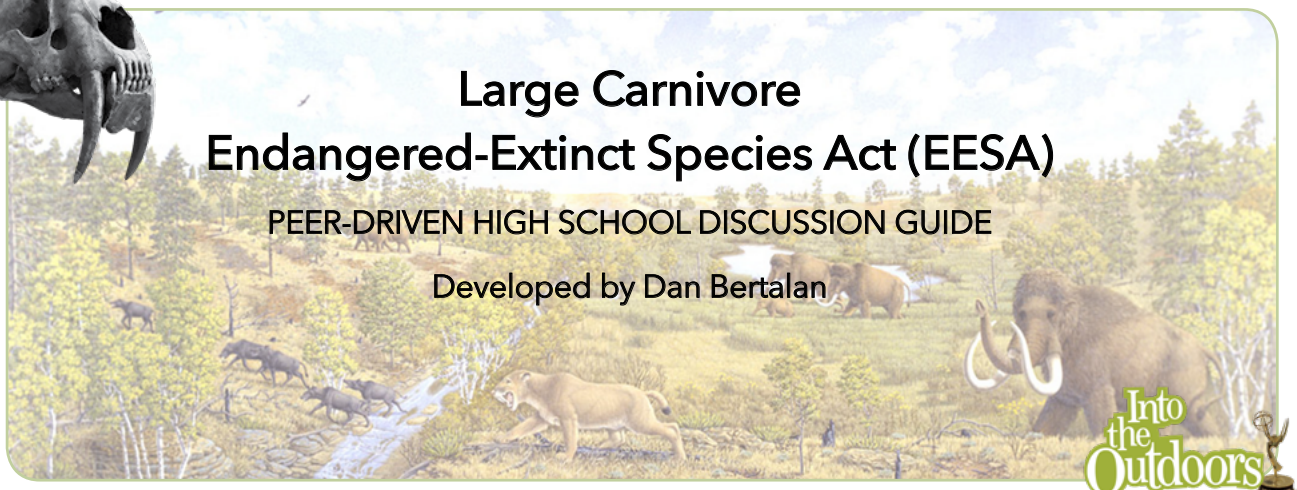
HIGH SCHOOL
LESSON GUIDE



Large Carnivore Endangered-Extinct Species Act (EESA)

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 creating a mock Endangered-Extinct Species Act for large carnivores. A video questionnaire 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. It's also designed to be "**fun and imaginative**" for both students and teachers.

Contents:

EDUCATIONAL PARTNERS

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. Most wildlife species are managed by their particular State wildlife agency. However, with the management of certain "endangered species" the U.S. Fish and Wildlife Service (FWS) is involved. They are serve as the primary agency that manages endangered species in the United States under the Endangered Species Act (ESA) with the collaboration and involvement of state fish and wildlife agencies. The FWS works to conserve listed species and their habitats through various actions, including identifying threats, developing recovery plans, and implementing conservation measures. This includes listing and delisting of large carnivore species such as the grizzly bear.

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 includes larger carnivores. For instance, 1978 the gray wolf was listed as endangered throughout the lower 48 states, with the exception of Minnesota. But some populations were delisted as they were deemed recovered, but this was reversed for some populations in 2022 and remains a point of contention.

Overview Continued...

Then there's the grizzly bear. Since 1975, grizzly bears in the contiguous U.S. have been listed as "threatened" under the ESA. This means they are at risk of extinction in the foreseeable future and are afforded federal protections against hunting and for their habitat. The ESA has been credited with helping grizzly populations recover significantly from the estimated 700-800 bears in 1975 to over 2,000 today, with key strongholds in areas like the Greater Yellowstone Ecosystem. Nonetheless, some organizations using various means and the legal system can and do interrupt the scope and intent of ESA management and recovery plans. For instance, in 2007, the FWS determined that the grizzly bear population in the Greater Yellowstone Ecosystem had met the recovery goals and delisted the species giving management authority back to the states. A suit was filed, and a federal court overturned the USFWS delisting, restoring threatened status to the GYE population with management authority once again held by FWS.

