



Storypath: A Project-Based Approach to Addressing Climate Change

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Three questions for our session:

?

What is Storypath?

?

How does Storypath engage learners in learning about climate change?

?

How does Storypath foster civic engagement about climate change?



Agenda

Introduce Storypath Approach

Understanding the Impact of Climate Change: The Mountain Gorillas

Setting



Character



Context Building



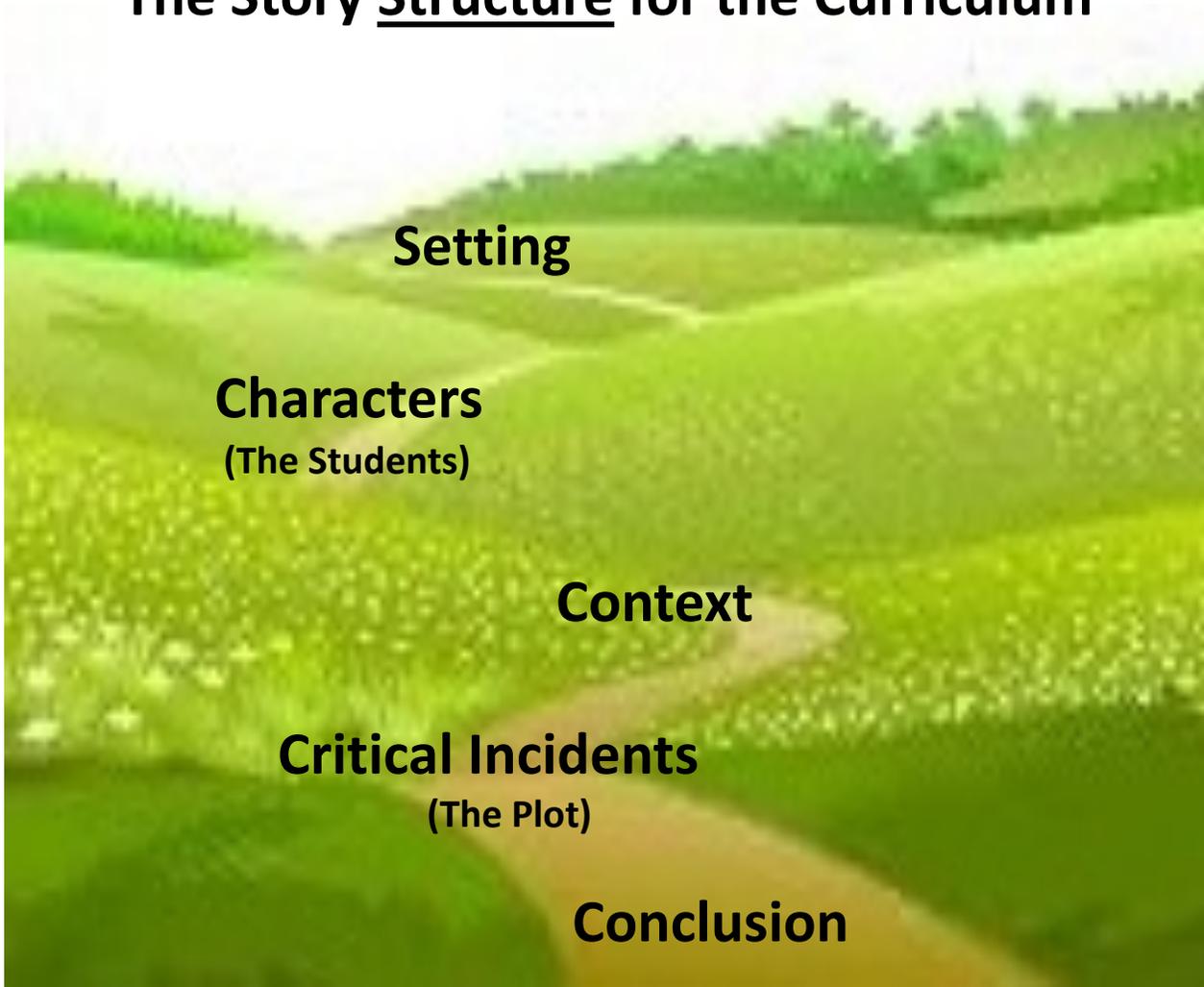
Critical Incident



Concluding Event

A Pathway to Learning

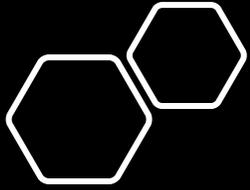
The Story Structure for the Curriculum



Instructional Delivery

Key questions guide learning to:

- problematize knowledge,
- encourage substantive conversations,
- create the lived experience,
- learn and use civic skills in context, and
- practice literacy skills in context



Why is the story form compelling?

