Climate Change Adaptation

Lesson Plans for Kindergarten to Grade 12

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ECO-ENERGY
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Environment and Climate Change Canada
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Introduction: Building Climate Change Resiliency in our Students

Climate change is the most important challenge of our time and today's students will grow up to be tomorrow's leaders in the continued fight to address climate change. Even with actions to curb carbon pollution, humans will experience more intense storm events, floods, droughts, forest fires, etc. for a long time and so it is important to be prepared and adaptable. By being prepared, safe and learning about adaptation at the community level, students can feel more resilient and empowered to take on future challenges. Similar to fire safety lessons, this guide takes a practical, fun, and not scary approach to learning how to reduce risk, be prepared and safer.

It is imperative that students are given the critical thinking, problem solving, innovation, collaboration, communication and mental resiliency skills to be successful and resilient global citizens ready and prepared to deal with climate change challenges at home and in their communities. The lesson plans in this guide are a great start.

The EOS Approach

The lesson plans and activities in this guide focus on climate change adaptation and resiliency. They were developed by EOS Eco-Energy with funding from Environment and Climate Change Canada. EOS is an award-winning not-for-profit environmental organization that was incorporated in 2004 and is based in Sackville, New Brunswick, Canada. EOS is a leader in empowering local solutions to climate change challenges and helps local communities and residents reduce and adapt to climate change. EOS coordinates the Chignecto Climate Change Adaptation Collaborative, a network of more than 90 professionals working on adaptation issues in the Chignecto border region. The activities in this guide have been tested by teachers and students.

How the Guide Works

The climate change adaptation lesson plans and activities in this guide are meant for use by teachers, environmental groups, summer camp counsellors, informal educators, parents and others looking for activities to build skills in storm safety and preparedness, community-based adaptation, and personal mental resiliency to climate change. The activities have been developed with New Brunswick students in mind but can be used anywhere. Lesson plans are divided into Elementary, Middle and High School levels but many of the activities within each lesson plan can be used a wide range of ages so we suggest looking at all activities throughout this guide.

Global Competencies

This guide provides a summary of the current New Brunswick Department of Education's Global Competencies. All activities are connected to at least one important global competency that the Department would like students to gain by the time they graduate high school. Climate change is

interdisciplinary and so there are activities in this guide that connect to science, social studies, geography, art, math, health class, and more.

The activities can each stand-alone but taken together and learned through the school years, they create a progression from learning about basic environmental awareness and storm safety at home, to what can be done at the community level to adapt on a larger scale, to what they can do to ensure personal mental resiliency to climate change including how to manage climate stress. The activities at the younger levels are play-based and all activities are focused on problem solving, inquiry-based and/or involve critical thinking to find positive solutions to climate change challenges at home, in the community, or personally.

Take it Further

This guide also provides links to additional information and resources at all levels including books, websites, videos, other games and activities, etc.

Frequently Asked Questions for Teaching About Climate Change Issues

Shouldn't I be more of an expert on climate change before I teach about it?

Climate change information is changing almost as fast at the climate itself. It is a challenge to stay on top of it all, but it doesn't mean you can't start somewhere, and this lesson plan guide is a great place to begin. You can start by looking over the section with background information on climate change adaptation. You can also bring in local experts to your class, such as EOS Eco-Energy, other environmental groups or someone from your local municipal office. There are lots of videos that present an introduction to climate change topics and there are lots of great books and resources as well. This guide helps to highlight some that are related to climate change adaptation and resiliency.

How can I incorporate climate change in my subject area or curriculum?

Climate change is a topic that is multi-disciplinary and can be used as the theme in any subject or class to explore concepts in the real world. This guide will show you how each activity connects to the global competencies.

How do I get my students to take action on climate change and be responsible citizens in the future?

Students exposed to inquiry-based learning become empowered and motivated to answer their own questions about a given phenomenon. Facilitation is crucial when guiding students toward ideas and questions that are age appropriate, relative to the subject-matter, and testable either through quantitative or qualitative data collection.

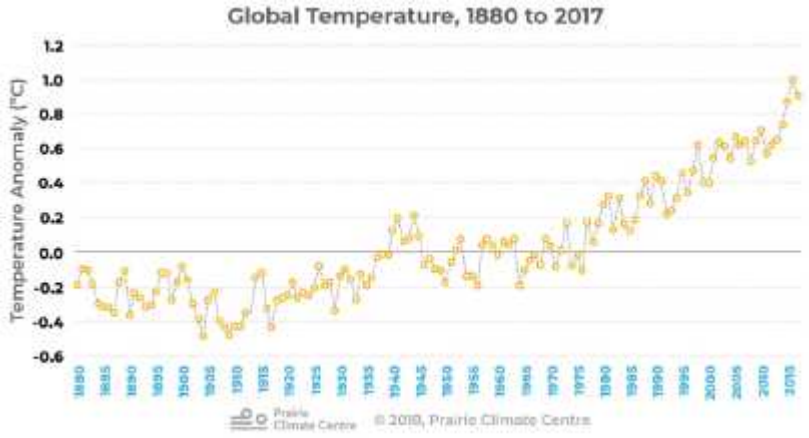
Where can I get help with the lesson plans in this guide?

EOS is more than happy to bring any or all of the activities in this guide to schools or summer camps in New Brunswick on request and pending funding. EOS knows that not all teachers can be subject matter experts in climate change, so we are happy to bring activities to your school or summer camp. Get in touch with EOS at eos@nb.aibn.com or 506-364-4487 or www.eosecoenergy.com.

Background Information for Teachers: What is Climate Change Adaptation?

This section outlines what climate change is and what adaptation means.

What is Human Caused Climate Change?



Climate is the average weather pattern over many years; it is not the weather. Climate dictates what parts of the planet tend to be warmer, colder, wetter, drier, and how often we see extreme weather events such as hurricanes. The earth's climate has been changing for millions of years, but since the 1970's scientists have reported increases in greenhouse gases (carbon dioxide, methane) in the atmosphere due to human activities such as the burning of fossil fuels, large scale agriculture, deforestation, etc. Greenhouse gases trap heat from the sun in the earth's atmosphere and cause the overall temperature to rise, just like a blanket or greenhouse effect. The earth's climate is in a careful balance so even a small overall rise in the average global temperature is affecting the climate.

https://egede-nissen.com/blog/climate-change/2018/the-carbon-budget-living-beyond-our-means/

For more information about Climate Change, The Climate Atlas of Canada has a very helpful overview of climate basics. Discover more in the Climate Atlas. The atlas underlines the scientific consensus and hard data which explains the ways our world's climate is changing.

What does Climate Change mean for New Brunswick?

