

Solving Local Problems: Adapting to Climate Change

KONA, HAWAII



COMMUNITY RESOURCE: **KE KAI OLA**

PERFORMANCE LEARNING TASK
GRADES 3-5

PURPOSE OF PERFORMANCE LEARNING TASK (PLT)

Please read through the entire resource document before administering the PLT. There are some videos that are linked to throughout the PLT – for best administration, we recommend loading the videos before beginning the task.

The Grades 3-5 PLT is a multi-step project. Its goal is to promote research and problem-solving skills that are relevant to STEM jobs in Kona and deepen students' understanding of Climate Change and its impact on their community.

Begin by reviewing the **vocabulary list** as a class, and asking the students if they know the definitions of any of the words. Students will be filling in the definitions of the vocabulary words as they move through the PLT and learn the definitions through context clues.

Scaffolding Module I begins by introducing students to the problem of global warming and the resulting climate change. After a brief classroom discussion to help orient students to the ideas of global warming and climate change, show the two embedded videos and have students take notes in their student logs and answer the accompanying questions.

In Scaffolding Module II, introduce students to a few of the "solutions" people have come up with around the world to help protect species from climate change. Then, have students answer the discussion question in pairs, small groups, or as a class.

Scaffolding Module III narrows its focus to Hawaii and discusses some of the problems facing local species. Then, have students answer the discussion question in pairs, small groups, or as a class.

The performance task consists of three **modules**. **Module I** has students research a local species that is threatened by climate change. **Module II** asks students to come up with a viable "solution" to help the species survive. The solution can be a program, like the one run by the Community Partner Ke Kai Ola, a product, or an invention. **Module III** asks students to present their solution to an expert from Ke Kai Ola.

The accompanying rubrics have been developed to help you assess your students as they move through the stages of the PLT. Due to the nature of the PLT, students will be assessed using two scales: **The Next Generation Science Standards (NGSS)** and **the Common Core State Standards (CCSS)**.

Print or share an electronic copy of the Student Log with each student.

PERFORMANCE LEARNING TASK - ASSESSMENT MAP

Scaffolding Modules Formative Instruction and Learning Standards		Performance Task Modules Assessment Learning Standards	
Scaffolding Module 1 <ul style="list-style-type: none"> Students fill out a list of relevant vocabulary words together as a class. Students learn about the concept of climate change and some of the impacts it has. Students answer questions related to content. 	Scaffolding Module 1 Fill out Vocabulary words <ul style="list-style-type: none"> L.4.4 (CCSS) ESS2.D: Weather and Climate Learn about climate change and its impact on species <ul style="list-style-type: none"> 3-LS3-1 (NGSS) 3-LS3-2 (NGSS) Engage in collaborative discussion <ul style="list-style-type: none"> SL.4.1 (CCSS) Answer questions about climate change <ul style="list-style-type: none"> RI.4.2 (CCSS) 3-ESS2-2 (NGSS) LS4-C: Adaptation (NGSS) 	PT Module I <ul style="list-style-type: none"> Students conduct research on a species that is threatened by climate change in or around Kona 	PT Module I Conduct Research <ul style="list-style-type: none"> W.4.7 (CCSS) 3-5-ETS1-1 (NGSS)
		PT Module II <ul style="list-style-type: none"> Students come up with a simple solution to the problem they researched in Module I 	PT Module II Design a solution <ul style="list-style-type: none"> 3-5-ETS1-2 (NGSS) RI.4.9 (CCSS) W.4.1 (CCSS)
Scaffolding Module II <ul style="list-style-type: none"> Students learn about some of the "solutions" humans are coming up with to help species suffering as a result of climate change. 	Scaffolding Module II Learn about some solutions <ul style="list-style-type: none"> 5-ESS3-1 (NGSS) Answer questions about solutions <ul style="list-style-type: none"> RI.4.3 (CCSS) 	PT Module III <ul style="list-style-type: none"> Students present their solution to their class and staff from Ke Kai Ola 	PT Module III Present solution <ul style="list-style-type: none"> SL.4.4 (CCSS) SL.5.5 (CCSS)
Scaffolding Module III <ul style="list-style-type: none"> Students learn about specific ways climate change is impacting Hawaii Students are then introduced to Ke Kai Ola, the Monk Seal Hospital in Kona 	Scaffolding Module III Learn about problems in Hawaii <ul style="list-style-type: none"> ESS3.C: Human Impacts on Earth Systems (NGSS) Learn about Ke Kai Ola and answer questions <ul style="list-style-type: none"> RI.4.5 (CCSS) RI.4.9 (CCSS) 5-ESS3-1 (NGSS) 	<div> Key for Standards L: Language (Vocabulary) SL: Speaking and Listening RI: Reading Science Information W: Writing </div>	

