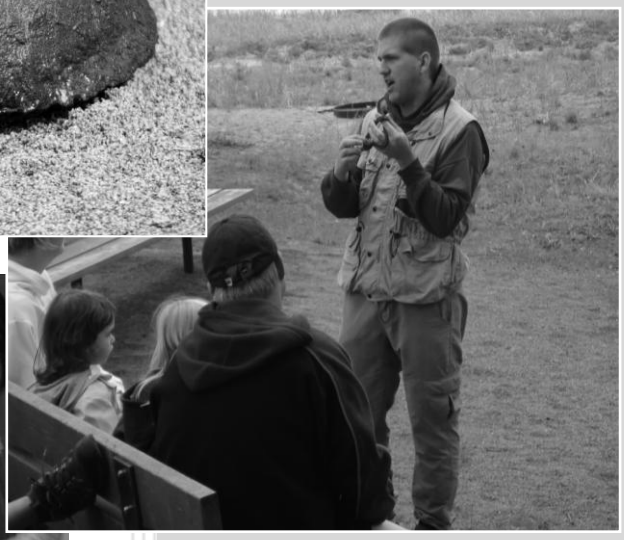
2009

Reptiles at Risk: Curriculum Activities



Developed for the
Reptiles at Risk on the Road Project
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Curriculum activity development: Heather Carscadden, Jeff Hathaway, Kyle Horner, Mary Ellen Peckham

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Sciensational Sssnakes!! co-founder Jenny Pearce, for her devotion to the cause of reptile conservation, and support of the Reptiles at Risk on the Road project activities.

For their tremendous support of all our efforts: Colin and Dolores Hathaway, and Glen and Betty Pearce

And a large number of sometimes anonymous people who helped out by volunteering at programs, giving advice, making connections, feeding us dinner, giving us a place to stay, and towing or repairing our van when it broke down- a big thank you to all of the helpful Canadians we have met along the way!

Cover Photos: (Clockwise from top) Blanding's Turtle, a threatened species, Lake Superior Provincial Park Presentation, A program participant holding an endangered Eastern Foxsnake.
Photo Credits: (Clockwise from top) Jeff Hathaway, Heather Carscadden, Jeff Hathaway

Contents

Reptiles at Risk on the Road Project Background

Sciensational Sssnakes!! has presented exciting hands-on programs about reptiles since 1994. We are the oldest reptile-focused wildlife education program in Ontario. In 2004, while touring northern Ontario, the concept of a cross-Canada project was born. The intent was to reach very specific areas of our country, where concentrations of wild reptiles are found, with messages of awareness and conservation. Two years later, in partnership with Laurentian University and the Canadian Amphibian and Reptile Conservation Network, this idea became reality and programs were conducted across the prairies during the summer. The east coast was our destination during the summer of 2007, and this program tour included our first French-language programs in Quebec. The summer of 2008 saw the completion of the original cross-Canada concept, as we toured all the way from Ontario to Vancouver Island and back. It has been an incredible experience!

In addition to these summer program tours, extensive activity was undertaken in Ontario during the fall and winter seasons. Hundreds of school programs were delivered in target regions that are home to species at risk reptiles. We began an on-going evaluation of what participants actually learn from our programs. Using before and after surveys, we assess both knowledge and attitudes regarding Ontario's reptiles. The preliminary statistical results are very significant, and we look forward to publishing a thorough analysis in the future. We believe this to be the most comprehensive evaluation of any wildlife outreach effort in Ontario to date. Various educational materials have also been developed under the project, which are available as free downloads from our project website. These specific activities linked to the 2009 Ontario curriculum are the most recent addition, and we hope that you will make use of them to spread our conservation messages about Ontario's reptiles.

The future of the project is uncertain. Our original objectives have been completed, and our funding for the future is unknown. I expect to step back from the project in 2009 to focus on opening our public nature centre, **Scales Nature Park**, near Orillia. We hope that the project will continue; some aspects including the free materials on our website, will continue regardless of the funding situation. If the project does not move forward, ***Sciensational Sssakes!!*** and **Scales Nature Park** will continue to work towards the goal of reptile conservation, in the same fee-for-service manner we have operated for the last fifteen years.

Thank you, on behalf of everyone involved in the project, for your interest in helping to conserve these amazing creatures! If we may be of assistance, please do not hesitate to contact us.

Sincerely,

Jeff Hathaway
Project Founder, Reptiles at Risk on the Road

Curriculum Activities Introduction

These curriculum-linked activities have been developed for use in Ontario classrooms to help achieve a broader awareness of our native reptiles, and their conservation. Funding to support the development of these materials was provided by the Ontario Ministry of Natural Resources Species at Risk Stewardship Fund.

We have provided at least one activity for grades 1 through 8; some grades feature multiple activities. These activities can be used on a stand-alone basis, though they have been designed to complement a Reptiles at Risk on the Road program, a *Sciensational Sssnakes!!* program, or a class visit to **Scales Nature Park**.

As a group, reptiles face tremendous challenges. Across Canada, 79% of reptile species are listed as a 'Species at Risk'. Within Ontario, the proportion is 65%, or 17 out of 26 species, with at least one more possibly being added to the list in the near future. This makes reptiles the most imperilled group of wildlife, at both the provincial and federal level. The continued existence of many of these species is very uncertain, and considerable effort will be required to conserve them for the future.

The threats to reptile species are varied, but there are some common problems such as habitat loss, road mortality, and intentional killing by people. For some species, collection from the wild as pets, or for food, is a serious issue. A subtle, but genuine, threat in some cases is an increased number of predators due to human activity. The spectre of climate change may complicate some of these problems even further.

All of these threats are caused by human activity and influence, which is true of most environmental issues today. Reducing these threats may be achieved through specific actions, but increasing the public awareness of these creatures and their issues, and engendering positive attitudes about them, is an important step towards conservation success. This is what we hope to achieve through our programs, and with the creation of these activities. Small steps, perhaps, but important ones. Wildlife management is really about people management most of the time.

We hope that you find these materials useful, and that they contribute to the conservation of reptiles across our landscape. We intend to add more activities in the future, so if you have any suggestions or recommendations, we would be very happy to hear them.

Grade 1

Curriculum Links:

Understanding Life Systems: Needs and Characteristics of Living Things

General Information: Children learn at a young age about all sorts of different kinds of animals. Unfortunately in most resources and children's books the animals presented are Lions, Elephants, Tigers, Giraffes and other exotic animals. Children don't learn about the really interesting wildlife that lives in their own backyard. We have provided some simple resources that can be used to cover curriculum topics while also learning about creatures found right here in Ontario. These are just a few examples of how you can incorporate Ontario species into your curriculum. We have also provided some simple worksheets on the following pages.

Section 1: Relating Science and Technology to Society and the Environment

1.1: Identify personal action that they themselves can take to help maintain a healthy environment for living things, including humans.

Example Activity: There are 8 different turtle species in Ontario. Seven of them are now considered species at risk, which means that they are disappearing at an alarming rate. By the time these children are at retirement age, there may not be any turtles left at all in significant portions of our province. One of the major threats to turtles is road mortality. Students can learn about turtles and how to safely remove them from the road (with adult help). Leaving turtles (and any wild creatures) in the wild is also important. In the wild turtles are able to reproduce and create more turtles to increase the population;, they can't do this in someone's home.

1.2: Describe changes or problems that could result from the loss of some kinds of living things that are part of everyday life, taking different points of view into consideration.

Example activity: Discuss what would happen if someone killed all the snakes or they all died. Some people who dislike snakes may be happy at first, however snakes are an important part of the environment and they help control populations of mice and small rodents. They also provide food for lots of other creatures. Foxes, racoon and hawks all will eat a tasty snake if it is available.

Section 3: Understanding basic Concepts

3.1: Identify environment as the area in which something or someone exists or lives.

3.2: Identify the physical characteristics of a variety of plants and animals.

3.4: Describe the characteristics of a healthy environment, including clear air and water and nutritious food, and explain why it is important for all living things to have a healthy environment.

Example Activity: For all these curriculum points, it is relatively simple to choose a lesser known animal like a Blanding's Turtle or Eastern Foxsnake as an example that way the students are not only learning about the basic concepts but also about a new creature. Information about these animals can be found in the information sheets on the Reptiles at Risk website.

3.5: Describe how showing care and respect for all living things helps to maintain a healthy environment.

Example Activity: Students could each learn about one Ontario reptile and come up with one way that we can help them. For many of Ontario's reptiles the leading cause of declining numbers is simply a lack of knowledge or respect from the people who live near them. People kill snakes wrongly thinking they are harmful, or run over turtles on the road because they don't care, or take snakes or turtles home as pets – all these things have an impact on the number of reptiles left in the wild. By learning about these creatures and showing respect for them, children can have a direct impact and help to maintain a healthy diverse environment.

Grade 1

Curriculum Links:

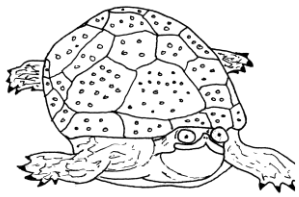
Understanding Life Systems: Needs and Characteristics of Living Things

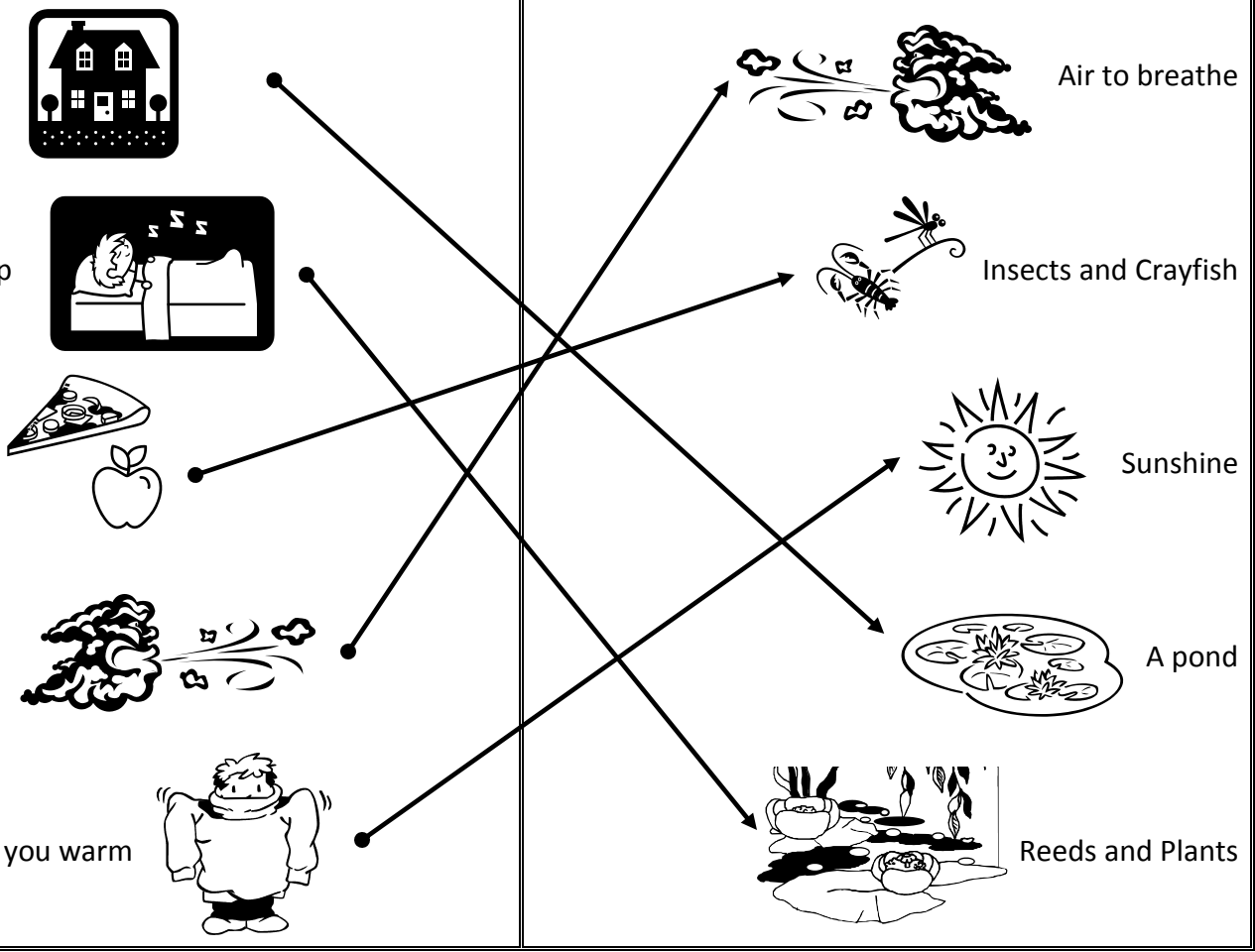
Section 2: Developing Investigation and Communication Skills

2.2: Investigate and compare the basic needs of humans and other living things, including the need for air, water, food, warmth, and space using a variety of methods and resources.

We all need the same things! – Answer Sheet

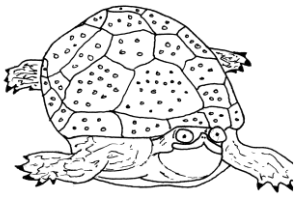
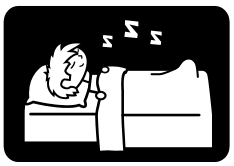
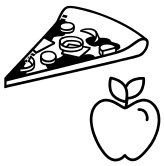
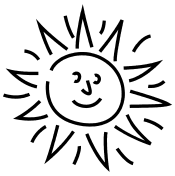
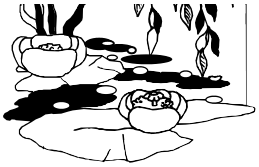
Draw a line to match what you need to live with what Petra the Blanding's Turtle needs.

You! (Draw a picture of yourself)	Petra the Blanding's Turtle 
Some things you need:	Some things Petra needs:



We all need the same things!

Draw a line to match what you need to live with what Petra the Blanding's Turtle needs. One is already done for you.

You! (Draw a picture of yourself)	Petra the Blanding's Turtle 
Some things you need:	Some things Petra needs:
A place to live 	 Air to breathe
A place to sleep 	 Insects and Crayfish
Things to eat 	 Sunshine
Air to breathe 	 A pond
Things to keep you warm 	 Reeds and Plants

Petra!

Petra is a Blanding's Turtle. She is 13 years old. She is small now but may grow up to be 25 cm long! She has a bright yellow chin and a mouth that makes her look like she is smiling. She can pull her arms, legs and head into her shell to protect herself when she is scared. She can't take her shell off like Franklin can; only cartoon turtles can do that. Blanding's Turtles are Threatened species. That means that there aren't many left in the wild. You can help save turtles like Petra by protecting and cleaning up ponds where turtles live, and helping turtles across the road – always be sure to get an adult to help you! Never take a turtle home as a pet though, they like their pond a lot better than your house. Petra is a pretty neat turtle.

Grade 2

Curriculum Links:

Understanding Life Systems: Growth and Changes in Animals

General Information: Students often learn about frogs, butterflies and insects when learning about growth and changes. These are all very interesting creatures to study, however we hope that the example activities below will help you to add reptiles to that list. There are also some easy to use worksheets on the following pages for your use.

Section 1: Relating Science and Technology to Society and the Environment

1.1: Identify positive and negative impacts that animals have on humans and the environment, form an opinion about one of them, and suggest ways in which the impact can be minimized or enhanced.

Example Activity: Students can study a misunderstood snake like the Massasauga Rattlesnake to discover what the positive impacts of that animal are on humans and the environment. For example: Massasauga Rattlesnakes help to control rodent populations, which helps maintain a healthy environment. Also Rattlesnake venom has been researched for use in some medications. While Massasauga Rattlesnakes do have venom, they are one of the least deadly venomous snakes to humans. Only 2 people are known to have died in Ontario in the last 200 years from a rattlesnake bite.

Section 2: Developing Investigation and Communication Skills

2.2: Observe and compare the physical characteristics and the behavioural characteristics of a variety of animals, including insects, using student-generated questions and a variety of methods and resources.

Example Activity: People often combine Reptiles and Amphibians and get the two confused. Students should compare the different types of amphibians (Frogs, Toads and Salamanders) to the different types of reptiles (Snakes, Turtles and Lizards).

2.3: Investigate the life cycle of a variety of animals, using a variety of methods and resources.

Example Activity: Some snakes lay eggs, some give birth to live young, the Smooth green snake does something almost in between, laying eggs that hatch very shortly after being laid. Students can investigate the difference between amphibian metamorphosis and reptile growth as well as the differences between their eggs/births.

2.5: Investigate the ways in which a variety of animals adapt to their environment and/or to changes in their environment, using various methods.

Example Activity: Winter is an interesting time for ectothermic animals such as reptiles. Since they cannot produce their own heat, they need to regulate their temperature by moving around in their environment to warmer and cooler locations. In the winter time there is very little heat to be had from the sun and environment, therefore reptiles in Ontario must hibernate. Students can investigate different ways that animals spend the winter. Turtles, for example, spend the winter at the bottom of ponds and marshes. Snakes choose a place underground in rocks, loose soil or animal burrows. This allows them to get below the frost line and prevents them from freezing in the winter. A place like this is called a hibernaculum. Some snakes will gather in huge numbers in these hibernacula.

Section 3: Understanding basic Concepts

3.2: Describe an adaptation as a characteristic body part, shape or behaviour that helps a plant or animal survive in its environment.

Example Activity: Students can investigate the shape of snakes and how it helps them in their environment. A snake's shape enables it to slither effectively along the ground. Some snakes like the Black Ratsnake are shaped like a loaf of bread which gives them edges running along their body to wedge into gaps in tree bark enabling them to climb trees!

Grade 2

Curriculum Links:
Understanding Life Systems: Growth and Changes in Animals

Section 1: Relating Science and Technology to Society and the Environment
1.2: Identify positive and negative impacts that different kinds of human activity have on animals and where they live, form an opinion about one of them, and suggest ways in which the impact can be minimized or enhanced.

What would you do? – Answer Sheet

Questions:

What might happen if Mr. Smith builds the shopping mall? Tell both good and bad things.

