



Meridian Stories

STEAM Challenge

Digital Storytelling Unit

Local Species Spotlight

Designed for Middle and High School Students

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Introduction

This Digital Story Telling Challenge will take two to four weeks to complete.

This Challenge targets key 21st century skills – creativity, collaboration, critical thinking, digital literacy and presentational skills – in equal measure with the curricular content. Delivering on all those learning goals requires student immersion and time. The results, as based on our research, are a high level of student engagement, deep learning, and 100% teacher endorsement.

The following Challenge:

- Should be completed by collaborative teams of two to four students.
- Is aligned to Common Core Curricular Standards.
- Contains an Evaluation Rubric that allows the teacher to clearly score and appraise the students' work.
- Is designed to be integrated into the classroom in alignment with existing curricula.
- Can be assigned as an extra credit project to teams of students that you think would benefit from this kind of immersive, deep learning experience. Additionally, will work well in informal educational settings.
- Should follow the rules of Digital Citizenry in their proper usage and/or citation of images, music and text taken from other sources. See the Digital Rules area in the free Media Resources section of the Meridian Stories site for guidance.

The **Media Resources** section also contains many other **free support materials** from short videos featuring professionals in the field – Artists and Innovators– to short written documents that cover everything from storyboarding to creative brainstorming, interviewing techniques to game design.

While it is helpful to have a Technology Integrator involved, they are not usually necessary: the students already know how to produce the media. ***The teacher's primary function in these Challenges is to guide the students as they engage with the content. You don't need to know editing, sound design, shooting or storyboarding: you just need to know your content area.***

At the end of the Challenge, it is often fun and useful to have a screening of all the media productions – they are never designed to run over 4 minutes each. Students can vote for their favorite videos that can then be screened in a larger assembly-like setting for the whole grade to see. Or this work can be presented as part of a student showcase for parents and friends. Presentational Skills is another 21st century skill that this project enables.

Our research indicates this to be a really useful exercise for two additional reasons:

1. Students actually learn from their peers' presentations – it is useful to hear a perspective that is not just the teacher's; and
2. The public setting – painful as it is for some students – provides them with an opportunity to 'own' their work and to be more accountable.

Finally, if you are interested to learn more about the community of schools who annually participate in the Meridian Stories Competitions – a community that is characterized by a friendly competitive spirit; feedback from Mentors on each submission; and the rewarding of digital badges in content, storytelling and digital literacy – please return to the Competitions section of the website or inquire at info@meridianstories.com.

Let's get started.

The Challenge

Every type of organism interacts with other organisms in its ecosystem. Whether these interactions involve nonliving or living factors, they are often essential for survival based on the organism's requirements for resources.

National Geographic is creating a Species Database of short 3-minute educational films on every local species in North America. They are hiring one of their investigators – you! – to do a spotlight on a species in your area and some of its interactions in its ecosystem to include in this database of knowledge. Because you have been working for Nat Geo so long, they are letting you pick the species, whether plant or animal. They have some requirements for you, however. Your final report must include:

- An interview with a subject-matter expert – this could be someone who works in an industry involving your species or a teacher who knows about the species (but not your own teacher!). Feel free to ask the expert about the subsequent criteria, or other questions you think would help the audience better understand the species.

Also, each 3-minute report must include the following information:

- A key adaptation in structure or behavior that makes the species suitable for the local habitat;
- The details of at least two interactions involving the species in its ecosystem, including what the species interacts with, the interaction type, and the purpose of interaction; and
- An explanation of how local environmental conditions affect growth of the organism or population (e.g. availability of food, light, space, water, etc.).

In accordance with the formatting of the Nat Geo Species Database, each spotlight:

1. Starts with a factual presentation of its key characteristics and behaviors;
2. Continues with an expert detailing further information about the species; and
3. Concludes with the rest of the information about interactions and local environmental conditions.

The final deliverable – which may use up to 20 seconds of outside footage, assuming rights are properly documented – should be formatted as a 3 minute documentary “species special” that could be aired on TV!

