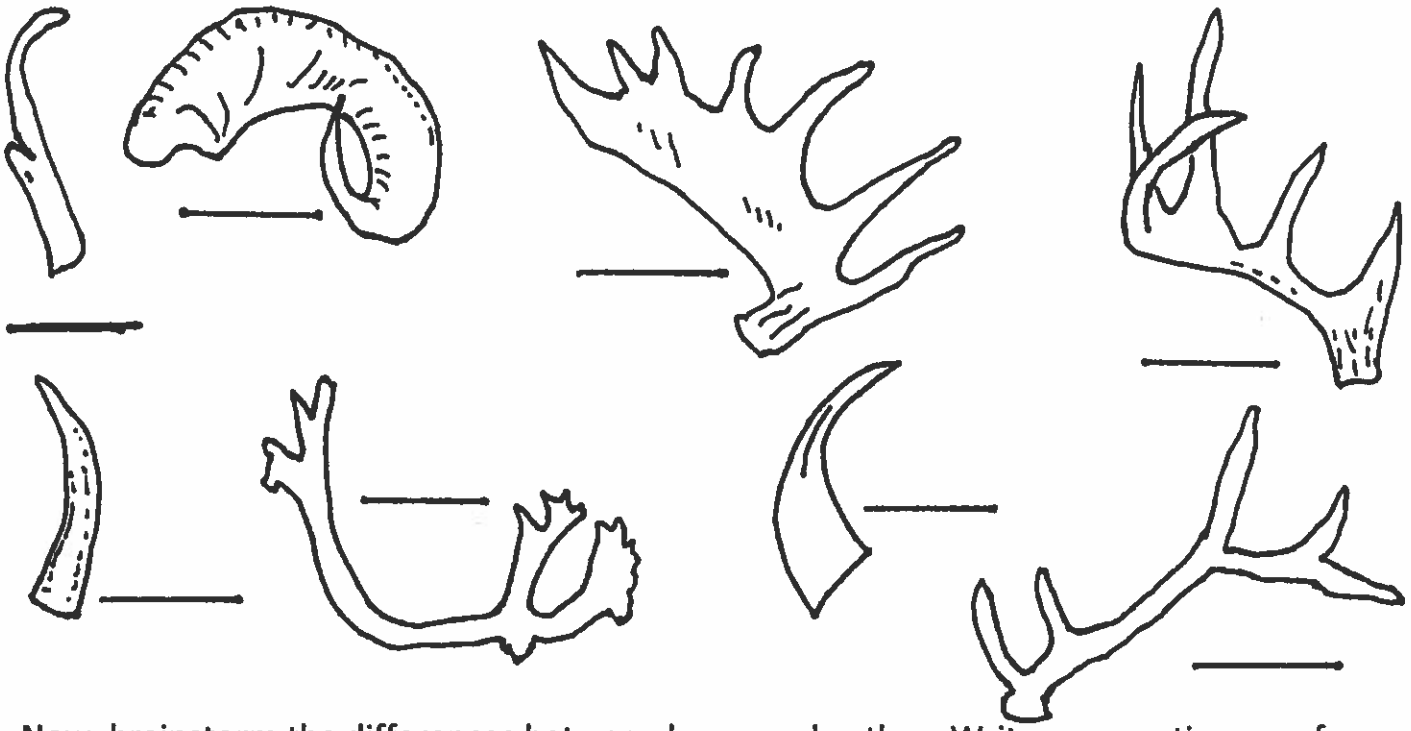
4. Which of the following graphs represents the more typically balanced population?



Horns and Antlers
Do You Know the Difference?

Write the letter of the name of the animal that grows the horn or antler in the spaces below. Circle the horns.

A. Mountain Goat	B. Bighorn Sheep	C. White-tailed Deer	D. Bison
E. Moose	F. Elk	G. Pronghorn	H. Caribou



Now, brainstorm the differences between horns and antlers. Write an acrostic poem for horns and antlers explaining some of the differences.