“A clear and compelling narrative helps us find meaning, not just scattered facts and abstract ideas. Stories help us remember and make sense of our lives and the lives around us....A story is not a diversion; the best stories make our lives more understandable and focused” (p. 48).

Wiggins, G., & McTighe, J. (1998).
Understanding by design. Alexandria, VI:
ASCD.



Research Base

Learners' social, cultural, and civic identities develop at a young age; therefore, teaching how democracy works matters greatly.

As active learners, young people construct meaning through dramatic play, rehearsing real life events, and tackling problems.

Cooperative problem solving, social-emotional learning and civic action can be effectively woven together for powerful learning.

Proven Practices for Civic Learning*

1. Provide instruction in government, history, law, and democracy (p. 7).
2. Incorporate discussion of current local, national, and international issues and events in the classroom, particularly those that young people view as important to their lives (p.10).
3. Encourage students' participation in simulations of democratic processes and procedures (p. 21).

Because...

Knowing how our democracy works is necessary for civic participation.

With knowledge, young people are more likely to vote, discuss politics, contact the government, and engage in other civic activities.

*Delander, B., & Guifoile, L. (January 21, 2016). Guidebook: Six proven practices for effective civic learning. Education Commission of the States.

C3 Framework

“Crafting compelling questions is a way to find the common ground between content and students. But ... for compelling questions to sing, they must hit two notes—they need to represent big content ideas and they need to express those ideas in ways that resonate with those things students know and value.”

Swan, K., Lee, J., & Grant, S.G. *Inquiry Design Model: Building Inquiries in Social Studies* (National Council for the Social Studies, 2018), 31.

Why gorillas for this topic?

**Compelling
Question:**

How can we protect
the mountain gorillas
from climate change?



Video Courtesy of Marcus Lupfer



Episodes

EPISODE 1 The Volcanoes National Park

EPISODE 2 The National Park Employees

EPISODE 3 The Volcanoes National Park Visitors' Center

EPISODE 4 Climate Change Endangers the Mountain Gorillas

EPISODE 5 An International Conference on Climate Change

Creating the Setting

Students create the setting by completing a frieze (mural) or other visual representation of the place. The setting anchors the story.

Brainstorming

Classroom Discourse

Affirming Students' Contributions

Assessing Understanding

Asking Questions

Cooperative Learning

How do students create the setting?

Students are introduced to the topic through a slide set and videos of the Rwandan Mountain Gorillas.

Art skills including perspective, scale, and color are discussed to support the construction of the setting.

Students collaborate by participating in the give and take of creating a suitable setting for their story.

Disciplinary language is introduced as students collaborate on making the setting.



Elements of Cooperative Learning (Johnson & Johnson, 2017)

- **Positive Interdependence** → *“We sink or swim together!”*
- **Individual accountability** → *each student contributes*
- **Face-to-Face Interaction** → *support/encourage each other*
- **Social Skills** → *give ideas, ask questions, listen, reach agreement, include everyone, celebrate together*
- **Group Processing** → *students assess how well they did*

Self-management

- I offered ideas about our research topic.
- I listened to my partner's ideas.
- I asked questions when I didn't understand something.
- I did my fair share of the work at each step of the display.

