



Are you ready to make a difference? We know you can! The Conserve Wildlife Foundation of New Jersey invites all students in New Jersey, 9th to 12th grades, to participate in the 2025 Species on the Edge 2.0 Contest. This challenge will help students learn how to protect and preserve rare and at-risk wildlife that live, breed, and migrate through New Jersey. You will be surprised to learn how many species are currently “on the edge” and endangered here in the nation’s most densely populated state.

This fun and engaging project will allow you to collaborate with your peers as you journey together to create real-world solutions to keep wildlife safe. This year, students will work in teams and, when presented with several different scenarios, will select a role such as research scientist, citizen scientist, engineer, policy maker, investigative reporter, college professor, director of a non-profit organization, or environmental artist. Students will construct a video to bring awareness and educate the public about endangered species and their environments.

The contest also helps students develop skills in Science, Technology, Engineering, Art, and Mathematics (STEAM), environmental advocacy, design thinking, social and emotional learning, teamwork, critical thinking, and project management. Entry to the contest is free and offers students and facilitators the opportunity to win cash prizes!

Student Prizes:

1st Place = \$2000

2nd Place = \$1000

3rd Place = \$500



Facilitator Prizes:

1st Place = \$750

2nd Place = \$500

3rd Place = \$250

To participate, students must complete the online entry form located at the following link: <http://www.conservewildlifenj.org/education/edge2.0/> by March 3, 2025. Completed videos must be submitted by April 18, 2025.

Conserve Wildlife Foundation of New Jersey (CWF) works to protect rare and at-risk wildlife through field research, habitat restoration, environmental education, and community engagement. For over twenty-five years, CWF has played a leading role in the dramatic recovery of species such as the bald eagle, peregrine falcon, and osprey. Our track record of success includes supporting over 40 imperiled species through extensive field work, educating more than 8,000 students and 3,000 adults annually, and connecting with our dedicated community of over 12,000 supporters.

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Why Participate in the Challenge?

The Species on the Edge 2.0 Contest is designed for students to investigate and understand what is happening to endangered species in New Jersey and discover the reasons why they are in jeopardy. It is a way for students to be part of the solutions needed to help sustain and preserve New Jersey's ecosystems. It is also a way for students to learn how to identify problems, create public awareness, and create real-world solutions to help keep the endangered species from further slipping away. This challenge allows students the flexibility to select from several scenarios and assume the role of a professional who will contribute to protecting endangered species. By doing this, students will benefit in the following ways:

- Gain an understanding of endangered species in NJ and will have the opportunity to contribute to a real-world solution that will be showcased throughout NJ.
- Utilize basic information regarding climate change, and other human actions that put wildlife in danger.
- Brainstorm, identify and problem solve to find solutions through the lens of empathy and caring for species and people.
- Work collaboratively in teams, with teacher facilitators, and with expert mentors, including renowned CWF biologists.
- Discover career pathways that contribute to protecting wildlife.
- Participate as citizen scientists playing a role in your community protecting wildlife and the habitats on which they depend.
- Contribute towards mitigation strategies to help offset the impacts of climate change and other environmental threats.
- Create positive and uplifting messages that can be shared through media of their choice.
- Have a chance to win cash prize money.

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Challenge Guidelines

1. All participants must be New Jersey high school students. Teams can be no less than 2 students and up to 6 students. Collaboration and teamwork are important components of this challenge. Students are responsible for acting appropriately and respectfully to other team members.
2. The challenge is free to all students. Students are asked to complete the online entry form by March 3, 2025, to officially enter. By submitting the completed entry form it indicates that you are committing to help endangered species. A great first step!
3. Conserve Wildlife Foundation retains the right to all entries and students will be required to sign a photo release form.
4. Each team requires an adult facilitator or mentor. The facilitator can be a teacher, parent, business leader in your community, or leader of a club or organization. The facilitator will be tasked with providing helpful information and guidance, but will not do the challenge, only guide from the side. The facilitator is not a team member, this is a student-led challenge. If students are having difficulty finding a facilitator, please contact CWF for help and guidance.
5. Each team will create and submit a short digital video, shared via a private link. The video should be 3 to 7 minutes in length and describe the species, problems, and solutions. Videos may include text, photographs, artwork, poems, and other content regarding your project.
6. Select a *student challenge scenario* to guide the solution you would like to address. Each scenario provides limited guidance and suggestions for a course of action. However, your team has the freedom to go beyond the provided suggestions to create other actions you would like to accomplish.
7. Become familiar with the *scoring rubric*. This will provide guidance on what judges will be looking for when scoring your final submission.
8. Submit your challenge short digital video no later than April 18, 2025, via a private link.
9. Submissions will be judged, and the top 10 candidates will move to the final round of judging. When the top 3 winners are selected, they will be notified via email. Winners will be announced by May 9, 2025.
10. CWF provides a species field guide to help teams choose an endangered or threatened species in NJ that you can investigate:
<https://conservewildlifenj.org/species-guide/>.
11. All submissions should include appropriate subject matter and align with CWF's mission and goals.

