Popular Education Evaluation for ORCA

Includes:
Final Report

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OTONABEE CONSERVATION

TAG GAME -- LIFE CYCLE OF AQUATIC INSECTS

What is the Purpose of this Activity?

This activity teaches children about the foodweb, it explains the predator-prey relationship and the life cycle. Allowing students to imagine the life of insects. It also allows for exercise and interaction.

Key messages:

- The life cycle

Food web interactions

- exercise

Materials:

10 to 20 minutes.
At least one staff/volunteer
Can be played more than once if students like.
Any age can play this game
Around 10 students
Diagram of life cycle of aquatic insects (e.g. mosquito) (optional)
Whistle to bring students back together after each round

How Does this Activity Work?

Explain the bugs to be played
Set some boundaries
Blow the whistle

Background:

OTONABEE CONSERVATION

TAG GAME -- LIFE CYCLE OF AQUATIC INSECTS

(Adapt discussion based on age of students.)

Aquatic insects are responsible for a large part of the secondary production that takes place in wetlands. The food web begins with green plant producers such as algae and aquatic plants. Primary consumers such as plankton and insects add to the food web. Aquatic insects are part of both the detrital and grazing food chains. Those in the detrital food chain (called detrivores) feed on dead and decaying plant and animal matter, and are therefore particularly important in the breaking down and recycling of organic material. Detrital feeders are usually the first to appear in a newly flooded wetland, because detritus is immediately available as a food source. Those in the grazing food chain consume aquatic vegetation and algae, which helps to maintain water quality. Others are predators feeding on other invertebrates, including birds, which feed on adults emerging from the water. Aquatic insects are an important food source for fish, amphibians and waterbirds. Aquatic insects are numerous and are sensitive to the environment. They can be useful in biological monitoring (that is, the use of biological data as an indicator of water quality) due to their position in wetland food chains; their relative abundance; their ability to live in a wide range of wetland types; and their relative sensitivities and tolerances to pollutants. Water quality and cleanliness is determined by counting numbers and types of aquatic insects in a wetland area. Because they are such an important part of aquatic ecosystems, aquatic insect communities are used to determine the impact of developments (mines, forestry) or to assess the effects of contaminants (pesticides, sewer effluent, etc.) on the natural environment. Each species reacts to pollutants in a characteristic manner; insects respond quickly and are relatively sedentary, so they cannot effectively leave the contaminated area. Understanding the range and importance of aquatic invertebrates is essential to conserve and manage wetland ecosystems.

The feeding habits of mosquitoes are quite unique in that it is only the adult females that bite man and other animals. The male mosquitoes feed only on plant juices. Some female mosquitoes prefer to feed on only one type of animal or they can feed on a variety of animals. Female mosquitoes feed on man, domesticated animals, such as cattle, horses, goats, etc; all types of birds including chickens; all types of wild animals including deer, rabbits; and they also feed on snakes, lizards, frogs, and toads. Most males live a very short time, about a week; and females live about a month depending on the above factors.

Natural predators:

The **dragonfly nymph** eats mosquitoes at all stages of development.
Bats can eat up to 1000 mosquitoes in an hour! In places with large mosquito populations, bat houses are often put up to encourage bats to come. In Texas, for example, there are bat rescue organizations that nurse injured ones back to health so they can help with mosquito populations.
Fish like guppies and mosquitofish can tolerate pollutants and temperature changes in water and they feed on mosquito larvae in water.

Procedure:

Tell students that they are going to travel through the stages of a mosquito's life cycle in a game of tag.

Introduce the life cycle of aquatic insects: egg, larva, pupa, adult. Discuss the dragonfly nymph as its predator. You could also add that in cities, such as Winnipeg, where the mosquito population is out of control, they breed dragonflies as a natural way of keeping the population in check, allowing people to spend more time outdoors in the summer. Discuss other natural predators.

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TAG GAME -- LIFE CYCLE OF AQUATIC INSECTS

Ask students to remind you what the first stage of the life cycle is (egg). Tell students that they will all start out as eggs. Tell them that this stage typically lasts 48 hours (two days). Have them put their hands on their heads to represent the roundness of eggs. Choose two students (or 3 if 30 students; 4 if more students) to be predators (ask students to remind you what one of the mosquito's predators is – dragonfly). Dragonflies run around with large, flapping wings. When an egg is tagged by a dragonfly, it becomes a dragonfly and tries to tag other eggs. Explain that, as the dragonflies feed on the eggs, it helps them to produce more dragonflies. The round ends when all eggs have become dragonflies. Give eggs a two-second head start.

Ask students to remind you what the second stage of the life cycle is (larva). Tell students that larvae live in water and come to the surface to breathe. All students, except two (or more) new predators (e.g. bats – mimic bat's movement), are now larva. Have them hold their hands at their chest, elbows bent, fingers wiggly to mimic a caterpillar's legs. Give larvae a head start. Round ends when all students are dragonflies.

Ask students to remind you what the third stage of the life cycle is (pupa). This is the resting, non-feeding stage. Choose new predators (e.g. fish – mimic fish swimming), and the rest of the students will stand with arms straight down at their sides, like they've been wrapped up in a cocoon. Give pupae a head start. Round end when all students are dragonflies.

What is the fourth stage of the life cycle? (adult). The females bite and the males feed on plant juices. <u>This round is different</u>. Two students (or more, depending on size of group) will start as mosquitoes. They will flap their wings very quickly as they run and make a loud buzzing sound (demonstrate in students' ears for humour). Everyone else is a human. When they get tagged the FIRST TIME, they must hop around on one leg (or limp, holding one leg) to show they've been

bitten. When they get tagged the SECOND TIME, they become a mosquito and help tag other humans. (ADAPT THIS FOR YOUNGER STUDENTS BY ONLY GETTING BITTEN ONCE BEFORE BECOMING A MOSQUITO).

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

What is the Purpose of this Activity?

This teaches students about the benthic population. It allows them a first hand experience of the skills involved in sampling. The students will learn about the habitat and life of benthic invertebrates and will explain the importance of bio-monitoring. It will also identify the roles of the benthic invertebrates in the ecosystem

Key Messages:

- Streams in urban areas play an important role in the ecosystem
- Healthy systems will have a greater diversity
- Poorer quality sites will have far less diversity
- Identification of the available invertebrates

Materials:

25-30 minutes in total for the session
At least 2 staff members
D-nets
Buckets
Preserved specimens
Pictures for ID
Tweezers, droppers, Petri dishes
Rubber boots/hip waiters

How Does this Activity Work?

Start the activity by introducing the water system

Explain the risks of working around water
Identify some samples
Demonstrate kick and sweep
Identify a sample together
Let the students practice their skills
Talk about the benthic invertebrate's role

Background

Aquatic insects are responsible for a large part of the secondary production that takes place in wetlands. The food web begins with green plant producers such as algae and aquatic plants. Primary consumers such as plankton and insects add to the food web. Aquatic insects are part of both the detrital and grazing food chains. Those in the detrital food chain (called detrivores) feed on dead and decaying plant and animal matter, and are therefore particularly important in the breaking down and recycling of organic material. Detrital feeders are usually the first to appear in a newly flooded wetland, because detritus is immediately available as a food source. Those in the grazing food chain consume aquatic vegetation and algae, which helps to maintain water quality. Others are predators feeding on other invertebrates, including birds, which feed on adults emerging from the water. Aquatic insects are an important food source for fish, amphibians and waterbirds. Aquatic insects are numerous and are sensitive to the environment. They can be useful in biological monitoring (that is, the use of biological data as an indicator of water quality) due to their position in wetland food chains; their relative abundance; their ability to live in a wide range of wetland types; and their relative sensitivities and tolerances to pollutants. Water quality and cleanliness is determined by counting numbers and types of aquatic insects in a wetland area. Because they are such an important part of aquatic ecosystems, aquatic insect communities are used to determine the impact of

developments (mines, forestry) or to assess the effects of contaminants (pesticides, sewer effluent, etc.) on the natural environment. Each species reacts to pollutants in a characteristic manner; insects respond quickly and are relatively sedentary, so they cannot effectively leave the contaminated area. Understanding the range and importance of aquatic invertebrates is essential to conserve and manage wetland ecosystems.

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

KINDERGARTEN

Focus: *Saying, Doing and Representing*

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers
- Many of the creatures you can see swimming, walking, flying but some live in the mud at the bottom
- These creatures are called "benthic macroinvertebrates"
    - Benthic means bottom dwelling
    - Invertebrate means they have no spine – point to your spine – get the kids to touch their spines
- Explain that these creatures are often the young stages of insects (larval) that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind children about safety around the water – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-
    - kick and sweep, triplicates, riffles and pools, transcet, labeling, live and preserved samples
- One staff person in the water, the other on the shore
- To get the children involved let them tell you where to sample, then let the kindergardens explore your findings, pass things around so they all are involved and get a chance to interact with the specimens
- Staff collect a sample and then put it in each groups bin

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

- Encourage the kids to use their spoons and explore the bin
- Staff circulate between each group and identify creatures
- Get Kids in group and act out some of the different bugs in the mud

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

GRADE 1

Focus: Impact on people and needs of living things

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers
- Many of the creatures you can see swimming, walking, flying but some live in the mud at the bottom
- These creatures are called “benthic macroinvertebrates”
    - Benthic means bottom dwelling
    - Invertebrate means they have no spine – point to your spine – get the kids to touch their spines
- Explain that these creatures are often the young stages of insects (larval) that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- If you find a creek or stream with water that isn’t very clean, you also try to find ways of cleaning it up
- Remind children about safety around the water – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-
    - kick and sweep, triplicates, riffles and pools, transect, labeling, live and preserved samples
- One staff person in the water, the other on the shore
- To get the children involved let them tell you where to sample, then let the students explore your findings, pass things around so they all are involved and get a chance to interact with the specimens
- Staff collect a sample and then put it in each groups bin

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

- Encourage the kids to use their spoons and explore the bin
- Staff circulate between each group and identify creatures
- Explain the different types of benthic invertebrates, those that eat plant material and algae and those predators that eat other benthic invertebrate
- Tidy up the bins and get the children to sit and talk about the bugs
- Get the children to identify what a good environment would be. Ie full of plants, algae, and other benthic invertebrates
- Explore with the children who might eat the benthic invertebrate. ie fish.
- What would happen if the water was too polluted for the benthic invertebrates, how would this affect the fish? How would this in turn affect the fisherman's dinner?
- Get Kids in group and act out some of the different bugs in the mud

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

GRADE 2

Focus: People's impact, Impact on people, pollution, resource responsibility

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers
- Many of the creatures you can see swimming, walking, flying but some live in the mud at the bottom
- These creatures are called "benthic macroinvertebrates"
    - Benthic means bottom dwelling
    - Invertebrate means they have no spine – point to your spine – get the kids to touch their spines
- Explain that these creatures are often the young stages of insects (larval) that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind children about safety on the boardwalk – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-
    - kick and sweep, triplicates, riffles and pools, transcet, labeling, live and preserved samples
- Explain D nets, 500µ *mesh*
- One staff person in the water, the other on the boardwalk
- Staff collect a sample and then put it in each groups bin
- Encourage the kids to use their spoons and explore the bin
- Each group also has one net and can scoop more material into the bin

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

- Staff circulate between each group and identify creatures
- Tidy up the bins and get the children to sit and talk about the bugs
- Explain the different types of benthic invertebrates, those that eat plant material and algae and those predators that eat other benthic invertebrate
- Get the children to identify what a good environment would be. Ie full of plants, algae, and other benthic invertebrates
- Explore with the children who might eat the benthic invertebrate. ie fish.
- What would happen if the water was too polluted for the benthic invertebrates, how would this affect the fish? How would this in turn affect the fisherman's dinner?

Restless? Extra Time? Get Kids in group and act out some of the different bugs in the mud

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

GRADE 3

Focus: People's impact, Impact on people, Parts of Plants and contribution, Soil characteristics and composition

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers
- Many of the creatures you can see swimming, walking, flying but some live in the mud at the bottom
- These creatures are called "benthic macroinvertebrates"
    - Benthic means bottom dwelling
    - Invertebrate means they have no spine – point to your spine – get the kids to touch their spines
- Explain that these creatures are often the young stages of insects (larval) that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- Show the major parts of the Benthic invertebrates. The feeding hands, the legs, the pre wings, the eyes, the mouth, the variety of tails
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind children about safety on the boardwalk – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-
    - kick and sweep, triplicates, riffles and pools, transcet, labeling, live and preserved samples

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BENTHIC EDUCATION PROGRAM SPEAKING NOTES

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- One staff person in the water, the other on the boardwalk
- Staff collect a sample and then put it in each groups bin
- Encourage the kids to use their spoons and explore the bin
- Each group also has one net and can scoop more material into the bin
- Staff circulate between each group and identify creatures
- Explain the different types of benthic invertebrates, those that eat plant material and algae and those predators that eat other benthic invertebrate
- Explain any significant features that students can use to identify the type of benthic and its lifestyle
- Tidy up the bins and get the children to sit and talk about the bugs
- Get the children to identify what a good environment would be. Ie full of plants, algae, and other benthic invertebrates
- Explore with the children who might eat the benthic invertebrate. ie fish, amphibians, other invertebrate.
- What would happen if the water was too polluted for the benthic invertebrates, how would this affect the fish? How would this in turn affect the fisherman's dinner?
- Explain that you can tell how clean the water is by which species of benthic macroinvertebrates you find
    - EPT (Ephemeroptera (mayflies) Plecoptera (stoneflies) and Trichoptera (caddisflies) ratio, taxa richness, family biotic index, ratio of scrapers to filtering collectors, EPT index, Percent contribution of dominant family
- Explain that part of your job is to collect these creatures from creeks and streams all around the area to see how clean the water is
    - Best to do replicates, for site and sampling date
- Answer any questions they have

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

GRADE 4

Focus: Perspectives of involved parties, human dependence on natural habitats, reasons for depletion/extinction, risks of specialized species

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    - Invertebrate means they have no spine – point to your spine – get the kids to touch their spines
- Explain that these creatures are often the young stages of insects (larval) that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- Show the major parts of the Benthic invertebrates. The feeding hands, the legs, the pre wings, the eyes, the mouth, the variety of tails
- If you find a creek or stream with water that isn’t very clean, you also try to find ways of cleaning it up
- Remind children about safety on the boardwalk – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-
    - kick and sweep, triplicates, riffles and pools, transcet, labeling, live and preserved samples

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- Explain any significant features that students can use to identify the type of benthic and its lifestyle
- Tidy up the bins and get the children to sit and talk about the bugs
- Get the children to identify what a good environment would be. Ie full of plants, algae, and other benthic invertebrates
- Explore with the children who might eat the benthic invertebrate. ie fish, amphibians, other invertebrate.
- What would happen if the water was too polluted for the benthic invertebrates, how would this affect the fish? How would this in turn affect the fisherman's dinner?
- Explain that you can tell how clean the water is by which species of benthic macroinvertebrates you find
    - EPT (Ephemeroptera (mayflies) Plecoptera (stoneflies) and Trichoptera (caddisflies) ratio, taxa richness, family biotic index, ratio of scrapers to filtering collectors, EPT index, Percent contribution of dominant family
- Explain that part of your job is to collect these creatures from creeks and streams all around the area to see how clean the water is
    - Best to do replicates, for site and sampling date
- Answer any questions they have

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

GRADE 5

Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts

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- Explain that these creatures are often the young stages of larval that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- Show the major parts of the Benthic invertebrates. The feeding hands, the legs, the pre wings, the eyes, the mouth, the variety of tails
- If you find a creek or stream with water that isn’t very clean, you also try to find ways of cleaning it up
- Remind students about safety on the boardwalk – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-
    - kick and sweep, triplicates, riffles and pools, transcet, labeling, live and preserved samples
- Explain D nets, 500µ *mesh*

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

- One staff person in the water, the other on the boardwalk
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- Staff circulate between each group and identify creatures
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    - EPT (Ephemeroptera (mayflies) Plecoptera (stoneflies) and Trichoptera (caddisflies) ratio, taxa richness, family biotic index, ratio of scrapers to filtering collectors, EPT index, Percent contribution of dominant family
- Explain that part of your job is to collect these creatures from creeks and streams all around the area to see how clean the water is
    - Best to do replicates, for site and sampling date
- Discuss impacts of society and strategies to reduce impact.

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

GRADE 6

Focus: Human impacts on biodiversity, and identify ways of preserving biodiversity locally. Considering points of view. Classification of organisms

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- Explain that these creatures are often the young stages of larval that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- Show the major parts of the Benthic invertebrates. The feeding hands, the legs, the pre wings, the eyes, the mouth, the variety of tails
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind students about safety on the boardwalk – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-
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- One staff person in the water, the other on the boardwalk
- Staff collect a sample and then put it in each groups bin

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

- Encourage the kids to use their spoons and explore the bin
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- Explore with the children who might eat the benthic invertebrate. ie fish, amphibians, other invertebrate.
- What would happen if the water was too polluted for the benthic invertebrates, how would this affect the fish? How would this in turn affect the fisherman's dinner?
- Explain that you can tell how clean the water is by which species of benthic macroinvertebrates you find
    - EPT (Ephemeroptera (mayflies) Plecoptera (stoneflies) and Trichoptera (caddisflies) ratio, taxa richness, family biotic index, ratio of scrapers to filtering collectors, EPT index, Percent contribution of dominant family
- Explain that part of your job is to collect these creatures from creeks and streams all around the area to see how clean the water is
    - Best to do replicates, for site and sampling date
- Discuss impacts of society and strategies to maintain or improve biodiversity. Consider the local impacts on benthic biodiversity.

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

GRADE 7

Focus: costs and benefits of selected strategies for protecting the environment. Ecosystem interactions (abiotic, biotic, producers, consumers and decomposers) and how humans alter the balances.

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- Explain that these creatures are often the young stages of larval that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- Show the major parts of the Benthic invertebrates. The feeding hands, the legs, the pre wings, the eyes, the mouth, the variety of tails
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind students about safety on the boardwalk – no running, pushing or jumping
- Break them up into groups – a few kids with each adult
- explain the sampling techniques-

    - kick and sweep, triplicates, riffles and pools, transcet, labeling, live and preserved samples
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    - EPT (Ephemeroptera (mayflies) Plecoptera (stoneflies) and Trichoptera (caddisflies) ratio, taxa richness, family biotic index, ratio of scrapers to filtering collectors, EPT index, Percent contribution of dominant family
- Explain that part of your job is to collect these creatures from creeks and streams all around the area to see how clean the water is
    - Best to do replicates, for site and sampling date

- Discuss impacts of society impact on altering the benthic communities. What strategies do we have to maintain or improve biodiversity. What are the costs and benefits of these strategies? What is ORCA's role? Consider the local impacts on benthic biodiversity.

GRADE 8

Focus: Water resources; their impact on specific regions, human activities, sustainability, scientific discovery. Personal, social, economical and environmental influence and the evolution of a system.

