



First Grade
Maya Mountain Marine Corridor, Belize
National Standards for First Grade Lessons

Writing

Standard 3 Level 1: K-2

1. Generates questions about topics of personal interest.
2. Uses a variety of sources to gather information.

Reading

Standard 7 Level 1 Grade K-2

1. Uses reading skills and strategies to understand a variety of informational texts.
4. Relates new information to prior knowledge and experiences.

Listening and Speaking

Standard 8 Level 1 Grade k-2

8. Listens and responds to a variety of media.

Thinking and Reasoning

Standard 1 Level 1 Grade K-2

Understands and applies the basic principles of presenting an argument.

Standard 5 Level 1 Grade K-2

Identifies simple problems and possible solutions

Mathematics

Standard 1 Uses a variety of strategies in the problem-solving

Level 1 Grade K-2

A) Draws pictures to represent problems.

B) 4. Makes organized lists or tables of information necessary for solving a problem.

Standard 3 Level 1 Grade K-2

3. Understand basic estimation strategies

Standard 4 Level 1 Grade K-2

1. Understand the basic Measures of length, width, height, weight, and temperature.

Life Sciences

Standard 6 Level 1 Grade K-2

1. Knows that plants and animals need certain resources for energy and growth
2. Know that living things are found almost everywhere in the world and that distinct environmental support the life of different types of plants and animals.

Standard 13 Level 1 Grade K-2

Understands that in science it is helpful to work with a team and share the findings with others.

Standard 12 Level 1 Grade K-2

1. Knows that learning can come from careful observations and simple experiments.

Standard 5 Level 1 Grade K-2

1. Knows the basic needs of plants and animals (air, water, nutrients, light or food, shelter)
2. Knows that plants and animals have features that help them live in different environments.

Standard 4 Level 1 Grade K-2

3. Knows that differences exist among individuals of the same kind of plant or animal.

Standard 7 Level 1 Grade K-2

2. Knows that there are similarities and differences in the appearance and behavior of plants and animals.



**First Grade
Maya Mountain Marine Corridor, Belize**

Lesson 1: Knowing the Essential Elements of a Habitat

Concept

Children will become acquainted with the landscape characteristics of their play space, their neighborhood and their classroom in order to better relate to the Belize landscape.

Essential Question

What sounds does your neighborhood make?

Additional Resources

- **Resource Index**- Check out this page at <http://www.rainforest-alliance.org/programs/education/teachers/curriculum/resources/index.html> for additional supplemental materials that complement these dynamic units and to access many of the resources listed below.
- **Slideshow** – The Learning Site provides a slideshow and script about Belize that includes background information about the animals, people and landscape of this region. The slideshow can be downloaded for viewing in the classroom, printed out and read as a story, or viewed online with the students.
- **Unit-Specific Stories** - The Rainforest Alliance has developed two original stories for use with these units, available in English, Spanish and Portuguese. The stories are available to download and print or can be viewed on-screen.

**Manny Manatee and the Mystery of the Murky Water
My Dad the Ranger**

- **Species Profiles** – The species profiles, available to view on screen or download from the beginning of the unit or the Resource Index, include photos, habitat, foraging behavior, group relationships, threats and many more facts.
 - Ocellated Turkey
 - Jaguar
 - Howler Monkey
 - Manatee
 - Scarlet Macaw
- **Ranger Rick Article** - Download "*Rick and the Gang Visit Costa Rica and Go Bananas,*" a colorful article about bananas and coastal wildlife from the National Wildlife Federation's Ranger Rick magazine.

- **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

Status Report – What is happening to the rainforest

- **Rainforest Products** – Visit <http://www.rainforest-alliance.org/resources/forest-facts/lives.html> for a summary of products that we use in our everyday lives that originate in rainforests. Both teachers and students will find information on the products found in their homes and supermarkets that either originated in tropical forests or are currently produced there.
- **Profiles in Sustainability** – Visit <http://www.rainforest-alliance.org/programs/profiles/index.html> for case studies on companies who work closely with the Rainforest Alliance to ensure that their practices protect wildlife, workers and communities.
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www.tidebelize.org
- **Certificate of Accomplishment** – Print out colorful rainforest certificates for your students to commemorate their completion of these units.

Step 1 - CONNECT (the concept to prior knowledge)

Challenge

Students will capture the essence of the landscape surrounding their school on a map that identifies sensory and landscape information.