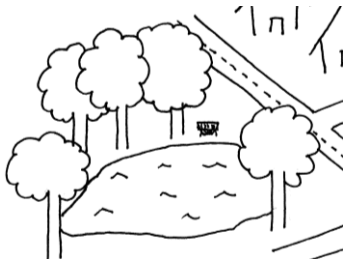
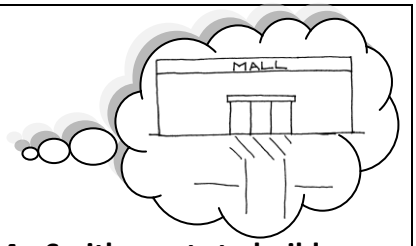
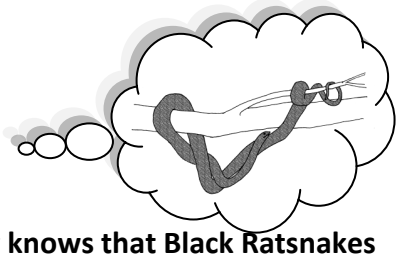
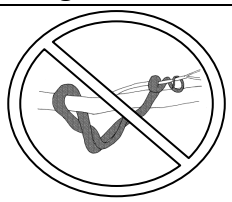
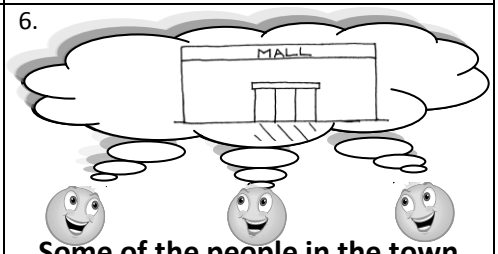
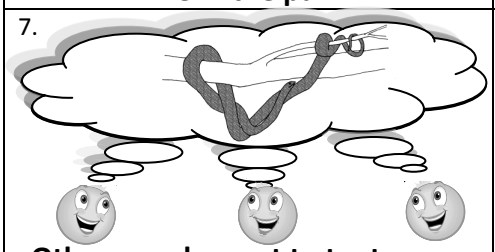
- Good:
  - A place to shop
  - A place to gather
  - Good for business/economy
- Bad:
  - No more trees
  - Pollution
  - No place to play

Can Mr. Smith build the mall and also help save the Black Ratsnakes? How?

- He could build the mall somewhere that already has had the trees cut down
- He could make a smaller mall and leave as many trees as he can in the park
- He could buy another spot as well and help protect the trees in that other spot

What would you do?

What would you do?

1.  **This is the town of Snorgle.**	2.  **In Snorgle there is a park.**	3.  **Mr. Smith wants to build a shopping mall where the park is.**
4.  **Sally knows that Black Ratsnakes live in the park.**	5.  **Black Ratsnakes are endangered! That means there aren't very many left in the wild.**	6.  **Some of the people in the town really want a shopping mall.**
7.  **Other people want to try to save the Black Ratsnakes.**	8.  **Nobody knows what to do.**	9. **What would you do?** 

Questions:

What might happen if Mr. Smith builds the shopping mall? Tell both good and bad things.

Can Mr. Smith build the mall and also help save the Black Ratsnakes? How?

What would you do?

Black Ratsnakes

Black Ratsnakes are the longest snakes in Canada! They can grow up to two and a half metres long. Black Ratsnakes love to climb trees, in fact they *need* trees to survive. Black ratsnakes are an endangered species partly because most of the trees have been cut down in the places where they used to live. We can help Black ratsnakes and other forest creatures by protecting the forests where they live.

Grade 3

Curriculum Links:

Understanding Life Systems: Growth and Changes in Plants

General Information: For many species of reptiles specific plants are a vital part or their habitat. The following activities will help link information about these important creatures to your unit of growth and changes in plants. We have also included an example from the Geography curriculum.

Section 3: Understanding basic Concepts

3.8: Identify examples of environmental conditions that may threaten plant and animal survival.

Example Activity: Most reptiles in Ontario are at the northernmost part of their range and are partly limited from expansion by temperature and environmental conditions. Students can brainstorm ideas of what may happen to reptile populations if/when climate change occurs. Colder, longer winters may threaten survival of some species, warmer, longer summers may allow some to expand their range which may affect other animals found in those areas.

Canada and World Connections: Urban and Rural Communities

Map, Globe and Graphic Skills

- Make and use maps of urban and rural communities containing the necessary map elements of title, scale, symbols and legend, and cardinal directions.

Example Activity: Rather than mapping a human community, why not map an animal community in your local area? Try comparing urban animal community (for example something in your school yard) versus a rural animal community (for example a park). Students can map areas for food, shelter, and water.

Grade 3

Curriculum Links:

Understanding Life Systems: Growth and Changes in Plants

Section 1: Relating Science and Technology to Society and the Environment

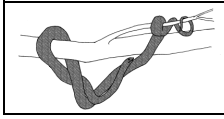
1.1: Assess ways in which plants are important to humans and other living things, taking different points of view into consideration.

Section 3: Understanding Basic Concepts

3.6: Describe ways in which plants and animals depend on each other.

Trees – Answer Sheet

List some of the ways that the tree is important to the following people and animals. We have provided some of the more obscure uses that may be useful for discussion points:

	Child	Shade, oxygen, protects soil, wood for homes and furniture, paper for books
	Builder	Landscape design and beauty, energy efficiency – cooling shade in summer
	Athlete	Wood for equipment, nicer place to run/play, cooling in summer
	Grey Squirrel	Food, shelter, protection from predators, home
	Cardinal	Food, shelter, protection from predators, home
	Black Ratsnake	A place to bask in the sun, a shady place to cool down, food (small mammals and birds in the tree), shelter, protection from predators

QUESTIONS:

The Black Ratsnake depends on having trees in its habitat. What do you think that they may use trees for? Use a book or the internet to help you. Is it also important to the trees to have Black Ratsnakes around? How might the Black Ratsnakes help trees?

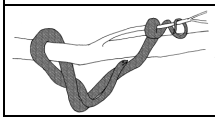
- Food – small mammals and birds that are found in the tree
- Snakes are ectothermic = they need to regulate their body temperature by moving to warmer and cooler places they cannot produce their own heat. Trees provide an excellent temperature gradient.
- Protection from predators, they camouflage well in a tree and can hide in branches

- They help trees by keeping the number of small mammals which eat parts of the tree or damage the trees in check.

Trees

Here we have a deciduous maple tree: 

Let's pretend that this tree is in a forest full of other trees. Different people and animals can use this tree in different ways. List some of the ways that the tree is important to the following people and animals.

	Child	
	Builder	
	Athlete	
	Grey Squirrel	
	Cardinal	
	Black Ratsnake	

Some animals depend on plants to survive. Black Ratsnakes love to climb trees, in fact they *need* trees to survive. The Black Ratsnake is the longest snake in Canada! They can grow up to two and a half metres long. Black Ratsnakes are an endangered species partly because most of the trees have been cut down in the places where they used to live. Now they are only found in two very small areas in Ontario. We can help Black Ratsnakes and other forest creatures by protecting the forests where they live.

QUESTIONS:

The Black Ratsnake depends on having trees in its habitat. What do you think that they may use trees for? Use a book, Reptiles at Risk resources or the internet to help you. Is it also important to the trees to have Black Ratsnakes around? How might the Black Ratsnakes help trees?

Grade 4

Curriculum Links:

Understanding Life Systems: Habitats and Communities

General Information: It is important that students learn about creatures found around them so that they can learn to appreciate and possibly help preserve the habitats and communities they live in. Many of Ontario's reptiles are considered species at risk. Many of the problems that they encounter are with people who know little about them or misunderstand them. By teaching our children about these creatures at an early age, perhaps we can help to protect what is left of their populations. Below are a few examples of how to work information about Ontario's reptile species into the curriculum. There are many more places they can be included as well - even just using them in examples helps introduce students to these wonderful creatures. We have also provided some simple activity sheets on the following pages.

Section 1: Relating Science and Technology to Society and the Environment

1.1: Analyse the positive and negative impacts of human interactions with natural habitats and communities.
1.2: Identify reasons for the depletion or extinction of a plant or animal species, evaluate the impacts on the rest of the natural community, and propose possible actions for preventing such depletion or extinctions from happening.
Example Activity: Many of Ontario's reptiles are considered species at risk. There are 8 different turtle species in Ontario. Seven of them are now considered species at risk, which means that they are disappearing at an alarming rate. By the time these children are at retirement age, there may not be any turtles left at all in significant portions of our province. One of the major threats to turtles is road mortality. Students can learn about turtles and how to safely remove them from the road. Leaving turtles (and any wild creatures) in the wild is also important. In the wild turtles are able to reproduce and create more turtles to increase or maintain the population; they can't do this in someone's home. Students could choose one Ontario reptile and study the positive and negative ways in which humans are affecting the reptiles and their habitats.

Section 3: Understanding Basic Concepts

3.7: Describe structural adaptations that allow plants and animals to survive in specific habitats.
Example Activity: Students can investigate the shape of snakes and turtles and how it helps them in their environment. A snake's shape enables it to slither effectively along the ground, however some snakes like the Black Rat Snake are shaped like a loaf of bread which gives them edges running along their body to wedge into gaps in tree bark enabling them to climb trees! Turtles have webbed feet to help them swim; those that swim faster or further have more webbing between their toes. Turtles also have shells to protect them, however the softshell turtle has a leathery shell instead of a hard shell.

3.8: Explain why changes in the environment have a greater impact on specialized species than on generalized species.
Example Activity: Students can investigate the reasons why certain reptiles are species at risk while others are not. For example Eastern Gartersnakes are a very generalized species that is easily able to adapt to living in city gardens. Eastern Foxsnakes are found in some of the same areas as Gartersnakes, however they are bound to forested shorelines and thus are having problems because of deforestation in those areas.

Grade 4

Curriculum Links:

Understanding Life Systems: Habitats and Communities

Section 2: Developing Investigation and Communication Skills

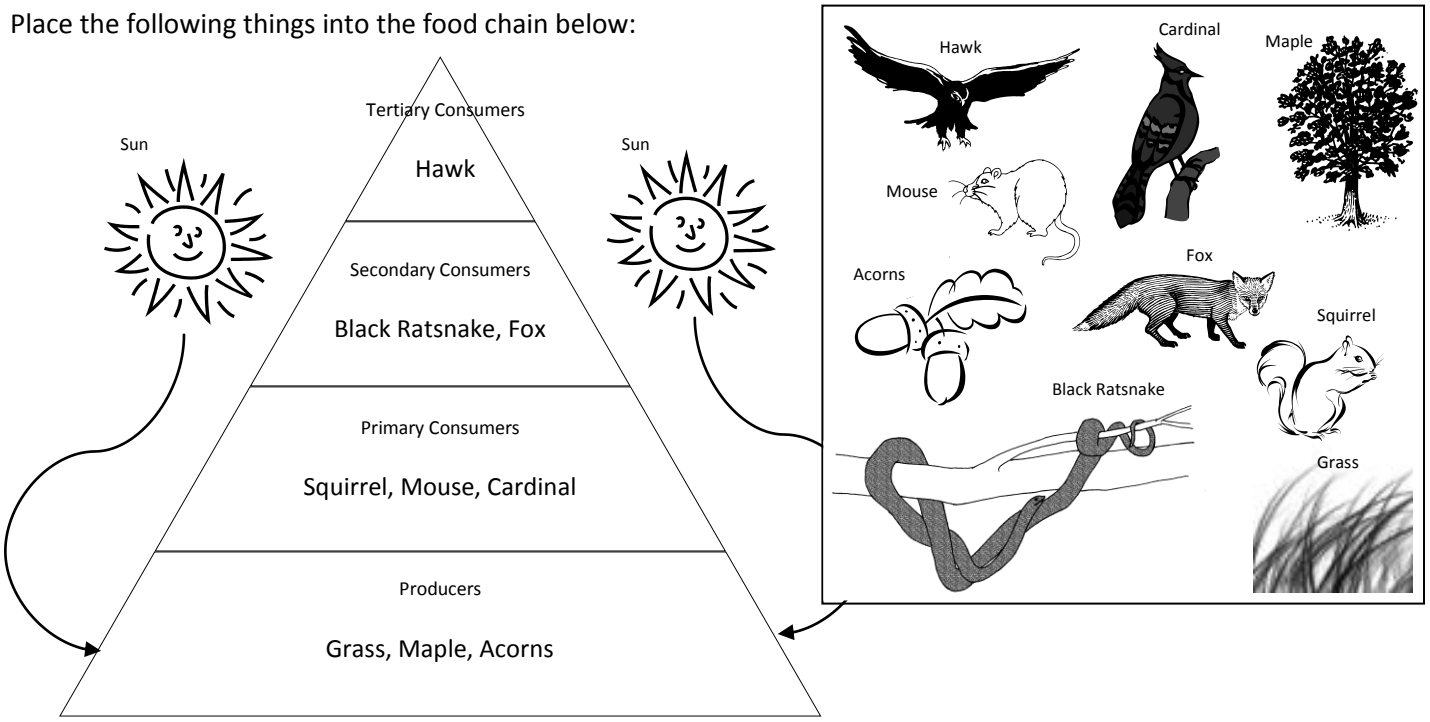
2.2: Build food chains consisting of different plants and animals, including humans.

Section 3: Understanding basic Concepts

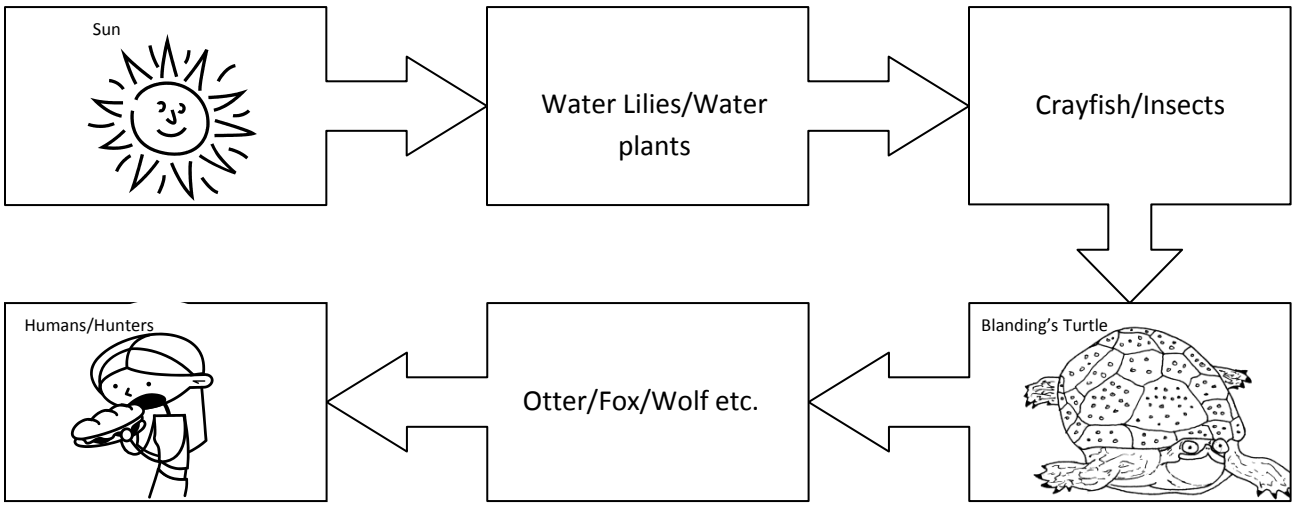
3.2: Demonstrate an understanding of food chains as systems in which energy from the sun is transferred to producers and then to consumers.

Food Chains – Answer Sheet

Place the following things into the food chain below:

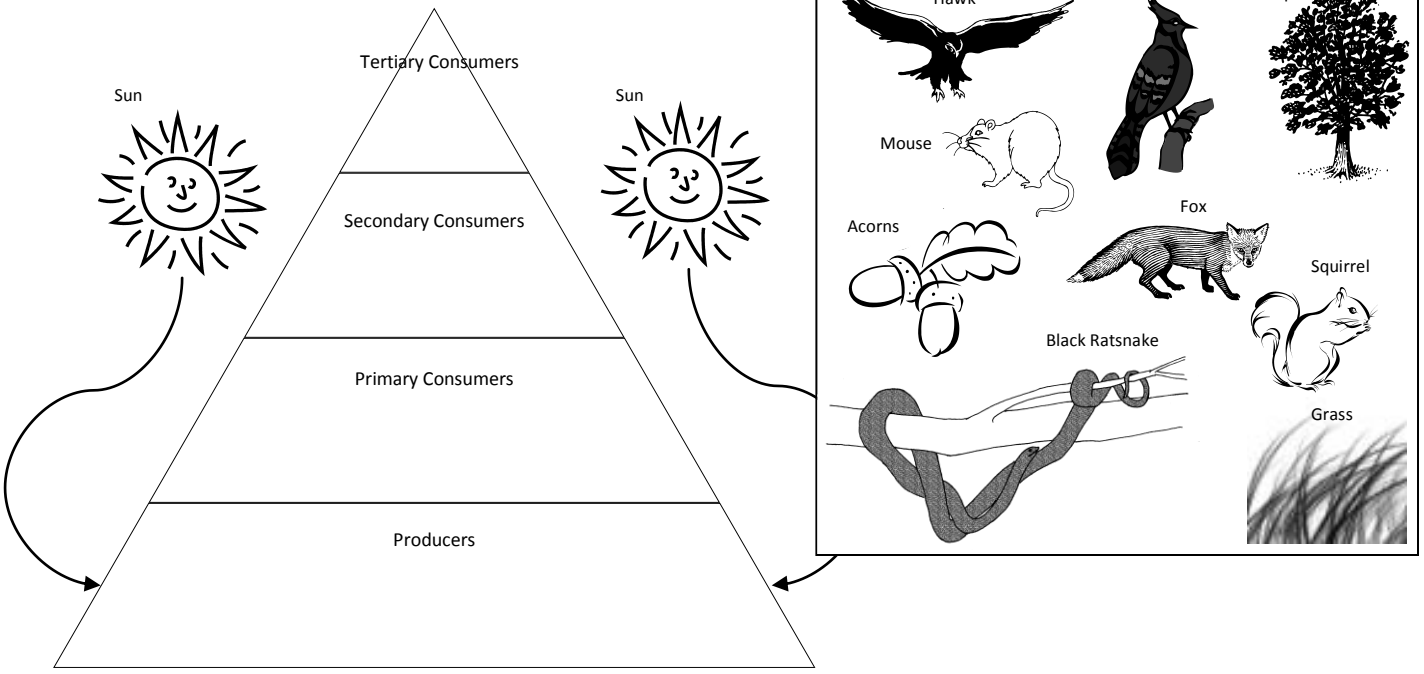


Fill in the food chain below using information from the internet, books or Reptiles at Risk resources: (Add more links if you need to.)

