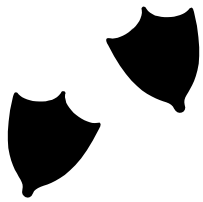


Hidden Hazards

Overview: In this activity, students will discover what plants and animals need to survive. Then they will pretend to be northern shovelers and try to get their food and water in order make it until migration – but it's a dangerous world out there for a duck!

Science Content Standards Correlations: pg 3

Activity Adapted From: Hidden Hazards, Flying WILD

Grade: 1

Key Concepts: All plants and animals need water, in addition, animals need food and plants need light. There can be obstacles to obtaining these necessities.

Objectives:

Students will be able to:
- name what plants and animals need to survive
- describe the difference between a herbivore, carnivore and omnivore and what kind of teeth they have
- explain how plants get water, light and oxygen
- name some of the obstacles animals face when trying to survive

Possible Locations:
- Wetlands Walk on the first loop just after passing auto tour road where trail splits right to go to stop 3, straight or left to the short cut
- "park and stretch" areas on auto tour

Materials Provided by the Refuge:
- photos of each animal (and their teeth) and plant
- food tokens (blue, green, yellow)
- 6 boundary markers
- 2 lengths of rope
- 3 pieces of flagging

Time Frame for Conducting this Activity (25 minutes)

Set Up (10 minutes)

Animal and Plant Survival (10 minutes)
- what plants and animals need to survive
- herbivore, carnivore, omnivore
- teeth as a hint to what animals eat
- how plants meet their needs

Introduction to Activity (5 minutes)
- explain activity
- assign roles

Hidden Hazards (5 minutes)
- hidden hazards as northern shovelers

Discussion (5 minutes)
- hazards did the northern shovelers face

How this Activity Relates to the Refuge's Resources

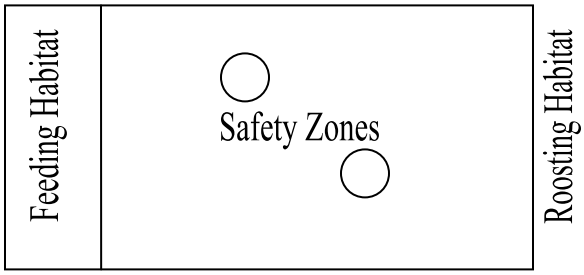
What are the Refuge's resources?
- significant wildlife habitat
- endangered species
- migratory birds
- resident wildlife

What makes it necessary to manage the resources?
- Wildlife may eat or become entangled in trash such as balloons, fishing line and Styrofoam peanuts.
- Loss of wetland habitats for wildlife due to development, such as landfills, buildings, agriculture land, roads, etc makes it more difficult for wildlife to find food, water, shelter and space.

What can students do to help?

Refuge staff acquire and preserve wetland habitat, but we need your help!
- be responsible for your own trash
- reduce, reuse and recycle, decreasing the need for landfills
- never dump anything down storm drains – pollution can contaminate and destroy wildlife habitat
- adopt a wetland or an endangered species
- only take your dog to place they are permitted and keep it on a leash
- keep your cat inside your house; they catch birds
- teach others what you have learned about habitats and endangered species

Prior to Activity (10 minutes)
- Set up hidden hazards field for the activity (directions below), if not already done.



- Set up boundary cones 50 feet long by 25 feet wide – adjust based on participants and available space.
- Place end-zone on one of the long ends of the field about 10 feet long using the cones.
- Spread the food tokens around the end-zone, which represents the feeding grounds
- Decide what kind of food tokens you want. They can all simply represent food and water. Or you can have a specific color represent a specific thing. There are three colors to work with: blue, green and yellow and the northern shovelers need three in order to survive. Some examples of variations include: require one of their three food tokens be blue to represent water, if they don't have three and one of their three isn't blue - they don't survive. Have yellow be a contaminated food token and those northern shovelers don't make it – if they passed it on to predators they don't make it either.
- To determine the number of food tokens needed take the number of "northern shovelers (NS)" you plan on having, minus three, then take that number and put three food tokens out for each NS. Ex: I have 20 students, three are going to be predators who will try to tag the NS, so I have 17 NS – 3 NS = 14 NS. So 14 NS times three food tokens each = 42 tokens in the feeding end-zone. The lack of available food will teach students about competition for food.