Relationship skills

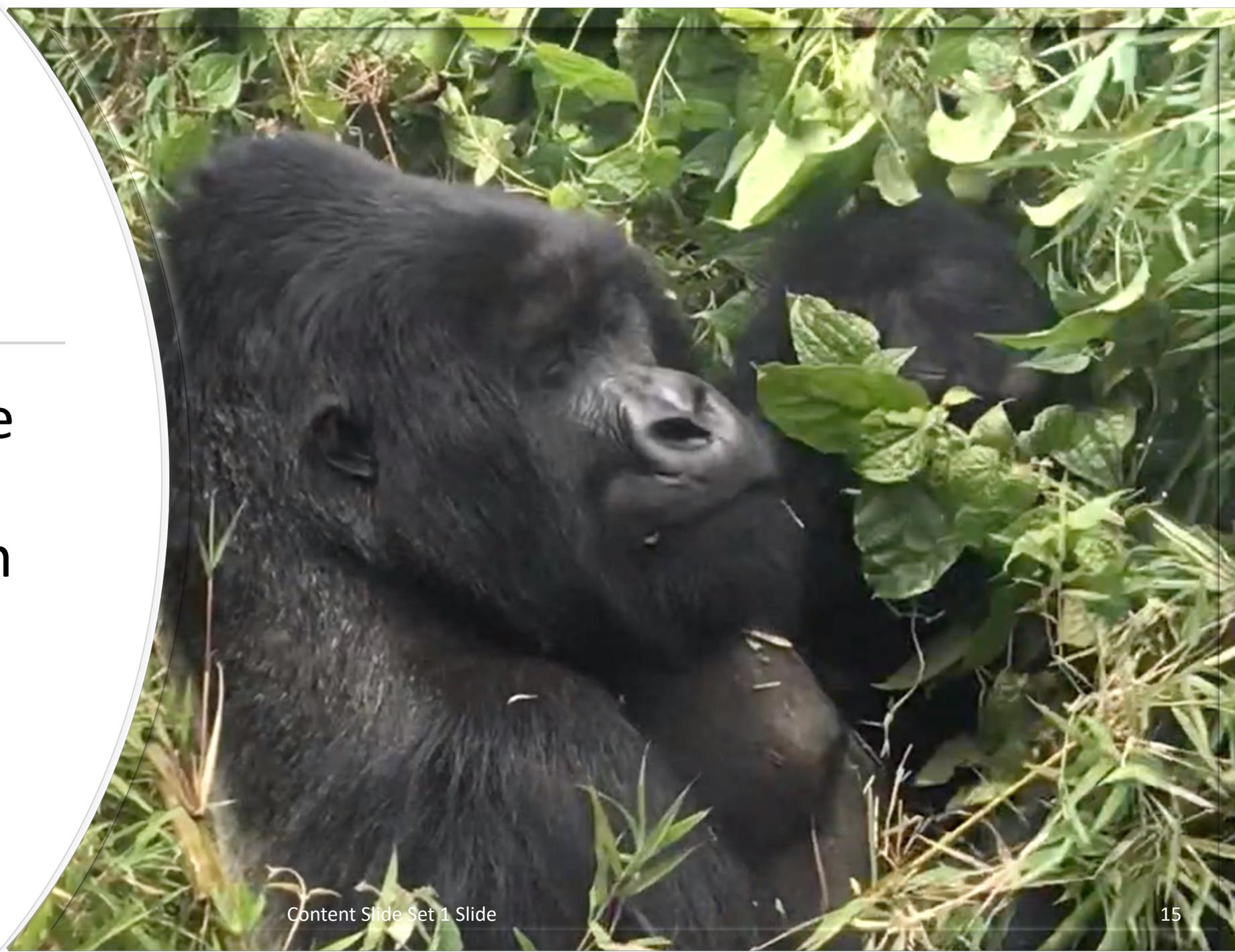
- I clearly communicated about tasks to be done for the display.
- I made positive comments to partner.
- I was willing to change my ideas to help complete the tasks.
- I helped my partner (if I finished my tasks early).

