

HIGH SCHOOL
LESSON GUIDE



Managing Grizzly Bears

PEER-DRIVEN HIGH SCHOOL DISCUSSION GUIDE

Developed by Dan Bertalan



The following Lesson Activity is designed for nearly a full week of peer-driven learning that provides engagement and stakeholder perspectives of managing grizzly bears. A video question worksheet and three separate “stakeholder group” worksheets also companion this activity. This expanded activity is designed to offer a lasting and meaningful learning opportunity through critical questions, research, debate and STEM elements as opposed to shorter, single-session lessons.

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EDUCATIONAL PARTNERS



The educational partner providing funding for this initiative web page

GRADE LEVELS

High School - Grades 9-12

CONTENT AREAS

Social Science, Environmental Science, Natural Resource Science

UNIT THEME

Wildlife Management

TOPICS

Wildlife Biology, Social and Biological Carrying Capacity, Natural Resources Management, Public Safety

TIME REQUIRED

Three, 45-minute sessions



OVERVIEW

The **North American Wildlife Conservation Model** is grounded in managing wildlife for the public's benefit through scientific principles, research, and data from the field. State wildlife management also relies heavily on input from the public. This involvement is essential and includes methods such as public meetings, surveys, and advisory boards that gather community feedback, which is then incorporated into both species-specific and broader state wildlife management plans.

In this approach, wildlife managers must consider public perspectives and strive to balance a species' biological carrying capacity with society's level of tolerance. When it comes to species like the grizzly bear—which can cause significant conflicts with people and human activities—wildlife managers often encounter a wide range of public opinions regarding how these animals should be managed. This makes managing species, like the grizzly bear, challenging.

In this lesson, students will discuss their current knowledge of grizzly bears, watch a video about managing grizzly bears while answering a questionnaire, then assume the roles of various stakeholders in researching, developing and presenting their **Grizzly Bear Management Plans**. Classroom debate will provide drive peer-driven interactive learning where the entire class attempts to develop a Grizzly Bear Management Plan that best serves the interests of the stakeholder groups and grizzly bears.

CONCEPT - Complex Wildlife Management

ENDURING UNDERSTANDING:

Students will understand the differences between the various stakeholder perspectives and the different management strategies for managing grizzly bears.

CONTENT OBJECTIVES:

Students will be able to evaluate the biological and social considerations in managing grizzly bears. They will also be able to research, develop and present a "Grizzly Bear Management Plan" to address today's challenges in managing America's largest predator.

LEARNER OBJECTIVES:

Students will use custom student "stakeholder" worksheets and online research to determine the challenges and potential solutions to managing grizzly bears. Students will use their online research to develop and present their own "Grizzly Bear Management Plan" that considers the needs of grizzly bears, ecosystems and society.

PROCESS OBJECTIVES:

Students will work in small and large groups to process new information and use evidence to come to conclusions.

MATERIALS NEEDED (each group, each student):

- Access to computers and the Internet
- [*Managing Grizzly Bears*](#) video
- Video **Questionnaire** to fill in while watching the video
- Three (3) **Stakeholder Student Group Worksheets**

Procedure

Session 1 - Before watching the video [*Managing Grizzly Bears*](#), ask students what they know about the challenges of managing grizzly bears (not black bears). Also ask students if they have ever seen a grizzly bear and explain where. Lead a short discussion on what they know about how professionals manage wildlife species.

Print and distribute the Student Video Worksheet (included in the Lesson PDF). Instruct students to fill in the worksheet while watching the video. Go over the questions with the students before viewing so they know what to look and listen for.

After viewing the video, review and discuss the answers to the questions as a class while encouraging discussion.

Next, divide the class into these three stakeholder groups:

- 1. Grizzly Bear Managers**
- 2. Community Safety Council**
- 3. Friends of Grizzlies**

Inform students they will be working together as teams within their stakeholder group to achieve their assigned Stakeholder Worksheet goals in Sessions 2 and 3.

To learn more about grizzly bears, download this free [*teacher's grizzly bear resource guide \(PDF\)*](#).

