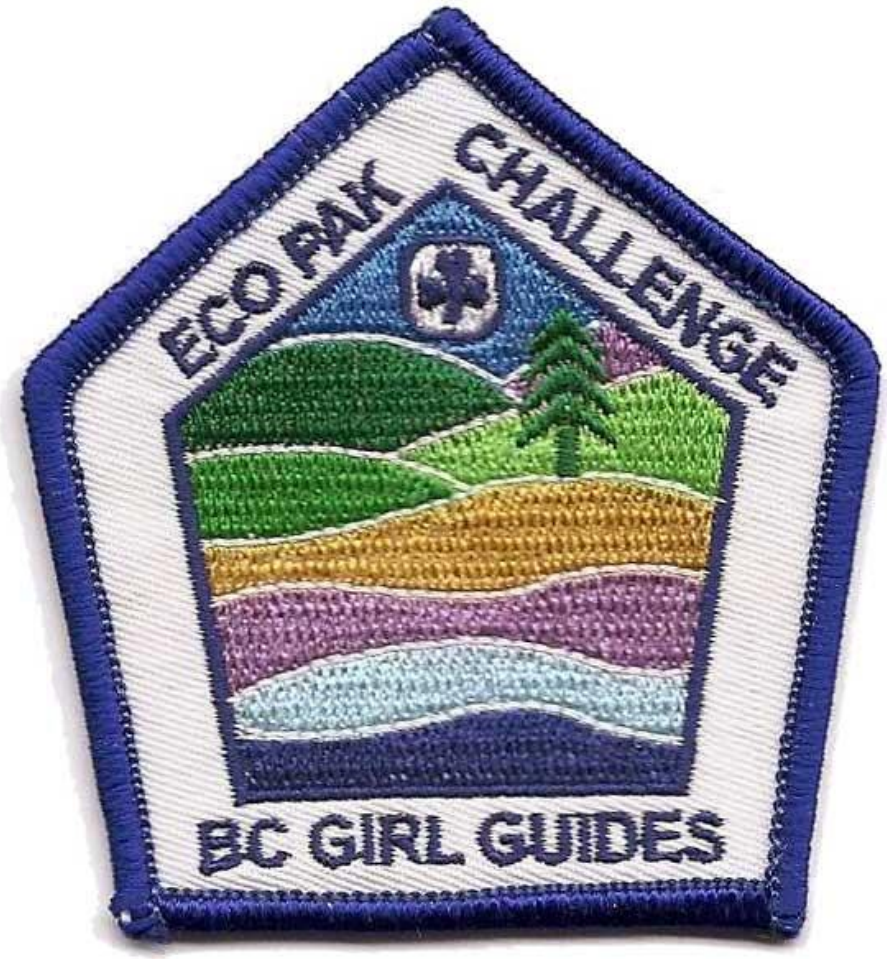
Girl Guides of Canada Guides du Canada
BRITISH COLUMBIA COUNCIL

ECO PAK CHALLENGE

AN ECOLOGY CHALLENGE
FROM THE BC PROGRAM COMMITTEE



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CONTENTS

INTRODUCTION TO THE ECO PAK

The Eco Pak is designed to meet our strategic priorities to help provide a better Guiding experience for the girls and to improve the unit Guider's experience. In 2006, each District in BC was given an Eco Pak backpack to use throughout their units, councils and committees.

Our goal is to continue to provide new tools and resources so that girls and Guiders alike can naturally integrate environmental considerations into their thinking and actions.

The "environment" is a broad topic and can be daunting for somebody who doesn't feel like they have the training or education. Don't be discouraged, all you need to start is a positive attitude and an interest in trying (you, with your Guiders and the girls, can learn together and teach each other).

The subject "environment" covers so many subjects and concepts (ecology, forestry, sustainability, pollution prevention and conservation – to name just a few). With the help of the Eco Pak we hope to provide you with a sample of games, activities, experiments, ideas for service projects, links to Guiding challenges, and a list of some resources so that you can start incorporating environmental stewardship as part of the whole Guiding program. The possibilities are endless, but we hope with the start we are giving you here that you will take it, run with it, and have fun with it!

The Eco Pak can be used with any age group. Beside most games, activities and experiments we have listed the suggested age group. Rangers can do and teach all of the activities. This is a guideline only. You may find that you can adapt many of the activities to other age groups.

In 2014 we have updated and revised that Eco Pak Challenge so that it can be shared on the internet. You no longer need access to an Eco Pak backpack in order to complete this challenge.

BC Program Committee (originally written in 2006; updated in 2014)

If you are thinking one year ahead, sow a seed.
If you are thinking 10 years ahead, plant a tree.
If you are thinking 100 years ahead, educate the people.
--Chinese proverb

THE ECO PAK BACKPACK

The Eco Pak was developed in 2006 and was contained in a special backpack. You do not need an Eco Pak backpack to complete the BC Eco Pak challenge – this challenge document contains all necessary instructions for the activities.

Following is the list of the original contents of the Eco Pak backpack:

Eco Pak Backpack Contents	
☐ Eco Pak booklet* ☐ Ecosystem Elements cards (Weird Web, Who Am I) * ☐ 4 Going Gold for the Environment (game board with game pieces, dice and question cards) ☐ 4 Explore the Outdoors kits (each contains a magnifying glass, marble, colour and texture card, plastic tube, wool, petri dish and dental mirror) ☐ 9 wooden symbol dice ☐ 2 thermometers ☐ feathers	☐ Eco Pak CD, which contains: ○ Eco Pak booklet* ○ Jeopardy Game* ○ BINGO Games* ○ Word Searches* ○ Canadian Girl Guides Eco-Challenges *(challenges are no longer valid)* ○ Other program resource files *(online links are provided in this document*)*

** items marked with an asterisk above are contained within this document*

EARNING YOUR ECO PAK CHALLENGE

Complete the appropriate number of activities from all four sections of the challenge, as shown in the table below.

	Sparks	Brownies	Guides	Pathfinders	Rangers/ Adults
Fun & Games	2	2	2	2	2
Hands On Learning	2	2	3	3	3
Taking it Outside and On the Trails	1	2	3	3	3
Living the Challenge (Service)	1-2 hours	2-3 hours	2-3 hours	2-3 hours	2-3 hours

When you have fulfilled the requirements, complete the **BC Crests Order Form** found on the BC Girl Guides website http://www.bc-girlguides.org/ (click on Program > Challenges & Activities > Provincial Challenges). Instructions on how to order the crests are provided on the form.

Adjusted Challenge Activity Requirements (April 2014)

ECO PAK CHALLENGE TRACKING SHEET

	Sparks	Brownies	Guides	Pathfinders	Rangers/ Adults
Fun & Games	2	2	2	2	2

- ❑ Lap Sit Game
- ❑ Bat and Moth Game
- ❑ Elements Game
- ❑ Shrinking Island Game
- ❑ Environment Jeopardy
- ❑ Oh Deer Game
- ❑ Hot Potato Game
- ❑ Word Searches
- ❑ Frozen Critters Game
- ❑ The Endangered Hoppit Game
- ❑ Tree Switch Game
- ❑ Environment Bingo
- ❑ Trash Relay Game
- ❑ Food Chain Game

Hands On Learning	2	2	3	3	3

- ❑ Weird Web
- ❑ Who Am I?
- ❑ Make a Tree
- ❑ Ecological Footprint
- ❑ The Great Cookie Extraction
- ❑ Dilution: A Pollution Solution
- ❑ Taster's Choice
- ❑ Edible Earth Parfaits
- ❑ Making Recycled Paper
- ❑ Oil Spill
- ❑ Plastic Bits 'N Pieces
- ❑ Groundwater Pollution Experiment
- ❑ Water, Pure and Simple
- ❑ Earth to Earth
- ❑ Make an Air Pollution Collector
- ❑ Song or Story
- ❑ Create an Outside Game
- ❑ Endangered Species of BC

Taking it Outside and On the Trails	1	2	3	3	3

- ❑ Explore the Outdoors
- ❑ Neighbourhood Outing
- ❑ Sound Maps
- ❑ Five Minute Fieldtrips
- ❑ Explore the Earth
- ❑ Wildlife Protection Fieldtrip
- ❑ Natural Resource Fieldtrip
- ❑ Waste Management Fieldtrip
- ❑ Wonderful Water
- ❑ Produce Fieldtrip

Living the Challenge (Service)	1-2 hours	2-3 hours	2-3 hours	2-3 hours	2-3 hours

- ❑ Yellow Fish Road
- ❑ Habitat Restoration
- ❑ Fish Stream Restoration/Hatchery Programs
- ❑ Animal Shelter Project
- ❑ Community Garden
- ❑ Recycling Challenge
- ❑ Community or Shoreline Cleanup
- ❑ Environmental Service Project

FUN & GAMES

Sparks	Brownies	Guides	Pathfinders	Rangers/Adults
2	2	2	2	2

1. Lap Sit Game

Guides, Pathfinders

Directions

1. Have the girls stand in a circle with their shoulders touching. Everyone should be facing the center of the circle.
2. Go around the circle and number the girls off 1 to 4. Ones represent “food”, twos represent “water”, threes represent “shelter”, and fours represent “space”. The entire circle represents a good habitat.
3. Ask everyone to turn to their right so that each girl is now facing the back of the girl standing in front of her.
4. Have everyone place their hands on the shoulders of the girl standing in front of them.
5. On the count of three, have everyone put their legs together and then sit down slowly until they are sitting on the lap of the girl behind them. The girl behind them acts as a chair for the girl in front. It is important that everyone does this at the same time! If this works, then you will have a good habitat and it will not collapse.
6. Next, make up a scenario where one of the components of the habitat is removed. For example, remove all the girls who are the “shelter” from the circle to represent deforestation, or the cutting down of all the trees in the forest. Have the girls remaining attempt to sit down in their circle, without moving, to fill in the spaces left by the girls who were removed. You will see that the habitat has fallen apart. Reinforce the concept that without shelter, organisms have no place to keep warm and stay safe.

Eco-Message

The purpose of this game is to teach the concepts of a habitat, a place where an organism lives, and its four components (food, water, shelter, and space). The girls should realize that organisms depend on these four essential components and the removal of any one of these components would have a huge impact on the ecosystem. Have the girls list some examples of the four components. Explain that without these four components, survival is not possible.

2. Bat and Moth Game

Brownies, Guides, Pathfinders

***CPAWS** has given BC Girl Guides permission to use this educational content from their **Southern Alberta's Education Resources** for the Eco Pak Challenge. Please visit their website at http://cpaws-southernalberta.org/upload/Bat_Moth.pdf to access the original content.*

Directions

1. Have students stand in a circle. Ask for two volunteers, and assign one of them the role of the bat, and one of them the role of the moth. Tell them that in this game the bat must catch the moth (and the moth must try to avoid capture) despite the fact that both animals will be blindfolded.
2. Tell students that this activity is in part a trust activity, and tell the two students to choose two people they can trust. The role of the two "trustworthy" friends is to blindfold the bat and the moth and then (still acting in a trustworthy manner) to move the blindfolded student to somewhere within the circle so that they do not know where the other animal is. Ask the remaining students to stand with their hands in front of their chests, and be prepared to move sideways to help the bat and the moth to stay within the circle.

Supplies

- a blindfold
- two noisemakers (can be cans filled with popcorn, rattles etc.)
- you'll require a large open area with no obstructions or rough ground. This can be a gymnasium floor, a grassy lawn, etc.

3. Tell the bat that they will have three chances to find out exactly where the moth is. They will be allowed to shake their can three times, and the moth must ***immediately*** shake its can as well, alerting the bat to the moth's whereabouts.
4. Let the game begin! Encourage the ring of students to remain quiet and "trustworthy" (although during later rounds you can actually ask them to make distracting background noise!). If necessary remind the bat that, when it talks, the moth knows where it is! (and vice versa). Allow different students to volunteer.

5. Ask the following discussion questions:

   - How did it feel to be hunted?

     Students may have found this a little alarming. Remind them that prey animals spend much of their lives in a state of alertness.

   - Why is this game called bat and moth, and not "hawk and dove"?

     In this activity, players rely exclusively on their sense of sound - just as bats do. Although bats have eyes, they do most of their "seeing" by echolocation. A bat uses its structural adaptations to emit very high frequency (20-40,000 Hertz) sound waves, or sonar, which bounce off its prey and are used to hone in on the location of its prey.

   - What strategies did the predator and the prey use in this game?

     Players probably developed different techniques - just as in nature animals develop behavioural adaptations to survival.

Eco-Message

The purpose of this game is to mimic how bats use echolocation to locate and capture their prey. Bats send out high-pitched sounds into their environment and then listen for the echoes to determine the location of objects in their surroundings.

3. Elements Game

Guides, Pathfinders

Directions

Supplies

- a bean bag

1. Have the girls stand in a circle.
2. Select one girl to be in the middle of the circle. This girl will yell out four elements: Earth, Water, Air, or Fire. She will throw a bean bag to someone in the circle.
3. The person who catches the bean bag has only a few seconds to name something that is living in that particular element that was called out. For example: Earth = squirrel; Water = humpback whale; Air = bald eagle. Once an answer is given, it cannot be used again during the game.
4. If the element “Fire” is called out, then the person who catches the bean bag should say nothing and thrown the bean bag back as soon as possible.
5. If the catcher does not have an answer then she becomes the new person in the middle of the circle.
6. To make the game harder, select a continent before the game starts. All the answers given must be animals that live on that continent.