Some effects of climate change and the associated impacts in New Brunswick are presented in the table below

Effects of Climate Change and Impacts in New Brunswick

Effect	Impacts
Temperature rise	• New pests like ticks • Heat stroke and other heat-related conditions and risks • Wetter and warmer winters • Longer growing seasons and potential to grow warmer climate fruits and vegetables
More extreme storms	• Stronger winds mean more power outages • Blizzards, ice storms, hurricanes can cause damage to buildings
Sea level rise	• Coastal flooding and impacts for roads and buildings
Storm surges	• Coastal flooding and erosion
More precipitation but happening less often in more intense events	• Droughts, which could lead to forest fires, and difficulty for agriculture • Inland flooding from intense rain fall
Climate change in general	• Causes climate change related stress and anxiety which can manifest in physical, behavioral and/or emotional ways. • Presents an opportunity to adapt how we live and create sustainable, healthy, caring, resilient and thriving communities.

What is Climate Change Mitigation?

We can slow down the effects of climate change by mitigating them or decreasing greenhouse gases and combatting climate change at the sources. We can do this by:

- Composting, reducing, reusing, recycling
- Eating local food and eating less meat
- Choosing energy efficient appliances
- Insulating and draft-proof your home so you use less heat
- Installing solar panels
- Biking, carpooling or choosing public transit
- Driving a small fuel-efficient car, or consider a hybrid or electric car
- Vote for politicians who share your views on climate change

- And so much more. For a list of actions you can take, check out: https://eosecoenergy.com/en/tips-for-living-sustainably/

What is Climate Change Adaptation?

Adaptation means adjusting the way we live during changing circumstances. We can adapt to climate change by adjusting how we live and the choices that we make. Making these adjustments will help decrease the negative effects of the changing climate and allow us to take advantage of any new favorable opportunities.

For example, we can adapt by:

- Choosing not to build houses in flood plains
- Having a storm emergency kit and evacuation plan
- Maintaining natural buffers to floods and storm surges (wetlands, stream vegetation, salt marsh)
- Planting trees
- Growing new foods better suited to hotter climates
- Learning traditional skills, preserving food (canning, dehydrating)
- Taking care of our mental health and harnessing climate anxiety into positive action
- And more

Governments have a role to play too:

- Creating climate change adaptation plans
- Maintaining natural buffers to floods (wetlands, stream vegetation, salt marsh)
- Adjusting stormwater and sewage infrastructure either by moving them, or by increasing their capacity
- Reducing run-off and flood risk by planting rain gardens, using permeable pavement, etc.
- Installing naturalized stormwater ponds
- Beginning a plan to retreat from low-lying flood-prone areas
- And more

What is Climate Change Resilience?

Resiliency is the ability to bounce back after tough times. To be resilient to climate change we need to adapt, be prepared for more severe weather, learn self-sufficiency skills, have a strong social support network, and learn to be mentally strong too. Activities in this guide will help students learn how to be resilient at all ages.

Background on Emergency Preparedness

Some activities here in our climate change adaptation lesson plans include emergency preparedness elements. Emergency preparedness can be very important, but we often worry about teaching or telling children about certain topics for fear of scaring them. Situational awareness and survival skills are vital to our lives and using games and age appropriate activities can help students become acquainted with skills they can use in the future. Let them ask lots of questions and give them space to consider many aspects of practical skills, emergency preparedness and awareness. Many students in the Tantramar region of New Brunswick, for example, have experienced floods or other emergency situations. These situations can be truly scary but being prepared can help reduce anxieties.

Order your own Red Cross Emergency Kit here:
https://www.redcross.ca/how-we-help/emergencies-and-disasters-in-canada/be-ready-emergency-preparedness-and-recovery/get-an-emergency-kit

Climate Adaptation and Global Competencies

Each part of this lesson plan is tied to at least one global competency as outlined by the New Brunswick Department of Education. These are skills and knowledge that all students should develop by their graduation and using the global competencies allows climate change education to span many classes and subjects while connecting to existing curriculum.

New Brunswick Global Competencies – Anglophone Sector

Critical Thinking and Problem Solving	Innovation, Creativity, and Entrepreneurship	Learning to Learn / Self-Aware & Self- Directed
• Solves meaningful, real-life, complex problems • Takes concrete steps to address issues • Designs and manages projects • Acquires, processes, synthesizes, interprets, and critically analyses information to make informed decisions (critical and digital literacy) • Engages in an inquiry process to solve problems • Sees patterns, makes connections, and transfers learning from one situation to another, including real world applications • Connects, constructs, relates, and applies knowledge to all domains of life such as school, home, work, friends, and community • Analyzes the functions and interconnections of social, economic, and ecological systems	• Contributes solutions to complex social, economic, and environmental problems • Enhances a concept, idea, or product through a creative process • Takes risks in thinking and creating • Formulates and expresses insightful questions and opinions to generate novel ideas • Tests hypotheses and experiments with new strategies or techniques • Makes discoveries through inquiry research • Demonstrates initiative, imagination, creativity, spontaneity, and ingenuity in a range of creative processes • Pursues new ideas and shows leadership to meet a need in a community • Leads and motivates with an ethical entrepreneurial spirit	• Learns the process of learning (metacognition) (e.g., independence, goal-setting, motivation) • Believes in the ability to learn and grow (growth mindset) and monitors progress in learning • Develops personal, education, and career goals and perseveres to overcome challenges to reach these • Self-regulates in order to become a lifelong learner • Reflects on thinking, experience, values, and critical feedback to enhance learning • Cultivates emotional intelligence to understand self and others • Adapts to change and shows resilience to adversity • Manages various aspects of life; physical, emotional, social, spiritual, and mental well-being • Develops identity in the Canadian context (e.g., origin and diversity) and considers one's connection to others and the environment • Takes the past into account to understand the present and approach the future
Collaboration	**Communication**	**Global Citizenship and Sustainability**
• Participates in teams, establishes positive and respectful relationships, develops trust, acts co-operatively and with integrity • Learns from, and contributes to, the learning of others • Co-constructs knowledge, meaning, and content • Assumes various roles on the team • Addresses disagreements and manages conflict in a sensitive and constructive manner • Networks with a variety of communities/groups • Respects a diversity of perspectives • Uses a rich variety of technology appropriately to work with others	• Asks effective questions to acquire knowledge • Communicates using a variety of media • Selects appropriate digital tools according to purpose and audience • Listens and shows empathy to understand all points of view • Gains knowledge about a variety of languages • Voices opinions and advocates for ideas • Creates a positive digital footprint • Communicates effectively and respectfully in different contexts in oral and written form in French and/or English and/or Mi'kmaq or Wolastoqey	• Understands ecological, economic, and social forces, their interconnectedness, and how they affect individuals, societies and countries • Acts responsibly and ethically in building sustainable communities • Recognizes discrimination and promotes principles of equity, human rights, and democratic participation. • Understands Indigenous traditions and knowledge and its place in Canada • Contributes to society and the culture of local, national, global, and virtual communities in a responsible, inclusive, accountable, sustainable and ethical manner • Engages in local, national and global initiatives to make a positive difference • Learns from and with diverse people and develops cross-cultural understanding • Participates in networks in a safe and socially responsible manner

New Brunswick Government Global Competencies

Check the blue boxes following each activity for global competency connections for each activity. This will help identify where lessons and activities fit into existing curriculum in New Brunswick.