STANDARDS IN SCAFFOLDING MODULES:

Common Core Standards (CCSS):

L.4.4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

SL.4.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

SL.4.4: Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

SL.5.5: Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

RI.4.2: Determine the main idea of a text and explain how it is supported by key details; summarize the text.

RI.4.3: Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

RI.4.5: Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

RI.4.9: Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.

W.4.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

W.4.7: Conduct short research projects that build knowledge through investigation of different aspects of a topic.

Next Generation Science Standards (NGSS):

3-LS3-1: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

3-LS3-2: Use evidence to support the explanation that traits can be influenced by the environment.

LS4-C: For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.

3-ESS2-2: Obtain and combine information to describe climates in different regions of the world.

5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

ESS2.D: Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.

ESS3.C: Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

PERFORMANCE LEARNING TASK (PLT) STRUCTURE AND FINAL PRODUCT

Community Resource

The community resource for this PLT is a small branch of the Marine Mammal Center called Ke Kai Ola ("The Healing Sea") which is located in the Natural Energy Laboratory of Hawaii Authority (NELHA) science camp in Kona on Hawaii Island. Ke Kai Ola works to rescue young, malnourished Hawaiian Monk Seals. These seals are suffering the results of climate change and human impact on and around the Hawaiian Islands. The mission of Ke Kai Ola is to care for them until they are ready to be released back into the wild.

For the purposes of this PLT, students will learn about Ke Kai Ola's mission and practices. The students will then use this information to inform how best to help preserve other species (plants and animals) that are being threatened by a changing climate and the impact of humans on the Hawaiian islands and surrounding waters.

- For more information on NELHA, visit their website: <http://nelha.hawaii.gov>
- For more information on Ke Kai Ola, visit their website: <http://www.marinemammalcenter.org/what-we-do/ke-kai-ola/>

Scenario

Your students are part of a group of scientists working in Kona who have been tasked with identifying a species on or around the islands of Hawaii that has suffered as a result of Climate Change. Students will be presented with a species that is threatened by climate change and then design a solution for how to help, using the geographical, geological, and natural resources of Kona. The species you research can be a plant or an animal and the impact of climate change can range from effects on the species itself to effects on the environment that supports it.

Questions/Topics of Focus:

- What is an impact of Climate Change affecting Hawaii?
- How can I design a solution to address this problem?

Final Product: Presentation of the problem they have researched and their proposal for a solution.

Define Vocabulary Words

Begin the PLT by having students turn to the vocabulary list on page 3-4 of their Student Logs, and start to define these words together as a class. Ask students if they know what each word means, and help the class to arrive at a good definition through discussion.

Vocabulary:

Atoll: a ring-shaped coral reef or a string of small coral islands

Biome: a place with a specific climate that supports certain species

Breeding: when humans intentionally put two individuals from the same or similar species together to mate and have offspring

Climate change: the visible effects of Global Warming

Conservation: protection and preservation of things found in nature (such as plants, animals, and habitats)

Erosion: the disappearance of land that has been worn away or ground down by human or natural impact

Habitat: the natural home of an animal or plant

Migration: when animals move from one area to another

Offspring: the child of an animal or plant

Tolerant: able to survive in a certain environment or circumstance

SCAFFOLDING MODULE I – INTRODUCTION TO THE IMPACTS OF CLIMATE CHANGE

Guiding Questions/Topics for Classroom Discussion: What is climate change? Who does it impact?

Have a classroom discussion to introduce students to the concept of climate change.

DISCUSSION POINTS FOR INSTRUCTOR:

- Climate Change is more than just Global Warming
 - **What is Global Warming?**
 - Global Warming causes the planet to get warmer
 - Hotter temperatures change the planet
 - One example is that the ice caps in the North Pole melt when it is hotter
 - **Climate Change is the visible effects of Global Warming** – meaning the things we can see and measure.