Social & Emotional
Learning

- Source: <https://casel.org/core-competencies/>

Content Slide Set 1

Protecting the Ecosystem: The Mountain Gorillas

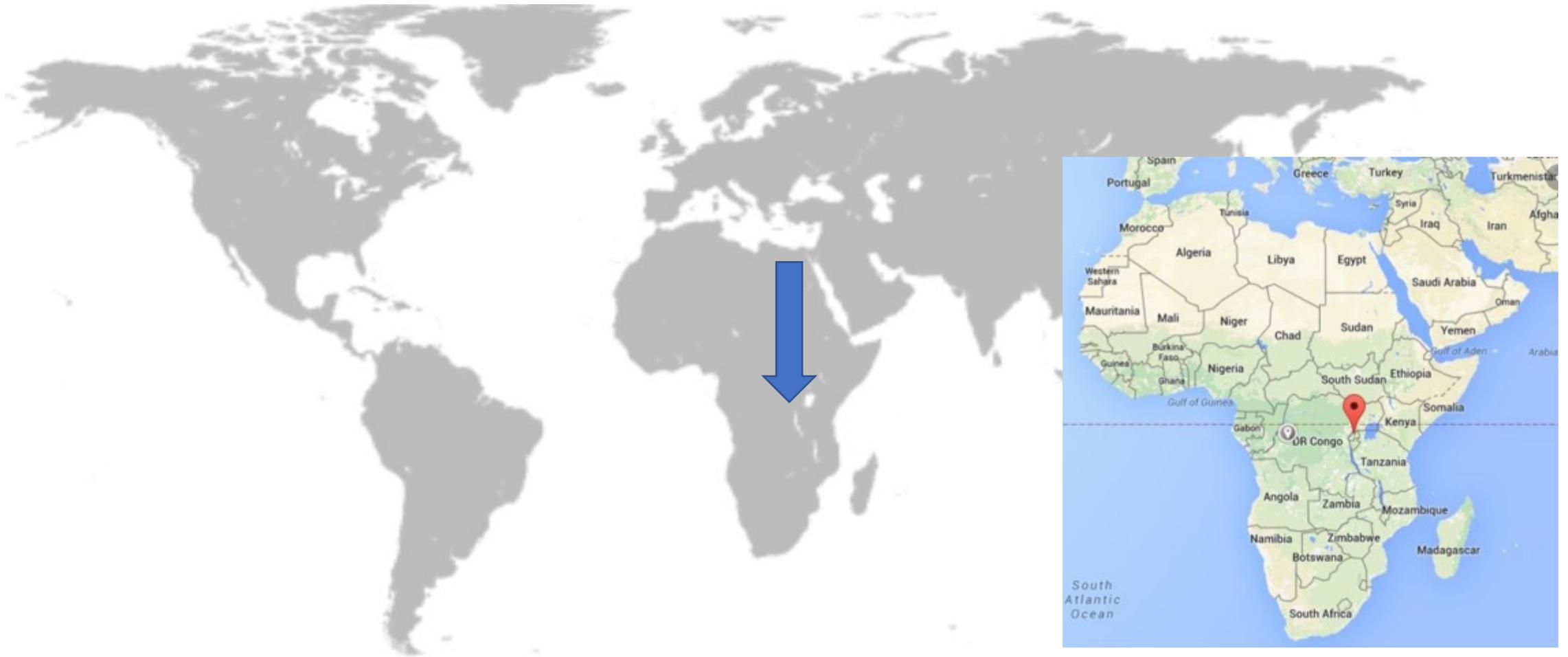


“Saving the Mountain Gorillas” National Geographic

Three Minute YouTube Video

<https://www.youtube.com/watch?v=9XL9KSohjLQ>

What do you notice about the environment, the gorillas, and the researchers?



Our story takes place on the continent of Africa in the tiny country of Rwanda. Rwanda is near the equator and is about the same size as the state of Maryland. The capital city is Kigali in the center of the country.



Volcanoes National Park Rwanda



Description of the Volcanoes National Park

We are traveling to a small country near the equator called Rwanda. Today we are going to explore the Volcanoes National Park, the oldest national park in Africa. The park is named for the five volcanoes that are inside the park's borders. It is a rainforest with inactive volcanoes in the park's mountains. One of the volcanoes, Mt. Sabyinyo, has the nickname of "Old Man's Teeth" because of its unusual peaks. High up in the mountains the ground is covered in grasses, mosses and lichens.

Down below, the forest is cool and moist, and the ground is covered with leaves and grass. Living in the park are mountain gorillas. Only three places on earth are home to these amazing apes, but more about these animals as our story unfolds.



Mt. Sabyinyo



Bamboo

Bamboo is plentiful in the park forming a belt between the higher elevation of the park and the lowlands. The lowlands of the park are abundant with shrub and grassland areas with swamp and wetlands vegetation. Hiking through the park, you'll find blackberry bushes, stinging nettles, celery, orchids and other flowers.



Stinging nettle



Vegetation on the forest floor



Hagenia Abyssinica Tree



Flowers and Leaves of the Hagenia Abyssinica Tree

The most common tree in the park is the *Hagenia abyssinica*. These large trees support other plant growth including mosses, lichen, ferns, and orchids. Flowers grow from the tree limbs providing a colorful landscape for the rainforest.

Another tree known as St. John's Wort grows from 40 to 60 feet (12 to 18 meters) and can be found from lower levels of the park to the alpine region. Brilliant yellow flowers with small pointed leaves add color to the forest.