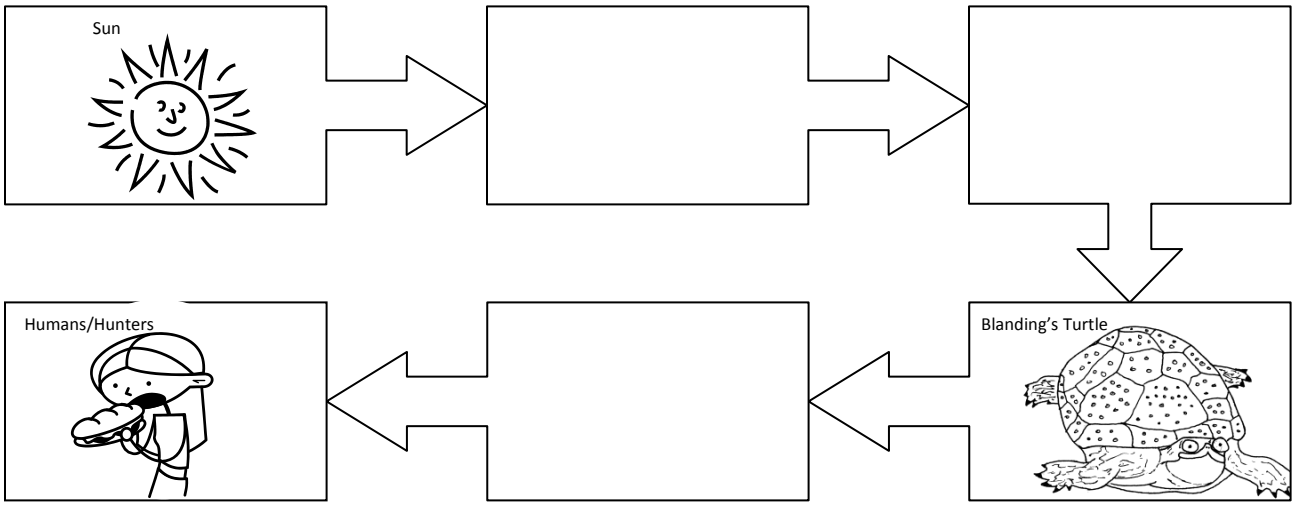


Food Chains

Place the following things into the food chain below:



Fill in the food chain below using information from the internet, books or Reptiles at Risk resources: (Add more links if you need to)



Black Ratsnakes

Black Ratsnakes are the longest snakes in Canada! They can grow up to two and a half metres long. Black Ratsnakes love to climb trees, in fact they *need* trees to survive. Black Ratsnakes are an endangered species partly because most of the trees have been cut down in the places where they used to live. We can help Black Ratsnakes and other forest creatures by protecting the forests where they live.

Blanding's Turtles

Blanding's turtles have bright yellow chins and a mouth that makes them look like they are smiling. Blanding's turtles are threatened, which means that there aren't many left in the wild. You can help save turtles like these by protecting and cleaning up ponds where turtles live, and helping turtles across the road. Never take a turtle home as a pet though, they like their pond a lot better than your house.

Grade 4

Curriculum Links:

Understanding Life Systems: Habitats and Communities

Section 2: Developing Investigation and Communication Skills

2.3: Use scientific enquiry/research skills to investigate ways in which plants and animals in a community depend on features of their habitat to meet important needs.

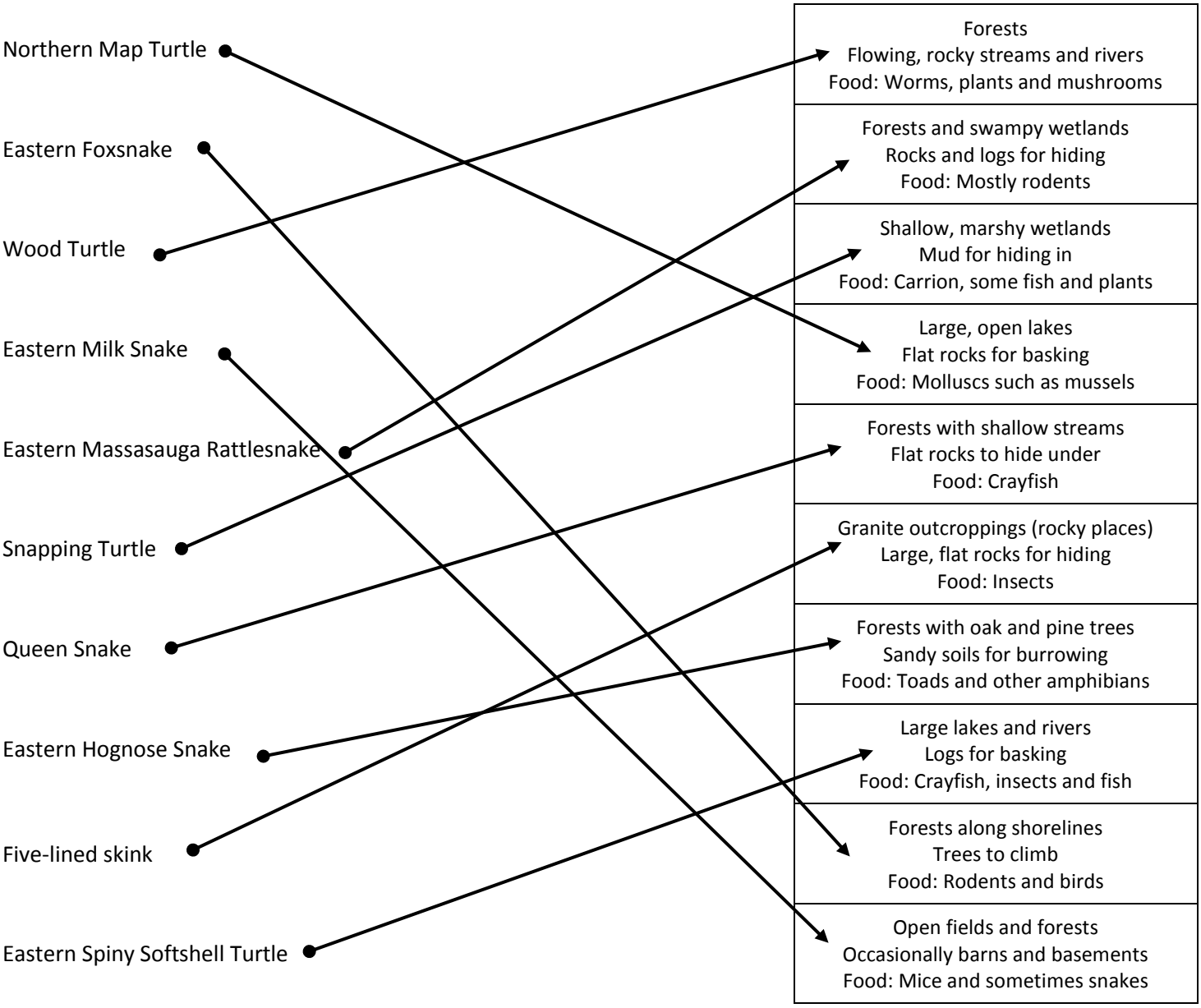
Section 3: Understanding Basic Concepts

3.1: Demonstrate an understanding of habitats as areas that provide plants and animals with the necessities of life.

3.3: Identify factors that affect the ability of plants and animals to survive in a specific habitat.

Habitats – Answer Sheet

Draw lines to connect the following Ontario reptiles to the habitat elements that they require.



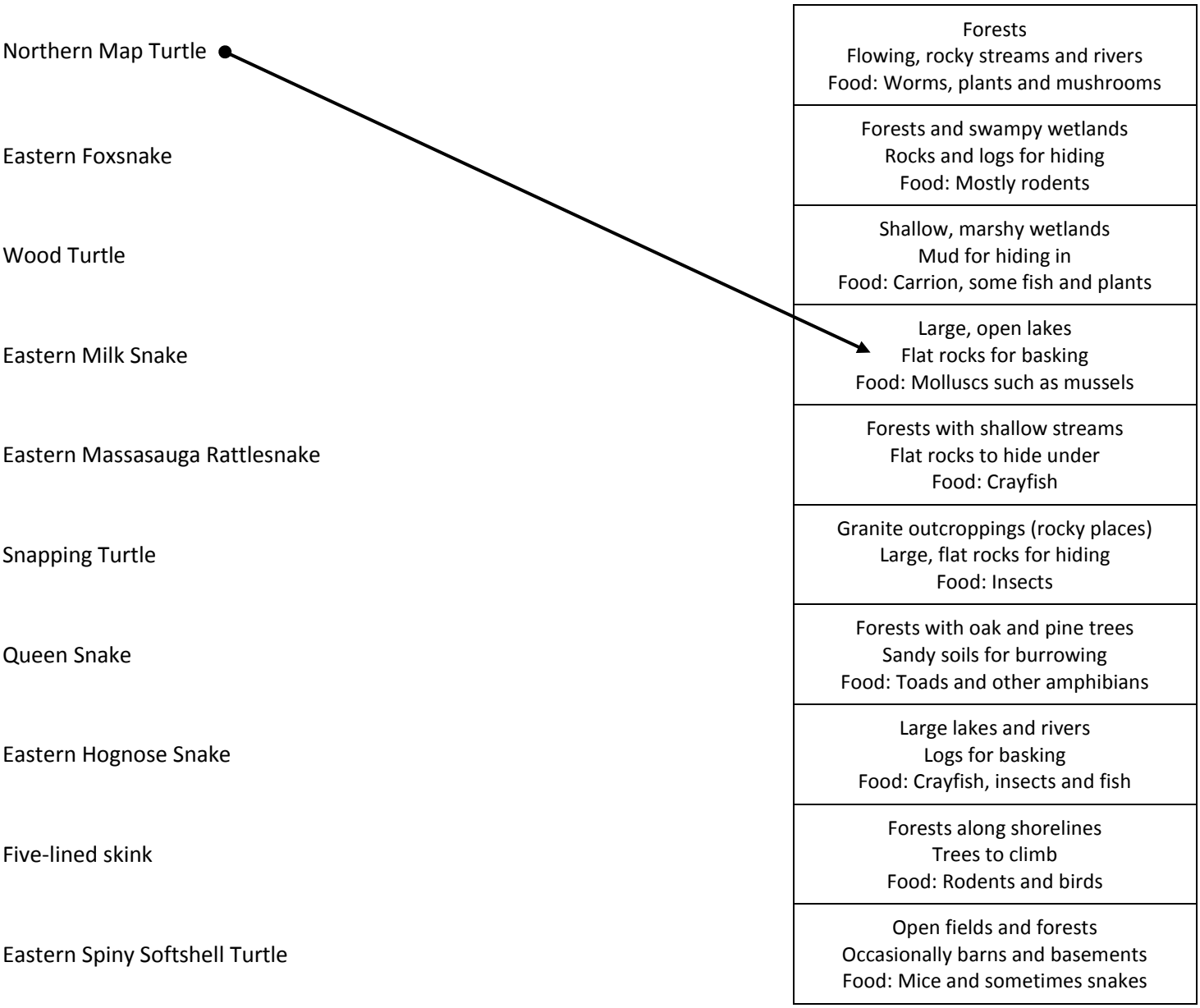
Habitats

A habitat is more than just a space for an animal to live! It includes all of the things the animal uses within that space, such as food, water and shelter. Animals often become species at risk because a part of their habitat is missing. It is important for scientists to know what an animal needs in its habitat in order to help protect those animals and all the parts of their habitat.

Here's a great example of a habitat:

- Space: The Eastern Garter Snake lives in forests, fields, and even backyards.
- Food: They eat a variety of animals including worms, fish, frogs and mice.
- Water: They are usually found near water such as ponds and streams, and sometimes swim to catch their prey.
- Shelter: They frequently hide under rocks and logs to avoid being seen by predators.

Draw lines to connect the following Ontario reptiles to the habitat elements that they require. Use books, Reptiles at Risk resources or the internet to help you. And remember: Food, water, shelter, space; a habitat's a perfect place!



Part B: Using books or the internet, write a detailed habitat description for the following reptiles: Eastern Ribbon Snake, Spotted Turtle, Black Ratsnake

Grade 5

Curriculum Links:

Understanding Life Systems: Human Organ Systems

General Information: In grade 5 students do not have many curriculum links related to the environment or wildlife; this does not mean that they can't learn anything about them. Using examples in your curriculum from the animal world can help students to appreciate differences in different systems which may further their understanding of human systems. We have included some simple activity sheets on the following pages.

Section 3: Understanding basic Concepts

3.2: Describe the basic structure and function of major organs in the respiratory, circulatory and digestive systems.
3.3: Identify interrelationships between body systems.

Example Activity: Relating our system to other animal systems helps students realize the complexity of these systems and also helps them link structure with function. For example noting the differences between human and turtle muscle and bone systems students will be better able to understand their function. Turtle bones are modified to make a shell to protect them. Our bones also protect our bodies but in a different way.

Grade 5

Curriculum Links:
Understanding Life Systems: Human Organ Systems

Section 3: Understanding basic Concepts
3.1: Identify major systems in the human body and describe their roles and interrelationships.

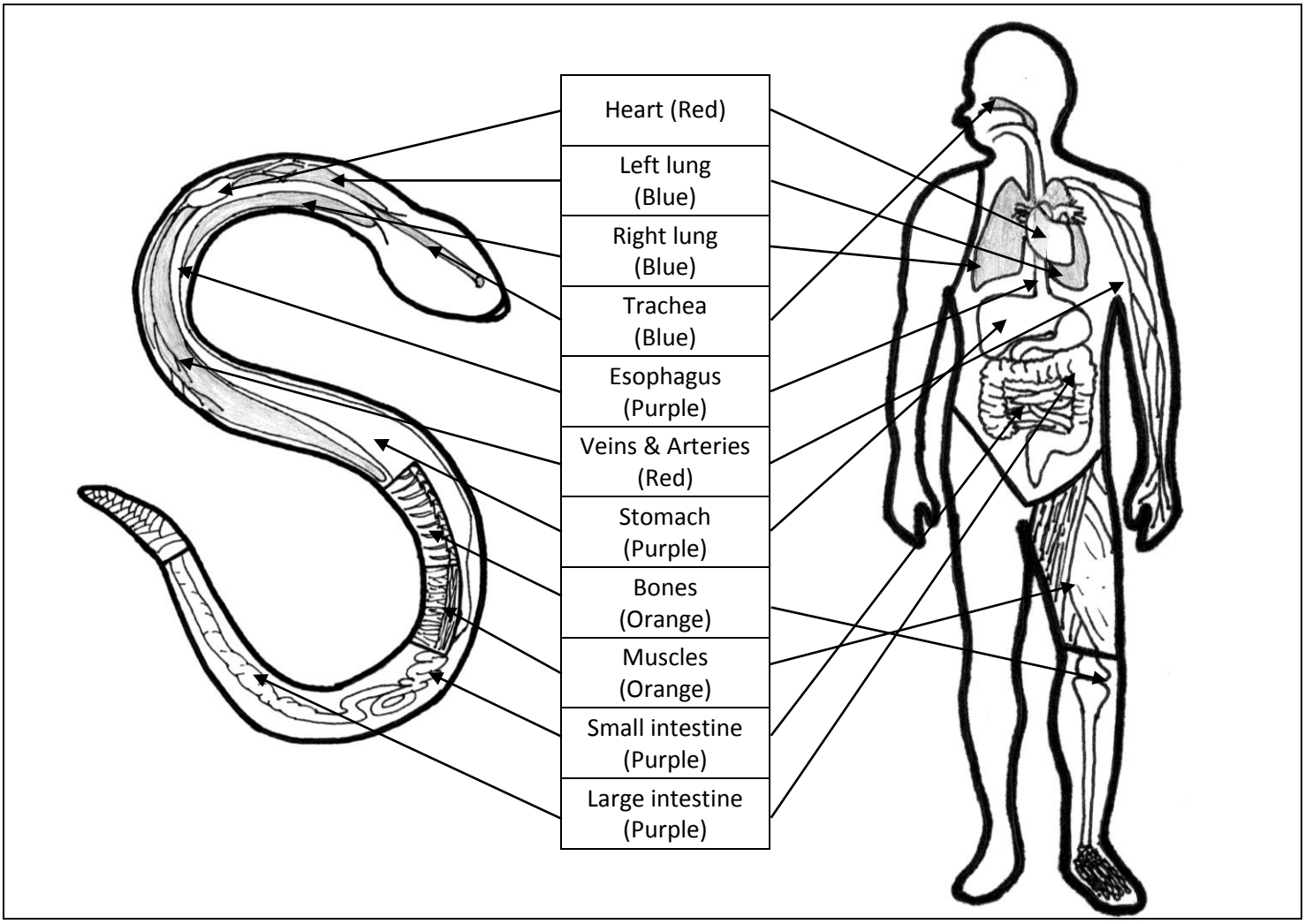
Organ Systems – Answer Sheet

What's the difference? – Use part two to help with a discussion on the student's hypotheses.

Which system is which?

In both pictures colour the...

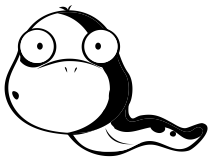
Circulatory system parts RED
Respiratory system parts BLUE
Digestive system parts PURPLE
Musculoskeletal system parts ORANGE



Organ Systems

An organ system is made up of different organs that all work together. For example the stomach and the intestines work together to make up part of the digestive system. All animals (mammals, birds, fish, reptiles, etc) have organ systems but there are differences between them. Fish, for example, have to spend their lives in water. Living in water poses different challenges to a fish's body than living on land does to ours. This is why fish have scaly skin with a mucous layer on it instead of a skin like ours. The skin is part of the integumentary system. For this activity we will be looking at the differences between four major organ systems in humans versus snakes.

