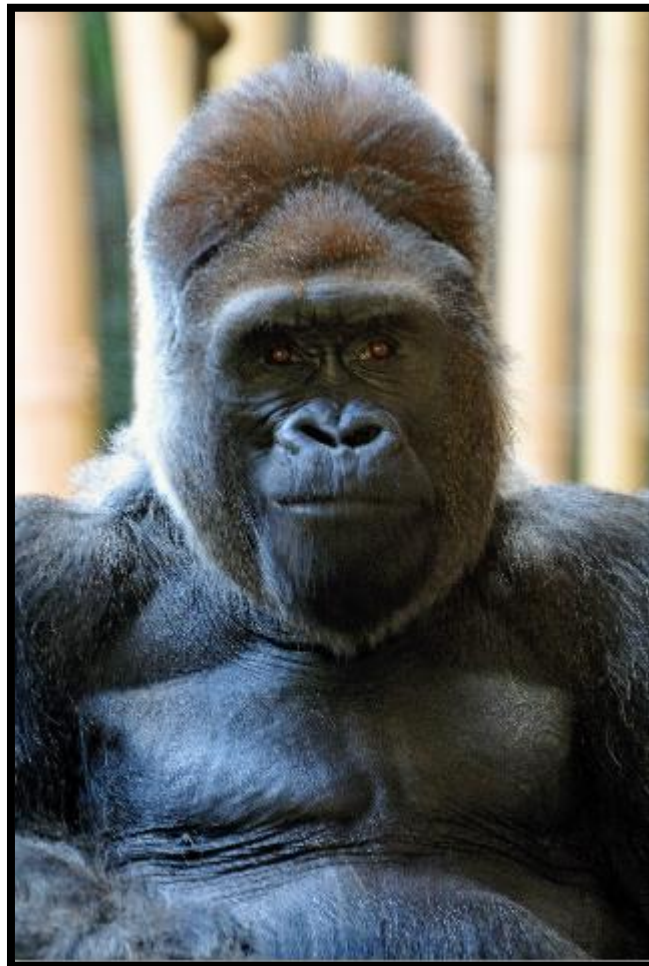




GRADE 7



INTERACTIONS IN THE ENVIRONMENT
TEACHER RESOURCE BOOKLET

TO THE TEACHER

Welcome! This resource guide has been designed to help you enrich your students' learning both in the classroom and at the Toronto Zoo. All activities included in this grade 7 booklet are aligned with the Understanding Life Systems strand of The Ontario Curriculum, Grades 1-8: Science and Technology, 2007. The pre-visit activities have been developed to help students gain a solid foundation about biodiversity before they visit the Zoo. This will allow students to have a better understanding of what they observing during their trip to the Toronto Zoo. The post-visit activities have been designed to help students to reflect on their Zoo experience and to make connections between their experiences and the curriculum. We hope that you will find the activities and information provided in this booklet to be valuable resources, supporting both your classroom teaching and your class' trip to the Toronto Zoo.

WHERE DOES IT FIT IN?

Strand: Understanding Life Systems

Topic: Interactions Within Ecosystems

Specific Expectations Met:

Understanding Basic Concepts

- ♦ **3.1** demonstrate an understanding of an ecosystem as a system of interactions between living organisms and their environment
- ♦ **3.2** identify biotic and abiotic elements in an ecosystem and describe the interactions between them
- ♦ **3.3** describe the roles and interactions of producers, consumers, and decomposers within an ecosystem
- ♦ **3.4** describe the transfer of energy in a food chain and explain the effects of the elimination of any part of the food chain.
- ♦ **3.5** describe the ways in which human activities and technologies alter balances and interactions in the environment

Developing Investigation and Communication Skills

- ♦ **2.3** use scientific inquiry/research skills to investigate occurrences that affect the balance within a local ecosystem
- ♦ **2.4** use appropriate science and technology vocabulary in oral and written communication
- ♦ **2.5** use a variety of forms to communicate with different audiences and for a variety of purposes

Relating Science and Technology to Society and the Environment

- ♦ **1.1** assess the impact of selected technologies on the environment
- ♦ **1.2** analyse the costs and benefits of selected strategies for protecting the environment

PRE-VISIT ACTIVITIES

1. LOCAL BIODIVERSITY

(Adapted from a lesson plan from <http://www.discoveryeducation.com/teachers/>)



As a class, go outside to a local natural area. Have the students observe the biotic (living) components of the area such as the plants, insects or animals, as well the abiotic (non-living) components they can see such as rocks, waste, and water. At the end of this booklet, you will find a sheet titled “Tracking Local Biodiversity,” which the students can use to record their observations and classify what they see as biotic or abiotic. If they do not know the name of something they see, then have them sketch what it looks like. Return inside and share what you have found. If students have been observant, they

will likely have found an incredible diversity within their own ‘backyard.’ If there was not a large variety in the things observed, discuss why that might be. Has it always been this way in this area, or has the diversity decreased for some reason?

You may choose to have the students collect (already dead) leaves for the plants they see. This way, they can bring them in and compare them with their friends. You may also go to a second area outside and determine whether there is a different diversity present there. It would be useful for the teacher to have a guide to plants (and animals) in the area, so as to help with identification. This activity can lead into a discussion on ecosystems and biodiversity.

