

Fifth Grade



- **Biodiversity**
- **Birds and Coffee**
- **Deforestation**
- **Community Action**

Lesson 1

Biodiversity

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El Imposible National Park, El Salvador

Concept

The more diverse an ecosystem is, the more interdependence of species exists within that system. The complex relationships among diverse species are difficult to identify. As species disappear or become extinct we begin to see the vital links that exist among species. Essential levels of biodiversity vary among biomes and bioregions.

Essential Question

Could an ocelot live where you live?

Step 1: Connect (the concept to prior knowledge)

Challenge

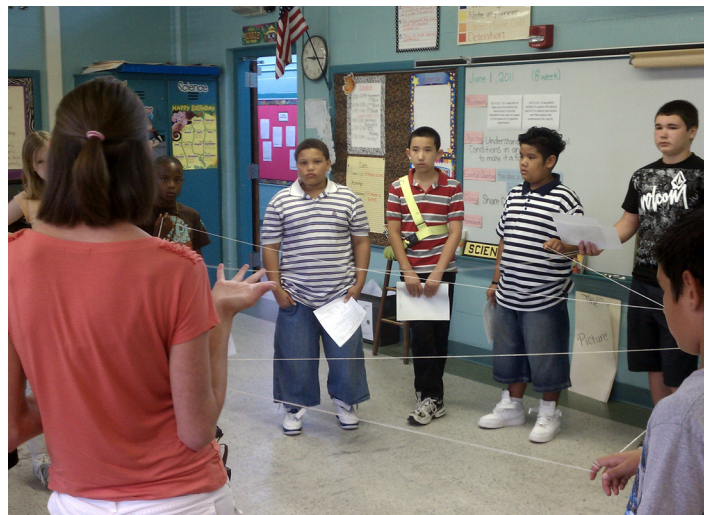
Students will observe the biodiversity in their backyard by connecting the adaptations of the animals in their neighborhood to the climate and habitats in which they live in.

Materials

- access to schoolyard or nearby park
- paper, pencils

Procedure

1. Take students out into the school grounds and look for signs of life.
2. Search for insects, birds, animal tracks, scat, feathers, nests, different types of trees, grasses, soil types, etc.
3. Make a class list that shows all findings in the schoolyard and post it as a visual in the classroom.
4. Make headings to organize groupings: insects, plants, mammals, birds, etc.
5. Discuss the Web of Life concept. Draw lines that connect one thing to another. For example: A nest is connected to a bird which is connected to the worms which is connected to the soil which is connected to the trees, and on and on.



Step 2: Literature/Discuss (give expert information book; ask questions)

Challenge

Students will learn about the biodiversity of the rainforest and compare and contrast with that of their own schoolyard findings.

Materials

- book: *The Great Kapok Tree* by Lynne Cherry
- biodiversity list from Step 1
- one piece of long string or rope

Procedure

1. Read *The Great Kapok Tree* by Lynne Cherry. Dis-

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cuss the different perspectives voiced throughout the book.

2. Activity: "The Web of Life"

- Have students stand in a large circle.
- Each student should choose one of the items from the classroom biodiversity list, making sure everyone represents a different living thing.
- Use a string or a rope to represent the links between each person.
- One person starts by saying the name they chose and, as a class, decide how they are connected to another organism in the circle.
- The rope is then passed to that organism.
- The goal is to finish with a web that is connected to everyone.
- This game demonstrates the intricate web of life.

3. Debrief in order for students to see how everything in their backyard, as in the rainforest, is ultimately connected in some way or another to their specific environment.

Step 3A: Practice (math and learning centers)

Challenge

Students will come up with their own web of life example.

Materials

- access to natural area (i.e., yard, park, etc.)

Procedure

1. Each student will look for an animal or insect in their own backyard or the schoolyard.
2. Students will make observations based on the behavior of that animal or insect.

3. Students will come up with their own web of life example based on the observations made and research on the behavior, food and habitat of that organism.
4. Students will make observations that support the theory that all organisms are connected: behavior, food, habitat, etc.

Step 3B: Create (performance tasks related to standard indicators)

Challenge

Students will demonstrate through writing how all living things interact with their environment in order to survive.