A snake's body is very long and thin in comparison to a human's body. Snakes have all the same organ systems that humans have however there are some changes to the systems to allow everything to work properly in a snake's body. Use the chart below to fill in your hypothesis (guess) as to what differences you think there might be. Some hints have been included to help you get started.

What's the Difference? (Hypothesis)				
	Musculoskeletal System	**Respiratory System**	**Digestive System**	**Circulatory System**
HINTS	Snakes can squeeze their body through small openings, they also move without arms and legs. How do you think they can do that?	We can't breathe while swallowing our food or we'll choke. Snakes take a long time to swallow food, how do they breathe while they swallow?	Our intestines zigzag back and forth across our body around our belly. Snakes are long and skinny, is there room for the intestines to zigzag?	All of our major organs are in our chest and belly. Snakes don't have a wide area like our chest and belly to have all those organs, how do they fit everything in?
				
				

Black Ratsnakes

Black Ratsnakes are the longest snakes in Canada! They can grow up to two and a half metres long. Black Ratsnakes love to climb trees, in fact they *need* trees to survive. Black Ratsnakes are an endangered species partly because most of the trees have been cut down in the places where they used to live. We can help Black Ratsnakes and other forest creatures by protecting the forests where they live.

Organ Systems – Part 2

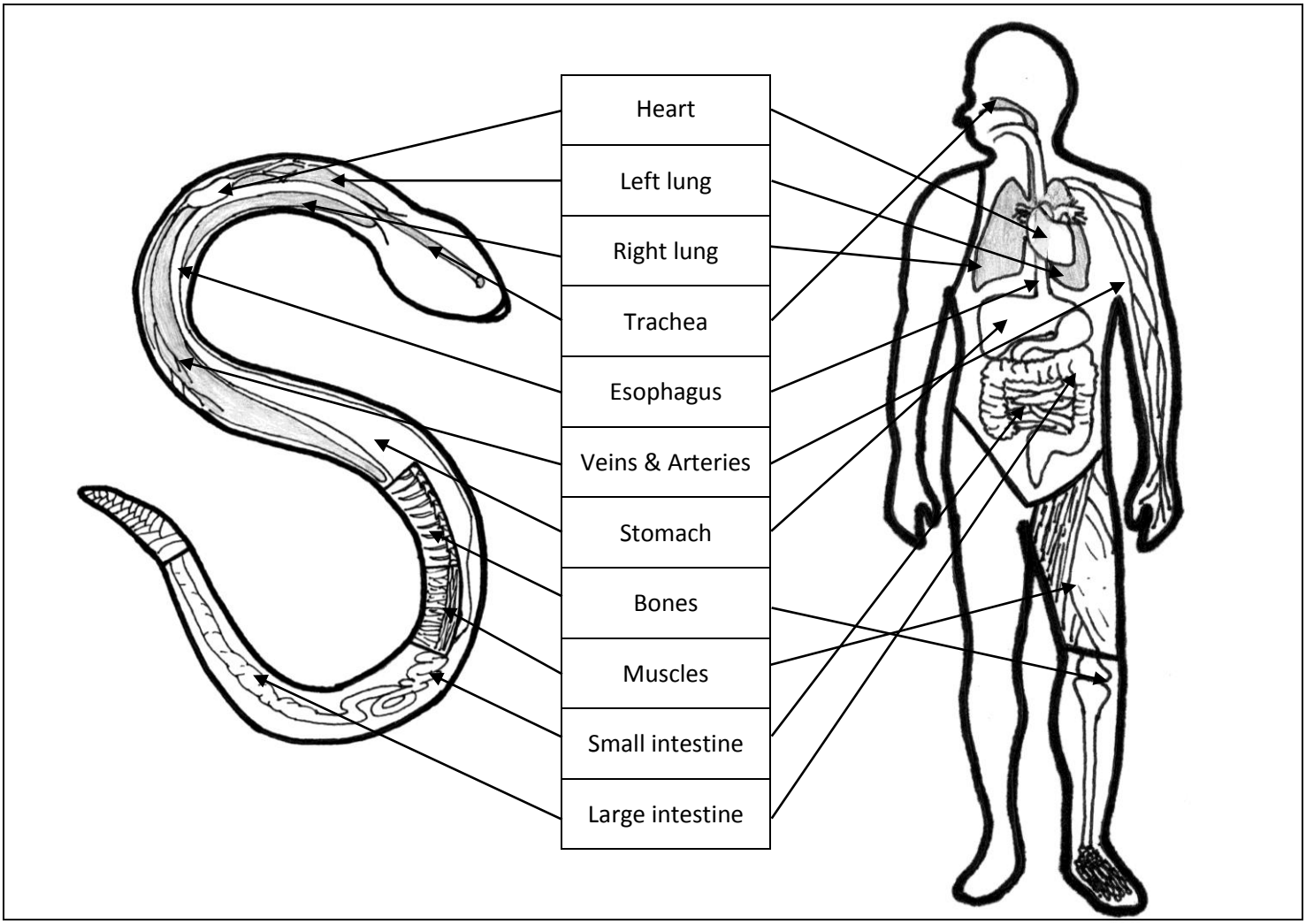
Now that you've made a hypothesis on what the differences are between human and snake organ systems are, let's have a look at some of those systems.

Which system is which?

In both pictures colour the...

Circulatory system parts RED Respiratory system parts BLUE

Digestive system parts PURPLE Musculoskeletal system parts ORANGE



What's the Difference? – Fact Sheet

- Musculoskeletal System
  - Snakes do not have a sternum – that is the bone that you can feel at the front of your chest holding your ribs together. Not having a sternum allows snakes to flatten out their ribs to fit in tight spaces. Snakes also have strong muscles running along and around their bodies to allow them to move around.
- Circulatory System
  - The snake's heart is about 1/3 of the way down the body.
- Digestive System
  - A snake's digestive system is stretched along the length of the body to allow room for all the parts. The stomach is long and thin and the small intestine is not as curled up as ours.
- Respiratory System
  - The esophagus of snakes extends well into the mouth. This means that as the snake slowly swallows a large food item they can still breathe. In some snakes one of the lungs is greatly reduced or not there at all.

Grade 6

Curriculum Links:

Understanding Life Systems: Biodiversity

General Information:

The Reptiles at Risk on the Road program links very easily with Grade 6 Biodiversity Curriculum. Students can learn valuable research skills while discovering our species at risk reptiles in Ontario. Many of Ontario's turtles, snakes and its only lizard are facing problems relating to biodiversity. While working on the biodiversity unit, why not use examples from Ontario's reptile species? Much of the information you would need can be found on our website as well as the Ontario Ministry of Natural Resources Species at Risk Website. The following links are easily related to our program as per the examples provided. These are just a few examples; in fact the entire unit could be based on Ontario reptiles. You will also find specific links with easy to use photocopy resource pages on the following pages.

Section 1: Relating Science and Technology to Society and the Environment

1.1: Analyse a local issue related to biodiversity, taking different points of view into consideration, propose action that can be taken to preserve biodiversity, and act on the proposal.

Example Activity: Learn about the Long Point Causeway Project and the impacts it may have on local wildlife including reptiles. Students could write letters to the Minister on the subject. Students could also debate a hypothetical (or real) conflict involving a forest habitat where Black Ratsnakes or Eastern Foxsnakes live. These animals need forests to survive. Students could debate the merits and disadvantages of the forest being clear cut for a mall or hotel.

1.2: Assess the benefits that human societies derive from biodiversity and problems that occur when biodiversity is diminished.

Example activity: Present information on a food web involving snapping turtles and their habitat, then ask what would happen if different parts are removed and biodiversity is diminished. For example, Snapping turtles are like the garbage collectors of their habitats, helping to clean up dead and decaying animals. Without them things may get messy.

Section 3: Understanding basic Concepts

3.7: Explain how invasive species reduce biodiversity in local environments.

Example Activity: Red-eared sliders are a common pet species of turtle. Populations of Red-eared sliders have been found in some urban ponds where people have released unwanted pets. These turtles can outcompete native turtles in these areas. Students can research issues related to releasing unwanted reptile pets and how that can affect native species.

Grade 6

Curriculum Links:
Understanding Life Systems: Biodiversity

Section 2: Developing investigation and Communication Skills

- 2.2 Investigate the organisms found in a specific habitat and classify them according to a classification system.

Classification – Answer Sheet

Activity 1: All these organisms can be found near the shores of Georgian Bay within the same habitat. Place the organisms below into the groups provided. Remember that each organism can belong to more than one group at a time. For each group, indicate at least one reason that the organism belongs. Feel free to add additional groups that may fit a given organism.

<table>
<tr><td colspan="5">Organisms

White Pine
Grey Squirrel
Black-capped Chickadee
White Trillium
Blanding's Turtle
Leopard Frog
Monarch Butterfly
Largemouth Bass
Eastern Foxsnake
White-tailed Deer
Perch</td></tr>
<tr><td colspan="5">Groups</td></tr>
<tr><td>Animal
Perch, Grey Squirrel, Black-capped chickadee, Blanding's turtle, Leopard frog, Monarch Butterfly, Largemouth Bass, Eastern Foxsnake, White-tailed Deer

- All move on their own</td><td>Mammal
Grey Squirrel, White-tailed Deer

- Have fur and produce milk</td><td>Bird
Black-capped chickadee

- Covered in feathers</td><td>Amphibian
Leopard frog

- Slimy skin, goes through metamorphosis</td><td>Plant
White Pine, White Trillium

- Produces energy through photosynthesis

Flowering plant
White Trillium

- Seeds are produced by a flower</td></tr>
<tr><td>Vertebrate
Perch, Grey Squirrel, Black-capped chickadee, Blanding's turtle, Leopard frog, Largemouth Bass, Eastern Foxsnake, White-tailed Deer

- Have backbones</td><td>Invertebrate
Monarch Butterfly

- No backbone</td><td>Fish
Perch, Largemouth Bass

- Has scales + gills</td><td>Reptile
Blanding's turtle, Eastern Foxsnake

- Scales and lungs</td><td>Coniferous Tree
White Pine

- Seeds are produced in a cone</td></tr>
</table>

Classification – Part 2 Answer Sheet

Ontario's reptiles can be classified into three main groups: snakes (17 species), turtles (8 species) and lizards (1 species). Many of these animals are species at risk, so the ability to classify them is important to help conserve them. Use books, the internet or Reptiles at Risk resources to look up the following reptiles, and divide them into the three groups. Then decide which characteristics of these reptiles can be used to tell the groups apart. As a final task also write the animal's status: Special Concern, Threatened or Endangered.

Stinkpot

Snake, Turtle or Lizard: **Turtle**

Characteristics used: **Have legs, no external ear opening, two functioning lungs, shell (carapace and plastron), no teeth**

Status: **Threatened**

Blue Racer

Snake, Turtle or Lizard: **Snake**

Characteristics used: **No legs, no external ears, one functional lung, hard scale over eye, belly scales that go across the underside of the body**

Status: **Endangered**

Eastern Hognose

Snake, Turtle or Lizard: **Snake**

Characteristics used: **No legs, no external ears, one functional lung, hard scale over eye, belly scales that go across the underside of the body**

Status: **Threatened**

Spiny Softshell

Snake, Turtle or Lizard: **Turtle**

Characteristics used: **Have legs, no external ear opening, two functioning lungs, shell (carapace and plastron), no teeth**

Status: **Threatened**

Five-lined Skink

Snake, Turtle or Lizard: **Lizard**

Characteristics used: **Have legs, external ear openings, teeth, no shell, two functioning lungs, no eye scale, belly scales that are small and overlapping**

Status: **Special concern or Endangered (depending on area)**

Eastern Massasauga

Snake, Turtle or Lizard: **Snake**

Characteristics used: **No legs, no external ears, one functional lung, hard scale over eye, belly scales that go across the underside of the body**

Status: **Threatened**

Classification

The classification of living things is essential to our understanding of the natural world. Classification simply means placing organisms into groups. This can help us figure out which organisms are related, and how closely. Typically, we start with very broad groups and gradually get narrower. For example, we can classify ourselves as animals, a group that contains everything from jellyfish and clams to birds and squirrels. We can then narrow it down to vertebrates (animals with a backbone), which rules out things like jellyfish and clams. To be more specific, we can classify ourselves as mammals, then apes, and finally human beings.

Every time we choose to place an organism in a given group, we must be able to prove that the organism belongs there. We do this by choosing characteristics of organisms that make them different from other ones.

Activity 1: All these organisms can be found near the shores of Georgian Bay within the same habitat. Place the organisms below into the groups provided. Remember that each organism can belong to more than one group at a time. For each group, indicate at least one reason that the organism belongs. Feel free to add additional groups that may fit a given organism.

<table>
<tr><td colspan="5">Organisms</td></tr>
<tr><td colspan="2">White Pine
Grey Squirrel
Black-capped Chickadee
White Trillium</td><td colspan="2">Blanding’s Turtle
Leopard Frog
Monarch Butterfly</td><td>Largemouth Bass
Eastern Foxsnake
White-tailed Deer
Perch</td></tr>
<tr><td colspan="5">Groups</td></tr>
<tr><td>Animal
Perch-moves on its own</td><td>Mammal</td><td>Bird</td><td>Amphibian</td><td>Plant</td></tr>
<tr><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td>Flowering plant</td></tr>
<tr><td>Vertebrate
Perch-has a backbone</td><td>Invertebrate</td><td>Fish
Perch-has scales + gills</td><td>Reptile</td><td>Coniferous Tree</td></tr>
</table>

Classification – Part 2

Ontario's reptiles can be classified into three main groups: snakes (17 species), turtles (8 species) and lizards (1 species). Many of these animals are species at risk, so the ability to classify them is important to help conserve them. Use books, the internet or Reptiles at Risk resources to look up the following reptiles, and divide them into the three groups. Then decide which characteristics of these reptiles can be used to tell the groups apart. As a final task also write the animal's status: Special Concern, Threatened or Endangered.

Stinkpot

Snake, Turtle or Lizard: _____

Characteristics used: _____

_____

Status: _____ _____

Blue Racer

Snake, Turtle or Lizard: _____

Characteristics used: _____

_____

Status: _____ _____

Eastern Hognose

Snake, Turtle or Lizard: _____

Characteristics used: _____

_____

Status: _____ _____

Spiny Softshell

Snake, Turtle or Lizard: _____

Characteristics used: _____

_____

Status: _____ _____

Five-lined Skink

Snake, Turtle or Lizard: _____

Characteristics used: _____

_____

Status: _____ _____

Eastern Massasauga

Snake, Turtle or Lizard: _____

Characteristics used: _____

_____

Status: _____ _____

Grade 6

Curriculum Links:

Understanding Life Systems: Biodiversity

Section 2: Developing investigation and Communication Skills

- 2.3 Use scientific inquiry/research skills to compare the characteristics of organisms within the plant or animal kingdoms.

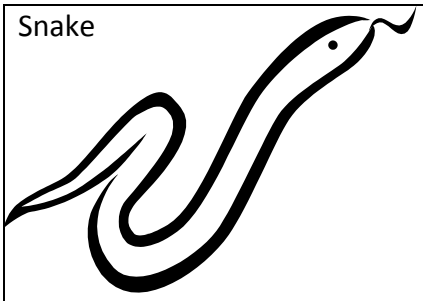
Section 3: Understanding basic Concepts

- 3.1: Identify and describe the distinguishing characteristics of different groups of plants and animals and use these characteristics to further classify various kinds of plants and animals.

Reptile Characters! – Answer Sheet

Match the characteristic to the reptile. Hint: Some of the characteristics apply to all three types of reptiles. Use a book or the internet to research your answers if you aren't sure.

Snake



- Small overlapping dorsal (back) scales
- Ventral (belly) scales extending across the body
- Forked tongue
- No eye lid
- No external ear
- Internal fertilization
- Oviparous (lays eggs) or Viviparous (live young)
- No legs

Turtle 

- Oviparous (lays eggs)
- Carapace
- Plastron
- Bridge
- Non-forked tongue
- Eye lid
- No external ear
- Internal fertilization
- Four legs

Lizard 

- Small overlapping dorsal (back) scales
- Small overlapping ventral (belly) scales
- Forked tongue
- Eye lid
- External ear
- Internal fertilization
- Oviparous (lays eggs) or Viviparous (live young)
- Four legs

Circle the correct response:

(Snake) Lizard Turtle

What characteristics did you use?

Has all the snake characters

What is different about this animal?

Also has vestigial legs!

Name the species: (use the internet if needed) *Rubber Boa*

Circle the correct response:

Snake Lizard (Turtle)

What characteristics did you use?

Has all the turtle characters

What is different about this animal?

Its carapace and plastron are soft!

Name the species: (use the internet if needed) *Eastern Spiny Softshell Turtle*

Circle the correct response:

Snake (Lizard) Turtle

What characteristics did you use?

Has all the lizard characters except for legs

What is different about this animal?

It has no legs!

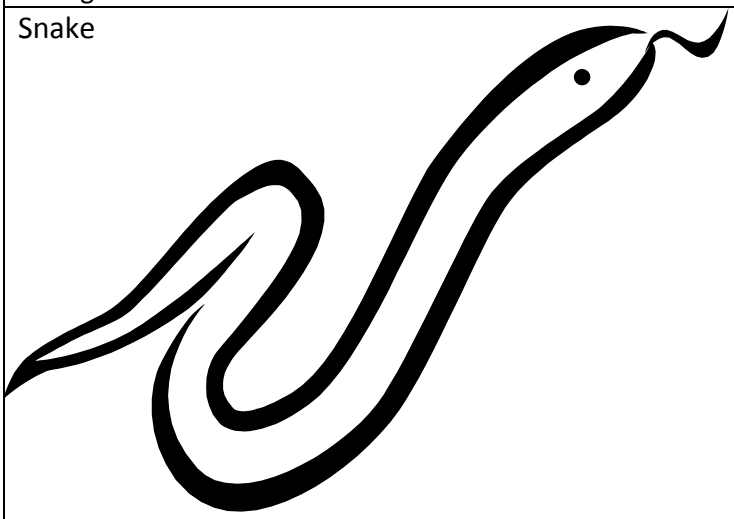
Name the species: (use the internet if needed) *Glass Lizard*

Reptile Characters!