Elementary Lesson Plans: Storm Prep and Safety

Background:

While these lesson plans are adaptable and widely applicable, they provide a geographically specific exploration of community adaptation for areas in New Brunswick. With climate change, New Brunswick will see storms increasing in frequency and intensity, but knowledge can help us prepare and adapt to be safer. We encourage you to contact EOS or another local organization in your area who can help deliver this program especially if extra background knowledge is needed.

Objectives: The goal of this lesson plan is to acquaint students with emergency preparedness, in particular for flooding and intense rain and winter storms.

A note on Teaching Emergency Preparedness:

(Adapted from Tim Young, author of *Playful Preparedness: Prepare Your Children--For Life: 26 Games for Teaching Situational Awareness, Prepping, Emergency Preparedness and the Survival Mindset to Children of All Ages*, 2015)

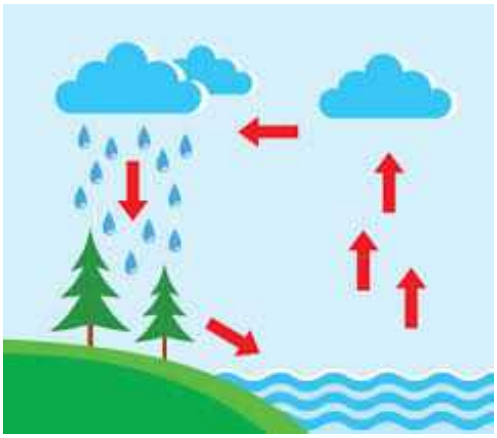
Sometimes adults avoid teaching children preparedness skills for fear of scaring them. While this is understandable, play is a great way to circumvent these fears and integrate life skills and practical knowledge into stress free environments.

Ways of playing may different for different age groups, but regardless there is an appropriate message for different ages and different levels of curiosity. Safety skills are integral to ensuring that children are confident, knowledgeable and prepared to deal with situations that arise every day.

Some suggestions about teaching personal safety and environmental awareness are beginning with small doses of information at first, speaking openly and avoiding secrecy around safety issues, and answering student questions as they arise.

Activity 1: Water Cycle Tag

Adapted from Science World (https://www.scienceworld.ca/resource/water-cycle-game/)



Background:
Begin the elementary lesson plan by thinking about and exploring the water cycle. Water is an essential ingredient of live and it surrounds us every day, from recreational activities, to drinking and bathing, and weather events like rain, snow, and clouds. Understanding where water comes from and how our actions can affect water everywhere, is a key place to begin.

Objective:
Teach students about the water cycle in an interactive, active game and explain how water in many different forms makes up the water cycle. This game is best played with a larger group of students in a wide-open space.

Length: 30 minutes (or as long as you want to play) **Ages:** 5 and up

Some facts about water:
The vast majority (~97%) of our water is found in the ocean. Water from all of the sources (ocean, soil, lake, rivers, mountain tops, etc.) evaporates because of solar energy heating up the water particles.
Water droplets in the sky condense and forms clouds. When the condensation of water droplets in a cloud increases, precipitation occurs as rain or snow. Some precipitation falls as snow or hail, and can accumulate as ice caps and glaciers, which can store frozen water for thousands of years. All of the water landing on the Earth's surface will move from high elevation to low elevation following the path of least resistance. One way is through running along the surface in a stream or river. Water eventually flows to the ocean where it accumulates until the water evaporates and the cycle continues. Some of the water gets collected into our water treatment tanks before it can unite with the ocean. Evaporation and precipitation are the links that keep the water cycle going.

Materials:
- Space to move around in such as a classroom or field
- Blue rope (lay it on the ground in the shape of a pond)
- Optional: 1 or 2 yellow pinnies, 4 white pinnies, and enough blue pinnies for rest of students
- Any other materials you might need for an outdoors game (sunscreen, jackets, a whistle, water bottles)

Instructions:
Part 1 – Water Cycle Demonstration
Start by laying out the "pond" and having student group close together near each other inside it. Explain to them they are water molecules in a pond. The pond can be different temperatures but then explain that the sun is very hot, and the water is getting hotter and hotter. As it gets warmer the water molecules (the students) should start to move around a little more and eventually move into the wider space beyond the

pond. Explain that they are now water vapour, water that has evaporated in the heat that is in the atmosphere. Next, explain to students that a cold breeze has blown through and clouds have started to form. Instruct students to join hands and make small groups (these are the clouds). Tell students that the clouds have become full of water and they're about to rain. Instruct students that there is a thunderstorm and the clouds are raining all their water back into the pond. Have the students rain (run) back together into the pond shape. Finally, tell students that temperatures are dropping, and the pond is becoming very cold. As the water gets colder and colder the water molecules (students) move less and less until the pond freezes and all the students stay as still as they can.

Part 2 – Water Cycle Tag Game

One student (or more depending on the size of the group) plays the part of the sun and wear a yellow pinny. Four or more students (again depending on the size of the group) hold hands in a circle at one part of the playing field wearing white pennies. They represent a cloud. The rest of the students are water droplets or water molecules and wear blue pinnies.

The sun runs around and tries to tag the water droplets. When a water droplet is tagged it "evaporates" and runs to the cloud. Once there it "condenses" by entering the circle formed by the cloud kids. When enough kids have condensed into the cloud, the cloud becomes too heavy and full of kids. The cloud kids can no longer hold them in, and the cloud bursts - precipitation! There is no winner or loser in this game - it's just really fun to get squished together in the cloud and see how many students the sun can tag before precipitation happens. Students get to be part of the water cycle!

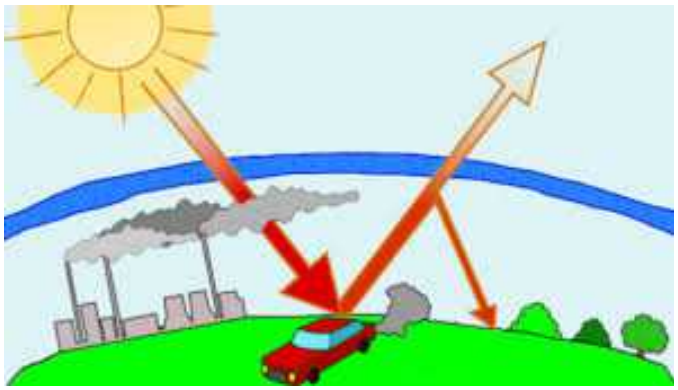
New Brunswick Government Global Competencies

- Understand ecological, economic, and social forces, their interconnectedness, and how they affect individuals, societies, and countries.
- Participates in teams by establishing positive and respectful relationships, developing trust, and acting interdependently and with integrity

Activity 2: Greenhouse Effect Tag

Adapted from *Green Teacher* (https://greenteacher.com/the-carbon-dioxide-game/)

Background:
The greenhouse effect involves energy from the sun that is trapped as heat by carbon dioxide and other gasses and particles in the atmosphere thereby increasing the global temperature of the Earth. Greenhouse Effect Tag is a fun, active way to explain the greenhouse effect and human contribution to global climate change.