4. Shrinking Island Game

Sparks, Brownies, Guides, Pathfinders

Directions

1. Place sheets of newspapers around the room to create "islands". You can also create islands by forming skipping ropes into circles on the ground. If there are enough supplies, try to create one island per girl.
2. The girls are going to represent animals that live on different islands.

Supplies

- sheets of newspaper or skipping ropes
- music

3. When the music plays, the girls have to pretend to look for food and water – away from their islands. They will continue to do this as long as the music is playing.
4. When the music stops, the girls have to quickly find safety and shelter on an island. This is to represent the animals seeking safety from their predators or harsh weather conditions.
5. Everyone must get on an island. If there are no islands available, then the girls must make room for other girls to share. If any of a girl's body part is outside the island, then she has "not survived". Encourage the girls to help each stay alive and fit on an island.
6. As the game continues, an island is removed during each round. This is to represent urbanization (e.g. cities) and human developments, where humans have taken over wildlife habitats. The game ends when there are only one or two islands left and all the girls are forced to squish together so that everyone fits. Stop the game when it is no longer possible to fit everyone on the remaining islands.

Eco-Message

The girls can learn about the importance of habitat and how a decrease in space for organisms to live can lead to limited resources like food, water, and shelter due to competition amongst the organisms in that community. Brainstorm with the girls and come up with ways in which a habitat can be changed. They will realize that both natural disasters (e.g. acid rain, greenhouse effect, global warming, climate change, forest fires, volcanic eruptions) and human activities (e.g. road construction, building of new homes and golf courses, expansion of farmland, deforestation, pollution) have negative impacts on the environment.

5. Environment Jeopardy

Sparks, Brownies, Guides, Pathfinders

Appendix A contains printable pages for the game (category labels and score/answer pages, as well as a summary of the questions and answers for each category). There are five categories, each with five answers/questions. These questions can be added to and/or changed to suit your age-level and topic of interest.

Air-Atmosphere	Eco-Acronyms	Fast Facts	Pollution	Sustainability
100	100	100	100	100
200	200	200	200	200
300	300	300	300	300
400	400	400	400	400
500	500	500	500	500

Directions

1. Divide the girls into two teams.
2. Decide which team will go first – flip a coin or do rock, paper, scissors.
3. For each round you can decide whether the teams can work together or whether somebody from each team will answer the question for that round.
4. A girl chooses a category and a point score.
5. Flip over the point card and read the answer on the back. The girl that rings her bell first must answer in the form of a question (e.g. “What is Reduce, Reuse, Recycle?”). If she gets it right, her team can go again. If not, the other team chooses the next category and point score.
6. Keep a tally of the points as the game continues.
7. Once all the categories have been answered, you can play the Final Jeopardy round. Tell the girls that it is Final Jeopardy and ask them to decide amongst their team how many points they will wager. Reveal the final Jeopardy answer. Give the girls the Final Answer and allow them 30 seconds to come up with the question (which they write down). Have the teams show their question and how many points they wagered. Once the final tally has been accounted for, announce your winner.

Supplies

- 2 bells
- paper and pencil for each team (for Final Jeopardy)
- Jeopardy set-up, an example is shown above (all supplies contained in Appendix A).

6. Oh Deer Game

Brownies, Guides

Directions

1. Set the boundaries of the playing area.
2. Divide the girls into two groups with equal numbers.
3. One group will represent the limited resources (food, water, and shelter). Each resource will be displayed as an action symbol with hands. To represent “food”, the girls will need to put both hands in front of them on their stomach. To represent “water”, the girls will put both hands over their mouth. To represent “shelter”, the girls will form a roof by putting both hands over their head.
4. The other group will represent the deer that need to get the limited resources.
5. Have one group form the “deer line” on one side of the playing area and the other group form the “resource line” on the opposite side of the playing area. Have the two groups face away from each other so that they are looking away from the center of the playing area.
6. Have each “deer” decide what resource it is looking for. Make the appropriate corresponding symbol that is associated with that resource.
7. Have each “resource” decide whether she is going to represent food, water, or shelter for this particular round. Then have them make their symbol using their hands.
8. On the count of three, ask both lines to turn and face each other. The “resource line” does not move. All the deer, while still displaying their action symbol with their hands, must run to the resource line as fast as they can and find their matching resource. Each deer must tag their corresponding resource (e.g. a deer making the action symbol for shelter needs to tag the shelter resource). The deer are going to compete for limited resources.
9. If a deer is successful in getting its resource, the deer takes the resource back to the “deer line”. This is to represent the deer surviving and reproducing when it is successful at getting the resources it needs. This will increase the deer population when resources are plentiful. If a deer does not find the resource it needs, it dies and joins the “resource line”. If a resource is not tagged, then it stays in the resource line.
10. Play several rounds and discuss what happens to the deer population when resources are available and when resources are diminished. The cycle of supply and demand is nicely demonstrated and observed in this game.

Eco-Message

The purpose of this game is to give the girls an understanding of limited resources such as food, water and shelter. The girls can learn the effects of increasing and decreasing population on limited resources. The bigger the population, the more competition there will be for the resources. Discuss with the girls that natural events can have an impact on the supply of the resources that are needed to support a healthy deer population.

7. Hot Potato Game

Sparks, Brownies, Guides

Directions

1. Wrap the prize using one sheet of paper and use one piece of tape to seal the paper.
2. Use another sheet of paper and wrap the prize again, using only one piece of tape. Place an index card with the song, game, or trivia between the first and second layer of wrapping.
3. Continue to wrap the prize with multiple layers and make sure that there is an index card between each layer of wrapping. The prize will represent the "potato".
4. Have the girls form a circle and sit on the floor.
5. When the music plays, the girls are to pass the "potato" (wrapped prize) from one girl to the next girl.

Supplies

- sheets of newspaper
- tape
- songs, games, or trivia written on index cards with their environmental themes
- a prize (e.g. something that can be shared with the entire group)
- music

6. When the music stops playing, the girl with the "potato" in her lap unwraps one layer. The girl reads the content on the index card and does what is instructed on the card. The card may instruct the group to sing a song (e.g. You Are My Sunshine) or play a game (e.g. Stella Stella Ola). To fit with the Eco Pak theme, have some cards that have trivia questions about the environment.
7. Start the music again and continue the game until all the layers are unwrapped. The game will end when the last layer is unwrapped and the prize is shared with the rest of the group.

8. Word Searches

Brownies, Guides

Use word searches to introduce a theme or new terms to the girls. They are great as a gathering activity to keep the girls busy while everyone is arriving. You can make your own word searches with free programs found on the Internet, or use one of the word searches found in Appendix B.

9. Frozen Critters Game

Brownies, Guides

Directions

1. Set the boundaries of the playing field. Designate one end of the field to be the "food source" and the other end of the field to be the "primary shelter". Randomly distribute 4 to 5 hula-hoops in the area between the "food source" and the "shelter" on the playing field. Make sure the hula-hoops are spread equally apart from each other. These areas on the field will represent additional shelter for the prey.
2. Place marbles on the ground in the "food source" area. There should be at least 3-4 marbles for each prey. The marbles represent food.
3. Divide the girls into two groups: predator and prey. There should be 1 predator to 4 prey. The prey should have bandanas in their pant pockets so that they are easily identified by the predators.
4. Use a whistle to start each round of the game. Each round lasts for 5 minutes. When a round begins at the sound of the whistle, the prey must pick up one marble per round as they move from the "primary shelter" to the "food source" and then back.
5. In order to survive, the prey must get three marbles on three separate trips without being caught by predators as they make their way across the field. If the prey sees a predator, they can either run to the nearest hula hoop and put one foot inside it or they can "freeze" when a predator is within 1 meter of it. The prey can remain frozen for as long as it likes. When the prey is frozen, they cannot be seen by the predator and therefore the prey should not move. Make note that the prey must get food before the round is over otherwise it will starve and not survive.
6. The predators can start anywhere on the playing field. They must take away the bandanas from the prey in order to successfully catch the prey. Predators can only catch moving prey outside their shelter. In order to survive, the predators must catch two prey (or have their bandanas). Once a prey is caught, the prey becomes a predator. At the end of a round, if a predator does not get a prey, it will become a prey.
7. Play several rounds and allow the girls to play both predator and prey.

Supplies

- 4-5 hula-hoops
- marbles
- playing field
- bandanas or headbands
- whistle

Eco-Message

The purpose of this game is to teach the girls about the relationship between predator and prey. They should understand that predators eat or hunt prey. In nature, prey must get food in order to survive, but must be careful that they are not eaten themselves by predators. There is a risk associated with leaving the safety of a shelter in search of food. Discuss with the group some strategies that the prey used to escape their predators and what predators did to successfully capture their prey. This can lead to some discussions on adaptations that animals have in nature to help them survive. The game demonstrates how the predator population influences a prey population and vice versa – this is known as the predator-prey cycle.

10. The Endangered Hoppit Game

Brownies, Guides

Directions

1. A Hoppit is an imaginary animal that hops around and collects food (e.g. popsicle sticks, marbles, buttons, paper, etc.) from the ground. The Hoppit will place all the food that it gathers in its home (represented by a tarp). When the Hoppit is tired, it can stop hopping and rest.
2. Distribute a variety of objects (to represent the food) on the ground.
3. Place a large tarp (to represent the Hoppits' home) in the middle of the playing area.

Supplies

- objects that can represent food (e.g. popsicle sticks, marbles, buttons, etc.)
- rope
- large tarp

4. The girls will represent Hoppits in the game. When the game begins, the Hoppits are to hop around on two legs and gather food on the ground. They need to bring the food back to their home (the large tarp) and build their own little pile of food. Each Hoppit must keep make sure that her pile is as high as the other Hoppits' food piles. The Hoppits need to keep hopping around and gathering food, but when they are tired they can rest in their home.
5. After 5 minutes of hopping on two legs, announce that environmental conditions have gotten worse and there is less food available for the Hoppits. The Hoppits can now only hop on one leg to gather food. They can rest in their home when they get tired. If a Hoppit accidentally hops on two legs or rests outside the home, then she is considered to be "dead" and must move to the sidelines.
6. After 5 minutes of hopping on one leg, announce that humans have built a road through their home. The Hoppits can continue to gather food and add to their food pile, but they cannot rest at their home anymore. In order to stay alive, the Hoppits have to continue to hop on one leg and gather food to add to their food pile.
7. Observe how many Hoppits are left after 1 minute has passed. Two minutes? Five minutes? How long before all the Hoppits are gone?

Eco-Message

The purpose of the game is to give the girls an understanding of important roles that organisms have in their ecosystem. If they are endangered and can potentially become extinct, this can have a huge impact on the ecosystem. The girls can learn about the routines and struggles that organisms have in order to survive in their environment. They can see the impact of human activities (e.g. road construction, habitat destruction, urbanization, etc.) on a population and how that population is affected by these actions. Discuss why some organisms are endangered and list some conservation practices that we can carry out in order to save some endangered species.

11. Tree Switch Game

Guides, Pathfinders

Directions

1. Divide the girls into 3 or 4 groups based on how many kinds of trees are in the area. It is best if there are more than 12 girls for this game.
2. Designate a girl to be "IT". She will stand in the middle of all the trees.
3. Each girl stands beside a tree, making sure that one hand is on the tree.
4. When the girl who is "IT" calls out the name of a tree (e.g. oak tree) all the girls who are at the oak trees must quickly change places with the other girls that are also at oak trees. As the girls are trying to switch tree places, the girl who is "IT" tries to claim an oak tree for herself.
5. If she gets to the tree first, then the last girl to a tree becomes the new "IT" girl.
6. When the girl who is "IT" calls out "Forest" all the girls must change places, making sure that they end up going to another tree of the same kind.

Supplies

- playing area with several different kinds of trees (e.g. fir, pine, oak, etc.)

Eco-Message

This is a great game for girls to learn the names of different types of trees and how to identify them.

12. Environment Bingo

Sparks, Brownies, Guides

Caller BINGO (Version #1):

1. Create your own BINGO cards using an online generator, such as http://print-bingo.com/ or use the blank card in Appendix C to have the girls create their own BINGO cards. If the girls are creating their own BINGO cards, give them a list of environment words or environment pictures to choose from. The words (for older girls) and the pictures (for younger girls) are included in Appendix B.
2. Pick a girl to be the caller. The caller should place all the BINGO words/pictures into a bowl, basket or hat.
3. The caller will pick a word or picture out of the bowl one at a time. She will call out each pick.
4. The girls use their BINGO markers to mark each word/picture they have.

Supplies

- BINGO markers (pieces of paper, candy, tokens, etc.)
- BINGO cards (one per girl)
- bowl, basket or hat
- pen or pencil (for Mingle BINGO)

5. There are a variety of ways to win: straight/diagonal lines, the entire sheet, the outside square, etc. – your choice.

Mingle BINGO (Version #2)

1. This version of Bingo is interactive. Each girl receives the same Mingle BINGO card and a pen or pencil.
2. The girls need to mingle and ask each other the questions on the Mingle BINGO card (found in Appendix C).
3. One person should sign only one item per BINGO card to ensure that the girls talk to as many people as possible.