Session 2 - Team Research & Plan Development

Print and distribute the three stakeholder worksheets to the various stakeholder groups (included in the Lesson PDF). Each of the stakeholder worksheets have detailed instruction and informational links to guide students on their research and presentations.

Each stakeholder group will have specific and sometimes opposing challenges in their goals in managing grizzly bears. In their separate assigned groups, have students perform research and discussion in developing their specific stakeholder Grizzly Bear Management Plan. Their plan should also include possible considerations of other stakeholder groups. The worksheets provide instructions and research guidelines for students to gather information.

Inform each group that two members of their group will also present their "Grizzly Bear Management Plan" in a public meeting (the entire class) as part of the public input process during Session 3. Their presentations should be supported by factual research and/or evidence, and presented with at least one form of art or media prepared by the group (either video, poster, graphs, charts, images).

Session 3 - Group Presentations & Public Debate

Have each of the three stakeholder groups present their Grizzly Bear Management Plan and the supporting research and reasons for their plans. Limit each group to 7 or 8 minutes of presentation time followed by several minutes of questions by the public and stakeholder groups.

After the three groups present their Grizzly Bear Management Plans, lead a group discussion on how similar or key elements of the various plans could be included in an overall plan to best serve the goals or interests of all three groups. The teacher may assist in leading the discussion while listing the key or similar aspects of each group's plans, including similar challenges.

Conclude the discussion by asking how many students might be interested in becoming wildlife managers and why.



**SPECIAL CONSIDERATIONS:**

This activity is richest when completed in groups with answers shared to a whole class. The student worksheet is not a typical worksheet as it encourages students to construct knowledge as they answer questions. The questions build off of each other.

Assessment: Students will be informally assessed based on their participation within their groups and during class presentations and discussions. Teachers could collect the discussion notes students took during the video to check for completion.

Students can be formally assessed using their Student Video Worksheets. Students can be assessed on meeting the formal learning objectives on how thoroughly students completed their Grizzly Bear Management Plan worksheets.

Extension Activities:

1. Students could watch the related classroom videos or [full documentary on managing grizzly bears](#) (America's largest carnivore) to expand their understanding of the complex challenges of managing endangered species. They can also conduct research on the current or changing policies of managing grizzly bears by exploring "grizzly bears" online at;

- U.S. Fish & Wildlife Service
- Wyoming Game & Fish
- Montana Fish, Wildlife and Parks
- Idaho Fish and Game
- Interagency Grizzly Bear Committee
- Orgs with interests in Grizzly Bear Management

2. Students may research their state's public input procedures for wildlife management and provide ways of engagement and examples of comments they would submit. Examples of engagement methods include:

- Public meetings
- Commission and Governing Board meetings
- Advisory Board meetings
- Additional approaches, such as virtual conferencing and submitting comments via email

To learn more about Grizzly Bears, download the free;

[Grizzly Bears of Montana Teacher Resource Guide](#)

Managing Grizzly Bears - Pre-Lesson Student Worksheet

Student Name: _____ Class: _____ Date: _____

Before the [***Managing Grizzly Bears video***](#), review these questions below and look for answers during the video.

1. What are some of the human influences that affect the management of grizzly bears?

2. How might changes in historic grizzly bear range affect their management?

3. How many recovery zones for grizzly bears are in their Recovery Plan?

4. What agencies are involved in managing grizzly bears?

5. What are the three main criteria in the Recovery Plan for grizzly bears?

6. Where have these recovery goals been met?

7. What affects the “social tolerance” of grizzly bears?

Grizzly Bear Managers - Grizzly Bear Management Plan Worksheet

Student Name: _____ Class: _____ Date: _____

Welcome to the Grizzly Bear Managers group. You work for the government agency that's entrusted with managing grizzly bears while at the same time considering people's livelihoods and putting human safety first. You've discovered that in recent years, that expanding populations and ranges of grizzly bears too often overlap with human expansion. Much of your time is devoted to minimizing bear attractants, such as securing livestock with electric fencing, teaching the public about bears, and handling bears that repeatedly cause problems by either removing or relocating them. There are days when you can't seem to get ahead of it and it feels like a never-ending battle.