H_____

O_____

R_____

N_____

S_____

A_____

N_____

T_____

L_____

E_____

R_____

S_____

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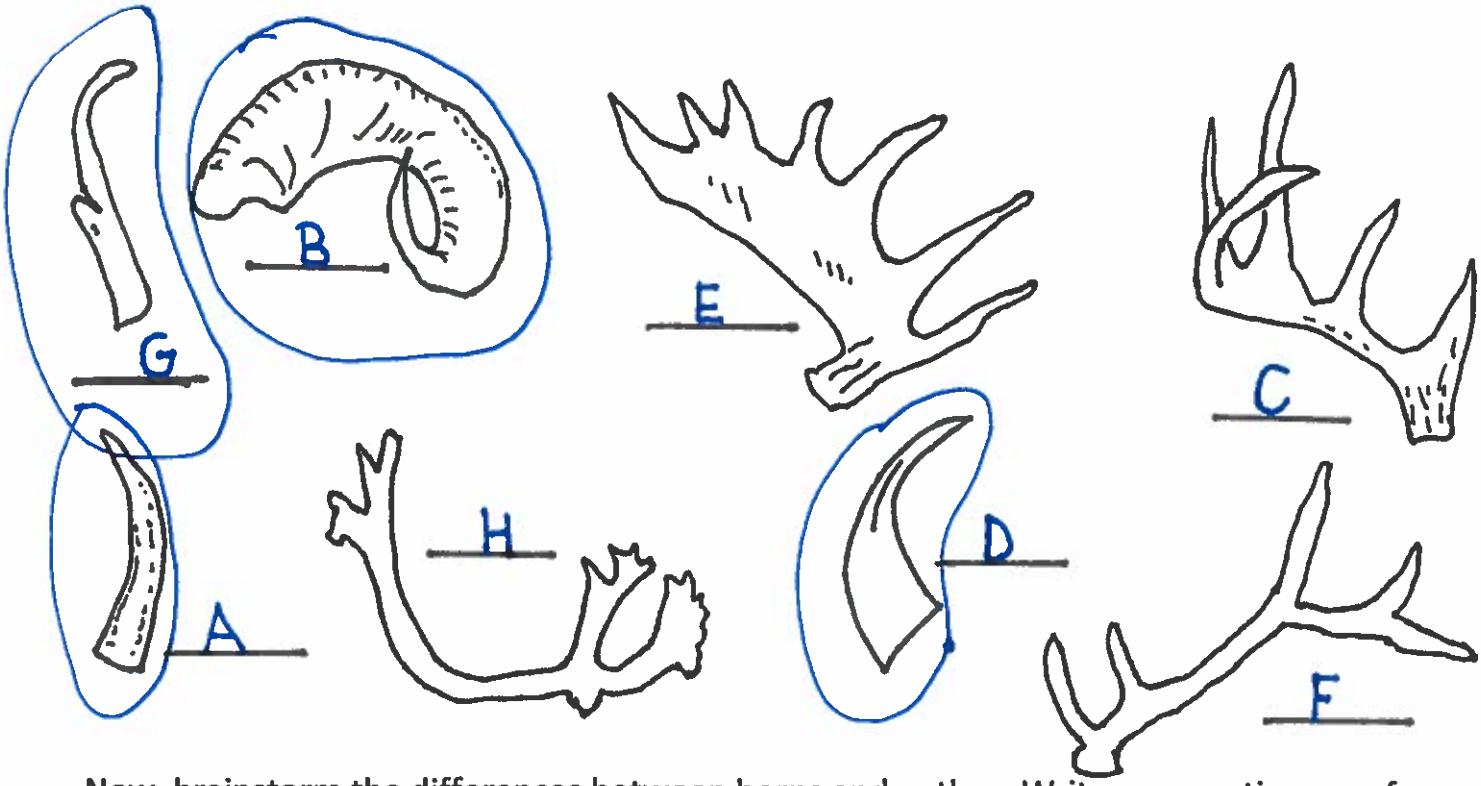

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H allow sometimes
O n head
R eally strong
N ever stops growing
S tays on head

A ll bone
N ew each year
T emporary
L ittle at first
E lK, deer, moose
R arely on females
S olid and branched

Winter Survival

Subject: Science

Objective: Students will be able to give four examples of behaviors animals use for winter survival.