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    - Benthic means bottom dwelling
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- Explain that these creatures are often the young stages of larval that grow up to be flies: mayflies, stoneflies but can also be leeches, beetles etc.
    - Pass around sample of molt of dragon fly etc…
- Show the major parts of the Benthic invertebrates. The feeding hands, the legs, the pre wings, the eyes, the mouth, the variety of tails
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind students about safety on the boardwalk – no running, pushing or jumping
- Break them up into groups – a few kids with each adult

OTONABEE CONSERVATION

BENTHIC EDUCATION PROGRAM SPEAKING NOTES

- explain the sampling techniques-
    - kick and sweep, triplicates, riffles and pools, transcet, labeling, live and preserved samples
- Explain D nets, 500µ *mesh*
- One staff person in the water, the other on the boardwalk
- Staff collect a sample and then put it in each groups bin
- Encourage the kids to use their spoons and explore the bin
- Each group also has one net and can scoop more material into the bin
- Staff circulate between each group and identify creatures
- Explain the different types of benthic invertebrates, those that eat plant material and algae and those predators that eat other benthic invertebrate
- Explain any significant features that students can use to identify the type of benthic and its lifestyle
- Tidy up the bins and get the children to sit and talk about the bugs
- Get the children to identify what a good environment would be. Ie full of plants, algae, and other benthic invertebrates
- Explore with the children who might eat the benthic invertebrate. ie fish, amphibians, other invertebrate.
- What would happen if the water was too polluted for the benthic invertebrates, how would this affect the fish? How would this in turn affect the fisherman's dinner?
- Explain that you can tell how clean the water is by which species of benthic macroinvertebrates you find
    - EPT (Ephemeroptera (mayflies) Plecoptera (stoneflies) and Trichoptera (caddisflies) ratio, taxa richness, family biotic index, ratio of scrapers to filtering collectors, EPT index, Percent contribution of dominant family
- Explain that part of your job is to collect these creatures from creeks and streams all around the area to see how clean the water is

    - Best to do replicates, for site and sampling date
- Discuss impacts of society impact on altering the benthic communities. how does this affect our water resources? What strategies do we have to maintain or improve our resource. How did these systems come about? What are the costs and benefits of these strategies? What is ORCA's role?

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

What is the Purpose of this Activity?

The purpose of this activity is to introduce the native frogs. The children will learn different frog calls, the importance of diversity in frogs, the sampling techniques used in the field, the life cycle of frogs and how to replicate the frog calls.

Key Messages:

- Where the frogs live
- The frog life cycle
- Healthy sites will have greater diversity in frogs
- Poorer quality sites will have far less diversity
- Identification of the frogs by picture and by call

Materials:

25-30 minutes in total for the session
Frog pictures for each one
Instruments: rubber bands, balloons (and water), shakers and combs
Cheat sheet for frog id and call
Fake frog eggs
Frog life cycle sheet

How Does this Activity Work?

Start with the frog's lifecycle
Talk about different types of frogs introduce call, picture and identifying features
Have the students practice the calls
Talk about the importance of frogs, their role in the ecosystem, and bio-monitoring

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

Background

Frogs are amphibians and can usually be found near water
Frogs lay eggs which hatch into tadpoles which grow into frogs
Frogs catch insects with their tongues
They hibernate in mud at the bottom of ponds
Species of frogs that live in Ontario: Spring Peeper, Leopard Frog, Chorus Frog, Pickerel Frog, Green Frog, Cricket Frog, Wood Frog, Mink Frog, Gray Tree Frog, Bull Frog, American Toad and Fowler's Toad

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

KINDERGARTEN

Focus: Saying, Doing and Representing

INTRODUCTION

- Introduce yourselves
- Ask them what they know about frogs?
- Take them through the life stages:
    - Pass around faux eggs
    - Talk about tadpoles, froglets, and frogs, then eggs again…

WETLAND ORCHESTRA ACTIVITY

- Introduce the students to each frog, describe the sound they make and have all the students make the sound with you
- Once you have introduced all of the frogs and sounds, give each student or group of students a sound to make
- Have each student/group make the sound and then have everyone make the sounds together to imitate a wetland

WOOD FROG

- Makes a low, quick, quacking croak like a duck
- Have the students make quacking sounds to imitate the wood frog

NORTHERN LEOPARD FROG

- Makes a rattling snore while floating on the water
- Have the students make snoring sounds to imitate the northern leopard frog **OR**
- Have the student rub wet hands on balloons to make a leopard frog sound

BULL FROG

- Makes a low “jug-o-rum” sound
- Blow gently across the open top of a pop bottle to make the low bellow of a bullfrog

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

GRAY TREEFROG

- Makes a long, slow, trilling sound
- Kids will recognize because of Dora the Explorer

GREEN FROG

- Sounds like a loose banjo string being plucked
- Have the students pluck a thick rubber band to imitate a green frog

SPRING PEEPER

- A chorus of 100 more spring peepers can be heard almost a kilometer away
- Shake a bag of tiny bells for a spring peeper choir

CHORUS FROG

- Run your finger over the small teeth of a pocket comb to sound like a chorus frog
- missing picture

Put the Band Together

- Hand out the combs, rubber bands (maybe these to adults), balloons, bells, bottles etc.
- reminding the kids to do the calls as well as the instruments.

Restless? Extra Time? Have kids jump around or race like frogs

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

GRADE 1

Focus: needs and characteristics of plants and animals, impact on people and the environment of objects/materials and assess uses of energy

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- Take them through the life stages:
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    - Talk about tadpoles, froglets, and frogs, then eggs again…

WETLAND ORCHESTRA ACTIVITY

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- Run your finger over the small teeth of a pocket comb to sound like a chorus frog
- missing picture

Explain that ORCA does Bio-monitoring of Wetlands

- So we listen for frog calls at night. Does anyone know why at night? - Predation
- Looking for BioDiversity (Bio=life, Diversity=Varitey)
- What do you think if we go and hear nothing?- no frogs, low biodiversity, we would prefer to hear a full wetland, with all the frogs.

Put the Band Together

- Hand out the combs, rubber bands (maybe these to adults), balloons, bells, bottles etc.
- reminding the kids to do the calls as well as the instruments.

Restless? Extra Time? Have kids jump around or race like frogs

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

GRADE 2

Focus:
- *animals have an impact on society and the environment*
- *humans have an impact upon animals and where they live*
- *animals adapt to their environment*
- *humans have an impact on the quality of air and water quality of air and water has an impact on living things*

INTRODUCTION

- Introduce yourselves
- Ask them what they know about frogs?
- Take them through the life stages:
    - Pass around faux eggs
    - Talk about tadpoles, the back legs coming first, then the front ones, froglets, and frogs, then eggs again…

WETLAND ORCHESTRA ACTIVITY

- Introduce the students to each frog, describe the sound they make and have all the students make the sound with you
- Once you have introduced all of the frogs and sounds, give each student or group of students a sound to make
- Have each student/group make the sound and then have everyone make the sounds together to imitate a wetland

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- Looking for BioDiversity (Bio=life, Diversity=Varitey)
- What do you think if we go and hear nothing?- no frogs, low biodiversity, we would prefer to hear a full wetland, with all the frogs.
- Discuss how do frogs affect their environment?

- Discuss how do we affect frog's environment?
- Discuss how is a frog adapted to its environment?

Put the Band Together

- Hand out the combs, rubber bands (maybe these to adults), balloons, bells, bottles etc.
- reminding the kids to do the calls as well as the instruments.

Restless? Extra Time? Have kids jump around or race like frogs

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

GRADE 3

Focus: the environment and human activity has an impact on habitats

INTRODUCTION

- Introduce yourselves
- Ask them what they know about frogs?
- Take them through the life stages:
    - Pass around faux eggs
    - Talk about tadpoles, the back legs coming first, then the front ones, froglets, and frogs, then eggs again…

WETLAND ORCHESTRA ACTIVITY

- For the older students who aren't as interested in the band, hand out the instruments before identifying the sounds.
- Introduce the students to each frog, describe the sound they make and have all the students make the sound with you

WOOD FROG

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- Looking for BioDiversity (Bio=life, Diversity=Varitey)
- What do you think if we go and hear nothing?- no frogs, low biodiversity, we would prefer to hear a full wetland, with all the frogs.
- Quiz the students on identifying frog calls
- How do we affect frog's environment? In our own lives. As a community. What are the consequences of these effects.
- Discuss how can we help frog populations?

Restless? Extra Time? Have kids jump around or race like frogs, or just make the frog noises like a band

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

OTONABEE CONSERVATION

FROG EDUCATION PROGRAM SPEAKING NOTES

GRADE 4

Focus: Perspectives, reasons for the depletion or extinction (why changes in the environment have a greater impact on specialized species), and human dependence on natural habitats and communities

INTRODUCTION

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- Looking for BioDiversity (Bio=life, Diversity=Varitey)
- What do you think if we go and hear nothing?- no frogs, low biodiversity, we would prefer to hear a full wetland, with all the frogs.
- Quiz the students on identifying frog calls
- Talk about the reason for depletion in frogs locally as well as globally
- Identify the different groups who the students think have the largest effect on frog communities.

- Talk about why frogs are important to humans.

Restless? Extra Time? Have kids jump around or race like frogs

GRADE 5

Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts

INTRODUCTION

- Introduce yourselves
- Ask them what they know about frogs?
- Take them through the life stages:
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- Quiz the students on identifying frog calls
- Talk about the reason for depletion in frogs locally as well as globally
- Identify the different groups who affect frog communities.
- What impacts has society been having on frog popualtions

- Talk about why frogs are important to humans.

Restless? Extra Time? Have kids jump around or race like frogs

GRADE 6

Focus: Human impacts on biodiversity, and identify ways of preserving biodiversity locally. Considering points of view. Classification of organisms

INTRODUCTION

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CHORUS FROG

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- missing picture

Explain that ORCA does Bio-monitoring of Wetlands

- So we listen for frog calls at night. Does anyone know why at night? - predation
- How do we impact BioDiversity, what do we do about it locally? (building regulations, conservation lands etc.)
- What do you think if we go and hear nothing?- no frogs, low biodiversity, we would prefer to hear a full wetland, with all the frogs.
- Quiz the students on identifying frog calls
- Talk about the reason for depletion in frogs locally as well as globally

- Identify the different groups who affect frog communities.
- What impacts has society been having on frog populations. Can we live with out impacting them? What do we do to ensure their survival?
- Talk about why frogs are important to humans.

Restless? Extra Time? Have kids jump around or race like frogs.

GRADE 7

Focus: costs and benefits of selected strategies for protecting the environment. Ecosystem interactions (abiotic, biotic, producers, consumers and decomposers) and how humans alter the balances.

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- What do you think if we go and hear nothing?- no frogs, low biodiversity, we would prefer to hear a full wetland, with all the frogs.

- Quiz the students on identifying frog calls
- Talk about the reason for depletion in frogs locally as well as globally
- Identify the different groups who affect frog communities.
- What impacts has society been having on frog populations. Can we live with out impacting them? What do we do to ensure their survival? What strategies do we have? What is ORCA's Role?

Restless? Extra Time? Have kids jump around or race like frogs.

GRADE 8

Focus: Water resources; their impact on specific regions, human activities, sustainability, scientific discovery. Personal, social, economical and environmental influence and the evolution of a system.

INTRODUCTION

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- Ask them what they know about frogs?
- Take them through the life stages:
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WETLAND ORCHESTRA ACTIVITY

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FROG EDUCATION PROGRAM SPEAKING NOTES

- How do we impact BioDiversity, what do we do about it locally? (building regulations, conservation lands etc.)
- Quiz the students on identifying frog calls
- Talk about the reason for depletion in frogs locally as well as globally
- Identify the different groups who affect frog communities.
- What impacts has society been having on frog populations. Can we live with out impacting them? What do we do to ensure their survival? What system do we have for their protection? What is ORCA's Role?

Restless? Extra Time? Have kids jump around or race like frogs.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

What is the Purpose of this Activity?

In this activity Students will learn the importance of eco-management. They will see or learn how to properly plant. They will learn about the environment they are planting in, and why the plants were chosen.

Key Messages:

- Be careful around shovels as they can hurt you. Leave them face down, and out of the path when not in use.
- No fingers in the holes when there are shovels around.
- Learn about the plants needs, and how we will provide them

Materials:

25- infinity minutes
At least 2 staff members
Shovels
Compost
Topsoil
Mulch
Plants
Trowels
Work boots
Water
Sunscreen
Watering can or bucket

How Does this Activity Work?

Introduce the plants and environment
Demonstrate planting
Break up into groups
Plant
Water

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

KINDERGARTEN

Focus: *Saying, Doing and Representing*

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups with an adult who will do the shoveling and divide the other tasks amongst the kids

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves
    - top soil, compost: broken down organic waste- loaded with nutrients
    - mulch : tree trimmings,
- Find a clear spot, a safe distance from other plantings

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

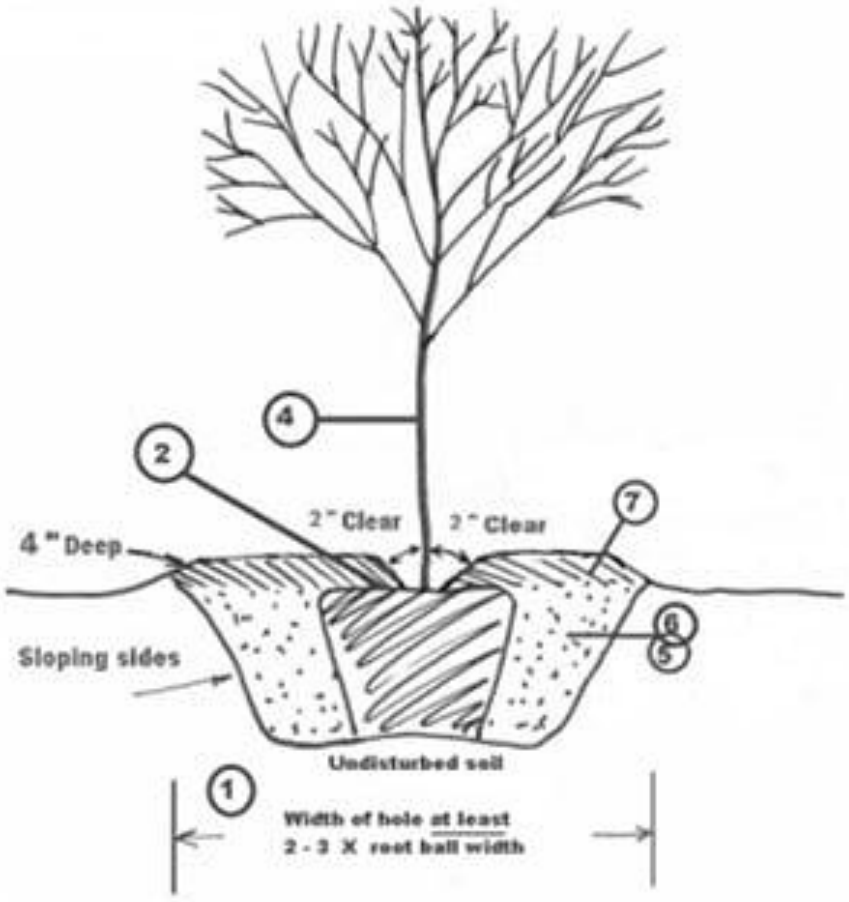
Extra time?: Go over the plantings with the kids to make sure they are done properly.

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES



GRADE 1

Focus: *Impact on people and needs of living things*

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups with an adult who will do the shoveling and divide the other tasks amongst the kids

If Native Plants;

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves
    - top soil, compost: broken down organic waste- loaded with nutrients
    - mulch : tree trimmings,
- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

GRADE 2

Focus: *People's impact, Impact on people, pollution, resource responsibility*

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them up into groups

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves
    - top soil, compost: broken down organic waste- loaded with nutrients
    - mulch : tree trimmings,
- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly.

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

GRADE 3

Focus: *People's impact, Impact on people, Parts of Plants and contribution, Soil characteristics and composition, soil components, components and characteristics*

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves
    - top soil, compost: broken down organic waste- loaded with nutrients, the students should be learning about soil and compost so give them a chance to explain what they know

PLANTING EDUCATION SPEAKING NOTES

- mulch : tree trimmings,
- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly.

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

GRADE 4

Focus: *Perspectives of involved parties, human dependence on natural habitats, reasons for depletion/extinction, risks of specialized species*

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Talk about the relationship of people and plants
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.
- The students will know much about specialized species and the risks that face them.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves

PLANTING EDUCATION SPEAKING NOTES

- top soil, compost: broken down organic waste- loaded with nutrients
- mulch : tree trimmings,

- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly.

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

GRADE 5

Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Talk about the relationship of people and plants
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.
- The students will know much about specialized species and the risks that face them.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves

- top soil, compost: broken down organic waste- loaded with nutrients
- mulch : tree trimmings,

- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly. Discuss impacts of society, forest management. Reducing our impact. *Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts*

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

GRADE 6

Focus: Human impacts on biodiversity, and identify ways of preserving biodiversity locally. Considering points of view. Classification of organisms

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Talk about the relationship of people and plants
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.
- The students will know much about specialized species and the risks that face them.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves

- top soil, compost: broken down organic waste- loaded with nutrients
- mulch : tree trimmings,

- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly. Discuss impacts of society, forest management. Reducing our impact on biodiversity. Talk about different interest groups and their influence on plantings, native plants, spreading invasives.

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

GRADE 7

Focus: costs and benefits of selected strategies for protecting the environment. Ecosystem interactions (abiotic, biotic, producers, consumers and decomposers) and how humans alter the balances.

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Talk about the relationship of people and plants
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.
- The students will know much about specialized species and the risks that face them.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves

- top soil, compost: broken down organic waste- loaded with nutrients
- mulch : tree trimmings,

- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly. Discuss impacts of society, forest management. Reducing our impact on biodiversity. The cost and benefits of these strategies. Talk about different interest groups and their influence; on plantings, native plants, spreading invasives, and ecosystem interactions.

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

PLANTING EDUCATION SPEAKING NOTES

GRADE 8

Focus: Water resources; their impact on specific regions, human activities, sustainability, scientific discovery. Personal, social, economical and environmental influence and the evolution of a system.

Introduction

- Introduce self/selves
- Gather children in a group to listen.
- Talk about the relationship of people and plants
- Ask them if they know what it is your planting- tell them if they don't know
- Ask them if they know why the site is special- tell them any specifics if it is.
- Break them into groups

If Native Plants;

- Explain Native species and their importance; that they are specifically adapted to their environment.
- Tell them how invasive species can out compete natives because of the lack of predation and resource exploitation. Potentially damaging agriculture and infrastructure.
- Tell them about the benefits to the community native plants will have.
- The students will know much about specialized species and the risks that face them.

If planting trees;

- Explain how succession works, by starting as lichen, to mosses, to grasses, to shrubs, to soft wood to hard wood.
- Tell them that you will be enhancing the secondary succession that would occur naturally over a longer period of time, by planting better trees etc, long before they would naturally arrive.

Demonstrate Proper Planting;

- Go over the materials you have by asking them questions:
    - shovels: when not in use face blade down, so no one side show bob's themselves

- top soil, compost: broken down organic waste- loaded with nutrients
- mulch : tree trimmings,

- Find a clear spot, a safe distance from other plantings
- No hands near shovel blades, and careful of open toes
- Dig a hole leaving the dirt beside
- If available place top soil in hole
- Put plant in standing nice and straight
- pinch dirt or more topsoil around plant firmly
- place mulch in circle around plant, to help absorb water and keep competition down.
- water plants, put things back

Extra time?: Go over the plantings with the kids to make sure they are done properly. Discuss impacts of society, sustainability and forest management. Reducing our impact on biodiversity. Talk about different interest groups and their influence; on plantings, native plants, spreading invasives, and ecosystem interactions.

Restless? : Get them to stretch like trees, reaching for the sun, then losing their leaves, up and down for as long as you need.

Thank the Kids, go over what you learned about specific site and plants put in.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

What is the Purpose of this Activity?

The students will learn about the snakes of Ontario. They will learn about their life cycle and yearly cycle. The will learn the visual identification skills to spot them. They will learn about snake habitat. The students will explore the threat levels of the snakes. To satisfy the tactile needs of the children snake props will be passed around and explained.

Key Messages:

- The life of a snake
- The dangers to snakes
- Explore the different species
- Explore their habitat

Materials:

25-30 minutes in total for the session
Snake props (molts, rubber snakes etc…)
Snake pictures

How Does this Activity Work?