Match the characteristic to the reptile. Hint: Some of the characteristics apply to all three types of reptiles. Use a book or the internet to research your answers if you aren't sure.

Characteristics:	Forked tongue
Small overlapping dorsal (back) scales	Non-forked tongue
Ventral (belly) scales extending across the body	No eye lid
Small overlapping ventral (belly) scales	Eye lid
Carapace	No external ear
Plastron	External ear
Bridge	Internal fertilization
Four Legs	Oviparous (lays eggs) or Viviparous (live young)
No legs	Oviparous (lays eggs)

Snake



- _____
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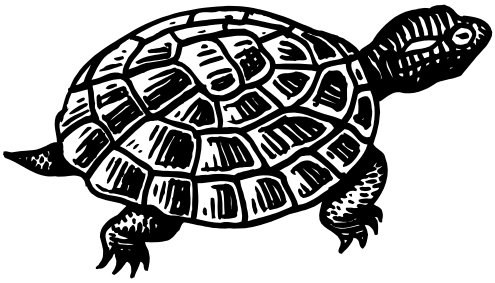
Turtle



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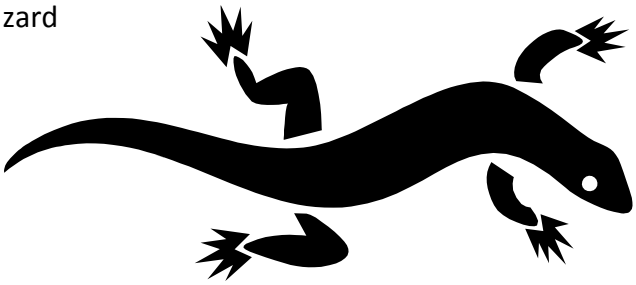
- _____

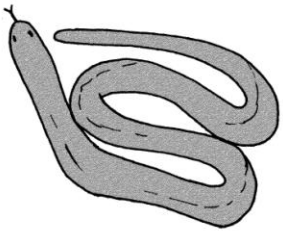
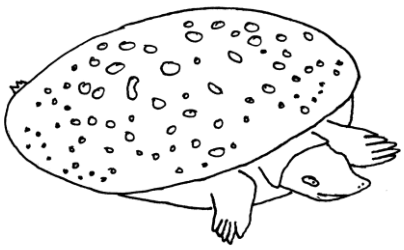
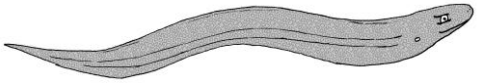
Lizard



- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Reptile Characters (Part 2)!

Based on what you have learned from the characteristics of a snake, turtle and lizard, place the following creatures in one of the three categories and list the characters that allowed you to place them in that category and what is different about them.

		
This creature is small and looks as if it is made of rubber or plasticine. It spends most of its time hiding in cool, moist areas under rocks and logs. It has tiny scales covering its body, with ventral scales extending across the belly. It also has anal spurs, which are vestigial legs! This is a species of special concern and is found in the Okanagan Valley in British Columbia.	This creature has a soft shell which is round and flat like a pancake. Due to its lack of protective shell, it can be more defensive than most and spends most of its time in the water. They have a long nose and neck, built like a snorkel and can be found in shallow water with only their nose exposed. This is a threatened species in Ontario.	This creature is covered in tiny scales across the entire body and also has external ears and eyelids. When frightened by a predator this creature has the ability to drop off its tail; sometimes the tail will drop off in several pieces! It is found in dry grasslands and woodlands in the south east portion of the United States.
Circle the correct response: Snake Lizard Turtle What characteristics did you use? What is different about this animal? Name the species: (use the internet if needed)	Circle the correct response: Snake Lizard Turtle What characteristics did you use? What is different about this animal? Name the species: (use the internet if needed)	Circle the correct response: Snake Lizard Turtle What characteristics did you use? What is different about this animal? Name the species: (use the internet if needed)

Now create and draw your own mystery creature with features from one of the three categories and have a classmate try to guess what it is.

Grade 7

Curriculum Links:

Understanding Life Systems: Interactions in the Environment

General Information: By grade 7 students can really start to understand the impact that they can have on the environment. Teaching about species at risk is an important conservation strategy for these animals. You protect what you know about. We have included many curriculum links to Ontario's reptile species at risk as well as an activity sheet you can use.

Section 1: Relating Science and Technology to Society and the Environment

1.1: Assess the impact of selected technologies on the environment.

Example Activity: One of the main threats to turtles is road mortality. There are several solutions to the problem of turtle and other animal road mortality being studied. Students can research different methods and report on the impact that those technologies are having on the environment.

1.2: Analyse the costs and benefits of selected strategies for protecting the environment.

Example Activity: Many conservation strategies come at an expense to taxpayers or property owners. Students can study the different points of view from a current conservation strategy. For example students could look at the costs and benefits associated with protecting a certain wetland from farm expansion, mitigating forest harvest in black ratsnake habitat, changing rules about shoreline development around Georgian Bay to protect the many species at risk in that area or rebuilding the causeway at Long Point.

Section 2: Developing Investigation and Communication Skills

2.2: Design and construct a model ecosystem, and use it to investigate interactions between the biotic and abiotic components in an ecosystem.

Example Activity: Corn snakes make an excellent class pet. For more information about having a corn snake as a class pet contact Sciensational Sssnakes!! You can use this class pet as a way to investigate the habitat requirements and interactions of corn snakes.

2.3: Use scientific inquiry/research skills to investigate occurrences that affect the balance within a local ecosystem.

Example Activity: Reptiles are one of the most endangered groups of animals in Canada. There are a lot of changes both human-made and environmental which have altered the balance in their ecosystems. Students could choose a reptile species at risk to research and learn about what changes in its ecosystem have occurred to affect the balance and cause that species to become at risk of extinction.

Understanding Structures and Mechanisms: Form and Function

Section 1: Relating Science and Technology to Society and the Environment

1.1: Evaluate the importance for individuals, society, the economy, and the environment of factors that should be considered in designing and building structures and devices to meet specific needs.

Example Activity: Students can study the costs and benefits of different types of structures used for animal crossings around the world. These crossings are vitally important to certain reptiles at risk. We do not have many of these structures in Ontario yet, however plans are underway to create some. Students could assess the current proposals based on their research of crossings from other places.

Grade 7

Curriculum Links:

Understanding Life Systems: Interactions in the Environment

Section 3: Understanding basic Concepts

3.1: Demonstrate an understanding of an ecosystem as a system of interactions between living organisms and their environment.

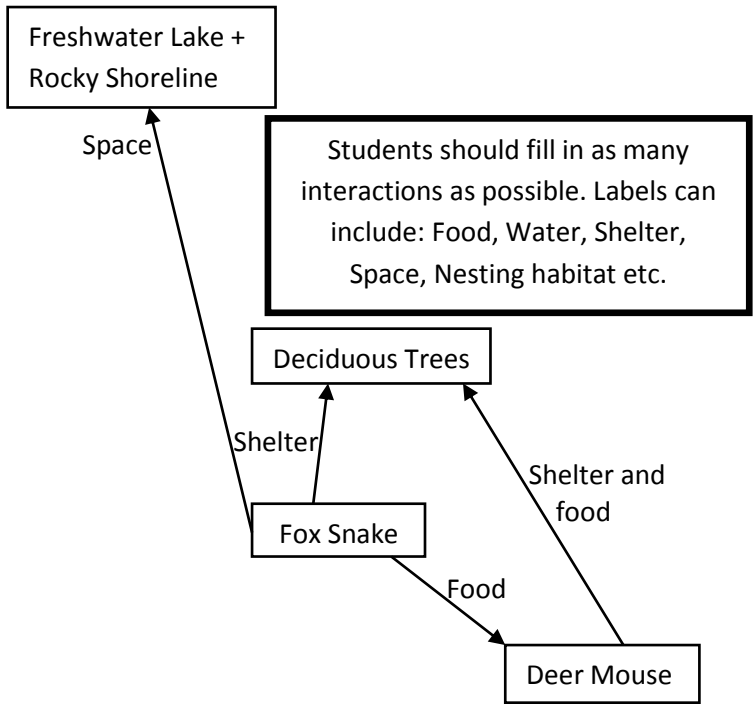
Ecosystems – Answer Sheet

Complete the diagram by adding more arrows and boxes to include the rest of the components from the list on the left. A couple of interactions have already been done for you.

Partial Ecosystem List:
(You can add more parts to the ecosystem as you think of them)

- ✓Eastern Fox Snake
- Massassauga Rattlesnake
- Five lined skink
- ✓Deer Mouse
- Meadow Vole
- Eastern Chipmunk
- Red Squirrel
- ✓Deciduous Trees
- Coniferous Trees
- Shrubs and small plants
- American Robin
- Purple Finch
- Red Fox
- Raccoon
- Red-Tailed Hawk
- ✓Rocky shoreline
- ✓Freshwater lake (Georgian Bay)
-
-
-
-

Draw your diagram here (label as many of the interaction lines as you can):



Draw an X through an important piece of the ecosystem. Describe below what you think would happen when that piece is removed from the ecosystem.

There are a few possibilities when a piece of an ecosystem is removed. The lower down the food chain the piece the more of an effect its removal will have. For example if trees are removed lots of other creatures will die. An animal which is higher up on the food chain will have less of an effect. For example if Foxes are removed then most likely there would be an explosion of mice for a few years, then hawks would be more abundant and eventually a new balance would result.

Losing any species in an ecosystem is sad and there may be long term effects we do not see, or things which we may have discovered about that species which may have helped humanity that we would never know about.

Ecosystems

Many Species at Risk around the world are having problems because a part of their ecosystem is being disturbed by human activity. For example, oil development in the Canadian Arctic is taking land away from Caribou populations, hazardous chemicals from cities further south rain down into the arctic environment polluting food sources for birds, polar bears and other animals.

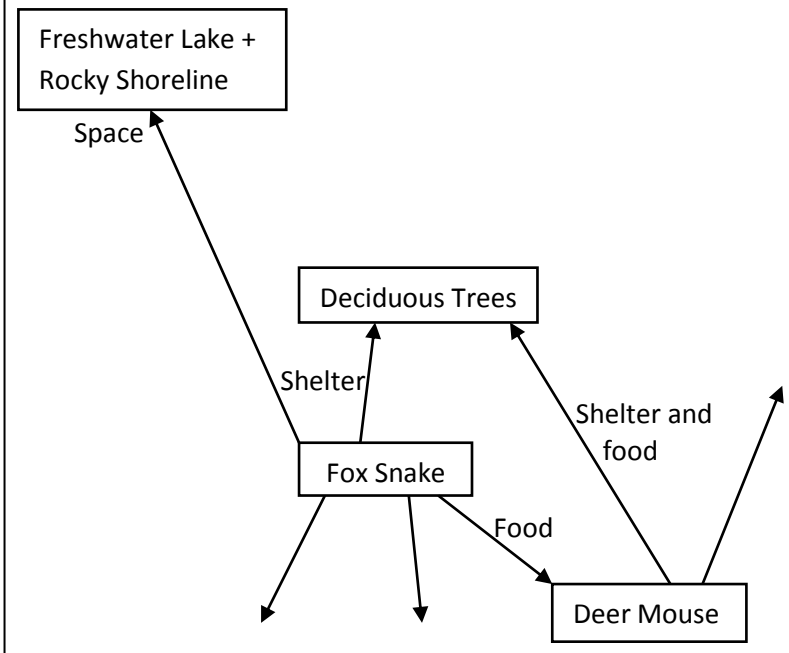
An ecosystem consists of many important interactions between living organisms and their environment. When one part or piece of an ecosystem is altered or removed the whole system may break down.

Complete the diagram by adding more arrows and boxes to include the rest of the components from the list on the left. A couple of interactions have already been done for you.

Partial Ecosystem List:
(You can add more parts to the ecosystem as you think of them)

- ✓Eastern Fox Snake
- Massassauga Rattlesnake
- Five lined skink
- ✓Deer Mouse
- Meadow Vole
- Eastern Chipmunk
- Red Squirrel
- ✓Deciduous Trees
- Coniferous Trees
- Shrubs and small plants
- American Robin
- Purple Finch
- Red Fox
- Raccoon
- Red-Tailed Hawk
- ✓Rocky shoreline
- ✓Freshwater lake (Georgian Bay)
-
-
-
-

Draw your diagram here (label as many of the interaction lines as you can):



Draw an X through an important piece of the ecosystem above. Describe below what you think would happen when that piece is removed from the ecosystem.

Grade 8

Curriculum Links:

Understanding Structures and Mechanisms: Systems in Action

General Information: Human structures have a huge impact on the environment. By learning about these impacts students can have a positive impact on conservation of natural spaces and species at risk. We have included an activity related to the Long Point Causeway project in Ontario. Lots of information on this topic can be found on the internet. The causeway project has its own website at: www.longpointcauseway.com.

Section 3: Understanding basic Concepts

3.9: Identify social factors that influence the evolution of a system.

Example Activity: As a follow-up to the activity sheet presented students could study the history of the Long Point causeway. A long time ago access to the marinas on Long Point was only available by boat. Increasing interest meant that the first causeway was built. This allowed new Model T fords to travel to the beaches of Long Point. As time went on some of the bridges were filled in blocking off water flow to the marsh but allowing more cars to travel the road. Cottages went up, road improvements were made and the whole system evolved. The social changes of attitude towards natural spaces and the value of the marsh itself or uses of the resources found in the marsh through the years has caused the whole access system to evolve into what it is today and also into what it will be in the future as new plans are approved and altered.

Grade 8

Curriculum Links:

Understanding Structures and Mechanisms: Systems in Action

Section 1: Relating Science and Technology to Society and the Environment

1.2: Assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration.

Long Point Causeway Improvement Project – Answer Sheet

Further information about the Long Point Causeway Improvement Project can be found on the internet. Specifically: www.longpointcauseway.com has a lot of information. Students could also search newspaper articles from the area. The activity sheet could be used as a starting point for a classroom debate on the issue. Students could research fully the point of view of one of the interest groups involved and debate each side of the issue.

Long Point Causeway Improvement Project

Long Point, Ontario is a long spit of land which extends out into Lake Erie near Port Rowan, Ontario. In the 1920's a causeway was built allowing tourists to access the beaches and marinas on this spit of land. The causeway was built partly along a rise in the land which formed a natural barrier between the outer bay and Big Creek Marsh. In order to build the causeway, bridges were put in at points where the water flowed between the two areas and clay was brought in to widen the path where needed. Over the years the causeway was altered to allow for the changing needs of users. All of the bridges were removed and filled in except for one, and the roadway was widened to allow for our larger cars. The road was also paved as traffic increased and cottagers started moving in.

A lot of wildlife uses the land around Long Point. It is one of the last remaining Carolinian Forest ecosystems in Ontario and is an important migration point for birds. Long Point also includes a significant wetland area for birds, fish, amphibians and reptiles. The causeway was built over an important corridor for fish, amphibians and reptiles to get into the marsh. It quickly became the fourth deadliest road for turtles in both Canada and the United States.

There is currently a push by several conservation groups headed by the Long Point Causeway Improvement Project to change the causeway as a way of reducing road mortality of wildlife along its route while also improving its safety for people and cars and adding new features for cyclists and wildlife viewers.

Read the attached article and answer the following questions. You can also get more information from the internet by searching the Long Point Causeway Improvement Project website at www.longpointcauseway.com, or by doing a general internet search on the topic.

1. There are several groups that are interested in this project, a couple of those are listed below. Choose two of the groups (one on each side of the argument) and write an argument for each group convincing a city planner why your point of view is the best one, remember to include the impact on individuals, society, and the environment in your arguments. More information on these groups and their interests can be found on the internet.

Pro:
Long Point World Biosphere Foundation
Ontario Ministry of Transportation

Some points to get you started:

- The proposal will fix the road shoulders expanding them to the standard 2m width required and making the road safer for all users
- Many species at risk live in the area and are being killed on the current road. Wildlife underpasses have been proven to reduce road mortality of many species
- Some residents, cottagers and visitors are excited about the proposal for a walking trail, improved fishing points, wildlife viewing platforms, and the addition of a bike trail

Con:
Concerned Cottagers and Residents
Some business Owners

Some points to get you started:

- Some cottagers are worried about losing trees along the roadway. Also bike lanes and walking trails will bring people closer to their homes. They are also worried that a larger road in front of their homes may decrease property values
- Some residents are concerned that the cost of the project will mostly be paid by them in taxes
- Some business owners are concerned that extensive ongoing construction would restrict the number of visitors coming during that time

2. If you had to make a decision on this project, what would you do and why?

Source: http://longpointcauseway.com/article.php/20080222082941712

What is the Long Point Causeway Improvement Project?

Friday, February 22 2008 @ 08:29 AM EST

The Long Point World Biosphere Reserve Foundation (LPWBRF) is leading a community-based project to revitalize the 3.5 kilometre-long causeway that links the Long Point Peninsula on Lake Erie with mainland southern Ontario. As a first step, the LPWBRF awarded a $40,000 contract to Ecoplans Limited of Kitchener, Ontario to conduct a feasibility study of potential improvements that would reduce wildlife mortality and restore the hydrological connections between Big Creek Marsh and Long Point Inner Bay. The improved Causeway could also provide ancillary social benefits including improved road safety and enhanced recreational opportunities while maintaining the rural character of the Long Point countryside.

The Long Point Causeway Improvement Project Steering Committee includes representatives from Bird Studies Canada, the Nature Conservancy of Canada, the Ontario Ministry of Natural Resources, the Ontario Ministry of Transportation, Norfolk County, the Norfolk Land Stewardship Council, the Long Point Region Conservation Authority, the Upper Thames River Conservation Authority, the Norfolk Field Naturalists, the Long Point Country Chamber of Commerce, the Long Point Ratepayers Association, the Long Point Anglers Association, the Long Point Waterfowlers' Association, the Toronto Zoo, and the Ruffed Grouse Society.