Even though your academic background has equipped you with a deep understanding of wildlife biology and management, the harsh reality of grizzly bear management is often an emotional struggle. You're frequently caught in the middle, working tirelessly to address and ease the tension and heartbreak that comes with close encounters and conflicts between humans and this iconic species. Every decision weighs heavily—not just on science, but on the hopes and fears of the people and the fate of the bears themselves.



To make matters worse, special interest groups who don't know all the details about managing bears, and the public place a lot of demands about how YOU NEED to manage bears their way and not what you may know as an experienced and professional bear manager. To top it off, despite your sound management plan and meeting the grizzly bear recovery goals, some groups are now even using the legal system to prevent you from making decisions based on science-based management.

Nonetheless, because of your commitment to managing both the biological and social carrying capacity of grizzly bears, you need to come up with a management plan that best serves grizzly bears, grizzly habitat, public safety, livestock, and yes, trying to address the special interests of other groups. So, you're going to use your wildlife management training and seasoned grizzly management experience to develop a balanced, rational, and common-sense **Grizzly Bear Management Plan**.

Your Goals - To develop your plan, you will conduct online research and create a plan that supports the goals of your Grizzly Bear Managers group. These goals include:

- Attempt to define and isolate prime grizzly bear habitat from human development and expansion.
- Develop proven and new innovative "community" and "grizzly safe" ways on how to prevent conflicts between humans and grizzly bears.
- Set guidelines and methods for handling "dangerous repeat offender bears" using both lethal and non-lethal measures, ensuring these actions are acceptable to the public and comply with legal requirements.

- Convince other groups to understand that it's simply impossible to safely share the landscape in harmony with grizzly bears because of their biological and behavioral characteristics as a species.
- Advocate for wildlife managers, rather than interest groups or the legal system, to have primary authority over scientific bear management.

When developing your plan, consider the possible goals of the other groups and how they might align or conflict with yours. In class Session 3, each group will have two members present their plans, followed by a class debate to find possible solutions for an overall **Grizzly Bear Management Plan** that balances the needs of all the groups, grizzly bears, and the local ecosystem.

Considerations to address when developing your plan and during the class debate in Session 3.

- Can your plan really protect the safety of all the humans, including young and seniors who share the landscape with grizzly bears?
- Can your plan ensure agricultural producer's (rancher and farmers) livestock from being injured and killed?
- How will your group of wildlife managers "remove" troublesome of over abundant grizzly bears that is acceptable to the public?
- What new innovative ways or inventions might be used to achieve your goals?
- How might you use or empower large landowners, such as ranchers and farmers, to join the main parts of your management plan?

Working with other members of your Grizzly Bear Managers group, research and develop your **Grizzly Bear Management Plan** that addresses your group **goals** and **considerations**. You will use your plan and your research to develop a "debate presentation" that will include at least one form of art or media such as either video, poster, graphs, charts, or images. Two members of your group will present your plan to the entire class during Session 3. Each group will have 7 to 8 minutes of plan presentation time, followed by a few minutes of questions by the other groups.

After the three groups present their management plans, the teacher will lead a group discussion on how similar or key parts of the various plans could be included in a unified plan that would satisfy the main interests of all three stakeholder groups... and of course, the future of grizzly bears!

Friends of Grizzlies - Grizzly Bear Management Plan Worksheet

Student Name: _____ Class: _____ Date: _____

Welcome to the **Friends of Grizzlies** group. You are part of a dedicated community of engaged individuals who value humans and other species equally. The reason that you live in a mountain valley community in the west was to be near the unspoiled landscape and wildlife that inhabits it. In particular, you hold the grizzly bear in the highest esteem because of all that it represents as a majestic wild creature blended with courage and intelligence. In fact, sometimes you wish you had been born a grizzly bear living free in the mountains instead of being stuck in the body of a lumbering bi-ped confined to all the trappings of society.