From a distance this environment often looks misty; sometimes it is called a cloud forest because the clouds seem to reach the earth.

The Volcanoes National Park is the home of the mountain gorillas as well as the endangered golden monkeys. Forest elephants live here too. Other animals include buffalos, black fronted duikers, bushbucks, bush pigs, spotted hyenas, black and white colobus, white colobus, baboons, and red-tailed monkeys. Many birds live in the park with such interesting names as long-crested eagle, paradise flycatcher, and red-faced woodland warbler.



St John's Wort

Alpine region: high mountain elevations often above where trees would grow

Tasks

We will add the gorillas later.

In your group make a list of features about the park.

Be ready to share.

In your group create a section of the Volcanoes National Park:

1. The Mountain Range
2. The Bamboo Forest
3. The Lowland Forest
4. The Animals Living there

What will you put in the setting?

1. Make a list of “things.”
2. Assign “things” to make to each group member.



How does the setting support learning?

- Key questions activate students' prior knowledge and allow the teacher to assess what students know.
- The discussion begins to build a knowledge base about the setting and reinforce the disciplinary language associated with the unit.
- Students collaborate developing cooperative learning skills.
- Everyone has agency as they all contribute meaningfully to the setting.
- Literacy skills are applied in context.

Purposeful Writing

Writing: Park Sign

Decide what information you will put on the sign. You must include at least three items.

1. Include the name of the park.
2. Write one statement that welcomes people to the park.
3. Write something you would like people to know about the park.

When you are writing your information about the park think about:

- Did I use words from the word bank to create excitement about visiting the park?
- Could readers picture the park in their mind? Did you use vivid and interesting adjectives to describe the nouns?

4. In the space below draft the sign you will make.
5. Add a visual to the sign.



- ✓ Decide where you will place each statement.
Think about spacing of the information.
- ✓ Check your draft:
 - Are words easy to read and properly spaced?
 - Is the information accurate?
 - Are all words spelled correctly?
- ✓ Check your visual:
 - Does the visual attract attention?
 - Is the visual carefully constructed?
 - Does the visual relate to the written information?

Assessment: The sign includes all the information requested. The writing created excitement about visiting the park and helped the readers to picture the setting. Words were used from the word bank using vivid and interesting adjectives to describe the nouns. The sign followed the checklist for the sign.



Creating the Characters

Students create characters for the story whose roles they will play during subsequent episodes.



Job Opportunities in the
Volcanoes National Park

Questions to Guide Learning

1. What kinds of educational experiences might people need in order to work in the Volcanoes National Park? *(Park workers could have almost any kind or amount of educational experience, such as a college degree in science or hands-on experience working in forests or with animals.)*
2. What jobs might a person have prior to coming to a park? *(Park workers could have almost any kind of job previously, though some jobs—such as park ranger, biologists, and zookeeper—relate to the tasks more directly than others.)*
3. What people skills would be important for working together in the park? *(ability to work well with other employees, communicating clearly, doing careful work, being dependable, listening carefully)*
4. What kind of statements can applicants make about their qualifications? *(Applicants try to highlight their strengths and provide examples of experiences they've had that relate to the job. For example, a person applying for photographer might write about experiences photographing wildlife for a nature magazine.)*
5. What job might you apply for in the park? *(Review the list of ideas they brainstormed earlier. Remind students they should list a first and second choice.)*

Job Titles for Park Employees

Read the job descriptions. Decide on the two jobs you want to apply for in the park.

Job Title	Job Description
Wildlife Biologist	Studies and advocates for the conservation of wild animals and their habitats
Botanist	Studies plants
Educator	Prepares lessons to teach visitors about the gorillas and other wildlife in the park
Environmentalist	Studies the environment and pollution; advocates for the protection of the environment
Guide	Guides tourists to find gorilla families and teaches tourists about the gorillas and their habitat
Manager	Oversees the work of the park and coordinates the workers
Park Ranger	Accompany tourists in the park; makes sure both people and wildlife are safe
Photographer	Photographs animals and plants as well as their habitats
Public Relations Officer	Writes and shares information about the park; promotes the preservation of the mountain gorillas and their habitat
Tracker	Understands animal tracks especially gorillas. Locates gorillas for biologists to study and assists the guides in finding gorillas for tourist visits
Veterinarian	A doctor who treats animals