The study was completed in April 2008 and recommended the following improvements:

1. Design and install a permanent ecopassage system that will provide animals with an alternative to having to cross the road overland. An ecopassage system consists of culverts and bridges to provide wildlife movement under the roadway and a continuous funnel system of wall or fence that directs wildlife toward the passages and prevents wildlife entering the roadway. Twelve ecopassages are recommended for the length of the causeway. This number should increase the likelihood of use by the species concerned and decrease the distance traveled by reptiles that are slow moving. Also, reptiles have relatively small home ranges and are susceptible to predation if they must move long distances.
   The funnel wall system will need to be made of relatively smooth material to prevent certain species from climbing over the wall. The wall needs to be at least one metre high and be fashioned with a 'lip' or 'cap' to prevent certain animals from scaling the wall. The funnel wall must be durable enough to withstand temperature extremes, erosion, winter road maintenance and ice build up.
2. Improve the existing hydraulic conditions by re-creating openings through the causeway to allow for the exchange of bay water with the marsh. While the causeway reduced the exchange of water with the Inner Bay there were several outlets that maintained circulation within the marsh. By the mid-twentieth century the southern outlets had been closed and water control structures were removed as they fell into disrepair.
3. According to the Norfolk County Lakeshore Special Policy Area Secondary Plan, the causeway is a candidate trail route and is indicated as an on-road cycling route extending from Long Point Provincial Park up the causeway and connecting with a trail system on the Front Road. The road expansion of the causeway necessary to implement the ecopassage system presents an excellent opportunity to consider a multi-use trail system along the west side of the road. The necessary expansion will easily accommodate a multi-use trail safely set back from the roadway as well as landscaping, all within the existing County road allowance.

Much more detail having to do with the proposed plan, additional signage, traffic calming methods, temporary measures and monitoring are included in the Ecoplans proposal. A copy of the proposal is available for downloading on this site and for review at the Port Rowan Public Library as well as the complete causeway map.

Fast facts

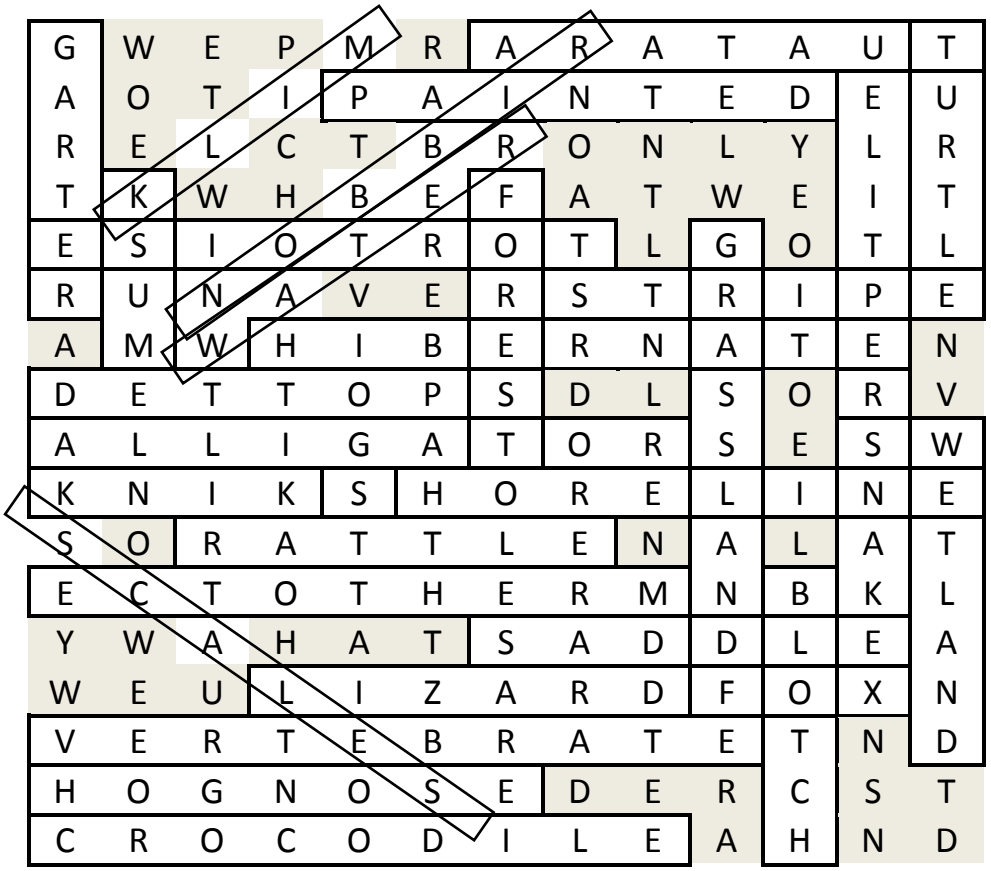
- The Causeway was constructed in 1927-8 to provide access to the Long Point beaches from the mainland.
- On average, nearly 2300 car trips are made across the causeway every day between April and October (2005 data). Four times this number of cars crosses the causeway on summer weekends.
- It is estimated that 10,000 animals die on the causeway annually, according to surveys by the Canadian Wildlife Service - Environment Canada (CWS). Most are leopard frogs but 99 other species of frogs, turtles, snakes, birds, and mammals have been run over including rare and endangered species.
- So many turtles are being run over at Long Point that the causeway is now ranked the 5th deadliest road in the world for turtles.
- The Big Creek Marsh acts as a giant natural kidney for the entire watershed. Because the marsh now has only one outlet into Long Point Bay, sediment and pollution-laden water now flows directly into the bay instead of being purified by the marsh

Additional Activities

Including Math, Language, Geography and Science

General Activities - Answers

Reptile Word Search



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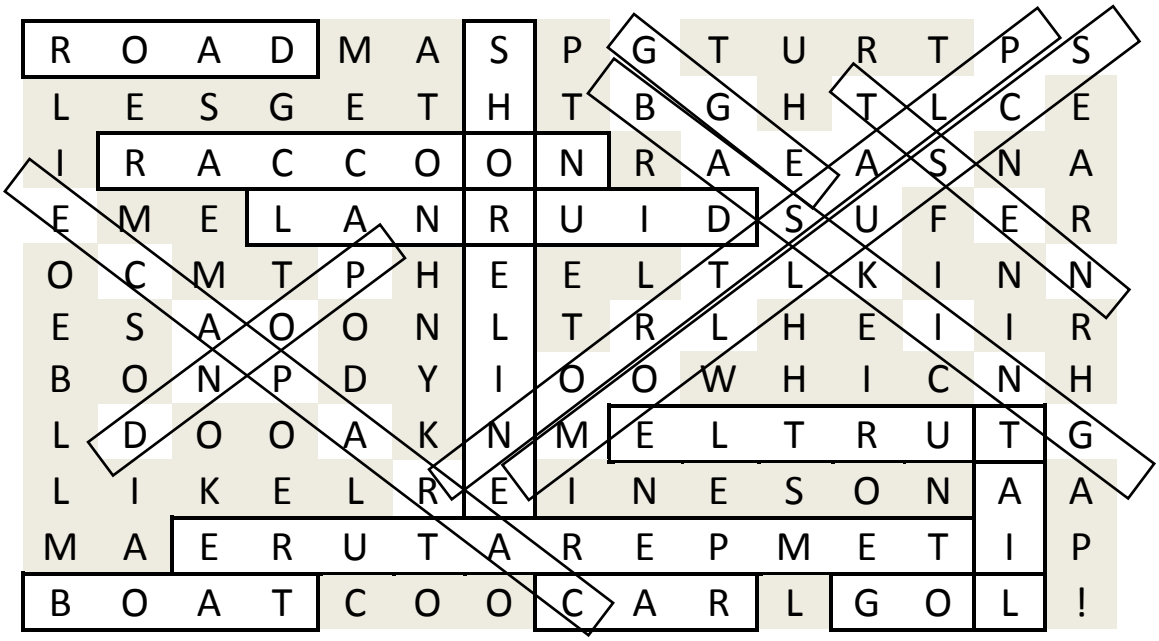
W	E	U	L	I	Z	A	R	D	F	O	X	N
V	E	R	T	E	B	R	A	T	E	T	N	D
H	O	G	N	O	S	E	D	E	R	C	S	T
C	R	O	C	O	D	I	L	E	A	H	N	D

"We protect only what we love and love only what we understand"

Map Turtle Word Search



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L	E	S	G	E	T	H	T	B	G	H	T	L	C	E
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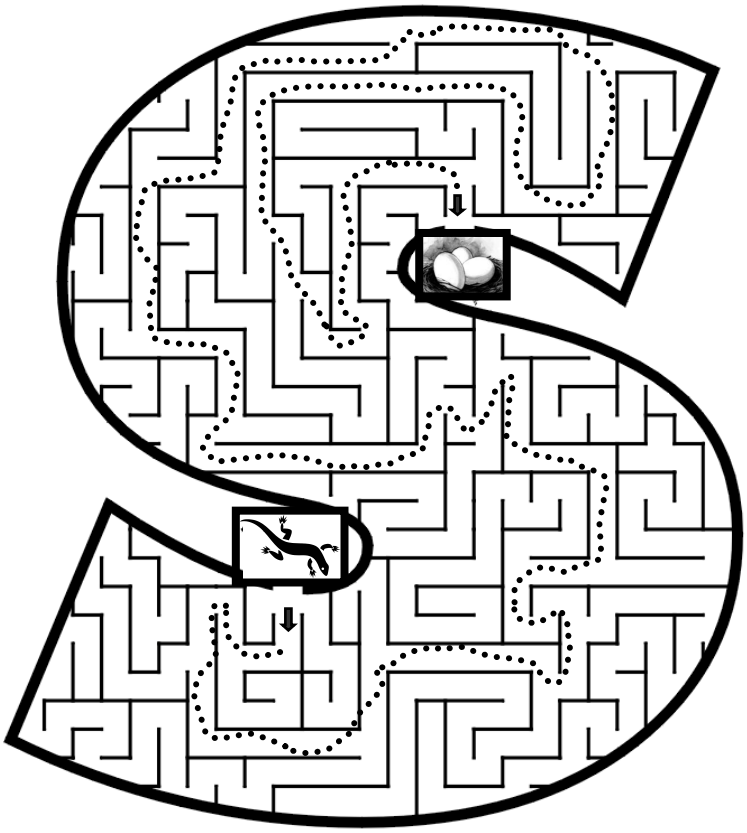
L	D	O	O	A	K	N	M	E	L	T	R	U	T	G
L	I	K	E	L	R	E	I	N	E	S	O	N	A	A
M	A	E	R	U	T	A	R	E	P	M	E	T	I	P
B	O	A	T	C	O	O	C	A	R	L	G	O	L	!

Map Turtles get their name from the lines on their body which look like lines on a map. Cool!

Five Lined Skink Maze



Spiny Softshell Word Jumble

"S P I N Y S O F T S H E L L T U R T L E S D O N O T H A V E A H A R D C A R A P A C E O R P L A S T R O N L I K E O T H E R T U R T L E S"

Reptile Word Search

Alligator	Lizard	Skink
Blotch	Milk	Snake
Crocodile	Musk	Spotted
Ectotherm	Painted	Stripe
Forest	Rattle	Tortoise
Fox	Reptile	Tuatara
Garter	Ribbon	Turtle
Grassland	Saddle	Vertebrate
Hibernate	Scales	Water
Hognose	Shoreline	Wetland

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

"__ _______ ____ ____ __ ____ ___ ____

____ ____ __ ___________"

Map Turtle Word Search

Map turtles are one of Ontario's eight species of turtle. These shy animals prefer deep water and thus, are found primarily in large water bodies such as Georgian Bay and the St. Lawrence River. Map turtles prefer, like all wild animals, to be left alone and will dive into the water from their basking sites at the first sign of an approaching person or predator. The diet of the map turtle consists mainly of molluscs, insects, fish and aquatic snails; they have also been recorded eating the Great Lakes invasive zebra mussel. Their body is designed specifically for this lifestyle; they have large, webbed feet which act as paddles to propel them through deep water and a large, strong jaw that is used to crush the shells of their prey species.

These beautiful animals are currently listed as a species of special concern, which means scientists are concerned about the status of their population but more complete research is needed to obtain information about their ecology. Much of the concern relating to this species stems from pollution in the Great Lakes which has diminished the quality of their habitat and collision mortality caused by boats and vehicles like cars on land. It is not difficult to minimize collision risks; slowing down your boat near shore and known basking sites and slowing down motorized vehicles, especially in the spring when females are traveling on land looking for nesting sites will go a long way to helping Map Turtle populations.

Basking	Carapace	Log	Plastron	Road	Temperature
Boat	Diurnal	Molluscs	Pond	Shoreline	Turtle
Car	Egg	Nest	Raccoon	Tail	

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

Use the left over letters to fill in this neat fact about Map Turtles:

___ ________ ___ ______ ____ ____ ___

_____ __ ______ ____ _____ ____ ____

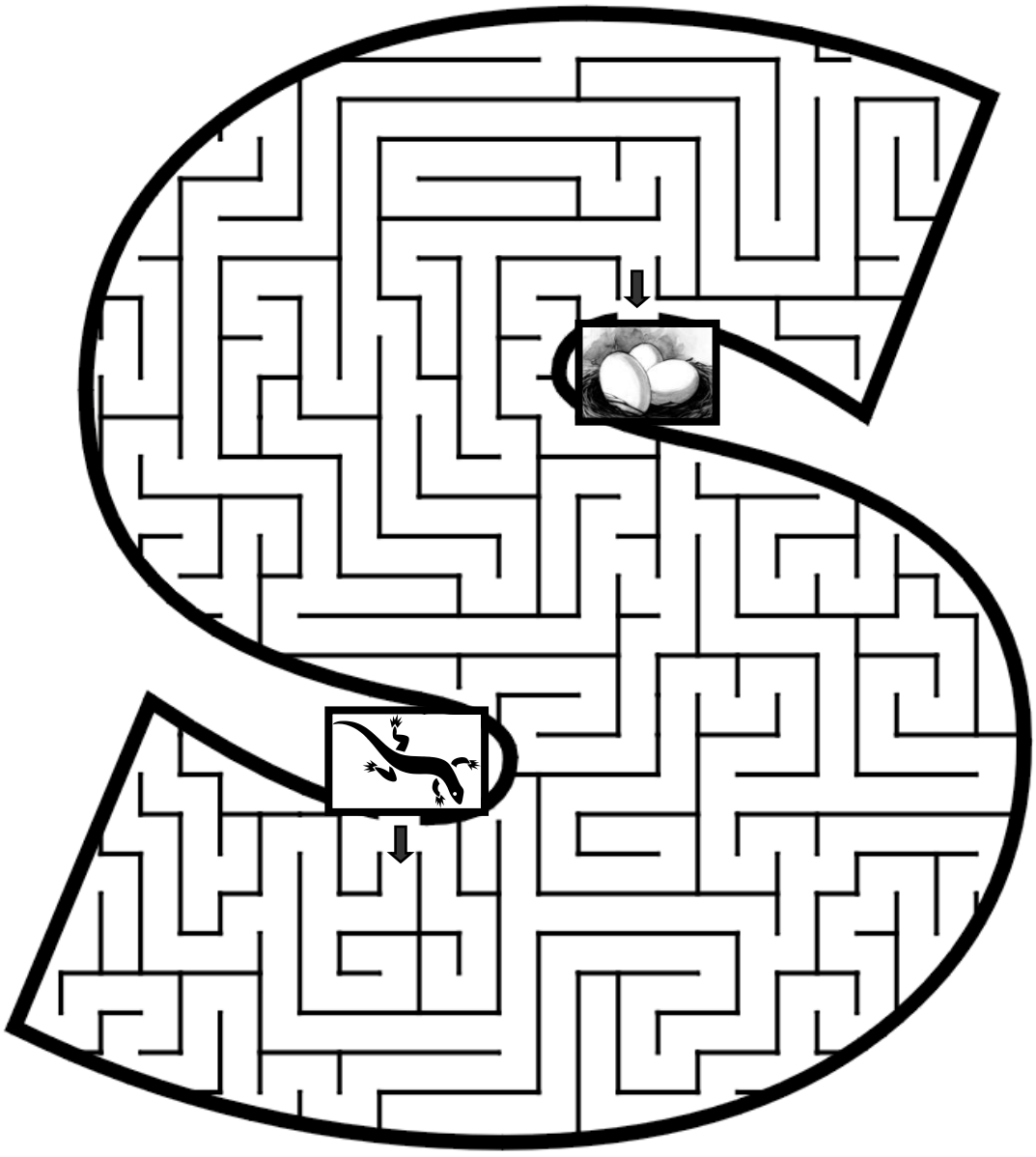
_____ __ _ ___. _____

Five Lined Skink Maze

Ontario's only species of lizard is the five lined skink. When these lizards are young they have a bright blue tail. The tail helps people identify them as five lined skinks. It also helps the lizards get away from predators. When they are being chased by a predator they can drop their tail and leave it behind as they run away. The bright blue tail remains on the ground wiggling away distracting the predator while the skink makes its escape. The predator gets a small meal by eating the tail left behind, but the skink gets to live another day and will re-grow its tail after a while.

These speedy animals are found in southern Ontario on the Canadian Shield and along some lateshores. They spend their lives in the leaf litter of deciduous hardwood forests. The five lined skink is currently listed as a species at risk in Ontario. Skinks are at risk because of habitat loss and people catching them as pets in some places. In some areas where skinks lived lots of forests have been cut down or changed so skinks can't live there anymore. Most reptiles lay their eggs or have their babies and then leave their babies to fend for themselves. Skinks on the other hand actually provide care and protection for their eggs. Pretty cool!

Help Swift (our native Ontario lizard) the five lined skink, find her nest of eggs.



