



Ecosystem Explorers Pre-Program Teacher Lesson Plan

Revised 7/6/2018

General Lesson Overview:

Due to changes in elevation, precipitation, and temperature within Rocky Mountain National Park (RMNP), the ecosystems of RMNP are extremely diverse, therefore making this National Park an ideal place to study biodiversity within various ecosystems.

School Subjects: Natural Sciences and Ecology
Grade Level: 4-5th
Time Requirement: one class period, 45min- 1hr

Pre-Program Lesson Objectives:

Students will be able to...

- 1) Research different abiotic factors of their ecosystem such as temperature, elevation, and precipitation.
- 2) Name at least two animals that are present in their ecosystem.
- 3) Name at least one plant that is present in their ecosystem.

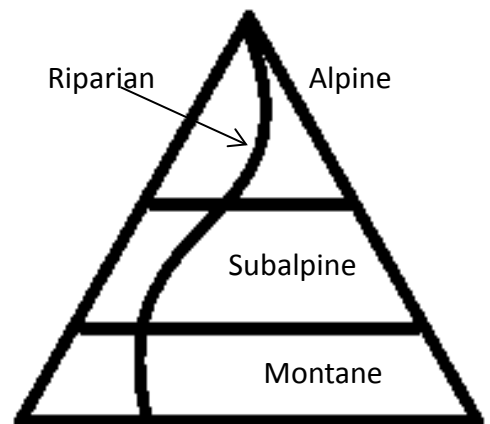
Background Information:

Rocky Mountain National Park is defined by the rugged Rocky Mountains that cut through the heart of the park from north to south. These mountains have shaped the landscape and created the conditions for the ecosystems we find within the park.

Three of the park's ecosystems, the montane, subalpine, and alpine tundra are delineated by elevation, with the montane ecosystem comprising the lowest elevations in the park (5,600 – 9,500 ft.) and the alpine tundra ecosystem comprising the highest elevations in the park (11,000 – 14,259 ft.). This fragile alpine tundra, which comprises 1/3 of the park, is one of the main scenic and scientific features for which the park was established and is one of the largest and best preserved examples of this ecosystem in the lower 48 states.

To learn more about RMNP's unique ecosystems please reference the "Ecosystems of Rocky Teacher Guide" found on the RMNP website:

<https://www.nps.gov/romo/learn/education/upload/Ecosystems-of-Rocky-Teacher-Guide.pdf>





Pre-Program Lesson:

Complete the following “Ecosystem Explorer” activity prior to the live distance learning program to introduce the various ecosystems of Rocky Mountain National Park and the importance of biodiversity in our National Parks.

Materials:

- Poster paper/construction paper (~36”x 32” triangle, cut into 8” tall sections- reference the graphic on page 1 to get an idea for the end result)
- Scissors
- Markers, crayons, colored pencils, other art supplies for decorating symbols
- Ecosystem Explorers handout (see below) printed out or accessible on computers for each group

Pre-Program Lesson Procedure:

1. Read page 1 of the Ecosystem Explorer handout as a group and discuss the concept of an ecosystem as a class.
2. Thinking about your local environment, have students brainstorm abiotic (nonliving: the sun, rain, rocks, etc.) and biotic (living: plants and animals) factors and consider how they interact with each other.
3. Break the students into four groups and assign each group one of the following ecosystems:
 - Alpine
 - Subalpine
 - Montane
 - Riparian
4. Assign each group their respective ecosystem pages in the handout to complete.
5. Have students research their ecosystem and answer the following:
 - What elevation range does your ecosystem fall within?
 - How much precipitation does your ecosystem receive?
 - What are two examples of common plants in your ecosystem?
 - Name at least two animals that live in your ecosystem.
6. Have students create their ecosystem on their poster using the provided materials (poster paper/construction paper, markers, pencils, etc.)
 - **NOTE: the ecosystems will be assembled on top of each other to replicate a mountain (montane at the bottom, subalpine, alpine tundra, and riparian which can be located anywhere as it is not dependent on elevation).**
7. Prepare the students to present their ecosystem to the ranger and compile the full mountain of ecosystems during the live distance learning program.



Ecosystem Explorers

Live Program Teacher Lesson Plan

Revised 7/6/2018

General Lesson Overview:

Due to changes in elevation, precipitation, and temperature within Rocky Mountain National Park (RMNP), the ecosystems of RMNP are extremely diverse, therefore making this National Park an ideal place to study biodiversity within various ecosystems.

School Subjects: Natural Sciences and Ecology
Targeted Grade Levels: 4-5th
Time Requirement: 1 hour

Live Program Lesson Objectives:

Students will be able to...

- 1) Name at least two ecosystems found in Rocky Mountain National Park.
- 2) Name at least three animals that call Rocky Mountain National Park home.
- 3) Present on their selected ecosystem regarding elevation, precipitation, animals present, and plants present.
- 4) Draw connections between Rocky Mountain National Park and their home environment.
- 5) Describe the role of biodiversity in the health of ecosystems.
- 6) Recognize the role of the NPS in preserving natural areas.

Materials for Live Program with Ranger:

- Ecosystem posters prepared by each group of students
- White board/easel/wall to piece together the ecosystem posters after each presentation
- Tape or adhesive to adhere the posters to the surface

Live Program Lesson Procedure:

1. The ranger(s) will begin the program by introducing the NPS, Rocky Mountain National Park, and components that are found in every ecosystem across the world.
2. The ranger(s) will then give a brief overview of all of the ecosystems found in RMNP and invite each group one at a time up to the front of the class to share what ecosystem they researched answering these questions:
 - a. What ecosystem did you study?
 - b. What elevation range is your ecosystem found within?
 - c. How much precipitation does your ecosystem receive?
 - d. What are two common plants that live in your ecosystem?
 - e. What are two common animals that live in your ecosystem?



3. After each group has presented their ecosystem, display their poster on a wall or white board as rangers elaborate on what the students presented.
4. At the end of all presentations, the end result should resemble a “mountain” of the ecosystems found at RMNP all with different abiotics and biotics. This will lead rangers to the discussion of biodiversity.
5. The program will be concluded with about 5-10 minutes of Q&A with the students. Encourage your students to come up with a few questions for the ranger(s).

*Adapted from *Canyon Connections*, Grand Canyon National Park

Standards Addressed by Ecosystem Explorers

Next Generation Science Standards (NGSS) (National Academy of Sciences)

- NGSS-2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.
- NGSS-5-LS2-1: Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- NGSS-5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- NGSS-MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- NGSS-MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

Colorado State Academic Standards (CSAS)

- SC09-GR.4-S.2-GLE.3-IQ.1,2,4
- SC09-GR.4-S.2-GLE.3-EO. b,c
- SC09-GR.6-S.2-GLE.1-IQ.1
- SC09-GR.6-S.2-GLe.1-EO.d

Common Core State Standards (CCSS)

CCS.ELA-Literacy.SL Speaking and Listening

4th grade: 4.1.A, 4.2, 4.4

5th grade: 5.1.A, 5.2, 5.4, 5.5



National Park Service
Rocky Mountain National Park

CCSS.ELA-Literacy.RI Reading: Informational Texts

4th grade: 4.1, 4.4, 4.5, 4.7, 4.9

5th grade: 5.1, 5.2, 5.3, 5.7

CCSS.ELA-Literacy.RF Reading: Foundational Skills

4th grade: 4.4

5th grade: 5.4

CCSS.ELA-Literacy.W Writing

4th grade: 4.2, 4.7, 4.8

5th grade: 5.2, 5.7, 5.8, 5.9