Deliverables include:

- Species Spotlight
- Format Outline (at teacher’s discretion)
- Interview Questions (at teacher’s discretion)
- Script Draft (at teacher’s discretion)

Evaluation Rubric

CONTENT COMMAND			
Criteria	1-3	4-7	8-10
Communication of Content – Two Interactions	The details about type, purpose, and object of one or both interactions are vague or unexplained	The details about type, purpose, and object of both interactions are adequate and easy to follow	The details about type, purpose, and object of both interactions are creatively presented and well-explained

Communication of Content – Key Adaptation	The key adaptation for local habitat is not present or not well explained	The key adaptation for local habitat is present and explained adequately	The key adaptation for local habitat is incorporated smoothly and explained clearly
Communication of Content – Local Environmental Condition	The effects of local environmental conditions on growth of the organism or population are not present or not well explained	The effects of local environmental conditions on growth of the organism or population are adequately portrayed	The effects of local environmental conditions on growth of the organism or population are clearly explained and smoothly incorporated
STORYTELLING COMMAND			
Criteria	1-3	4-7	8-10
Scripting	The script does not convey the content in a well organized or consistently engaging fashion	The script clearly conveys the content	The script clearly conveys the content in an engaging narrative
Interview	The interview – the questions asked - don't significantly contribute to the informational value and clarity of the documentary	The interview – the questions asked - service the informational value and clarity of the documentary	The interview – the questions asked - enhance the informational value and clarity of the documentary
Overall Narrative Clarity	The narrative - combination of visuals, scripting and interviews - is hard to follow	The narrative is presented clearly, but is inconsistently engaging	The narrative is presented clearly and compellingly
MEDIA COMMAND			
Criteria	1-3	4-7	8-10
Visual Shot Selection	The combination of still shots, plus existing and new video footage, does not effectively communicate the content	The combination of still shots, plus existing and new video footage, adequately communicates the content	The combination of still shots, plus existing and new video footage, effectively and engagingly communicates the content
Editing and Music	The Species Spotlight feels patched together	The Species Spotlight flows, but there are occasional	The Species Spotlight is edited cleanly and

	and the overall editing and use of music detracts from the story	editing or musical distractions	effectively, resulting in an engaging video experience that is also enhanced by the music
21st CENTURY SKILLS COMMAND			
Criteria	1 – 3	4 – 7	8 – 10
Collaborative Thinking	The group did not work together effectively and/or did not share the work equally	The group worked together effectively and had no major issues	The group demonstrated flexibility in making compromises and valued the contributions of each group member
Creativity and Innovation	The group did not make a solid effort to create anything new or innovative	The group was able to brainstorm new and inventive ideas, but was inconsistent in their evaluation and implementation of those ideas	The group brainstormed many inventive ideas and was able to evaluate, refine and implement them effectively
Initiative and Self-Direction	The group was unable to set attainable goals, work independently and manage their time effectively	The group required some additional help, but was able to complete the project on time with few problems	The group set attainable goals, worked independently and managed their time effectively, demonstrating a disciplined commitment to the project

The Process

Below is a suggested breakdown for the students' work.

During Phase I, student teams will:

- Pick a species native to their area, plant or animal, on which to focus.
- Research the types of relationships that can exist in ecosystems, including predatory, mutually beneficial, and competitive.
 - What examples of these can you think of involving your species?
 - Pick at least two to spotlight.

- Research how behaviors and structures (such as characteristic animal behaviors, or specialized plant structures) can affect a species' reproduction.
 - Pick a key trait (either structure or behavior) in the chosen species to elaborate upon.
- Research local environmental conditions for your species, including availability of food, sunlight, space, and water.
 - Explain how these conditions, or one condition in particular, affect the growth or reproduction of the organism or population.
- Identify and approach an expert to interview about your species and contact them to arrange a time and place to interview.
- Consider the format of the Nat Geo Species Spotlight and decide what content you want to include in the three sections (background and behaviors, the interview, and the extra information) and roughly how much time you want each section to take up.
 - ***Teacher's Option: Format Outline*** – Teachers may require students to formalize an outline of what information will be included in what section of the species spotlight.
- Decide what the key visuals are in your Species Spotlight.
 - Research possible outside footage of your species to integrate into your Spotlight.
 - Consider whether a diagram of your species would add to the narrative.

