



## Wildfires: Impact of Climate Change

### TEACHER'S GUIDE

**Grades:** 8 – 12

**Subjects:** Science and Environmental Science

**Purpose:** Students will learn how an ecosystem can be affected by climate change, which affects the ecosystem's overall health. The first lesson will be focused on watching a virtual field trip, "Climb-it Change," and answering guided questions with intermittent pausing throughout the video. The second part of the lesson will be a research activity about wildfires. The third lesson will be a student presentation on the student-led research. This guide contains a set of discussion questions and answers for any grade level, which can be used during and after the virtual field trip. It also contains links to additional resources ranging from lessons, activities, videos, demonstrations, experiments, and multimedia presentations.

**Essential Question:**

- How can the health of an ecosystem be affected by climate change?

**Supporting Questions:**

- Can wildfires leave a measurable impact on an ecosystem?
- How can we, as individuals, raise awareness towards an environmental issue?

**Time Frame:** Three (3) 50-minute sessions, or three block schedule sessions

**Description:** The impacts of climate change can be seen in ecosystems in many ways. Some effects can be minor, and some can be more detrimental to the overall health of the ecosystem. Since ecosystems can manage changes (or disturbances) well for a certain amount of time, disturbances can often be seen through long-term research or research projects that look at changes throughout a period, as seen in the Climb-It Change documentary.

Wildfires in the Western United States have become more severe in recent years and have become more frequent at higher elevations, where fires were historically rare. Even though wildfires are a naturally occurring process, they have increased due to climate change and human impacts. Scientists have conducted research focused on the impacts of wildfires on ecosystems. Overall, wildfires can affect ecosystem dynamics, which is the study of changes in ecosystem structure caused by environmental disturbances or internal forces. Throughout this brief unit, students will understand how these processes occur and how they can be agents of change in the face of a warming planet.

## **Objectives:**

The student will...

- Understand the adaptations and climate change impacts on an alpine plant species: the spotted Saxifrage (*Saxifraga austromontana*)
- Explain how wildfires are affecting the alpine mountain ecosystem
- Compare and contrast mountains in the Northwestern United States
- Draw a detailed picture of the plant species *Saxifraga austromontana* to display its adaptations to its environment
- Research wildfires as an impact of climate change
- Summarize research to raise awareness about an environmental issue

## **Standards:**

### **Next Generation Science Standards- Middle School**

- MS-LS2 Ecosystems: Interactions, Energy, and Dynamics

### **Crosscutting Concepts**

- Patterns
- Cause and Effect
- Energy and Matter
- Stability and Change

### **Disciplinary Core Ideas:**

- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
- LS4.D: Biodiversity and Humans
- ETS1.B: Developing Possible Solutions

### **Science and Engineering Practices**

- Analyzing and Interpreting Data
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence

### **Performance Expectation Middle School**

Students who demonstrate understanding can:

- A. MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- B. MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

## Next Generation Science Standards - High School

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

### Crosscutting Concepts

Cause and Effect  
Systems and System Models  
Energy and Matter  
Stability and Change

### Disciplinary Core Idea:

LS2.C: Ecosystem Dynamics, Functioning, and Resilience  
LS4.D: Biodiversity and Humans  
ETS1.B: Developing Possible Solutions

### Science and Engineering Practices

Constructing Explanations and Designing Solutions  
Engaging in Argument from Evidence

### Performance Expectation High School

Students who demonstrate understanding can:

- A. HS-LS2-6. Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new ecosystem.
- B. HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

## Common Core Standards

### 6th-8th Grade Science and Technical Subjects

- CCSS.ELA-Literacy.RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts.
- CCSS.ELA-Literacy.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.
- CCSS.ELA-Literacy.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- CCSS.ELA-Literacy.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- CCSS.ELA-Literacy.SL.8. Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