Materials

- paper, pencils

Procedure

Students will synthesize their observations of an organism and create a story that parallels *The Great Kapok Tree*. Using their observations as a framework, they will write their own stories to explain who depends on what for survival and why these interactions are unique to their environment.

Step 4: Present (edit work/students orally present projects)

Challenge

Students will practice their oral reading skills.

Materials

- story from Step 3B

Procedure

Each student will read their story to the class.

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Assessment Rubric

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Teacher observations of performance tasks with rubrics as listed below, as well as collected work samples.

Assessment Guidelines	3=P (Proficient)	2=S (Satisfactory)	1 = NW (Needs Work)
Student's story shows the connection between organisms and their environment.			
All spelling, punctuation and grammar are accurate.			
Student's illustrations follow the story line.			
Story provides multiple links between organisms and their environment.			
The story and illustrations represent student's full potential.			

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Birds and Coffee

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El Imposible National Park, El Salvador

Concept

In a global economy, where products from one country or bioregion are used in another bioregion, resource use and changes in the landscape impact the lives of species that depend on several bioregions for survival.

Essential Question

How are migratory birds affected by coffee production in El Salvador?

Step 1: Connect (the concept to prior knowledge)

Challenge

Students will identify with the changing of the seasons and how these changes affect human and animal behavior. Students will explain what migration is and why many songbirds migrate south for the winter.

Procedure

1. As a class, brainstorm questions such as:
 - How do you dress during the different seasons?
 - What do you see in winter that you don't see in the summer?
 - How do animals react to the changing seasons (key words: migration, hibernation, adaptation)?

Step 2: Literature/Discuss (give expert information book; ask questions)

Challenge

Students will learn about the two main coffee production methods used in the rainforest and be able to identify how this affects the habitat and health of migratory birds.

Materials

- El Imposible National Park Slideshow
- slideshow script
- Conservation Coffee Summary
- CD or cassette of bird calls or bird music
- chairs



Procedure

1. Give a mini-lecture on migratory birds.
2. Address the reasons why birds migrate (food, climate, shelter).
3. Give a mini-lecture on coffee production in the Salvadoran rainforest.
4. Provide information on sun and shade coffee growing practices, and who's using what and why (for more background information, see the Conservation Coffee Summary).
5. Activity: Migrating Birds (a takeoff of Musical Chairs): In this rendition of Musical Chairs, students will role play as birds and each chair will

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represent a tree. Set up a large number of chairs in a group, enough for each student to have a seat.

6. Have a CD or cassette of bird calls or other bird music.

Round 1

- Have students stand together as if they were a flock of birds getting ready to fly south for the winter.
- Play bird calls and tell the students to migrate to the rainforest (a chair).
- Once every student is seated, ask them what they think the chairs symbolize.
- The goal is for students to understand that the rainforest is much more than just a bunch of trees; it provides shelter, food, oxygen, etc., not only to the birds, but also to the other animals and indigenous people that live among the rainforest canopy.

Round 2

- Take several of the chairs and set them upside down on the outskirts of the inner bunch.
- Start the music again and initiate another mock migration. A number of students should be without a chair (without a tree/home/protection, etc.).
- Debrief and ask them what the overturned chairs represent (deforestation for coffee production and other threats to rainforests).
- Continue until students clearly understand the benefits of conserving the forest.
- Discuss the benefits of shade-grown coffee. By cultivating coffee underneath the shade of trees, the forest remains intact not only to migrating birds, but to the local people and animals that live there and depend on its resources year-round.

Step 3A: Practice (math and learning centers)

Challenge

Students will discover the distances that many birds fly in order to find food and shelter in the rainforest canopy. These distances will be translated to a determined scale and presented visually.

Materials

- research tools: bird books, maps, Internet, etc.
- chalk

Procedure

1. In groups of two or three, students will pick one local migratory bird to study. Using a variety of resources (books, maps and the internet), students will calculate the mileage and through what states and countries their bird travels from start to finish during migration.
2. After the mileage has been estimated, students will come up with a standard scale to represent their calculations. For example: 100 miles = 1 foot.
3. Space and weather permitting, all groups will create their own "Bird Migration Map" on the playground using chalk. Each map will include a scale and a visual representation of where the bird takes off from and where it lands.