[1]

Similar to Water Cycle Tag, this game helps student understand the greenhouse effect by acting it out. By starting with a brief explanation of the greenhouse effect, student will later be able to connect their understanding of this system to the actions on the Human Action cards (included at the end of this activity). Because of its scale, the greenhouse effect can be hard to conceptualize, but the active and visual portions of this game give students a better understanding of the energy balance of our earth.

Objective:
The greenhouse effect is large and can be complicated, but this activity helps students start to think about how pollution, the atmosphere, human actions and the sun all work together to maintain and change our climate.

Length: 30 minutes **Ages: 5 and up**

Materials:
- A large open area
- Chalk (for concrete) or rope (if playing on grass or dirt)
- A set of human action cards (found at end of this activity, print and cut out) in a bag
- White pinnies (C02), yellow pinnies (sunbeams)

Instructions:
Make two concentric circles on the ground, one about 2 feet in diameter, and a larger one about 15 feet in diameter. The smaller circle represents the Earth and the larger one represents Earth's atmosphere.

For round one, choose two students to be CO2 molecules, and place them anywhere in the Earth's "atmosphere." Once they are in the atmosphere, they cannot move their feet. The rest of the students are sunbeams representing energy from the sun. The object of the game is for the sunbeams to enter the atmosphere, tag the Earth (by touching the inner circle with a foot or hand) and then escape the atmosphere

[1] Source: https://www.upsbatterycenter.com/blog/climate-change-history-greenhouse-effect/

without getting tagged by a CO2 molecule. Sunbeams who are tagged must stay standing still in the atmosphere. Those who avoid being tagged bounce back out of the atmosphere into space. Each round lasts approximately 30 seconds and during that time the sunbeams try to tag the Earth only once. This simulation recreates the greenhouse effect: energy from the sun is trapped as heat by CO2 and other gases and particles in the atmosphere.

After the first round, have the escaped sunbeams form a circle around the atmosphere to check how much energy has been trapped. Discuss how this may affect the temperature of the planet. Remind students that a certain amount of CO2 is necessary to keep the planet consistently warm enough to support life. During the first round, most of the energy will have escaped the atmosphere because CO2 levels are low. Before continuing the game, clear all the trapped sunbeams out of the atmosphere.

For the second round, increase the number of CO2 molecules in the atmosphere. Do this by reaching into the "What did humans do?" bag and pulling out an action card (for this round, include only cards that add CO2 to the atmosphere). After a student reads the card, increase the number of CO2 molecules in the game (dictated by card) and play again.

For the third and subsequent rounds, put all of the action cards in the bag so that CO2 levels will go up or down depending on which card is drawn. Discuss what happens each time. The game demonstrates that when you increase the amount of CO2, more heat gets trapped (illustrated by the student sunbeams standing in the atmosphere) and the Earth warms up. The action cards demonstrate how even small-scale actions can decrease the amount of greenhouse gas that we emit to the atmosphere.

Wrap-up:
Review how energy from the sun gets trapped in the Earth's atmosphere. Discuss how human actions, particularly burning fossil fuels, can enhance the greenhouse effect by putting more CO2 into the atmosphere. The game can be a springboard into a variety of other explorations such as researching alternative energy sources, discussing sustainable lifestyles, and examining the different choices humans can make in relation to the environment.

New Brunswick Government Global Competencies

- Understand ecological, economic, and social forces, their interconnectedness, and how they affect individuals, societies, and countries.
- Connects, constructs, relates, and applies knowledge to all domains of life such as school, home, work, friends and community.
- Takes action and makes responsible decisions that support social settings, natural environments, and quality of life for all, now and in the future.

Action Cards

Humans drive cars
Every liter of gas puts 2.35 kg of CO_2 into the atmosphere (18.8 lbs per US gallon).
(Add two CO_2 molecules)

Humans drive more cars
In 1908 Ford built the Model T car. Between 1908 and 1928, 15 million were sold. Today, an estimated 500 million cars are in use worldwide.
(Add two CO_2 molecules)

Humans cut down trees
Trees remove CO_2 from the atmosphere during photosynthesis. Fewer trees means more CO_2.
(Add four CO_2 molecules)

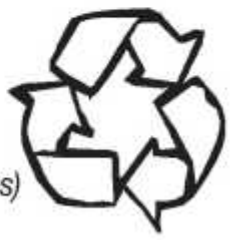
Humans burn trash
Burning waste puts CO_2 into the atmosphere along with other pollutants.
(Add two CO_2 molecules)

Humans ride bikes
Riding a bike is the most energy efficient form of transportation, and it's fun!
(Remove two CO_2 molecules)

Humans plant trees
Trees remove CO_2 from the atmosphere during the process of photosynthesis. More trees means less atmospheric CO_2
(Remove four CO_2 molecules)

Humans create energy efficient technology
(Remove four CO_2 molecules)

Humans recycle
Recycling saves energy, reducing our use of fossil fuels.
(Remove two CO_2 molecules)



Activity 3: 72 Hour Preparedness Kit Game

Background:
Storms are increasing in intensity and frequency in New Brunswick due to our changing climate. Students will likely experience extreme winter weather, ice storms, flooding events, etc. and many likely already have. Emergency preparedness is an important part of personal and community safety and can help ease worries and stress around extreme weather events. Understanding why these weather events happen and what a person can do to stay safe are the best way to address these fears.

Objective:
Students will learn about the materials and supplies necessary for an emergency kit and encourage their family to prepare an emergency preparedness kit.

Length: 45 minutes **Ages:** 5 and up (also good for Teacher professional development days)

Materials:
- 2 emergency kits per class (more for larger groups) with a list of included emergency items
- Add play money and play food if you like as well as fake identification, toilet paper, a comfort item, etc.
- Other items that would not normally be included in an emergency kit (eg. makeup, jewelry, extra toys, etc.)
- A large area (open classroom, gym or outside)
- Computer and monitor (if you want to start with the video)

Instructions:
Familiarize yourself with items included in the emergency preparedness kit and why each item is included before conducting this activity.

If you like, you could set the stage by starting with a video that explains the basics of climate change and that it will bring stormier weather. One example is 2015 video called "Climate Change According to a Kid" and can be found at: https://www.youtube.com/watch?v=Sv7OHfpIRfU

Discuss with the class what kinds of weather events they have been through with their families and how they prepared. What kinds of things might you need when the power goes out, or there is a blizzard or flood that prevents you getting into town? Explain that emergency officials recommend every household have an emergency kit stocked with supplies to keep them going for at least 3 days (72 hours).