13. Trash Relay Game

Sparks, Brownies, Guides

Directions

1. Place the three bins (recycling, trash and compost bins) at the other end of the field (e.g. about 10 meters away from the teams).
2. Divide the trash so each team has an equal sized pile. Place the piles about half way between the start line and the bins.
3. Divide the girls into 3 or 4 teams depending on the size of the group. There should be at least 3-4 girls in each team for the relay race. Have the teams all line up at the start line.

Supplies

- trash (recyclable items, paper items, etc.)
- rubber gloves
- recycling bin
- trash bin
- compost bin
- whistle

4. Give each team a pair of rubber gloves for the game.
5. When the whistle blows, the first girl puts on the pair of gloves and runs to the trash pile. She should pick up one item and then run to the end and place the item in the appropriate bin. She should then run back to her team and give the next girl in line the gloves. The relay race continues until all the trash has been sorted.

Eco-Message

Once everyone is done, go to the three bins and review with the girls whether the trash was thrown in the appropriate bins. Determine how many items were placed in the “wrong” place. Discuss some ways in which we can reduce the amount of garbage that we generate as a society.

14. Food Chain Game

Brownies, Guides, Pathfinders

Directions

Supplies

- Food Chain Chart (below)

1. All the girls will start out as algae. Without saying a word, they mingle in the group and find other girls who are doing the same actions as they are. Once they find each other, they play one game of "Rock, Paper, Scissors".
2. The winner of the game will become the next organism on the chart and the loser of the game will move down on the food chain to the previous organism level (e.g. if a salmon loses, she becomes a dragonfly larva).
3. There is no level lower than algae. If a girl loses against another algae girl, the winner becomes a mosquito larva and the loser stays as algae.
4. The goal of the game is get to the Bear level.

Food Chain Chart

Organism	Action
Algae	Arms over your head, slowly waving back and forth
Mosquito larva eats algae	Point your nose into the air and nod up and down
Dragonfly larva eats mosquito larva	Wiggle your hips back and forth while quickly sticking your tongue in and out.
Salmon eats dragonfly larva	Put hands on the side of your body and make them into fins; pucker your lips like a fish.
Bear eats salmon	Clutch hands so they look like claws; make a growling noise

Eco-Message

The girls will learn about the different levels in a food chain and how energy is transferred from one organism to the next when it is eaten. Think of other food chains and make up actions for the organisms in them.

HANDS ON LEARNING

Sparks	Brownies	Guides	Pathfinders	Rangers/Adults
2	2	3	3	3

1. Weird Web

Brownies, Guides, Pathfinders

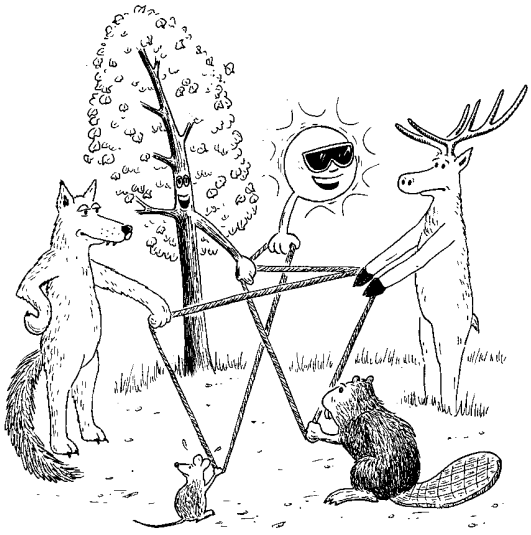
CPAWS *has given BC Girl Guides permission to use this educational content from their* ***Southern Alberta's Education Resources*** *for the Eco Pak Challenge. Please visit their website at http://cpaws-southernalberta.org/upload/5min_Fieldtrips.pdf to access the original content.*

Directions

Supplies

- signs from **Who am I?** activity, included in Appendix D.
- two balls of at least 100m of twine or very thin rope

1. Instruct students to stand or sit in a circle, showing their **Who Am I?** signs. You should also be part of the circle. Tell students that you will be playing the role of the sun, the ultimate source of life for all things (as befits your role as teacher!). Pass the ball of string to the tree, and say "I am passing the ball to the tree, because it needs me to survive. I give energy to the tree."
2. Tell students that they can pass the ball to another ecosystem element in the circle **only if it needs you in order to survive, or if you need it in order to survive".** For example, the squirrel could pass the ball to the tree (which it needs to survive) or to the owl (which needs it to survive).



3. Make sure that each exchange is justified by each student as they pass the ball, and that the whole group understands and agrees with the rationale that is given. Challenge students to establish connections with everyone in the circle, so that no organisms are left out. (Note: you might find it useful to have students rehearse this by having them point to ecosystem elements they need to survive – or that need them to survive - before the ball of string is passed).
4. When every organism is connected, have students pull gently to make the string taut. Ask students to examine the pattern they have created. Tell them that this pattern represents the very complex pattern of interconnections between organisms that occurs in a natural ecosystem. For this reason, interrelationships within an ecosystem are sometimes referred to as the **'web of life'**. Ask students if the web they created is more simple or more complex than the web of life that actually exists

in their schoolyard or in a park; students should realize that things in nature are far more complex than the simple web they have created.

5. Tell students that something has just happened to change this ecosystem: a new community is being built nearby, and an area of the forest will need to be logged to provide the space. Keeping the string taut, ask the "tree" student(s) to suddenly release the string when you count to three. After the string is released, immediately ask if anyone felt the tension in the string change when the tree dropped out (several, including the squirrel, should say yes). Ask those affected by the loss of the tree to say how they are affected.
6. Count to three again, and ask these “affected” students to in turn drop the string. Keep going until everyone has dropped the string. Have students drop the string in front of them so they can pick it up again for the next round. Students should come to realize that any change to an ecosystem - whether slight or profound - is felt throughout the system. Tell students the golden rule of ecology: **In an ecosystem, you can never do just one thing**.

   Easy Option: Rather than have students drop their strings, ask them to gently tug on the string. Those feeling the tug can tug in turn, and so on. This eliminates the need to pick up the dropped string
7. .Ask students to repeat this activity using the following changes to the ecosystem:

   - A developer drains a wetland to build a new community
   - The municipality sprays to remove pesky mosquitoes from the area
   - Decreasing ozone levels allows more ultraviolet radiation, which kills cells and slows the growth of the trees
   - A species of worm goes extinct. This worm specialized in breaking down deer and elk poop and releasing the nutrients back into the soil
   - The forest is in a park - but the park is too small to preserve large carnivores, causing them to be extirpated from the area

Emphasize two points to students:

a. Recent studies are showing that carnivores are far more important than previously thought. Their presence or absence may actually dictate how healthy the entire ecosystem is. This is known as the ‘top down’ or regulatory effect.
b. Humans usually understand only a small amount of what actually goes on in an ecosystem: the relationships and interdependencies are normally too complex. This often makes our attempts to ‘manage ecosystems’ almost comical! Read the story of 'Cats in Parachutes' by Bart Robinson elaborates on this. (https://www.google.ca/#q=cats+in+parachutes+bart+robinson)

Eco-Message

The girls should understand how different organisms are interconnected in a food web. The Sun is the source of energy for all life. The energy from the Sun is captured by plants, which are then eaten by plant-eating animals (herbivores). These animals are then eaten by carnivores. Discuss the pattern that is created by the string as it is passed from one person to the next.

2. Who Am I?

Brownies, Guides, Pathfinders

***CPAWS** has given BC Girl Guides permission to use this educational content from their **Southern Alberta's Education Resources** for the Eco Pak Challenge. Please visit their website at http://cpaws-southernalberta.org/upload/Who_am_I.pdf to access the original content.*

Directions

Supplies

- signs from **Who am I?** activity, included in Appendix D.
- string to hang signs around students' necks

1. Introduce or review a number of different classification schemes with the students. As you review these words and their definitions, record them on the board so that students will be able to see them throughout the activity.

   Producer: an organism that makes its own food (green plant)
   Consumer: an organism that feeds on those below it on the food chain
   Decomposer: an organism that derives its energy from decomposing matter
   Predator: an animal that kills others for food
   Prey: an animal that is hunted and killed by predators
   Carnivore: an animal that eats meat (animals)
   Omnivore: an animal that eats animals and plants
   Herbivore: an animal that eats plants

2. Students should be given one of the common ecosystem elements included in the ***Who am I*** signs (e.g. grass, coyote, etc.). Students are not to show this card to anyone.

3. Ask students to hang their sign ***on the back of*** one of their fellow students so that their fellow students don't know what sign they have. Encourage students to distribute signs without talking. Tell the students:

   The object of this game is for you to determine what ecosystem element you are. You can do this by asking questions of the other students that use the key words on the board such as, "Am I a carnivore?" – All questions can only be answered by a yes or a no! You can guess what your ecosystem tag is, but you only get ONE guess, so keep asking yes or no questions until you're fairly sure what you are. Schmooze around and mingle with each other and think of as many yes/no questions as possible.

4. Answer any questions and let the games begin! Monitor all questions and answers. If students find they need more information, stop the game briefly, and tell students that they are allowed to ask more general yes/no questions ("Do I have fur"? "Am I bigger than a breadbox?") to find out more. When most students know what they

are, allow them to move beyond yes/no answers and give hints to the remaining students.

5. Once students have discovered their identities, challenge them to do the following group work:

   When I say 'go' I want everyone to get into a group of either...
   - producer, consumer and decomposer
   - first order, second, order, third order consumer
   - predator and prey
   - carnivore, omnivore, and herbivore.

6. Another variation of the above activity is to divide the class into two groups and challenge each group to come up with a "Frozen Drama" in which each member of the ecosystem demonstrates their interactions with others (e.g.. the tree might be standing with its arms outstretched, the cougar is preparing to pounce on a browsing deer, etc.). One of the members of the group will be the only one who can talk; their job is to narrate the frozen drama to the 'audience.'

3. Make a Tree

Guides, Pathfinders

CPAWS *has given BC Girl Guides permission to use this educational content from their* ***Southern Alberta's Education Resources*** *for the Eco Pak Challenge. Please visit their website at http://cpaws-southernalberta.org/upload/5min_Fieldtrips.pdf to access the original content.*

Directions

Supplies
- at least 12 students
- a large, dry, open play space
- cue cards with script for different parts of a tree (included in Appendix D).

1. **Heartwood**: Pick the two tallest students to be the heartwood and have them stand back to back. Hand one of them the heartwood cue card to read aloud, with gusto!
2. **Taproots**: Next choose four or five students to be the taproots and have them sit at the base of the heartwood facing out. Hand out the tap root cue card and ask them to read aloud, with pride!
3. **Lateral roots**: For lateral roots, try to choose students with long hair. They'll have to lie on the ground. Ask these lateral roots to lie on their backs with their feet against the trunk and their bodies extending away from the tree. Students should try to spread their hair out behind them, and spread their arms out above their heads. Hand out the lateral root cue card asking one of the roots to read. Say to the students, "When I say, 'Suck it up!,' you taproots and lateral roots all make a loud slurping sound, like this. (Make a loud slurp sound.) "Suck it up!"
4. **Xylem**: For the xylem, choose enough students to form a complete circle around the heartwood. Ask them to form the circle facing inward and holding hands. Be sure they do not step on the lateral roots. Ask a student to read the card. Say to the students, "When I say, 'Bring the water up!' the xylem throws its arms up in the air,

saying Wheeeee!'. Let's practice, with the roots drawing the water into the tree, and the xylem pumping it up. "Suck it up!" (Slurpppppppp!) "Bring the water up!" (Wheeeee!)

5. **Phloem**: For the phloem, arrange another group of students in a circle around the xylem, also facing inward and holding hands. Ask one of them to read. Help the students playing phloem to stretch their arms upward and outward, so that they intersect each others arms at the wrists and forearms, leaving their hands to flutter like leaves. Say, "When I say, Let's make food', raise your arms and flutter your leaves. Absorb the energy from the sun to make food. And when I say, Bring the food down!', you say, "Whooooooo!", and bend at the knees, droppingyour arms and body towards the ground. Let's practice. Go through the sounds and motions with all of the parts in this order: Suck it up! Let's make food! Bring the water up! Bring the food down! Outer bark: The remaining students are theouter bark. They should circle around the tree, facing outward. Hand the cue card, and have someone read.
6. **Outerbark**: The remaining students are the outer bark. They should circle around the tree, facing outward. Hand the cue card and have someone read. Tell the outer bark to protect the tree, like football blockers, with both elbows out, and both fists close to their chests. Tell them that you will play the role of a hungry insect trying to bore into the tree. The bark should try to fend you off.
7. Practice the whole role play a few times: Heartwood, stand tall and strong! Get tough bark! Suck it up! Let's make food! Bring the water up! Bring the food down! Before you disperse, help the roots up off the ground, and have a big group Whoooooop! For being such a flourishing tree.

4. Ecological Footprint

Guides, Pathfinders

An ecological footprint is a measure of the amount of usable land and water that humans (either individually, as a city, or a country) consume to produce resources they need and to absorb their waste. An ecological footprint can be used to determine our supply and demand on the planet's resources. We want the girls to understand that we must make good decisions about sustainability make an effort to reduce our footprint.