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12. **Disclaimer:** Content with actions which may make a team ineligible:

- a. Ask respective owners' permission to use their images, music, and clips. Please do not use content that you do not own or have not asked permission to use. When you have permission to use content, please include the following disclaimer "I hereby declare that I do not own the rights to this image, music, clip, etc. All rights belong to the owner (Owner's Name and link to original source of content)."
- b. Using intimidation, harassment, abuse, discrimination, derogatory or demeaning speech, violence, violent language, threat of violence, or symbols directed against another person or group of people.
- c. Avoid naming any specific agency, organization, company, individual, etc. as being responsible for the endangerment of the species.
- d. **Submissions that ignore the disclaimer will be immediately disqualified**

Background Information

Human action is causing the earth's climate to change faster now than at any point in the history of modern civilization. New Jersey is not spared from the effects of climate change. We are experiencing sea level rise, beach erosion and other environmental issues. Climate change is affecting wildlife in New Jersey in various ways, with both short-term and long-term impacts on ecosystems and individual species. Climate change is not the only issue that threatens wildlife. Species are also impacted by habitat loss, invasive and exotic species, pollution, illegal trapping and poaching, and accidental deaths. So why should we care? Humans are also in harm's way from climate change, pollution, and other human created technologies that have consequences to our environment and our health. However, our most sensitive ecosystems and the species that live there will feel the effects and stand to suffer at no fault of their own. By helping the species on the edge, we can learn how to help ourselves rethink societal unsustainable actions, and how to find solutions to climate change, human actions, and other environmental hazards.

When planning, consider the following:

Habitat range: As temperatures rise, some species are moving to find suitable habitats. This can lead to changes in the distribution of wildlife in New Jersey and place them in unfamiliar areas, and impact other animals that live in that area through unbalanced ecosystems.

Migration patterns: Climate change can affect the timing and routes of animal migrations. Birds, for example, may alter their migration patterns in response to changes in temperature and the availability of food.

Impact on food sources: Changes in temperature and precipitation patterns can affect the abundance and distribution of plant and animal species that serve as food sources for wildlife. This can impact the species that depend on these resources.

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Sea level rise: New Jersey has a significant coastline, and rising sea levels due to climate change can lead to the loss of coastal habitats. This impacts species that rely on these areas for breeding, feeding, and shelter.

Adaptation challenges: Some species may struggle to adapt to the rapidly changing climate, particularly those with specialized habitat or feeding requirements. This can lead to population declines or local extinctions.

Impact from the human-built environment and pollution: Wildlife may experience habitat destruction, fragmentation, pollution, and disruptions like noise and light pollution. Buildings, bridges, roads, pipelines and other human built structures could impede migratory pathways of certain species. Pollution from industry and transportation may create dangerous byproducts that end up in the ecosystems where wildlife lives and can harm them in many ways.

Changes in seasonal occurrences: Climate change can influence the timing of natural events, such as the timing of flowering, hibernation, or breeding. This can create mismatches between the timing of these events and the availability of resources, impacting species that depend on specific seasonal cues.

Increased frequency of extreme weather events: New Jersey is experiencing more frequent and intense weather events, including hurricanes and storms. These events can lead to habitat destruction, flooding, and disruptions to wildlife populations.

Increased stress and disease: Climate change can lead to increased stress on wildlife populations, making them more susceptible to diseases. Changes in temperature and precipitation can increase the frequency of disease among wildlife.

Note: Although the species listed are wildlife, there are several plant species that are endangered as well. Keep that in mind when taking on this challenge. Endangered plants are not part of this challenge but know that the consequence of human progress goes beyond wildlife.