Materials

- 8.5"x11" Outline/map of the area around the school (1 per student; prepared by teacher)
- One larger replica of school area map
- Art supplies

Procedure

1. Students will be handed a rough outline of the area around their school. They will be oriented to the map by discussing experiences different students might have had walking or playing in those spaces.
2. Students will take the maps outside and add descriptive information to the rough outline. These observations should include plants (drawings), rocks, dirt areas, random items in the landscape, smells, sounds and temperature changes. Each child will fill in what they think is important.

3. Inside the classroom on a large replica of the map of the schoolyard, the teacher will collect and transfer the observations using symbols for common landscape elements, drawings cut from maps and words to describe sensory elements. The class will decorate this map so that it represents their school landscape.

Step 2 – LITERATURE/DISCUSS (Give Expert Information Book; Ask Questions)

Challenge

Students will begin to see their play space and school as a multi-textured landscape.

Materials

- Book: **Welcome to the Green House** by Jane Yolen

Procedure

Visualization: Ask the children to close their eyes and listen as you read **Welcome to the Green House** by Jane Yolen. Ask them to pay special attention to the sounds and visual pictures that are created in their minds by this book.

Step 3A – PRACTICE (Math and Learning Centers)

Challenge

Students will compare and contrast the map of their schoolyard with different maps that slowly move out in distance encompassing a greater area.

Materials

- Local, national and world maps

Procedure

1. As in the Powers of Ten, introduce students to maps that locate their schoolyard within different geographies that are local first and gradually geographically further away.
2. Students carry out a variety of interesting calculations in order to establish the area/dimensions of their playspace/schoolyard in relationship to the city/state they are in.
3. Looking at their own map of the schoolyard, ask students to guess at how to measure their schoolyard and relate how large it is in comparison to their neighborhood, city/town, state and/or country.

Step 3B – CREATE (Performance Tasks Related to Standard Indicators)

Challenge

Students will write a short 'impression' poem. (This can be a haiku that captures the essence of the 'sitting' place.)

Materials

- Paper, pencils
- Maps from Step 1

Procedure

1. Students return to a place that interested them outside around the building.
Students write a short poem about this place that uses sensory images, landmarks, weather observations, sounds, etc.
2. The poems will be transferred to the map corresponding to the location in the schoolyard.

Step 4 - PRESENT (Edit Work/Students Orally Present Projects)

Challenge

Students read their poetry aloud to the class.

LESSON 1 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)
1. Student understands the procedure for mapping a defined area and the differences in scale of a drawing and the actual schoolyard.			
2. Student discusses the sensory elements of the schoolyard and how these help define its character.			
3. Student compares and contrasts the scale drawing of the schoolyard with maps that represent different geographical areas, gradually increasing the scale of the mapped area.			
4. Student captures the character of their schoolyard using poetry or other descriptive narrative.			
5. Student prepares and delivers an oral presentation of their descriptive narrative for their peers.			



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**Lesson 2: Protecting the Critical Habitat of the Manatee and the
Loggerhead Turtle**

Concept

Regardless of the natural surroundings or the day-to-day conditions in any given place, plants and animals rely on their environment to provide them with the raw materials they need for life and the conditions to live safely and without stress. To protect manatees and loggerheads, we need to protect their homes.

Essential Question

What do manatees and loggerhead turtles have in common with you and your neighborhood?

Additional Resources

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Step 1 – CONNECT (the concept to prior knowledge)

Challenge

Students will identify the characteristics of the manatee and the loggerhead turtle and give evidence of similarities and differences between these species and humans. Students will describe the kinds of homes (and play spaces) each species needs to survive (example: manatee needs clean and deep water).

Materials

- Maps of schoolyard from Lesson 1, Step 1
- Species profiles (provided on the Rainforest Alliance Learning Site)
- Story: **Manny the Manatee**, an original Rainforest Alliance story
- Map that includes coastal ecosystem of Belize

Procedure

1. Students will identify places where they feel most comfortable, safe and healthy on the map of their schoolyard/play space.

2. Students are acquainted with the manatee and the loggerhead turtle using the species profiles from the Rainforest Alliance.
3. Students will be acquainted with a map of the coastal ecosystem of Belize and the river system discussed in **Manny the Manatee**, a Rainforest Alliance story.
4. Discuss with students what is different in this landscape as compared to their own neighborhoods.

Step 2 - LITERATURE/DISCUSS (Give Expert Information Book; Ask Questions)

Challenge

Students learn about the Belize environment through a story and hear about changes in land practices that may threaten the comfort, safety and health like those that are faced by the manatee and loggerhead turtle in Belize.