Materials:

- 12" X 18" construction paper
- markers or colored pencils

Procedure:

1. Discuss with students the behaviors they take on when winter arrives. How do they handle the cold weather? In what activities do they participate? Does their behavior change from summer to winter? Share the poem, "Coping with Cold," (following page) with your students.
2. Discuss with the class the wildlife they see during the winter. Are there fewer animals to see? Does animal behavior change in any way? Why does the behavior change? How do winter animals make a living?
3. Introduce or review the different strategies animals use during the winter.
   A. **Migrate:** Animals travel to another area where weather is warmer and food is more accessible.
   B. **Adapt:** These animals make changes to behavior or to their bodies. For example, they may grow newer, thicker fur in the fall or change the coloring of their coats to blend in with their environment. Some animals gather food when it is available and store it for later. Other animals change their diet for the different seasons.
   C. **Hibernate:** True hibernators are animals that go into a special deep sleep. Their body temperature drops, heartbeat and breathing slow down. They eat extra food in the fall and store it as body fat.
   D. **Dormancy:** Cold-blooded animals like fish, frogs, snakes and turtles have no way to keep warm in the winter. This inactive period, or dormancy, is similar to hibernation.
4. Ask students to research more thoroughly winter survival techniques for different animals. Give each student a 12" X 18" piece of construction paper. Instruct them to fold the paper into fourths. They should then draw lines on the folds and label each box. Use the following labels: Migrate, Hibernate/Dormancy, Adapt and My Preference. For the Migrate, Hibernate/Dormancy, and Adapt boxes, students should give an explanation of the technique and give at least three examples of animals that use the particular technique. They should then illustrate one of the animals demonstrating that behavior.
5. For the fourth box, My Preference, students should tell which technique they would prefer if they were an animal surviving the winter.

Coping with Cold

By Shelley Cooke, Idaho Dept. of Fish and Game

When winter approaches and cold weather draws near
what happens to the animals this time of year?

Can they put on a jacket to keep themselves warm,
or stay snuggled in bed during a harsh winter storm?

Perhaps take a trip to the place of their choice,
to a beach in the tropics to relax and rejoice?

If people can do it, can animals too?
Let's take a quick look and see if they do.

Early in the fall as the days start getting short,
I hear quacking and honking, creating a ruckus of sorts.

I look to the sky, for what could it be?
A flock of geese flying south in the shape of a V.

I see a squirrel in the treetop, some nuts in his cheeks,
to store for the winter in the upcoming weeks.

He'll take them and hide them in some secret space,
and when he gets hungry, he'll search for that place.

The animals of the mountains, like the wolf, elk and goat,
all grow extra fur for a thick winter's coat.

Then, in the springtime, they'll shed that thick pelt,
about the same time the snow starts to melt.

I believe there is a rabbit who is known as a hare
that during the winter changes the color he wears.

Most of the year, he is dark, head to toe
but turns white during the winter, to blend in with the snow.

The frogs and the turtles that live in the lakes,
sleep buried in mud until spring, when they wake.

They breathe through their skin, which keeps them alive.
When the water warms up, they begin to revive.

I've heard that the bear will retreat to a den,
to sleep all winter through, no matter how long it's been.

He prepares in the fall by eating more than his share,
then emerges in springtime, looking no worse for wear.

Moles and chipmunks, and some kinds of mice,
will stay inside when it's cold and roam around when it's nice.

They will huddle together in a tight little ball,
and hide in the homes they built in the fall.

People and animals are alike in some ways.
We all have a plan to survive cold winter days.

Some sleep, some snuggle, some fly south on their wings,
but all that really matters is we survive until spring!