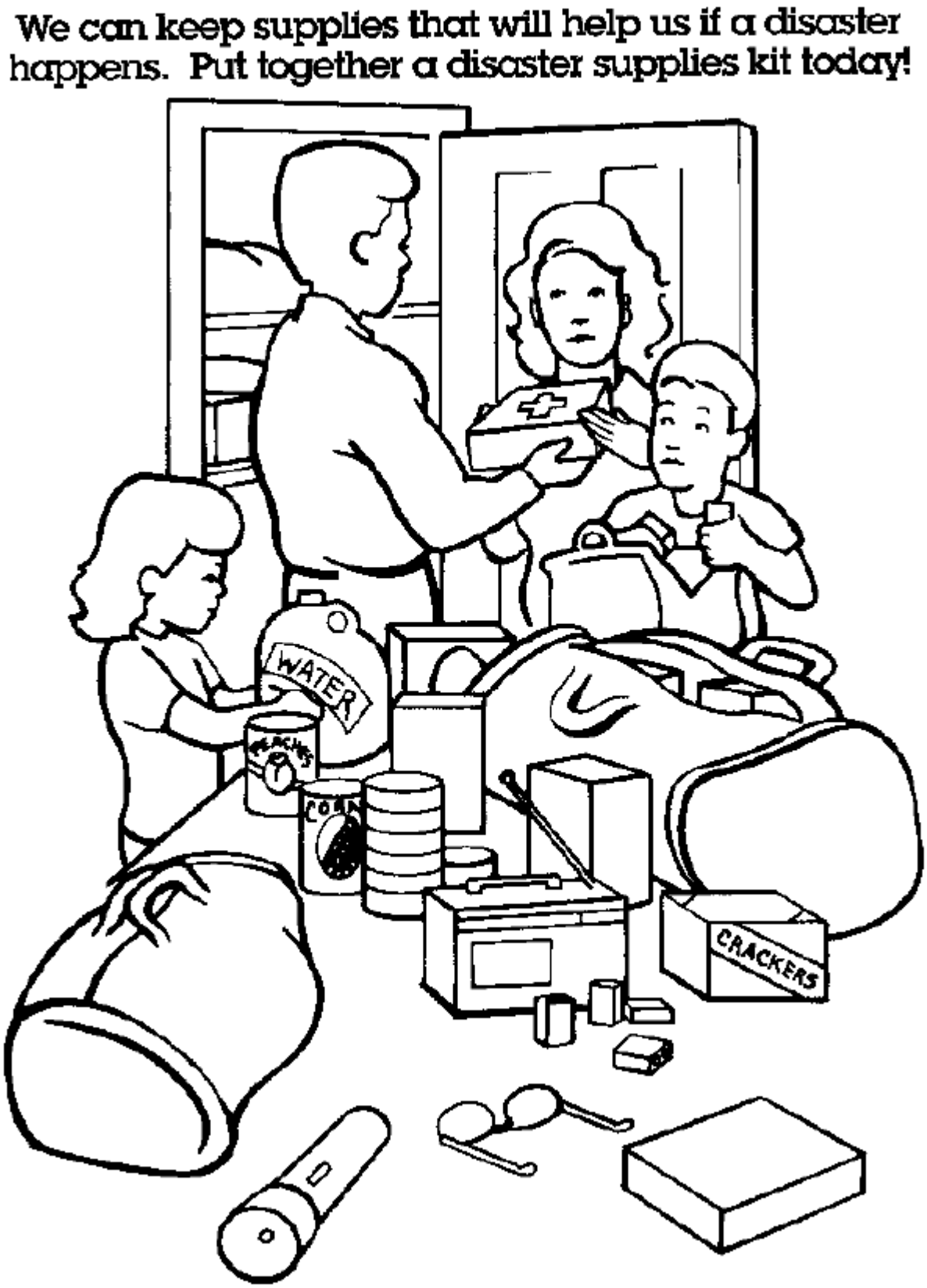
Then, empty the contents of both emergency kits into one pile at one end of the play area and exclude items that might be dangerous to run with or for younger children (ie. Pocket knives, sharp objects). Add the other 'non-essential" items to this pile. Put the empty emergency kits at the other end of the play area. Split the class into two groups and have each stand behind the empty emergency kit bags. Explain that we will pretend a storm is coming and that we need to get ready and stock up on supplies. In relay race style, explain that the two groups are to line up behind the bags, the first student runs and grabs something that does belong in an emergency kit, then the next student and the next until either everyone has gone or students believe they've collected all the items that they might need in an emergency. Ask students to sit down when they are done.

Ask students to take a moment and look through their emergency kit. Ask them why they chose the things they did. Then read through the itemized list of emergency kit items and see if students have collected all these items. Answer questions about why certain items would be included, and why other items should not be. To continue the discussion, you can ask students about things that might not be included in a standard first aid kit but might be relevant for their family or where they live. For example, toys or stuffed animals as comfort objects, important documents, money, toilet paper and other things.

This activity could also be enriched by inviting a local emergency measures staff or professional to talk about local storm safety, extreme weather, and their role in keeping the community safe.

New Brunswick Government Global Competencies

- Analyzes the functions and interconnections of social, economic and ecological systems.
- Adapts to change and is resilient in adverse situations.
- Participates in teams by establishing positive and respectful relationships, developing trust, and acting interdependently and with integrity.
- Assumes various roles on the team and respects a diversity of perspectives.
- Addresses disagreements and manages conflict in a sensitive and constructive manner.
- Asks effective questions to create a shared communication culture, attend to understand all points of view, express their own opinions, and advocate for ideas.
- Takes action and makes responsible decisions that support social settings, natural environments, and quality of life for all, now and in the future.



Source: https://free-clipart-pictures.com/explore/hurricane-drawing-disaster-preparedness/

Activity 4: Flooding safety

Background:
Floods are becoming more and more common in the face of climate change. This can be scary, but we will have to adapt to big storms. Some of our houses and businesses are very close to rivers and coastlines, which can make them vulnerable to flooding, storm surges and/or sea level rise.

Objective:
This activity provides students with the very basics of flood knowledge and safety. It may begin conversations about floods they have seen or heard about in the past.

Length: 10-15 minute worksheet **Ages:** 9-12

Materials:
Flood worksheets printed for the class (see next pages)

Set up:
Print copies of the flood worksheets for the class, or if you would like to save paper or if your students cannot yet read, this activity can be done by projecting the work sheets and filling them in as a class.

Directions:
Have students use the words in the Word Bank Box to fill in the blank spaces in the Flood Basics sheet.

New Brunswick Government Global Competencies

- Learns from, and contributes to, the learning of others.
- Voices opinions and advocates for ideas.
- Adapts to change and is resilient in adverse situations.