Challenge 2

Students will discover where the coffee in their neighborhood is made, how it is produced and by which method, sun or shade. The goal is for students to connect this information with the findings from the above challenge in order to grasp the importance of conserving rainforest habitat for migratory birds and all living things (i.e. trees, animals, insects, humans).

Materials

- coffee labels

Procedure

1. Students will trace the origins of coffee sold or used in their neighborhood by looking at labels at home and/or in stores.
2. Then, groups will research if the coffee is grown with sun or shade practices depending on the region in which it came from and information provided by the label.

Step 3B: Create (performance tasks related to standard indicators)

Challenge

Students will ask their parents or local store owners to buy shade-grown as opposed to sun grown coffee.

Materials

- migratory information from Step 3A
- paper
- art materials

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Procedure

Students will design brochures for parents or local store owners trying to convince them to sell or buy shade-grown coffee. Brochures should include migratory bird information from the first challenge and coffee research from the second challenge.

Step 4: Present (edit work/students orally present projects)

Challenge

Students will practice public speaking.

Materials

- brochures from Step 3B

Procedure

Students will distribute brochures and read them to the class.

Lesson 2

Assessment Rubric

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Teacher observations of performance tasks with rubrics as listed below, as well as collected work samples.

Assessment Guidelines	3=P (Proficient)	2=S (Satisfactory)	1 = NW (Needs Work)
Student's brochures is based on scientific facts.			
Student's brochure setup is easy to follow.			
Spelling, grammar and punctuation are accurate.			
The information included in the brochure is convincing.			
Brochure represents student's full potential.			

Lesson 3

Deforestation

5

El Imposible National Park, El Salvador

Concept

One element of a complex ecosystem may provide essential components to the survival of many species of plants and animals.

Essential Question

How can the clearing of trees destroy a community?

Step 1: Connect (the concept to prior knowledge)

Challenge

Students will identify and connect with the benefits of trees.

Procedure

1. As a class, brainstorm the relationship between trees and humans.
 - How do we benefit from trees?
 - How do they benefit from us?
2. Discuss oxygen/CO₂ exchange, soil stabilization and protection from erosion, animal habitat, shade, medicine from the rainforest, etc.



Step 2: Literature/Discuss (give expert information book; ask questions)

Challenge

Students will be challenged with opposing viewpoints of the relationship and attitudes between humans and the forest.

Materials

- book: *The Lorax* by Dr. Seuss

Procedure

1. Read *The Lorax* by Dr. Seuss.
2. Discuss the two main characters. Explore students' thoughts and reactions to what these characters represent in our society.

Step 3A: Practice (math and learning centers)

Challenge

Students will use their knowledge of the forest to predict a deforestation scenario.

Materials

- paper, pencils

Procedure

1. Students will create a story that shows what they think would happen if all the trees were cut down in their neighborhood.
 - Who would be affected?
 - What changes would occur? And so on...
2. Students will act out their stories for the class and/or the whole school.

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Deforestation

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Step 3B: Create (performance tasks related to standard indicators)

Challenge

Students will organize a community tree planting day.

Procedure

1. Have students pretend they have replanted a forest that was cut down for coffee production. Predict how long it would take to look like a forest again.
2. Students will organize a community tree planting day.
3. Students will monitor the growth of their trees throughout the year.

Step 4: Present (edit work/students orally present projects)

Challenge

Students will put on an open house to present their service project to the community.

Materials

- recycled or Forest Stewardship Council-Certified paper

Procedure

Students will make and distribute invitations, on recycled or tree-free paper, for an open house where they will describe to the community their goals and objectives for their tree planting service project.

Additional resources: "Find Certified Products" (www.rainforest-alliance.org/find-certified); Forest Stewardship Council® (www.fsc.org)

Lesson 3

Assessment Rubric

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Teacher observations of performance tasks with rubrics as listed below, as well as collected work samples.

Assessment Guidelines	3=P (Proficient)	2=S (Satisfactory)	1 = NW (Needs Work)
Student clearly states backyard deforestation scenario.			
Student's spelling, punctuation and grammar are accurate.			
Student's story is based on scientific discovery.			
Story is neatly typed or handwritten.			
Student makes a clear statement as to how deforestation would affect all living organisms in their community.			

Lesson 4

Community Action

5

El Imposible National Park, El Salvador

Concept

Decisions about how one uses the resources within a particular bioregion must consider the biodiversity and complexity of the ecosystem.