Introduce the threat levels
Talk about specific threats
Talk about snake habitat
Show the different snake pictures
Hand out the props
Go through a snakes life

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

Kindergarten

Focus: *Saying, Doing and Representing*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
- They find warm places to hibernate; in borrows, logs, caves. Called a hibernaculum, any where free from frost. Different species may share the same den.
- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)

SNAKE VARIETY:

Mention names, hand out or show pictures.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

SNAKES WITH STRIPES

Birth live young

EASTERN GARTER SNAKE

- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught
- Excellent swimmers
- Eat frogs, fish and insects

RED-SIDED GARTER SNAKE

- Identical to eastern
- Found near Ontario and Manitoba's border
- Hibernate in large snake pits with 10s of thousands of snakes

BUTLERS GARTER SNAKE

- Less than 50cm
- Vunerable species
- Eat worms and leeches

NORTHERN RIBBON SNAKE

- White spot below each eye
- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

SNAKES WITH BLOTCHES

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)

SNAKE EDUCATION SPEAKING NOTES

- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands
- Eat mice, voles and other small mammals

EASTERN MILK SNAKE

- Buzzing sound when threatened
- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)
- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

- Large 1.6m
- Strong musk
- Eats rodents, small birds and eggs
- Threatened
- Majority of global habitat is around Georgian bay

EASTERN HOGNOSE SNAKE

- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
- Vulnerable
- Much persecution for their elaborate display

BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

SNAKES WITH UNIFORM COLOUR

BROWN (or DeKAYS) SNAKE

- 40cm long
- Nocturnal
- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

- Very similar to brown snake
- Do not survive in urban conditions

NORTHERN RING-NECKED SNAKE

- Distinctive ring around neck
- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

We have molts of real snakes. Hold them up. Ask them Why snakes do this?

Pass the molts around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Get children to demonstrate slithering, cobra like displays, hibernating and sunning. Feel free to prance around like a predator.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 1

Focus: Impact on people and needs of living things

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
- They find warm places to hibernate; in borrows, logs, caves. Called a hibernaculum, any where free from frost. Different species may share the same den.
- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)

SNAKE VARIETY:

Mention names, hand out or show pictures.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

SNAKES WITH STRIPES

Birth live young

EASTERN GARTER SNAKE

- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught
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RED-SIDED GARTER SNAKE

- Identical to eastern
- Found near Ontario and Manitoba's border
- Hibernate in large snake pits with 10s of thousands of snakes

BUTLERS GARTER SNAKE

- Less than 50cm
- Vunerable species
- Eat worms and leeches

NORTHERN RIBBON SNAKE

- White spot below each eye
- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

SNAKES WITH BLOTCHES

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)

SNAKE EDUCATION SPEAKING NOTES

- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands
- Eat mice, voles and other small mammals

EASTERN MILK SNAKE

- Buzzing sound when threatened
- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)
- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

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- Strong musk
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Pass the molts around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Get children to demonstrate slithering, cobra like displays, hibernating and sunning. Feel free to prance around like a predator.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 2

Focus: *People's impact, Impact on people, pollution, resource responsibility*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
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- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)
- Walk them through the levels of concern and snake variety

SNAKE VARIETY:

SNAKE EDUCATION SPEAKING NOTES

Mention names, hand out or show pictures.

SNAKES WITH STRIPES

Birth live young

EASTERN GARTER SNAKE

- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught
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- Ive in wetlands
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QUEEN SNAKE

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- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

SNAKES WITH BLOTCHES

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

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- Majority of global habitat is around Georgian bay

EASTERN HOGNOSE SNAKE

- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
- Vulnerable
- Much persecution for their elaborate display

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

SNAKES WITH UNIFORM COLOUR

BROWN (or DeKAYS) SNAKE

- 40cm long
- Nocturnal
- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

- Very similar to brown snake
- Do not survive in urban conditions

NORTHERN RING-NECKED SNAKE

- Distinctive ring around neck
- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

LEVELS OF CONCERN

EXTINCT

A species that no longer exists anywhere

EXTIRPATED

SNAKE EDUCATION SPEAKING NOTES

A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED
A species facing imminent extinction or extirpation in Ontario and is a candidate for regulation under Ontario's ESA.

THREATENED
A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

We have molts of real snakes. Hold them up. Ask them Why snakes do this?

Pass the molts around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Get children to demonstrate slithering, cobra like displays, hibernating and sunning. Feel free to prance around like a predator.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 3

Focus: *People's impact, Impact on people, Parts of Plants and contribution, Soil characteristics and composition*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
- They find warm places to hibernate; in borrows, logs, caves. Called a hibernaculum, anywhere free from frost. Different species may share the same den.
- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)
- Walk them through the levels of concern and snake variety

SNAKE EDUCATION SPEAKING NOTES

SNAKE VARIETY:

Mention names, hand out or show pictures.

SNAKES WITH STRIPES

Birth live young

EASTERN GARTER SNAKE

- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught
- Excellent swimmers
- Eat frogs, fish and insects

RED-SIDED GARTER SNAKE

- Identical to eastern
- Found near Ontario and Manitoba's border
- Hibernate in large snake pits with 10s of thousands of snakes

BUTLERS GARTER SNAKE

- Less than 50cm
- Vunerable species
- Eat worms and leeches

NORTHERN RIBBON SNAKE

- White spot below each eye
- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

SNAKES WITH BLOTCHES

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)
- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands
- Eat mice, voles and other small mammals

EASTERN MILK SNAKE

- Buzzing sound when threatened
- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)
- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

- Large 1.6m
- Strong musk
- Eats rodents, small birds and eggs
- Threatened
- Majority of global habitat is around Georgian bay

EASTERN HOGNOSE SNAKE

- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
- Vulnerable

- Much persecution for their elaborate display

BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

SNAKES WITH UNIFORM COLOUR

BROWN (or DeKAYS) SNAKE

- 40cm long
- Nocturnal
- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

- Very similar to brown snake
- Do not survive in urban conditions

NORTHERN RING-NECKED SNAKE

- Distinctive ring around neck
- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

LEVELS OF CONCERN

EXTINCT

A species that no longer exists anywhere

EXTIRPATED

SNAKE EDUCATION SPEAKING NOTES

A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED
A species facing imminent extinction or extirpation in Ontario and is a candidate for regulation under Ontario's ESA.

THREATENED
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SPECIAL CONCERN
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Restless?/Extra time? Get children to demonstrate slithering, cobra like displays, hibernating and sunning. Feel free to prance around like a predator.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 4

Focus: *Perspectives of involved parties, human dependence on natural habitats, reasons for depletion/extinction, risks of specialized species*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
- They find warm places to hibernate; in borrows, logs, caves. Called a hibernaculum, any where free from frost. Different species may share the same den.
- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)
- Walk them through the levels of concern and snake variety

SNAKE VARIETY:

SNAKE EDUCATION SPEAKING NOTES

Mention names, hand out or show pictures.

SNAKES WITH STRIPES

Birth live young

EASTERN GARTER SNAKE

- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught
- Excellent swimmers
- Eat frogs, fish and insects

RED-SIDED GARTER SNAKE

- Identical to eastern
- Found near Ontario and Manitoba's border
- Hibernate in large snake pits with 10s of thousands of snakes

BUTLERS GARTER SNAKE

- Less than 50cm
- Vunerable species
- Eat worms and leeches

NORTHERN RIBBON SNAKE

- White spot below each eye
- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

SNAKES WITH BLOTCHES

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)
- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands
- Eat mice, voles and other small mammals

EASTERN MILK SNAKE

- Buzzing sound when threatened
- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)
- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

- Large 1.6m
- Strong musk
- Eats rodents, small birds and eggs
- Threatened
- Majority of global habitat is around Georgian bay

EASTERN HOGNOSE SNAKE

- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
- Vulnerable
- Much persecution for their elaborate display

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

<u>SNAKES WITH UNIFORM COLOUR</u>

BROWN (or DeKAYS) SNAKE

- 40cm long
- Nocturnal
- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

- Very similar to brown snake
- Do not survive in urban conditions

NORTHERN RING-NECKED SNAKE

- Distinctive ring around neck
- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

<u>LEVELS OF CONCERN</u>

EXTINCT

A species that no longer exists anywhere

EXTIRPATED

SNAKE EDUCATION SPEAKING NOTES

A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED
A species facing imminent extinction or extirpation in Ontario and is a candidate for regulation under Ontario's ESA.

THREATENED
A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

We have molts of real snakes. Hold them up. Ask them Why snakes do this?

Pass the molts around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Get children to demonstrate slithering, cobra like displays, hibernating and sunning. Feel free to prance around like a predator.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 5

Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts

INTRODUCTION

- Introduce self/selves
- Ask Students what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
- They find warm places to hibernate; in borrows, logs, caves. Called a hibernaculum, anywhere free from frost. Different species may share the same den.
- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)
- How can we reduce our impact?
- Walk them through the levels of concern and snake variety
- Talk about snakes role in the ecosystem

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

LEVELS OF CONCERN

EXTINCT
A species that no longer exists anywhere

EXTIRPATED
A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED
A species facing imminent extinction or extirpation in Ontario and is a candidate for regulation under Ontario's ESA.

THREATENED
A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

SNAKE VARIETY:

Mention names, hand out or show pictures.

SNAKES WITH STRIPES
Birth live young

EASTERN GARTER SNAKE

- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught
- Excellent swimmers
- Eat frogs, fish and insects

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

RED-SIDED GARTER SNAKE

- Identical to eastern
- Found near Ontario and Manitoba's border
- Hibernate in large snake pits with 10s of thousands of snakes

BUTLERS GARTER SNAKE

- Less than 50cm
- Vunerable species
- Eat worms and leeches

NORTHERN RIBBON SNAKE

- White spot below each eye
- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

<u>SNAKES WITH BLOTCHES</u>

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)
- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands
- Eat mice, voles and other small mammals

EASTERN MILK SNAKE

- Buzzing sound when threatened
- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)

SNAKE EDUCATION SPEAKING NOTES

- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

- Large 1.6m
- Strong musk
- Eats rodents, small birds and eggs
- Threatened
- Majority of global habitat is around Georgian bay

EASTERN HOGNOSE SNAKE

- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
- Vulnerable
- Much persecution for their elaborate display

BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

<u>SNAKES WITH UNIFORM COLOUR</u>

BROWN (or DeKAYS) SNAKE

- 40cm long
- Nocturnal

SNAKE EDUCATION SPEAKING NOTES

- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

- Very similar to brown snake
- Do not survive in urban conditions

NORTHERN RING-NECKED SNAKE

- Distinctive ring around neck
- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

We have props of real snakes. Hold them up. Ask them Why snakes do this? Pass the molts around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz them on the snake pictures. Discuss threats

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 6

Focus: Human impacts on biodiversity, and identify ways of preserving biodiversity locally. Considering points of view. Classification of organisms

INTRODUCTION

- Introduce self/selves
- Ask Students what they know about snakes?
    - What do they eat?
    - Where do they live?
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
- They find warm places to hibernate; in borrows, logs, caves. Called a hibernaculum, anywhere free from frost. Different species may share the same den.
- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)
- How can we reduce our impact? Who impacts them the largest? Can we live without impacting them? So what do we do to ensure their survival?

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

- Walk them through the levels of concern and snake variety
- Talk about snakes role in the ecosystem

LEVELS OF CONCERN

EXTINCT
A species that no longer exists anywhere

EXTIRPATED
A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED
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A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

SNAKE VARIETY:

Mention names, hand out or show pictures.

SNAKES WITH STRIPES
Birth live young

EASTERN GARTER SNAKE
- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught

SNAKE EDUCATION SPEAKING NOTES

- Excellent swimmers
- Eat frogs, fish and insects

RED-SIDED GARTER SNAKE

- Identical to eastern
- Found near Ontario and Manitoba's border
- Hibernate in large snake pits with 10s of thousands of snakes

BUTLERS GARTER SNAKE

- Less than 50cm
- Vunerable species
- Eat worms and leeches

NORTHERN RIBBON SNAKE

- White spot below each eye
- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

<u>SNAKES WITH BLOTCHES</u>

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)
- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands
- Eat mice, voles and other small mammals

EASTERN MILK SNAKE

- Buzzing sound when threatened

SNAKE EDUCATION SPEAKING NOTES

- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)
- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

- Large 1.6m
- Strong musk
- Eats rodents, small birds and eggs
- Threatened
- Majority of global habitat is around Georgian bay

EASTERN HOGNOSE SNAKE

- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
- Vulnerable
- Much persecution for their elaborate display

BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

<u>SNAKES WITH UNIFORM COLOUR</u>

BROWN (or DeKAYS) SNAKE

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

- 40cm long
- Nocturnal
- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

- Very similar to brown snake
- Do not survive in urban conditions

NORTHERN RING-NECKED SNAKE

- Distinctive ring around neck
- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

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Restless?/Extra time? Quiz them on the snake pictures. Discuss threats

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 7

Focus: costs and benefits of selected strategies for protecting the environment. Ecosystem interactions (abiotic, biotic, producers, consumers and decomposers) and how humans alter the balances.

INTRODUCTION

- Introduce self/selves
- Ask Students what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
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SNAKE EDUCATION SPEAKING NOTES

- How can we reduce our impact? What are the costs of this? How do we see the beenfits?
- Walk them through the levels of concern and snake variety
- Talk about snakes role in the ecosystem

LEVELS OF CONCERN

EXTINCT
A species that no longer exists anywhere

EXTIRPATED
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SNAKE VARIETY:

Mention names, hand out or show pictures.

SNAKES WITH STRIPES
Birth live young

EASTERN GARTER SNAKE

SNAKE EDUCATION SPEAKING NOTES

- Named after fancy striped garters historically worn by men
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- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

<u>SNAKES WITH BLOTCHES</u>

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)
- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands
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OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

EASTERN MILK SNAKE

- Buzzing sound when threatened
- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)
- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

- Large 1.6m
- Strong musk
- Eats rodents, small birds and eggs
- Threatened
- Majority of global habitat is around Georgian bay

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- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
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BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

<u>SNAKES WITH UNIFORM COLOUR</u>

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

BROWN (or DeKAYS) SNAKE

- 40cm long
- Nocturnal
- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

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- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

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Restless?/Extra time? Quiz them on the snake pictures. Discuss threats

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

GRADE 8

Focus: Water resources; their impact on specific regions, human activities, sustainability, scientific discovery. Personal, social, economical and environmental influence and the evolution of a system.

INTRODUCTION

- Introduce self/selves
- Ask Students what they know about snakes?
    - What do they eat?
    - Where do they live
    - Dangers
- Tell them you will learn about the snakes found in Ontario

INFORMATION

- Ask them how many different types exist in Canada: 18
- Of those one is extripated, two are vulnerable, two are endangered and one is threatened.
- Tell them about hibernation, by asking what the snakes do in the winter.
    - Do they go tobogganing with the frogs?
- They find warm places to hibernate; in borrows, logs, caves. Called a hibernaculum, anywhere free from frost. Different species may share the same den.
- Are snakes like us? Feel your cheeks? Are they warm? Snakes are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- How do Snakes have babies? Laying eggs and live births in dens
- At risk of Habitat loss (70% of wetlands gone in 200yrs), Road mortality (they bask on them), persecution (bad reputation), collection (for sale and personal use), subsidized predators (raccoons, skunks, feral cats)

SNAKE EDUCATION SPEAKING NOTES

- How can we reduce our impact? What are the costs of this? How do we see the benefits?
- What system can we put in place to protect them? What would influence that system. Talk about ORCA's role.
- Walk them through the levels of concern and snake variety
- Talk about snakes role in the ecosystem

LEVELS OF CONCERN

EXTINCT
A species that no longer exists anywhere

EXTIRPATED
A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED
A species facing imminent extinction or extirpation in Ontario and is a candidate for regulation under Ontario's ESA.

THREATENED
A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

SNAKE VARIETY:

Mention names, hand out or show pictures.

SNAKES WITH STRIPES
Birth live young

OTONABEE CONSERVATION

SNAKE EDUCATION SPEAKING NOTES

EASTERN GARTER SNAKE

- Named after fancy striped garters historically worn by men
- 50-70cm long, release musk and may bite when caught
- Excellent swimmers
- Eat frogs, fish and insects

RED-SIDED GARTER SNAKE

- Identical to eastern
- Found near Ontario and Manitoba's border
- Hibernate in large snake pits with 10s of thousands of snakes

BUTLERS GARTER SNAKE

- Less than 50cm
- Vunerable species
- Eat worms and leeches

NORTHERN RIBBON SNAKE

- White spot below each eye
- Ive in wetlands
- Reach up to 75 cm

QUEEN SNAKE

- Semi aquatic, lives on shores of rivers
- Eats moulted crayfish
- Dams and shoreline construction have eliminated much of their habitat

<u>SNAKES WITH BLOTCHES</u>

EASTERN MASSASAUGA RATTLESNAKE

- Ontario's only venomous snake (only 2 deaths recorded ever)
- About 70 cm
- Live in wetlands and rocky areas
- Live young with fully functional venom glands

SNAKE EDUCATION SPEAKING NOTES

- Eat mice, voles and other small mammals

EASTERN MILK SNAKE

- Buzzing sound when threatened
- Once believed to milk cows, that's where it got its name
- Eats rodents and other snakes (immune to toxins)
- Up to 1m long

NORTHERN WATER SNAKE

- Eats fish and frogs (often diseased fish which helps maintain healthy fish populations)
- Lives near water

LAKE ERIE WATER SNAKE

- Endangered
- Only on islands of western lake erie

EASTERN FOX SNAKE

- Large 1.6m
- Strong musk
- Eats rodents, small birds and eggs
- Threatened
- Majority of global habitat is around Georgian bay

EASTERN HOGNOSE SNAKE

- Acts like a cobra when threatened but doesn't bite. If this fails it plays dead
- Up to 80cm long
- Vulnerable
- Much persecution for their elaborate display

BLACK RAT SNAKE

- Eats rats and bird eggs
- Lay eggs in damp location
- Longest snake in Canada 2.56m

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SNAKE EDUCATION SPEAKING NOTES

SNAKES WITH UNIFORM COLOUR

BROWN (or DeKAYS) SNAKE

- 40cm long
- Nocturnal
- Eats slugs and worms (a gardeners friend)

NORTHERN RED BELLIED SNAKE

- Very similar to brown snake
- Do not survive in urban conditions

NORTHERN RING-NECKED SNAKE

- Distinctive ring around neck
- Eats earth worms, slugs, salamanders and other snakes

SMOOTH GREEN SNAKE

- Eats insects only: grasshoppers, crickets, caterpillars and spiders
- 50cm long and very slender and fast

BLUE RACER

- 1.8m long
- Endangered species

We have props of real snakes. Hold them up. Ask them Why snakes do this? Pass the molts around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz them on the snake pictures. Discuss threats

Ask for questions. Review what you have learned. Thank them for participating.

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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

What is the Purpose of this Activity?

The purpose of this activity is to introduce the students to tree identification and tree education. It gives students a chance to conceptualize trees as a scientist, practicing taxanonomy skills. It gives the students the chance to participate in identifying trees, while discussing the importance of trees in the environment.

Key Messages:

- Learn to use the id key
- Talk about tree products
- Discuss trees role in the ecosystem

Materials:

25-30 minutes in total for the session
At least one staff member
Tree Id sheets (optional take home)
Large print out for younger grades
Outdoor area with trees, or else collect samples beforehand
Magnifying glasses
Pruners
Tape (for samples or large Id sheet)

How Does this Activity Work?

Discuss the information on trees
Introduce the id key
Go through it with the students
Let students go off in groups with supervision to identify
Or go through samples as a group

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

BackGround

Alternate – leaves that are staggered, not placed directly across from each other on the twig.

Blade – The flat part of a leaf or leaflet, characteristic of broadleaf trees.

Bract – a modified leaf that bears a flower/seeds.

Broadleaf – a tree with leaves that are flat and thin, and generally shed annually.

Compound leaf – A leaf with more than one blade. All blades are attached to a single leaf stem. Where the leaf stem attaches to the twig, there is a bud.

Conifer – a cone bearing tree; some are berry-like.

Deciduous – shedding all leaves annually.

Evergreen – trees with needles or leaves that remain alive an on the tree through the winter and into the next growing season.

Lobes – projections that shape the edge of a leaf.

Opposite – 2 or 3 leaves that are directly across from each other on the same twig.

Palmate – arranged like fingers on the palm of a hand.

Pinnate – arranged like a feather.