Student Challenge Scenarios

In this project-based learning challenge, one individual on your team will pretend that they are the person identified in the scenario that you have selected. For example, if you select the scenario of the Investigative Reporter, one individual on your team will play an investigative reporter in your video. Other members of your team may assume another support role on the team, they may be a behind-the-scenes member, who supports the team, video production, they may be featured in your video offers research and findings, etc. You may also feature others in your video, including experts in the field. For example, an environmental biologist being interviewed by the investigative reporter in your video. Each scenario below details what should be included in your final video, but it does not limit you, and you should use your own creativity and make the best possible production you decide to undertake.

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Your group will select ONE of the below scenarios for the challenge:

Scenario 1: The Investigative Reporter:

One way to help protect endangered species and the environments in which they live is to find out the facts about the issues behind their endangerment. These issues can then be communicated to the public to create awareness. Imagine you and your teamwork for a local media/news company. The executive of the network has a special interest in endangered species and would like your team to take on the task of doing a story on one of the endangered species in NJ. You must gather all the information you can find about why these species are at risk and how we can help. Report your findings to the public and include tips for what the public can do to help. Your story can be a segment that you would view on a news program or podcast. In your news segment, you can include video or photographs, artistic renderings, maps, etc.

Your team may consist of any of the following...

- The Investigative Reporter
- Research Assistant
- Camera-Operator
- Technology Specialist
- Others at your discretion

Scenario 2: The Research Scientist:

A research scientist is someone who gathers information and uses research and evidence. They make hypotheses, test them, analyze data, share their findings, and draw conclusions to provide suggested courses of action. The Conserve Wildlife Foundation of New Jersey (CWF) is requesting that as a research scientist, you take on an investigation of a NJ endangered species. They are asking you to identify the dangers to the species, and design a plan to help protect, and even reverse the circumstances the species is experiencing. Your video as the research scientist will include a review of your findings and will be presented at a local conference for environmental educators.

Your team may consist of any of the following...

- The Research Scientist
- Data Analyst
- Media Specialist
- Others at your discretion

Scenario 3: The College Professor

As a professor at a local college, your department chair has asked you to create a presentation on an endangered species and deliver it to a group consisting of community members, legislators, and teachers who reside in the local area. You are to identify the threats to the species and to design a presentation for the protection of the species. Your presentation should include a call-to-action for the viewers. Your video will be of your presentation to the group, and should relay detailed facts about the species, an explanation of the threats, your plan, and your call to action.

Your team may consist of any of the following...

- The Professor
- Professor's Teaching Assistant
- Audio-visual Producer
- Others at your discretion

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Scenario 4: The Engineer:

Some engineering and technological advancements have consequences if the environment and people are not considered in the process. In the case of endangered species, many past and current technologies and engineering improvements have had unintended consequences on the environment and have placed some wildlife and their ecosystems in harm's way. Keep in mind, not all things that humans invent are good for our environment. Unintended outcomes place us all at risk. A town in New Jersey has hired your engineering company because they are planning to build a new shopping mall and have a local species living in the area that may require protection. They do not want to have unintended consequences on the species' population. They are asking you to design an engineering plan to protect the species. Your video will include a presentation to the local government officials about the species, potential causes of endangerment from building the shopping mall, and a design plan to protect the species. Your video can include examples of other places in New Jersey that have built shopping malls and other buildings, or construction projects that have had unintended consequences to wildlife populations in New Jersey.

Your team may consist of any of the following...

- The Primary Engineer (you choose the type of engineer)
- Environmental Specialist
- Videographer
- Others at your discretion

Scenario 5: The Policy Maker:

Policy Makers play a crucial role in protecting endangered species, conserving biodiversity, and ensuring sustainable management. One of their roles includes enacting legislation and regulations and assisting in ensuring enforcement and compliance. As a policy maker in New Jersey, a community activist has informed you that there is a species that is in immediate danger and requires protection. Develop a legislative platform where you address the concerns and implement strategies including policies to conduct scientific research, monitoring, and data analysis. Include an assessment of the effectiveness of conservation measures, and formulate a plan that outlines specific actions, goals, and timelines for recovering the identified endangered species population and habitat. Your video presentation should include the presentation of your plan at a local town hall meeting in front of community members.

Your team may consist of any of the following...