Directions

1. The girls can calculate their ecological footprint by going to the website http://www.earthday.org/footprint-calculator. It will give the girls an idea of the type of impact they have based on factors like transportation choice, housing type, energy use, and the location of where they live.
2. Have the girls share with the rest of the group the size of their ecological footprint.
3. Discuss ways that they can reduce the size of their footprint (e.g. eating less meat, walking instead of driving, composting kitchen waste and yard clippings, recycling, purchasing locally grown products, turning off the light when no one is in the room, etc.).

5. The Great Cookie Extraction

Brownies, Guides

Supplies

- chocolate chip cookies
- toothpicks
- paper towel

Directions

1. Hand out one chocolate chip cookie to each pair of girls.
2. Ask the girls to guess how many chocolate chips there are in each cookie.
3. Give the girls a set amount of time to try to get as many chocolate chips out of the cookie using their hands and the toothpicks provided. Place the extracted chocolate chips on a piece of paper towel.
4. Once the time is up, ask the girls to count the number of chocolate chips on the paper towel.
5. Ask the girls to take note of the condition of the cookie after they have taken out all the chocolate chips. Has the cookie crumbled? Is it still intact? Most of the girls should notice that all that is left are crumbs. Ask the girls if they can put the cookie back to the way it was.
6. Have a discussion about how mining different resources (e.g. coal, fossil fuels) can have a negative impact on the environment.
7. Repeat this activity with another chocolate chip cookie. Ask the girls to carefully take out as many chocolate chips as possible without causing a lot of damage to the cookie. After 4 minutes, discuss the results. Compare the number of chocolate chips extracted and the condition of the cookie this time to the previous time.

Eco-Message

Consider the pros and cons of mining for natural resources. What are the effects of trying to extracting things (e.g. drilling for oil, mining for coal, etc.)? Is the environment harmed when humans are trying to obtain these natural resources?

6. Dilution: A Pollution Solution

Brownies, Guides, Pathfinders

Adapted from an activity in "World of Fresh Water" by the United States Environmental Protection Agency, 1997.

Directions

Supplies

- 2 clear jars
- green food colouring
- large clear bowl
- water

1. Add some water to one clear jar ("polluted jar"). The water will represent water in a lake.
2. Add 2-3 drops of green food colouring to each jar. The food colouring will represent pollutant in the lake.
3. Explain to the girls that rainwater will dilute the pollutant found in the lake so that the water in the lake will eventually be clean again. The rainwater is the new water and this water will gradually replace the water that is already in the lake. Ask the girls how long they think it would take for this to happen? For small lakes it will take about 10 years and for bigger lakes it will take over 200 years.
4. Explain to the girls that renewal time refers to the amount of time it takes for "new" water to replace all of the existing lake water.
5. To demonstrate renewal time in this activity, add water to the second clear jar ("clean water jar"). The water in the second jar will represent new water (e.g. rainwater, groundwater, and water from runoff from surrounding areas, etc.
6. Hold the "polluted jar" over a large bowl. Carefully pour the water from the "clean water jar" into the "polluted jar", making sure that all the water that flows out will end up in the large bowl. The girls should see that the "pollutant" is slowly being flushed out of the "lake".
7. Ask the girls if they can see the green food colouring (pollutant) in the lake. If they can still see the green food colouring, then do another renewal cycle. Pour another jar-full of clean water into the polluted water jar to flush out the food colouring. It will probably take 3 to 4 times before the girls will no longer see the pollutant.
8. Have the girls examine the water in the bowl. Ask them if the pollutant has been removed from the water? Is it still there? The girls will realize that the pollutant has not been removed, but just displaced into another location (e.g. moved from one lake to another lake). Ask them if they have they actually fixed the problem.

Eco-Message

It is difficult to fix a water pollution problem. Dilution is sometimes used as a solution for pollution, but it takes a long time. This activity gets the girls to consider two concerns related to cleaning the lake of pollutants: 1. Where does the polluted water from a lake go? Does it move into a river or to another lake? 2. Has all the pollutants been flushed from the lake so that the lake water is now considered to be "renewed"?

7. Taster's Choice

Brownies, Guides, Pathfinders

Adapted from an activity in "World of Fresh Water" by the United States Environmental Protection Agency, 1997.

Note: Make sure to tell the girls that using your sense of taste is not a good way to determine whether water is safe to drink. But for the purpose of this activity, all the substances used is safe.

Directions

1. Remove the labels from 6 clear bottles.
2. Label the 6 bottles from 1 to 6.
3. Fill the 6 bottles with different water mixtures:
    - Bottle 1: plain water
    - Bottle 2: carbonated water
    - Bottle 3: water with salt
    - Bottle 4: water with lemon juice
    - Bottle 5: water with sugar
    - Bottle 6: water with artificial flavouring (e.g. vanilla, coconut)

Supplies

- 6 clear bottles
- carbonated water
- salt
- lemon juice
- sugar
- artificial flavouring (e.g. vanilla, coconut, etc.)
- small Dixie cups

4. Make sure that all the water in the 6 bottles look the same so that the girls cannot tell them apart.
5. Explain to the girls that none of the water samples used in this activity are dangerous to drink. They will be asked to drink the 6 water samples.
6. Set the 6 bottles out on a table. Ask the girls which bottle they think has "clean water" (e.g. tap water). Record their answers.
7. Have the girls sample the water from each bottle by pouring a small amount into a Dixie cup. Have another Dixie cup available for the girls to spit in.
8. After everyone has had a chance to sample the drinks, discuss what they found during the activity.
9. Discuss what freshwater (water from lakes) is with the girls.

8. Edible Earth Parfaits

Sparks, Brownies, Guides, Pathfinders

The Groundwater Foundation *has given BC Girl Guides permission to use this educational content for the Eco Pak Challenge. Please visit their website at http://www.groundwater.org/kids/trythis.html to access the original content.*

Supplies

- clear plastic cups
- ice cream scoop
- spoons
- drinking straws
- blue/red food colouring
- vanilla ice cream or fruity sorbet
- clear soda pop
- small gummy bears, chocolate chips, crushed cookies, breakfast cereal, or crushed ice
- variety of coloured cake decoration sprinkles and sugars

Directions

1. Explain to the girls the following terms: groundwater, aquifers. **Groundwater** is rainwater or water from snowmelt that is found in cracks and spaces in soil, sand and rock in the ground. It is stored in **aquifers** (layers of soil, sand and rock). It comes up through a spring or is accessible through lakes and streams.
2. Begin to construct your edible aquifer by filling a clear plastic cup 1/3 full with gummy bears, chocolate chips, or crushed ice (represents sand/gravel)
3. Add enough soda (represents water) to just cover the candy/ice.
4. Add a layer of ice cream to serve as a "confining layer" over the water-filled aquifer.
5. Then add more "sand/gravel" on top of the confining layer.
6. Coloured sugars and sprinkles represent soils and should be sprinkled over the top to create the porous top layer.
7. Now add the food colouring to the soda. The food colouring represents contamination.
8. Watch what happens when it is poured on the top of the aquifer. Point out that the same thing happens when contaminants are spilled on the earth's surface.
9. Using a drinking straw, drill a well into the center of your aquifer.
10. Slowly begin to pump the well by sucking on the straw. Watch the decline in the water table.
11. Notice how the contaminants can get sucked into the well area and end up in the groundwater by leaking through the confining layer.
12. Now recharge your aquifer by adding more soda which represents a rain shower.
13. Review what you have learned as you enjoy eating your edible aquifer.

Eco-Message

Pollutants can get into groundwater in areas where a confining layer is disturbed by a well. Groundwater can be contaminated by landfills, septic tanks, overuse of fertilizers that leach into the ground, and leaky underground gas tanks. If groundwater has been contaminated by pollutants, it is no longer safe to drink. In this activity, the girls get a chance to learn about confining layers, contamination, recharge, and water tables to have a better understanding about aquifers and groundwater.

9. Making Recycled Paper

Guides, Pathfinders

Directions

1. Explain to the girls that it takes about 1 million trees to print a typical newspaper per year. Paper can be made from pulp, hemp, and cotton.
2. Ask the girls to list all the paper products (e.g. toilet paper, tissue paper, paper napkins, paper plates, writing paper, etc.) that they use on a daily basis. Have the girls realize that we only use these paper products for a short time, but it takes a tree decades to grow. Encourage the girls to recycle paper and use products made from recycled paper.
3. The girls will get a chance to make their own recycled paper.
4. Tear some scrap paper or newspaper into tiny pieces and place them into a bucket of hot water. Leave for 30 minutes.
5. Use a wire whisk to beat the mixture. Continue to do this until the pulp is creamy in texture.
6. You may want to add some dye for colour or some leaves for texture.
7. Pour the pulp mixture into a measuring cup.
8. Add some water to the pan so that it is at least 3 cm deep.
9. Place the window screen at the bottom of the pan.
10. Pour one cup of the pulp mixture onto the screen.
11. Use your fingers to spread the pulp mixture so that it is evenly spread out in the water.
12. Lift the screen out of the pan and let the water drain from the screen.
13. Place the screen on some dish towels. Remove the screen, leaving only the pulp behind on the dish towels.
14. Cover the pulp with another dish towel. Use a rolling pin to remove the excess moisture from the pulp mixture.
15. Allow the pulp to sit and dry for 24 hours.

Supplies

- scrap paper or newspaper
- whisk
- hot water
- bucket
- big square pan (5 cm deep)
- mesh window screen that can fit into the square pan
- rolling pin
- measuring cup
- dish towels
- dye
- leaves

10. Oil Spill

Brownies, Guides, Pathfinders

Adapted from Learning Resources – Power of Science – Ecology, 2003.

Directions

Part 1: Creating an Oil Spill

1. Add some water to a bowl.
2. Add 2-3 drops of food colouring to the water.
3. Place a paper clip on the surface of the water.
4. Add a drop of olive oil to the water. Observe what happens to the oil. Does it mix with the water?
5. Observe what happens to the paper clip.
6. Add 5 more drops of oil to the water. Observe what happens.
7. Add 2-3 drops of liquid dishwashing soap to the water. Observe what happens. Where does the oil go? What happens to the layer of oil on top of the water?
8. Discuss the following questions as a group:
    - Do oil and water mix well together?
    - Do oil, water, and soap mix well together?
    - What are the effects of soap on a water-oil mixture?
    - Explain why using soap to clean up an oil spill is not such a good idea?

Supplies

- shallow bowl
- water
- paper clip
- olive oil
- liquid dishwashing soap
- food colouring
- table spoon
- cotton balls
- string
- sponge
- sand
- leaves

Part 2: Cleaning up an Oil Spill

1. Have the girls discuss what they will do to clean up an oil spill. Have them brainstorm and list some priorities of what should be done first.
2. Try to stop the oil from spreading in the pan.
3. Are there materials that you can use to stop the oil from spreading or to contain the oil spill? Have the girls try to keep the oil near the center of the pan.
4. Use the materials provided to “clean up” the oil spill. Try to remove the oil from the water. Think of what materials will be good to soak up the oil from the water.
5. Evaluate how successful you were at cleaning up the oil spill. Determine how much of the oil you removed. Create another oil spill and see how effective you can be in the cleanup. Would you use the same strategies if the oil spill occurred out in the middle of the ocean than if it occurred near a rocky shoreline?

Eco-Message

Oil spills have a huge impact on marine plant and animal life. Fish use their gills to breathe (take in oxygen) and when that water is covered in oil, the fish suffocate

because they are unable to obtain the oxygen that they need to survive. Birds use their wings for flight and insulation. When the feathers on their wings are covered in oil they cannot fly and stay warm. This can make them sick and can result in death.

Oil that washes ashore destroys the habitat of marine animals. Toxic levels of oil can also pass up the food chain, from the primary producers (e.g. kelp) to top consumers (e.g. eagles and hawks).

In calm waters, oil cleanup crews often use big booms to surround the oil slicks to prevent the oil from spreading. They then soak up all the oil. When the water is a lot rougher, the cleanup crews let the waves break up the oil slick. They then add detergent to further break up the oil slick and carry the oil to the bottom. If the oil makes it onto shore, the cleanup crews will wash away the oil using soap and detergent.

11. Plastic Bits 'N Pieces

Guides, Pathfinders

Adapted from Learning Resources – Power of Science – Ecology, 2003.

Directions

1. Using scissors, have the girls cut up the plastic objects into little pieces.
2. Place all the small plastic pieces in a pile on a table.
3. Ask the girls to blow on the pile of plastic. Observe what happens. Did some types of plastics move (e.g. the lighter plastics) while other types of plastics (e.g. the heavier plastics) did not? Notice that not all plastics are the same. List some characteristics that plastics have that can help separate them.
4. Ask the girls to analyze the tools that are in front of them. Consider how the balloon, tape, container, and water can be used to separate the plastics. Can you do something with the balloon to help it attract or pull some plastic objects away from other plastic objects? For example, rubbing a balloon against your hair will electrically charge it. Can you do something with the container (e.g. shake the plastic inside it) to help separate the plastic?
5. Tell the girls that they should try to separate and sort the different types of plastics into different groups.