2. RAIN FOREST FREE WRITE

Assessing your student’s prior knowledge is extremely important; having an idea as to what you students know about a given topic can inform your teaching practices throughout a unit and ensure that your students are working at an appropriate level.

Using a Smart board, overhead projector or poster board, display a picture of a rain forest for your students to look at. You can find these pictures online or in a print resource such as *National Geographic*. You may wish to show a picture that demonstrates the biodiversity within this region, or a picture of some of the human activity that is threatening the area. Give the students a piece of paper ahead of time and make sure they have a pencil in hand before you show them the picture. When they are ready, show them the picture and give them four minutes to write down everything that comes to mind when they see the picture; this can include observations of plants and animals, what they think is happening, what they know about subject matter in the picture, etc.

After the four-minute free write, join together in a community circle. Allow the students to share one important thing that they wrote down during their free write. Do the students have similar connections to the picture? Did anyone notice something that no one else did? What don’t we know about this picture? What questions do we still have?

3. ROAMING THE RAINFOREST

(Lessons have been accessed through www.exchange.smarttech.com)

Bringing technology into the classroom is a wonderful way to engage your students and teach new concepts in a fun and exciting format. The following activities have been accessed through the Smart Exchange website; membership to the site is free and provides teachers with access to hundreds of pre-planned lessons. Teachers can use the search engine to select a topic, grade, and subject area to narrow their search.

Materials

- SMART NOTEBOOK program (so that lesson plans will open)
- SMART Board (if you do not have access to a SMART Board, a projector and laptop will also work)
- Tennis ball (for students with fine motor difficulties, holding a tennis ball can help them move text on the board)

If you have used the KWL chart, then you will know the level of background knowledge that your students possess.

You can access the SMART Board lesson plan titled 'The Rainforest' here:

<http://exchange.smarttech.com/details.html?id=a5a70481-85b4-41ff-9096-4d2bb45fabf1>

This lesson would work well for students who have limited background knowledge; the lesson provides students with some basic information about the rain forest and introduces them to the vegetation layers of the rain forest. The lesson includes interactive activities where students can match definitions and discuss where certain animals live within this ecosystem.

You can access the SMART board lesson plan titled 'The Rainforest' here:

<http://exchange.smarttech.com/details.html?id=2701feb2-7a0e-4a4c-9cec-e99301b7ed77>

This lesson would work well for students who seem to possess more in-depth background knowledge. The lesson introduces the students to the location of rain forests around the world, explains the vegetation layers of the rain forest in detail, and discusses why rain forests are such a valuable ecosystem. The lesson provides easy to follow links to satellite images and image resources, while also including interactive quizzes and activities for the students to use. The only criticism for this lesson would be that it offers a rainfall comparison between the rain forests and rainfall at American locations; however, the comparisons are still worthwhile.

If you wish to extend this lesson, you may want to have your students record information during the presentation as to why the rain forest is important. This information can be used to form a series of persuasive paragraphs!

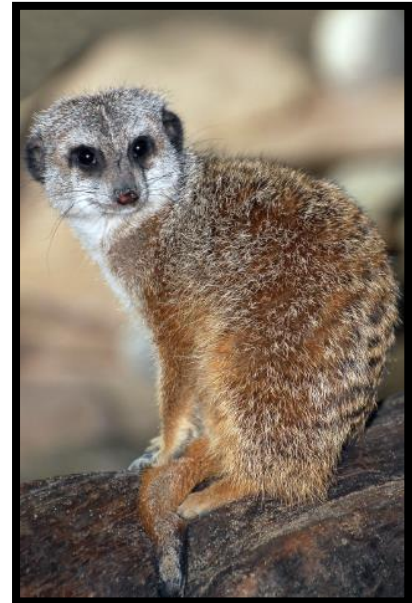
Tying It All Together

Language Strand: Oral Communication

- **1.2** demonstrate an understanding of appropriate listening behaviour by adapting active listening strategies to suit a wide variety of situations
- **2.2** demonstrate an understanding of appropriate speaking behaviour in most situations, adapting contributions and responses to suit purpose and audience

Language Strand: Writing

- **1.3** gather information to support ideas for writing, using a variety of strategies and a wide range of print and electronic resources
- **1.6** determine whether the ideas and information they have gathered are relevant, appropriate, and sufficiently specific for the purpose, and do more research if necessary



4. VOCABULARY TOSS

When beginning a new unit of study, it is important to ensure that your students are familiar with new vocabulary. Often times, students may be able to take an educated guess as to what a new word means, but he or she may have some misconceptions.

Give your student a piece of 8.5"x11" paper and ask him or her to fold it in half. Assign each student a word from the vocabulary list found at the end of this booklet. Some students may have the same word; this is fine. On one half of their folded sheet, ask the students to write down what they think the new word could mean. After they have done this, let the student use a dictionary, textbooks, or the internet to find the actual meaning of the word. Have the students write the actual definition on the other side of their fold paper and include some examples of the word as well. For each word in the vocabulary list, ask a student to volunteer and share the definition he or she found. You may wish to have your students record them in their science notebooks.

Feeling Bold?