- The policy maker
- Research assistant
- Public relations manager
- Others at your discretion

Scenario 6: The Environmental Artist:

As an environmental artist you are planning an exhibit to increase awareness and educate citizens in your community about how to protect a specific endangered species. By combining artistic creativity with educational content and community engagement, you will create a compelling exhibit that not only showcases the beauty of endangered species but also highlights the importance of conservation and collective action. Your presentation will include a narrated tour (walking or digital) of your exhibit including any of the following works of art depicting the endangered species and your solution toward mitigating its threats including things such as:

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interactive Installations (i.e. replicas of endangered habitats), up-sculptures using recycled materials or natural resources (i.e. juxtaposition of the beauty of the animals and the threats it faces), audio-visual presentations, photography and artwork, data visualization (presenting statistics, trends, and facts), and/or interactive digital platforms or mobile applications that allow visitors to learn more about endangered species, explore their habitats through virtual reality or augmented reality, and discover ways to contribute to conservation efforts.

Your team may consist of any of the following...

- The Environmental Artist
- Ecologist
- Video Production Manager
- Others at your discretion

Scenario 7: The Director of Non-Profit Organization:

You are a director of a non-profit organization who advocates for the protection of endangered species. Your role includes driving conservation efforts, fostering collaboration, mobilizing resources and fundraising, advocating for change, and ensuring the foundation's success in protecting and preserving endangered species for future generations. Your board of directors has asked you to host an event to bring awareness and fundraise for one specific species of your choice. They are asking that you identify, cultivate, and secure funding opportunities, grants, donations, and sponsorships to support the foundation's conservation efforts and operational needs. Your video will include a presentation to the board including the research about the species, strategies for preservation, and a detailed explanation of the event that you will host to promote public awareness, education, and engagement on endangered species conservation issues through outreach programs, events, campaigns, media relations, and online platforms.

Your team may consist of any of the following...

- The Director of the Non-Profit Organization
- Wildlife Biologist
- Public Relations Manager
- Others at your discretion

Scenario 8: The Citizen Scientist Volunteer:

Volunteer citizen science projects are collaborations between scientists and interested members of the public. Through these collaborations, volunteers (known as citizen scientists) have helped make thousands of important scientific discoveries. As a citizen scientist, you play a valuable role in protecting endangered species by actively participating in various scientific research, monitoring, and conservation initiatives. You have determined that the population of a local species in your community is rapidly declining. While you may not have formal scientific training or qualifications, you plan to contribute your time, effort, and observations to gather data, raise awareness, and support this species' recovery. Your video will consist of the presentation of your campaign to voice concerns, provide facts about the endangered species and detail a plan of protection at a local planning board meeting. Be sure to include data and facts that you have collected, and any research-based evidence that supports your plan of protection.

Your team may consist of any of the following:

- The Citizen Scientist Volunteer
- Environmental Advocate
- Community Liaison
- Others at your discretion

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Scenario 9: Endangered Species Career Path of Your Choice:

If you do not select one of the above scenarios, you may also identify an alternative career to the ones identified in the above scenarios. Please make sure that your video clearly specifies what the career role is that you are assuming, and includes information regarding the species, the dangers to the population, and recommendations for the recovery of the species. You should create a compelling and impactful video about the species and its threats, and suggest the implementation of a comprehensive plan to protect the endangered species and their habitats, inspiring positive change to help ensure a sustainable future for the wildlife you identify.

Scoring Rubric

Criteria	Excellent (4)	Proficient (3)	Basic (2)	Limited (1)	Score (out of 32)
Meets the Design Brief Requirements	Excels at including the design brief components and includes a detailed explanation of the species, threats, and a comprehensive plan of protection.	Includes the components of the design brief with an explanation of the species, threats, and a good plan of protection	Limited inclusion of the design brief with a limited explanation of the species, and threat, and plan of protection. May be missing one component of the design brief.	Missing several components of the design brief and/or without a plan of protection being offered.	
Research and Information	Thorough research with detailed and accurate information about the species, its habitat, threats, and conservation efforts.	Good research with sufficient information about the species, its habitat, threats, and conservation efforts.	Limited research with some information about the species, its habitat, threats, and conservation efforts.	Minimal research with incomplete or inaccurate information about the species.	