Supplies

- different types of plastic objects (e.g. sandwich bags, grocery bags, six-pack can holders, packing material, drinking straws, fishing line, etc.)
- scissors
- large container with a lid
- balloon
- tape

12. Groundwater Pollution Experiment

Brownies, Guides, Pathfinders

Directions

1. Fill all three glasses of water about ¾ full.
2. When you do this experiment, place the emphasis on the concept of groundwater and the effects of pollution. Pretend the food colouring is a form of pollution - add about four drops of blue food colouring to the water in one glass and about four drops of red food colouring to the water in the second glass; do not add anything to the water in the third glass. Watch the food colouring swirl and take over the water.
3. Cut the celery stalks about 1 inch from the base of the stalk and then place one into each of the three glasses. Pretend that they are little plants, trees or even people who drink water from the ground.
4. After a few hours, observe the celery. You may need to break off part of the stem to see changes in the veins of the celery. You should be able to see how the "polluted" water has moved up the stalk.
5. Discuss with the girls how pollution in the water affects us all.

Supplies

- 3 glasses to hold water and celery
- water
- 3 celery stalks with leaves
- food colouring (red & blue)
- knife

13. Water, Pure and Simple

Brownies, Guides, Pathfinders

Adapted from Learning Resources – Power of Science – Ecology, 2003.

Directions

1. Instruct the girls to not drink any water during this experiment.
2. To make the “polluted water”, add some water to one jar until it is half full.
3. To the same jar, add 2 spoonfuls of sand, soil, leaves, and twigs. Place the lid on the jar and shake well. Allow the polluted water in the jar to sit for 15 minutes.
4. After 15 minutes, look into the jar and make some observations. What is floating on the surface of the water? What is at the bottom of the jar? The materials at the bottom of the jar are called sludge.
5. Place a screen or piece of cheese cloth over a funnel. Use a rubber band to attach the screen to the funnel.

Supplies

- 2 clear plastic jars with lids
- screen or cheese cloth
- rubber bands
- gravel, sand, and soil
- funnel
- small leaves and twigs
- water

6. Place the funnel over the second jar that is still empty.
7. Carefully pour the dirty water from the first jar into the funnel. Try not to mix the sludge around.
8. Have a discussion with the girls and have them examine the filtered water. What did the screen filter out? Ask the girls if they would consider the filtered water to be clean now.

Eco-Message

Water needs to be filtered and treated to remove dirt and other pollutants before we can drink it. We also need to make sure that our water does not get contaminated with other pollutants.

14. Earth to Earth

Guides, Pathfinders

Adapted from Learning Resources – Power of Science – Ecology, 2003.

Directions

1. Use a pair of scissors to cut 5 cm square pieces from the plastic grocery bag, the paper grocery bag and a sheet of newspaper.
2. Add 125 mL of soil into a plastic sandwich bag. Put a third of each of the three cut up pieces into the plastic grocery bag. Add some more soil to the bag so that the pieces are covered. Add a little bit of water to moisten the soil.
3. Add some water to the plastic container. Put a third of each of the three cut up pieces into the plastic container.
4. Put the rest of the remaining cut up pieces into another plastic sandwich bag.
5. Have the girls predict which of the three containers the Earth Friendly test objects will break down the fastest. Place the test objects in each of the three containers and seal them up.
6. Place all three containers in an area where there is a lot of sunlight. Allow them to stay there for 3 weeks.
7. At the end of the 3 weeks, make some observations (e.g. colour, indications of decay, texture, any physical or chemical changes, etc.).

Supplies

- paper grocery bags
- plastic grocery bags
- newspaper
- plastic sandwich bags
- clear plastic containers
- scissors
- soil from your garden
- water
- measuring cup
- “Earth Friendly” test objects

15. Make an Air Pollution Collector

Guides, Pathfinders

Adapted from Educational Insights – Eco-Detective, 1993

Directions

1. Use a pair of scissors to cut out 4 squares of waxed paper (10 cm x 10 cm).
2. Use a pair of scissors to cut out 4 squares of cardboard (12 cm x 12 cm).
3. Use the masking tape to attach the waxed paper square to the cardboard square.
4. Label and number the top of each cardboard square with “collector #1”, “collector 2”, “collector 3”, and “collector 4”.

Supplies

- masking tape
- 4 squares of waxed paper
- 4 squares of cardboard
- petroleum jelly
- magnifying glass

5. Apply enough petroleum jelly to the waxed paper squares so that they are sticky. These coated squares will be the air pollution collectors.
6. Place the four air pollution collectors in four different locations around your neighborhood/camp. Choose two locations that you think will collect large particles and two locations that will collect only a few particles. Write down the location on the back of the cardboard square.
7. Leave the collectors for several days and go back to retrieve them.
8. Separate the waxed paper from the cardboard piece.
9. Use a magnifying glass to examine what types of particles were collected on each sheet. Discuss with the rest of the group.

Eco-Message

The girls will learn that there are solid particles in the air which will affect the air quality in an area. In major cities, there is more pollution and therefore smog. The poor air quality is not good for the living things in the environment. The girls can help reduce air pollution by walking or biking, rather than driving everywhere. Have them think of other ways they can help with reducing air pollution.

16. Song or Story

Sparks, Brownies, Guides, Pathfinders

Learn a song or read a story about animals, water, nature or recycling.

Some song suggestions from the Arts to Go - Music booklet are included in Appendix F, however you can choose any related song or story.

17. Create an Outside Game

Sparks, Brownies, Guides, Pathfinders

Create an outside game using recyclable materials, such as a mini-golf course, a croquet course or any carnival style game. BE IMAGINATIVE!

18. Endangered Species of BC

Sparks, Brownies, Guides, Pathfinders

Find out what plants and animals are endangered in BC. Choose one species that is threatened or no longer present in your area. Explain (in a story or skit) or illustrate (using a poster), what you think has caused its disappearance and what could be done to encourage its return.

Some websites to start your research on follow:

- Species @ Risk: http://www.speciesatrisk.bc.ca/
- BC Ministry of Environment: http://www.env.gov.bc.ca/atrisk/
- Wilderness Committee: https://wildernesscommittee.org/BCSpecies

TAKING IT OUTSIDE AND ON THE TRAILS

Sparks	Brownies	Guides	Pathfinders	Rangers/Adults
1	2	3	3	3

1. Explore the Outdoors

Sparks, Brownies, Guides

Directions

1. Distribute pencil and plain white paper to the girls. Create a scavenger hunt that the girls can use to discover things in the environment.
2. Have the girls look under a rock, in a log, and behind some moss while making sure not to disturb the surrounding environment. Ask the girls to make note of anything they can observe with their sense of sight and their sense of touch.
3. Use a magnifying glass to carefully observe the surface of various objects in nature (e.g. Bark of a tree, leave on a tree, moss growing on a rock, bugs, worms, etc.). Have the girls make some sketches of what they observed.
4. Have the girls compare the textures and colours of things in nature to that of a plain sheet of paper. Encourage the girls to use their sense of touch to feel things.
5. Take a piece of yarn and place it on the ground. Form a circle and observe everything that is inside the circle.
6. Have the girls place a marble in their hand. Ask them to close their eyes and focus on the environment around them using their sense of hearing. Record their observations on a piece of paper.

Supplies

- magnifying glass
- plastic plate
- textured colour paper
- 30 cm piece of yarn
- marble
- plain white paper
- pencil

2. Neighbourhood Outing

Sparks, Brownies, Guides, Pathfinders

Visit a neighborhood park, stream, lake, marsh, bog, grassland, or forest and learn about the plants and animals that live there. Record what you observe. Have an adventure!

3. Sound Maps

Brownies, Guides, Pathfinders

***CPAWS** has given BC Girl Guides permission to use this educational content from their **Southern Alberta's Education Resources** for the Eco Pak Challenge. Please visit their website at http://cpaws-southernalberta.org/upload/5min_Fieldtrips.pdf to access the original content.*

Directions

Supplies

- pencils
- journals

1. Lead a silent walk in a natural area, such as a large, wooded park. Every time a student hears a natural sound she raises one of her fingers, counting up to ten.
2. When a student hears ten different sounds, he or she stops.
3. When everyone has stopped, they get out their journals. Students should write their name in the middle of a new double page, and draw light lines dividing the two pages into quarters. Tell the students that instead of drawing a regular map they will be drawing a **sound map**.
4. In a bottom corner they should draw the map's key. Each new sound heard will be represented with a symbol and recorded in the key.
5. Ask students to also draw an X and their name in the centre of the map. As each new sound is heard, the symbol is recorded on the map at the where it was heard relative to the X on the map. Have fun making as zany a map as ever was seen!

Discussion

- What happens to the map if you move the 'centre of hearing' (you) to one of the corners of the map? Try drawing it.
- How many people had similar symbols? Why?
- How did you feel about the human sounds you heard? Why?

Eco-Message

The girls will learn that sometimes there are different perspectives for the same situation. The girls will also realize that there are different sounds heard in the city than in an open field in the middle of a forest.

4. Five Minute Fieldtrips

Sparks, Brownies, Guides, Pathfinders

Try one or two of the CPAWS Five Minute Field Trips, not otherwise listed in this resource.

Visit their website at http://cpaws-southernalberta.org/upload/5min_Fieldtrips.pdf to access the original content.

5. Explore the Earth

Sparks, Brownies, Guides, Pathfinders

Go for a short hike to explore the Earth:

1. Collect some rocks and try to identify them, using a field guide on rocks and minerals.
2. Gently turn over a rock to see what lives under it, and then put it back, of course.
3. Check how moist the soil is under plant cover and compare to how moist the soil is on the trail.
4. Talk about how plants help prevent erosion of the soil.

6. Wildlife Protection Fieldtrip

Sparks, Brownies, Guides, Pathfinders

Visit one of the following sites and learn about the role they fulfill in protecting wildlife.

- ❑ tree farm
- ❑ bird sanctuary
- ❑ fish hatchery
- ❑ game farm
- ❑ bird or animal care facility

7. Natural Resource Fieldtrip

Guides, Pathfinders

Visit one of the following sites and learn what measures are being taken by industry and/or government to conserve these resources for future use.

- ❑ sawmill
- ❑ pulp mill
- ❑ smelter
- ❑ mine
- ❑ other site that harvests natural resources

8. Waste Management Fieldtrip

Sparks, Brownies, Guides, Pathfinders

Tour your local landfill or recycling center and answer the following questions.

1. What items belong/ do not belong here?
2. How can we make our world/ environment better?

9. Wonderful Water

Sparks, Brownies, Guides, Pathfinders

1. Name 6 to 12 ways we use water every day.
2. How can we conserve water at home?
3. Try to carry a container of water on your head like many children and women have to do in the world. If you had to carry water for your family, would you be able to go to school?
4. Explore a local stream, pond or lake and have an adventure!

10. Produce Fieldtrip

Sparks, Brownies, Guides, Pathfinders

Tour a local farm that provides local (or organic) produce and answer the following questions.

1. If the food we eat is grown close to home, do we have a better impact on our environment?
2. How do fertilizers affect our food?
3. Try a Map Your Meal activity from the January 2014 FunFinder - Operation Earth Action Issue.

LIVING THE CHALLENGE (SERVICE)

Sparks	Brownies	Guides	Pathfinders	Rangers/Adults
(1-2 hours)	(2-3 hours)	(2-3 hours)	(2-3 hours)	(2-3 hours)

1. Yellow Fish Road

This national conservation education initiative, designed and managed by Trout Unlimited Canada, has participants paint yellow fish at street drains to bring attention to the fact that pollutants on the street will end up in the local body of water. For more information visit http://www.yellowfishroad.org or contact the Ministry of Environment.

2. Habitat Restoration

Contact local environmental groups regarding joining an invasive species pull, or replanting natural wild flowers and plants in sensitive areas.

Learn how to manage invasive species through the Invasive Species Council of British Columbia website at http://www.bcinvasives.ca/.

3. Fish Stream Restoration/Hatchery Programs

Contact the Ministry of Environment or local environmental groups for more information.

4. Animal Shelter Project

Find out what would be appropriate for the species in your area, and build one of the following:

- ❑ birdhouse or bird feeder
- ❑ bat roosting box
- ❑ duck nesting box
- ❑ Mason bee box
- ❑ butterfly house

Put the shelter into use, or donate to a group that will use/ care for project.

5. Community Garden

Establish or assist with the planting and maintaining of a garden at a community garden, seniors' care facility, local church, daycare or park.

6. Recycling Challenge

Participate in a recycling challenge. Search online for recycling challenges near you (https://www.google.ca/#q=recycling+challenge), or create your own challenge.

7. Community or Shoreline Cleanup

Participate in a community cleanup, such as one of the following.

- ❑ Pitch-In (http://www.pitch-in.ca/)
- ❑ Earth Day (http://www.earthday.ca/)
- ❑ Tim Hortons Community Cleanup (http://www.timhortons.com/ca/en/about/media-community.html)
- ❑ Adopt a Road / Street / Highway / Stream
- ❑ Great Canadian Shoreline Cleanup (http://www.shorelinecleanup.ca/)

8. Environmental Service Project

Complete another service project of your choice that meets the spirit of the Eco Pak.

ONLINE RESOURCES

There are a numerous sources of information, community groups, government agencies, non-profit organizations, and environmental resources out there. The following is a list of resources that you may find helpful.