Once your students have had the opportunity to learn the new vocabulary words, you may wish to play 'Vocabulary Toss' for extra practice. Divide your students into two equal teams and form a parallel line. At the front of each line place an empty waste basket. Flip a coin to see which team will go first. Say one of the vocabulary words to the student at the front of the line; if the student can correctly define that word, his or her team will receive 5 points and the student will have the chance to try and toss a sponge into the waste basket. If the student gets the sponge into the basket, their team gets an additional 5 points. After the toss, it is the other team's turn to define a new vocabulary word. If the team did not define the word correctly in the first place, the other team has a chance to steal. Once all of the vocabulary words have been read and the points have been totaled, the team with the most points will be crowned the winners!

Tying It All Together

Language Strand: Oral Communication

- **1.2** demonstrate an understanding of appropriate listening behaviour by adapting active listening strategies to suit a wide variety of situations

Language Strand: Writing

- **3.2** spell familiar words

- **3.3** confirm spellings and word meanings or word choice using a variety of resources appropriate for the purpose

FOLLOW-UP ACTIVITIES

1. RESEARCH PROJECT

As an independent or group project, students will choose a particular plant or animal within a tropical rain forest ecosystem and research the impact that human activity has had on it. You may want to focus on species that students saw during their tour of the zoo. Several key questions should be answered, such as: what are the characteristics of the animal/plant? How is it adapted to live in its particular ecosystem? What human activities have taken place in its habitat? How has this plant/animal been affected by human activity? If there are harmful effects because of human activity, what can be done

to eliminate them? The results of their research can be presented as a poster, a written report, or a creative presentation, depending on teacher and student preference. At the end of this booklet, you will find a template titled “Ecosystem Research” that will help students organize their information.

When assigning a research project, it is important to talk to your students about finding reliable information sources (especially on the internet). Tell your students that web addresses that contain .gov typically have up-to-date information. Web addresses ending in .org have been created by an organization; the information may be accurate, but beware of bias. Additionally, .com addresses are commercial addresses and should be treated with caution; investigate the site to see who created it and the source of the information. For more information concerning reliable research sources, check out: <http://dept.sccd.ctc.edu/tlc/resources/teach.html>

When your students are deciding which animal to research, be sure to remind them of the animals they may have seen while at the Toronto Zoo:

- Asian brown tortoise
- Asian giant millipede
- Black-breasted thrush
- Burmese star tortoise
- Concave casqued hornbill
- Crocodile newt
- Gaur
- Green water dragon
- Pied imperial pigeon
- Reticulated python
- Sumatran orangutan
- Sumatran Tiger
- White-handed gibbon
- Aba Aba
- African clawed frog
- Egyptian Fruit Bat
- Gaboon Viper
- Giant Baboon Spider
- Helmeted guineafowl
- Naked mole-rat
- Nile soft-shelled turtle
- Pygmy hippopotamus
- Red river hog
- Royal python
- Slender-tailed meerkat
- Western lowland gorilla

Tying It All Together

Language Strand: Reading

- **1.4** demonstrate an understanding of increasingly complex texts by summarizing important ideas and citing a variety of details that support the main ideas
- **1.3** identify a variety of reading comprehension strategies and use them appropriately before, during, and after reading to understand increasingly complex texts

Language Strand: Writing

- **1.1** identify the topic, purpose, and audience for more complex writing forms
- **1.5** identify and order main ideas and supporting details and group them into units that could be used to develop a multi-paragraph piece of writing, using a variety of strategies

Language Strand: Media Literacy

- 3.4** produce a variety of media texts of some technical complexity for specific purposes and audiences, using appropriate forms, conventions, and techniques

How To Assess

- Topic is well-chosen and well-researched
- Information is clearly presented
- Presentation is creative
- All relevant questions are addressed

2. MAKE A PHYSICAL FOOD WEB

(Idea and fact cards from <http://www.vtaide.com/png/habitats/index.htm>)

Every student in the class is given an index card that has on it the name of an animal or plant present in the tropical rain forest ecosystem. Each index card also lists key facts about the role that that animal or plant plays in the ecosystem (please see 'Rainforest Fact Cards' at the end of this booklet.) The class then will physically represent the relationships in their ecosystem by tossing a ball of yarn between every related plant, animal, or human. For instance, an alligator preys on the capybara, therefore the two students representing them should be connected by a piece of yarn. Students will end up linking themselves together using yarn and create a large physical food web which will not only serve as a visual representation of how interconnected living things are, but will also be a lot of fun. While the students are in the web, it would be a good opportunity to briefly talk about food webs and the interdependence of living things.



Acting as a “human influence” such as a clear-cutter or beef-producer, the teacher can then remove certain students as their animal or plant becomes extinct. All students who were connected by string to that person are now affected and may also become extinct if that was their major food source. Alternatively, they may thrive because their main predator has just become extinct – one of the eliminated students could then join back in to represent the overpopulation of that species.

Another option would be to have the teacher step onto the ‘yarn web;’ as the teacher steps down, everyone connected by the yarn will feel a tug and consequently, that tug means that that students’ plant or animal has in some way felt the effects of something that happened to another plant or animal within the system.