Materials

Story: **Manny the Manatee**, an original Rainforest Alliance story

Procedure

1. Students listen to **Manny the Manatee and the Mystery of the Murky Water**.
2. Students discuss the changes in Manny's environment that make life uncomfortable.
3. Students discuss things that have changed in their own neighborhoods that may have changed the way that they play or walk to school or threatened their comfort and safety in these places.

Step 3A - PRACTICE (Math and Learning Centers)

Challenge

Students understand the landscape that Manny lives in by looking at maps that scale sequentially closer to the coastal ecosystem from a map that includes North America.

Materials

- Maps of world, Central America and Belize

Procedure

1. Place the sequentially scaled maps on the floor in a random order and have students order them so that they begin to focus on the coastal Belize area.
2. The last map in the sequence should be one that contains Manny's home.

Step 3B – CREATE (Performance Tasks Related to Standard Indicators)

Challenge

Students will create a map similar to their schoolyard map that represents the area where the manatee and loggerhead turtles live.

Materials

- Paper, pencils

Procedure

1. On another roughly outlined map, students draw their conception of the place where the manatee and loggerhead live, based on what they know about the animals from different resources like the slideshow, book and species profiles.

Step 4 – PRESENT

Challenge

To connect their own sense of place with the place where the manatee and turtle live.

Materials

- Map of Belize from Step 3B

Procedure

1. Students will describe to others what they think the manatee and the loggerhead need to be comfortable, healthy and safe. They will use the Belize map they have created as reference.

LESSON 2 ASSESSMENT RUBRIC:

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

Assessment Guidelines	3 = P (Proficient)	2 = S (Satisfactory)	1 = NW (Needs Work)
1. Through the comparison of the schoolyard and coastal Belize, student compares and contrasts the habitats of humans, the manatee and the loggerhead turtle based on characteristics that provide comfort, health and safety.			
2. Student identifies aspects of each environment that have changed over the last five years that discuss which changes caused threats to health, comfort and safety.			
3. Student identifies the distance between the rainforest and their North American home. Student locates coastal Belize on a map and understands the physical relationship between his/her home and the home of the loggerhead turtle.			
4. Student identifies the differences between North America and Belize according to their locations on the globe.			



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Lesson 3: How Do the Jaguar and Howler Monkeys in Belize Depend on Us?

Concept

Forests that line the rivers along a watershed play an important role in keeping waterways healthy, safe and comfortable for animals and people.

Essential Question

How does the weather (particularly the amount of rain) link the jaguar and howler monkey with the manatee and the loggerhead turtle?

Additional Resources

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Informational Introduction for the Teacher

The Maya Forest is the watershed for the Coastal Ecosystem of Belize. If the waterways that carry rainfall are degraded, the soil from the rainforest floor erodes into the rivers and travels down to the coast. When roots of trees aren't present to hold back the soil, it floods the rivers making the rivers murky and muddy. When the habitat of the jaguar and howler monkey is deforested it negatively affects the manatee and loggerhead at the other end of the watershed. Due to deforestation to meet the needs of rising consumer markets, erosion occurs because the roots of trees are needed to hold soil in place. This is true in the North American forests as well.

Step 1 – CONNECT (The Concept to Prior Knowledge)

Challenge

Identify the ways that a landscape might change due to weather. By altering the landscape through the simulation of flood and resulting erosion, children will understand why rivers get muddy/murky at the coast. This will help them understand how Manny's home was affected by erosion.

Materials

- Book: **The Magic School Bus: At the Waterworks**, by Joanna Cole and Bruce Degen
- Map of local watershed
- Simulated watershed system: 3-inch high baking pan, dirt and clean water

Procedure

1. Discuss where the water comes from to get to the school faucets. Sources of water are often a distance away from the faucet. The water the manatee and loggerhead swim in originates far from their home but affects the safety and health of their water.
2. Read **The Magic School Bus: At the Waterworks**, by Joanna Cole and Bruce Degen.
3. Show the students a map of their watershed. Describe how the water flows from its origin to the school.
4. Discuss how water picks up loose materials on its way to the ocean or reservoir.
5. Show students how water picks up materials along the riverway by simulating a watershed in the classroom or in the play space. This can be done using a 3" high baking pan in which dirt is formed into a landscape that roughly simulates a downward incline to the ocean from hills. Have students take a sample of the clean water at the start and compare it to the murky water that lands in a pool at the end of the waterway.
6. Discuss how this kind of riverbank can affect changes in water quality with large amounts of moving water. (You could simulate another environment using pieces of sod to stabilize the riverbank. This shows the difference between rooted plants lining a river, holding in soil and a pure dirt-lined riverbed. Or, do the experiment outside using two different sites in the schoolyard and have students describe the differences.