Canadian Model Forest Network	http://www.modelforest.net/cmfn/en/
Canadian Wildlife Federation Educational Resources	http://cwf-fcf.org/en/discover-wildlife/resources/educational-resources.html
CPAWS Canadian Parks and Wilderness Society – Southern Alberta Chapter	http://cpaws-southernalberta.org/campaigns/education
Earth Day Canada	http://www.earthday.ca
Eco Kids Earth Day Canada	http://www.ecokids.ca/
Environment Canada	http://www.ec.gc.ca/
Fisheries and Oceans Canada	http://www.dfo-mpo.gc.ca/
Global, Environmental and Outdoor Education Council Large list of online resources.	http://www.geoec.org/resources/index.html
Government of Alberta Environmental Education	http://environment.gov.ab.ca/edu/homeEd.asp
Great Canadian Shoreline Cleanup	http://www.shorelinecleanup.ca/
The Groundwater Foundation Kids' Corner activities	http://www.groundwater.org/kids/
Invasive Species Council of British Columbia	http://www.bcinvasives.ca/
Langley Environmental Partners Society (LEPS)	http://www.leps.bc.ca/resources
Pitch-In Canada	http://www.pitch-in.ca
Project Wet Water education	http://www.projectwet.org/
Project Wild Wildlife conservation education	http://www.projectwild.org/
Sierra Club BC Resources and Tools	http://www.sierraclub.bc.ca/education/resources-tools
United States Environmental Protection Agency	http://www.epa.gov/
Yellow Fish Road	http://www.yellowfishroad.org/

PROGRAM CONNECTIONS

Below is a list of potential program connections for each Guiding level. See how the activities that you choose apply to the suggested connections below. This is not a comprehensive list, feel free to apply your activities to other parts of the program as you see fit. Remember that each activity you complete can accomplish multiple parts of the program.

Sparks

Going Outside Keeper

In My Community Keeper

Brownies

Key to My Community
1. My Neighbourhood
Community Counts interest badge

Key to the Living World
1. Wondrous Walks
2. Plant Life
3. Water All Around
4. Celebrate Earth Day
5. Reduce! Recycle! Reuse!
6. Weather Watch
7. Seasons Come and Go
Terrific Trash interest badge
Grow Your Garden interest badge
Bird Watcher interest badge
Saving Our Plants and Animals interest badge
Help Our Planet interest badge
Water, Water Everywhere interest badge

Key to Camping
Happy Hiking interest badge
Team Together interest badge

Key to the Arts
I Can Be interest badge
Super Crafts interest badge

Key to Active Living
2. Outdoor Action
Go For It! interest badge
Food Power interest badge

Key to Girl Guides
Taking Part interest badge
Saving Water interest badge

Guides

Community Service Badge
Green Connection

You in Guiding: Be Involved in Your Community
1. Learn about a local community issue.
4. Participate in a Green Connection service project.
6. Complete any activity of your choice.

You and Others: Learn About Leadership in a Group
2. Play a game that explores how groups work together.
3. Design and lead an activity that can be done on an outing.

You and Others: Personal Growth interest badges
Recycling

Beyond You: Explore the Outdoors and Nature
1. Find five things in nature that interest you.
6. Complete an activity of your choice that takes you outdoors.

Beyond You: Learn about the Environment
1. Explore the environment.
2. Learn about an organization or person who is a leader in promoting a healthy environment.
3. Learn about water.
4. Explore plants, animals, insects, etc. in their natural environment.
6. Complete an activity of your choice to demonstrate what you've learned about the environment.

Beyond You: Fun in the Outdoors interest badges

Bird Watching	Hiking
Conservation	Naturalist
Ecology	Outdoor Adventures
Endangered Species	Outdoors in the City
Farming	Water
Forestry	Wildflower
Gardening	

Beyond You: Science and Technology interest badges

Chemistry	Science
Plants and Animals	Weather

Pathfinders

Finding the Path: Choosing Your Own Direction
5. Plan and participate in a community service project.

Finding the Path: Bridging the Gap
5. Organize and play outdoor games.

Pathfinders (continued)

Finding the Path: Beyond Pathfinders
5. Work with Rangers on a community service project.

Creating Your Future: We're a Team!
1. Do an icebreaker activity.
3. Team up to serve others.
4. Play team games.

Creating Your Future: Lending a Hand
1. Investigate a nonprofit environmental group and get involved.
2. Investigate a corporately sponsored environmental initiative and get involved.
6. Plan and participate in a service project.

Creating Your Future: Be a Model Citizen
Provide service on an issue that is important to you.

Let's Take it Outside: Outdoor Know-How
1. Plan a day trip away from civilization.
7. Follow the Leave No Trace organization's seven principles.

Let's Take it Outside: Out on the Trails
6. Plan and go on an outdoor day trip.
9. Go on an outdoor adventure.

Let's Take it Outside: Winter Wonderland
10. Learn about polar bears and emperor penguins.

Let's Take it Outside: Up Close and Personal with Nature
1. Examine a fallen log.
2. Explore plant and animal life.
3. Investigate a pond, stream or tidal pool.
4. Discover uses of some wild plants.
5. Identify local plants that can be harmful.
6. Identify trees or shrubs in your area.
7. Go bird watching.
8. Make a bird feeing station.
9. Find out about invasive species (mammals, birds, insects, plants) in your area.
10. Learn about an endangered species.
12. Visit a botanical garden, aquarium, wildlife park or zoo.
13. Invite someone to your meeting who works for the natural environment.

A World to Discover: What's Up Around the World?
4. Discuss the importance of clean water.
9. Find out how the changing environment is affecting life in other countries.

Living Well: We Are What We Eat
Additional activity: produce fieldtrip

Pathfinders (continued)

Exploring a Theme: Web Surfin'
2. Use a search engine to help find information.

Exploring a Theme: Creating a Garden
Community garden – all parts of this module.

Exploring a Theme: Everything Comes from STEM
1. Use the scientific method.
4. Invite someone who works in scientific research to talk to you.

Exploring a Theme: Our Environment
All parts of this module.

Rangers

Celebrate Guiding
12. Inspiring Others
15. The Guiding Movement
17. Get Up and Have Fun
19. Let's Get Serious
23. Making a Difference

Community Connections
3. Take a Closer Look
5. Raise Your Voice
8. Students Speak Out
19. Spruce it Up
20. Influence Others
22. Volunteerism
26. Community Challenges

Environment, Outdoors and Camping
1. Shopping and the Environment
2. Reduce, Reuse, Recycle
3. Energy Check
4. Falling from the Sky
5. A Life Outdoors
6. Our Local Environment
7. Take a Hike
8. Going Natural
9. Get Creative
10. Get Involved
11. Slipping Away
12. Protecting Our Natural Resources
13. Water, Water Everywhere
14. Urban Wildlife
23. Natural vs. Unnatural
24. Are We Almost There?
25. For the Birds
26. To Camp or Not to Camp

Rangers (continued)

Global Awareness
5. First, Second, Third
17. What Matters to You
24. What's Fair?
26. I'm So Hungry
27. Ecotourism

Healthy Living
16. Eating Local
18. Down on the Farm
19. Going Organic
31. H2O

Leadership and Management
2. Leading Children

When you have fulfilled the requirements, complete the **BC Crests Order Form** found on the BC Girl Guides website http://www.bc-girlguides.org/ (click on Program > Challenges & Activities > Provincial Challenges). Instructions on how to order the crests are provided on the form.

APPENDIX A: ENVIRONMENT JEOPARDY

The following pages can be printed to use for the Environment Jeopardy Game.

Category Headings (1 per page)

Score/Answer Cards (1 per page, folded)

Final Jeopardy Card (folded)

Summary of all Questions and Answers.

Eco Acronyms

Air and Atmosphere

Fast Facts

Sustainability

Pollution

100

RRR

ZOO

CFC

ƎOO

PCB

400

DFO

500

NIMBY

Air / Atmosphere

001

A

component

of air.

200

The gas in the atmosphere, which saves us from the UV rays from the sun.

Air / Atmosphere

300

An unwanted chemical or other material found in the air is called this.

400

This type of car runs on gas and electricity and is cleaner than regular cars.

500

Also known as Global Warming.

100

85% of the countries in the world participate in this April 22nd celebration.

200

You can find one quarter of the world's temperate rainforest in this province.

300

According to the World Wildlife Fund, this is how often one acre of wilderness is destroyed.

(once every 15 seconds, once a minute, once an hour)

400

Paper made from this crop can be recycled 7 to 8 times (unlike wood pulp, which can only be recycled 3 times).

500

How often Earth loses an entire animal or plant species.

(once every 20 minutes, once an hour, once a day, once a week)

100

These are two modes of environmentally friendly transportation.

200

Although it covers 70% of the Earth, only 0.5% of this resource is used by humans.

300

Using this household "appliance" just once uses as much water as the average person in a developing country uses in a day.

400

This source of clean energy is powerful enough to take the place of every fossil fuel in every way.

500

How many planets would we need to provide an adequate supply of natural resources if everyone lived like the average Canadian. (1, 4 or 10)

100

This item could be reused, but it is normally thrown away.

Pollution

200

A physical process mistakenly suggested as the "solution for pollution".

Pollution

300

The distribution/spilling of this substance into water is often deadly for seabirds.

Pollution

400

This type of pollutant causes acidification of the rivers, lakes and also damages tree foliage and degrades soil quality.

Pollution

500

This gas is produced mainly by automobiles.

Jeopardy

Final

This book by Dr. Seuss is about the Once-ler that chopped down all the Truffula trees causing all sorts of pollution.

ENVIRONMENT JEOPARDY SUMMARY

Eco-Acronyms Category

A: RRR
Q: Reduce Reuse Recycle

A: CFC
Q: Chlorofluorocarbons

A: PCB
Q: Polychlorinated biphenyls

A: DFO
Q: Department of Fisheries and Oceans

A: NIMBY
Q: Not In My Back Yard

Air and Atmosphere Category

A: An unwanted chemical or other material found in the air is called this
Q: Air Pollution

A: A component of air
Q: Carbon Dioxide, Oxygen, Nitrogen

A: The gas in the atmosphere, which saves us from the UV rays from the sun
Q: Ozone

A: Also known as “Global Warming”
Q: Greenhouse Effect

A: This type of car runs on gas and electricity and is cleaner than regular cars
Q: Hybrid

Fast Facts Category

A: 85% of the countries in the world participate in this April 22nd celebration
Q: Earth Day

A: You can find one quarter of the world’s temperate rainforest in this province
Q: British Columbia

A: According to the World Wildlife Fund, how often is one acre of wilderness destroyed (once every 15seconds, once a minute, once an hour)
Q: 15 seconds

A: Paper made from this crop can be recycled 7-8 times (unlike wood pulp which can only be recycled about 3 times)
Q: Hemp

A: How often does Earth lose an entire animal or plant species (every 20 minutes, once an hour, once a day, once a week)
Q: 20 minutes

Sustainability Category

A: These are two modes of environmentally friendly transportation
Q: Biking, walking, running, rollerblading, carpooling, public transportation, etc.

A: Although it covers 70% of the earth, only 0.5% of this resource is usable by humans
Q: Water

A: Using this household ‘appliance’ just once uses as much water as the average person in a developing country uses in a day
Q: Flushing the toilet

A: This source of clean energy is powerful enough to take the place of every fossil fuel in every way that it is used
Q: Sun

A: If everyone on earth lived like the average Canadian, how many planets would we need to provide an adequate supply of natural resources (1, 4 or 10)
Q: 4

ENVIRONMENT JEOPARDY SUMMARY

Pollution Category	Final Jeopardy
A: A physical process mistakenly suggested as the 'solution for pollution' **Q:** Dilution **A:** The distribution/spilling of this substance into water is often deadly for seabirds (destroys the structure of their feathers) **Q:** Oil **A:** This type of pollutant causes acidification of rivers, lakes and also damages tree foliage and degrades soil quality. **Q:** Acid Rain **A:** This gas is produced mainly by automobiles (It hiders the body's ability to carry oxygen in the blood, causing serious problems for people with cardiovascular diseases) **Q:** Carbon Monoxide **A:** This item(s) could be reused, but it **is** normally thrown away. **Q:** Plastic bag, yoghurt container, glass bottle, etc.	**A:** This book by Dr. Suess is about the Once-ler that chopped down all the Truffula trees causing all sorts of pollution **Q:** What is "The Lorax"

APPENDIX B: ENVIRONMENT WORD SEARCHES

The following word searches are included in this appendix:

- Air quality
- Climate change
- Ecosystems
- Recycling

Air Quality Word Search

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

ALLERGY
AMBIENT
ASBESTOS
ASTHMA
ATMOSPHERE
ATOMS
BENZENE
COMBUSTION
CONTAMINANTS
ELEMENTS
EMISSIONS
ENERGY
HUMIDITY
INVERSION
LEADLUNGS
MILDEW
MOLD
OXYGEN
OZONE
PARTICULATES
PESTICIDES
POLLUTION
RADIATION
RESPIRATION
SMOG
TEMPERATURE
VOCS

Climate Change Word Search

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

AEROSOLS
BIOMASS
CLIMATE
DROUGHT
EMISSION
FORESTS
FOSSIL FUEL
GLACIERS
GLOBAL WARMING
GREENHOUSE GAS
HYDOCARBON
METHANE
OZONE
PRECIPITATION
RAINFALL
SEALEVEL
SNOWFALL
STRATOSPHERE
TEMPERATURE
ULTRAVIOLET
WEATHER

Ecosystem Word Search

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

AIR
ANIMAL
BACTERIA
CARBON DIOXIDE
CARNIVORE
COMMUNITY
CONSUMERS
DECOMPOSERS
ECOSYSTEM
ENDANGERED
ENERGY
ENVIRONMENT
FOOD CHAIN
HABITAT
HERBIVORE
LANDFORM
OMNIVORE
OXYGEN
PLANT
POPULATION
PREDATOR
PREY
PRODUCERS
SCAVENGERS
SOIL
SUN
TEMPERATURE
WATER

Recycling Word Search

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

ALUMINUM
BOTTLES
CANS
CARDBOARD
COMPOST
CONSERVE
ENVIRONMENT
GLASS
LANDFILL
LITTERING
OIL
PAPER
PLASTIC
RECYCLE
REDUCE
RESOURCES
REUSE
STEEL
TREES
WASTE
WOOD

APPENDIX C: ENVIRONMENT BINGO

For Older Girls – Environment Words

The list of terms on the next page are some examples of words that be used to fill the blank Environment BINGO Game. Go over the meanings of the words with the girls first, then give them the list and a blank BINGO card so they can fill in their own cards. They will not be able to use all the words!