### **Common Core English and Language Arts Standards for Writing Grade 6-8**

- CCSS.ELA-LITERACY.WHST.6-8.2. A Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- CCSS.ELA-LITERACY.WHST.6-8.2. B Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
- CCSS.ELA-LITERACY.WHST.6-8.2. D Use precise language and domain-specific vocabulary to inform about or explain the topic.
- CCSS.ELA-LITERACY.WHST.6-8.6 - Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

### **Common Core English and Language Arts Standards for Writing Grades 9-12**

#### **Grades 9-10**

- CCSS.ELA-LITERACY.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
- CCSS.ELA-LITERACY.RST.9-10.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- CCSS.ELA-LITERACY.RST.9-10.8 Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.
- CCSS.ELA-LITERACY.RST.9-10.9 Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

#### **Grades 11-12**

- CCSS.ELA-LITERACY.RST.11-12.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- CCSS.ELA-LITERACY.RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- CCSS.ELA-LITERACY.RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- CCSS.ELA-LITERACY.RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**Vocabulary:**

- **Alpine Ecosystems** – Alpine environments are defined as being **high elevation, cold, windy, and snowy**, and characterized by low growing season temperatures and a very short frost-free period.
- **Controlled burn or prescription fire** – This is the intentional application of fire to live or dead vegetation for land management purposes.
- **Ecosystem Dynamics** – This is the study of the changes in ecosystem structure caused by environmental disturbances or by internal forces.
- **Elevation** – This is distance above sea level. Elevations are usually measured in meters or feet.
- **Hydrophobic** – Meaning “water fearing.” Hydrophobic compounds do not dissolve easily in water and are usually non-polar.
- ***Saxifraga austromontana*** – Is the scientific genus and species name of the alpine plant species known as spotted Saxifrage as its common name.
- **Wildfire** – A wildfire is an unplanned fire that burns in a natural area such as a forest, grassland, or prairie. Wildfires are often caused by human activity or a natural phenomenon such as lightning, and they can happen at any time or anywhere.

### **Overview of Lessons:**

**Day 1:** Students will first watch an engaging documentary on graduate research focused on how wildfires have affected a plant species located in the mountains of Northwestern United States. Through this informative video, students will be exposed to research conducted on plants found in alpine ecosystems. Students will have questions to answer throughout the video to serve as a formative check for understanding.

Please use the following [Student Worksheet Handout](#) for your students. The document can be copied and edited as needed for your students.

For a follow up activity, you may pick between the following two options or assign both:

- **Option 1** - Students will create a T chart to observe and discuss the differences between the mountains that Trevor and Matt traveled to during their research.
- **Option 2** - Students will conclude day 1 by working on a drawing and labeling activity based on the main plant species discussed in the documentary.

**Day 2:** Students will continue discussing this topic by doing research on wildfires and their causes. This will lead into a short project to be started and completed by the end of day 3. The project will be presenting a summary of research collected on wildfires to raise awareness of this problem and how human activities have heightened wildfires in recent years.

**Day 3:** Students will finish their research and present their summary of research. These can be presented in class. The summaries should be two minutes to two and a half minutes long.

**Day 4 (Optional extension):** Students will understand how they, as individuals, can take action in their communities and develop an action plan.

### ***Block Scheduling Considerations***

If this lesson is to be used in a classroom that uses a block schedule, the following adaptations can be made.

1. Day 1: Including part 3, part 4 and part 5 would be class #1
2. Day 2: Research, notetaking, and practicing presentations would be class #2
3. Day 3: Presentations, questions, and providing classmate feedback would be class #3

## **Day 1- Lesson Plan & Activities**

### **Objectives:**

Students will understand an impact of climate change through a documentary about research on plants found in alpine ecosystems in the Northwestern United States.