Simple leaf – a single leaf blade with a bud at the base of the leaf stem.

KINDERGARTEN

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

Focus: Saying, Doing and Representing

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
  - Dyes and medicines are made from the bark
  - Leaves and roots provide oils for medicines and makeup.
- All the products made from trees create many more jobs. Did you ever wonder who makes pencils or chewing gum?
- Food for people (apples, pears, peaches and cherries, nuts.
- Trees make our world a nicer place. Image your neighborhood, parks and campgrounds without trees.
- As a form of therapy, children that suffer from Attention Deficit Hyperactivity Disorder or (ADHD) can benefit from the presence of trees and other greenery. Kids with ADHD have been proven to be calmer, more responsive, and better able to concentrate when in a space with lots of trees.
- Cities are hot places in the summer. With so much pavement and concrete absorbing and re-radiating the sun's heat, cities are much hotter than the surrounding countryside. Urban trees help to cool the air around them in two ways: first, by directly shading streets and buildings and second, by actually lowering the temperature of the air around them. They act as massive natural air-conditioners, cooling the air 3 to 5ºC (5 to 9ºF) by transpiring vast amounts of water through their leaves.
- Reduce Noise Pollution

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

- Clusters of trees can effectively buffer noise. Tree buffers 30 meters (100') wide along highways and industrial sites reduce the impacts of noise pollution on humans and wildlife.

TREE IDENTIFICATION

Explain to students that there is a scientific process scientists use to classify plants and animals. This process is called TAXONOMY. Taxonomy provides an organized system for grouping things together based on certain "similar" characteristics. Its kind of like a map that helps scientist find their way to the right name, by answering questions.

When scientists classify trees they start by dividing trees into two main groups.

- Ask if anyone knows what these two groups might be.
- Tell them if they don't know. (I will have a picture of each example.)

Introduce them to an ID key or large print out. Explain that it is a tool that Scientists use to identify different species of plants and animals. We are going to use this tool to ID trees.

Mark trees to be identified. ID the first tree with them. If time permits let them split into groups and ID another marked tree. Once a tree is identified tell them a little bit more about that tree.

Thank the students and ask for questions.

Extra time? Get the students to mimic by stretching up like trees and shaking their leaves off.

GRADE 1

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

Focus: needs and characteristics of plants and animals, impact on people and the environment of objects/materials and assess uses of energy

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
  - Dyes and medicines are made from the bark
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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

- Reduce Noise Pollution
  - Clusters of trees can effectively buffer noise. Tree buffers 30 meters (100') wide along highways and industrial sites reduce the impacts of noise pollution on humans and wildlife.

TREE IDENTIFICATION

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When scientists classify trees they start by dividing trees into two main groups.

- Ask if anyone knows what these two groups might be.
- Tell them if they don't know. (I will have a picture of each example.)

Introduce them to an ID key or large print out. Explain that it is a tool that Scientists use to identify different species of plants and animals. We are going to use this tool to ID trees.

Mark trees to be identified. ID the first tree with them. If time permits let them split into groups and ID another marked tree. Once a tree is identified tell them a little bit more about that tree.

Thank the students and ask for questions.

Extra time? Get the students to mimic by stretching up like trees and shaking their leaves off.

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

GRADE 2

Focus:
- *humans have an impact upon animals and where they live*
- *humans have an impact on the quality of air and water, the quality of air and water has an impact on living things*

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
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air-conditioners, cooling the air 3 to 5ºC (5 to 9ºF) by transpiring vast amounts of water through their leaves.

- Reduce Noise Pollution
  - Clusters of trees can effectively buffer noise. Tree buffers 30 meters (100') wide along highways and industrial sites reduce the impacts of noise pollution on humans and wildlife.
- Discuss who might live in a tree, and what happens if there are no trees
- What do trees do for our air? They clean it and make oxygen.

TREE IDENTIFICATION

Explain to students that there is a scientific process scientists use to classify plants and animals. This process is called TAXONOMY. Taxonomy provides an organized system for grouping things together based on certain "similar" characteristics. Its kind of like a map that helps scientist find their way to the right name, by answering questions.

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Mark trees to be identified. ID the first tree with them. If time permits let them split into groups and ID another marked tree. Once a tree is identified tell them a little bit more about that tree.

Thank the students and ask for questions.

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

Extra time? Get the students to mimic by stretching up like trees and shaking their leaves off.

GRADE 3

Focus: the environment and human activity has an impact on habitats

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
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- All the products made from trees create many more jobs. Did you ever wonder who makes pencils or chewing gum?
- Food for people (apples, pears, peaches and cherries, nuts.
- Trees make our world a nicer place. Image your neighborhood, parks and campgrounds without trees.
- As a form of therapy, children that suffer from Attention Deficit Hyperactivity Disorder or (ADHD) can benefit from the presence of trees and other greenery. Kids with ADHD have been proven to be calmer, more responsive, and better able to concentrate when in a space with lots of trees.
- Reduce Energy Needs
  - By placing trees in strategic locations around a building, homeowners can save 25 to 40% of their annual heating and cooling bills. Evergreens placed on the north and west

sides of a building reduce heating costs by providing a windbreak in the winter. Deciduous trees on the south side let the sun shine through in winter, but shade the building in summer, lowering air-conditioning costs.
  - Cities are hot places in the summer. With so much pavement and concrete absorbing and re-radiating the sun's heat, cities are much hotter than the surrounding countryside. Urban trees help to cool the air around them in two ways: first, by directly shading streets and buildings and second, by actually lowering the temperature of the air around them. They act as massive natural air-conditioners, cooling the air 3 to 5ºC (5 to 9ºF) by transpiring vast amounts of water through their leaves.
- Reduce Noise Pollution
  - Clusters of trees can effectively buffer noise. Tree buffers 30 meters (100') wide along highways and industrial sites reduce the impacts of noise pollution on humans and wildlife.
- Improve Property Value and Support the Economy
  - The market value of residential properties in neighbourhoods with mature trees can be as much as 25% higher than non-treed neighbourhoods. People simply prefer to live and spend time in treed neighbourhoods.
  - Trees also provide a business-generating atmosphere. Studies have shown that street trees and leafy landscaping can encourage the public to spend 11% more in businesses located within vegetated landscapes.
- Improve Physical and Psychological Health
  - Green spaces and natural areas promote psychological well-being.
  - People enjoy walking in treed areas to relieve stress.
  - Treed neighbourhoods have lower crime rates and an enhanced sense of community.
  - The journal *Science* published a study of recuperation rates after surgery, showing that hospital patients with a view of

trees recovered more quickly than patients who could only look out on brick walls.

HOW DO TREES HELP THE ENVIRONMENT?

- Improve Air Quality
  - Trees are like the lungs of the planet. If trees didn't breathe, neither could we
  - Most people are aware that trees replenish the air with oxygen, but did you know that their leaves remove pollutants and noxious gases? By absorbing compounds like nitrogen oxide, sulphur dioxide, carbon monoxide and ozone, trees help to alleviate smog. Poor air quality sends hundreds of local people to hospital for treatment each year – many of them children.
  - Mature trees can absorb roughly 48 pounds of CO2 a year. The tree in turn releases enough oxygen to sustain two human beings.
- Combat Climate Change
  - As we pump carbon dioxide into the atmosphere by burning fossil fuels, more of the sun's heat is trapped in our atmosphere, consequently heating up the earth. Trees can help to offset this problem by pulling some of that carbon out of the air and storing it in their wood, leaves and roots. Carbon can also be stored in the soil by allowing tree leaves to compost. Younger trees are most efficient in storing carbon.
- Prevent Floods and filter pollutants from water
  - Trees and other greenery reduce storm water run-off by intercepting and slowing rainfall which encourages the water to percolate into the soil, rather than flow over the surface.
  - The urban forest as a whole plays a valuable role in reducing flood risk and preventing polluted storm water from running directly into our sewers and streams by

absorbing the water through their roots and holding pollutants in their wood.
  - For every 5% of tree canopy added in a community, run-off is reduced by approximately 2%.
  - Roots help hold soil in place to prevent erosion which not only saves soil, but also keeps our waterways cleaner. You may have observed that water is usually cleaner when there is an abundance of trees
- Provide Wildlife Habitat
  - Trees and corridors of green space provide important habitat for urban wildlife. For 80% of Canadians, the urban forest is their primary link and exposure to wildlife. As natural areas are lost to agriculture or development, urban green spaces become a lifeline for wildlife such as birds, butterflies, squirrels, raccoons and more. A diverse urban forest provides a range of food sources and shelter.

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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

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GRADE 4

Focus: Perspectives, reasons for the depletion or extinction (why changes in the environment have a greater impact on specialized species), and human dependence on natural habitats and communities

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- Discuss how different people in different jobs might see a tree
- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
  - Dyes and medicines are made from the bark
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- Reduce Energy Needs

TREE EDUCATION PROGRAM SPEAKING NOTES

  - By placing trees in strategic locations around a building, homeowners can save 25 to 40% of their annual heating and cooling bills. Evergreens placed on the north and west sides of a building reduce heating costs by providing a windbreak in the winter. Deciduous trees on the south side let the sun shine through in winter, but shade the building in summer, lowering air-conditioning costs.
  - Cities are hot places in the summer. With so much pavement and concrete absorbing and re-radiating the sun's heat, cities are much hotter than the surrounding countryside. Urban trees help to cool the air around them in two ways: first, by directly shading streets and buildings and second, by actually lowering the temperature of the air around them. They act as massive natural air-conditioners, cooling the air 3 to 5ºC (5 to 9ºF) by transpiring vast amounts of water through their leaves.
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- Improve Physical and Psychological Health
  - Green spaces and natural areas promote psychological well-being.
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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

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HOW DO TREES HELP THE ENVIRONMENT?

- Improve Air Quality
  - Trees are like the lungs of the planet. If trees didn't breathe, neither could we
  - Most people are aware that trees replenish the air with oxygen, but did you know that their leaves remove pollutants and noxious gases? By absorbing compounds like nitrogen oxide, sulphur dioxide, carbon monoxide and ozone, trees help to alleviate smog. Poor air quality sends hundreds of local people to hospital for treatment each year – many of them children.
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TREE IDENTIFICATION

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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

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GRADE 5

Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- Discuss uses of trees and the long term effects of these uses.
- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
  - Dyes and medicines are made from the bark
  - Leaves and roots provide oils for medicines and makeup.
- All the products made from trees create many more jobs. Did you ever wonder who makes pencils or chewing gum?
- Food for people (apples, pears, peaches and cherries, nuts.
- Trees make our world a nicer place. Image your neighborhood, parks and campgrounds without trees.
- As a form of therapy, children that suffer from Attention Deficit Hyperactivity Disorder or (ADHD) can benefit from the presence of trees and other greenery. Kids with ADHD have been proven to be calmer, more responsive, and better able to concentrate when in a space with lots of trees.
- Reduce Energy Needs

TREE EDUCATION PROGRAM SPEAKING NOTES

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  - Trees also provide a business-generating atmosphere. Studies have shown that street trees and leafy landscaping can encourage the public to spend 11% more in businesses located within vegetated landscapes.
- Improve Physical and Psychological Health
  - Green spaces and natural areas promote psychological well-being.
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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

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HOW DO TREES HELP THE ENVIRONMENT?

- Improve Air Quality
  - Trees are like the lungs of the planet. If trees didn't breathe, neither could we
  - Most people are aware that trees replenish the air with oxygen, but did you know that their leaves remove pollutants and noxious gases? By absorbing compounds like nitrogen oxide, sulphur dioxide, carbon monoxide and ozone, trees help to alleviate smog. Poor air quality sends hundreds of local people to hospital for treatment each year – many of them children.
  - Mature trees can absorb roughly 48 pounds of CO2 a year. The tree in turn releases enough oxygen to sustain two human beings.
- Combat Climate Change
  - As we pump carbon dioxide into the atmosphere by burning fossil fuels, more of the sun's heat is trapped in our atmosphere, consequently heating up the earth. Trees can help to offset this problem by pulling some of that carbon out of the air and storing it in their wood, leaves and roots. Carbon can also be stored in the soil by allowing tree leaves to compost. Younger trees are most efficient in storing carbon.
- Prevent Floods and filter pollutants from water
  - Trees and other greenery reduce storm water run-off by intercepting and slowing rainfall which encourages the water to percolate into the soil, rather than flow over the surface.
  - The urban forest as a whole plays a valuable role in reducing flood risk and preventing polluted storm water

from running directly into our sewers and streams by absorbing the water through their roots and holding pollutants in their wood.
  - For every 5% of tree canopy added in a community, run-off is reduced by approximately 2%.
  - Roots help hold soil in place to prevent erosion which not only saves soil, but also keeps our waterways cleaner. You may have observed that water is usually cleaner when there is an abundance of trees
- Provide Wildlife Habitat
  - Trees and corridors of green space provide important habitat for urban wildlife. For 80% of Canadians, the urban forest is their primary link and exposure to wildlife. As natural areas are lost to agriculture or development, urban green spaces become a lifeline for wildlife such as birds, butterflies, squirrels, raccoons and more. A diverse urban forest provides a range of food sources and shelter.

TREE IDENTIFICATION

Explain to students that there is a scientific process scientists use to classify plants and animals. This process is called TAXONOMY. Taxonomy provides an organized system for grouping things together based on certain "similar" characteristics.

When scientists classify trees they start by dividing trees into two main groups.

- Ask if anyone knows what these two groups might be.
- Tell them if they don't know. (I will have a picture of each example.)

Introduce them to an ID key. Explain that it is a tool that Scientists use to identify different species of plants and animals. We are going to use this tool to ID trees.

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

Mark trees to be identified. ID the first tree with them. If time permits let them split into groups and ID another marked tree. Once a tree is identified tell them a little bit more about that tree.

GRADE 6

Focus: Human impacts on biodiversity, and identify ways of preserving biodiversity locally. Considering points of view. Classification of organisms

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
  - Dyes and medicines are made from the bark
  - Leaves and roots provide oils for medicines and makeup.
- All the products made from trees create many more jobs. Did you ever wonder who makes pencils or chewing gum?
- Food for people (apples, pears, peaches and cherries, nuts.
- Trees make our world a nicer place. Image your neighborhood, parks and campgrounds without trees.
- As a form of therapy, children that suffer from Attention Deficit Hyperactivity Disorder or (ADHD) can benefit from the presence of trees and other greenery. Kids with ADHD have been proven to be calmer, more responsive, and better able to concentrate when in a space with lots of trees.
- Reduce Energy Needs

TREE EDUCATION PROGRAM SPEAKING NOTES

  - By placing trees in strategic locations around a building, homeowners can save 25 to 40% of their annual heating and cooling bills. Evergreens placed on the north and west sides of a building reduce heating costs by providing a windbreak in the winter. Deciduous trees on the south side let the sun shine through in winter, but shade the building in summer, lowering air-conditioning costs.
  - Cities are hot places in the summer. With so much pavement and concrete absorbing and re-radiating the sun's heat, cities are much hotter than the surrounding countryside. Urban trees help to cool the air around them in two ways: first, by directly shading streets and buildings and second, by actually lowering the temperature of the air around them. They act as massive natural air-conditioners, cooling the air 3 to 5ºC (5 to 9ºF) by transpiring vast amounts of water through their leaves.
- Reduce Noise Pollution
  - Clusters of trees can effectively buffer noise. Tree buffers 30 meters (100') wide along highways and industrial sites reduce the impacts of noise pollution on humans and wildlife.
- Improve Property Value and Support the Economy
  - The market value of residential properties in neighbourhoods with mature trees can be as much as 25% higher than non-treed neighbourhoods. People simply prefer to live and spend time in treed neighbourhoods.
  - Trees also provide a business-generating atmosphere. Studies have shown that street trees and leafy landscaping can encourage the public to spend 11% more in businesses located within vegetated landscapes.
- Improve Physical and Psychological Health
  - Green spaces and natural areas promote psychological well-being.
  - People enjoy walking in treed areas to relieve stress.
  - Treed neighbourhoods have lower crime rates and an enhanced sense of community.

  - The journal *Science* published a study of recuperation rates after surgery, showing that hospital patients with a view of trees recovered more quickly than patients who could only look out on brick walls.
- Biodiversity
  - Discuss impact of forestry on biodiversity. Why?
  - Identify ways of preserving and improving it

HOW DO TREES HELP THE ENVIRONMENT?

- Improve Air Quality
  - Trees are like the lungs of the planet. If trees didn't breathe, neither could we
  - Most people are aware that trees replenish the air with oxygen, but did you know that their leaves remove pollutants and noxious gases? By absorbing compounds like nitrogen oxide, sulphur dioxide, carbon monoxide and ozone, trees help to alleviate smog. Poor air quality sends hundreds of local people to hospital for treatment each year – many of them children.
  - Mature trees can absorb roughly 48 pounds of CO2 a year. The tree in turn releases enough oxygen to sustain two human beings.
- Combat Climate Change
  - As we pump carbon dioxide into the atmosphere by burning fossil fuels, more of the sun's heat is trapped in our atmosphere, consequently heating up the earth. Trees can help to offset this problem by pulling some of that carbon out of the air and storing it in their wood, leaves and roots. Carbon can also be stored in the soil by allowing tree leaves to compost. Younger trees are most efficient in storing carbon.
- Prevent Floods and filter pollutants from water
  - Trees and other greenery reduce storm water run-off by intercepting and slowing rainfall which encourages the

water to percolate into the soil, rather than flow over the surface.
  - The urban forest as a whole plays a valuable role in reducing flood risk and preventing polluted storm water from running directly into our sewers and streams by absorbing the water through their roots and holding pollutants in their wood.
  - For every 5% of tree canopy added in a community, run-off is reduced by approximately 2%.
  - Roots help hold soil in place to prevent erosion which not only saves soil, but also keeps our waterways cleaner. You may have observed that water is usually cleaner when there is an abundance of trees
- Provide Wildlife Habitat
  - Trees and corridors of green space provide important habitat for urban wildlife. For 80% of Canadians, the urban forest is their primary link and exposure to wildlife. As natural areas are lost to agriculture or development, urban green spaces become a lifeline for wildlife such as birds, butterflies, squirrels, raccoons and more. A diverse urban forest provides a range of food sources and shelter.

TREE IDENTIFICATION

Explain to students that there is a scientific process scientists use to classify plants and animals. This process is called TAXONOMY. Taxonomy provides an organized system for grouping things together based on certain "similar" characteristics.

When scientists classify trees they start by dividing trees into two main groups.

- Ask if anyone knows what these two groups might be.
- Tell them if they don't know. (I will have a picture of each example.)

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

Introduce them to an ID key. Explain that it is a tool that Scientists use to identify different species of plants and animals. We are going to use this tool to ID trees.

Mark trees to be identified. ID the first tree with them. If time permits let them split into groups and ID another marked tree. Once a tree is identified tell them a little bit more about that tree.

GRADE 7

Focus: costs and benefits of selected strategies for protecting the environment. Ecosystem interactions (abiotic, biotic, producers, consumers and decomposers) and how humans alter the balances.

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
  - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
  - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
  - Dyes and medicines are made from the bark
  - Leaves and roots provide oils for medicines and makeup.
- All the products made from trees create many more jobs. Did you ever wonder who makes pencils or chewing gum?
- Food for people (apples, pears, peaches and cherries, nuts.
- Trees make our world a nicer place. Image your neighborhood, parks and campgrounds without trees.
- As a form of therapy, children that suffer from Attention Deficit Hyperactivity Disorder or (ADHD) can benefit from the presence of trees and other greenery. Kids with ADHD have been proven to

be calmer, more responsive, and better able to concentrate when in a space with lots of trees.