For Younger Girls – Environment Pictures

Make several copies of the environment pictures. Cut the pictures apart and have the girls use a glue stick to attach them onto the blank BINGO card. They will not be able to use all of the pictures!

Mingle BINGO

Each girl receives the same Mingle BINGO card.

Environment Words

Adaptation: when a plant or animal changes so that it can better survive in its environment.

Air: the invisible gas that surrounds us on Earth; people and animals breathe air.

Atmosphere: the layer of air that surrounds the Earth.

Biodegradable: can be decomposed by natural methods.

Biodiversity: when there is a large variety of plants and animals in an environment.

Biologist: someone who studies things that are alive.

Carbon dioxide: a gas that is produced by breathing out and when fuels burn; plants use it for energy.

Carnivore: an animal that eats animals (meat).

Climate: weather conditions.

Compost: decayed plants.

Conservation: carefully using our natural resources by protecting, preserving and restoring them.

Ecology: how living things relate to their environment.

Ecosystem: everything in an environment: includes both living and non-living things.

Endangered: a plant or animal that is rare, and could die out entirely.

Environment: the natural world.

Extinct: something that was once alive but no longer exists.

Global warming: the increase in the world's temperature.

Groundwater: water that is under the surface of the earth.

Habitat: the place where a plant or animal lives.

Herbivore: an animal that only eats plants.

Landfill: a place where garbage is buried.

Migration: when birds, fish or other animals move from one area to another.

Ocean: salt water that covers a lot of the Earth's surface.

Omnivore: an animal that eats both plants and animals.

Organism: a living thing.

Ozone: a form of oxygen that is found high in the atmosphere. It protects us by stopping many of the Sun's ultra-violet rays from getting to the Earth.

Pollution: things that make our environment dirty.

Predator: an animal that kills and eats other animals.

Preserve: to keep the environment in good condition.

Prey: an animal that is hunted and eaten by other animals.

Protection: keeping something safe from harm or destruction.

Rainwater: water that falls as rain.

Recycle: to treat something that has been discarded so it can be made into something new and used again.

Renewable: something that can be replaced by nature.

Shelter: a place that provides protection for animals.

Stewardship: protecting and taking care of something, such as the environment.

Survival: being able to live even in difficult conditions.

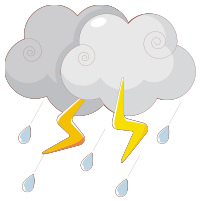
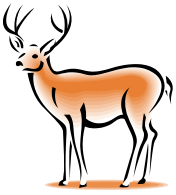
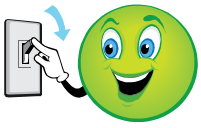
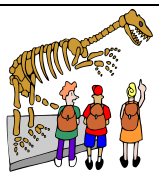
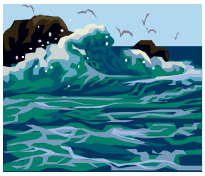
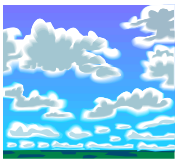
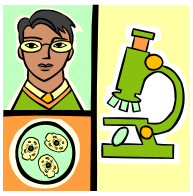
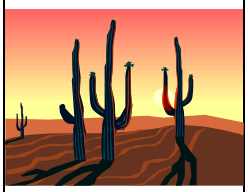
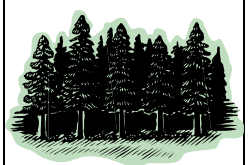
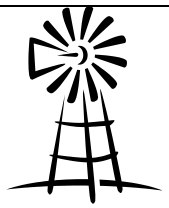
Sustainable: when an ecosystem can continue indefinitely without depleting resources.

Waste: garbage.

Water: the liquid that all plants & animals need to survive.

Wilderness: a natural area where there are either very few or no people.

Environment Pictures

 thundercloud	 carnivore (tiger)	 Earth	 stewardship	 recycle bin	 recycle symbol
 trees	 flower	 plant	 garden	 wilderness	 recycle bag
 shelter (nest)	 herbivore (deer)	 conservation (lights off)	 omnivore (bear)	 herbivore (squirrel)	 herbivore (rabbit)
 birds migrate	 pollution	 waste	 water	 extinct (dinosaur)	 endangered (sea turtle)
 rainwater	 predator (eagle)	 prey (mouse)	 habitat (ocean)	 atmosphere (sky)	 endangered (whale)
 biologist	 global warming	 carbon dioxide (breathing out)	 insect (bee)	 shelter (beehive)	 habitat (pond)
 habitat (desert)	 habitat (marsh)	 carnivore (cougar)	 habitat (forest)	 air (windmill)	 sun

Environment BINGO Card

B I N G O

		FREE SPACE		

To win: make a line – either across, down or diagonal
or play blackout BINGO!

Mingle

B I N G O

Has done a water experiment.	Recycles at home.	Has been to a desert habitat.	Knows when Earth Day is.	Can name a renewable resource.
Has planted a tree.	Knows what an omnivore is and can tell you one.	Has participated in a community cleanup.	Has seen a beaver dam (shelter).	Takes the bus to school.
Uses reusable containers for her lunch.	Walks to school.	**FREE SPACE**	Has made something with recycled objects.	Has grown something in a garden.
Knows what Yellow Fish Road is.	Has been to a forest habitat.	Has built an animal habitat (i.e. bat box or other habitat)	Has been to the ocean.	Composts at home.
Has visited a wetland.	Has seen a bird nest (shelter).	Can name a predator and its prey.	Likes to hike.	Has participated in a shoreline cleanup.

Find someone to answer and sign off on each square above –
you need to find a different person for each square!

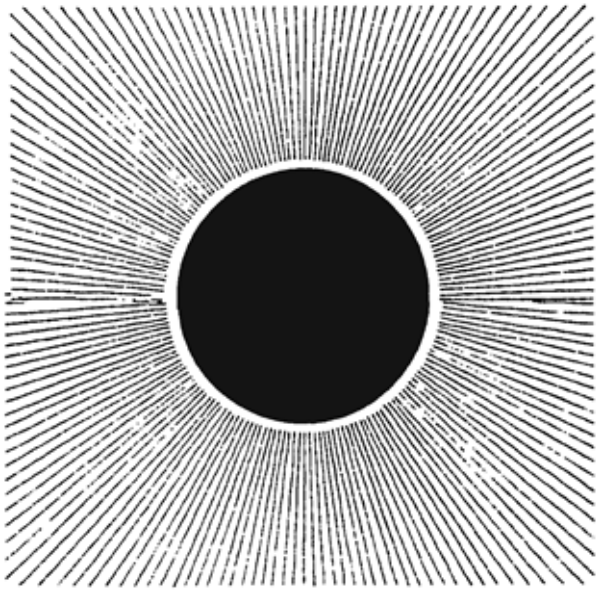
APPENDIX D: WHO AM I? CARDS

CPAWS *has given BC Girl Guides permission to use this educational content from their* ***Southern Alberta's Education Resources*** *for the Eco Pak Challenge. Please visit their website at http://cpaws-southernalberta.org/upload/Who_am_I.pdf to access the original content.*

The following cards are used for the Who Am I? and Weird Webs activities, included in the Hands on Learning section of the Eco Pak. These cards are best laminated before using.