### **Materials:**

For each group of students/individual student:

- Notebook paper or journal
- Pencil or pen
- Coloring pencils – Optional
- Blank Copy Paper
- Computer or laptop
- Projector or Screen Casting Capability
- [Wildfires - World Health Organization](#) – Article
- [Prescription: Fire](#) - Article
- [Controlled Burning YouTube Video](#)
- [Student Worksheet Handout](#)
- [Climb-It Change Video](#) - [Link Here](#)

### **Part 1: Engage – Impacts of Climate Change**

1. Start the lesson by leading a conversation about climate change and, specifically, the impacts of climate change. Ask students: *What are some of the impacts or consequences of climate change that you have learned about in the past either in a class or in media?*
2. Share this first article: [Wildfires - World Health Organization](#) with students to discuss what a **wildfire** is. This will assist in building context towards this lesson. Discuss the definition of a wildfire at the beginning of the article.
3. Share this second article: [The Nature Conservancy Article – Prescription: Fire](#) with your students to review what causes wildfires and how scientists are working to prevent them.

4. Within this article, watch the video embedded to give context to your class about a couple of causes of wildfires and how this is different from a naturally-occurring controlled fire known as a **controlled burn or prescribed fire**. [Linked here](#) is the video on YouTube.
5. Explain to students that they will be working on a short term project related to the effects of climate change and what people can do to help these problems. This project will be broken down into a few parts, starting with a documentary to give students insight into related research on a climate change concern.

## **Part 2: Explore** - *Climb-It Change Documentary*

1. Display the documentary to watch with students:
  - Climb-It Change Video – Vimeo [Link Here](#)
2. Explain before beginning that during the video, you will be pausing to answer questions individually and to pay close attention to the different ecosystems as there is an activity to complete after watching the video.
3. Play the documentary and pause to discuss each question and lead a guided, scaffolded viewing of the full-length documentary. (Suggested: Pick 6 out of the 8 to pause and discuss).

**Discussion Questions:** You can use or adapt these questions for a follow-up discussion with your students after viewing the virtual field trip or pause as you go along.

1. What challenges did Trevor and Matt face during their hikes?  
*A: Some of the challenges were: Fatigue from ongoing days of hiking and climbing (Two mountains a day at times), Flooding at one of the mountain sites.*
2. What states and provinces did Trevor and Matt travel to?  
*A. Washington, Idaho, Colorado, Wyoming, and Montana.*
3. What were the data collecting measurements they used to study the plants in each ecosystem?  
*A: Time based Search 1 Hour, species abundance in each area, species density, soil samples (to detect the presence of charcoal from a fire), substrate samples (to look at rocks)*
4. Is it expected that plants would be the same in high elevations vs. low elevations? Why or why not?



*A: Plants in higher elevations have different adaptations and life spans than plants at lower elevations.*

5. What are some visual differences from the mountains they traveled to?

*A: Different plant species: some have more trees; some have more flowers. Snowy vs. more forested mountains.*

6. How much was the estimated percentage of loss in the plant species by 2050?

*A: Estimated 40%*

7. From the information given by Trevor, what do you think a predictive model is?

*A: A predictive model is created from a mathematical process used to predict future events or outcomes by analyzing patterns found in a set of data.*

8. Towards the end of the video, Trevor mentions some concluding thoughts and advice. Which message of his resonated with you the most? Which idea could you relate to considering the conservation of natural lands and taking time to be out in nature?

*A: Answers may vary*

- *Go and see where natural resources come from. They are finite resources.*
- *Enjoy nature during our current time, because natural areas are already different than they used to be, and they are bound to change more over time.*
- *When in nature, think about things from a conservation perspective. Leaving the space as it is.*
- *Forming a personal connection to nature in hopes of creating a stronger perspective towards its protection.*



**Part 3: Explain – Activity**

*\*Best to be conducted if students have laptops to review the video on their own in small groups. If not, this can be still conducted as a class activity.*

1. As a direct follow up to the documentary, students can work in small groups to review the different mountain landscapes highlighted during Trevor’s research.
2. Explain to students that they will be analyzing and making observations of the mountain ecosystems from the documentary. Students can be broken into small groups (from 2-4 students depending on the class size) and they can pick two of the states that Trevor visited as research sites.
3. On student laptops, they may rewatch the video to look for the mountains they would like to use for their examples. If the teacher prefers, this alternatively can be conducted as a class activity.
4. Have students look up the mountains that Trevor and Matt climbed. Have them contrast two different mountains by making a T chart with three sections. Students should be analyzing any verbal information about the mountains and visual differences.
5. Some examples of differences can be - Mountain Elevation, Vegetation Type, Snowy, Forested, Rocky, etc. Students can also make observations on any other ecological differences mentioned.