In this lesson, students will discuss their current knowledge of endangered species, including grizzly bears, watch a video about the ESA and grizzly bears while answering a questionnaire, then assume the roles of various stakeholders in researching, developing and presenting a mock Endangered-Extinct Species Act (EESA). Classroom debate will drive peer-driven interactive learning where the entire class attempts to develop an EESA that best serves the interests of the stakeholder groups and "unique EE" species.

CONCEPT - Endangered Species Wildlife Management

ENDURING UNDERSTANDING:
Students will understand the differences between the various stakeholder perspectives for creating an endangered species act for an unusual large carnivore.

CONTENT OBJECTIVES:
Students will be able to evaluate the biological and social considerations in managing a truly endangered species. They will also be able to research, develop and present a "Endangered-Extinct Species Act" to address the unique challenges in managing one of the most fearsome carnivores to have ever roamed North America… eons ago.

LEARNER OBJECTIVES:
Students will use various "stakeholder" worksheets and online research to determine the challenges and potential solutions to managing a unique large carnivore. Students will use their online research to develop and present their own "Endangered-Extinct Species Act" that considers the needs of a large carnivore, 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
- Grizzly Bears and the Endangered Species Act **video**
- Video **Questionnaire** to fill in while watching the video
- Three (3) **Stakeholder Student Group Worksheets**

Procedure

Session 1 - Before watching the Grizzly Bears and the Endangered Species Act video, ask students what they know about the challenges of managing endangered species. Also ask students if they have ever seen an endangered species and explain which one and where they saw it. Lead a short discussion on what considerations makes a species an "endangered species"..

Print and distribute the Video Questionnaire (included in this Lesson PDF). Instruct students to fill in the worksheet while watching the video. Go over the questions with the students before viewing the video 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. **Smilodon Engineers**
2. **Wildlife Managers**
3. **People First**

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. Take a moment and review the stakeholder student worksheets to become familiar with their roles in the lesson activity.

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 (worksheets included in this PDF). Each of the stakeholder worksheets has detailed instructions to guide students on their research and presentations.

Each stakeholder group will have specific and sometimes opposing challenges in their goals in creating their Endangered-Extinct Species Act. In their separate assigned groups, have students perform research and discussion in developing their specific stakeholder EESA. Their EESA should also include possible considerations of other stakeholder groups. The worksheets provide instructions and research guidelines for students to gather information.

I**nform each group that two members** of their group will also present their Endangered-Extinct Species Act to the entire class during Session 3. Their presentations should be supported by mostly 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).

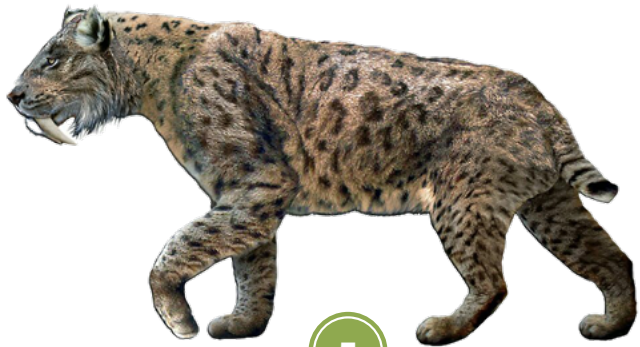
Session 3 – Group Presentations & Public Debate

Have each of the three stakeholder groups present their EESAs and the supporting research and reasons for their EESA. 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 Endangered-Extinct Species Acts, **lead a group discussion** on how similar or key elements of the various EESAs could be included in an overall EESA 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 EESA, including similar challenges. Conclude the discussion by asking how many students might be interested in getting involved in managing endangered species and why.

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 Endangered-Extinct Species Act worksheets.



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.

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 what endangered species are listed in their state and what plans are providing certain management goals.

To learn more about Grizzly Bears, download the free;

Grizzly Bears of Montana Teacher Resource Guide

Grizzly Bears and the Endangered Species Act - Video Questionnaire

Student Name: Class: Date:

Before watching the video, *Grizzly Bears and the Endangered Species Act* , review these questions below and look for answers during the video.