Flooding Basics Fill in the Blanks

1. You should not _____ in flood water.
2. Flood water can be _____ .
3. Being _____ with your neighbours can help you during a flood.
4. Weather forecasts will issue a _____ when a flood is about to happen.
5. Move important items to _____ places before a flood to keep them safe.
6. Your parents should turn off the _____ in your home during a flood.
7. Your emergency kit should have items like _____, a _____ and _____.
8. Stay away from fallen _____ _____.
9. You should always know where your _____ kit is.
10. Water and _____ left after a flood should be avoided.
11. Flooding can be caused by rain, melting _____, or large _____ storms.
12. Drinking _____ may need to be tested after a flood before you drink it.

Word Raft

Friends Batteries Ocean Emergency
Swim Warning Power Snow Water
Dangerous Power Lines Mud Flashlight High Food

Activity 5: Learn How to Adapt to Flooding by Playing in the Mud

Background:
While flooding (both coastal and inland or freshwater) is a serious problem, there are things we can do to reduce our flood risk and adapt. Some communities in New Brunswick have dykes, or earth walls, to keep the sea out, some communities are by rivers, which can rise and flood their banks especially in the spring, other communities are in low-lying locations that can be flooded. In this activity, students work in small groups to protect a tiny house from an impending "rainstorm." This activity allows students to experiment with natural materials, design their own dykes to help keep the water from reaching their houses, and see how water flows on the land.

Objective:
Students will learn about adapting to a rain storm, how water flows over land, and what natural materials might offer the best protection.

Length: 20-60 minutes **Ages:** 5 and up

Materials:
- Outdoor area with gravel, mud, dirt
- Collection of tiny toy houses or small waterproof blocks
- Fallen leaves sticks, rocks, sand, grasses, and other found natural materials
- Small shovels
- Watering cans and water
- Rubber boots, rain gear if needed (this can be done in any weather)
- Optional: toy dump trucks to haul materials ☺

Get students thinking about adaptation:
Lead up to this activity by reading (or showing the videos of) traditional children's stories of adaptation like:

> *The Three Little Pigs* - They learned how to *adapt* to the big bad wolf!
> https://www.youtube.com/watch?v=2s7cz6p7jew
>
> *Going on a Bear Hunt* – Oh no! Mud, a river, a snow storm… They couldn't go over it, they couldn't go under it! https://www.youtube.com/watch?v=kL36gMrHJaI

Site Preparation:
This activity is best done outside. For this activity you will need a variety of foraged materials such as fallen sticks, rocks, grasses, mosses, sand, gravel, mud, dirt, etc. This can either be done in advance or incorporated into the activity. If you have students help collect materials, remind them to only pick up things from the ground and not to destroy existing, living plants. Dig a series of "stream beds" in the dirt, it is ideal to find a

location with a bit of a slope so water from the watering cans (the "rainstorm") will lead to flooding downstream. Place a tiny toy house near the bottom of each stream. Divide the class into groups and each group gets assigned to a house.

Activity Instructions:
Tell students that there is an imaginary rainstorm coming. Stream beds are dry right now, but they will overflow with the storm. What would be the best way to protect your house? And what would be the best materials to use? Tell them they cannot alter the stream bed or fill it in. In real life you need to apply for a permit to alter a watercourse and even if permission was granted, it would cost a lot of money to do so. You can never fill in a stream either. What are some ways that people are adapting in New Brunswick already? (retreating from rivers and coast lines, building higher dykes, moving dykes, using different materials, building their houses up high, etc.). Teams then work together to build small dykes around the houses and wait for the rainstorm. Use watering cans to simulate rain, pour water down the streams and see what happens. Have all students watch what happens to each house.

Have a discussion afterwards. Will the water rushing down the streams flood the houses, go around the dykes, or go through them? What materials and designs worked best and why? What would students do differently next time? If you have time and want to extend the activity, have students make their improvements and have another rainstorm go through. Did their improvements help? Allow students to pour more or less water, watch how the river changes, and see if the settlements survive the flood. You can talk about different intensities of storms and how flooding effects the banks of rivers. Did you notice any erosion? Which areas are the lowest? Where did the water flow?

Take it Further:

Here are some ideas to add on to this activity:

- Learn the history of the dykes in New Brunswick and dive into 1600's Acadian Settlements. Check out some history of the Tantramar Dykelands at: https://www.mta.ca/marshland/topic4_acadians/acadian.htm
- Include the cost of different adaptations and provide each team with play money. Before they decide whether to retreat (move back), raise their house or build a dyke, they will need to see if they have enough money. This could add a level of complexity and make the activity appropriate for older students.

New Brunswick Government Global Competencies

- Engages in an inquiry process to solve problem.
- Takes risks in thinking and creating.
- Tests hypotheses and experiments with new strategies and techniques.
- Participates in teams by establishing positive and respectful relationships, developing trust, and acting interdependently and with integrity.
- Assumes various roles on the team and respects a diversity of perspectives.
- Addresses disagreements and manages conflict in a sensitive and constructive manner.
- Asks effective questions to create a shared communication culture, attend to understand all points of view, express their own opinions, and advocate for ideas.
- Takes action and makes responsible decisions that support social settings, natural environments, and quality of life for all, now and in the future.
- Adapts to change and is resilient in adverse situations.
- Manages their time, environment, and attention, including their focus, concentration, and engagement.

Additional Activities and Resources for Elementary Climate Change Adaptation

More Activities:

- Talk to local experts and municipal government staff and leaders about climate change impacts and adaptation plans in your community.
- Make a video about climate change in your community.
- Talk about ways you adapt to other changes in your life.
- Do an art project that shows the different things you should put in an emergency preparedness kit.
- Write a fictional story about what you think your community might look like in the future.

Additional Websites:

- This government of Canada website has additional emergency preparedness information: https://www.getprepared.gc.ca/index-eng.aspx
- Here is an emergency plan template students can fill in with their families: https://www.getprepared.gc.ca/cnt/rsrcs/pblctns/yprprdnssgd/yprprdnssgd-eng.pdf (English) https://www.preparez-vous.gc.ca/cnt/rsrcs/pblctns/yprprdnssgd/yprprdnssgd-fra.pdf (French)
- Canadian Red Cross Activity books for ages 7 to 12: https://www.redcross.ca/how-we-help/emergencies-and-disasters-in-canada/resources-for-teachers-and-voluntary-sector-organizations/teachers-and-educators-of-children/help-students-learn-about-and-prepare-for-disasters/expect-the-unexpected-program
- Red Cross activity books are bilingual: https://www.croixrouge.ca/nos-champs-d-action/urgences-et-catastrophes-au-canada/ressources-pour-les-enseignants-et-les-organismes/enseignants-et-educateurs/aider-les-eleves-a-se-preparer-aux-catastrophes/le-programme-prevoir-l-imprevisible?lang=fr-CA&_ga=2.51856617.1942151642.1568655019-1522617160.1568655019
- Ready.gov is an American site with a variety of resources on various emergency scenarios and is aimed at kids who want to explore on their own. It includes games and practical advice: https://www.ready.gov/kids
- Station 15 PBS documentary - https://www.pbs.org/video/station-15-i8tibc/