Step 2 – LITERATURE/DISCUSS (Give Expert Information Book; Ask Questions)

Challenge

Students discover the habitat of the jaguar and the howling monkey. They begin to conceptualize how life for the jaguar and monkey is tied to the manatee and loggerhead and ways that it is similar to their watershed.

Materials

- Video: **"A Walk in the Rainforest"** available from Bullfrog Films
- Book: **At Home in the Rain Forest**, by Diane Willow and Laura Jacques
- Species profiles: jaguar, howler monkey – Available on the Learning Site

Procedure

1. Show students **"A Walk in the Rainforest"** available from Bullfrog Films. In this video, an 8 year-old boy takes his friends on a tour of a rainforest in Belize. The video portrays a variety of plants and animals that live there.

2. Read **At Home in the Rain Forest**, by Diane Willow and Laura Jacques. This story describes the sights and sounds of the rainforest, introducing the reader to the plants and animals that inhabit this precious ecosystem.
3. Read the **Here is the Tropical Rain Forest**, by Madeleine Dunphy. This story has a cumulative text, taking the reader on a journey through the rainforest from the mossy forest floor up to the emergent layer at the top.
4. Show students the species profiles of the jaguar and the howler monkey. Describe where they live in the rainforest (i.e. the canopy, understory, forest floor) and discuss their relationship with the river or watershed.
5. Make comparisons to how these four species use and live within the Maya Mountain Marine Corridor. Remind students of how their watershed is similar. What effect would erosion have on the jaguar and monkey in the Maya Mountain Marine Corridor compared to the manatee and the loggerhead at the mouth of the River?
6. Look at the Rainforest Alliance Web page, <http://www.rainforest-alliance.org/programs/aar/belize.html>, which discusses threats to the environmentally important Maya Mountain Marine Corridor and efforts to protect it.
7. Additional References:
Nature's Green Umbrella by Gail Gibbons

Step 3A – PRACTICE (Math and Learning Centers)

Challenge

Students carry out a number of comparisons to judge how muddy the water at the end of their simulated watershed is when lined with sod or just dirt.

Materials

- Simulated watershed system from Step 1
- Sod
- Dirt

Procedure

1. Using the simulated watershed system, one with sod and the other bare dirt, create a chart that gives indicators of muddiness. Have students name the various gradations and align them with the health of the water for living species, including the manatee and turtle.
2. Collect water samples from each 'watershed' after a bucket of water has been poured down. Match the samples with the chart of muddiness.
3. Annotate the samples with gradations of "healthy for land animals" or "healthy for water animals."

Step 3B – CREATE (Performance tasks related to Standard Indicators)

Challenge

Students are challenged to research the four different species highlighted in this unit and write a story from the perspective of each one regarding the watershed and how important it is to their livelihood.

Materials

- Paper
- Art supplies

Procedure

1. Students draw pictures of themselves using water and write one or two sentences about how important water is to their lives.
2. Students draw pictures of the different species using the water source and write one or two sentences on how important the water is to their lives.

Step 4 – PRESENT

Challenge

Students will each begin to compile a book called *The Rainforest and Me*. In this will go their maps of local place and Belize as well as the new information on water sources.

LESSON 3 ASSESSMENT RUBRIC:

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

Assessment Guidelines	3 = P (Proficient)	2 = S (Satisfactory)	1 = NW (Needs Work)
1. Students identifies how weather impacts a landscape, particularly rain/erosion through the watershed simulation task.			
2. Student begins to understand the concept of a watershed through the mapping activity. Student will understand how different animals living in a watershed depend on its health and services.			
3. Student collects data from the watershed simulation and shows how erosion impacts the health of a watershed.			
4. Student represents through pictures, the relationship different animals have to watersheds and the importance of maintaining the health and function of watersheds for their welfare.			



**First Grade
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Lesson 4: Who Takes Care of the Maya Forest Corridor?

Concept

The work of conservationists is tireless. It demands a knowledge of the ecological dynamics and the relationship that humans have in each region. A ranger is responsible for balancing human use with the health of the environment.