1. When was the Endangered Species Act (ESA) adopted?

2. Why were grizzly bears listed under the ESA?

3. What government agencies determine the recovery criteria for an endangered species?

4. Have grizzly bears been “biologically recovered” in the Greater Yellowstone ecosystem or the Northern Continental Divide Ecosystem?

5. What can interfere with the ESA process?

6. When was the grizzly bear “listed” under the ESA?

7. What agency or agencies should manage endangered species?

Smilodon Engineers - Large Carnivore EESA

Student Name:_____Class:_____Date:

Welcome to the **Smilodon Engineers Group** comprised of a team of brilliant genetic engineers that have made a remarkable breakthrough. Archeologists unearthed a Smilodon skull from a cave in the Grand Canyon with intact DNA that your team used to clone… yes, a **real sabretooth tiger** that once roamed North America during the Pleistocene Epoch until 10,000 years ago. Many other large mammals disappeared back then, with potential causes including climate change and notably the quick spread of Paleo hunters in America that found the huge cats especially incompatible with their "human" lifestyles.

Your team is so smart that you eventually created a bunch of Smilodons that somehow escaped their enclosure (ooops!) and migrated back to a remote region of the Grand Canyon National Park where the skull was unearthed. The big cats DNA has also naturally programmed them to kill and eat other warm-blooded creatures which has caused some serious hiccups with mule-ride and horse tours down into the canyon. In fact, the Park Service and public safety officials are in an uproar about what the big cats are not only doing to the tourist trade, but to actual tourists. Ranchers outside the park are also concerned about possible impacts if the sabretooths expand their range outside the canyon where sheep and cattle might once again become Pleistocene victims.

Some believe passionately that because humans likely caused their extinction that humans are ethically obligated to now allow sabretooths to once again roam the landscape… within reason of course. And because your team created this dilemma, you need to come up with an Endangered-Extinct Species Act (EESA) that defines how your Smilodon's will be managed. Your biggest challenge is the fact you cloned a large "carnivore" that can threaten society more than if you would have cloned a Pleistocene giant beaver instead. Maybe next time… think before you clone.

Your Goals - To develop your EESA, you will conduct online research and create an EESA that is specifically designed for Smilodon Engineers beliefs while addressing the goals listed below.

- Develop a list of potential new innovative methods or technologies that can reduce conflicts between canyon tourists and sabretooths. (consider pet or domestic technologies that might be adapted).
- Establish guidelines and methods for what to do with "bad-kitty offenders" using both lethal and non-lethal measures while ensuring these actions are acceptable to the public and comply with legal requirements.

- Develop a set of 3 to 4 "EESA guidelines" that clearly define the limits or goals of your Smilodon program.
- Develop at least three persuasive concepts that you use to educate and enlist public support for your program.

When developing your Endangered-Extinct Species Act (EESA), consider the possible goals of the other EESA stakeholder groups and how they might align with yours. In class Session 3, each group will have two members present their EESAs, followed by a class discussion to decide on the ideal combination guidelines to include in an overall Endangered-Extinct Species Act (EESA)… including ways the public (and canyon tourists) can help reduce conflicts with Smilodons.

Considerations to address when developing your EESA and during the class discussion in Session 3.

- Research the current FWS ESA to get ideas that can be adapted to support your Smilodon ESA.
- Can your EESA realistically help protect the safety of canyon tourists, including mules and horses used on canyon tours?
- Because public education is actually the business of "selling ideas" that your target audience responds to… what psychological motivators can you use in your messaging? (here's a hint: if most people eat meat, why can't we tolerate other species that eat meat?)

Working with other members of your Smilodon Engineers group, research and develop your EESA that addresses your group's **goals** and **considerations**. You will use your research to develop a 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 EESA to the entire class during Session 3. Each group will have 7 to 8 minutes to present their EESA, followed by a few minutes of questions by the other groups.

After the three groups present their EESAs, the teacher will lead a group discussion on how similar or key parts of the various EESAs could be included in a unified EESA that can help manage your Smilodons. Even compelling educational messaging does no good if nobody hears or sees it. So, research and be prepared to also discuss how your EESA will be effectively distributed to the different types of tourists so that it will have a real park and canyon-wide impact.