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Presentation	Well organized, enthusiastic, and engaging presentation with a clear introduction, body, and conclusion. Effective use of visuals (images, graphs, etc.) to support information.	Clear and organized presentation with a logical structure and some enthusiasm. Visuals are used to enhance the understanding of the content.	Some organization in the presentation, but may lack a clear structure and enthusiasm. Visuals are present but may not effectively support the information.	Presentation lacks organization, enthusiasm, and coherence. Visuals are minimal or irrelevant.	
Creativity and Originality	Demonstrates creativity in presenting information, bringing a unique perspective to the project. Innovative use of visuals or multimedia elements.	Shows creativity in the presentation, with some unique elements. Makes an effort to engage the audience.	Limited creativity, with minimal attempt to present the information in a unique way.	Little to no creativity evident in the presentation. Information is presented in a straightforward manner.	
Depth of Understanding	Displays a deep understanding of the species, its ecological role, and the broader implications of its endangerment.	Shows a good understanding of the species and its importance in the ecosystem.	Demonstrates a basic understanding of the species, but lacks depth in discussing its ecological significance.	Limited understanding of the species and its role in the ecosystem.	

Clarity and Communication	Information is communicated clearly and effectively, with appropriate language and terminology. The audience can easily follow the presentation.	Information is mostly clear, but there may be some instances of unclear language or terminology. The audience can generally follow the presentation.	Information is presented with some clarity, but there are instances of unclear language or terminology that may confuse the audience.	Information is unclear, making it difficult for the audience to follow the presentation.	
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Technical Skills	Demonstrates excellent technical skills in video production, editing, and presentation Utilizes advanced techniques effectively.	Shows good technical skills in video production and editing. Utilizes basic techniques effectively.	Demonstrates basic technical skills in video production and editing. Limited use of techniques.	Lacks technical skills in video production and editing. Numerous technical errors or issues.	
Engagement and Impact	Captivating and holds the audience's attention throughout. Conveys a strong message and creates a lasting impact Emotionally/ intellectually engaging.	Engaging and maintains the audience's interest. Conveys the message effectively. Connects with the audience on some level.	Adequately engages the audience. Message is somewhat clear but lacks impact. Limited connection with the audience.	Fails to engage the audience. Message is unclear or ineffective. Does not connect with the audience.	
Total Score					

Additional Student Resources

A Sick Planet

<https://www.youtube.com/watch?v=v006xb5nVtM>

Brainstorming, creativity, and innovation

<http://www.infinn.com/creative.html>

<http://www.brainstorming.co.uk/tutorials/preparingforbrainstorming.html>

Citizen science programs

<https://www.nasa.gov/get-involved/globe/>

Climate change - NASA <https://climate.nasa.gov/resources/global-warming-vs-climate-change/>

Wildlife Habitat Supporter Program

<https://dep.nj.gov/njfw/conservation/wildlife-habitat-supporter-program/>

Communication skills

<http://www.mindtools.com/page8.html>

Concept mapping

<http://www.cotf.edu/ete/pbl2.html>

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Evidence of climate change

<https://www.youtube.com/watch?v=zszUK7i7K0>

NJ Department of Education Climate Change Resources

<https://www.nj.gov/education/standards/climate/>

NJ Climate Change Education Hub

<https://njclimateeducation.org/>

Environmental Protection Agency

<https://www.epa.gov/endangered-species>

New Jersey's Endangered, Threatened, and Special Concern Species

<https://dep.nj.gov/njfw/wildlife/endangered-threatened-and-special-concern-species/>

Habitat protection and restoration in NJ

<http://www.conservewildlifenj.org/protecting/habitat/>

NJ endangered and threatened species

<http://www.conservewildlifenj.org/species/>

National Geographic

<https://education.nationalgeographic.org/resource/endangered-species/>

National Park Service

https://www.nps.gov/pore/learn/nature/endangered_animals.htm

NOAA's sea level rise viewer [https://coast.noaa.gov/slr/#/layer/slr/10/-](https://coast.noaa.gov/slr/#/layer/slr/10/-8253780.19246149/4971282.781725687/15/satellite/none/0.8/2050/interHigh/midAccretion)

[8253780.19246149/4971282.781725687/15/satellite/none/0.8/2050/interHigh/midAccretion](https://coast.noaa.gov/slr/#/layer/slr/10/-8253780.19246149/4971282.781725687/15/satellite/none/0.8/2050/interHigh/midAccretion)

Teamwork

https://www.canr.msu.edu/news/five_ways_youth_can_be_good_team_members

The Center for Biological Diversity

<https://www.biologicaldiversity.org/campaigns/esa/index.html>

The National Wildlife Federation

<https://www.nwf.org/Educational-Resources/Wildlife-Guide/Understanding-Conservation/Endangered-Species>