First choice: _____

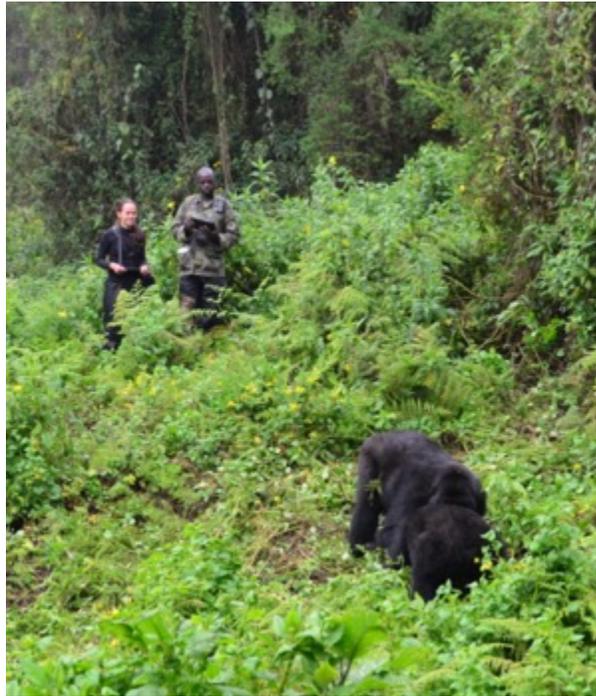
Second choice: _____



The park manager demonstrates how to use a GPS to help trackers locate gorillas.



Jonas Nubaha, is the longest-serving tracker in the park. He began his job in 1979!



The guide explains how to track the gorilla without disrupting his journey.

Learn about the Park Employees

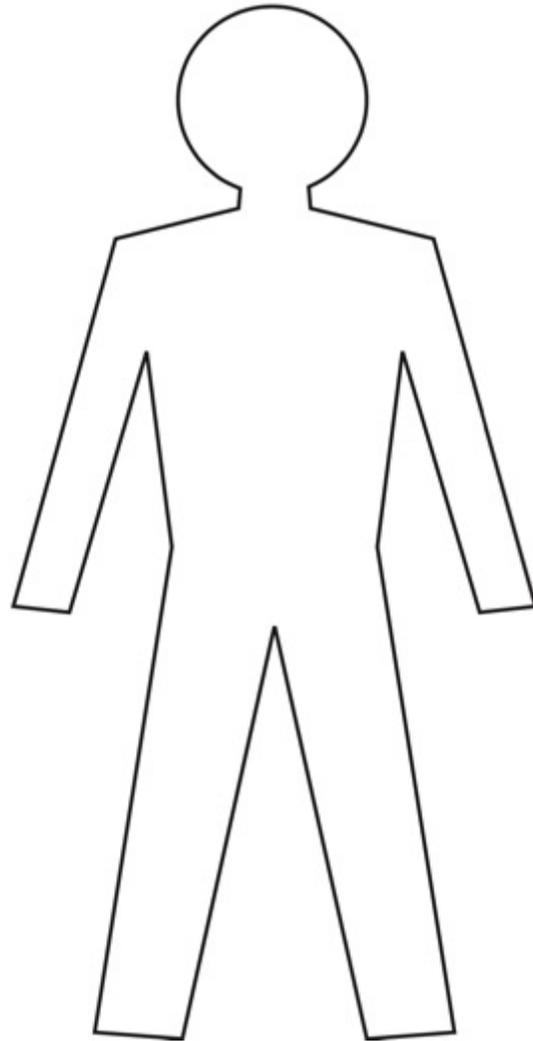


Trackers use vehicles to travel long distances through the park.



Biologists are researching gorillas and gathering data about the number of gorillas in the park.

Sources: <https://gorillafund.org/counting-mountain-gorillas-uganda/> <https://www.panda.org/?254110/New-census-critical-for-mountain-gorillas-in-> <https://gorillafund.org/world-ranger-day/> <https://gorillafund.org/your-questions-part-3/>



1. Outline your figure.
2. Dress your figure for the park job. (Think about the appropriate clothes for the job.)
3. Add details to the figure such as hands, feet, hair and facial features.
4. Draw three tools that you will use to do your job.
5. Label the tools.

Connections to C3 Framework

The Storypath instructional approach uses compelling and supporting questions to guide learners through each of the episodes.