More Climate Change Adaptation Related Games:

- The game of home hazard preparation - https://getreadygame.com
- Science World - https://www.scienceworld.ca/resources/activities/water-cycle-game
- Green Teacher - https://greenteacher.com/the-carbon-dioxide-game/
- *Playful Preparedness: Prepare Your Children--For Life: 26 Games for Teaching Situational Awareness, Prepping, Emergency Preparedness and the Survival Mindset to Children of All Ages* by Tim Young (2015)

Middle School Lesson Plan: Community Adaptation to Climate Change

Background:

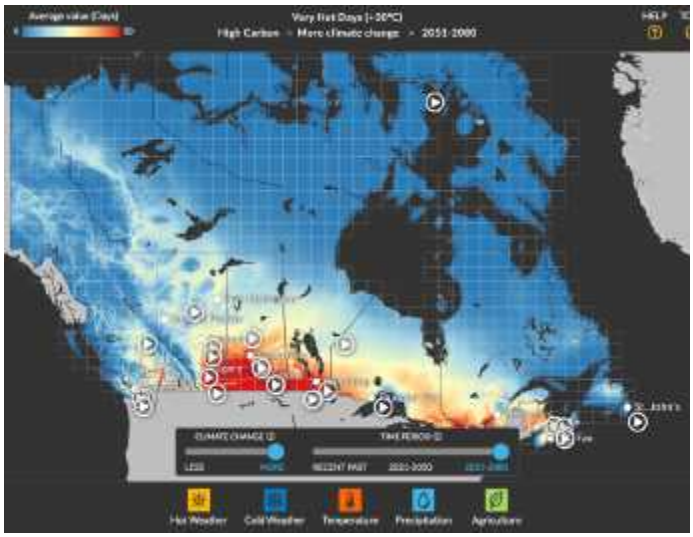
While these lesson plans are adaptable and widely applicable to any region, they provide a geographically specific exploration of community adaptation for areas in New Brunswick, Canada. This lesson plan can be done by individual teachers, but we also encourage you to contact EOS or another local organization in your area who can help deliver this program especially if extra background knowledge is needed.

Objective:

This lesson plan introduces issues of climate change adaptation through a local lens. It builds upon the concepts of adaptation and storm safety at home in the Elementary Lesson Plans and moves on to explore community-based adaptation and resiliency. This set of lesson plans is a great opportunity to pull in local resources and to reach out to field-experts to add context and regional specificity to these concepts.

Activity 1: What's Happening where you live?

Background:
This activity explores the Climate Atlas website. It is best done in a computer lab or on an overhead projector so that everyone can see. Encourage students to explore all the tools on the site.
This activity can either be done as an individual exploration or collaborative project with small groups.



Objective:
Students learn about climate change impacts in their region.

Length: 20 minutes - 1 hour **Ages:** 12 and up

Climate Atlas Link: https://climateatlas.ca/map/canada/plus30_2060_85#

Instructions:
Open the Climate Atlas tool and explore different locations, time frames, and weather elements.
The activity can be an open exploration, or the attached Climate Atlas worksheet can also be used to guide the activity (see following pages).

New Brunswick Government Global Competencies

- Sees patterns, makes connections, and transfers learning from one situation to another, including real world applications.
- Connects, constructs, relates, and applies knowledge to all domains of life such as school, home, work, friends, and community.
- Makes discoveries through inquiry research.
- Understand ecological, economic, and social forces, their interconnectedness, and how they affect individuals, societies, and countries.
- Analyzes the functions and interconnections of social, economic, and ecological systems.

Climate Atlas Worksheet

Go to: https://climateatlas.ca/map/canada/plus30_2030_85#

At the bottom of the page make sure the settings are:
Climate Change: More
Time Period: 2021-2050

1.Choose a location:
Province:

Explore the details on the right side of the screen
You can change what details are shown by clicking the icons on the lower bar
When you change between variables a pop-up will appear explaining the variable you have chosen. Read the paragraph under "Climate Variable" for more information on your chosen variable.

1.How many very hot days (+30°C) will your chosen region experience in 2021-2050 compared to 1976-2005?

1976-2005 2021-2050

◊ _____Days ◊ _____Days

2. Under Agriculture, how many Frost-Free days will there be in 2021-2050 compared to 1976-2005?

1976-2005 2021-2050

◊ _____Days ◊ _____Days

3. Under Cold Weather, what will the Average Coolest Minimum Temperature be in 2021-2050 compared to 1976-2005?

1976-2005 2021-2050

◊ _____°C ◊ _____°C

4. What kind of weather is normal where you live?

5. Have you noticed any changes in the weather since you were younger?

6. Has your family or older friends noted changes to the landscape over time?

7. What do you think the future of the landscape you have chosen might look like?

8. How do you think this climate future will affect you and the way you live?

Activity 2: Map Skills

Adapted from *Playful Preparedness: Prepare Your Children--For Life: 26 Games for Teaching Situational Awareness, Prepping, Emergency Preparedness and the Survival Mindset to Children of All Ages,* by Tim Young, 2015 (p.77)

Background:
Learning map skills and map literacy are important survival skills as well as providing students with the tools to read and gather information from maps of their community and surrounding environment. Maps are one way of communicating information. Geographic information is often conveyed through maps and map reading skills give students the opportunity to understand and interpret complex spatial information.

Objective:
This activity will allow students to get outside, work on a creative project, and learn valuable map skills which are a part of emergency preparedness and community planning. Student may have different experience levels with mapping or navigating and this will allow them to create different types of navigating tools.

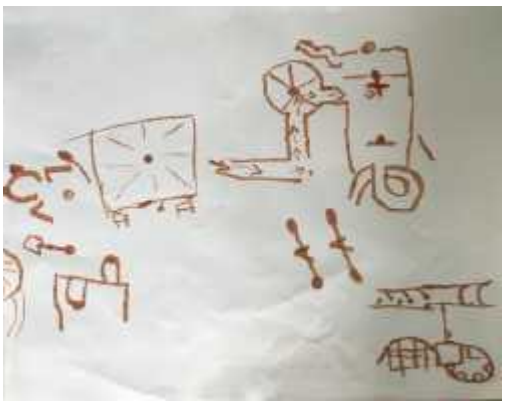
Length: 30-40 minutes **Ages:** 5-12

Materials:
- Paper
- Pencils or pens of a variety of colours
- Random items for each student to hide or draw maps to (stuffed animals, playground toys)

Instructions:
Go outside on the school grounds or other outdoor space that is accessible and near your school. Give each student a piece of paper and a unique item that will not be confused with anyone else's. Each student should hide their unique item somewhere in the outdoor space and hide it well, so it is not immediately obvious. Next, have everyone come back and draw on their paper, ask them to draw a map to instruct another student where their object is. You could suggest not using any words as this will be more of a challenge. Give students 10-15 minutes to draw their maps and then have each student exchange with another student and use their map to find the hidden item. Once everyone has returned to the main space with their items (ensure everyone has been able to find their item and help those who might be struggling with their map), talk about how the map making and item-finding went. You might ask:
- What elements of the map we were following were most helpful?
- What parts of the map were confusing?
- What would make your map easier to read?
- What situations are maps helpful in?
- Have you ever had to use a map before?
- What other tools might you use with a map? (telescope, compass, trail signs)
- When might you need a map? When might you need to create a map for someone else?