**T Chart Example**

Characteristic	Mountain Name #1	Mountain Name #2
Mountain Top	Snowy	Rocky
Vegetation Type	Forest	Wildflowers
Other Characteristics	Lake / River	Burn site

**Part 4: Evaluate – Formative Assessment (Check for Understanding)**

Q: The project in total took a year and half from start to finish. Do you believe that is a long

time? Why do you think this work took Trevor so long? What are some factors that he had to consider?

*A: Open ended, students should reflect on the time it takes to start and finish a project. The documentary goes through the standard route of completing a science research project: Question, Hypothesis, Planning, Experimentation, Results, Conclusions. This can be reviewed with students as well.*

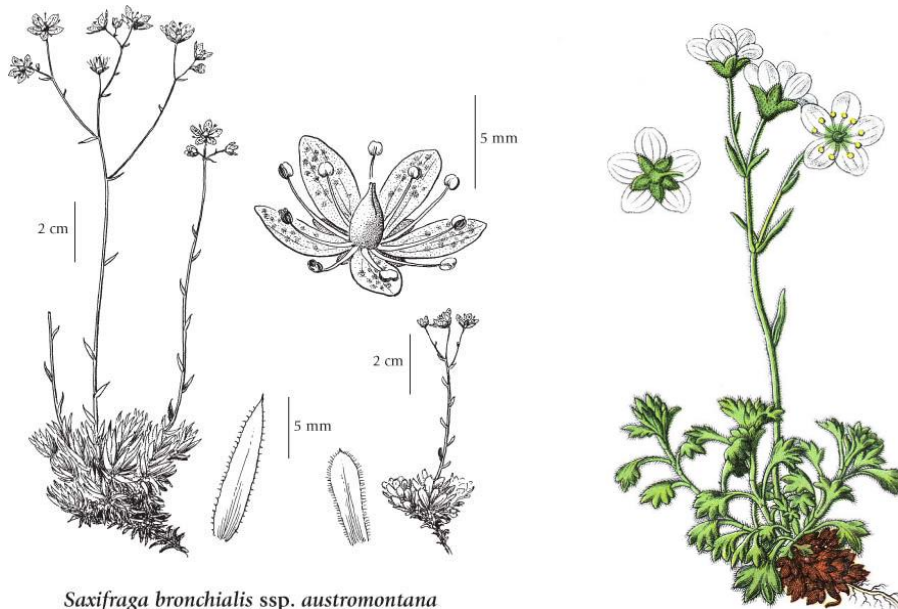
**Part 5: Extend – Time Permitting (Can be used on Day 2 as well)**

**Activity:** Drawing of *S. austromontana* and labeling its identifying features as adaptations.

**Context:** The plant species discussed in the documentary is an alpine mountain ecosystem species. Because of this, the species has gone through its own adaptations to survive in that habitat. Understanding a species' adaptations gives further context as to why it is important for an ecosystem and why it should be preserved.

1. Students will be given a blank piece of paper and guided to review the beginning of the documentary starting at [timestamp] 2:15 with Trevor explaining information on the plant.
2. Have students sketch a drawing of *S. austromontana* on their paper. They will draw the plant from the roots, stems, and flowers. Have students label the plant with the adaptations that Trevor mentions, related to the plant's stem and leaves.

**Example Pictures**



*Saxifraga bronchialis* ssp. *austromontana*

## Day 2 - Lesson Plan & Activities

**Objective:** Students will conduct research to learn more about wildfires and prepare a summary to be shared with their class. Students will share information and awareness about an environmental issue to an audience.