Dimension 1: Developing Questions and Planning Inquiries is threaded throughout the Storypath as students imagine and then create the The Volcanoes National Park, identify disciplinary ideas associated with two compelling questions:

- How can we protect the mountain gorillas from climate change?
- How can we make our voices heard to advocate for preserving the mountain gorillas' habitat?

Dimension 2: Applying Disciplinary Concepts and Tools is accomplished through tasks related to researching the mountain gorillas, their habitat, and the impact of climate change on their habitat.

Dimension 3: Evaluating Sources and Using Evidence takes place through examining information on climate change and how it affects the the mountain gorillas' habitat.

Dimension 4: Communicating Conclusions and Taking Informed Action culminates the unit with an international conference where students make the case for saving the mountain gorillas and their habitat by advocating political action to mitigate climate change.

Building Context

Students are involved in activities that stimulate them to think more deeply about the people and place they have created.



Creating Displays for the Visitors' Center
Presenting Your Displays
Creating Gorilla Troops for the Setting

What observations can we make about the mountain gorillas?

Video 1



Video 2



Guiding Questions for Research

[The New England Primate Conservancy](#)
[World Wildlife Fund: Mountain Gorillas](#)
[Volcanoes National Park](#)
[National Geographic Mountain Gorillas](#)
[African Wildlife Foundation Mountain Gorillas](#)
[The Dian Fossey Gorilla Fund International](#)
[Volcanoes National Park](#)

1. What are the physical characteristics of the mountain gorillas?
2. How do mountain gorillas communicate with each other?
3. What do mountain gorillas eat?
4. Why do mountain gorillas live together in troops?
5. What role does the male leader/silverback play in the troop?
6. What is a day like in the life of a mountain gorilla?
7. What is like to be a baby gorilla?
8. What are the threats to the mountain gorillas?
9. How do veterinarians help the mountain gorillas?
10. What role did Dian Fossey play in saving the gorillas?
11. What are the rules for visiting the gorillas in the park?
12. What kind of display can we make for visitors to learn about the mountain gorillas?

Student Work

All about gorillas



Around 1,063 exist in the wild. They live in two isolated groups. We share around 98% of our DNA with gorillas. They're one of the biggest most powerful living primates. They can eat all day long. They cozy up at night. They have 16 different types of call. Gorillas are one of our closest living relatives. After chimpanzees and bonobos. They share between 95% and 99% of our DNA gorillas and chimpanzees. Life expectancy.



Gorillas live for 35 to 40 years in the wild gorillas run 25 mph. Their height is 5.1ft. Gorillas are some of the most powerful and striking animals not only for their size and force but also for their gentle human-like behavior. They play a crucial role in local biodiversity roaming through large territories and helping for example to spread the seeds of the fruit they consume.

For more information go to: 10 top facts about mountain gorillas.

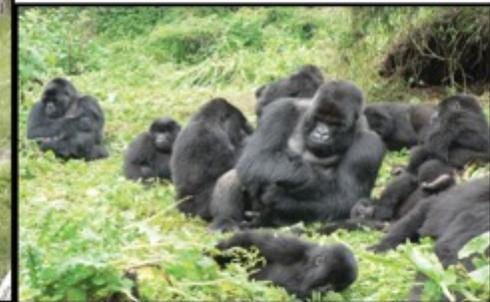
The New Further research:

The New England Primate
Conservancy England Primate
Conservancy

How Do Mountain Gorillas Communicate?



Mountain Gorillas communicate in a lot of different ways. Like us they can use facial expressions and body gestures to communicate. Each movement they make or sound they make has a special meaning. And obviously we don't understand different kinds of animals communicating to us because we don't know what exactly they are saying. Another thing is that, Mountain Gorillas can smile just like us, how cool is that!



The leader of the troop (silverback) gives commands, and everyone follows his commands. The leader communicates when it is time to eat, rest, move through the forest and when it is time to sleep for the night or take a nap during the day. The silverback has a lot of jobs he needs to do, and that keeps him busy. A gorilla usually is chosen to be the leader if it's the oldest of them all, which needs a lot of responsibility. The Silverback protects the young ones so watch out if you see a silverback because they might think you're trying to hurt the other gorillas.



Creating
Gorilla Troops
for the Setting

Critical Incident

Characters confront problems typical of those faced by people of that time and place.



The gorillas and their habitat are impacted by climate change. What can we do?

World Wildlife Fund

Mountain Gorillas and Climate Change

Creditable and reliable source? See [NCSS Position Statement on Media Literacy](#).