Threats to wildlife

<http://www.conservewildlifenj.org/species/threats/>

United States Fish and Wildlife Service

<https://www.fws.gov/program/endangered-species>

United States Geological Survey

<https://www.usgs.gov/faqs/what-are-differences-between-endangered-threatened-imperiled-and-risk-species>

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Teacher/Facilitator Guide

Teachers and other professionals who serve as facilitators for the Species on the Edge 2.0 contest are encouraged to allow students to drive the project, make their own decisions, document and track progress, communicate effectively, explore, and discover what is needed to solve problems that cause species to be endangered. The teaching methods for Species on the Edge 2.0 are based on Project and Problem Based Learning. This means students are in charge of selecting their areas of interest and are at the center of this challenge at all times.

Some tips for facilitators include:

- Ask good questions that will help guide students and keep them on track related to the role they have selected.
- Communicate with your administration, other staff members and parents regarding the nature of the contest and students' progress on the project. This will help recruit support for their participation in the contest, in other words, expand their team.
- Assist students with outreach to subject matter experts, other teachers with content knowledge, and resources that provide background information about endangered species. Allow students to address these topics on their own first and assist later if needed. Keep in mind, they are in charge.
- Arrange a time and a place for students to meet, work and create their solutions.
- Encourage the use of digital learning tools to assist students in all facets of their project. Students are usually very good with digital learning tools but may struggle with utilizing them appropriately. Ensure that students exercise appropriate internet safety and that school rules are being followed.
- Support all students' ideas with encouragement and foster the balance of reality and practicality of their actions and solutions.
- Avoid providing students with the answers, but rather gently guide them and ask good questions that may lead them to different pathways. Guide from side and do not provide step-by-step instructions for students. We strongly suggest that facilitators do not do the project for the students or provide them with your solutions.

Important Definitions for Facilitators

Project-based learning (PBL): This is an educational approach that focuses on students actively engaging in real-world, meaningful projects to gain knowledge and skills. Instead of traditional classroom instruction where students passively receive information, PBL emphasizes hands-on, collaborative, and inquiry-based learning. In a project-based learning environment, students typically work on projects that are relevant to their interests and involve solving complex problems. These projects often require critical thinking, creativity, communication, and collaboration skills. The goal is to help students develop a deeper understanding of the subject matter and acquire skills that are applicable in real-life situations.

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Key characteristics of project-based learning include:

- Real-world relevance: Projects are designed to be connected to the real world, addressing authentic problems or challenges.
- Inquiry and exploration: Students are encouraged to ask questions, conduct research, and explore various aspects of the project to find solutions.
- Collaboration: PBL often involves teamwork, fostering collaboration and communication skills, as students work together to achieve project goals.
- Critical thinking: Students are challenged to think critically, analyze information, and make informed decisions within the context of their projects.
- Creativity: PBL encourages students to think creatively, propose innovative solutions, and express their ideas in unique ways.
- Ownership and autonomy: Students take ownership of their learning by actively participating in the planning, execution, and evaluation of their projects.
- Integration of disciplines: PBL often integrates multiple subject areas, providing a holistic approach to learning.
- Authentic Assessment: Assessment in this is often based on the students' ability to analyze the problem, develop solutions, and communicate their findings. Assessment methods may include presentations, reports, and demonstrations.

Design Thinking: This is a problem-solving and innovation methodology that places a strong emphasis on understanding and meeting the needs of end-users. It originated in the field of design but has since been widely adopted in various industries as an approach to creative and collaborative problem-solving. Design Thinking involves a structured and iterative process that focuses on empathy, ideation, and prototyping. Design Thinking is not limited to designers; it can be applied by anyone interested in solving complex problems in a user-centered and creative way. Many organizations use Design Thinking as a framework to drive innovation in product development, service design, and problem solving.

Key principles and characteristics of Design Thinking in wildlife preservation include:

- Introduce the Principles: Begin by introducing learners to the core principles of wildlife preservation and key elements of design thinking using real world examples.
- Empathy Activities: Incorporate activities that help learners develop empathy. This could include conducting interviews, observations, or role-playing exercises to understand wildlife needs, challenges, and experiences.
- Hands-on Projects: Encourage hands-on projects where learners can apply the design thinking process to solve scenarios presented. Provide opportunities for ideation, prototyping, and testing solutions.
- Collaborative Learning: Encourage collaboration and interdisciplinary teamwork, challenge assumptions, and leverage different perspectives to develop innovative solutions.
- Feedback and Reflection: Emphasize the importance of feedback and reflection in the design thinking process. Encourage learners to share their ideas, receive feedback from peers and mentors, and reflect on their learning experiences to identify areas for improvement.
- Provide Resources and Tools: Offer learners access to resources, tools, and technologies that support the design thinking process. This could include brainstorming tools, prototyping materials, or digital platforms for collaboration and communication.