### Materials

For each group of students/individual student:

- Notebook or journal
- Computer or laptop
- Pen or pencil
- [The Science of Wildfires: Why they are getting worse \(Video\)](#)
- [Student Worksheet \(Digital\)](#)

### Part 1: Engage

1. Explain to the class that today they will be conducting research on wildfires to learn more about how they are caused and to learn how they can be prevented in the future.
2. Start the following video on wildfires, which gives an overview of the topic:
  - [The Science of Wildfires: Why they are getting worse \(Video\)](#)



- Discuss some of the causes of wildfires that are mentioned throughout the video.
3. Review the video with the class as needed and answer questions if any arise.

**Part 2: Explain - Research**

1. Explain to the class that today they will be working on conducting their own research on wildfires. This research will lead into a class activity in which they will present a summary of their findings.
2. Depending on the class size/classroom set up, their summaries can be conducted as an independent or small group project of two students per group.
3. Explain to students that they will be given different options as to what their focus on wildfires can be. Students may use the websites below to start their research and should be encouraged to continue researching using additional sources. Students can be advised to use reputable websites that end in .gov/.edu/.org. Students can also find information on their topic on [The Nature Conservancy's Website](#)
4. Students will research their topic and take notes to develop a summary
5. **Summary Guidelines** – A strong presentation should:
  - A. Be a verbal summary that is two minutes – two and a half minutes long
  - B. Provide information on their wildfire related topic, including research on what is being done to solve their identified problem.
  - C. Include the student’s interpretation and analysis of the solutions for their problem.
6. A sample rubric will be displayed below and can be shared with students before starting their research.

**Sample Rubric:**

Point Value Scale	0	1	2	3	4
Presentation Criteria	The presenter did not meet any of the requirements	The presenter included a minimal amount of the requirements	The presenter included a portion of the requirements and did not fully meet the expectations	The presenter met the expectations fully and included the necessary requirements	The presenter exceptionally explained in detail their wildfire topic and current solutions to this problem

**The research options are displayed below:**

- Research Option 1 – Wildfires around the world
- Research Option 2 – Wildfires in the Pacific Northwest
- Research Option 3 – Animals and plants affected by wildfires
- Research Option 4 – Communities affected by wildfires

The following websites can be shared with students to start their research.

**A. Wildfires around the world**

- [3 reasons wildfires are getting more dangerous—and 3 ways to make things better](#)
- [2022 International Wildfires](#)
- [Australian Fires Fueled Unprecedented Blooms](#)

**B. Wildfires in the Pacific Northwest**

- [3 reasons wildfires are getting more dangerous—and 3 ways to make things better](#)
- [Climate Change Impacts in the Pacific Northwest - The Nature Conservancy](#)
- [Wildfires Erupt in the Pacific Northwest](#)

**C. Animals and plants affected by wildfires**

- [3 reasons wildfires are getting more dangerous—and 3 ways to make things better](#)
- [The Effects of Fire on Rare Plants](#)
- [How Does Wildfire Impact Wildlife and Forests?](#)
- [Australia's fires 'killed or harmed three billion animals](#)

**D. Communities affected by wildfires**

- [3 reasons wildfires are getting more dangerous—and 3 ways to make things better](#)

- [The Indigenous Peoples Burning Network in Action - The Nature Conservancy](#)
- [Wildfires Impact Minorities - The Nature Conservancy](#)
- [Fighting Fire With Fire \(Australia\) - The Nature Conservancy](#)

Students are expected to work on their research, take notes, and begin developing their summary for the class period.