Grizzly bear

Wolf

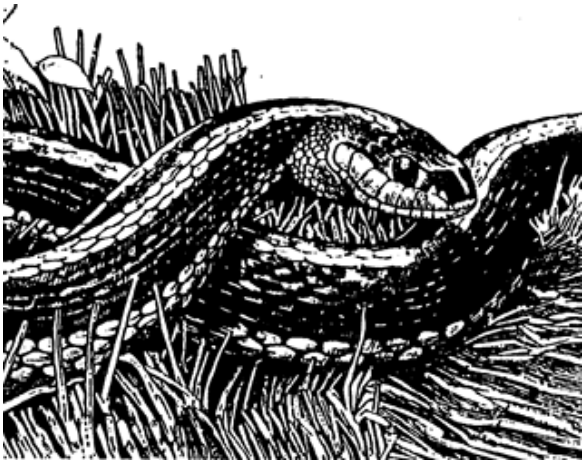


Sun

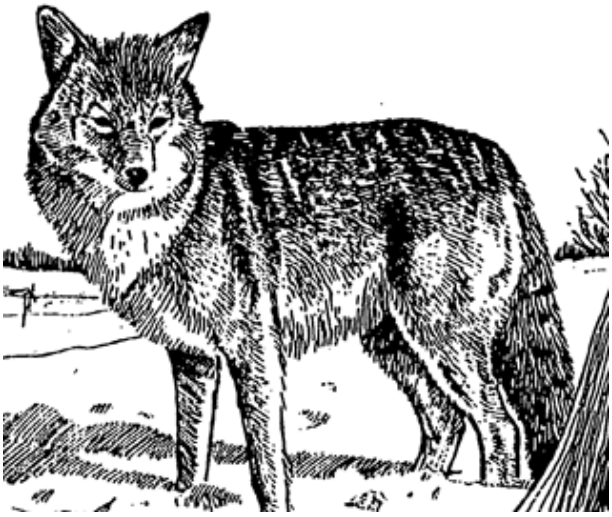
Squirrel

Bush

Flower

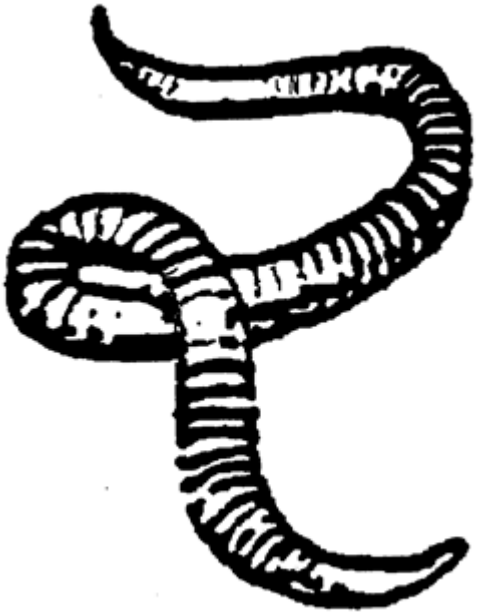


Snake

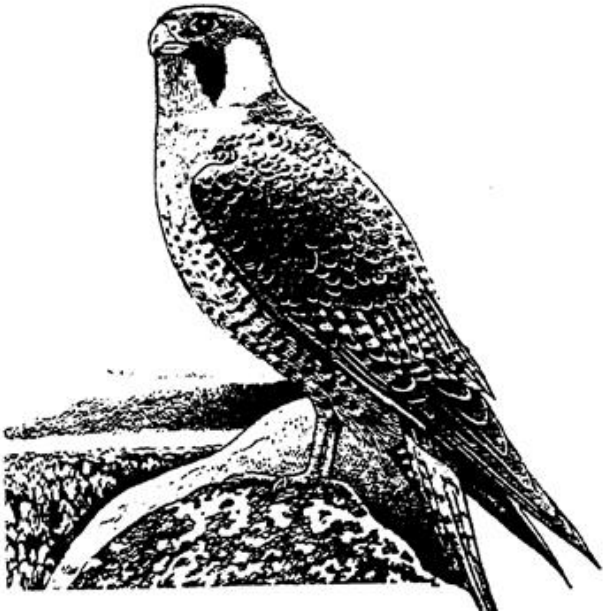


Coyote

Moose

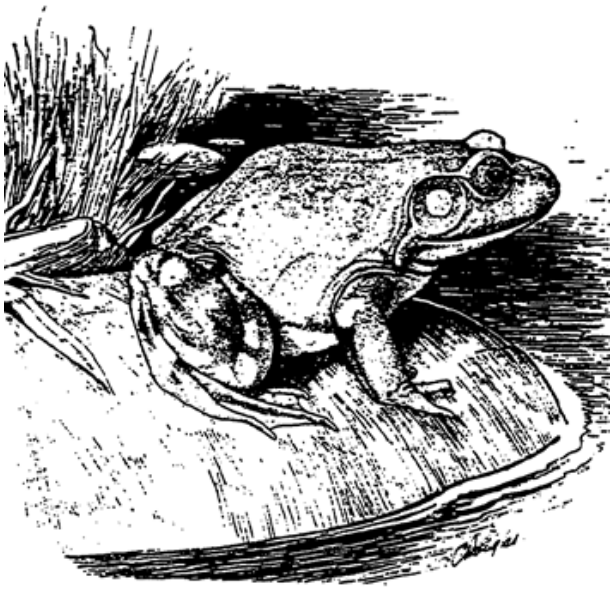


Worm



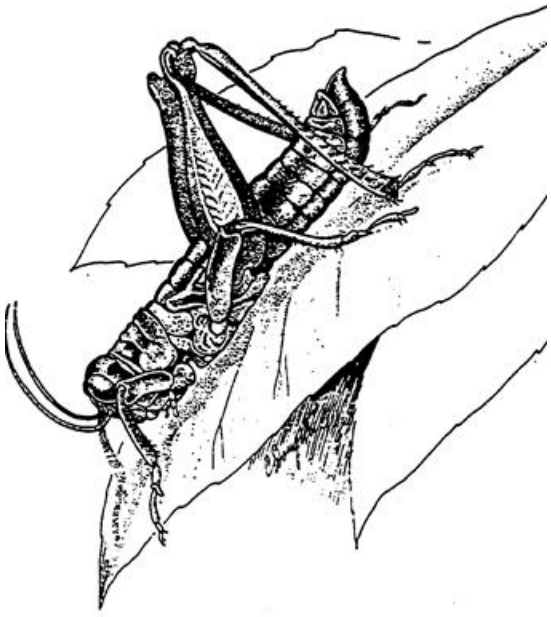
Peregrine falcon

Beaver



Frog

Grass



Grasshopper

Ground squirrel

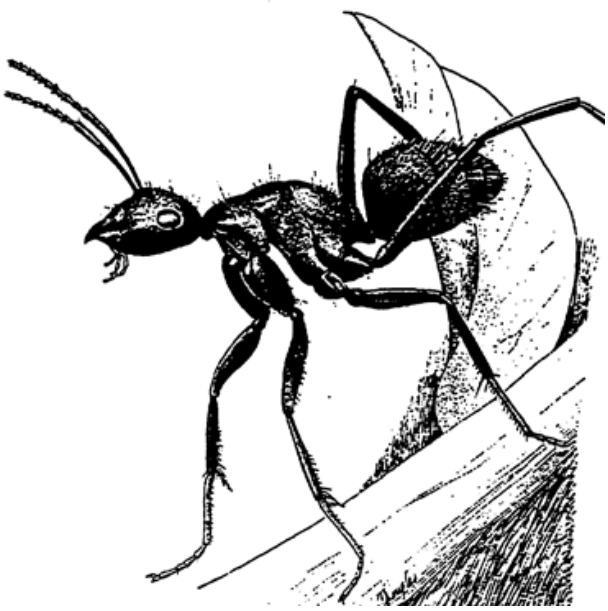
Human

Crow

Poplar tree

Elk

Cougar

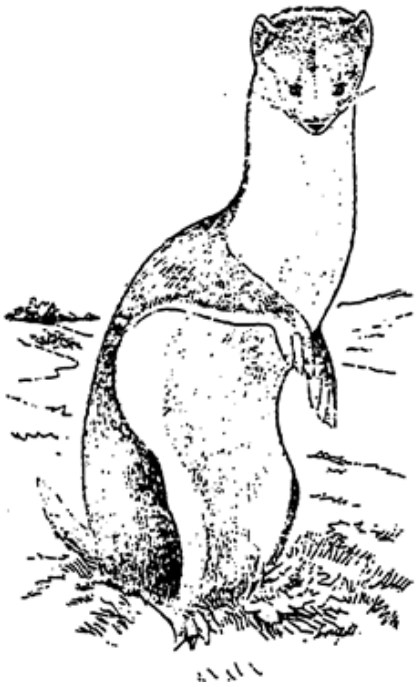


Ant

Pine tree

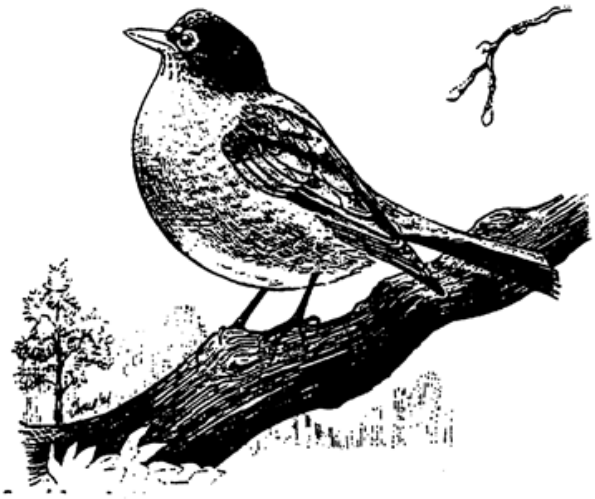
Bee

Porcupine



Weasel

Warbler



Robin

Aquatic Plants

Water Boatman

Dragonfly Larva

Caddisfly Larva

APPENDIX E: MAKE A TREE CUE CARDS

__CPAWS__ has given BC Girl Guides permission to use this educational content from their __Southern Alberta's Education Resources__ for the Eco Pak Challenge. Please visit their website at http://cpaws-southernalberta.org/upload/5min_Fieldtrips.pdf to access the original content.

HEARTWOOD We are the inner core of the tree, the heartwood. (Flex arm muscles.) Heartwood is strong enough to hold the trunk and branches up so each leaf can get the sun's energy. Heartwood is the oldest part of the tree, so old, it's... DEAD. When the tree was young, the heartwood was alive.	**TAP ROOT** We are the tap root. We are planted deep in the soil, up to ten meters down. We hold the tree in place during fierce winds, and suck up the water from deep within the ground. Not all trees have a tap root, some just have lateral roots.
LATERAL ROOTS We are the lateral roots, and there are hundreds and hundreds of us. We grow outward all around the tree in the ground. At our tips we have thousands of root hairs covering just about every particle of soil around. When the root hairs sense water is nearby, their cells grow towards the water so they can suck it up.	**XYLEM** We are the xylem, or water tubes. We draw water up from the roots, lifting it to each of the tree's branches. We lift hundreds of litres a day, at speeds of over 150 kilometres an hour! After the roots draw the water into the tree, the job of xylem is to bring the water up the tree.
PHLOEM We are the phloem, or food tubes. We are the part of the tree that carries the food made by leaves to every part of the tree. These are our leaves.	**OUTERBARK** We are the outer bark. We protect the tree from fire, insects, extreme temperature changes and people who want to scratch us with knives.

APPENDIX F: SONG LINKS

Following are online links to some songs related to animals, water, nature or recycling. You are welcome to substitute your own songs relating to these themes.

Note 1: BC Girl Guides is not responsible for the content or accuracy of the links below. Furthermore, BC Girl Guides does not endorse or favour any of the websites linked to below. These links are provided as a reference to help Guiders learn the songs.

Note 2: Online sources are not always reliable, so if a link is broken, use a search engine to try and locate the song you are looking for.

Song Title	Lyrics	Music
A Place in the Choir	http://dragon.sleepdeprived.ca/songbook/songs12/S12_1.htm	http://youtu.be/aqm-S9J1s_k
Animal Fair	http://dragon.sleepdeprived.ca/songbook/songs2/s2_29.htm	http://back.numachi.com:8000/dtrad/midi/ANIMFAIR.midi
Breton Fisherman's Prayer	http://dragon.sleepdeprived.ca/songbook/songs8/S8_25.htm	http://tuneguide.e-guiding.com/breton.mp3
Chinese Fishermen's Song	http://guidingjewels.ca/resources/songs/579-song-chinese-fishermen-s-song-bai-lang-tao-tao	http://tuneguide.e-guiding.com/chinesefish.mp3
Cuckoo	http://guidingjewels.ca/resources/songs/532-song-the-cuckoo	http://peninsulaguides.webs.com/guidesongs.htm
Farewell to Nova Scotia	http://dragon.sleepdeprived.ca/songbook/songs9/S9_17.htm	http://tuneguide.e-guiding.com/farewell-to-ns.mp3
First Tulip	http://guidingjewels.ca/resources/songs/605-song-first-tulip-the	http://guidingjewels.ca/resources/songs/605-song-first-tulip-the
Five Chartreuse Buzzards	http://www.outdoorschool.org/songchartreuse.html	http://www.youtube.com/watch?v=cpTSrORfgDI
For This is British Columbia	http://guidingjewels.ca/resources/songs/576-song-for-this-is-british-columbia	http://guidingjewels.ca/resources/songs/576-song-for-this-is-british-columbia
Frogs, The	http://guidingjewels.ca/resources/songs/533-song-the-frogs	http://guidingjewels.ca/resources/songs/533-song-the-frogs
Hindi Song	http://guidingjewels.ca/resources/songs/608-song-hindi-song	http://guidingjewels.ca/resources/songs/608-song-hindi-song
I Can Make a Difference	http://guidingjewels.ca/resources/songs/512-song-i-can-make-a-difference	http://tuneguide.e-guiding.com/difference.mp3
I Like the Flowers	http://guidingjewels.ca/resources/songs/574-song-i-like-the-flowers	http://peninsulaguides.webs.com/guidesongs.htm
If You Should Meet an Elephant	http://guidingjewels.ca/resources/songs/515-song-if-you-should-meet-an-elephant	http://tuneguide.e-guiding.com/elephant.mp3
Irish Blessing	http://guidingjewels.ca/resources/songs/573-song-an-irish-blessing	http://tuneguide.e-guiding.com/irish.mp3
It's a Small World	http://dragon.sleepdeprived.ca/songbook/songs1/s1_14.htm	http://tuneguide.e-guiding.com/small.mp3
It's Raining, It's Pouring	http://www.songsforteaching.com/nurseryrhymes/itsraningitspouring.php	http://www.youtube.com/watch?v=kmvHYT7glAQ

Song Title	Lyrics	Music
Kookaburra	http://www.kididdles.com/lyrics/k003.html	http://www.youtube.com/watch?v=t3M3hkWpkHw
Land of the Silver Birch	http://guidingjewels.ca/resources/songs/516-song-land-of-the-silver-birch	http://tuneguide.e-guiding.com/Land-of-the-Silver-Birch.mp3
Listen to the Earth	http://guidingjewels.ca/resources/songs/572-song-listen-to-the-earth	http://tuneguide.e-guiding.com/listen.mp3
Little Drop of Dew	http://www.kauthcampsalumni.com/songsTGen3.htm	http://www.youtube.com/watch?v=WEBTHou-7yo
Little Green Frog	http://dragon.sleepdeprived.ca/songbook/songs3/S3_20.htm	http://www.youtube.com/watch?v=dki50rmJV9A
Mr. Sun, Please Shine Down on Me	http://www.songsforteaching.com/folk/ohmrsun.php	http://www.youtube.com/watch?v=FwOomEMSxC0
Prayer to Gitchi Manitou	http://guidingjewels.ca/resources/songs/571-song-prayer-to-gitchi-manitou	http://guidingjewels.ca/resources/songs/571-song-prayer-to-gitchi-manitou
Rain Song	http://guidingjewels.ca/resources/songs/553-song-rain-song	http://guidingjewels.ca/resources/songs/553-song-rain-song
Raindrop Round	http://www.scribd.com/doc/85829/tons-of-GS-songs-688-pages	http://tuneguide.e-guiding.com/raindrop.mp3
Row, Row, Row Your Boat	http://dragon.sleepdeprived.ca/songbook/songs2/s2_25.htm	http://www.kidsongs.com/lyrics/row-row-row-your-boat.html
Sing a Song of Canada	http://guidingjewels.ca/resources/songs/598-song-sing-a-song-of-canada	http://guidingjewels.ca/resources/songs/598-song-sing-a-song-of-canada
Squirrel	http://guidingjewels.ca/resources/songs/529-song-squirrel-squirrel	http://tuneguide.e-guiding.com/squirrel.mp3
Sweetly Sings the Donkey	http://guidingjewels.ca/resources/songs/530-song-sweetly-sings-the-donkey	http://guidingjewels.ca/resources/songs/530-song-sweetly-sings-the-donkey
Swimming Hole	http://guidingjewels.ca/resources/songs/531-song-swimming-hole	http://guidingjewels.ca/resources/songs/531-song-swimming-hole
Tall Trees	http://guidingjewels.ca/resources/songs/593-song-tall-trees	http://tuneguide.e-guiding.com/tall-trees.mp3
They All Call it Canada	http://dragon.sleepdeprived.ca/songbook/songs9/S9_27.htm	http://tuneguide.e-guiding.com/canada.mp3
Tingalayo	http://guidingjewels.ca/resources/songs/538-song-tingalayo	http://guidingjewels.ca/resources/songs/538-song-tingalayo
Walk Around	http://guidingjewels.ca/resources/songs/599-song-walk-around	http://tuneguide.e-guiding.com/walkaround.mp3
We Want the Sunshine	http://guidingjewels.ca/resources/songs/566-song-we-want-the-sunshine	http://tuneguide.e-guiding.com/sunshine.mp3
Whippoorwill	http://guidingjewels.ca/resources/songs/595-song-whippoorwill	http://guidingjewels.ca/resources/songs/595-song-whippoorwill
White Coral Bells	http://guidingjewels.ca/resources/songs/617-song-white-coral-bells	http://tuneguide.e-guiding.com/white.mp3