Ask the class to think about an example that impacts them

- Raising sea levels
 - Hotter temperatures
 - Snow melting on the mountains
- Changes in temperature contribute to the extinction of plants and animals

Show this video from the Peggy Notebaert Nature Museum to learn about Climate Change and how it's affecting plants and animals around the world:

<https://www.youtube.com/watch?v=yD6khRIL0tc>



Ecosystems and Climate Change

Have students answer the questions on page 5 in their student logs about what they see in the first video and then go over the answers as a class.

What is Climate Change? Who does it impact?

Questions about first video:

1. What is a biome? What are some examples of biomes?

Possible Responses:

- A place with a certain climate that supports certain species.
 - A climate is defined as “the average weather over time”
- Examples: deserts, jungles, tundra, forests, tropical islands, etc.

2. Does climate change affect all plants and animals in the same way? Why or why not?

Possible Responses:

- No, some species are more affected than others because they are more sensitive to smaller changes.
- Humans are more capable of adapting than many other animals so sometimes we forget that many other species cannot simply put on a sweater or turn on the air conditioner.
- Plants are in more danger than animals because they cannot move themselves.
- Some organisms within the same species and habitat are better adapted for the conditions associated with climate change.

3. Why does moving plants and animals to another place not always work?

Possible Responses:

- Species are adapted to more than just temperature – they are also adapted to: hours of daylight, soil, amount of rain, etc.

Show this video to teach about some species in other parts of the world that are being affected by climate change.

Video is 9 minutes long and contains information that may be upsetting to students about the extinction of certain species.

https://www.youtube.com/watch?v=B_73M4FHbOw



Global Warming and its Effect on Wildlife

Ask students to answer the questions on page 6 in their student logs about what they see and then go over the answers as a class.

Questions about Second Video:

1. What are some major disasters we see that are caused by global warming?

Possible Responses:

- Floods
- Fires
- Droughts
- Temperature Extremes

2. What are some of the species being most impacted by global warming and how?

Possible Responses:

- Frogs – over 70 species already extinct from changes in temperature
- Polar Bears and Penguins – natural habitat disappearing
- American Pika – cannot withstand high temperatures
- Fish such as Salmon – decreased flow of rivers & increasing water temperature
- Sea Turtles – changes to mating habits and gender of baby turtles
- Alpine Butterfly – affected by rising tree line and disappearing meadows

SCAFFOLDING MODULE II– HELPING SPECIES ADAPT TO CLIMATE CHANGE

Students will now read about some examples of humans finding solutions to help species adapt to and survive climate change. Students should read along beginning on page 7 of their Student Logs.

1. Blinky Drinkers for Koala Bears in Australia

Usually Koala Bears get their water from the leaves of the Eucalyptus trees. Now, **hot dry weather** caused by **climate change** has caused many of the trees to dry up or fall, and **koala bears are going thirsty**. An Australian farmer named Robert Frend came up with **a solution**. He invented the “Blinky Drinker,” a watering station that attaches to trees, so koala bears can safely drink water without leaving their homes in the trees.



Robert Frend and a baby koala bear
(image via <http://honesttopaws.com/koalas-blinky-drinkers/>)

2. Monarch Butterfly Habitat Exchange

One of the things **endangering** the monarch butterfly population is the disappearance of one of their favorite foods: **milkweed**. Milkweed is a flowering plant that naturally grows in prairies and grassy roadsides. However, with **climate change** causing **higher temperatures and less rain in certain parts of the country**, milkweed is not growing like it used to. This makes it difficult for the butterflies to survive.

The Monarch Butterfly Habitat Exchange is a program started by the **Environmental Defense Fund** to help the butterflies. The program pays farmers to grow and tend to milkweed in their fields, replacing the lost food for the butterflies, and **helping them to survive**.



A Monarch butterfly feeding on milkweed.

(Image via <https://www.edf.org/ecosystems/monarch-butterfly-habitat-exchange>)

3. Assisted Migration and Intentional Breeding for the American Pika

The American Pika is a small mammal that lives in cold areas. American Pikas **cannot survive in hot weather** and are in danger from rising temperatures. Scientists believe that helping the American Pika **migrate** to cooler areas may help them survive. This is one example where moving a species can work.

Another possible solution is **breeding** Northern Pikas with Pikas from farther south. Southern Pikas are more **tolerant** to hotter temperatures. Scientists believe the **offspring** of the Northern and the Southern Pikas should be able to **survive hotter temperatures**.