During Phase II, student teams will:

- Draft the interview questions.
 - Once you have assessed the information that you have and that you need, draft your questions in the hopes that your expert will be able to supply you with information that you need to complete your species portrait.
 - ***Teacher's Option: Interview Questions*** – Teachers may require that teams hand in their draft of Interview Questions for review.
- Shoot the interview.
 - What has your team learned from the interview(s) and how will that affect the overall narrative?
- Draft the script, as based on what has already been covered in the interview.
 - Finalize the script.

- ***Teacher's Option: Script Draft*** – Teachers may require that teams hand in their script drafts for review.
- Finalize inclusion of outside existing footage, as desired.
- Cast the video (if necessary)
- Create costumes, props, and other set pieces as needed
- Pre-produce the video, preparing for all the shots that you will need to shoot

During Phase III, student teams will:

- Shoot the video
- Edit the video
- Post-produce the video, adding music and sound effects as desired
- Finalize any written deliverables

Essential Questions

1. What are some iconic or important local species?
 - a. What are the key characteristics, behaviors, and/or interactions that characterize that species?
2. How have species evolved to affect the probability of successful reproduction? *MS-LS1-4*
3. What kinds of relationships do species have with other species or nonliving factors within their ecosystem? *MS-LS2-2*
4. How does one identify, approach and successfully interview an adult subject matter expert?
5. How has immersion in the creation of original content and the production of digital media – exercising one's creativity, critical thinking and digital literacy skills - deepened the overall educational experience?
6. How has working on a team – practicing one's collaborative skills - changed the learning experience?

Student Outcomes

1. The student will become more familiar with local species and why certain ones are iconic or important to the local society.
 - a. The student will learn about a species in detail and better understand how characteristic behaviors or structures evolved in

- that species, and what types of interactions characterize its existence and lifespan.
2. The student will better understand how characteristic animal behaviors and specialized plant structures can help species' reproduction.
 3. The student will learn about predatory, competitive, mutually beneficial, and other types of relationships that are typical of interactions among organisms across multiple ecosystems.
 4. The student will experience how to interview and converse with an outside subject matter expert in the field.
 5. The student will utilize key 21st century skills, with a focus on creativity, critical thinking and digital literacy, in their process of translating STEAM content into a new narrative format.
 6. The student will have an increased awareness of the challenges and rewards of team collaboration. Collaboration – the ability to work with others - is considered one of the most important 21st century skills to develop in students as they prepare for life after secondary school.

NGSS Curricular Correlations

The *Local Species Spotlight Challenge* addresses a range of curricular objectives that are articulated in the **Next Generation Science Standards**. Below please find the standards that are addressed, either wholly or in part.

Next Generation Science Standards (NGSS)

High School – Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

- Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. (HS-LS2-1)
- Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. (HS-LS2-6)
- Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. (HS-LS2-8)

High School – Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

- Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. (HS-LS4-3)
- Construct an explanation based on evidence for how natural selection leads to adaptation of populations. (HS-LS4-4)

High School Disciplinary Core Ideas:

- Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. These limits result from such factors as the availability of living and nonliving resources and from challenges such as predation, competition, and disease. (LS2.A; HS-LS2-1, HS-LS2-2)
- Environmental factors affect expression of traits, and hence affect the probability of occurrences of traits in a population. (LS3.B; HS-LS3-2, HS-LS3-3)
- The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population (LS4.B; HS-LS4-3)
- Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally, and physiologically well suited to survive and reproduce in a specific environment. (LS4.C; HS-LS4-3, HS-LS4-4)
- Adaptation also means that the distribution of traits in a population can change when conditions change. (LS4.C; HS-LS4-3)

Middle School – From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

- Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. (MS-LS1-5)

Middle School – Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

- Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. (MS-LS2-1)
- Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. (MS-LS2-2)

Middle School – Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

- Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. (MS-LS4-4)
- Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Middle School Disciplinary Core Ideas:

- Animals engage in characteristic behaviors that increase the odds of reproduction. (LS1.B; MS-LS1-4)
- Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. (LS1.B; MS-LS1-4)
- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (LS2.A; MS-LS2-1)
- In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (LS2.A; MS-LS2-1)
- Growth of organisms and population increases are limited by access to resources. (LS2.A; MS-LS2-1)

- Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (LS2.A; MS-LS2-2)
- Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (LS4.B; MS-LS4-4)
- Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. (LS4.C; MS-LS4-6)