Despite grizzly bear numbers being devastated over the past 150 years by a combination of intentional lethal and unintentional non-lethal human activities, grizzlies are not only starting to rebound, but showing up in places that haven't been seen in decades. That's the good news. However, the downside is that human populations have grown and moved into former bear habitats over the past 150 years. To make matters worse, most humans don't seem to know how to share the landscape with grizzlies and appear to be blatantly contributing to creating conflicts with grizzly bears. You don't understand what is so difficult about managing your bear attractants. It is particularly frustrating to you when people choose to live in areas with grizzly bears, create small hobby farms with chickens and goats, and then become upset when predators kill their animals - often resulting in bears being killed by so-called "grizzly bear managers." It doesn't seem fair that a person having fresh eggs for their family trumps grizzly bears' rights.

Because you believe grizzly bears are as valuable as humans, your dedication to preserving every grizzly bear in the state—combined with your strong empathy for them—inspires you to raise public awareness about their historic right to exist undisturbed on their ancestral lands, free from human interference. So, you're going to use your sense of wildlife compassion, grizzly-like intellect, and emotional power of persuasion to develop a **Grizzly Bear Management Plan** for the primary benefit of grizzlies. From your perspective, humans have consistently shown that they put their own interests above those of wildlife and ecosystems. It is high time that grizzly bears interests come first.

Your Goals - To develop your plan, you will conduct online research and create a plan that supports the goals of your Friends of Grizzlies group. These goals include:

- Conserve and restrict the remaining grizzly bear habitat so they have a place to live conflict-free from humans.
- Develop proven and new innovative "community wide" ways on how to prevent conflicts between humans and grizzly bears.
- Explore non-lethal and "emotionally unharful" solutions to protect "trouble bears" from being killed by wildlife managers.

- Convince other groups to understand that sharing the landscape in harmony with grizzly bears is their historic right plus it's the "eco-ethical" thing to do as humans who have all the power and responsibility to control wildlife and ecosystems.

When developing your plan, consider the possible goals of the other groups and how they might conform or conflict with your goals. In class Session 3, all of the groups will have two group members present their plans then have a class debate on possible solutions to developing an overall **Grizzly Bear Management Plan** that best serves the interests of all the groups, grizzly bears, and the ecosystem within your valley.

Considerations to address when developing your plan and during the class debate in Session 3.

- Can your plan really protect the safety of all the humans, including young and seniors who share the landscape with grizzly bears?
- Can your plan protect the livestock that share the landscape with grizzly bears?
- How legally far will your group go to protect troublesome bears or too many grizzly bears from being "eliminated" by wildlife managers?
- What new innovative ways or inventions might be used to achieve your goals?
- How might you energize and empower the entire community to embrace your plan?
- How might you "conserve" grizzly habitat lands from being overtaken or dominated by human activities or enterprises (ranching-farming)?

Working with other members of your Friends of Grizzlies group, research and develop your **Grizzly Bear Management Plan** that addresses your group **goals** and **considerations**. You will use your plan and your research to develop a "debate presentation" that will include at least one form of art or media such as either video, poster, graphs, charts, or images. Two members of your group will present your plan to the entire class during Session 3. Each group will have 7 to 8 minutes of plan presentation time, followed by a few minutes of questions by the other groups.

After the three groups present their management plans, the teacher will lead a group discussion on how similar or key parts of the various plans could be included in a unified plan that would satisfy the main interests of all three stakeholder groups... and of course, grizzly bears!

Greater Grizzly Community - Grizzly Bear Management Plan Worksheet

Student Name: _____ Class: _____ Date: _____

Welcome to the Greater Grizzly Community Group. Your group is made up of a mix of agricultural producers (ranchers and farmers), private landowners, backcountry outfitters, and outdoor recreationists, including hunters. You are used to focusing on fire hazards and weather extremes while recreating outdoors. You used to worry about the increase in summer tourist traffic in your community. With grizzly bear populations increasing, it seems like most of your time now focuses on protecting people and livestock, as well as minimizing the impact bears have on local livelihoods. You know that grizzly bears are always as "hungry as a bear" and eat just about anything from cows, to crops, to camp food, to garbage, to picnic baskets, and even the occasional backpacker!