Essential Question

Making sure animals and people are safe in their habitats is a big job. Who makes sure we are safe, healthy and comfortable?

Additional Resources

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Step 1 – CONNECT (The Concept to Prior Knowledge)

Challenge

Students identify the rules, laws, jobs and people who help them feel safe, keep them healthy and make them comfortable and happy. They identify the rules, laws, jobs and people who look after the livelihood of animals, particularly those in the Maya Forest Reserve.

Materials

- Paper, pencils
- Art supplies

Procedure

1. Students make a list of all the rules, laws, jobs and people who make their playground and school safe. They extend this list to include their homes.
2. Students identify changes that have been made to their playgrounds or homes to increase safety or comfort.
3. Students may draw a picture to show one incident/person who helps them feel safe in their neighborhood or play space.

Step 2 – LITERATURE/DISCUSS (Give Expert Information Book; Ask Questions)

Challenge

Students identify the people who are trying to keep the rainforest safe for the four focus species.

Materials

- Book: **The Great Kapok Tree** by Lynne Cherry
- Story: **My Dad the Ranger**, a Rainforest Alliance story

Procedure

1. Read **The Great Kapok Tree** by Lynne Cherry. Identify the threats to the animals and the rainforest that are identified in this book. Discuss the reasons that people might be cutting down trees in the rainforest.
2. Read **My Dad the Ranger**, a Rainforest Alliance story. Talk about the ways that the ranger is protecting the four species of focus. Discuss people in the lives of the students who provide safety and health. What do they do that is different than the ranger?
3. Visit <http://www.rainforest-alliance.org/programs/aar/belize.html> for a discussion of threats to the environmentally important Maya Mountain Marine Corridor and efforts to protect it. Give a short overview of Belize and the Maya rainforest: Belize's tropical rainforests are home to more than 220 tree species and 350 species of birds. Forest areas include the largest true subtropical rainforest in Belize, with a great diversity of rare and endangered plants, birds, insects and animals, including five species of wild cats. Cover information about what the Toledo Institute for Development and the Environment (TIDE) is doing to protect Belize's rainforests. Due to its tremendous natural diversity, the Toledo Institute for Development and the Environment (TIDE), with support from The Nature Conservancy and the Rainforest Alliance, is working to conserve the "Ridges to Reef" conservation corridor in Southern Belize. Visit <http://www.tidebelize.org/> for more information about TIDE's work.

Step 3A – PRACTICE (Math and Learning Centers)

Challenge

Students carry out a variety of interesting comparisons between the two environments: their neighborhoods and the Marine corridor. Students create a column graph that compares the threats to the safety of humans and animals within both environments.

Materials

- Paper, pencils

Procedure

1. Have students brainstorm the kinds of things that might threaten the integrity of their playground, school or home.

2. List those things in columns labeled respectively. Then list the things that might threaten the Maya Forest Marine Corridor (both the forest and the watershed).
3. Compare and contrast the sources of threats and the results of threats.

Step 3B – CREATE (Performance Tasks Related to Standard Indicators)

Challenge

Using the materials they have studied, students will translate what they know into a symbolic representation.

Materials

- Paper
- Art supplies

Procedure

1. Students will create a 3D model of the two environments in small groups. This might be in the form of a diorama or a flat cookie sheet sized model.
2. Students will talk about the ways the two environments are the same and what threats they face in the future to their safety, health and comfort.

Step 4 - PRESENT

Challenge

Students will write stories that use the two different 3D representations as a background for a personal exploration of the rainforest or of an exploration of their playground from the perspective of a jaguar, howler monkey, manatee or loggerhead turtle. The stories will highlight where animals feel safe, where they can get what they need to survive and whether they feel comfortable.

LESSON 4 ASSESSMENT RUBRIC:

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

Assessment Guidelines	3 = P (Proficient)	2 = S (Satisfactory)	1 = NW (Needs Work)
1. Student identifies what he/she needs to know to help keep watersheds healthy.			
2. Student names the different ways that people can protect environments making them safe and healthy.			
3. Student lists the threats to the health of the rainforest.			
4. Student creates a column graph that compares and contrasts the things that threaten both his/her own home environment and those of animals in the rainforest.			
5. Student identifies people or groups that are working to keep the rainforest in Belize safe for the four focus species.			
6. Student uses written narratives to describe the environment from the perspectives of a jaguar, monkey, manatee or loggerhead turtle highlighting what animals need to feel safe, healthy and comfortable.			