### **Part 3 – Extend**

1. Time permitting, students may work on practicing their summary with classmates in the class.

## **Day 3 - Lesson Plan & Activities**

**Objective:** Students will present their wildlife related research to their class.

### **Materials:**

For each group of students/individual student:

- Notebook paper or journal
- Computer or laptop
- Projector or Screen Casting Capabilities
- Timer or Cell Phone Timer
- Kahoot Activity – [Link Here](#)

### **Part 1: Engage –**

1. Display the following link for students, either on a projector or for them to look at on their laptops: [Fire and Smoke Interactive Map](#)
2. Explain to students that this is an interactive map to look at smoke and fire levels in the North America region, including Alaska, parts of Canada, Mexico, and Puerto Rico. The map shows air quality levels and active fires as well.
3. Go through any current active fires or low air quality areas displayed by using the legend and ask students: *Why do you believe there are active fires in this area? Why do you believe the air quality is low at these locations?*

**Part 2: Explain –**

1. Explain to students that today we will be presenting our research on wildfires. The rubric / expectations can be reviewed during this time as needed.
2. Depending on the class time allotted, students may review and prepare for their presentation. This may take up to 15-20 minutes depending on the class size. This would be an appropriate time for practicing with another student.

**Part 3: Explore –**

1. Students will begin their presentations. Remind students of their time limit to avoid overly long presentations. As each presentation ends, provide time for a Q&A from classmates and yourself, which can take 1-2 minutes.

**Part 4: Extend –**

1. Kahoot activity on the Climb-It Change Documentary and Wildfires – [Kahoot Link Here](#)

**Day 4- Lesson Plan & Activities (Optional extension)**

**Objective:** Students will understand how they, as individuals, can take action in their communities and develop an action plan.

**Extension Opportunity: For Everything There Was a Season (Link)**

**Description:** Trevor's new video series explores the impacts of climate change on each of the seasons in the Greater Yellowstone Region. A changing climate alters the fragile balance of survival for both animals and plants in the Greater Yellowstone region. In these four seasonal videos, we'll show you how a changing world is impacting nature and humans – and give you tangible actions we can all use to make a positive difference.

**Part 1: Engage –**

Begin by watching all four parts of "[For Everything There was a Season](#)" either in class or prior in a blended learning model. For each video, students should answer the questions outlined. A [Socratic seminar](#) method can be used. Alternatively, teacher can lead a general class-wide discussion while watching, pausing when necessary.

**Spring** - Watch video: [Spring](#)

**Discussion:** *How does snow starting later than it historically has impact the entire ecosystem? Why*



does the delay have an impact on Spring? What are some cascading effects of the temperature changes? How do the impacts of climate change in Wyoming impact the rest of the country?

Summer - Watch video [Summer](#)

**Discussion:** What makes summer critical for species' survival? Why is the melting of glaciers important for the region and how have those been impacted by climate change? What is causing increases in fires and the length of fire season? What are some consequences of those changes?

Fall - Watch video [Fall](#)

**Discussion:** How is early snow melt impacting the Fall in the West of the United States? What kind of restoration work is being used to support wildlife? What are some restoration solutions that help tackle the pressures of climate change?

Winter- Watch video [Winter](#)

**Discussion:** How do warming temperatures impact the winter season? How is rain on snow impacting the wildlife? How is diminishing snow pack impacting communities?

### **Part 2: Reflection –**

1. As a wrap up to this topic, a discussion can be conducted on the following question: *“What can we do as individuals and as a society to address climate change?”* This activity can be used as a reflection activity for students.
2. Tell students that they will reflect on this question by individually conducting research on ways to get involved in their own communities and developing an action plan to execute.
3. Explain to students that there are ways in which they can get involved in climate change action in their local community and gain an understanding of climate change globally. The following websites provide youth-centered organizations which are working towards protecting our environment through outreach and activism work.
4. Begin by introducing students to the organization [Fridays for Future](#), which provides a map of actions showing how climate work that is happening all over the world.
5. Students should be tasked with completing research and selecting ONE action-based activity or volunteer opportunity. This can include starting something new in their own community/school or getting involved with an existing organization or group.
6. Students can *work individually or in groups of no more than 3.*
7. Using their research, *students will develop an action plan.* Provide the following criteria for their completed action plan. For accountability, you may use the outlined scoring system.
  - Define a goal (10%)

- Generate a list of intended/possible actions (10%)
  - Prepare a timeline for implementation (10%)
  - Allocate resources (10%)
  - Identify possible problems or challenges to implementation (10%)
  - Develop strategies for monitoring progress or success (10%)
  - Assign tasks equally among group members (10%)
  - Implement the plan (30%)
8. Schedule a class session at a later time in the year for students to reflect on how the implementation of their plans went and share their results with their classmates.
  9. At this time, students should use a medium of their choice or selected by teacher to present their plan and implementation results to the class. Mediums include visual presentations, digital presentations, videos, speeches.