- Reduce Energy Needs
  - By placing trees in strategic locations around a building, homeowners can save 25 to 40% of their annual heating and cooling bills. Evergreens placed on the north and west sides of a building reduce heating costs by providing a windbreak in the winter. Deciduous trees on the south side let the sun shine through in winter, but shade the building in summer, lowering air-conditioning costs.
  - Cities are hot places in the summer. With so much pavement and concrete absorbing and re-radiating the sun's heat, cities are much hotter than the surrounding countryside. Urban trees help to cool the air around them in two ways: first, by directly shading streets and buildings and second, by actually lowering the temperature of the air around them. They act as massive natural air-conditioners, cooling the air 3 to 5ºC (5 to 9ºF) by transpiring vast amounts of water through their leaves.
- Reduce Noise Pollution
  - Clusters of trees can effectively buffer noise. Tree buffers 30 meters (100') wide along highways and industrial sites reduce the impacts of noise pollution on humans and wildlife.
- Improve Property Value and Support the Economy
  - The market value of residential properties in neighbourhoods with mature trees can be as much as 25% higher than non-treed neighbourhoods. People simply prefer to live and spend time in treed neighbourhoods.
  - Trees also provide a business-generating atmosphere. Studies have shown that street trees and leafy landscaping can encourage the public to spend 11% more in businesses located within vegetated landscapes.
- Improve Physical and Psychological Health
  - Green spaces and natural areas promote psychological well-being.

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

  - People enjoy walking in treed areas to relieve stress.
  - Treed neighbourhoods have lower crime rates and an enhanced sense of community.
  - The journal *Science* published a study of recuperation rates after surgery, showing that hospital patients with a view of trees recovered more quickly than patients who could only look out on brick walls.

HOW DO TREES HELP THE ENVIRONMENT?

- Improve Air Quality
  - Trees are like the lungs of the planet. If trees didn't breathe, neither could we
  - Most people are aware that trees replenish the air with oxygen, but did you know that their leaves remove pollutants and noxious gases? By absorbing compounds like nitrogen oxide, sulphur dioxide, carbon monoxide and ozone, trees help to alleviate smog. Poor air quality sends hundreds of local people to hospital for treatment each year – many of them children.
  - Mature trees can absorb roughly 48 pounds of CO2 a year. The tree in turn releases enough oxygen to sustain two human beings.
- Combat Climate Change
  - As we pump carbon dioxide into the atmosphere by burning fossil fuels, more of the sun's heat is trapped in our atmosphere, consequently heating up the earth. Trees can help to offset this problem by pulling some of that carbon out of the air and storing it in their wood, leaves and roots. Carbon can also be stored in the soil by allowing tree leaves to compost. Younger trees are most efficient in storing carbon.
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  - Trees and other greenery reduce storm water run-off by intercepting and slowing rainfall which encourages the

water to percolate into the soil, rather than flow over the surface.
  - The urban forest as a whole plays a valuable role in reducing flood risk and preventing polluted storm water from running directly into our sewers and streams by absorbing the water through their roots and holding pollutants in their wood.
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  - Trees and corridors of green space provide important habitat for urban wildlife. For 80% of Canadians, the urban forest is their primary link and exposure to wildlife. As natural areas are lost to agriculture or development, urban green spaces become a lifeline for wildlife such as birds, butterflies, squirrels, raccoons and more. A diverse urban forest provides a range of food sources and shelter.

How to Responsibly Manage Forests

- Discuss costs and benefits of environmental management
  - The cost of proper environmental assessment
  - The cost of replanting
  - The benefits of responsible management are seen above
  - Active encouraging a renewable resource
- How is ORCA involved?
  - They manage forest lands in the area
- What other strategies exist?

TREE IDENTIFICATION

Explain to students that there is a scientific process scientists use to classify plants and animals. This process is called TAXONOMY.

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

Taxonomy provides an organized system for grouping things together based on certain “similar” characteristics.

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- Ask if anyone knows what these two groups might be.
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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

GRADE 8

Focus: Water resources; their impact on specific regions, human activities, sustainability, scientific discovery. Personal, social, economical and environmental influence and the evolution of a system.

Introduce your self and lead a discussion based on the following questions

HOW DO TREES HELP HUMANS?

- All our houses are made with wood and a lot of our furniture as well.
- Practically every part of a tree is used to make some useful product.
    - Ground up wood is used to make paper for magazines, newspapers, candy wrappers, and cereal boxes.
    - Sap, the liquid that flows in trees, is used to make maple syrup, chewing gum, crayons, paint, and soap.
    - Dyes and medicines are made from the bark
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OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

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  - Most people are aware that trees replenish the air with oxygen, but did you know that their leaves remove pollutants and noxious gases? By absorbing compounds like nitrogen oxide, sulphur dioxide, carbon monoxide and ozone, trees help to alleviate smog. Poor air quality sends hundreds of local people to hospital for treatment each year – many of them children.
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How to Responsibly Manage Forests

- Discuss costs and benefits of environmental management
  - The cost of proper environmental assessment
  - The cost of replanting
  - The benefits of responsible management are seen in the last section
  - Active encouraging a renewable resource
- How is ORCA involved?
  - They manage forest lands in the area
- What other strategies exist? What other personal, social economical perspectives are involved with trees

TREE IDENTIFICATION

OTONABEE CONSERVATION

TREE EDUCATION PROGRAM SPEAKING NOTES

Explain to students that there is a scientific process scientists use to classify plants and animals. This process is called TAXONOMY. Taxonomy provides an organized system for grouping things together based on certain "similar" characteristics.

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TURTLES EDUCATION SPEAKING NOTES

What is the Purpose of this Activity?

The students will learn about the turtles of Ontario. They will learn about their life cycle and yearly cycle. The will learn the visual identification skills to spot them. They will learn about safe roads for turtles. The students will explore the threat levels of the turtles. To satisfy the tactile needs of the children, turtle shells will be passed around and explained.

Key Messages:

- The life of a turtle
- The dangers to turtles
- Explore the different species
- Explore their habitat

Materials:

25-30 minutes in total for the session
Turtle shells
Turtle pictures

How Does this Activity Work?

Introduce the threat levels
Talk about turtle habitat
Show the different turtle pictures
Hand out the shells
Go through a turtles life
Discuss safe roads for turtles

TURTLES EDUCATION SPEAKING NOTES

KINDERGARTEN

Focus: *Saying, Doing and Representing*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - lead them with what and who is found there
    - Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
- its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Tell them about hibernation, by asking what the turtles do in the winter.
    - Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?

TURTLE VARIETY:

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE

- Point out shell shape and the softness.

SPOTTED TURTLE

- Ask what a good name for this one would be.

WOOD TURTLE

- Talk about camouflage

BLANDING'S TURTLE

- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE

- Looks like a map, any guesses to its name?

MIDLAND PAINTED TURTLE

- Doesn’t it look like someone painted these red marks? That‘s where the name came from.

STINKPOT TURTLE

- Powerful musk as defense

COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

Pass the shells around. Warning them to be careful, as you need them for other kids too.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

Restless?/Extra time? Get children to demonstrate a turtle hiding, hibernating and sunning. Feel free to prance around like a predator.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

GRADE 1

Focus: Impact on people and needs of living things

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Talk to the children about the habitat needs for turtles and how they can be impacted by us.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles

like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?

TURTLE VARIETY:
Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE

- Point out shell shape and the softness.

SPOTTED TURTLE

- Ask what a good name for this one would be.

WOOD TURTLE

- Talk about camouflage

BLANDING'S TURTLE

- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE

- Looks like a map, any guesses to its name?

MIDLAND PAINTED TURTLE

- Doesn't it look like someone painted these red marks? That's where the name came from.

STINKPOT TURTLE

- Powerful musk as defense

COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

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Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Get children to demonstrate a turtle hiding, hibernating and sunning. Feel free to prance around like a predator.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

Grade 2

Focus: *People's impact, Impact on people, pollution, resource responsibility*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Talk to the children about the habitat needs for turtles and how they can be impacted by humans
- Walk them through the levels of concern

EXTINCT

A species that no longer exists anywhere

EXTIRPATED

A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED

A species facing imminent extinction or extirpation in Ontario and is a candidate for regulation under Ontario's ESA.

THREATENED

TURTLES EDUCATION SPEAKING NOTES

A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?

TURTLE VARIETY:
Mention names, hand out or show pictures.

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- Point out shell shape and the softness.

SPOTTED TURTLE

- Ask what a good name for this one would be.

TURTLES EDUCATION SPEAKING NOTES

WOOD TURTLE

- Talk about camouflage

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COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Get children to demonstrate a turtle hiding, hibernating and sunning. Feel free to prance around like a predator.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

Grade 3

Focus: *People's impact, Impact on people, Parts of Plants and contribution, Soil characteristics and composition*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Get the children to talk about the habitat needs for turtles and how they can be impacted by humans
- Walk them through the levels of concern

EXTINCT

A species that no longer exists anywhere

EXTIRPATED

A species that no longer exists in the wild in Ontario but still occurs elsewhere. (local extinction)

ENDANGERED

A species facing imminent extinction or extirpation in Ontario and is a candidate for regulation under Ontario's ESA.

THREATENED

TURTLES EDUCATION SPEAKING NOTES

A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?

TURTLE VARIETY:
Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE

- Point out shell shape and the softness.

SPOTTED TURTLE

- Ask what a good name for this one would be.

TURTLES EDUCATION SPEAKING NOTES

WOOD TURTLE

- Talk about camouflage

BLANDING'S TURTLE

- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE

- Looks like a map, any guesses to its name?

MIDLAND PAINTED TURTLE

- Doesn’t it look like someone painted these red marks? That‘s where the name came from.

STINKPOT TURTLE

- Powerful musk as defense

COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz the kids on the pictures of the turtles.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

Grade 4

Focus: *Perspectives of involved parties, human dependence on natural habitats, reasons for depletion/extinction, risks of specialized species*

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Talk to the children about the habitat needs for turtles and how they can be impacted by humans
- Walk them through the levels of concern

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THREATENED

TURTLES EDUCATION SPEAKING NOTES

A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?

TURTLE VARIETY:
Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE

- Point out shell shape and the softness.

SPOTTED TURTLE

- Ask what a good name for this one would be.

TURTLES EDUCATION SPEAKING NOTES

WOOD TURTLE

- Talk about camouflage

BLANDING'S TURTLE

- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE

- Looks like a map, any guesses to its name?

MIDLAND PAINTED TURTLE

- Doesn’t it look like someone painted these red marks? That‘s where the name came from.

STINKPOT TURTLE

- Powerful musk as defense

COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz the kids on the pictures of the turtles.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

GRADE 5

Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Talk to the children about the habitat needs for turtles and how they can be impacted by humans
- Walk them through the levels of concern

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TURTLES EDUCATION SPEAKING NOTES

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SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?
- How can we reduce our impact?
- Walk them through the levels of concern and snake variety
- Talk about turtles role in the ecosystem

TURTLE VARIETY:
Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE

TURTLES EDUCATION SPEAKING NOTES

- Point out shell shape and the softness.

SPOTTED TURTLE

- Ask what a good name for this one would be.

WOOD TURTLE

- Talk about camouflage

BLANDING'S TURTLE

- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE

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- Doesn’t it look like someone painted these red marks? That‘s where the name came from.

STINKPOT TURTLE

- Powerful musk as defense

COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz the kids on the pictures of the turtles.

TURTLES EDUCATION SPEAKING NOTES

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

GRADE 6

Focus: Human impacts on biodiversity, and identify ways of preserving biodiversity locally. Considering points of view. Classification of organisms

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Talk to the children about the habitat needs for turtles and how they can be impacted by humans
- Walk them through the levels of concern

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THREATENED

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

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SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?
- How can we reduce our impact? Who impacts them the largest? Can we live without impacting them? So what do we do to ensure their survival?

TURTLE VARIETY:
Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE

- Point out shell shape and the softness.

TURTLES EDUCATION SPEAKING NOTES

SPOTTED TURTLE

- Ask what a good name for this one would be.

WOOD TURTLE

- Talk about camouflage

BLANDING'S TURTLE

- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE

- Looks like a map, any guesses to its name?

MIDLAND PAINTED TURTLE

- Doesn't it look like someone painted these red marks? That's where the name came from.

STINKPOT TURTLE

- Powerful musk as defense

COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz the kids on the pictures of the turtles.

TURTLES EDUCATION SPEAKING NOTES

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

GRADE 7

Focus: costs and benefits of selected strategies for protecting the environment. Ecosystem interactions (abiotic, biotic, producers, consumers and decomposers) and how humans alter the balances.

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Talk to the children about the habitat needs for turtles and how they can be impacted by humans
- Walk them through the levels of concern

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TURTLES EDUCATION SPEAKING NOTES

THREATENED
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SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?
- How can we reduce our impact? What are the costs of this? How do we see the beenfits?
- What role do turtles play in the ecosystem?
- Walk them through the variety.

TURTLE VARIETY:
Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE

TURTLES EDUCATION SPEAKING NOTES

- Point out shell shape and the softness.

SPOTTED TURTLE

- Ask what a good name for this one would be.

WOOD TURTLE

- Talk about camouflage

BLANDING'S TURTLE

- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE

- Looks like a map, any guesses to its name?

MIDLAND PAINTED TURTLE

- Doesn’t it look like someone painted these red marks? That‘s where the name came from.

STINKPOT TURTLE

- Powerful musk as defense

COMMON SNAPPING TURTLE

- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz the kids on the pictures of the turtles.

TURTLES EDUCATION SPEAKING NOTES

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

GRADE 8

Focus: Water resources; their impact on specific regions, human activities, sustainability, scientific discovery. Personal, social, economical and environmental influence and the evolution of a system.

INTRODUCTION

- Introduce self/selves
- Ask Children what they know about wetlands?
    - Lead them with what and who is found there
- Describe importance to water quality
- Tell them you will learn about the turtles found in Ontario

INFORMATION

- Ask them how many different types exist in Canada
    - its under 10…its 8
- Of those 8, 7 are threatened. And the other the snapping turtle is of special concern.
- Ask kids what happens if we don't try to save the turtles.
    - you can lead them with 'what happened to the dinosaurs'?
- Talk to the children about the habitat needs for turtles and how they can be impacted by humans
- Walk them through the levels of concern

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TURTLES EDUCATION SPEAKING NOTES

THREATENED
A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SPECIAL CONCERN
A species with characteristics that make it sensitive to human activities or natural events.

TURTLE LIFE

- Tell them about hibernation, by asking what the turtles do in the winter.
    - -Do they play ice hockey with the frogs?
- They dig themselves into the mud for warmth and hibernate at the bottom of the water.
- What do you do when you wake up from sleeping? In the spring they come out to eat.
- Are turtles like us? Feel your cheeks? Are they warm? Turtles are cold blooded; they need to lay in the sun to help them get moving. Kind of like stretching before we run.
- In the spring after eating the Turtles want to have babies? Does anyone know how Turtles do this? They lay eggs. Where do Turtles like to lay their eggs? – Sandy soil. Like roads? Has anyone seen turtles beside the road? Is this a safe spot for them? Does anyone's parents or sibling stop for turtles? Maybe mention the Kawartha Turtle Trauma Center?
- How can we reduce our impact? What are the costs of this? How do we see the benefits?
- What system can we put in place to protect them? What would influence that system. Talk about ORCA's role.
- Walk them through the variety
- Talk about snakes role in the ecosystem

TURTLES EDUCATION SPEAKING NOTES

TURTLE VARIETY:
Mention names, hand out or show pictures.

SPINY SOFT-SHELL TURTLE
- Point out shell shape and the softness.

SPOTTED TURTLE
- Ask what a good name for this one would be.

WOOD TURTLE
- Talk about camouflage

BLANDING'S TURTLE
- Not a upside down cereal bowl like most turtles, different helmet shaped shell.

NORTHERN MAP TURTLE
- Looks like a map, any guesses to its name?

MIDLAND PAINTED TURTLE
- Doesn’t it look like someone painted these red marks? That‘s where the name came from.

STINKPOT TURTLE
- Powerful musk as defense

COMMON SNAPPING TURTLE
- Should recognize this one. Talk about its jaw to lead them

We have shells of real turtles. Hold them up. Ask them if Turtles can flee their shell if a predator comes? Ask them what they think spine is by pointing at it. Get them to touch their spine.

OTONABEE CONSERVATION

TURTLES EDUCATION SPEAKING NOTES

Pass the shells around. Warning them to be careful, as you need them for other kids too.

Restless?/Extra time? Quiz the kids on the pictures of the turtles.

Ask for questions. Review what you have learned. Thank them for participating.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

What is the Purpose of this Activity?

The purpose of this activity is to introduce the students to the work and the tools for water quality testing. It gives students a chance to conceptualize watersheds in a more realistic view. It allows students some hands on experience with equipment from the field.

Key Messages:

- Water chemistry is one way of monitoring water quality and making sure that it provides habitat for fish and other aquatic organisms
- Why and how ORCA measures the Chlorides, pH, conductivity, temperature, turbidity and dissolved oxygen

Materials:

25-30 minutes in total for the session
At least one staff member
Household liquids to test
Bucket
Conductivity meter
pH meter
Dissolved Oxygen meter
Thermometer
For younger grades bring;
    model watershed
    cars
    sticks

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

How Does this Activity Work?

Introduce the samples and the equipment to be used
Explain what the parameters being tested are.
Explain any risks if sampling in river or lake
Go through the tests
Let the children experiment with the equipment

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

KINDERGARTEN

Focus: Saying, Doing and Representing

INTRODUCTION

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers and the quality of water impacts all of them
- Water chemistry is one way of monitoring water quality and making sure that it provides habitat for fish and other aquatic organisms
- You can ask the students if they can identify any species of fish that live in the area
- Chlorides, temperature, turbidity and dissolved oxygen are common parameters that are measured. Explain them in simple terms for the children.
- Then you will demonstrate how to use the probe
- Explain that ORCA collects water samples from creeks and streams all around the area to see how clean the water is
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind children about safety near water – no running, pushing or jumping

Take the students through examples of different liquids. Show them how to test temperature, let them help you organize the turbidity examples in order of clarity. Talk about salts in the water, citing seawater and fresh water. Talk about how this might be difficult for life in polluted areas.

Demonstrate pollution using the model watershed by putting in different 'pollution'.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

GRADE 1

Focus: needs and characteristics of plants and animals, impact on people and the environment of objects/materials and assess uses of energy

INTRODUCTION

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers and the quality of water impacts all of them
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- You can ask the students if they can identify any species of fish that live in the area
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- Remind children about safety near water – no running, pushing or jumping

DISCUSSION

Take the students through examples of different liquids. Show them how to test temperature, let them help you organize the turbidity examples in order of clarity. Talk about salts in the water, citing seawater and fresh water. Talk about how this might be difficult for life in polluted areas.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

Demonstrate pollution using the model watershed by putting in different ‘pollution’. Talk about how this affects the needs of different plants and animals. How does this impact our lives.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

GRADE 2

Focus:
- *animals have an impact on society and the environment*
- *humans have an impact upon animals and where they live*
- *animals adapt to their environment*
- *humans have an impact on the quality of air and water quality of air and water has an impact on living things*

INTRODUCTION

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers and the quality of water impacts all of them
- Water chemistry is one way of monitoring water quality and making sure that it provides habitat for fish and other aquatic organisms
- You can ask the students if they can identify any species of fish that live in the area
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- Remind children about safety near water – no running, pushing or jumping

DISCUSSION

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

Take the students through examples of different liquids. Show them how to test temperature, let them help you organize the turbidity examples in order of clarity. Talk about salts in the water, citing seawater and fresh water. Talk about how this might be difficult for life in polluted areas.

Demonstrate pollution using the model watershed by putting in different ‘pollution’. How are we impacting the live of animals and their habitats. How have adaptations made the animals specific to their homes. What impact do humans have on the quality of water and how does this affect the lives of plants and animals.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

GRADE 3

Focus: the environment and human activity has an impact on habitats

INTRODUCTION

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers and the quality of water impacts all of them
- Water chemistry is one way of monitoring water quality and making sure that it provides habitat for fish and other aquatic organisms
- You can ask the students if they can identify any species of fish that live in the area
- Chlorides, pH, conductivity, temperature, turbidity and dissolved oxygen are common parameters that are measured.
- Then you will demonstrate how to use the probe
- Explain that ORCA collects water samples from creeks and streams all around the area to see how clean the water is
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind children about safety near water – no running, pushing or jumping

Why is Dissolved Oxygen Important?