An American Pika

(image via <http://www.latimes.com/nation/la-oe-smith-pika-evolution-climate-change-20140922-story.html>)

Question for Discussion

Ask the class to answer these questions during a classroom discussion and take notes in their logs on page 10:

What have humans done or are planning to do to help these three species affected by climate change? List specific actions for each.

Koala Bears

Koala bears were suffering from thirst because of hot, dry weather that is affecting the trees that they live in. To help the koala bears, one Australian farmer invented a water bottle that can hang on the trees. The invention is called a "Blinky Drinker" and allows the koala bears to drink water while staying in the trees.

Monarch Butterflies

The Monarch Butterflies were dying because they did not have enough milkweed to eat to survive. The Monarch Butterfly Habitat Exchange paid farmers to plant more milkweed in their fields. This helps the butterflies have enough food on their migration.

American Pika

The American Pika cannot survive in hot weather. To help the pikas adapt to climate change, scientists want to move them to cooler areas. They also want to try breeding them with another kind of pika who can survive in warmer temperatures.

SCAFFOLDING MODULE III – EXAMPLES OF CLIMATE CHANGE IN HAWAII

Have a brief classroom discussion to discuss some of the impacts of Climate Change that can be observed in Hawaii. Ask students for examples of these impacts that they know about, either from personal experience, or that they have learned about.

Then discuss these examples, which are included in the Student Logs, to show how Climate Change is impacting the islands of Hawaii.

1. Rising temperatures are causing the snow on Mauna Kea to melt.



Discussion Points:

- Mauna Kea is the highest point in Hawaii
- Near the summit, Mauna Kea has a layer of permafrost. Permafrost is rock, ice, or soil that stays frozen throughout the year.
- Climate change is causing the permafrost to melt. In some areas, scientists have documented 90% loss of permafrost layer.

2. Changes to trade winds impact rain patterns resulting in extreme drought and flooding



(image via <http://www.hawaiiwildfire.org/news-center/parched-driest-january-on-record-parts-west-hawaii>)



(image via <http://westhawaiitoday.com/news/local-news/heavy-rains-cause-flooding-kona-area>)

■ Discussion Points:

- Trade winds are winds that blow from the East, close to Earth's surface in tropical areas.
- Warming ocean temperatures has caused trade winds to weaken.
- Trade winds usually bring rain to the island, so weaker trade winds have led to less rainfall and increased drought.
- Reduced trade winds cause the ocean's surface to warm even more and sea levels to rise. This can lead to coastal flooding.

3. Rising sea levels from melting glaciers cause coastlines and atolls to disappear



The Kure Atoll in the Hawaiian islands (image via: https://en.wikipedia.org/wiki/Kure_Atoll#/media/File:KureISS006-E-29046.PNG)

Discussion Points:

- Increased ocean temperatures have caused glaciers to melt and sea levels of Earth's ocean's to rise.
- Rising sea levels cause flooding along Hawaii's coastlines and atolls.

Introduction to Ke Kai Ola



Monk Seal Hospital

Located in Kona

Helping Monk Seals Survive A Changing Climate

Adapting to a New World: Monk Seals and Ke Kai Ola

One species being impacted by these changes are **Hawaiian Monk Seals**. Monk seals are marine mammals native to the Northwest Hawaiian Islands. Rising sea temperatures and the **erosion** of coastal lands are threatening the survival of this native Hawaiian species.



Scientists in Kona are doing something to help Hawaiian Monk Seals survive. They built a hospital where they nurse young and malnourished monk seals back to health then release them into the wild once they are adults, so that they can live on their own. The monk seal hospital is called Ke Kai Ola, and is a great example of how people can help animals survive Climate Change.

Show these videos about Ke Kai Ola to learn more about how scientists in Kona are helping the monk seals:

Video 1: Hawaiian Monk Seals and Climate Change

https://youtu.be/plgqwGuH_ks



Hawaiian Monk Seals and Climate Change

Video 2: Ke Kai Ola

<https://youtu.be/sQjoK59OL6Y>



Ke Kai Ola Overview

Question for Classroom Discussion

How does climate change impact monk seals?

Climate change contributes to the erosion of the shores where monk seals live and raise their young. It also has caused some of their food sources to disappear.

What is Ke Kai Ola's solution to this problem?