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- **Promote a Growth Mindset:** Foster a growth mindset by emphasizing the value of experimentation, learning from failures, and embracing challenges as opportunities for growth. Encourage learners to take calculated learning risks and persevere through obstacles.
- **Celebrate Diversity:** Recognize and celebrate diverse perspectives, backgrounds, and skills within the learning community. Encourage learners to embrace inclusivity and consider a wide range of viewpoints when solving problems.
- **Facilitate Reflection and Documentation:** Encourage learners to document their design thinking process, insights, and learnings. This could include maintaining a design journal, creating portfolios, or presenting their work to peers and stakeholders.
- **Encourage Lifelong Learning:** Design thinking is a mindset, and a skill set that can be applied across various domains and throughout one's life. Encourage learners to continue exploring, experimenting, and refining their design thinking skills beyond the classroom.

STEAM Education: This term stands for Science, Technology, Engineering, Arts, and Mathematics. It is an integrated approach to learning that encourages students to think more broadly about real-world problems. The inclusion of arts (the "A" in STEAM) distinguishes it from STEM education by recognizing the importance of creativity and design in problem-solving.

Key components of STEAM education include:

- **Science (S):** Emphasizes inquiry, observation, and experimentation to understand the natural world. Students explore various scientific concepts and engage in hands-on activities.
- **Technology (T):** Focuses on the use of technology tools and applications to enhance learning. This can include coding, digital literacy, and the use of various technological devices.
- **Engineering (E):** Encourages a problem-solving mindset and the application of engineering principles. Students engage in designing, building, and testing solutions to real-world challenges.
- **Arts (A):** Integrates creative thinking and artistic expression into the learning process. This includes visual arts, performing arts, and design principles. Arts help foster innovation and imaginative problem-solving.
- **Mathematics (M):** Involves the application of mathematical concepts in various contexts. It emphasizes critical thinking, logical reasoning, and problem-solving skills.

Key Principles of STEAM Education:

- **Interdisciplinary Learning:** STEAM education breaks down the traditional silos between subjects and encourages the integration of knowledge from different disciplines to solve complex problems.
- **Hands-On and Experiential Learning:** Students engage in hands-on activities, experiments, and real-world experiences to deepen their understanding of concepts. This approach helps make learning more tangible and applicable.
- **Inquiry-Based Learning:** Students are encouraged to ask questions, explore topics independently, and discover solutions through inquiry. This promotes a sense of curiosity and a love for learning.

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- **Creativity and Innovation:** Arts and design thinking are woven into the curriculum to foster creativity. Students are encouraged to approach challenges with innovative and imaginative solutions.
- **Critical Thinking:** STEAM education emphasizes the development of critical thinking skills, including analysis, synthesis, and evaluation of information. Students learn to think critically and solve problems systematically.
- **Collaboration:** Students often work in teams on projects, mirroring the collaborative nature of work in many professional fields. This encourages effective communication and teamwork.

Career Pathways That Support Endangered Species

Exploring a career related to endangered species involves working to protect, conserve, and manage species that are at risk of extinction. Here are several career paths within this field:

Wildlife Biologist:

- Conduct research on endangered species to understand their behaviors, habitats, and threats.
- Monitor and assess the population status of endangered species
- Develop and implement conservation plans to protect endangered species.

Conservation Biologist:

- Work to conserve biodiversity by studying ecosystems, habitats, and the interactions between species.
- Design and implement conservation strategies to protect endangered species and their environments.

Zoologist or Wildlife Manager:

- Manage and oversee wildlife populations, including those that are endangered.
- Develop and implement conservation programs and policies.
- Work in wildlife reserves, national parks, or conservation organizations.

Environmental Educator:

- Educate the public about endangered species, their importance, and the need for conservation.
- Develop educational materials and programs to raise awareness and promote conservation.

Wildlife Veterinarian:

- Provide medical care to endangered species in captivity or in the wild.
- Work on rehabilitation and release programs for injured or sick animals
- Research and address health issues affecting endangered species.