Dissolved oxygen analysis measures the amount of gaseous oxygen (O2) dissolved in an aqueous solution. Oxygen gets into water by diffusion from the surrounding air, by aeration (rapid movement), and as a waste product of photosynthesis.

When performing the dissolved oxygen test, only grab samples should be used, and the analysis should be performed immediately.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

Environmental Impact of DO:

Total dissolved gas concentrations in water should not exceed 110 percent. Concentrations above this level can be harmful to aquatic life. Fish in waters containing excessive dissolved gases may suffer from "gas bubble disease"; however, this is a very rare occurrence. The bubbles or emboli block the flow of blood through blood vessels causing death. External bubbles (emphysema) can also occur and be seen on fins, on skin and on other tissue. Aquatic invertebrates are also affected by gas bubble disease but at levels higher than those lethal to fish.

Adequate dissolved oxygen is necessary for good water quality. Oxygen is a necessary element to all forms of life. Natural stream purification processes require adequate oxygen levels in order to provide for aerobic life forms. As dissolved oxygen levels in water drop below 5.0 mg/l, aquatic life is put under stress. The lower the concentration, the greater the stress. Oxygen levels that remain below 1-2 mg/l for a few hours can result in large fish kills.

Why are Chlorides Important?

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Environmental Impact of Chlorides:

Chlorides are not usually harmful to people; however, the sodium part of table salt has been linked to heart and kidney disease. Sodium chloride may impart a salty taste at 250 mg/l; however, calcium or magnesium chloride are not usually detected by taste until levels of 1000 mg/l are reached. Public drinking water standards require chloride levels not to exceed 250 mg/l.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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- rocks containing chlorides,
- agricultural runoff,
- wastewater from industries,
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The pH scale ranges from 0 to 14, where 7 is considered neutral. Less than 7 is considered acidic and greater than 7 is basic (alkaline).

Environmental Impact of pH:

A pH range of 6.0 to 9.0 appears to provide protection for the life of freshwater fish and bottom dwelling invertebrates.

The provincial water quality objectives reg have a pH range of 6.5 to 8.5.

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determine the toxic effects, if any, of these substances. For example, 4 mg/l of iron would not present a toxic effect at a pH of 4.8. However, as little as 0.9 mg/l of iron at a pH of 5.5 can cause fish to die.

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Environmental Impacts of Conductivity:

Elevated dissolved solids can cause "mineral tastes" in drinking water. Corrosion or encrustation of metallic surfaces by waters high in dissolved solids causes problems with industrial equipment and boilers as well as domestic plumbing, hot water heaters, toilet flushing mechanisms, faucets, and washing machines and dishwashers.

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

DISCUSSION

How are we affecting the lives of plants in polluted rivers? How are we affecting the leaves of plants? The roots? What are the different parameters important for?

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

GRADE 4

Focus: Perspectives, reasons for the depletion or extinction (why changes in the environment have a greater impact on specialized species), and human dependence on natural habitats and communities

INTRODUCTION

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers and the quality of water impacts all of them
- Water chemistry is one way of monitoring water quality and making sure that it provides habitat for fish and other aquatic organisms
- You can ask the students if they can identify any species of fish that live in the area
- Chlorides, pH, conductivity, temperature, turbidity and dissolved oxygen are common parameters that are measured.
- Then you will demonstrate how to use the probe
- Explain that ORCA collects water samples from creeks and streams all around the area to see how clean the water is
- If you find a creek or stream with water that isn't very clean, you also try to find ways of cleaning it up
- Remind children about safety near water – no running, pushing or jumping

Why is Dissolved Oxygen Important?

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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OTONABEE CONSERVATION

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

DISCUSSION

How are we responsible for water quality? How are we dependent on natural water systems? What are the different parameters important for?

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

GRADE 5

Focus: long-term impacts on society and the environment of human uses of energy and natural resources, and ways to reduce these impacts

INTRODUCTION

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers and the quality of water impacts all of them
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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

DISCUSSION

What impacts does society have on the environment? How are we responsible for water quality? What do we do to reduce our impact? What is ORCA's role in this? How are we dependent on natural water systems? What are the different parameters important for?

GRADE 6

Focus: Human impacts on biodiversity, and identify ways of preserving biodiversity

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

locally. Considering points of view. Classification of organisms

INTRODUCTION

- Introduce yourself
- Explain that there are many creatures that live in wetlands, streams, lakes and rivers and the quality of water impacts all of them
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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

DISCUSSION

What impacts does water quality have on the environment? How are we responsible for water quality? What do we do to preserve biodiversity? What is ORCA's role in this? How are we dependent on natural water systems? What are the different parameters important for? How does water quality impact biodiversity?

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

GRADE 7

Focus: costs and benefits of selected strategies for protecting the environment. Ecosystem interactions (abiotic, biotic, producers, consumers and decomposers) and how humans alter the balances.

INTRODUCTION

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OTONABEE CONSERVATION

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WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

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DISCUSSION

What impacts does water quality have on the environment? What strategies does Canada, Ontario, Peterborough have for responsible water quality management? What costs are associated with these strategies? What is ORCA's role in this? How are we dependent on natural water systems? What are the different parameters important for? How does water quality impact ecosystem interactions?

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

GRADE 8

Focus: Water resources; their impact on specific regions, human activities, sustainability, scientific discovery. Personal, social, economical and environmental influence and the evolution of a system.

INTRODUCTION

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Total dissolved gas concentrations in water should not exceed 110 percent. Concentrations above this level can be harmful to aquatic life. Fish in waters containing excessive dissolved gases may suffer from "gas bubble disease"; however, this is a very rare occurrence. The bubbles or emboli block the flow of blood through blood vessels causing death. External bubbles (emphysema) can also occur and be seen on fins, on skin and on other tissue. Aquatic invertebrates are also affected by gas bubble disease but at levels higher than those lethal to fish.

Adequate dissolved oxygen is necessary for good water quality. Oxygen is a necessary element to all forms of life. Natural stream purification processes require adequate oxygen levels in order to provide for aerobic life forms. As dissolved oxygen levels in water drop below 5.0 mg/l, aquatic life is put under stress. The lower the concentration, the greater the stress. Oxygen levels that remain below 1-2 mg/l for a few hours can result in large fish kills.

Why are Chlorides Important?

Chloride is a salt compound resulting from the combination of the gas chlorine and a metal. Some common chlorides include sodium chloride (NaCl) and magnesium chloride (MgCl2). Chlorine alone as Cl2 is highly toxic, and it is often used as a disinfectant. In combination with a metal such as sodium it becomes

essential for life. Small amounts of chlorides are required for normal cell functions in plant and animal life.

Environmental Impact of Chlorides:

Chlorides are not usually harmful to people; however, the sodium part of table salt has been linked to heart and kidney disease. Sodium chloride may impart a salty taste at 250 mg/l; however, calcium or magnesium chloride are not usually detected by taste until levels of 1000 mg/l are reached. Public drinking water standards require chloride levels not to exceed 250 mg/l.

Chlorides may get into surface water from several sources including:

- rocks containing chlorides,
- agricultural runoff,
- wastewater from industries,
- oil well wastes, and
- effluent wastewater from wastewater treatment plants.

Chlorides can corrode metals and affect the taste of food products. Therefore, water that is used in industry or processed for any use has a recommended maximum chloride level. Chlorides can contaminate freshwater streams and lakes. Fish and aquatic communities cannot survive in high levels of chlorides.

Why pH is Important:

pH is a measure of the acidic or basic (alkaline) nature of a solution. The concentration of the hydrogen ion [H+] activity in a solution determines the pH. Mathematically this is expressed as:

$pH = - \log [H+]$

The pH value is the negative power to which 10 must be raised to equal the hydrogen ion concentration.

OTONABEE CONSERVATION

WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

The pH scale ranges from 0 to 14, where 7 is considered neutral. Less than 7 is considered acidic and greater than 7 is basic (alkaline).

Environmental Impact of pH:

A pH range of 6.0 to 9.0 appears to provide protection for the life of freshwater fish and bottom dwelling invertebrates.

The provincial water quality objectives reg have a pH range of 6.5 to 8.5.

Runoff from agricultural, domestic, and industrial areas may contain iron, aluminum, ammonia, mercury or other elements. The pH of the water will determine the toxic effects, if any, of these substances. For example, 4 mg/l of iron would not present a toxic effect at a pH of 4.8. However, as little as 0.9 mg/l of iron at a pH of 5.5 can cause fish to die.

Why is Conductivity Important?

The conductivity (or specific conductance) of an electrolyte solution is a measure of its ability to conduct electricity. The SI unit of conductivity is Siemens per metre (S/m).

Conductivity measurements are used routinely in many industrial and environmental applications as a fast, inexpensive and reliable way of measuring the ionic content in a solution.[1] For example, the measurement of product conductivity is a typical way to monitor and continuously trend the performance of the water purification systems.

In many cases, conductivity is linked directly to the total dissolved solids (T.D.S.). High quality deionized water has a conductivity of about 5.5 µS/m, typical drinking water in the range of 5-50 mS/m, while sea water about 5 S/m[2] (i.e., sea water's conductivity is one million times higher than deionized water).

Environmental Impacts of Conductivity:

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WATER QUALITY EDUCATION PROGRAM SPEAKING NOTES

Elevated dissolved solids can cause "mineral tastes" in drinking water. Corrosion or encrustation of metallic surfaces by waters high in dissolved solids causes problems with industrial equipment and boilers as well as domestic plumbing, hot water heaters, toilet flushing mechanisms, faucets, and washing machines and dishwashers.

Indirect effects of excess dissolved solids are primarily the elimination of desirable food plants and habitat-forming plant species. Agricultural uses of water for livestock watering are limited by excessive dissolved solids and high dissolved solids can be a problem in water used for irrigation.

Canadian Drinking Water Quality Guidelines have set an aesthetic guideline of 500 mg/L of TDS.

DISCUSSION

What impacts does water quality have on the environment? What system does Canada, Ontario, Peterborough have for responsible water quality management? What costs are associated with these strategies? How did this system come to be? What is ORCA's role in this? How are we dependent on natural water systems? What are the different parameters important for? How does water quality impact sustainability?

OTONABEE CONSERVATION

WATERSHED IN ACTION EDUCATION SPEAKING NOTES

What is the Purpose of this Activity?

This activity is a good way to get kids interacting with one another, while learning about rivers and the pollutants their subjected to.

Key Messages:

- Learn about the tributaries of water.
- Discover different types of pollutants and polluters
- Understand the importance of environmentally responsible behaviour

Materials:

Group of Large (20 or more) K to high school
map of our watershed
drawing of a simple maze representing municipal sewer system
bucket
small buckets for each starting point along the watershed
items to represent pollution (e.g. plastics, beans, paper clips, etc.)

How Does this Activity Work?

Introduce the idea of stream tributaries
Hand out pollutants
Get kids to form a rivershed
Discuss the pollutants that reach the bucket

INTRODUCTION:
Discuss how rainwater can clean plants and sidewalks on its way to storm sewers. Where does the water go from washing cars? The soapy water is washed down the street into the storm drains. Where does that water go?

OTONABEE CONSERVATION

WATERSHED IN ACTION EDUCATION SPEAKING NOTES

Show an example of a simple maze that represents the maze of sewer pipes under the ground that take water away from the city. It should have two exits: one exit is a water treatment plant; the other exit is a river.

Talk about the sources of water that can run into the sewer (street water, lawns, parking lots, etc.) What might this water carry away into the sewers with it? (Oil, fertilizers, road salt, etc.)

Take it out further: Show a map of our watershed. Discuss how many entry points there are into our water systems from communities, homes, and industry along the way.

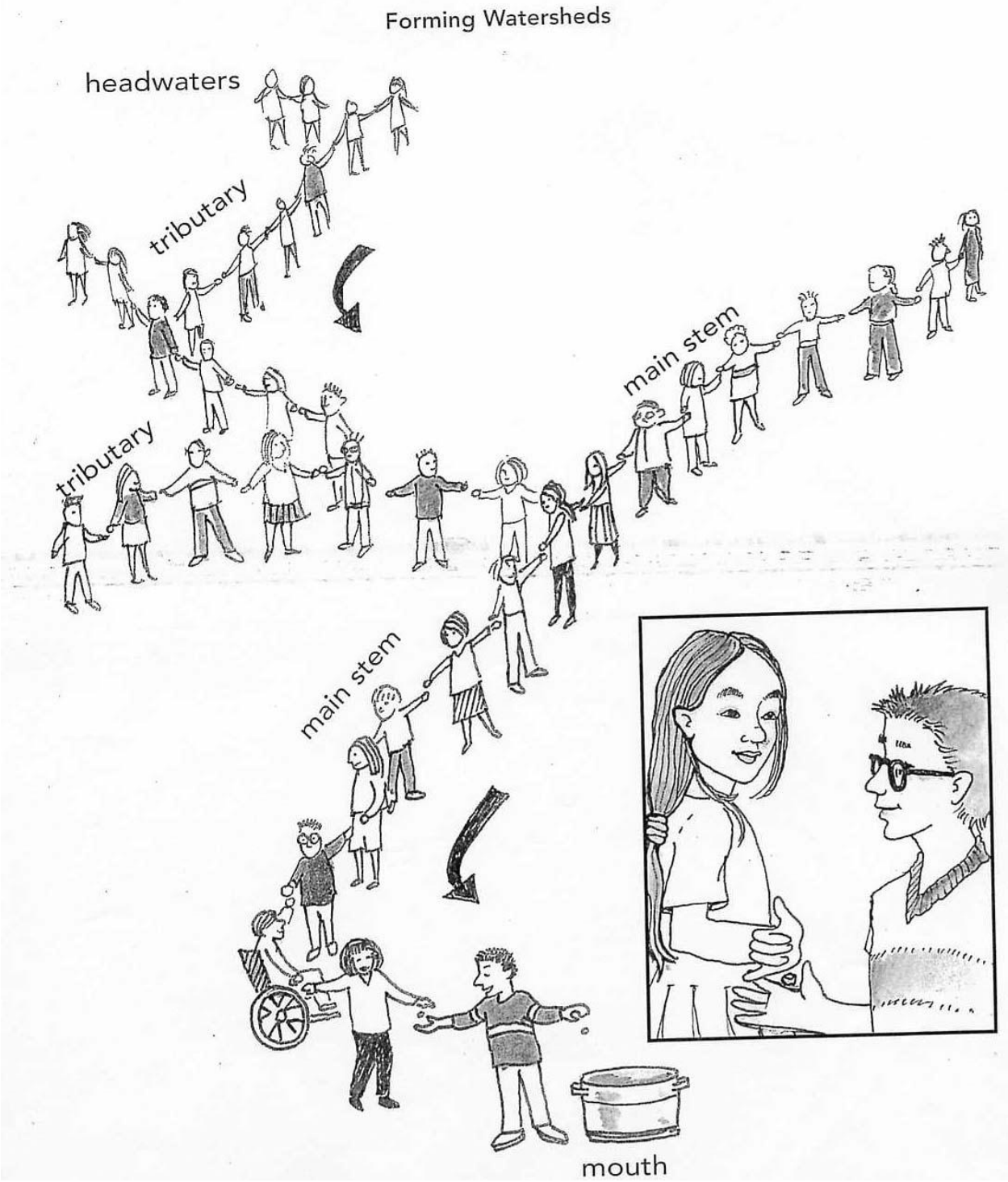
PROCEDURE:

Arrange group into a sample watershed (see diagram). Put a bucket at the mouth. Starting at the beginning of each tributary and the main stem, pass out pollutants (or have a small container set up) and have students pass them downstream, until they drop them into the mouth bucket.

Discuss places where there were build-ups of pollutants. Where do all of the pollutants eventually end up? Remind students of the water cycle and the fact that all of our water is interconnected. What happens in one area of a watershed doesn't stay there! Discuss ways to reduce our impact on our watershed at home and at school.

OTONABEE CONSERVATION

WATERSHED IN ACTION EDUCATION SPEAKING NOTES



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WATERSHED IN ACTION EDUCATION SPEAKING NOTES

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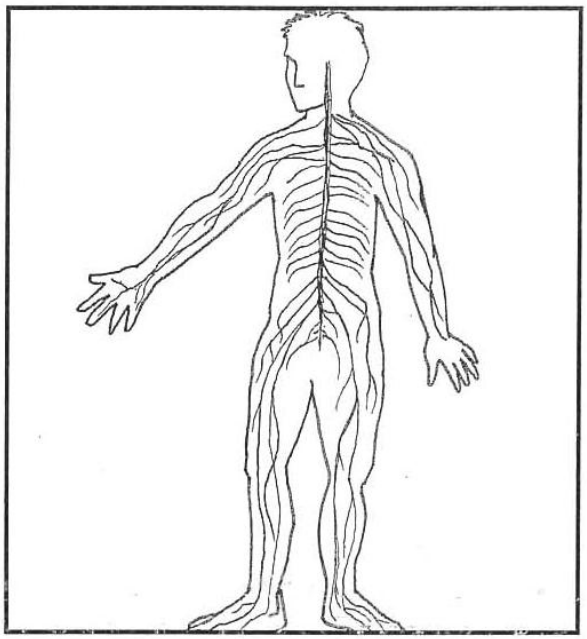
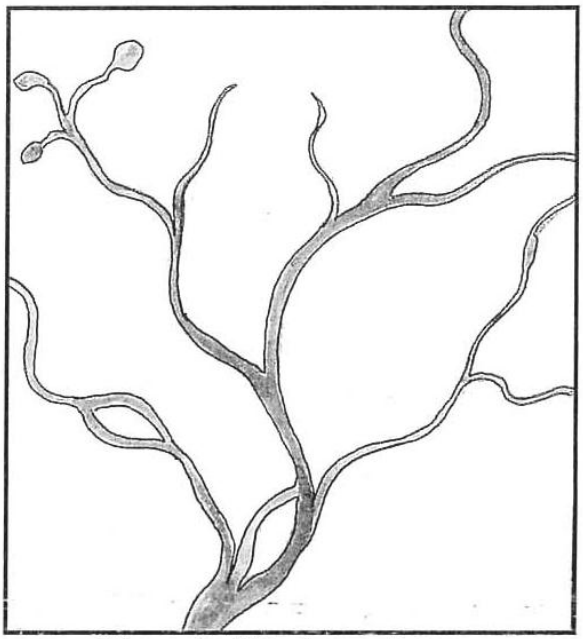
WATERSHED IN ACTION EDUCATION SPEAKING NOTES

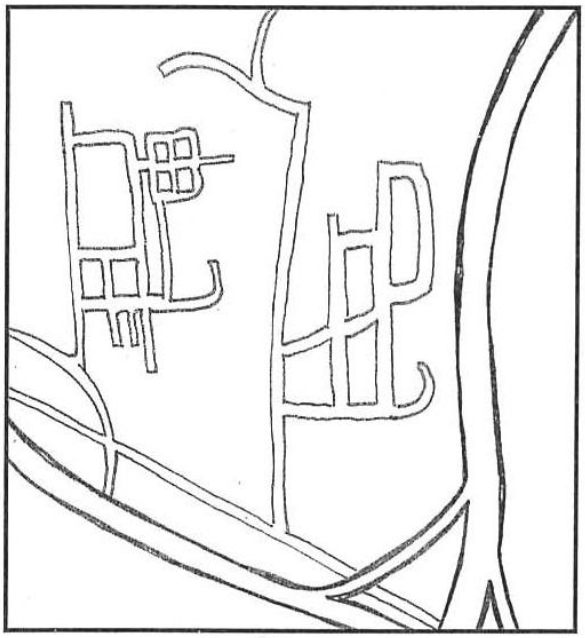
Branching Patterns



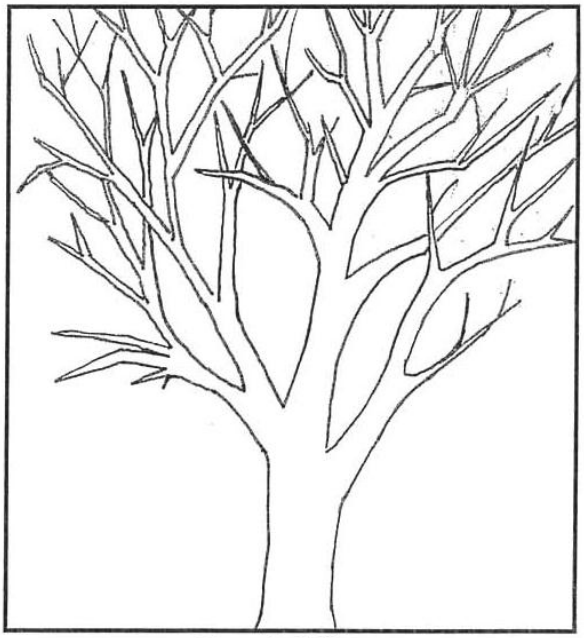
Human Nervous System



Watershed Drainage Pattern



Road System



Tree in Winter

OTONABEE CONSERVATION

WHO POLLUTED THE RIVER? POLLUTION EDUCATION SPEAKING NOTES

What is the Purpose of this Activity?