Wildlife Managers - Endangered-Extinct Species Act (EESA)

Student Name:_____Class:_____Date:

Welcome to the **Wildlife Managers Group** comprised of a team of wildlife professionals wrestling with a dilemma that some are calling a "remarkable breakthrough". Archeologist unearthed a Smilodon skull from a cave in the Grand Canyon with intact DNA that genetic scientists cloned into a **real sabretooth tiger** that once roamed North America during the Pleistocene Epoch until 10,000 years ago.

As if one sabretooth wasn't bad enough, the cloners got carried away with themselves and actually created a bunch of Smilodons that somehow escaped their "secure" enclosure and migrated back to a remote region of the Grand Canyon National Park where the skull was unearthed. The big cats DNA has also naturally programmed them to kill and eat other warm-blooded creatures which is devastating the park's herds of elk, mule deer, and bighorn sheep. Though they haven't killed any tourists yet, it's only a matter of time before they go after mule-train tours venturing down into the canyon. To make matters worse, national news about the sabretooths is drawing in hordes of curious park tourists fascinated with seeing or photographing one of the once-extinct cats. Based on your knowledge of the wide-ranging characteristics of mountain lions, it's a good bet that the Smilodons will soon expand their range outside the canyon and develop a taste for easy prey like sheep and cattle.

Some special interest groups believe passionately that because humans likely caused Smilodon extinction, humans are now ethically obligated to allow sabretooths to once again roam the landscape. They're using emotionally based media and the legal system to influence the future of these sabretooths. Your role is to apply reason and science in managing a remarkable but dangerous species—one that may have preyed on humans long ago.

So, your team needs to come up with an Endangered-Extinct Species Act (EESA) that defines how Smilodon's will be managed. Your biggest challenge in that is the fact that this cloned large "carnivore" presents the biggest wild threat to humans that wildlife managers have ever imagined dealing with.

Your Goals - To develop your EESA, you will conduct online research and create an EESA that is specifically designed for Wildlife Managers using your knowledge while addressing the goals listed below.

- Develop a list potential new innovative methods or technologies that can reduce conflicts between canyon tourists and sabretooths. (consider pet or domestic technologies that might be adapted).
- Establish guidelines and methods for what to do with "bad-kitty offenders" using both lethal and non-lethal measures while ensuring these actions are acceptable to the public and comply with legal requirements. (consider how wildlife managers deal with grizzly bears).
- Develop a set of 3 to 4 "EESA guidelines" that clearly define the limits or goals of your Smilodon program that consider sabretooths, the ecosystem and humans.
- Develop at least three persuasive concepts that you use to educate and enlist support from special interest groups that want all Smilodons protected.

When developing your Endangered-Extinct Species Act (EESA), consider the possible goals of the other EESA stakeholder groups and how they might align with yours. In class Session 3, each group will have two members present their EESAs, followed by a class discussion to decide on the ideal combination guidelines to include in an overall Endangered-Extinct Species Act (EESA), including ways the public (and canyon tourists) can do to help reduce conflicts with Smilodons.

Considerations to address when developing your EESA and during the class discussion in Session 3.

- Research the current FWS ESA to get ideas that can be adapted to support your Smilodon EESA.
- Can your EESA realistically help protect the safety of canyon tourists, including mules and horses used on canyon tours?
- Because public education is actually the business of "selling ideas" that your target audience responds to… what psychological motivators can you use in your messaging? (here's a hint: What was the repeated message in the *Jurassic Park* movie series?)

Working with other members of your Wildlife Managers group, research and develop your Endangered-Extinct Species Act that addresses your group's **goals** and **considerations.** You will use your research to develop a 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 EESA to the entire class during Session 3. Each group will have 7 to 8 minutes to present their ESA, followed by a few minutes of questions by the other groups.

After the three groups present their EESA s, the teacher will lead a group discussion on how similar or key parts of the various EESAs could be included in a unified EESA that can help manage your Smilodons. Even compelling educational messaging does no good if nobody hears or sees it. So, research and be prepared to also discuss how your EESA will be effectively distributed to the different types of tourists so that it will have a real park and canyon-wide impact.