This activity cannot accurately represent the dynamics of the ecosystem, but it can be a great discussion-starter, and will hopefully let the class see the indirect effects of the loss of one species. Many factors can negatively impact an ecosystem such as the hunting of animals, deforestation, habitat fragmentation, and pollution. After your class discusses these issues, discuss how humans can positively impact an environment; for example, implementing laws to protect habitats, monitoring endangered species, planting trees, and reducing waste. How can your class help the environment?

Feeling Bold?

Your students have been learning about the functions of an ecosystem and the interactions that take place within these systems. Now, it is time for your students to apply their knowledge and take action by researching an environmental cause and fighting for change!

While there are many projects and causes to support that would help the environment, you may wish to learn more about an initiative called Phone Apes, developed by the Toronto Zoo, which students may enjoy being a part of. Since 2006, the Toronto Zoo has been providing 100% landfill free cell phone recycling to schools, community groups, and

corporate environments. Recycling old cell phones is extremely important, especially when one takes into account the origin of the materials used to create the circuit boards within them. Coltan is a metallic ore used to produce the element tantalum, which is used to create the capacitors that control electric flow in cell phones, laptops, and pagers. Coltan is mined from the rainforests found within the former Republic of Congo and therefore disrupts and destroys the habitat that is home to the endangered Lowland Gorilla.

Your students could adopt a cause such as this and create school announcements, posters, and notices to ask the school community to donate old electronic devices. There could even be a classroom challenge within the school to see which class can collect the most devices! By emailing phoneapes@torontozoo.ca, you can receive your own Phone Apes collection box and marketing materials. Collection boxes can be dropped off at the Toronto Zoo's Guest Services office or Education/Volunteer Centre (the Bomannville Zoo is also an off-site partner in this project and will collect boxes as well!)



For more information visit: <http://www.torontozoo.com/conservation/PhoneApes.asp>,

3. CREATE A NEW ECOSYSTEM

As a creative project, students work in groups of 2-3 to design their own ecosystem that is balanced and sustainable. Students must make sure there is food for everything in their ecosystem to eat, that there are producers, consumers and decomposers, and that the populations will be stable. This project will demonstrate the complexity of ecosystems, and the factors that need to be accounted for to ensure that the ecosystem is sustainable. Within their ecosystem, the students must include arrows or yarn that link plants and animals together and represent the transfer of energy within the ecosystem from producers to consumers and decomposers. Students may make up new animals and plants if they choose, and each project will be presented in a visual format (3D model, poster, etc.), with an accompanying oral presentation that explains their ecosystem and justifies the choices they made.

Typing It All Together

Visual Arts Strand

- **D1.4** use a variety of materials, tools, techniques, and technologies to determine solutions to increasingly complex design challenges

Language Strand: Oral Communication

- **2.3** communicate orally in a clear, coherent, manner, using a structure and style appropriate to both the topic and the intended audience
- **1.2** demonstrate an understanding of appropriate listening behaviour by adapting active listening strategies to suit a wide variety of situations
- **2.2** demonstrate an understanding of appropriate speaking behaviour in most situations, adapting contributions and responses to suit purpose and audience

How to Assess

- Ecosystem has appropriate representatives from all trophic levels

- ❑ Choice of biotic and abiotic elements of ecosystem shows that factors were considered thoughtfully
- ❑ Visual presentation is creative and well-designed
- ❑ Oral presentation is clear, engaging and instructive

4. LETTER-WRITING PROJECT



This activity is designed to show your students how easy it is to get involved and make a difference by protecting the environment. Students will be given a scenario and asked to become an activist for resolving this issue; the student must write a two-page letter to a government official, bringing an issue to his or her attention and demanding action.

Explain to your students that laws can help control the actions of people who might, knowingly or unknowingly, destroy habitats and harm the environment. Currently elected politicians are responsible for making and changing laws in Canada, yet how do they know which laws to support and which to change? Inform your students that politicians rely on citizens to tell them which laws are important to them and as a result, letters can become very powerful tools when it comes to changing the way the world works.

Explain the aims of a letter writing campaign (influence lawmakers, increase protection for the environment). Have the students select a problem and determine how the situation could be improved by government action such as improved legislation or enforcement. Determine which level of government is responsible (federal, provincial or municipal) and find addresses to send your letters to. Introduce/review the proper way to write a formal letter.

Hand out the “Writing to Make a Difference” template (attached at the end of this booklet) that will work as an outline when students are getting started on their letters. Once they have completed the outline they may start on their rough draft, which they will eventually edit, peer-edit and produce a final draft.

Feeling Bold?

After the students have finished their letters have them briefly discuss the following questions as a follow-up to the activity:

- What concerns were you trying to convey?
- What makes an effective letter? (personal approach, concise simple, clearly stated concern or stand, clear request for actions, respect etc.)
- How can a letter writing campaign help endangered species? (raise awareness, change laws, increase protection)

There are many scenarios that your students can decide to write about, including real-life situations concerning Canadian ecosystems (e.g., the logging of old-growth forests in British Columbia). If you use a real-life situation, collect all the finished letters and mail them to the appropriate government official!