List the principle pollutions in our waterways and identify sources of pollution. Draw connections between individual actions and results at the community level. Discuss the positive actions that can be taken to help conserve resources and prevent pollution. Realize that protecting the environment is not a one-time event, but requires ongoing changes in some daily habits.

Key Messages:

- Explore the typical communities impact on pollution
- Learn about involvement in environmental causes
- Protecting the environment is ongoing

Materials:

At least one staff/volunteer
20-30 min.
Students from grade 3 or higher
1 clear container of water for every 10 - 15 students
1 labelled black plastic film canister per student
Canister ingredients (all are safe for students to handle)

CANISTER LABEL	CANISTER INGREDIENT
Trees	Oregano or Parsley Flakes
Construction Site	Soil (dry, clayish) or cocoa or cinnamon
Person Fishing	Fishing line or dental floss
Farmers	Baking Soda

Gardeners	Baking Soda
Beach Party	Assorted Litter
Family Picnic	Assorted Litter
Barnyard Cat	Litter
Washing the Car	Soapy Water
Antifreeze	Water with Blue-Green Kool-aid
Mystery Liquid	Water and Soy Sauce
Homeowner	Water, Orange Kool-Aid and Toilet Paper/Tissues
Electricity Plant	Vinegar
Commuters	Vinegar and Vegetable Oil
Motorboat	Vinegar and Vegetable Oil

Dry Ingredients: Fill canister halfway full with dry ingredients listed above
Liquid Ingredients: Fill canister 2/3 full with liquid ingredients listed above

How Does this Activity Work?

Prepare and label the canisters as described in the materials section, enough for each student to have one canister. For each 15 students, fill one clear container with water nearly to the top.
Distribute one canister to each student. Instruct them to keep the canister closed and upright. The students should also be told not to reveal the identities of their canisters at this point.
Explain that you will tell a story about the water body and that each one of them will play a part in the story. When they hear the name of the character listed on their canister in the story, they should open their canister, and empty its contents into the container (representing the water body).
Read the story on the next pages. Pause after each question to give students time to think and respond. After the story has been read, use the following questions for a follow up discussion.

OTONABEE CONSERVATION

WHO POLLUTED THE RIVER? POLLUTION EDUCATION SPEAKING NOTES

WHO POLLUTED THE RIVER - STORY

For many thousands of years, people have lived on the banks of the River. They hunted in the forests, harvested foods from wetlands, and caught fish for the river.

o Imagine that you are living 500 years ago, and you took the container of water in front of you from the river. How does it look to you?

o Would you drink this water? Would you eat the fish from this water? Would you swim in this water?

One of the first explorers to visit to the river (the name of local water source) kept a journal of his discoveries. He wrote about the Native American villages, the rivers and streams and the "sweet water", and seeing so many fish that he and his crew tried to scoop them out with a frying pan.

Soon people began to arrive. They found fertile land for farming, forests full of wildlife, and a river that provided plenty of food. It was an outstanding environment for settlement, and the people prospered.

The river has changed a lot since it was first explored. This is a story of those changes. Listen for the name of the character printed on your canister. When you hear your character named, open the canister, and dump its contents into the river.

Years went by, and occasional storms drenched the area. High winds whipped through the TREES and blew leaves into the water.

Gradually, towns started to grow along the banks of the river. Developers cleared wetlands and forests to build houses and businesses. Rains washed loosened soil from CONSTRUCTION SITES into the river.

OTONABEE CONSERVATION

WHO POLLUTED THE RIVER? POLLUTION EDUCATION SPEAKING NOTES

At first, towns were small. Upstream, FARMERS planted crops to feed the towns' growing population. Some of those crops grew right up to the river, and fertilizer washed off the land and into the water. Other farmers kept pigs, cows, and other animals in their BARNYARDS. As rainwater drained out of the barnyard, it carried some of the manure into a little creek behind the farm. The creek flows to the river.

As the towns grew, more and more people began to move to the nearby countryside. These country homes are not connected to the city sewer system. Wastewater (elaborate on wastewater) from these homes flows into the septic tanks under the ground. One HOMEOWNER has not maintained the septic tank, and poorly treated sewage seeped into the river.

To meet the electricity needs of the towns; area officials decided that they would need to generate more power. To burn coal and produce power, an ELECTRIC 101POWER PLANT was build along the river. Gases coming out of the smokestacks combine with moisture in the air to form acids. The pollution falls back to the earth as acid rain or smog.

Traffic congestion can also be a problem for COMMUTERS and truck drivers who drive to and from work. Exhaust fumes, just like power plant emissions, can cause acid rain. If a vehicle is not kept in good repair, it might also leak oil or other fluids, which will wash off the pavement and into the river with the next rain.

And how do the residents of the town and surrounding areas spend their time? In one neighbourhood, a lot of GARDENERS are out working in their yards. Some of them are using weed killer and insect spray to keep the lawns pretty. The next rain will wash some of these into a little creek nearby and into the river.

OTONABEE CONSERVATION

WHO POLLUTED THE RIVER? POLLUTION EDUCATION SPEAKING NOTES

One father is teaching his daughter how to change the ANTIFREEZE in the family truck. They pour out the used antifreeze into the driveway. Antifreeze is sweet tasting and can poison animals in they drink it. It can also get into the nearby creek and poison fish.
Nearby, a boy is WASHING THE CAR. The soapy water rushes down into the driveway into the storm drain; the storm drain empties into the river. The grease and grime on a car contains asphalt from the roads, asbestos from the brakes, rubber particles from the tires, toxic metals, and rust. If the boy had gone to the local car wash, the water would have been treated before it returned to the river.

Next door, a family is cleaning out their garage. They find an old rusty can with a tattered skull and crossbones label still stuck on it. What could it be? It looks dangerous, and they want to get rid of it before someone gets hurt. But how? Junior gets an idea: "Let's pour it down the drain by the curb!" So the MYSTERY LIQUID goes down the storm drain. The poison is out of site, but it is headed to the river.

On nice days, many people head down to the river. Some zoom all around in MOTORBOATS and don't notice that a little oil leaks into the water. A group of friends have spread blankets on the shore for a BEACH PARTY. Lots of families are PICNICING in the parks too. Some of these people have left trash on the shore. With the next storm, that trash will wash into the river. One the shore, a PERSON FISHING snags a hook on a log and breaks off the nylon fishing line.

DISCUSSION QUESTIONS:

1. Would you drink this water now?
2. Would you swim or boat in it?
3. Is it healthy for fish or other wildlife?

OTONABEE CONSERVATION

WHO POLLUTED THE RIVER? POLLUTION EDUCATION SPEAKING NOTES

4. Who polluted the river or whatever water body you are describing? (Everyone played a role)
5. What effect did the increasing population have on the water quality? (More people meant less wetlands and trees – which filter water, there were more vehicles, there was less open space, etc.)
6. Can you think of any ways that population increases have helped the bay? (Higher population densities led to more efficient use of resources, stronger environmental laws, public resources like sewage treatment plants, etc.)
7. Think about the pollution in your canister. Could something be done to prevent that type of pollutant from entering the water? How? (Go around the group and let each student address the pollutant in their canister.)
8. Challenge students to come up with ways to clean up the water in the container. After all, everything has to go somewhere. (Solids can be strained out. They may also find filters or absorbent cotton helpful.)
9. Once this type of pollution has entered the bay, bow can we get it out? How can we clean up the watershed? Do they think it is easier to prevent pollution or to clean it up later? Have them explain their ideas.
10. What could each of us do to help improve the health of our watershed by preventing some of this pollution?

Source:
Tracy

A Review Of Environmental Education And Its Importance

Peter Faught
For: David Beresford
BIO 3901 H

Humans, like all other organisms, rely on the natural world for the necessary resources of life. Most significant human development has been about how to exploit resources of the environment from early stone tools, to agriculture, to modern industry. Humans have become very effective in exploiting resources from the earth. This exploitation is one of the major reasons for the dominance of humans over all other species. The ability to exploit resources has been actively shared among people and further developed through education and learning. Unfortunately, our resource exploitation has become unsustainable by changing the environment we live in and reducing its productivity for the future. In realizing that our practices have become unsustainable there is an international push toward sustainable development. We need education to now help us become more sustainable. Education and learning are the key ingredients in this move to become more sustainable (LLEE, 2006). Environmental education is used as a general term to refer to this broad range of initiatives, philosophies and approaches towards sustainable living (CEGN, 2006). This paper will explore its importance, how students learn, how the education works, the necessary improvements, the way it is instituted in Canada and how it is being done in the developing world specifically Cambodia.

Why It Is Important

One major reasons to teach early is that these early childhood years are the period of the greatest and most significant developments in a person's life and are generally regarded as the foundation upon which the rest of their life is constructed (Davis 2009). The opportunity to teach children about the environment should not be passed up.

Education for the environment is a specific type of socially critical environmental education, which includes an overt agenda of values education and social change. It challenges the dominant ideology, and puts forward an alternative world-view (Cotton, 2006). Critics of education for the environment have argued strongly that the role of education should be to encourage independent thought, not to promote a

specific world-view. The teacher should impart knowledge rather than attempt to act as an agent of change (Cotton, 2006). The problem with environmental issues is that they are controversial at least in part because of the differing attitudes and values held by interest groups (Cotton, 2006). This may be a good place to teach the controversy, trying to define the interests of those parties involved, as well as teaching the science involved with the environmental issue. Social change may well be at the heart of environmental education, but environmentally responsible citizens would be a positive change in society.

If environmental education does produce social change then that change is seen in its many benefits. It has been suggested that advancing environmental education within the mainstream system is key to long-term success (CEGN, 2006). It will in turn create environmentally literate citizens. Moving society towards sustainability cannot rest with experts it needs support and active participation of an informed public who are active in voting, consuming, business and as community leaders. (CEGN, 2006). Early childhood education is an important strategy to get children as they are in a key developmental stage of life. As well, children are an important influence on their parents (CEGN, 2006). Education for sustainable development and sustainability education emphasize the integration of environmental, economic and social dimensions (CEGN, 2006). Positive attitudes towards science in the early years of education, increases the chance of exploration of science careers in the future (Waliczek et al. 2003). As science careers are not only a growing opportunity for students, but as well these types careers develop the knowledge essential for sustainability on the planet. Studies have shown that elementary students generally express positive attitudes towards math and science. But in junior high and high school aged students tend to consider them boring (Waliczek et al. 2003). It is important to keep students interested in science by making it more accessible. Environmental education also allows opportunities for unstructured play that overscheduled youth are lacking (Duerden et al, 2010). Thereby improving education experiences in a general way. Our modern way of life with continued urbanization decreases the chance for youth to explore nature firsthand (CEGN,

2006). The school's outdoor programs are becoming the only option as making science more accessible to students involves getting them out there and working with nature. Place-based education emphasizes the importance of connection to one's local community including its history, culture, economy and natural and built environments (CEGN, 2006). Exploring the community is a great way to tie in the importance of environmental issues to the local situation. Outdoor programs have been historically used in conjunction with general school curriculum to promote learning about plant knowledge, agricultural methods, and nature. They are hands on, real world experiential learning. Many educators believe they promote higher grades and greater overall academic achievement (Waliczek et al. 2003). The outdoors is a positive, fun environment for children to learn about the world. It has been shown to teach responsibility, improve their attitudes towards school and reduce dropout rates. As academic achievement is directly correlated to children's attitudes it is important to foster positive attitudes (Waliczek et al. 2003). If students are exploring in a natural setting, the natural elements of plants, animals, soil, water and rocks provide opportunities to explore diverse materials (Waliczek et al. 2003). This hands-on approach also keeps students interested and involved.

Although the program that Waliczek and coauthors (2003) were studying had done well in the attitude testing, as the program found positive terms of enjoyment in 58.3 % of the reviews. Not all the reviews were good. Negative feedback included 10% of respondents reporting that students became distracted and lacked attentiveness. Despite this bad review, research has shown that early experiences exploring nature are linked with development of the imagination and a sense of wonder (Waliczek et al. 2003). Developing these areas is an important motivator for a life long interest in learning (Waliczek et al. 2003). Environmental education creates opportunities that do so much more beyond educating about nature.

How Students Learn

Everyone has heard of the people learning better through different forms. Each type of learning offers something to the different types of learners. Hands on experiences

are beneficial to students; as they have shown to increase motivation as well as having stronger impacts on the student (Ballantyne et al, 2009). Learning in the natural environment has also shown to be extremely important in developing knowledge, attitudes and responsible actions towards it (Ballantyne et al, 2009) all of which is beneficial for future decisions to be made in any field that might affect the environment. The productive pedagogy is a common framework for teachers to choose and develop strategies for teaching. There are four categories in the pedagogy: *Intellectual Quality Category* involves; the depth, detail or level of specificity, it requires thinking critically, classroom dialogue, and generally a deep understanding of the concept or idea. *Supportive Classroom Environment Category* requires; direction for students, it requires engaging students, a clear understanding of the evaluation, and allows the student to practice self-regulation. The *Recognition of Difference Category*; sharing with students cultural knowledge, inclusivity of all students, teaching done in a narrative style, building a group identity, creating an attitude of active citizenship. The last category, the *Connectedness Category* involves; linking students background knowledge to material, making connections to the world, integrating knowledge from different subjects, and problem solving of both real world and intellectual problems. After interviewing students and teachers and observing environmental programs; the most engaging, effective, and enduring learning experiences in the context of learning in natural environments, occur through experience-based rather than teacher-directed strategies (Ballantyne et al, 2009). Because of this finding, Ballantyne and his co-authors (2009) propose a new category in addition to this productive pedagogy. An *Experience Based Learning Category* under which includes; learning by doing, experiencing the characteristics of the natural environment, activities of real life learning, exploration with all the senses, and investigating within a local context. This type of context; is more engaging for students, has been attributed to better and more enduring for remembering of material and important in facilitating attitudinal and behavioral changes (Ballantyne et al, 2009). Recognition of new methods showing very promising results deserves implementation.

As the field is divided on the effectiveness of experienced based learning, Deurden and his coauthors (2010) looked into comparing direct and indirect contact with nature in environmental programs. Meta-analysis of the comparison research indicates that classroom experiences based programs were most effective in positively impacting ecological attitudes and behaviour. Deurden argues the applicability of these findings as the differences between comparison groups includes; a wide range of: education level (from elementary to the college level), curricula, philosophies, learning experiences and settings. Also most studies measure attitudes or knowledge but not behaviour. Using the method involved in Theory of Planned Behaviour (TPB) which suggests an individual's intention to engage in behaviour is the best prediction of actual behaviour. By combining behaviour, attitudes, and knowledge in study reveals more realistic and meaningful data. As direct approaches build attitudes that are more likely to lead to behavior than attitudes developed as a result of indirect experiences. As findings suggest that direct experiences lead to affective or emotional, value based attitudes while indirect experiences lead to cognitive based attitudes. The non-formal education community may bring greater flexibility and ease of innovation to the challenges of the formal system. But combination may constitute the most effective intervention. (CEGN, 2006). This affective based experience appears to act as a catalyst, converting preexisting knowledge into action (Duerden et al, 2010). While knowledge was gained during classroom setting, in direct environmental education produced the growth in attitude and behavior. This understanding delivers an effective approach to understanding the processes whereby individuals contemplate and then actually implement certain behaviours. As indirect experiences lead to more cognitively based attitudes while direct experiences produce more affectively based attitudes. The debate over which is better is misplaced, as they both are.

The purpose of environmental education is to update students understanding of the environment. The mental model is a person's knowledge of a phenomenon (Tunnicliffe et al, 2000). Schools are interested in teaching Consensus models, the accepted scientific viewpoints about phenomena. Consensus models are developed

with a greater role of schools, but the environment is not simply a background against individual organisms. Testing children's taxanonmoy skills the students ordered places of learning as home, direct observation, school, TV/video/CD-Rom/books. Home referenced family members and gardens. School was most often related to science lessons. (Tunnicliffe et al, 2000). With plants, apposed to animals the youngest pupils grouped them into larger groups, as they had less interaction with them, they don't star in shows or books (Tunnicliffe et al, 2000). Older kids use behavioral and habitat attributes. (Tunnicliffe et all, 1999). Most students categorize into habitat or anatomy. Need to classify that which one sees in front of one seems to be a fundamental human need. Evolved from its adaptive significance, for example; edible and poisonous (Tunnicliffe et al, 2000). Teachers can go beyond classifying if they encourage more less obvious anatomical features, by starting with the environment and species significant features and then explore how organisms are adapted anatomically to their particular habitats (Tunnicliffe et al, 2000). Species interactions in relation to their environment needs to be a focus of environmental education. One way to do this is with an activity that is designed to engage children's interest. This has been shown through improvement in post-test scores compared with pre-test scores. Indicating that interventions based on factual information can be successful (Myant et al 2008). But children come with pre-existing mental models that are resistant to change. It is important to discuss this prior knowledge so as to integrate it with new knowledge (Tunnicliffe et all, 1999). Basic facts are not enough the mechanisms need to be understood, as traditional lecturing methods that provide relevant factual knowledge are not enough, indicating that the type of factual knowledge and the mode of presentation are important (Myant et al 2008). A more involved approach is need and textbook authors realize and address these issues of misconception, some identified misconceptions had by students are given first, then students are informed of the scientific explanations supported by examples to create dissatisfaction with other ideas (Myant et al 2008). A proper science education involving interacting with systems provides a conceptual change that would suggest that children's misconceptions were replaced with more scientific knowledge. With children's ideas

being replaced, they were able to causally link the key facts to a coherent theory. The students are undergoing the process of representational re-description (Myant et al 2008). Essentially undergoing the process of learning. It is essential to properly and affectively update students understanding of the environment.

Bloom's taxonomy states that children progress through the stages of knowledge, comprehension, application, analysis, synthesis and evaluation (Waliczek et al. 2003). So during analysis related words and ideas were organized together. Students progresses through these ideas from the first to the fourth stages, with the last two are harder and equally difficult. Productive learning requires cognition at all levels of Bloom's taxonomy (Waliczek et al. 2003). Math and science in the outdoor classroom appeared to be effectively teaching the subject matter. As words and terms describing each state of Bloom's were present. 50% of responses included terms related to knowledge such as; look, listen and explore. 87% of students responded with application words such as graphing, plotting, measuring. 19% indicated proof of analysis with terms such as experiment and investigate. At the highest levels of learning (evaluation and synthesis) related terms showed up 26% of the time, including testing, and problem solving words. This was most exciting as generally students are not challenged enough in these areas during academic settings. With the two highest levels of learning comes stronger remembrance of the subject matter (Waliczek et al. 2003). A strive to build the capacity of the education system would include an outdoor classroom.