Essential Question

How can communities make decisions that benefit both their families and the animals that live within them?

Step 1: Connect (the concept to prior knowledge)

Challenge

Students will examine their role in harming or helping the environment.

Materials

- paper, pencils

Procedure

1. Brainstorm a list of decisions that students make on a daily basis that affect the welfare of the environment. Categorize these as being either harmful or helpful.
2. Trace local actions to distant consequences. Ask students how our decisions at home affect the people in El Salvador? How do their decisions affect us? Discuss our role as consumers and how that affects how resources are used around the world.

Step 2: Literature/Discuss (give expert information book; ask questions)

Challenge

Students will discover the source of all the resources used at their school.

Materials

- paper, pencils

Procedure

1. Brainstorm a list of things that students and faculty use while they are at school. Examples: paper,



electricity, running water, pencils, markers, books, physical education equipment, lunch trays, etc.

2. Students will conduct research to trace all of these materials to their original sources. Where does the water in your community come from? What kind of fuel does your school use to make electricity? What are your supplies made of?

Step 3A: Practice (math and learning centers)

Challenge

Students will choose a resource (water, paper, electricity) and do an environmental assessment of their school community.

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Materials

- ecological footprint calculator from Earth Day Network (www.earthday.org/footprint-calculator)

Procedure

- In small groups or individually, students will observe and record how resources are used in their school community. Through interviews and direct observation, students will do an environmental assessment of their school. An audit of how resources are used might include the type of energy that heats the school, the amount of electricity used to light classrooms, the food that is used in the cafeteria, or the materials used in the construction of the building. An audit survey is available at the Earth Day Network Footprint Calculator. Examples of survey questions might include: Do students leave the water on while they clean up for lunch? Is there enough natural light in each classroom to leave the lights off? Do students and teachers recycle? Explore the cost versus environmental benefits of using recycled paper.
- Results of resource use and/or conservation practices will be displayed on charts and diagrams.

Step 3B: Create (performance tasks related to standard indicators)

Challenge

In small groups or individually, students will create a plan to conserve a resource in their school community.

Materials

- assessment from Step 3A

Procedure

Using the environmental assessment results, students will come up with a step-by-step proposal for resource conservation within their school community. Refer to EcoFootprint at Redefining Progress.

Step 4: Present (edit work/students orally present projects)

Challenge

Students will have to present their information to a mixed audience in an effective way.

Procedure

Students will present their results and proposals to the rest of the school community in a way that they feel will be most effective in demonstrating the results of their findings.

Lesson 4

Assessment Rubric

Teacher observations of performance tasks with rubrics as listed below, as well as collected work samples.

Assessment Guidelines	3=P (Proficient)	2=S (Satisfactory)	1 = NW (Needs Work)
Student collected enough data to make a conservation proposal.			
Student's step-by-step plan is clear and concise.			
Visuals (graphs, diagrams, etc.) clearly demonstrate student's data collection.			
Student makes a clear statement as to how their proposal will contribute to the conservation of school resources.			

Fifth Grade



Supplementary Materials

- Teacher Summary**
- Resources**
- National Standards**



**Rainforest
Alliance**



El Salvador has the highest population density (260 people per square kilometer) and the lowest percentage of intact primary forest (about two percent) in all of Latin America. Much of the country is intensely farmed, even the steepest slopes, making them susceptible to landslides and flooding. El Salvador, like much of Central America, was ravaged by civil conflict for most of the 70s and 80s. These conflicts stemmed in part from an intense need for land among the many landless peasants. Most recently, the already hard-hit communities of northern El Salvador were struck by major earthquakes, destroying much of the little infrastructure the area had.

Of the few remaining natural areas in El Salvador, El Imposible (The Impossible) National Park has the greatest diversity of species of plants and animals in the country. At least 400 species of plants and many spectacular animal species, such as the ocelot, great curassow, black-hawk eagle and crested guan are making their last stand in El Imposible.