Spiny Softshell Word Jumble

The Spiny Softshell turtle does not look like the other seven species of turtles found in Ontario, and the reason why is reflected in its name. This aquatic animal, unlike other turtles, does not have the hard plastron (bottom piece of turtles shell) or carapace (top piece of turtles shell) often associated with turtles instead they have a soft leathery plastron and carapace. Spiny Softshell turtles are olive in colour and are found in Lake Erie and nearby water bodies. Spiny softshell turtles prefer areas with muddy substrate and lots of vegetation; both tools they can use to help them hide in the water away from their predators such as skunks and raccoons. When hiding amongst the vegetation or under the mud, these turtles can use their long, snorkel like nose to breathe; this lets them keep their soft, vulnerable bodies hidden. As these turtles spend so much time in the water, their diet is made up of other aquatic animals such as crayfish, fish and some types of insects. Unfortunately due to pollution and habitat destruction, the areas where these turtles can live are becoming restricted. Currently Spiny Softshell turtles are listed as threatened in Ontario.

ELL	ER T	Y SO	AVE	ACE	LIKE	OT H
~~TURT~~	A HA	LAST	RON	DO N	OTH	FTSH
~~RD C~~	SPIN	LES	ARAP	OR P	URTL	ES

Rearrange the boxes to reveal a secret message about Spiny Softshell turtles. Two boxes have been placed for you.

"_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ TURT _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

_ _ RD C _

_ _ _ _ _ _ _"

Ontario Reptile Word Anagrams

Below is a list of Ontario species of reptiles. How many words can you make from the letters in each name following list? Each word should be 3 letters long or longer. We have given you a few words to get you started.

Five Lined Skink

Like
Kind
Skinned

Black Rat Snake

Blanding's Turtle

Math Problems – Answers

ALGEBRA

Grade 6-7

1a. 3 eggs survived, 9 eggs were eaten. 1 of the survivors was a male the other 2 were females.
2a. 9 trips, 4 with five small trees each load and 5 with one large and two small trees each load
b. 108m
3a. Nest #1: 3, Nest #2: 6, Nest #3: 12
4a. Snake 1 3cm, Snake 2 9cm, Snake 3 13.5cm

SEQUENCING

Grade 6

1a. 3.3g, 2.8g, 2.67g, 2.5g, 2.17g, 2.14g, 2,116g, 2,1g
2a. 296g, 296.4g, 296.43g, 299.99g, 300g, 300.01g
3a. 9.01g, 9.001g, 9.0g, 8.89g, 8.8g, 8.999g, 8.99g, 8.9g
4a. 2.99g, 2.0g, 1.78g, 1.67g, 1.56g, 1.5g, 1.1g, 1.0g
5a. 90.1cm, 90.001cm, 90cm, 89.99cm, 85.999cm

AREA AND VOLUME

Grade 6-7

1a. 1130.40cm^3
b. 602.88cm^2
c. 0.5m
d. $6.00
2a. $11.28, $169.16
b. $19.46
c. $175.00
d. 20cm
e. 0.008m^3 or 8000cm^3
3a. 25m^2
b. 75m^3
c. 3.13m
d. 9.79m^2
e. 29.39m^3

FRACTIONS

Grades 6-7

1a. 22
b. 234
c. 33
d. 96
2a. Gartersnake 0.3m/s, Five-lined Skink 0.15m/s, Watersnake 0.2m/s, Painted Turtle 0.02m/s
b. 1.08km/hr, 0.54km/hr, 0.72km/hr, 0.072km.hr
c. Gartersnake, Watersnake, Five-lined Skink, Painted Turtle
3a. There were 3 survivors, 9 were eaten
b. 1 was a male, 2 were females

ALGEBRA

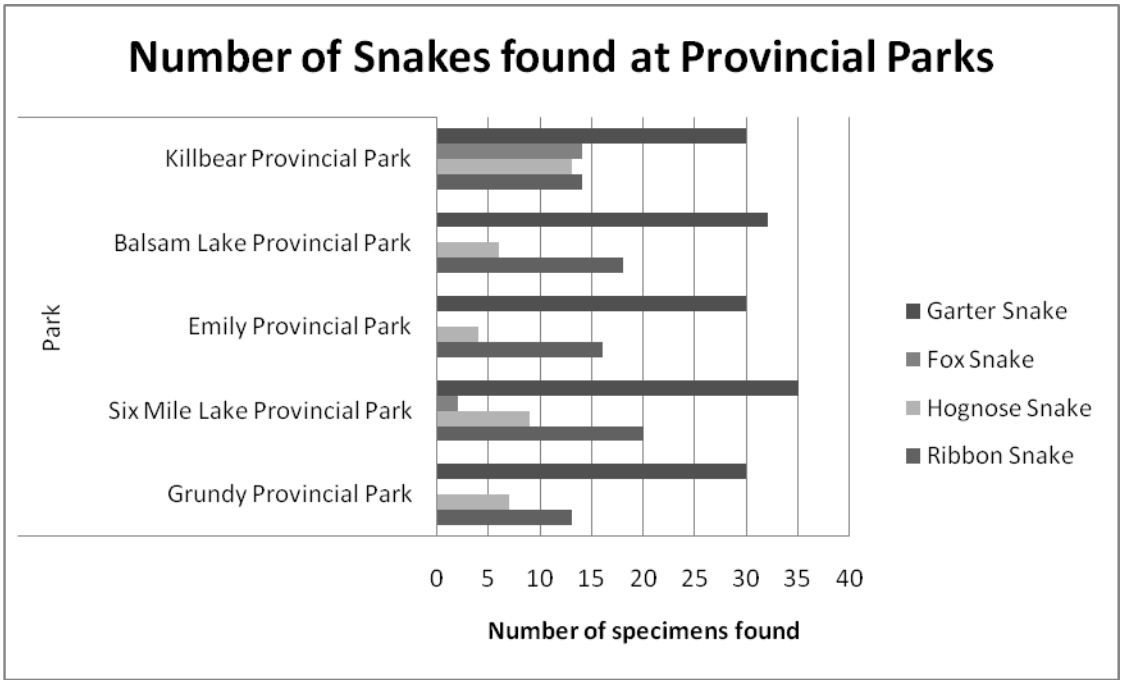
Grade 7-8

1a. 0.83m = 83cm
2a. 0.1m = 10cm
3a. 16, #of sides = (#of cages * 3) + 1
b. 25
c. $4.29
d. $107.16
4a. Lurvy gets 7 toads, Charlotte gets 5

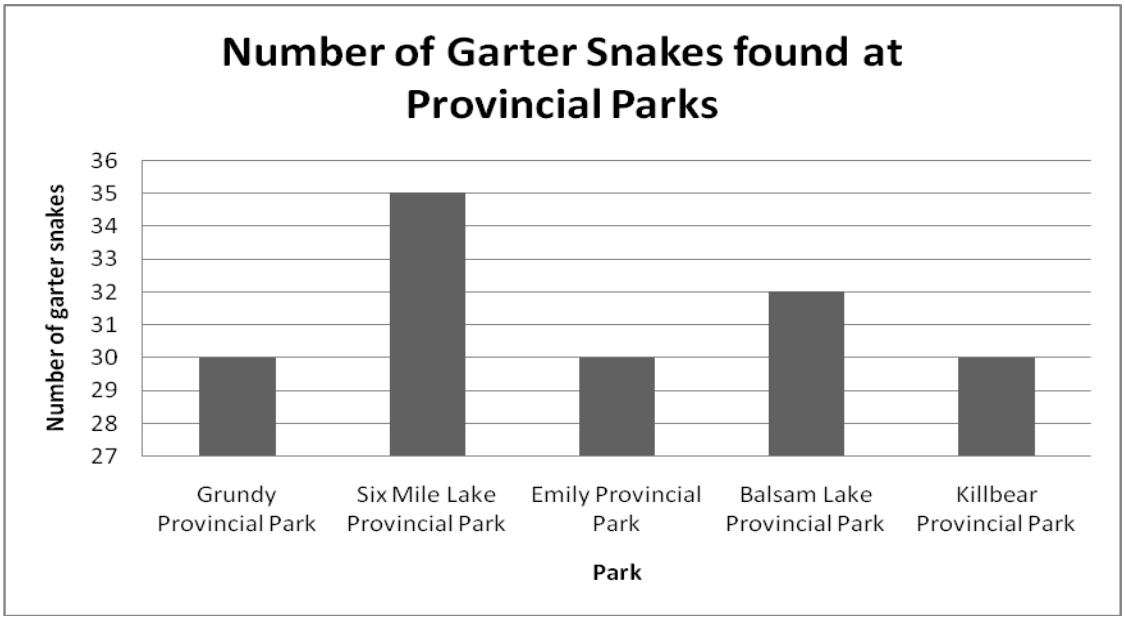
GRAPHING

Grades 7-8

1a.



b. Bar graph, to show multiple types of snakes.
c.



MEAN, MEDIAN AND MODE

Grade 7-8

1a. Mean 3.69, Median 4, Mode 3
b. Mean, Median and Mode all = 4
2a. Mean 72.71, Median 70, Mode 70
b. Mean 71.8, Median 70, Mode 70
3a. Mean 6.67, Median 6, Mode 6
b. Mean 5.67, Median 5, Mode 5

RATIO AND PERCENT

Grade 8

1a. 9
2a. 5:4
b. No
3a. 18.75% eat only frogs, 25% eat frogs and fish, 15% eat only fish, 41.25% eat a mixed diet

ALGEBRA

Grade 6-7

1. A Blanding's Turtle with its bright yellow chin laid 12 eggs in a nest it had dug after being helped across the road by a student. Of these 12 eggs, one quarter survived to become adults, three quarters were eaten by predators as small baby turtles; of the survivors one third were males, two thirds were females.
   a. Turn the fractions into whole numbers.

2. Geoff wants to plant some trees to help provide habitat for the longest snake in Canada, the Black Rat Snake. He can carry 5 small OR 1 large and 2 small trees at a time. Geoff parks his truck 6 metres from where he can plant the trees.
   a. If Geoff has 35 trees in total, 30 small trees and 5 large trees, and he always carries a full load, what is the smallest number of trips he can take to move all the trees?
   b. How many metres did Geoff walk to make all those trips?

3. Megan was researching spotted turtles and found three nests. The second nest had twice as many eggs as the first one, and half as many as the third nest. The second nest had 6 eggs.
   a. How many eggs were in each nest?

4. While Megan was out researching the spotted turtles she found four garter snakes. The first garter snake was young and only 3cm long. The second garter snake she found was three times the size of the first one and the third garter snake was one and a half times larger than the second garter snake.
   a. List the size of the snakes from smallest to largest.

SEQUENCING

Grade 6

1. It is a common misconception that water snakes spend all their time in water. Although the water is a useful tool for these animals they do bask and give birth on land. One thing they routinely use the water for is to hunt fish. A water snake catches 8 fish in two weeks at the following weights. The fish each weighed the following: 2.1g, 2.5g, 3.3g, 2.14g, 2.17g, 2.67g, 2.8g and 2.116g.
   a. Report the fish from heaviest to lightest.

2. Hognose snakes love to eat toads, and they use their upturned nose to dig into the mud and find such nutritional treasures. In a given week a hognose snake might find 6 toads. A researcher found that one week a hognose snake ate 6 toads of the following weights: 300.01g, 299.99g, 296.43g, 296.4g, 296g and 300g
   a. Order the toads from lightest to heaviest.

3. Wood turtles love to eat worms and have developed a special technique for hunting them. These intelligent turtles will thump their feet on the ground to imitate the sound of rain and will snatch up the worms once they rise to the surface. In one thumping session a wood turtle is able to eat 8 worms weighing 1.1g, 1.0g, 2.0g, 2.99g, 1.5g, 1.56g, 1.78g and 1.67g.
   a. List the worms the wood turtle ate from heaviest to lightest.

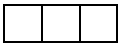
4. Fox snakes, which are yellow and brown in colour, are one of the arboreal species of snakes found in Ontario. Over 70% of their known worldwide population lives in Ontario. Like the Black ratanake, they rely heavily on forests for their survival. A researcher was tracking these animals to learn more about them and found 5 large snakes at the following lengths: 90cm, 90.1cm, 85.999cm, 89.99cm, and 90.001cm.
   a. List the snakes from longest to shortest.

AREA AND VOLUME

Grade 6-7

1. Spiny soft shelled turtles lay their eggs on land like most turtles. Crystal, a wildlife technician, has decided to put a fence around the nests she finds to help prevent raccoons and skunks from eating the eggs.
   a. If the average nest is a cylinder 10 cm deep with a radius of 6 cm, what is the volume of the nest?
   b. What is the surface area of that nest (include top, bottom and sides)?
   c. Crystal decides that she wants to place fencing around the nest. The fencing will go 4 cm deeper and 2 cm wider than the nest, what length of fencing, in metres, would she need to circle the nest?
   d. If the fencing costs $12.00 a metre, how much would it cost to fence the turtle nest?

2. Jenny went to the hardware store so that she could buy some fencing for the Spotted Turtle nests she wanted to protect from raccoons and skunks. She bought 15 pieces of fencing at $9.98 for each piece.
   a. If sales tax is 13%, how much will each piece of fence cost after tax? How much did she spend in total?
   b. In total how much did she spend in taxes on all the pieces?
   c. If she was given back $5.84 in change, how much money did she hand to the clerk?
   d. If each square piece of fencing has a perimeter of 80 cm, what is the length of each side?
   e. If she built a cube shaped cage using 5 of the pieces of fencing (the sixth side is the ground), what is the volume of the cage?

3. Robin plans to build several turtle enclosures at a local turtle rehabilitation centre. This will allow the turtles to go outside and get sun on the nice days while they are recuperating. If she builds three enclosures back to back she will cut down on the amount of fencing she needs to buy as they will be able to share edges. 
   a. Robin would like to build three equally sized square enclosures. She has 50 metres of fencing, what is the area of each enclosure?
   b. If the fencing is 3 metres tall, what is the volume of each enclosure?
   c. If Robin wanted to make five square enclosures instead of three how long would each side be?
   d. What would be the area of the new cages?
   e. What would be the volume of the new cages?

FRACTIONS

Grades 6-7

1. While doing some research on reptiles you decide to figure out their speeds. You record a garter snake moving from one end of your tent to the other (1.5 metres) in 5 seconds. Later that summer you see a skink move from under a rock to another rock about 30 cm away in 2 seconds. On another day you see a water snake, and it swims from one side of the pond to the other (4 metres) in 20 seconds. On the last day of the summer you see a painted turtle moving on land heading back to the pond; it moves 2.3 metres in 1 minute and 45 seconds.
   a. What is the speed of each reptile in metres per second?
   b. What is the speed of each reptile in kilometres per hour?
   c. Name the reptiles from the fastest to the slowest based on your observation.

2. A Blanding's Turtle with its bright yellow chin laid 12 eggs in a nest dug after being helped across the road by a student. Of these 12 eggs, one quarter survived to become adults and three quarters were predated (eaten by other animals) as small baby turtles.
   a. Turn the fractions into whole numbers.
   b. If one third of the survivors were males and two thirds were females, how many males and females were there?

ALGEBRA

Grade 7-8

1. Steve was out for a hike and spotted a water snake basking beside a 2.5 metre tall wall. Steve took a picture of the snake. In the picture the wall appears to be 3cm in height and the snake appears to be 1cm long.
   a. How long is the snake in real life?

2. On the same trip Steve saw a Blanding's turtle out basking on a 5 metre long log. He knew it was a Blanding's turtle because of the bright yellow chin. He also took a picture of the Blanding's turtle. In the picture the turtle's shell was 0.1 cm tall (from the log to the top of the army helmet shaped shell) and the log was 5cm long.
   a. How tall is the Blanding's turtles shell in real life?

3. Heather is working at a turtle rehabilitation centre which helps take care of injured turtles after they have been hit on roads. She needs to make a pond system for the centre. To make a pond enclosure she needs 4 pieces of fencing – one for each wall, to make two enclosures she needs 8 pieces of fencing. If she places two pond enclosures side by side she needs only seven pieces of fencing since the enclosures can share one edge. 
   a. How many pieces of fencing will she need in order to make 5 enclosures side by side? Show the formula used.
   b. If Heather wanted to make eight enclosures, what is the minimum number of pieces of fencing she would need?
   c. If each piece of fencing costs $3.76 plus 14% sales tax, what is the total cost of a piece of fencing?
   d. How much will Heather have to spend to make all eight enclosures?

4. Justin was taking care of two captive Hognose Snakes for Sciensational Sssnakes and he needed to feed them some toads. Justin started by dividing the toads into two piles, one pile for Lurvy and one pile for Charlotte. Justin enjoys counting things so he noticed that if he took one toad from Lurvy's pile and moved it to Charlotte's pile, the two hognose snakes would each get the same number of toads. If he instead moved one toad from Charlotte's pile to Lurvy's pile, then Lurvey would have twice as many toads as Charlotte.
   a. How many toads would each snake get if Justin does not move any toads?