Possible scenarios that the students can write about:

- A new subdivision is being built in a forested area that is rich in biodiversity. As a result, thousands of animals are losing their habitats and facing challenges as the ecosystem is disrupted.
- A two-lane road is going to be constructed through a wetland habitat that is frequented by endangered turtles. Many people are in fear that the turtles will be hit by cars once the road is built, further threatening the species.
- Many people in your neighbourhood are dumping their garbage in a nearby natural area that is only yards away from a creek. Chemicals from their waste have been leaching into the ground and you fear that this will affect the wildlife in the area.

Tying It All Together

Language Strand: Writing

- 1.1 identify the topic, purpose, and audience for more complex writing forms
- 1.2 generate ideas about more challenging topics and identify those most appropriate for the purpose
- 1.3 gather information to support ideas for writing, using a variety of strategies and a wide range of print and electronic resources
- 1.5 identify and order main ideas and supporting details and group them into units that could be used to develop a multi-paragraph piece of writing, using a variety of strategies
- 2.8 produce revised draft pieces of writing to meet identified criteria based on the expectations

Language Strand: Reading

- 1.2 identify a variety of purposes for reading and choose reading materials appropriate for those purposes

How to Assess

When assessing this activity you may consider the following:

- Student's researching abilities
- How informed the student was on the topic they were writing about
- Whether the student sufficiently completed their outline and preplanning
- Student's ability to revise, reformat and take in constructive criticism
- If all elements of a formal letter were included
- Student's participation and contribution to the follow-up discussion

5. ECOSYSTEM MYSTERY

In this activity, students act like wildlife biologists to try to solve an ecosystem mystery. Find a real-life, or create a fictional, example of a species in a particular ecosystem that ran into trouble due to ecosystem changes caused by natural occurrences or human activity (disease introduced, food source became extinct, etc.) Tell this story to the students without explaining the reason for the problem. Ask them questions and give them clues to figure out the cause of the problem and possible solutions.

After working through the mystery as a class, you may choose to discuss how wildlife biologists and others go



through similar procedures to analyze the problems different species run into because of human activity.

Have the students create their own (fictional) ecosystem mystery, with enough clues that their classmates could solve it. Their mystery can be as creative as they like, but must involve the effects on a species because of human activity in its ecosystem.

At the end of this booklet, you will find three examples of such mysteries!

Tying It All Together

Language Strand: Writing

-1.1 identify the topic, purpose, and audience for more complex writing forms

Language Strand: Oral Communication

- 2.3 communicate orally in a clear, coherent, manner, using a structure and style appropriate to both the topic and the intended audience

- 1.2 demonstrate an understanding of appropriate listening behaviour by adapting active listening strategies to suit a wide variety of situations

How To Assess

- Student demonstrates understanding of ecosystems and human influence on them
- Sufficient, but not overly simple, evidence is provided to solve mystery
- Mystery is well-constructed and creative
- Proper writing skills are demonstrated

6. BUILD AN ECOSYSTEM



As a class project, build a terrestrial or aquatic ecosystem. This is a great way to get students to apply the things they have learned about ecosystems throughout the unit. When introducing the idea, discuss with students what their ecosystem will need to be self-sufficient. What carnivores and herbivores should we use, and how many of each? What kinds of producers and decomposers are appropriate? What kind of light will be needed? Throughout the remainder of the

unit (and semester), discuss the reasons for the successes and failures of the ecosystem, and make decisions as a class to add or take away things from it as necessary. The more the students are in charge of this project, the better – be prepared and willing for the ecosystem to struggle, especially at the beginning.

If you have the resources and enthusiasm, build both an aquatic and a terrestrial ecosystem, and compare the roles played by the plants and animals in each. On the other hand this project can be as simple as filling a pickle jar from a local pond. If you choose to do this in your classroom, be sure you are aware of any school rules on animals in the classroom, and be sure to model responsible ecological behaviour with the species you choose and how they are treated.

Use species native to your area if possible, or, if you do use alien species, do not release them into the wild at the end of the term. The introduction of non-native species is one of the biggest reasons for species endangerment.

A local store that sells aquarium supplies will be able to give you advice on appropriate species and materials to use. For additional information about what types of organisms to include in your system, visit: http://www.edutel.org/pondwatch/pondwatch_lesson1.html and http://camillasenior.homestead.com/Personal_Ecosystem.pdf.

VOCABULARY LIST

- biodiversity** Biological diversity – the variety of living things on earth.
- biome** A large geographic area with characteristic climate, flora and fauna.
- biosphere** The region of the earth in which life exists. The thin layer from the lower atmosphere to the bottom of the oceans. This includes some layers of rock.
- canopy** The second highest layer of a tropical rain forest – these tall trees reach a height of 30-60 metres. The crown of each tree often touches and intertwines with its neighbours preventing sunlight from reaching the lower layers.

conservation	The act of protecting and preserving plants, animals, and their environment or habitat.
consumer	A living thing that must eat other living things to survive.
decomposer	A living organism that breaks down dead animals or plants in order to get food.
emergent layer	The highest level of trees in a tropical rain forest – these obtain the most sunlight, rain and wind
forest floor	The lowest level of the tropical rain forest – consists of herbs, fungi, leaf litter etc.
producer	A green plant that makes food which is the first step in a food chain; photosynthesis is the process by which plants make and store food.
understory	The second lowest level of the tropical rain forest – consists of shrubs, ferns and small trees that are able to thrive in the dimly lit dampness below the canopy.