People First - Endangered-Extinct Species Act (EESA)

Student Name:_____Class:_____Date:

Welcome to the **People First Group** comprised of a team of citizen leaders shocked with what some scientists are calling a "remarkable breakthrough". Archeologists unearthed a Smilodon skull from a cave in the Grand Canyon with intact DNA that genetic scientists used to clone into a **real sabretooth tiger** that once roamed North America during the Pleistocene Epoch until 10,000 years ago. You believe their breakthrough was handled irresponsibly. How could they possibly think this was a good idea!!

As if one sabretooth wasn't bad enough, the cloners actually created a bunch of Smilodons that somehow escaped their "secure" enclosure and migrated back to a remote region of the Grand Canyon National Park where the skull was unearthed. The big cats DNA has also naturally programmed them to kill and eat other warm-blooded creatures which is devastating the park's herds of elk, mule deer, and bighorn sheep. Though they haven't killed any humans yet, you know that it won't be long before they begin killing and eating tourists on mule tours in the canyon. To make matters worse, national news about the sabretooths is drawing in hordes of curious park tourists fascinated with seeing or photographing one of the once-extinct cats, creating absolute chaos.

These genetic engineers in their own self-interest profess that because humans likely caused Smilodon extinction, that humans are now ethically obligated to allow sabretooths to once again share the landscape. It seems insane to permit one of North America's deadliest predators to return, because you know it will result in catastrophic loss of life in horribly gruesome ways for its human victims.

And that's where you come into bring **reason** to help rigorously manage, cage, or simply exterminate a species from the past that is likely genetically programmed to kill and consume humans. So, your team needs to come up with an Endangered-Extinct Species Act (EESA) that defines how Smilodon's will be managed. Your biggest challenge in that is the fact that this cloned large "carnivore" presents the biggest wild threat to humans since the recent expansion of grizzly bears in some Western states.

Your Goals - To develop your EESA, you will conduct online research and use rational common sense and create an EESA that is specifically designed to put people first using your knowledge while addressing the goals listed below.

- Develop a list potential new innovative methods or technologies that can truly protect people from becoming sabretooth victims.
- Establish firm guidelines for dealing with "bad-kitty offenders" using both lethal and non-lethal measures while ensuring these actions are acceptable to the public and comply with legal requirements. (consider how wildlife managers deal with problem grizzly bears).
- Develop a set of 3 to 4 "EESA guidelines" that clearly define the limits or goals of the Smilodon program that put the safety of humans above everything else.
- Develop at least three persuasive concepts that you can use to educate and enlist widespread public support of stringent controls on the Smilodons.

When developing your Endangered-Extinct Species Act (EESA), consider the possible goals of the other EESA stakeholder groups and how they might not align with yours. In class Session 3, each group will have two members present their EESAs, followed by a class discussion to decide on the ideal combination guidelines to include in an overall Endangered-Extinct Species Act (EESA), including ways the public can avoid being a food source for the Smilodons.

Considerations to address when developing your EESA and during the class discussion in Session 3.

- Research the current FWS ESA to get ideas that can be adapted to support your Smilodon EESA.
- Can your EESA realistically help protect the safety of canyon tourists, including mules and horses used on canyon tours? (Scientists understand that all creatures have what's called an "optimum foraging strategy". Research and used that concept to defend your EESA.)
- Because public education is really the business of "selling ideas" that your target audience responds to… what psychological motivators can you use in your public messaging? (here's a hint: What was the repeated message in the *Jurassic Park* movie series? And that "fear" is the biggest influential tool that marketers use either in movies or real life.)

Working with other members of your People First group, research and develop your Endangered-Extinct Species Act that addresses your group's **goals** and **considerations**. You will use your research to develop a 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 EESA to the entire class during Session 3. Each group will have 7 to 8 minutes to present their EESA, followed by a few minutes of questions by the other groups.

After the three groups present their EESAs, the teacher will lead a group discussion on how similar or key parts of the various EESAs could be included in a unified EESA that can help manage Smilodons. Even compelling educational messaging does no good if nobody hears or sees it. So, research and be prepared to also discuss how your EESA will be effectively distributed to the public so that it will have a real park, canyon-wide, and regional impact.

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 mediums (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.*