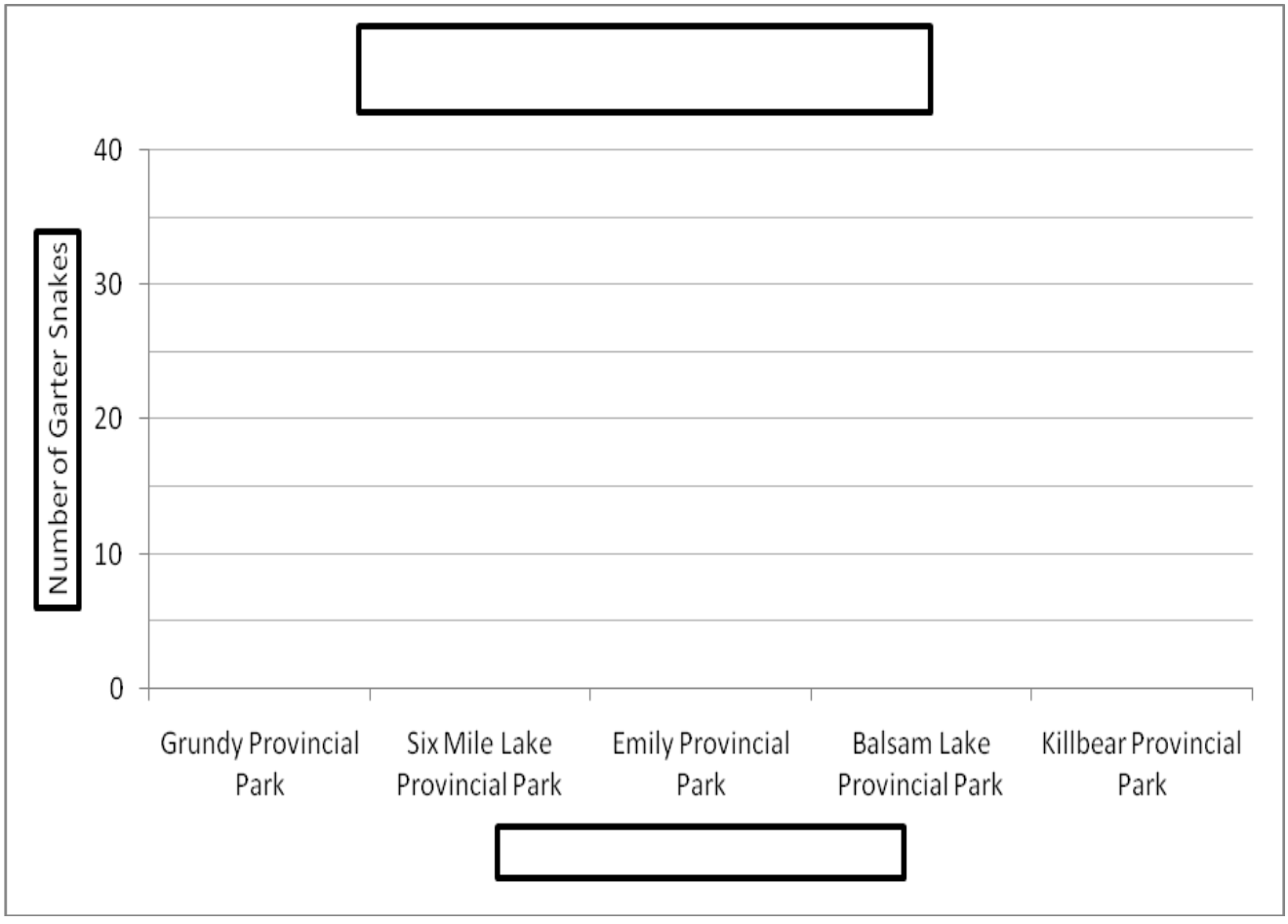
GRAPHING

Grades 7-8

1. Ontario Provincial Parks are a great place to see many of the reptile species at risk. In the table below there are several species of reptiles at risk and the total number found by Ontario Parks Staff in the summer of 2008.

Number of specimens found at Ontario Parks in the summer of 2008					
	Park				
Species	Grundy Provincial Park	Six Mile Lake Provincial Park	Emily Provincial Park	Balsam Lake Provincial Park	Killbear Provincial Park
Ribbon Snake	13	20	16	18	14
Hognose Snake	7	9	4	6	13
Fox Snake	0	2	0	0	14
Garter Snake	30	35	30	32	30

a. Use a separate piece of paper to make a chart representing the number of specimens (columns) found at each park (rows). Don't forget to label your axis and title your graph.
b. What type of chart did you choose for a. and why did you choose that type?
c. Complete the chart below. Don't forget to add labels and a title.



MEAN, MEDIAN AND MODE

Grade 7-8

1. Sarah studied Stinkpot turtles for the summer of 2008. These small turtles get their common name from a musk-like smell they produce when they are frightened or nervous. These turtles live in lakes in some parts of southern Ontario and are a Threatened Species. After a period of incubation within the mother turtle, 3-5 eggs will be laid in a nest. Sarah found 13 nests in her study area with the following number of eggs in each nest: 3, 3, 4, 6, 1, 2, 4, 5, 3, 3, 4, 5 and 5.
   a. What is the mean number of eggs in each nest? What is the median and mode?
   b. How would the mean, median and mode change if all the turtles that laid 3 eggs laid 4 eggs instead?

2. Milk snakes are often found in fields where they hunt mice, one of their preferred foods. These snakes are currently listed as a species of special concern and can be recognized by the "Y" or "V" shaped marking on the top of their heads. One scientist was out looking for milk snakes to learn more about their ecology and behaviour and found seven snakes of varying lengths listed here: 69cm, 70cm, 82cm, 73cm, 70cm, 68cm and 77cm.
   a. What is the median length for the milk snakes the researcher found? What is the mean and mode?
   b. How would the mean, median and mode change if the lowest and highest values were not included in the list?

3. Five-lined skinks lay their eggs in May and June and they hatch mid-late July. Researchers were tracking the nests to learn how many of the eggs would hatch and recorded the following numbers of hatchlings per nest: 2, 4, 6, 7, 3, 5, 6, 9, 10, 11, 10, 9, 5, 6 and 7.
   a. What was the mean number of hatchlings? What was the median and mode?
   b. How would the mean, median and mode change if there were one less hatchling in each clutch?

RATIO AND PERCENT

Grade 8

1. Milk snakes are found in Ontario and are nocturnal. Farmers used to think that the snakes milked the cows, but in reality they were around the farms for another reason – the mice!
   a. If one milksnake eats 15 % of the mice on the farm and three milksnakes can eat 45 percent of the mice on the farm, how many mice will two milksnakes eat if there are 30 mice on the farm?

2. Sean was walking through an ideal forest habitat looking for arboreal snakes. He saw 5 Black Ratsnakes and 4 Eastern Foxsnakes.
   a. What is the ratio of Black Ratsnakes to Fox snakes?
   b. If Sean saw twice as many Black Ratsnakes and twice as many Eastern Foxsnakes, would the ratio change?

3. Ribbon snakes can be differentiated from garter snakes by a white half moon shape in front of their eye. You track 80 ribbon snakes and find that 15 eat only frogs, 20 eat frogs and fish, 12 eat only fish and the rest each a mixed diet of fish, frogs and other animals they are able to catch.
   a. What percentage of snakes eats each diet?

Language and Research Activities – Answers

Black Ratsnake Summary

- Black ratsnakes are the longest snakes in Canada
- They are arboreal and use trees for food, protection and habitat
- Snakes are ectothermic. Black ratsnakes can use trees for basking
- Black ratsnakes can find food in trees
- Black ratsnakes are endangered because of loss of habitat, pollution and people hurting them
- By learning about Black ratsnakes people will want to save them

Article Questions

a. They can help move some turtles to other places or help ensure that construction doesn't interfere too much with the turtle habitat. Also continuing to educate people can help the turtles as well.
b. They can use construction methods that do not pollute the pond and also design houses that leave lots of natural habitat around the pond.
c. Hopefully all of us.
d. The reporter seems to be slightly on the side of the scientists. Reporters should be neutral.
e. Help turtles cross the road. Conserve habitat. Help to rebuild natural areas around local streams and ponds.

Sentence Summary

Blanding's turtles have a high domed shell and bright yellow chin and enjoy basking on logs. They are at risk because of habitat loss and road mortality.

Map turtles eat molluscs, crayfish and insects which they find in lakes and large rivers. They are timid and often dive into deep water when approached.

Sequencing

Mouse, Milk Snake, Robin, Garter Snake, Blue Jay, Skink, Squirrel

Turtle Logic Puzzle

	Point Pelee	Algonquin	Fitzroy	Long Point	Rondeau	Georgian Bay	Spotted	Stinkpot	Spiny Softshell	Blanding's	Map	Wood
Geoff					√			√				
Adam						√	√					
Justin			√							√		
Robin		√										√
Lenny				√					√			
Heather	√										√	
Spotted						√						
Stinkpot					√							
Spiny Softshell				√								
Blanding's			√									
Map	√											
Wood		√										

Vocabulary

- Ectotherms
  a. a cold blooded animal
- Carnivore
  a. animal that eats only meat
- Endangered
  b. worse then threatened and better then extinct
- Wetland
  c. a semi aquatic area between land and water
- Reptile
  c. scaly animals which don't produce milk
- Plastron
  b. the bottom of the turtles shell
- Shedding
  b. when reptiles replace their skin
- Arboreal
  c. a snake that lives in trees

Black Ratsnake Summary

To find Black Ratsnakes within Canada, one must travel to the province of Ontario. These majestic black snakes are the longest native snakes found in Canada. Their adult size typically ranges from 1.5 to 2.0 metres, but they have been recorded as long as 2.5 metres. Unfortunately, this snake is now an endangered species in South-western Ontario! In parts of Eastern Ontario there are more of them left and they are designated at Threatened.

Despite not having any arms or legs, Black Ratsnakes are great tree climbers. Instead of having a tubular body shape like some other snakes, their body is shaped much like a loaf of bread. This shape gives them two edges which run along the sides of their bodies and strong muscles also run along those edges. They can use these strong muscles and edges to wedge into cracks in tree bark, enabling them to climb straight up trees. Black Ratsnakes, like other arboreal snakes, rely heavily on the forest for food, protection, and habitat. The limbs of the trees provide a safe place for the snakes to bask. Basking is an important process for ectothermic animals. Snakes regulate their body temperature by absorbing the heat from the sun's rays or other warm objects and physically moving themselves to warmer or cooler environments to change their body heat. Certain bodily processes only work at a higher temperature, so warming their bodies in the sun allows snakes to digest food and ensure that eggs mature in time to be laid, as well as encouraging other metabolic processes to take place.

Arboreal snakes, such as the Black Ratsnake, also use the branches of trees to find prey items such as small birds and rodents. Black Ratsnakes have a direct influence on rodent populations and should, therefore, be encouraged to live in areas where rodents may be a problem – for example near where people live. Black Ratsnakes also use the tree branches for shelter and a place to hide from predators such as raccoons and hawks.

The loss of forest habitat has directly affected the Black Ratsnake population. With less suitable habitat available for the population, the number of individuals decreased. Another problem is that adult snakes are sometimes run over on roads. People themselves are also a problem for Black Ratsnakes as they will sometimes harm or kill them. Education is one way to prevent this and to help the species from becoming extirpated (eliminated from Ontario but still found in the US). It is through education that we learn the value of this species and the many benefits it provides for us and our ecosystem.

Using the space below, summarize the main points of the article above.

Article Questions

Winter 2008

Volume 6, Issue 3

Reptiles at Risk!

Special Interest Articles:

- HAPPY HOMES:

Happy Homes, a local real estate company has bought the land surrounding Fairy Tale Pond to be developed for residential use. Construction is expected to begin next week.

Inside this issue:

Turtles in Trouble!

The future of the turtles inhabiting Fairy Tale Pond has been decided. Local government has decided to sell the land to "Happy Homes", a local construction company that is planning on building and selling waterfront properties. Scientist John Smith, active in the attempt to stop the development, said "we tried to protect this pristine pond and the important flora and fauna which reside here". The scientist was involved in debates where he argued for the many free benefits of wetlands such as "purifying our water, protecting us during the flood season, and providing habitat for many economically important organisms". Prior to the town's decision there were also petitions and awareness campaigns. Scientists are worried about the loss of such important turtle habitat and are suggesting methods to provide extra protection in areas where they can still reside. Many turtles are expected to leave the pond area on a dangerous journey for better habitat once development begins. One civilian involved in the protest remarked "turtles are my favourite animals and very important to the wetland system." Turtles are important in their ecosystem. Many of them are scavengers. They like to eat dead, decaying and rotting organisms from the waterways in Ever After. This food choice helps to ensure that the water and marsh remain clean and continue to provide many benefits to Ever After.

Development on Fairy Tale Pond

The city of Ever After is pleased to announce that development along the waterfront of Fairy Tale Pond will start Monday. The local real estate company "Happy Homes" bought the land surrounding the pond to create a new subdivision. They discussed benefits of the subdivision with the town citing continual economic growth as the primary reason for the purchase of land. Ever After is excited about the new subdivision and its contribution to the economy. When asked about turtle woes, Happy Homes replied "no comment" and cited other ponds where the species of turtles can be found.

Use a separate sheet to answer the following questions about the articles above:

a. How might the naturalists help the turtles who will now be in danger due to the construction?
b. How might the construction company help the turtles?
c. Who is socially responsible for turtle protection?
d. What is the point of view of the reporter? Can you tell? Should you be able to tell?
e. What can you as students do to help protect turtle species in your area?

Sentence Summary

Summarize the following facts about turtles into four sentences or less. Be sure to use proper punctuation and spelling

- Map turtles eat molluscs, crayfish and insects.
- Blanding's turtles have a yellow chin
- Map turtles live in lakes
- Road mortality is a large problem for turtles
- Habitat destruction for new roads and houses contribute to low population numbers
- Map turtles are identifiable by yellow lines which look like lines on a map found on their body
- Blanding's turtles have a high domed shell
- Blanding's turtles enjoy basking on logs
- Map turtles are timid and often dive into deep water when approached

Sequencing

Anna likes to walk through the forest looking for wildlife. Each time she sees an animal she records it in her journal. Unfortunately the pages in her journal got mixed up after her last trip and she needs help sorting out what order she saw the animals in. On that particular sunny afternoon she found the following animals: a garter snake, a milksnake, a mouse, a robin, a blue jay, a five-lined skink and a squirrel. The first place she visited when she left her house was the field where she found her mouse. Just before she went into the forest which was the second place she visited, she saw a robin singing in a tree. Anna found the milksnake before she went to the forest, but it was not the first animal she found. She was excited about the milksnake because she knew it was rare to see them during the day, as they are mostly nocturnal. She recognized it by the "Y" shaped pattern on the top of its head. The blue jay was spotted after the garter snake but before the skink. The garter snake, a common species, was a great find while it was out sunning on a rock in the forest. Anna was excited to see this as she remembered that garter snakes, like all reptiles, are ectothermic and therefore are the same temperature as their environment; she knew the snake was basking to warm its body up. Once she was in the forest, Anna rolled a log and found a skink. The skink she found was a young five lined skink, the only native Ontario species of lizard. She recognized it due to its bright blue tail, but she was only able to see it for a minute before it scurried out of sight. On her way home, Anna saw a squirrel as she was leaving the forest.

List the animals in the order that Anna found them:

Turtle Logic Puzzle

There are 8 species of turtles in Ontario, 6 of which are species at risk. Animals which are 'Species at Risk' are animals for whom we are concerned about population numbers due to small numbers of breeding pairs, pollution or habitat destruction or other threats. Many scientists study these animals to help ensure their continued survival.

At Laurentian University some of the researchers' papers have gotten mixed up. There are 6 researchers, 3 males: Geoff, Adam, Justin, and 3 females: Lenny, Robin and Heather. Each researcher is studying only one of the turtles who are 'at risk': Spotted Turtles, Stinkpot Turtles, Spiny Softshell Turtles, Blanding's Turtles, Map Turtles and Wood Turtles. Each of the researchers is staying at one of the following parks: Georgian Bay Islands National Park, Rondeau Provincial Park, Long Point Provincial Park, Fitzroy Provincial Park, Algonquin Provincial Park and Point Pelee National Park. Use the clues below to figure out which researcher is working on what species of turtle and which Ontario Park they are researching in. There is no overlap between researchers, turtle species or the park they are staying in for the summer, although some researchers may visit other parks on their time off.

1. None of the females study the Stinkpot or the Spotted turtles nor do any of them live in Fitzroy Provincial Park or Georgian Bay Islands National Park
2. One female researcher lives in Point Pelee National Park and another studies Wood turtles
3. None of the male researchers are working with map or Spiny Softshell turtles. There is no male researcher living at Algonquin Provincial Park
4. Geoff is staying at Rondeau; a second male researcher is working on Blandings turtles but not at Georgian Bay Islands National Park
5. Spiny Softshell and stinkpot turtles are not being studied at Georgian Bay Islands National Park; Heather is not working with the Spiny Softshell turtles
6. Heather visited Algonquin park on her time off to see a Wood turtle; Justin went to Long Point Provincial Park to visit Lenny who does not study the Wood turtle.
7. Robin visited Lenny and then Adam; during this time she got to stay in Georgian Bay National

	Point Pelee	Algonquin	Fitzroy	Long Point	Rondeau	Georgian Bay	Spotted	Stinkpot	Spiny Softshell	Blanding's	Map	Wood
Geoff												
Adam												
Justin												
Robin												
Lenny												
Heather												
Spotted												
Stinkpot												
Spiny Softshell												
Blanding's												
Map												
Wood												

Vocabulary

Circle the correct definition for each word:

- Ectotherms
  a. a cold blooded animal
  b. a warm blooded animal
  c. a hot blooded animal

- Carnivore
  a. animal that eats only meat
  b. animals that only eat plants
  c. animals that eat plants & meat

- Endangered
  a. better then threatened but worse than extinct
  b. worse then threatened and better then extinct
  c. the same thing as extinct

- Wetland
  a. a place with trees on dry land
  b. the bottom of a river
  c. a semi aquatic area between land and water

- Reptile
  a. an animal that produces milk and have scales
  b. animals who are vegetarians and have scales
  c. scaly animals which don't produce milk

- Plastron
  a. the top of the turtles shell
  b. the bottom of the turtles shell
  c. the side of the turtles shell

- Shedding
  a. is when reptiles lose their tails
  b. is when reptiles replace their skin
  c. is when reptiles lay eggs

- Arboreal
  a. a snake that spends its life on the ground
  b. a snake that only wakes up at night
  c. a snake that lives in trees

Species at Risk Research Activity

Endangered animals and plants are found on every continent of the planet. In Canada, we protect these species and others we are worried about with the Species at Risk Act (SARA). Ontario also has a new Endangered Speciea Cat (ESA). There are several categories within these systems: special concern (some interaction the organism has may put it at risk), threatened (an interaction the organism has is putting it at risk), endangered (at risk of becoming extirpated or extinct), extirpated (completely gone from one area/province) and extinct (gone forever). Many of Ontario's reptiles are currently on this list; some are threatened such as the Eastern Hognose Snake while others are endangered such as the Black Rat Snake. As Ontario citizens, it is our responsibility to help protect the plants and animals on this list to ensure they do not become extinct or extirpated. One way to do this is through education and research. Choose one reptile species at risk to research. Answer and discuss the following questions in your presentation or report.

- What is the name of the species and does the name have any story behind it?
- What factors are contributing to the demise of this species?
- What habitat requirements does this species have?
- Where do you find this species?
- What can we do to help the species and prevent it from becoming extinct?
- What are three facts about this species that you discovered while researching it?