-Set up two safety zone circles with ropes anywhere in the middle section of the playing field.
-Have flagging ready for two or more predators to distinguish them from the NS.

How to Lead This Activity by Following the "Do, Read, Ask" Teaching Format

Animal and Plant Survival (10 minutes)
Do
Have students sit down in front of you.

Ask
? What do all plants and animals need to consume to survive?
(They need water, in addition, animals need food and plants need light.)

Read
"We're going to take a look at the wildlife that can be found in wetlands and what they eat. We're even going to learn how to tell what wildlife eat just by looking at the shape of their teeth. Then we're going to talk about how plants meet their needs. After that we'll finish off with a fun activity and find out that meeting your needs as an animal isn't always easy. So let's get the fun started!"

Ask
? When an animal only eats vegetation (plants), what are they called?
(Herbivore)

? When an animal mostly eats meat, what are they called?
(Carnivore)

? When an animal eats both vegetation and meat, what are they called?
(Omnivore)

Read
"Now that we've learned what to call different types of wildlife based on what they eat, let's take a look at a few specific animals.

"But first let's do a quick lesson on what our teeth are called. Feel your front teeth with your tongue; these slim-flat teeth are called incisors. Next, do you feel your four pointy teeth? They are on either side of your incisors and they are called canines. Last, there are all of those wide flat teeth in the back of your mouth that you use for chewing and those are called molars.

"OK now that we know what different types of teeth are called, let's look at animal teeth."

Do
As you ask the following questions, show the photo of the animal or plant you're talking about.

Ask
? What kind of teeth do black-tailed deer have and what do they eat?
(Black-tailed deer have canines and incisors for grabbing and breaking food - mostly leafy plants, but also blackberry and twigs of cedar, willow and other trees. They also eat acorns and apples. They have molars in the back of their mouth for chewing their cud.)

? Based on what black-tailed deer eat, what would we call them? Herbivore, carnivore or an omnivore?
(Herbivores)

? What kind of teeth do coyotes have and what do they eat?
(Coyotes have canines for grabbing and holding prey and for tearing chunks of meat from larger prey. Coyotes also have molars for chewing, but those don't get much use. They eat mostly small mammals such as squirrels and rabbits.)

? Based on what coyotes eat, what would we call them?
(Carnivores)

? What kind of teeth do muskrats have and what do they eat?
(Muskrats use their large incisors to eat aquatic vegetation such as cattails and water lilies, they also eat crayfish, frogs and fish. Their incisors grow continuously throughout their lives so they must wear down their teeth by gnawing on various materials.)

? Based on what muskrats eat, what would we call them?
(Omnivores)

? What kind of bills do northern shovelers have and what do they eat?
(northern shovelers use their comb-like teeth along the edges of their bills to strain aquatic animals, plants, seeds and sometimes even mud from the water.)

? Based on what northern shovelers eat, what would we call them?
(Omnivores)

? What kind of bills do snow geese have and what do they eat?
(Snow geese use their broad-serrated bill for cutting vegetation such as plant shoots, rice and other wetland plants.)

? Based on what snow geese eat, what would we call them?
(Herbivores)

? What kind of bills do bald eagles have and what do they eat?
(Bald eagles use their large hooked bills to eat fish, waterfowl, rabbits and other prey. Bald eagles are opportunistic feeders, which means they will scavenge carcasses or steal fish away from smaller raptors.)

? Based on what bald eagles eat, what would we call them?
(Carnivores)

? OK, I have one last animal for you, then we're going to talk about plants. What kind of "teeth" do western pond turtles have and what do they eat?
(Western pond turtles use their jaws to cut and chew insects, crayfish, tadpoles, algae, cattail roots and other similar foods. Instead of teeth the upper and lower jaws of the turtle are covered by a rigid beak.)