Traders from Guatemala used to travel through the mountainous forests of El Salvador to reach the local markets, carefully leading their mules through the steep Impossible Pass, from which the park takes its name. The park is one of the few existing examples of the typical Mesoamerican Pacific coastal rainforests. It is a major source of air purification for the northwestern part of the country and the source of eight major rivers, which supply drinking water to the entire region and feed important coastal mangroves. Additionally, the park is part of the Mesoamerican Biologic Corridor, a major conservation initiative to create a connected series of protected areas between the U.S. and Colombia, running the length

of Central America. El Imposible represents the only viable forests within El Salvador, and thus is a crucial component of the Corridor.

El Imposible is characterized by middle elevation tropical montane forest. At its highest elevations, El Imposible has small remnants of cloudforest—the misty forests that are home to sloths, ocelots, orchids and bromeliads, among others. The park stretches down into the valleys, encompassing many spectacular waterfalls and rivers, where the forest changes over to lush rainforests replete with toucans, macaws, anteaters, capuchin monkeys, snakes and dozens of other birds species. Gone are the large mammals that could once be found in El Salvador's forests—jaguars, tapirs, pumas—which could no longer take the continued reduction of habitat. El Salvador's forests are crucial habitat for the millions of migratory songbirds that travel south from the U.S. and Canada each winter in search of warmer temperatures and fresh food supplies. Many of “our” birds in the Northeast travel to the coffee forests of Central America each year—more than 3,000 miles each way!

El Imposible National park, created by government decree on March 16, 1989, includes a core protected area of 8,818 acres. The core of the park is restricted to scientific research and recreational uses, in much the same way that our national parks are used. When the park was created, it was drawn on top of existing private lands. The government has pledged to help the families who live inside the park to relocate by buying their land at a fair price. However, in the 12 years since the park was established, none of the families have received compensation. Surrounding the core is a buffer zone of 5,449 acres that



are intended to be used for limited farming, while prohibiting deforestation, hunting, fishing and any new building in the area. Families living within the buffer zone have been a key part of SalvaNatura's plan for managing El Imposible. Many of the more than 100,000 residents of the area are living at or below the poverty level, desperate for an opportunity to provide a better life for their children and themselves. SalvaNatura has long recognized that they must work with these families to help them meet their economic needs while respecting the aims of the national park.

All of the land within the buffer zone is privately owned. SalvaNatura has been fundraising over the years to buy available land to help families relocate. Thus far, with support from international donors (including the Rainforest Alliance), SalvaNatura has purchased more than 1,200 acres. All of SalvaNatura's lands are adjacent to the park and within the buffer zone previously described. These lands are managed under the same restrictions as the rest of the park. Wildlife habitat is growing and natural regeneration is taking place in degraded areas. SalvaNatura is able to enforce park regulations that foster natural regeneration of wildlife habitat on its property and on lands that belong to the Salvadoran government. However, it is a constant struggle to enforce regulations on private properties in the buffer zone.

The hillsides of El Imposible are well-suited to low-impact agricultural practices and have been farmed in some fashion for hundreds of years. SalvaNatura (SN) and the Rainforest Alliance (RA) have been working with these small farmers to develop guidelines for growing environmentally-sustainable coffee in the hills of El Im-

posible. Coffee is a major cash crop throughout Central America. But due to price fluctuations and the high costs of agrochemicals, many small farmers are unable to provide for their families on their small parcel of land. SN and RA help farmers to improve their quality, production and income, while decreasing their impact on the fragile wildlife of El Imposible. As part of their effort to promote sustainable livelihoods among the communities of El Imposible, SN promotes wise soil management, planting fruit trees (great habitats for birds and a good source of nutrition for children), using living trees as fences and fire wood nurseries (most residents still use wood to cook and heat, taking wood from the forest), and organizes community projects including school nurseries and latrines.

In addition to their efforts to increase the size of the park, SalvaNatura has concentrated much of its efforts in promoting eco-tourism in the buffer zone. Hiking, bird watching and archaeological trips are organized by a group of trained guides from the community. These guides, many of them former hunters or loggers, are now able to make a living without destroying the forest. To help others in the communities around the park, SN has provided small loans to help start up a family-owned inn, local restaurant, natural medicine stall, handicraft gift shop and three country stores. These businesses improve the experiences of visitors to the park, by providing the comforts one expects when traveling, while providing a livelihood to local families.