Ke Kai Ola rescues sick young seals and nurses them back to health. Then they release them so they can live in the wild again.

PERFORMANCE TASK MODULES

Tell students that they'll be using Ke Kai Ola as an example of how people are helping animals facing problems caused by climate change. Students will research another animal or plant species facing problems in Hawaii, and come up with their own solutions.

MODULE I: Students Conduct Research

Students conduct research on a plant or animal species on the islands of Hawaii facing risks and dangers due to the effects of Climate Change.

Divide students into groups of 3-4 and assign each group one of the three options: Honeycreeper Birds, Haleakala Silverswords, and Coral Reefs.

Students will conduct research on the problem and existing efforts to solve or better the issue. Research links for getting started are provided below. Please note that some of the research links may be above reading level for Grade 3-5 students. *The Research Template*, included here with multiple copies in the student journal, will help guide students through challenging texts and the excess of information on the internet.

Research Guidelines found in the Student Log:

RESEARCH GUIDELINES:

- Use the links as a starting point. Then, look for 3-4 additional sources of your own.
- Work with your partners to identify main ideas and supporting details. Complete the Research Chart for each source.
- Find other resources like books, videos, and websites to answer additional questions. Always look for a **reliable source** like a major news source or government website. Using websites that end in .edu, .gov, .org can help you find the most reliable sources.

GUIDING QUESTIONS FOR RESEARCH:

- What are the problems this species faces?
- What are the causes of these problems?
- What solutions or adaptations, if any, already exist?
- What more do you need to know?

Resources about Hawaii and Climate Change:

- <http://nca2014.globalchange.gov/highlights/regions/hawaii>
- <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-hi.pdf>
- http://www.defenders.org/sites/default/files/publications/climate_change_and_hawaii.pdf

Research Template

SOURCE TITLE & AUTHOR	
Main Ideas:	
Key details:	
Which Guiding Questions does this research help answer? (Write questions & answers below.)	
What other questions do I have?	

Research Links:

Honeycreeper Birds



Research Links for the Honeycreeper

- <https://www.zmescience.com/ecology/animals-ecology/climate-change-hawaii-birds-08092016/>
- <https://kids.britannica.com/students/article/Hawaiian-honeycreeper/325926>
- <https://www.sciencedaily.com/releases/2009/05/090526140840.htm>
- <https://www.youtube.com/watch?v=lkDGA4GF4jk>

Haleakalā Silversword



Research Links for the Haleakalā Silversword

- <https://www.livescience.com/26340-hawaii-silverswords-dying-climate-change.html>
- <https://www.nps.gov/hale/learn/nature/silversword.htm>
- <http://www.kindofcurious.com/2010/02/eleven-amazing-things-about-haleakala.html>
- <http://www.arkive.org/hawaiian-silversword/argyroxiphium-sandwicense/image-G81380.html>
- <https://blogs.scientificamerican.com/extinction-countdown/amazing-hawaiian-plant-loved-endangered-climate-change/>

Coral Reefs



Research Links for the Coral Reefs

*In the case of Coral Reefs, students may choose to focus on the coral itself as a species, or may approach the coral reefs as a dying habitat, and focus on any plant or animal species that naturally lives in coral reefs.

- <http://kids.nceas.ucsb.edu/biomes/coralreef.html>
- <https://www.popsci.com/hawaii-coral-reefs-bleaching>
- <http://dlnr.hawaii.gov/coralreefs/climate-change-and-marine-disease/>
- <https://video.nationalgeographic.com/video/coral-reefs>
- <https://climatekids.nasa.gov/coral-bleaching/>

MODULE II: Students design a solution.

Students will design a possible solution to the problem and do additional research in order to outline processes and provide support for their proposed solution. This may address the direct needs of the species, or may address a root of the problem connected to climate change or another environmental factor.

1. Design a solution that addresses one of the needs of the endangered species, climate change, or another human activity that is contributing to the species' endangerment.
2. Research should also identify additional questions that would need to be answered in order to implement the proposed solution.
3. Specify whether your solution directly helps the species you studied (like the monk seal hospital), helps to offset the effects of climate change that are endangering the species (like green roofs), or helps to solve another environmental issue affecting the species (like a beach cleanup).

MODULE III: Students present their plan.

Students will organize their research into a presentation that explains the problem and presents their proposal for a solution.