Mountain gorillas (*Gorilla beringei beringei*) possess a number of traits that contribute to their resilience to a changing climate: they are tolerant of a wide range of temperatures, are exposed to fairly high climate variability, have low freshwater requirements, and feed on a variety of abundant food.



[Download \(941 KB\)](#)

However, a number of other traits make them vulnerable to a changing climate. Their population is very small and their range highly restricted. A limited dispersal ability (due to human settlements), coupled with a long generation time, a low reproductive rate, and low amounts of genetic variation, will limit the ability of the species to adapt to a changing climate.

Of high concern is the susceptibility of gorillas to disease. Diseases can be passed from humans to gorillas, and pose a high threat due to the widening distribution of disease under a changing climate, the frequent interaction between humans and gorillas, and the clustered distribution of the species. Other threats like habitat destruction, poaching, sociopolitical instability, commercial activities, and growing human population pressure, remain high and have the potential to increase due to the effects of climate stressors on humans and resulting changes in livelihoods.

Priorities for climate-informed conservation of mountain gorillas should include monitoring disease and maintaining and possibly increasing suitable habitat. It is also essential to create improved conditions for people to adapt to current and future changes in climate, and to continue to reduce threats such as instability in the east/ central African region.

Determining species vulnerability

The study identified the key vulnerabilities of a species based on four factors:

Sensitivity: the inability of the species to persist, as is, under changing climatic conditions.

Adaptive capacity: the ability of the species to respond to changes in climate.

Exposure: the extent of climatic change and variation that the species encounters and is projected to encounter.

Other threats: any other relevant threats, as well as the human responses to climate change that exacerbate these threats.



Media Literacy!

How do we become critical thinkers, effective communicators, and engaged citizens in today's world?



NAMLE

-  ACCESS
-  ANALYZE
-  EVALUATE
-  CREATE
-  ACT

Media literacy is the ability to access, analyze, evaluate, create, and act using all forms of media. Media are defined as the means of communication that reach or influence people widely (for example; radio, television, newspapers, magazines, and the Internet). To be media literate, ask questions and keep your eyes wide open. Some questions we can ask:

- WHO** made this?
- WHY** was it made?
- WHAT** is missing from this message?
- HOW** might different people interpret this message?
- WHO** might benefit from this message?
- WHO** might be harmed by this message?

Join NAMLE today! Membership is FREE. For more information, go to www.namle.net and follow [@medialiteracyed](https://twitter.com/medialiteracyed) on Twitter and Facebook.

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How do I make a convincing argument about climate change?

Scientists learn about our environment by observing, describing and experimenting. At each step, they must do careful work. Here is the process that scientists follow:

- Make a **claim**. A claim is a statement that answers a question.
- Find **evidence** for the claim. The data that supports a claim.
- Provide **reasons** for the evidence. Reasoning explains how and why evidence supports a claim using science.
- **Rebuttal**. Explain why the opposing view is incorrect.

Taking a Position

What is the issue?

Claim: What is your position on the issue?

Evidence: Write at least three facts to support your position.

1. _____
2. _____
3. _____

Reasoning: Write at least two reasons why someone should support your position.

1. _____
2. _____

Rebuttal: How will you respond to the other point of view?

Civic Action: What can you do to address climate change?

Assessment: The issue is identified with a clear position statement. The claim is clearly stated with verifiable evidence to support the claim. Reasoning for and against reflect an understanding of the issue and the impact on the mountain gorillas' habitat. Response (rebuttal) to the opposing point of view is realistic and reflects an understanding of the issue. An action step on climate change is listed and doable.

Using Words Effectively

You are going to create a persuasive argument for your position. Here are two writing traits to use to help you. With a partner, brainstorm words that you can use and write them in the columns below.

Word choice: Interesting words create a vivid picture of the topic. Describing words add depth of understanding and color to the picture created in the reader's mind.	Ideas and content: The topic should be focused and include important details. The information should be accurate and the writer should write as an expert on the topic.
Describing words	Key words that an expert would use

Concluding Event

An activity that brings closure to the story.



An International Conference on
Climate Change

Preparing for the
conference



Save the
Mountain
Gorillas

Stop Climate
Change
Now!

Thanks to Tina DoRan Criste, Yakima
School District, Yakima, WA, for
student photos and work samples.

The International Conference on Climate Change