### **Resources to share with students—**

*(These are a starting point. Educators should share some resources relevant to their local context)*

- [Denver Youth Congress \(TNC\) - YouTube Video](#)
- [Empowering Youth Changemakers for Climate Action \(TNC\)](#)
- [Climate Justice Alliance - Frontline Youth](#)
- [Fridays for Future - Take Action](#)
- [Girl Rising – Climate Education Initiative for Girls](#)
- [Sunrise Movement - Campaigns](#)

### **Additional Resources for Educators**

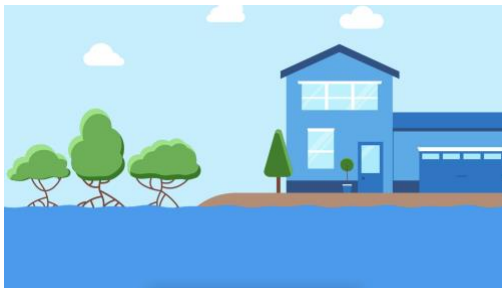
To learn more about this topic, navigate the following resources:

Article: [Alpine Tundra Ecosystem Information](#)

Article: [What are Wildfires?](#)

Article: [Southwest Colorado Wildfires](#)

**Nature Lab Related Resources:** The following lesson plans and videos can be used to supplement this virtual field trip and teaching guide. **Students will learn how climate change is impacting other ecosystems, such as coastal ecosystems and even cities!**



### **Ocean Heroes: Coastal Frontline Communities and Climate Justice**

*Grade Levels: 6-12*

The health of the oceans is suffering, and this has affected some of us more than others. Coastal communities, and those who are less-advantaged, are more at risk from rising sea levels and storms.

<https://www.nature.org/en-us/about-us/who-we-are/how-we-work/youth-engagement/nature-lab/virtual-field-trips/>

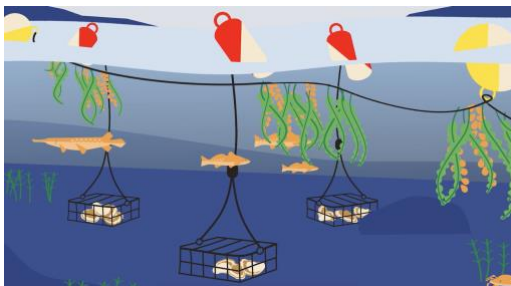


### **Changing Climate, Changing Cities**

*Grade Levels: 6-12*

Get a front-row, ground-level seat to the challenges cities face as they confront this force of nature, the solutions experts are promoting to mitigate it.

<https://www.nature.org/en-us/about-us/who-we-are/how-we-work/youth-engagement/nature-lab/virtual-field-trips/>



### **Protecting Our Oceans and Ourselves**

*Grade Levels: 6-12*

More people rely on our ocean for food, energy, transport, recreation and other natural resources than any other time in history. Effective efforts to protect our oceans so that we can continue to rely on them include coastal resilience improvement efforts such as coral reef and mangrove restoration, and restorative aquaculture, which supports seafood sustainability and healthy coastal ecosystems.

<https://www.nature.org/en-us/about-us/who-we-are/how-we-work/youth-engagement/nature-lab/virtual-field-trips/>

## HOW CAN WE MAKE OUR MATERIALS BETTER?



*We hope you have enjoyed these educational resources. As we continue to evolve, we want to develop materials that will be most beneficial for you! Please complete the following brief survey to help us adapt our materials and create environmental education resources that will be most useful for all educators.*

[Complete survey here](#)