Another important project being carried out by SalvaNatura is environmental education for local children. Local schoolchildren are benefiting from the creation of

“Los Habitantes del Imposible,” (the Residents of El Imposible) a program held in 40 local schools to promote pride among the residents. The materials teach children about what a special place they live in, and encourage careful stewardship of the land. SalvaNatura supports 132 literary circles in neighboring communities and has published numerous stories and guides, including a col-

lection of national postage stamps. All of these projects are part of SalvaNatura's efforts to provide the communities of El Imposible with viable economic alternatives, raising them out of desperate poverty, so that they will be able to contribute to the preservation of El Salvador's very *possible* national park.



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Resource Index

Check out this page for additional supplemental materials that complement these dynamic units and to access many of the resources listed below.

www.rainforest-alliance.org/curricula/resources

Slideshow (1)

The Curriculum site provides a slideshow and script about El Salvador that includes background information about the animals, people and landscape of this region. The slideshow can be download for viewing in the classroom, printed out and read as a story, or viewed online with the students.

www.rainforest-alliance.org/pictures/el-salvador-kids

Unit-Specific Story (2)

The Rainforest Alliance has developed two original stories for use with this unit, available in English, Spanish and Portuguese. The stories are available to download and print or can be viewed onscreen.

- *Alex Goes Exploring in El Imposible*
www.rainforest-alliance.org/pictures/alex-explores-el-imposible
- *Life in San Miguelito*
www.rainforest-alliance.org/pictures/life-in-san-miguelito

Species Profiles (3)

The species profiles include photos, habitat, foraging behavior, group relationships, threats and many more facts.

- ocelot
- great curassow
- king vulture
- blue-crowned motmot

www.rainforest-alliance.org/species

Rainforest Products

Check out a summary of products found in our homes

and supermarkets that either originated in tropical forests or are currently produced there.

www.rainforest-alliance.org/articles/tropical-forests-in-our-daily-lives

Park Profiles

A basic introduction to El Imposible National Park.

www.rainforest-alliance.org/adopt-a-rainforest/el-salvador

Rainforest Poster

Download and print out this colorful two-page poster, which is available for you to use in explaining the layers of the rainforest, its products and the environmental threats facing many rainforests around the world.

Inside the Canopy – structure and species of the rainforest

www.rainforest-alliance.org/publications/inside-the-rainforest-canopy

Conservation Coffee Summary

Access a seven-page introduction to the issue, including a glossary of terms. These are appropriate for students to read independently.

www.rainforest-alliance.org/sites/default/files/uploads/pdfs/curricula/conservation-coffee.pdf

Venn Diagram Template

Download a photocopy-ready Venn diagram designed to complement this unit.

www.rainforest-alliance.org/sites/default/files/uploads/pdfs/curricula/venn-brazil.pdf

Certificate of Accomplishment

Print out colorful rainforest certificates for your students to commemorate their completion of these units.

www.rainforest-alliance.org/curricula/certificate-of-participation

English

Standard 1: Reading for Perspective

Level 2: Grade 3–5

- Students read a wide range of print and non-print texts to build an understanding of texts, of themselves and of the cultures of the U.S. and the world

Standard 3: Evaluation Strategies

Level 2: Grade 3–5

- Students apply a wide range of strategies to comprehend, interpret, evaluate and appreciate texts

Standard 4: Communication Skills

Level 2: Grade 3–5

- Students adjust their use of spoken, written and visual language to communicate effectively with a variety of audiences and for different purposes

Standard 7: Evaluating Data

Level 2: Grade 3–5

- Students conduct research on issues and interests by generating ideas and questions, and by posing problems

Life Sciences

Standard 3

Level 2: Grade 3–5

- Students develop an understanding of the structure and function in living systems, populations and ecosystems, and diversity and adaptations of organisms

Mathematics

Standard 1

Level 2: Grade 3–5

- Students understand the need for measuring with standard units and that measurements are approximations and how differences in units affect precision

Technology

Standard 4: Technology Communication Tools

Level 2: Grade 3–5

- Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences

Standard 5: Technology Resource Tools

Level 2: Grade 3–5

- Students use technology to locate, evaluate and collect information for a variety of sources

Social Studies

Standard 5: Environment and Society

Level 2: Grade 3–5

- Students should understand how human actions modify the physical environment

Science

Standard 6: Personal and Social Perspectives

Level 2: Grade 3–5

- Students develop an understanding of populations, resources and environments