To make matters worse, there are some people who don't seem to understand how dangerous a grizzly bear can be. They think that humans and grizzly bears can peacefully coexist. As a livestock producer you are often told to use nonlethal methods, even though these strategies aren't always effective. People don't understand that you genuinely love your livestock and even hand rear some of them. The presence of predators, like grizzly bears, causes stress in your livestock, including increased cortisol levels, leading to reduced foraging time and lower weight gain in offspring.

While you're reimbursed for lost livestock, compensation often doesn't make up for what's truly lost. When you lose an animal, its unique genetics are gone from your herd, which diminishes genetic diversity overall. This can be especially problematic for smaller operations or those located where predators, like the grizzly bear are common, as it limits your herd's chances for long-term success. You are also fed up with people characterizing you as being anti-bear and anti-wildlife. You are passionate about wildlife, even grizzly bears. Much of your state's wildlife depends on private land. Your property offers valuable habitat for many species. You just prefer not to have a dangerous grizzly bear in your backyard or destroying your livelihood.

They also don't realize that the constant need to stay alert for potential bear encounters while outdoors can be quite stressful, as you must always remain vigilant and practice bear safety. You tired, as a hunter, of being advised to make plenty of noise so bears will leave the area; however, making too much noise while hunting can decrease your chances of success. Then, there are the tourists who want plenty of grizzly bears, so when they come to visit they can see them. Some of them are even foolish enough to get up close to these bears to get a photo. .

Despite the combinations of human-bear-safety conflicts that you face, your group needs to come up with a **Grizzly Bear Management Plan** that best serves public safety and your group's various stakeholder concerns while adhering to laws that offer some protection to grizzly bears.

Your Goals - To develop your plan, you will conduct online research and create a plan that supports the goals of your Greater Grizzly Community group. These goals include:

- Develop proven and new innovative “community safe” and “grizzly safe” methods or technologies to reduce conflicts between humans and grizzly bears.
- Set guidelines and methods for handling “dangerous repeat offender bears” using both lethal and non-lethal measures, ensuring these actions are acceptable to the public and comply with legal requirements.
- Develop a set of 4 to 6 “community-wide laws” that citizens need to follow to reduce conflict with grizzly bears.
- Develop methods to prevent a serious grizzly bear encounter.

When developing your plan, consider the possible goals of the other groups and how they might align or conflict with yours. In class Session 3, each group will have two members present their plans, followed by a class debate to find possible solutions for an overall **Grizzly Bear Management Plan** that balances the needs of all the groups, grizzly bears, and the local ecosystem.

Considerations to address when developing your plan and during the class debate in Session 3.

- Can your plan really protect the safety of all the humans, including young and seniors who share the landscape with grizzly bears?
- Can your plan ensure agricultural producers' (rancher and farmers) livestock from being injured and killed?
- What new innovative ways or inventions might be used to reduce conflicts?
- What is your alternative plan if these innovative ways and inventions do not reduce conflicts?
- How might you energize and empower the entire community to join your plan in safely reducing human-grizzly conflicts?

Working with other members of your Greater Grizzly Community group, research and develop your **Grizzly Bear Management Plan** that addresses your group **goals** and **considerations**. You will use your plan and your research to develop a “debate presentation” that will include at least one form of art or media such as either video, poster, graphs, charts, or images. Two members of your group will present your plan to the entire class during Session 3. Each group will have 7 to 8 minutes of plan presentation time, followed by a few minutes of questions by the other groups.

After the three groups present their management plans, the teacher will lead a group discussion on how similar or key parts of the various plans could be included in a unified plan that would satisfy the main interests of all three stakeholder groups... and of course, human and livestock safety and the future of grizzly bears!