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Conservation Geneticist:

- Use genetic techniques to study and monitor endangered species populations.
- Develop strategies to maintain genetic diversity within populations.
- Contribute to breeding and reintroduction programs.

Environmental Lawyer:

- Advocate for the protection of endangered species through legal avenues.
- Work on cases related to habitat preservation, conservation policies, and wildlife protection laws.

Ecotourism Specialist:

- Develop and promote sustainable tourism initiatives focused on endangered species.
- Educate tourists about the importance of conservation and responsible wildlife viewing.

GIS Specialist (Geographic Information Systems):

- Use spatial data to analyze habitats, migration patterns, and other factors affecting endangered species.
- Assist in the planning and implementation of conservation projects.

Research Scientist in Ecology or Behavior:

- Study the ecological relationships and behaviors of endangered species.
- Contribute valuable information for conservation efforts and management plans.

Additional Facilitator Resources

Educating high school students about endangered species is crucial for fostering awareness and promoting conservation efforts. Here are some websites that high school teachers can use to support their lessons on endangered species:

- World Wildlife Fund (WWF)
 - Website: <https://www.worldwildlife.org/>
 - Features: Information on endangered species, conservation efforts, and educational resources such as lesson plans and activities.
- IUCN Red List of Threatened Species
 - Website: <https://www.iucnredlist.org/>
 - Features: Comprehensive database of the conservation status of species, including assessments, distribution maps, and species accounts.
- National Geographic – Endangered Species
 - Website: <https://www.nationalgeographic.com/animals/reference/endangered-species/>

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- Features: Articles, photos, and videos about endangered species, their habitats, and conservation efforts.
- Endangered Species Coalition
 - Website: <https://www.endangered.org/>
 - Features: Information on U.S. endangered species, advocacy efforts, and educational resources for teachers and students.
- Defenders of Wildlife
 - Website: <https://defenders.org/>
 - Features: Resources on endangered species in the U.S., conservation initiatives, and educational materials for teachers and students.
- ARKive
 - Website: <https://www.arkive.org/>
 - Features: Multimedia profiles of endangered species, including photos, videos, and factsheets, suitable for educational purposes.
- Smithsonian National Museum of Natural History – Global Change • Website: <https://naturalhistory.si.edu/research/biodiversity/center-for-biodiversity-genomics/global-change>
 - Features: Information on biodiversity, conservation, and the impact of global change on species, with educational resources for teachers.
- Conservation International
 - Website: <https://www.conservation.org/>
 - Features: Articles, reports, and educational resources on conservation topics, including endangered species and their habitats.
- The Nature Conservancy
 - Website: <https://www.nature.org/>
 - Features: Information on conservation projects, endangered species, and ecosystems, with resources for educators and students.
- Wildlife Conservation Society
 - Website: <https://www.wcs.org/>
 - Features: Profiles of endangered species, conservation initiatives, and educational materials for teachers and students.
- National Wildlife Federation
 - Website: <https://support.nwf.org/>
 - Features: Protect and restore wildlife habitats across public lands, working lands, waterways, coasts, and communities

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Sample Connections to NJSLs

English Language Arts

W.IW.9–10.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

W.NW.9–10.3. Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.

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

SL.PI.9–10.4. Present information, findings, and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience.

RI.CR.11–12.1. Accurately cite a range of thorough textual evidence and make relevant connections to strongly support a comprehensive analysis of multiple aspects of what an informational text says explicitly and inferentially, as well as interpretations of the text.

RI.CT.11–12.8. Analyze and reflect on (e.g., practical knowledge, historical/cultural context, and background knowledge) documents of historical and scientific significance for their purposes, including primary source documents relevant to U.S. and/or global history and texts proposing scientific or technical advancements.

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

W.IW.11–12.2. Write informative/explanatory texts (including the narration of historical events, scientific procedures/ experiments, or technical processes) to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.

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

Science

HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

HS-LS4-5 Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species

HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

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HS-ESS3-3 Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.

Math: HS Statistics and Probability

B. Making Inferences and Justifying Conclusions S.IC

Make inferences and justify conclusions from sample surveys, experiments, and observational studies

1. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
2. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
3. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
4. Evaluate reports based on data (e.g. interrogate study design, data sources, randomization, the way the data are analyzed and displayed, inferences drawn and methods used; identify and explain misleading uses of data; recognize when arguments based on data are flawed).

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