RESOURCE LIST

*S = student friendly site

*T = teacher friendly site

<http://www.science.ca/> (S&T)

Excellent searchable, Canadian website with a wealth of information. Includes current science news and events, the opportunity to interview a Canadian Scientist, an area to post questions on specific topics, an activities resource, and a 'questions of the week' section posted by Canadian students.

<http://www.ipl.org/youth/projectguide/> (S&T)

A useful resource for students and teachers doing Science Fair projects. Site includes links to a variety of website resources that guide you through the necessary steps for completing a Science Fair experiment (e.g. the scientific method, choosing a topic, tips and tricks, etc).

<http://www.discoveryeducation.com/teachers/> (S&T)

Curriculum resources, lesson plans for teachers. Activities, games and resources for students. A thorough and well-designed site.

Tropical Rain Forests

<http://www.rainforest.org/> (T)

Tropical Rainforest Coalition website. More general information. Has a “schools” link that gives ideas on how to get involved in helping to save tropical rain forests.

<http://www.ran.org/> (T)

Rainforest Action Network, Information Center. Teacher/Student resources as well as fact sheets.

Ecosystems

<http://www.mbgnet.net/> (S&T)

Great site all about biomes/ecosystems. Easy to navigate, with in-depth information on 12 different land, fresh-water and marine biomes/ecosystems.

<http://exchange.smarttech.com> (T)

The above hyperlink will take you to a website that contains hundreds of pre-made interactive Smartboard lesson. Using Smart Exchange, teachers can search and download lessons. Membership to the site is free. If you do not have access to a Smartboard; a laptop and projector will be effective as well.

Books

Malnor, Bruce, Malnor, Carol, & Joy Pratt, Kristin. 1998. A Teacher’s Guide to a Walk in the Rainforest. Dawn Publications. (T)

Well-organized and easy to follow. Activity suggestions for teachers who are teaching their students about the rain forest.

Kindersley, Dorling. 2006 . 24 Hours Rain Forest. Dorling Kindersley Ltd. (T)

Beautiful photography and valuable information about the animals and plants found within rain forest ecosystems.

Tracking Biodiversity!

Use pictures, words, or diagrams to explain what you are observing in the environment. Classify what you see as abiotic (non-living) or biotic (living) in the chart below.

ABIOTIC	BIOTIC
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Ecosystem Research

1

What are the characteristics of the animal/plant?

How is it adapted to live in its particular ecosystem?

What human activities have taken place in its habitat?

Ecosystem Research

2

How has this plant/animal been affected by human activity?

If there are harmful effects because of human activity, what can be done to eliminate them?

Additional Notes:

References I have used:

Rainforest Fact Cards

(All fact cards can be found at <http://www.vtaide.com/png/habitats/index.htm>)



The **RAINFORESTS** produce abundant **seeds, flowers, fruit and leaves** for birds, insects and mammals.



The **RAINFORESTS** produce abundant **seeds, flowers, fruit and leaves** for birds, insects and mammals.



The tropical rainforest has dense vegetation with three different layers: (1) emergent layer (2) canopy and (3) understory. The canopy (which receives 90% of the **SUNLIGHT**) is where the treetops touch each other, creating a shaded forest interior (understory) where it is dark and humid.



ORANGUTAN
aka **Man of the Jungle**
Habitat: rainforests **Size:** 0.8-1.5m high; no tail; 33-90kg
Adaptation: extremely long & powerful arms **Diet:** fruit, seeds, shoots, leaves, flowers, bulbs, insects, eggs, birds & small mammals **Predator(s):** man destroying their habitat; baby orangutans sold as pets

Rainforest Fact Cards

(All fact cards can be found at <http://www.vtaide.com/png/habitats/index.htm>)



GORILLA ~ Gentle Giant

Habitat: rainforests **Size:** 1.2-1.7m high; no tail; 70-270kg
Adaptation: moves about in a stooped position, using the knuckles of the hands to bear part of its weight **Diet:** leaves, buds, flowers, fruit, fungus, bark & insects **Predator(s):** man clearing the forests thus destroying their habitat



**HOWLER MONKEY
~ Soundblaster**

Habitat: rainforests **Size:** 56-92cm head body; 59-92cm tail; 7-10kg **Adaptation:** its roar can be heard at least 3 km away **Diet:** leaves, fruit, flowers, maggots & insects **Predator(s):** harpy eagle



GOLDEN LION TAMARIN

Habitat: rainforests **Size:** 19-22cm head body; 26-34cm tail; 400-800gm **Adaptation:** have claws (instead of fingernails) which they use to forage for insects in cracks and crevices in trees **Diet:** insects, fruit, lizards & birds **Predator(s):** man destroying their habitat for agriculture & development



OCELOT aka Tiger Cat

Habitat: rainforests **Size:** 70-90cm long; 10-16kg **Adaptation:** its coat of stripes & spots enable it to hide among the bushes & trees **Diet:** fish, frogs, mice, rabbits, monkeys, lizards, snakes, birds & young deer **Predator(s):** man hunting them for their fur

Rainforest Fact Cards

(All fact cards can be found at <http://www.vtaide.com/png/habitats/index.htm>)