Educational Standards (linked)**Common Core ELA****Reading Informational Text****Grades 9-10**

CCSS.ELA-Literacy.RI.9-10.1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

CCSS.ELA-Literacy.RI.9-10.2 - Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.

CCSS.ELA-Literacy.RI.9-10.7 - Analyze various accounts of a subject told in different media (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.

CCSS.ELA-Literacy.RI.9-10.8 - Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.

Reading Informational Text**Grades 11-12**

CCSS.ELA-Literacy.RI.11-12.1 - Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.

CCSS.ELA-Literacy.RI.11-12.3 - Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.

CCSS.ELA-Literacy.RI.11-12.7 - Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

Writing
Grades 9-10

CCSS.ELA-Literacy.W.9-10.1 - Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

CCSS.ELA-Literacy.W.9-10.1.a - Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence.

CCSS.ELA-Literacy.W.9-10.1.b - Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns.

CCSS.ELA-Literacy.W.9-10.1.c - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

CCSS.ELA-Literacy.W.9-10.1.d - Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

CCSS.ELA-Literacy.W.9-10.1.e - Provide a concluding statement or section that follows from and supports the argument presented.

CCSS.ELA-Literacy.W.9-10.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)

CCSS.ELA-Literacy.W.9-10.5 - Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (Editing for conventions should demonstrate command of Language standards 1-3 up to and including grades 9-10 [here](#).)

CCSS.ELA-Literacy.W.9-10.7 - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

CCSS.ELA-Literacy.W.9-10.8 - Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

CCSS.ELA-Literacy.W.9-10.9 - Draw evidence from literary or informational texts to support analysis, reflection, and research.

Writing

Grades 11-12

CCSS.ELA-Literacy.W.11-12.1 - Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

CCSS.ELA-Literacy.W.11-12.1.a - Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence.

CCSS.ELA-Literacy.W.11-12.1.b - Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases.

CCSS.ELA-Literacy.W.11-12.1.c - Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

CCSS.ELA-Literacy.W.11-12.1.d - Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

CCSS.ELA-Literacy.W.11-12.1.e - Provide a concluding statement or section that follows from and supports the argument presented.

CCSS.ELA-Literacy.W.11-12.4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)

CCSS.ELA-Literacy.W.11-12.5 - Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (Editing for conventions should demonstrate command of Language standards 1-3 up to and including grades 11-12 [here](#).)

CCSS.ELA-Literacy.W.11-12.7 - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

CCSS.ELA-Literacy.W.11-12.8 - Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

CCSS.ELA-Literacy.W.11-12.9 - Draw evidence from literary or informational texts to support analysis, reflection, and research.

Speaking and Listening**Grades 9-10:**

CCSS.ELA-Literacy.SL.9-10.1 - Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

CCSS.ELA-Literacy.SL.9-10.1.a - Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

CCSS.ELA-Literacy.SL.9-10.1.b - Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.

CCSS.ELA-Literacy.SL.9-10.1.c - Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.

CCSS.ELA-Literacy.SL.9-10.1.d - Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.

CCSS.ELA-Literacy.SL.9-10.2 - Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

CCSS.ELA-Literacy.SL.9-10.4 - Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

CCSS.ELA-Literacy.SL.9-10.5 - Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

Speaking and Listening

Grades 11-12:

CCSS.ELA-Literacy.SL.11-12.1 - Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

CCSS.ELA-Literacy.SL.11-12.1.a - Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.

CCSS.ELA-Literacy.SL.11-12.1.b - Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.

CCSS.ELA-Literacy.SL.11-12.1.c - Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.

CCSS.ELA-Literacy.SL.11-12.1.d - Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

CCSS.ELA-Literacy.SL.11-12.2 - Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

CCSS.ELA-Literacy.SL.11-12.4 - Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

CCSS.ELA-Literacy.SL.11-12.5 - Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

Next Generation Science Standards (High School)

HS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics - Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics - Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-7 Ecosystems: Interactions, Energy, and Dynamics - Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*

HS-LS2-8 Ecosystems: Interactions, Energy, and Dynamics - Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.

HS-LS4-6 Biological Evolution: Unity and Diversity - Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.*