? Based on what western pond turtles eat, what would we call them?
(Omnivores)

? Have you started to notice a pattern? If an animal has sharp teeth or a sharp bill what do they eat?
(Meat)

? If an animal has flat teeth or a flat bill what do they eat?
(Plants)

? Good job, now let's talk about plants. If animals need water and food, what do plants need?
(Water and light)

? So if plants get their water by taking it up through their roots. How do they get the light?
(Plants get other nutrients and sugars through photosynthesis conducted by the leaves. Photosynthesis is when plants make carbohydrates from carbon dioxide (what we breath out) and water using light as an energy source (to power the process), then release oxygen as a byproduct – which is good for us!)

Read
"Once the plants have taken in their water and light they move the nutrients between different parts of the plant through specialized structures called xylem, which moves water and nutrients from the roots to the rest of the plant, and phloem, which transports food from the leaves to the rest of the plant."

Ask
? Remind me, what do all plants and animals need to consume to survive?
(They need water, in addition, animals need food and plants need light.)

? What else do both plants and animals need? (Do – take a deep breath in)
(Oxygen!)

? Animals get oxygen by breathing, just like you and me, but how do plants get oxygen?
(They absorb it through their roots.)

? Out here in the wetlands, a lot of the plants have roots that are underwater, how do you suppose they get oxygen?
(Plants such as cattails and bulrush have hollow tubes that transport oxygen to the roots from the top of the plant.)

Do
Pass around cuttings from a cattail or bulrush so they can see the hollow tubes.

Introduction to Activity (5 minutes)
Read
"OK now that we've learned all about what plants and animals need to survive we're going to become northern shovelers and see if we can get enough food and water to make it until migration!"

Do
Designate roles:
1 bald eagle
1 coyote
The rest northern shovelers
** If you have a lot of kids feel free to designate more predators.

Give each predator a length of flagging to tie around their belt loop, wrist or any place that stands out to distinguish them from the northern shovelers.

***If you don't want northern shovelers sitting on the sideline once they've been tagged by predators, you can have them give up their food tokens and go try again. If you're going to do this, place more food tokens in the end-zone.*

Read
"OK I need the northern shovelers to waddle over to their roosting habitat (the long end of the field without the end-zone), which is where you sleep, and the predators spread out among the middle of the playing field.

"OK northern shovelers, you have to get from your roosting habitat to your feeding habitat without being tagged – gently! – by the predators. You have two safe zones – they can't tag you there or in your roosting or feeding habitats. **However, if you are tagged, you're their meal and they get what food tokens you've collected so far, then you can come cheer on your fellow northern shovelers with me.

"Now northern shovelers, you have to make this journey three times, each time you can only pick up one food token. Once you've made the trip three times have a seat in your roosting habitat.

"Any questions?

"Alright northern shovelers you have five minutes to make your three trips!" *(This time can be adjusted based on how the activity is going).*

Hidden Hazards (5 minutes)
Do
Time the activity, watch for how rough the predators are tagging the prey, make sure the prey that does get caught isn't getting too upset…the usual kid management stuff.

Once time is up have the northern shovelers show how many food tokens they have.

Discussion (5 minutes)
Read
Basic Version *(If you used a different variation for the food tokens, talk about the different colors here)***:**
"OK, how many northern shovelers got three food tokens? Congratulations! You were able to get all the food and water needed in order to survive.

"How about you predators? Who got six or more tokens? Congratulations! You survived too."

Ask
? So northern shovelers, for those of you who didn't survive, what happened?
(Predators, not enough food, not enough time)
(if you did a variation – didn't get water, got contaminated food, etc)

Read
"Being an animal isn't as easy as it looks is it? They have to get water and food *and* avoid predators. Being a plant may not be too much easier since they might get eaten by those herbivores, but that's OK because it's all part of nature and what goes on out here in the wetlands.

"OK, I'm going to walk around with this envelope and put your food tokens in as I go by.

"Any questions?"

Do
If you're the last group to use this activity gather all the materials and bring them into the visitor center or to the Refuge staff member that was helping your group. Thank you!