TIGER ~ Lone Hunter

Habitat: rainforests **Size:** 1.3-2.7m body; \approx 1m tail; 100-360kg **Adaptation:** hunts at night with its sharp vision & keen hearing **Diet:** deer, wild boar, monkeys, rabbits even fish & frogs **Predator(s):** man hunting them for their skin & body parts used in Chinese medicine & exotic recipes


JAGUAR ~ Animal God

Habitat: rainforests **Size:** 1.5-1.8m head body; 70-91cm tail; 67-76cm high; 45-151kg **Adaptation:** **Diet:** fish, frogs, caiman, mice, tapirs, deer, capybaras & other rodents **Predator(s):** man hunting them for their skin **Extra:** worship as god by some cultures


TOUCAN ~ Irritating RRRK!

Habitat: rainforests **Size:** 63cm body; 18cm bill; 500gm **Adaptation:** uses its long bill to reach fruit on branches that are too small to support their weight, and also to skin the fruit **Diet:** fruit, insects, bird eggs, small birds & lizards **Predator(s):** ocelot, jaguar & man capturing them as pets


HARPY EAGLE ~ Superbird

Habitat: rainforests **Size:** 5-9kg; 2m wingspan **Adaptation:** so powerful that it can snatch a sloth from top of a tree while flying & can carry an animal weighing 10kg **Diet:** sloths, possums, monkeys, birds, iguanas & snakes **Predator(s):** man shooting them & destroying their habitat & nesting sites

Rainforest Fact Cards

(All fact cards can be found at <http://www.vtaide.com/png/habitats/index.htm>)



RAGGIANA BIRD OF PARADISE
Habitat: rainforests **Size:** ≈ 34cm body **Adaptation:** males clap wings, shake feathers & heads to attract females **Diet:** mainly fruits **Predator(s):** man hunting them for their feathers for local ceremonial costumes



BLUE BIRD OF PARADISE
 ~ Show Off
Habitat: rainforests **Size:** ≈ 30cm body **Adaptation:** males hang upside down fanning out their wings to impress the females **Diet:** mainly fruits **Predator(s):** man destroying their habitat through clearing of forests and hunting them for their pectoral & tail feathers



ANT ~ Team Player
Habitat: rainforests **Size:** 2-25mm **Adaptation:** has huge jaw to fight any small intruders **Diet:** leaves, plant juices, seeds, berries even wood **Predator(s):** frog, lizard & echidna (anteater)



BEEBLE ~ Armoured Insect
Habitat: rainforests **Size:** 0.025-15cm **Adaptation:** its body is protected by a usually hard layer (aka "cuticle") **Diet:** plants, other insects, dung, dead animals **Predator(s):** wasps & birds

Rainforest Fact Cards

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GLASSWING BUTTERFLY

~ See-through Wings

Habitat: rainforests **Size:** 0.8-4cm from tip to tip of its spread wings **Adaptation:** some have transparent wings so they seem to disappear **Diet:** nectar of flowers & other plant liquids **Predator(s):** birds; flies & wasps lay their eggs on or in the bodies of the butterfly caterpillars



PLATYPUS

~ Egg-laying Mammal

Habitat: rainforests (near lakes & streams) **Size:** 30-45cm body; 10-15cm tail; ≈ 1.4kg **Adaptation:** has webbed feet & can stay underwater for up to five minutes **Diet:** insects, worms, shellfish & shrimps **Predator(s):** large fish, snakes & man



SLOTH ~ Upside-down Bum

Habitat: rainforests **Size:** 41-74cm long; ≈ 4kg **Adaptation:** cling to tree trunks or branches with their limbs & seldom descend to the ground because it cannot walk & must pull itself along the ground with its claws **Diet:** leaves, fruit & shoots **Predator(s):** ocelot & jaguar



COATI ~ The Sniffer

Habitat: rainforests **Size:** 41-66cm body; 45-68kg **Adaptation:** sniff & dig in search for food **Diet:** insects, land crabs, snails, spiders, fruit, bird eggs, lizards & mice **Predator(s):** big cats, eagle, snake & alligator **Extra:** has a long, flexible snout & a long, ringed tail

Rainforest Fact Cards

(All fact cards can be found at <http://www.vtaide.com/png/habitats/index.htm>)



HUNTER Card



FLYING SQUIRREL
~ Night Glider

Habitat: rainforests **Size:** 22-35cm long **Adaptation:** a large, loose flap of skin, connecting its front & hind legs enabling it to glide **Diet:** young shoots, buds, fruit, nuts, bark, fungi, bird eggs, young birds, insects & carrion **Predator(s):** eagle, big cats



CAPYBARA aka Water Pig
Habitat: rainforests (specifically near rivers) **Size:** 1.2m long; ≈ 45kg **Adaptation:** has webbed toes & plunges into the water at any sign of danger **Diet:** plants & water plants **Predator(s):** jaguars, alligators & man



RAINFORESTS
Hunter Card

Rainforest Fact Cards

(All fact cards can be found at <http://www.vtaide.com/png/habitats/index.htm>)