The presentation should include some or all of the following:

- A clear description of the problem
- A clear description of the solution
- Found or created images
- Found or created videos
- Graphs or charts to help explain the problem
- A PowerPoint
- A Question and Answers portion at the end in case someone has more questions

PERFORMANCE ASSESSMENT RUBRIC

How to use this rubric:

Collect the Student Logs once the project is completed.

Student performance is graded on a scale from 0-3, 0 indicating that the student did not participate in the activity assessed by the standard, and 3 indicating that the student is demonstrating the highest level of expected performance and competency.

The CCSS is used to assess students' reading, writing, research, speaking and listening skills, including those associated with collaboration, conversation, and presenting.

The NGSS is used to assess students' ability to understand scientific reasoning, information, and processes.

Both sets of standards incorporate Critical Thinking and Analytical Reasoning skills, including student's ability to analyze information and synthesize ideas to create a coherent argument or solution to a problem.

Total points should not be tallied and there is no final score. Instead, the rubric should be used to identify areas of strength and weakness, either with individuals or with your entire class, so that you may tailor your instruction to address these areas.

PERFORMANCE ASSESSMENT RUBRIC

Standard	No Score	1	2	3
W.4.7 (CCSS) Conduct short research projects that build knowledge through investigation of different aspects of a topic.	Student does not conduct research.	Student demonstrates evidence of having completed minimal research using only the provided links and minimally filling out research guidelines in their student logs.	Student demonstrates evidence of having completed research using the provided links and one or two outside sources, partially filling out research guidelines in their student logs.	Student demonstrates evidence of having completed thorough research using provided links and multiple outside sources and completing research guidelines in their student logs.
3-5-ETS1-1 (NGSS) Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	Student does not identify a problem associated with climate change's impact on a species.	Student demonstrates minimal understanding of the problems impacting the assigned species and how it relates to climate change.	Student demonstrates an understanding of the problems impacting the assigned species and how it relates to climate change.	Student demonstrates a thorough understanding of the problems impacting the assigned species and makes strong connections to how it relates to climate change.
3-5-ETS1-2 (NGSS) Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	Student does not generate a solution to a problem associated with climate change's impact on a species.	Student identifies a problem but generates a solution that does not adequately address the problem and/or does not draw on any sources.	Student identifies a problem and generates a solution that adequately addresses the problem, drawing on a few sources and/or classroom discussions.	Student identifies a problem and generates a solution that effectively addresses the problem, drawing on multiple sources and classroom discussions.
RI.4.9 (CCSS) Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.	Student does not integrate information from sources into solution.	Student integrates vague information from one source into their solution, using sparse details to support the solution.	Student integrates information from two or three sources into their solution, and uses some specific details to support the solution.	Student integrates strong and supporting information from various sources and classroom discussions into their solution, using multiple specific details to support the solution.

W.4.1 (CCSS) Write opinion pieces on topics or texts, supporting a point of view with reasons and information.	Student does not develop a proposed solution to address a climate change problem.	Student gathers some vague information, focusing mostly on extraneous details, to develop an argument for how and why their solution addresses the problem, but does not identify additional questions or specify the nature of the solution.	Student gathers relevant information to develop an argument for how and why their solution addresses the problem, including identifying one or two additional questions and specifying the nature of the solution.	Student gathers important and relevant information, leaving out extraneous details, to develop a strong argument for how and why their solution addresses the problem, including identifying additional questions and specifying the nature of the solution.
SL.4.4 (CCSS) Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.	Student does not report on project.	Student does produce a presentation, but the presentation is disorganized and does not use relevant and descriptive information to support main ideas and arguments. The presentation is difficult to follow and understand.	Student produces a presentation that is organized around a solution and uses relevant and descriptive information to support the main idea. Student speaks clearly.	Student produces a strong presentation that is well organized around a solution and uses multiple pieces of relevant and descriptive information to strongly support the main idea. Student speaks clearly and the presentation is easy to understand.
SL.5.5 (CCSS) Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.	Student does not include multimedia components in presentation and/or student does not report on project.	Student incorporates one or two graphics into presentation that vaguely connect to the main ideas.	Student incorporates multiple graphics and/or media into presentation which works to support the main idea.	Student incorporates multiple graphics and media into presentation which strongly support the main idea and clearly demonstrates the ideas that are better shown using media.



S O F O S
Learning Solutions