How it's done in Canada

Education can be done in three main contexts; formal (generally in school), Non formal (organized outside activities) and informal (learning from the media, personal reading, experience and interactions). (CEGN, 2006). Under the Constitution in Canada, formal education falls within provincial and territorial jurisdiction, including the setting of the educational curriculum. Which directs resources allocation, teacher training, and the development of textbooks and other

materials. (CEGN, 2006). Different provinces and territories have different aspirations. Manitoba is one that has taken a more active role in environmental education. For example, the Manitoba Department of Education, Citizenship and Youth (MDECY) has established a Sustainable Development Initiative who developed a provincial Education for Sustainability Action Plan and created an education for sustainable development working group. (CEGN, 2006). As Canada responded to the UN Decade of Education for Sustainable Development (2005 - 2014), Environment Canada is working with other stewards to move forward education for sustainable development in Canada. This includes support for a series of emerging provincial/territorial working groups (co-led with the MDECY, and Learning for a Sustainable Future) that will bring together regional players (governments, formal/non-formal/ informal education sectors, and business and community leaders) to set priorities and support advancement of education for sustainable development. (CEGN, 2006).

They are not the only department involved in environmental education as Natural Resources Canada provide resources for teachers, Parks Canada runs education and interpretation in parks and marine conservation areas, and Fisheries and Oceans Canada address local environmental education in coastal communities. (CEGN, 2006). All of these programs provide the tools nationwide, but inside the provinces the real control is found within the municipalities school boards. They are responsible for implementing the provincial curriculum; this includes making necessary budget allocation decisions. This allows for a lot of variety, as some boards can afford to have environmental educational resource positions, other municipalities screen programs offered by outside agencies and may distribute the material within their district and others prepare environmental reports or Sustainable Development Action Plans (i.e. Toronto and Montreal respectively) (CEGN, 2006). However, not all boards have the money of the big cities. Once in side the school, the principals and teachers play a influential role by implementing the curriculum and delivering the environmental program with their own unique bias. While volunteer associations or networks of teachers exist to support

environmental education, they have limited capacity. There are green school initiatives which include design, energy conservation, recycling, green purchasing etc. “whole school” projects and schoolyard greening initiatives all use the school itself as a teaching environment. (CEGN, 2006).At the post secondary level, institutions are involved in environmental education, with research chairs and Masters degrees in Environmental Education (CEGN, 2006). There is much being done to educate Canadians about the environment.

Despite all the effort being put forth in improving environmental education there are many problems. There is no method of sharing existing programs and materials and many are started from scratch. While there are some volunteer network existing to spread the programs they are limited and the programs exhaust resource in their construction. The programs that do get shared may experience barriers of language and culture context between Quebec, Native and National. With design of these programs being so rudimentary it is difficult to include contexts for Immersion, ESL and FSL. Most of these problems are due to the nature of support, as most is for initiating a program, with very little support given to recurrent activities, improve, distribute and reuse of existing programs. (CEGN, 2006). The networks need to build their capacity and influence. Despite all these roadblocks the programs still run, but others are not happy about it. Controversial issues and activism on environmental issues, can be seen as inappropriate in publicly funded schools. Terminology and philosophical issues persist in the field. (CEGN, 2006). In some municipalities resources would not be awarded to good environmental education due to *public* concern. Other worries include; liability, competing priorities, and budget cuts. On top of those problems, much in the environmental education field uses integrated approaches that are learner centered, opposed to traditional models of teacher and individual subjects of study. (CEGN, 2006). Teachers do not learn about this style in teacher preparation courses. They require ongoing support on environmental education. To overcome the many obstacles discussed, the schools need to build their capacity, they need to be encouraged to create links to the community with; Community investigations, residential camps, field trips, out of

class activities and youth programs. As initiatives that engage both school and the surrounding community can impact wider audiences and may have greater longevity and probability of success (CEGN, 2006). Environmental education has come along way and requires much work still, building the capacity of the networks and schools will go far towards improving the environmental education system.

Improvements

Although the environmental programs in existence now are strong. There is always room for improvements. Various studies have identified constraints on implementing environmental education in schools including lack of time, lack of unbiased resources, lack of school support, and lack of staff expertise and motivation (Cotton, 2006). This shows that more research and better trained professional environmental educators are needed.

People see controversy in environmental education this controversy can slow its progress. Cotton (2006) suggests a substantial divergence from the aims of environmental education offering a balanced picture of the viewpoints, not favoring or promoting viewpoints. As many students already hold strong beliefs about the environment it is important to challenge their understanding of those views. The balanced picture may be a preemptive defense from opinionated parents. Fear of indoctrinating seems to be one of the primary reasons for teachers to be soft on some controversial environmental issues. A common teaching tool of investigation called an *Enquiry Approach* can be used to challenge strong views through question rather then simply stating a belief (Cotton 2006). With this approach the teacher does not preach to the students but rather, they investigate issues together. Co-construction classroom curriculum is what is developed between the teacher and pupils. The reason environmentalism has had a hard time to move into the classroom is because of the views on both education and the environment. Liberal education is based on beliefs about tolerance of different viewpoints and avoiding imposition of values, while the origins of environmental education are rooted in the

political movement of environmentalism, a movement based on a desire for specific behavioral outcomes (Cotton, 2006). Not everyone agrees, Hwang (2009) feels that as pervasive and systemic environmental degradation is becoming more widely recognized, education must be charged with a prominent role in consciousness-raising and stimulating action to ameliorate negative changes and processes. Hwang (2009) is aware that the mainstreaming of environmental education into school practice may even undermine the ideals of environmental education through processes, compromises and effects of participation that reinforce rather than transform school institutions. This softening of environmentalism isn't the only thing interfering with it being properly taught but also the global competition for academic success impedes the progressive educational projects and undermines any teacher's environmental initiatives (2009). Cotton reacts to those who demand teacher neutrality on issues, by giving an honest real view of the situation, being that neutrality disregards the intrinsic value orientation of the education system. As education is not a neutral enterprise, and neither should teachers (Cotton, 2006). Not all teachers are liberal environmentalist as some teacher's have expressed this lack of neutrality by rejecting the more radical aims of environmental education. As some new curriculum has presented; views of the subject matter which did not match the teachers' views; required teaching strategies that were unfamiliar; and expected students to behave in ways inconsistent with usual practices (Cotton, 2006). This often results in the subject not receiving the attention it deserves. Innovators of environmental curriculum need to work in conjunction with teachers to develop new projects. With the new practice carefully mapped onto the actual working lives of teachers. The subject must be taught so that neither the adequacy of the new ideas, or the inadequacies of the old ideas are assumed. An approach to environmental education that enables curriculum developers to take account of subjective and objective constraints on teachers' action, and moves away from the deficit view of teaching whereby the failure of developments is seen as a failing on the part of teachers to implement them successfully (Cotton, 2006). The ordinarily average teaching role is held in between what they are mandated to do and what they can or want to do. Hwang feels the modern role of a teacher needs to complete

the change from being passive to active, where opportunities to address issues can be done thoroughly. Environmental education needs to be approached carefully as there are many opinions beyond the classroom to take into consideration. Safer approached don't have to take away from the lesson.

While the debate for how we teach rages on, the question of when we teach is being raised. There has been an expanding body of research literature from a diverse number of fields indicating that early investments in human capital offer significant returns both to individuals and to the wider community (Davis 2009). If this is true, then there is a major issue with the literature gap in early childhood education for sustainability. There does exist some research on education in or about the environment, but very little *for* the environment. This is unfortunate as even the original meaning of the word Kindergarten is children's gardens it s a throw back to its roots in learning in nature (Davis 2009). The Australian Journal of Environmental Education in 12 years has published less than 5% of its articles on early childhood education. Although it appears to be changing as most of those articles came in the last 4 years (2003-2007). In Environmental Education Research less than 1% in a 12 year period was to do with early childhood education. European Early Childhood Education Research Journal has occasional articles regarding environmental education, but again they are always about the environment, never for it. Most likely the thinking is that there are practical and ethical reasons for not conducting research on young children. It is difficult to collect valuable and reliable information from such limited verbal and writing skills. Cost of supervision, time and police checks also comes into play. Studying children has always been difficult as they are a vulnerable group, the ethic boards are very careful with selecting the work that is done with them (Davis 2009). There is a non-existent research base, lack of researchers, and negligible research grant opportunities, all of these things have significantly limited the opportunity to study early childhood environmental education (Davis 2009). There is very little research in relation to children in early learning settings such as childcare centre's, kindergartens and preschools that focuses on the theoretical, pedagogical, or broader educational issues (Davis 2009).

Early childhood environmental education deserves more involvement. The nature of much of the early childhood educators, being less educated and mostly volunteers makes it hard to stay current on emerging trends. However early childhood education loses out to the compulsory schooling sector for attention and resources (Davis 2009). Perhaps more than just environmental education at this young age needs improvement.

While it may be that the young are not properly exposed it is clear to Ballantyne (2009) that the most effective way to teach is through experience based learning in the natural environment. The author feels that this information should be used in the design of professional development programs to equip teachers to facilitate learning in natural environments. With this in place, more research could be done to fine tune the environmental education programs. Jickling (2009) realizes the importance of the environmental education conception. As it, like all education, shapes interpretations of ethics, and vice versa. That is why it is troubling for Jickling to see an underrepresentation of value-laden ideas in our research literature. The funding landscape involves uncertainty and risk, which could make some types of progressive research inconvenient. Researcher's can have great difficulty sustaining their desired research and often are guilty of following the funding, which may not necessarily be going where we need it.

By Giving; teacher the tools to handle the opinions inside and beyond the classroom, the student the education as soon as they are ready, and the subject its proper attention will create a much improved subject. Society would reap the benefits of this type of environmental education.

Environmental Education Cambodia

The importance of good environmental practices reaches beyond borders and economic conditions. It is well understood that these good practices are influenced by environmental education. While writing a paper about the state of Canadian

environmental education, I had the opportunity to visit many organizations working in the same field in a developing country; Cambodia. Even in this immensely poor country people understand the value of teaching the youth about the environment. In a country that has in its recent history been practicing little care for the natural environment, there are efforts to make change and respect this valuable resource. While there is some integration of environmental education into some formal education, most of the work is done in non-formal activities. Technical and financial assistance for environmental education has been provided through the government and non-government organization's (NGOs) since 1993 (LLEE, 2006). There has been of late great effort to create conservation lands. Particularly among the portions of major rivers that Cambodia shares with neighboring countries. One such major river provides South Vietnam with its flooding essential for rice production is the Tonle Sap. Historically it was the river that gave rise to the great ancestral agricultural dynasties in Cambodia. This Tonle Sap Biosphere Reserve contains characteristically small in scale and target local communities, teachers and primary school students (LLEE, 2006). A huge effort has been undertaken to produce sustainable practices. All the limitations seen in developed countries are magnified as knowledge of people, human resources, cooperation, language, budget and materials remain sparse. As so many of the people live day-by-day, there is a limited environmental ethic among the people. With a usurped government in charge after a coup d'état in the nineties, the low law enforcement and corruption were also considered significant challenges to effective environmental education (LLEE, 2006). The organizations working in these conditions strive for more participation, inclusion in livelihoods, cooperation, reducing the corruption, stronger law enforcement, better use of media, proper training, demonstrations, enjoyment, incentives for better practices and proper programs translated into simpler language for in villages (LLEE, 2006). There was a National Forum on environmental education that served together to gather information and develop recommendations to the various organizations on these very challenges. The results covered the needs to develop material and activities for specific audiences, focusing on careful translation of information to the people. It focused on pressing issues of

behaviour change, using all available resources to produce a stronger vision. The forum concentrated on expansion and coordination, which is difficult to do in a country where the idea of sharing knowledge means giving up some power. It set in motion practices to evaluate their environmental education as a means to increase its effectiveness. From this forum they created a National Environmental Education & Awareness Campaign (NEEAC). From this they developed an outreach program (EAEOP: Environmental Awareness and Education Outreach Program), using theatre, radio, television, curriculum and best practices guides to reach the people. In Cambodia there is a grass roots effort to put into practice an effort to reduce our impact on the environment, to promote a more sustainable future.

There was a United Nations Conference on Environment and Development in 1992 and the Earth Summit, they both gave high priority to Environmental Education in pursuing the kind of development that would respect and nurture the natural environment. A system to foster values and attitudes to respect the environment (LLEE, 2006). The conferences highlighted that to do this would mean increasing teachers knowledgeable in environmental education content; creating teacher trainers; creating instructional materials; and developing community education (LLEE, 2006). As some of the major issues holding back these types of education programs are; insufficient training and reference materials; lack of public initiative and difficulty in encouraging participation; limited networking and coordination; low interest in tertiary institutions; and difficulty teaching (LLEE, 2006). These types of conferences made available funding to create opportunities like the Cambodian Department of Environmental Education and Communication (DEEAC). The DEEAC is a governmental institution responsible for all means of environmental education activities. Their programs are focused on improving the state of the environment via education. The Human Resource Development Program is strengthening the capacity of department staff and raising awareness of government institution and people regarding the environment. The Environmental Education and Training program promotes environmental education and training to all parties concerned in order to seek their participation and support for environmental

protection and conservation. The Environmental Information and Dissemination program promote the communication of environmental information to all parties concerned in order to seek their participation and support the natural resource protection and conservation. The writing and research on the environmental information program attempts to encourage and improve standards of writing and research on the environmental information (LLEE, 2006). The Ministry of the Environment (MOE) is a relatively young ministry but many officials have a bachelor or engineering degrees in various social and scientific fields. The ministry has technical departments for each province and municipality; they are responsible for environmentally sound management within their territory. The MOE has been cooperating with other governmental ministries whose works are related to environmental issues.

There is much environmental education work being done in the NGO sector. Such as the Cambodia Family Development Services (CFDS), Soutien a l'Iniative Pour l'Aide a la Reconstruction (SIPAR) and Forum NGO have created some smaller scale materials, mostly posters and stories for community use (LLEE, 2006). The provincial environment departments in the provinces of Battambang, Prek Toal and Pursat have also produced posters in collaboration with the Department of Nature Conservation and Protection, the Department of Environment and the Technical Co-ordination Unit (TCU). The Culture & Environment Preservation Association (CEPA) has also been busy not only protecting the environment but in educating. They also have been patrolling community forestry and fishery sites, these field trips are conducted to monitor and evaluate activities. Along with training of trainers, they also have been conducting research in other important areas. Network and monthly meetings are also conducted, as is peer-to-peer environmental education in communities. They have found that when educating people that have low or no educational background or knowledge, it is helpful to use a variety of media such as; videos, posters, and pictures (LLEE, 2006). A religious group; Buddhism for Development in the province of Kampong Thom has been conducting training activities on topics such as, community forestry importance, community forestry,

land & commune council laws, morality, human rights, report writing, leadership and management. The community forestry committees that they set-up, undergo monthly meetings and conduct Participatory Rural Assessments, which work to develop local forestry by-laws, boundary demarcation and patrolling for community forestry sites. They help the local community to develop livelihood activities such as rice & vegetable gardening, animal raising, composting and rice banks. Within these communities they also conduct primary health activities and assist with self-help groups. Another organization called Save Cambodia's wildlife (SCW) has many programs including eco tourism of many different conservation areas, as well as selling rice for farmers who use sustainable rice practices. They also have; workshop meetings, presentations and study tours; they facilitate the development of local by laws; help out with resource mapping and boundary demarcation; they coordinate and assist community management committees and women's' associations; They have also assisted with environmental livelihood activities through tree nursery/reforestation, system of rice Intensification, rice & animal banks, village livestock agents, and volunteers for crop planting. The organization Mlup Baitong with help from the Food & Agriculture Organization (FAO) has produced an environmental education training manual. Including the topics of; general environment concepts, environmental education, natural resource management, waste management, facilitation, wildlife conservation, drawing, silk screen printing, Buddhism & environment, monitoring & evaluation, training of trainers, participatory rural appraisal, bird & tree identification, micro project grafting and germination. As well Mlup Baitong has been active in World Wetlands Events & National Environment Days, environmental forums, educational tours and tree planting activities. Waste management activities in the provinces of Kampong Speu, Kampong Thom have included the production of waste bins and plastic lunch boxes. They have conducted research in three provinces on waste and environment problems. They conduct field trips to monitor activities in target areas. They have study tours for the community and exposure visits for schools. Community forestry patrolling is also conducted. The World Wildlife Fund (WWF) is also active in Cambodia in a large variety of ways. I had the opportunity to meet with some of

their members who took me through some of their projects as well as detailing some of the complications of working within a corrupt government, including ignoring reports and hiding evidence. Rangers are trained by the WWF and equipped for involvement in assessment, patrolling, enforcement, forest management, and mapping of biodiversity resources. The WWF runs community activities include co-management agreements, alternative and sustainable livelihoods activities, participatory land use planning, traditional ecological knowledge (customary livelihoods) and non-timber forest product use. As Cambodia is by far predominantly a Buddhist country the WWF work with influential groups such as monks to educate and create programs to pass on this education. Community management & community forestry action plans are also developed. Forestry law extension teams translate and simplify the government's forestry law so local people understand their rights and obligations. WWF is also working with the Indigenous Land-use Network to assist in gaining community tenure of lands. In Cambodia there are many land disputes, as the government has changed hands many times in the recent decades (8 times since the 50's), and there are often many claims to different pieces of land. In the capital city Phnom Penh, a group called Community Sanitation and Recycling Organization (CSARO) works on recycling projects. A lot of Cambodia's major international aid comes from Japan. The Japan International Cooperation Agency (JICA) has been involved with environmental awareness training at the government level.

There are many opportunities for environmental education in Cambodia. They can be applied via formal education through social and religious education systems, and non-formal education, and mass media via radio, TV and newspapers. Environmental education is also being conducted through communities as discussed above and through programs like the Commune Development Council (CDC) and Forestry & Fisheries Community Associations. The education system, while still having much room for improvement, is estimated as having more than 50% of Cambodian people with access to basic education. However Cambodian environmental education still has many constraints. There are many hurdles in

implementing environmental education programs such as; the limited human resources, limited materials and facilitation equipment, lack of financial support, lack of planning, limited cooperation and commitment from the stakeholders, with limited knowledge of the environment, people 's commitment and participation is still limited. The education system is in shambles as having gone through 5 major language changes in the last half of the past century. On top of that Cambodia has limited environmental legislation, regulations and enforcement tools for managing its natural resources (LLEE, 2006). The subject of environmental issues is a relatively new subject in Cambodia, which makes people curious and willing to know more about it. Now Cambodia has some sort of political stability even if it was an illegal take over. But there is still a great need for education, as most Cambodian people do not know what the environment is and its importance in their daily life.

Environmental education will continue to succeed with continued understanding of learning, capacity building for the organizations working in environmental education and a strive for implementation. Its importance is unquestionable as it is a process that provides learners with awareness and knowledge about the environment, and fosters the development of the skills, attitudes and motivations to enable learners to make informed decisions and take responsible actions that incorporate environmental considerations. (CEGN, 2006).

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Final suggestions.

General -Magnifying glasses- 2$ each 48 available
-garbage's/compost/recycle bins

Tree ID: Big printing of pictures for Identification
-include blue spruce
- with tape to put up individuals for comparison
- scissors/pruners
- take home id keys

Water Quality-more interactive model

Turtles-Spiny Soft-shell Turtle: (need pic)
-Wood Turtle: (need pic)

Snakes
-Need all pics, molts, rubber snakes…something.

Stats:
The Otonabee Regions Conservation Authority environmental education program had 750 students from eleven schools in the surrounding area. The students came from a variety of grades; 138 students in JK, 194 students in K, 29 students from grade 1, 62 students from grade 2, 112 students from grade 3, 101 students from grade 4, 51 students from grade 5, 19 students from grade 6, 19 students from grade 6, 19 students from grade 7, 5 students from grade 8 and 20 students from grade 11. The students came from a diverse group of local schools: Queen Mary, Ridpath, St. Anne's, Queen Elizabeth, Warsaw Public, Westmount, Monsignor O'Donaghue, King George, Roger Nielson, Campbellford and North Hope. The students were led through the environmental programs by staff and volunteers, who put in respectively 176.75 and 94.5 hours to take the students through it.