POISON-ARROW FROG
 ~ Eat Me If You Dare
Habitat: rainforests (specifically among leaf litter) **Size:** 2.5cm long; 28g **Adaptation:** secretes deadly poison in its skin mucus
Diet: spiders & insects
Predator(s): man ... native hunters use the frog's poison by wiping their arrows & blow-gun darts across the frog's skin



IGUANA aka Bamboo Chicken
Habitat: rainforests **Size:** ≈ 2m long; 5kg **Adaptation:** its digestive system contains certain bacteria that help it to digest plants (most other lizards eat insects) **Diet:** fruit, flowers & leaves
Predator(s): man capturing & selling them as pets or eating their meat



ANACONDA ~ The Constrictor
Habitat: rainforests (near rivers)
Size: 4-9m long; 135-250kg
Adaptation: kill by wrapping its coil tightly around its prey; swallow prey whole by opening its jaws (wide enough) which are held together with stretchy ligaments **Diet:** birds & small mammals **Predator(s):** man



ALLIGATOR ~ The Ambusher
Habitat: rainforests **Size:** 1.5-6m long **Adaptation:** unable to chew their food so it either swallows small animals whole or twists off pieces of larger animals & swallows those whole **Diet:** fish, frogs, snakes, turtles, birds, mammals & carrion **Predator(s):** man hunting it for sport & for its hide

Writing to Make a Difference

1. Create an outline of your letter:

a) Who am I writing to (name, position title, address):

b) Who am I:

c) What is the issue or problem?:

d) What is my stand on it?:

e) What I would like the politician to do about it:

f) Request that the politician write back to tell you what they will do:

g) Thank the politician:

2. Write a first draft of your letter in the formal style. Include the date, the name, title and address of the person you are sending it to, the salutation, the body, the complimentary close, your signature and your address.

3. Write your final copy and mail it.

Ecosystem Mystery #1

Mystery:

Between August and October of 2011, approximately 6 000 dead birds washed up on the shore of Georgian bay in Southern Ontario. Loons, mallards, grebes, gulls, and Canada geese were found dead. The shores in which many of the birds were found is also home to many cottagers. The birds did not have any wounds on their bodies at their time of death. In early August, many dead fish were also littering the shores. What caused the mass die-off of birds in this area?

Questions:

- Could human activity have played a role in the mass death of the birds?
- What do birds feed upon? Where is their food located?
- If the birds did not have visible wounds, how did they die?
- What could have killed both the fish and the birds?

Clues:

- The human residents in the area did not cause the birds to die.
- Something within their food source affected the birds.
- The birds were not killed by predators.

Answer:

Type E botulism is the most likely cause of death for the fish and birds along Georgian Bay. This bacterium naturally occurs as harmless spores in lake bottom sediment, but in conditions when there is a lack of oxygen and enough nutrients the bacteria can find its way into the food chain.

Source: <http://www.torontosun.com/2011/10/24/thousands-of-dead-birds-wash-ashore-in-ont>

Ecosystem Mystery #2!

Mystery:

The black-footed ferrets, found in the Canadian prairies, have faced many challenges ranging from habitat destruction due to urban sprawl and to susceptibility to sylvatic plague. In 1978, the black footed ferret was listed as extirpated in the prairies (meaning it could no longer be found in this area). Today however, Grassland National Parks now supports Canada's first population of black-footed ferrets since they disappeared several decades ago. How did the black-footed ferret population re-emerge?

Questions:

- Could human activity have played a role in the re-population of the area?
- If an animal is extinct in one area, how could it re-emerge? What are some possibilities?

Clues:

- The black-footed ferrets needed a little help in order to re-populate the area.
- If introduced to an area under favourable conditions, a species can begin breeding and increasing its population.

Answer:

In 2003, the Toronto Zoo spearheaded black-footed ferret recovery in Canada and in 2004, in partnership with Parks Canada, US Fish & Wildlife Service, the Calgary Zoo, private stakeholders and other organizations, a joint Black-footed Ferret/Black-tailed Prairie Dog Recovery Team was established to set up the reintroduction of black-footed ferrets into Canada. As a result of extensive planning, 34 ferrets were released on to Canadian soil on October 2, 2009 and have been successfully breeding in the area! An example of how humans can positively impact the environment!

Source: <http://www.torontozoo.com/conservation/captive-breeding.asp?pg=bff>

Ecosystem Mystery #3!

Mystery:

In recent years, bird populations in the Kingston area have been declining. The population seems to be declining due to bird deaths and lower birth rates. Tests have revealed no toxins within the birds' blood and food sources within the area have not declined. Some of the dead birds have had serious wounds to their bodies. What could explain these phenomena?

Questions:

- Could human activity have contributed to the declining bird population?
- What could wound a bird and cause lower birth here is their food located?

Clues:

- The birds were not attacked by a predator.
- The birds were hit by some sort of blade; planes did not play a role.
- Human development did play a role in terms of energy generation.

Answer:

Dozens of wind turbines had been installed on Kingston's Wolfe Island; their long blades cut through the air and birds who were caught in the wrong place at the wrong time were hit by them. The turbines were placed close together and disrupted the flight routes of many birds in the area, therefore making it harder for birds to find mating partners and reproduce.

Source:

http://news.thomasnet.com/green_clean/2011/09/07/environmentalists-dilemma-birds-or-wind-turbines/