Examples of Student Maps
(Activity done with 5-12 year olds)






Take it further:

To further explore maps and geography, there are lesson plans developed by ESRI, National Geographic, and Canadian Geographic to provide further education and lesson plans for Elementary and Middle School levels:

- https://community.esri.com/groups/geomentors
- https://www.nationalgeographic.org/education/map-skills-elementary-students/?ar_a=1
- https://www.canadiangeographic.ca/content/kids-games

New Brunswick Government Global Competencies

- Solves meaningful, real-life, complex problems.
- Demonstrates initiative, imagination, creativity, spontaneity, and ingenuity in a range of creative processes.
- Communicates using a variety of media.

Activity 3: Salt Marshes, Farmland and Aboiteaux: Changing Environments Over Time

Background:
This activity will encourage students to think about the many times, events, and people who have influenced our familiar landscapes. Consider how lands may have looked in the past and what they will look like in the future. Landscapes, both natural and human-influenced, have histories that can tell us about their unique environment. Exploring these changes can help student think critically about how humans influence and change our landscapes in the past, present, and future.

Objective:
Students will think critically about how humans influence and change our landscapes in the past, present, and future.

Length: Multi-Day **Ages:** 11 and up

Materials:
- Paper and drawing materials
- Background information on chosen landscape

Preparation:
Choose a local location connected to salt marshes, farmland and aboiteux. (If this is not relevant to your area, consider landscapes with fishing histories, ship building, industrial or other that students will be familiar with.) Ideally this location will be within walking (or field trip) distance.

Part 1: Imagining the Past
Take your class to your chosen spot. Talk to students about different people who have lived on the landscape they are looking at. You can ask them to think about what activities those people would have done on their land (hunting, fishing, farming, building, ceremonies). Once you've talked a little bit about the history of the space ask students to spread out with a paper and 1 or 2 drawing materials, to spread out from each other and find a comfortable spot to sit. Ask students to draw what they think the landscape would have looked like before humans used this landscape. Give them lots of time to draw, make notes, or write about the space.

Part 2: Adding information (done right after Part 1 or at a later date)
The next part of this activity requires research materials or presenters from which students can gather information about various uses of the landscape over time. This could include a variety of things:
- Having a speaker(s) connected to the traditional communities that would have used the lands (eg. a local indigenous speaker, someone who's family farmed or fished on the land).
- A visit to a local museum or cultural centre with a presentation or displays that would inform students about the space in question.
- A variety of books or websites that students could easily navigate
- Contact local heritage organizations or museums who might be able to lend you additional material or speakers

You could choose to do multiple parts of this list to compile a wider understanding of the place your class is investigating.

Part 3: Bringing it all together
For the last part of this activity students will bring together what they've learned about the history of the landscape into a piece of art, writing, or display. This part of the activity is best adapted to the size, ability, time and resources that your class has. Students will produce a work that reflects what they've learned about how landscapes change over time. This could look like:

- A painting with various sections for past, present, future
- A collection of memos or writing of things they learned
- A work of writing, fiction or non-fiction inspired by the location
- A poster or presentation of what they've learned
- A graphic writing piece

Take it Further:
This activity could easily be extended into multiple class periods, but also multiple subjects (science, social studies, English, French, art).

New Brunswick Government Global Competencies

- Sees patterns, makes connections, and transfers learning from one situation to another, including real world applications.
- Connects, constructs, relates, and applies knowledge to all domains of life such as school, home, work, friends, and community.
- Makes discoveries through inquiry research.
- Understand ecological, economic, and social forces, their interconnectedness, and how they affect individuals, societies, and countries.
- Analyzes the functions and interconnections of social, economic, and ecological systems.
- Takes the past into account to understand the present and approach the future.
- Learns from and with diverse people and develops cross-cultural understanding.

Activity 4: Adaptation vs. Mitigation

This activity was adapted from Canadian Geographic[2]

Background:
Adaptation and mitigation are important ways to address climate change. Understanding how these two strategies are used in tandem to combat and live with climate change can help students think about the wide range of tools we have to be resilient.

Objective:
Students will learn to define and distinguish climate change adaptation and mitigation measures in this quick matching game.

Length: 30 minutes **Ages:** 13 and up

Materials:
- Adaptation and Mitigation Action Cards
- White board, flip chart or large paper to draw on (as seen in photo above)
- Markers or drawing utensils
- Computer access (optional)

Preparation:
Print and cut out the Adaptation and Mitigation Actions Cards (see blue cards at end of activity description)

Instructions:
Begin by showing one of these videos on what adaptation is:

From the Government of Germany on why it's time to adapt to climate change now:
http://resources4rethinking.ca/en/resource/climate-change-adaptation-its-time-for-decisions

From the United Nations on community adaptation:
http://resources4rethinking.ca/en/resource/adapting-to-a-changing-climate

On a large visible whiteboard draw a vertical line down the centre and label one side Mitigation and the other Adaptation. Have students brainstorm and contribute their understanding of these terms and add these to the board. Alternatively have students use personal laptops or devices to research synonyms and definitions and add those to the board. Add synonyms that may help students better understand the definitions. Mitigation means alleviation, reduction, diminution, lessening, easing, weakening. Adaptation means converting, alteration, modification, adjustment, changing, transformation. Review what's been written on the

[2]http://www.canadiangeographic.com/educational_products/activities/climate_change_lesson_plans/EN/Society_and_Economy_Activities/Climate_Change_Lesson_Plan_Society_and_Economy_Activity_3.pdf

board and synthesize a simple and understandable definition. See more on adaptation and mitigation in the introduction to this guide.

Hand out the Adaptation and Mitigation Actions Cards to small groups of students, have them come to a consensus if these actions are adaptation or mitigation. Have one student from each group add their group's cards to the board with tape or sticky tack. Have students brainstorm additional adaptation and mitigation measures that can be added to both sides. For example:

Mitigation:
- Replace fossil-fuel-based energy with renewable energy sources like wind and solar.
- Plant millions of trees to absorb and trap carbon dioxide from the atmosphere.

Adaptation:
- Revise building code to ensure flood-resistant basements.
- Protect, re-vegetate, and stabilize sand dunes, riverbanks, etc. to reduce erosion.
- Raise your house to reduce flood risk.
- Plant a rain garden to absorb rainwater and reduce flood risk.
- Get a 72-hour emergency kit

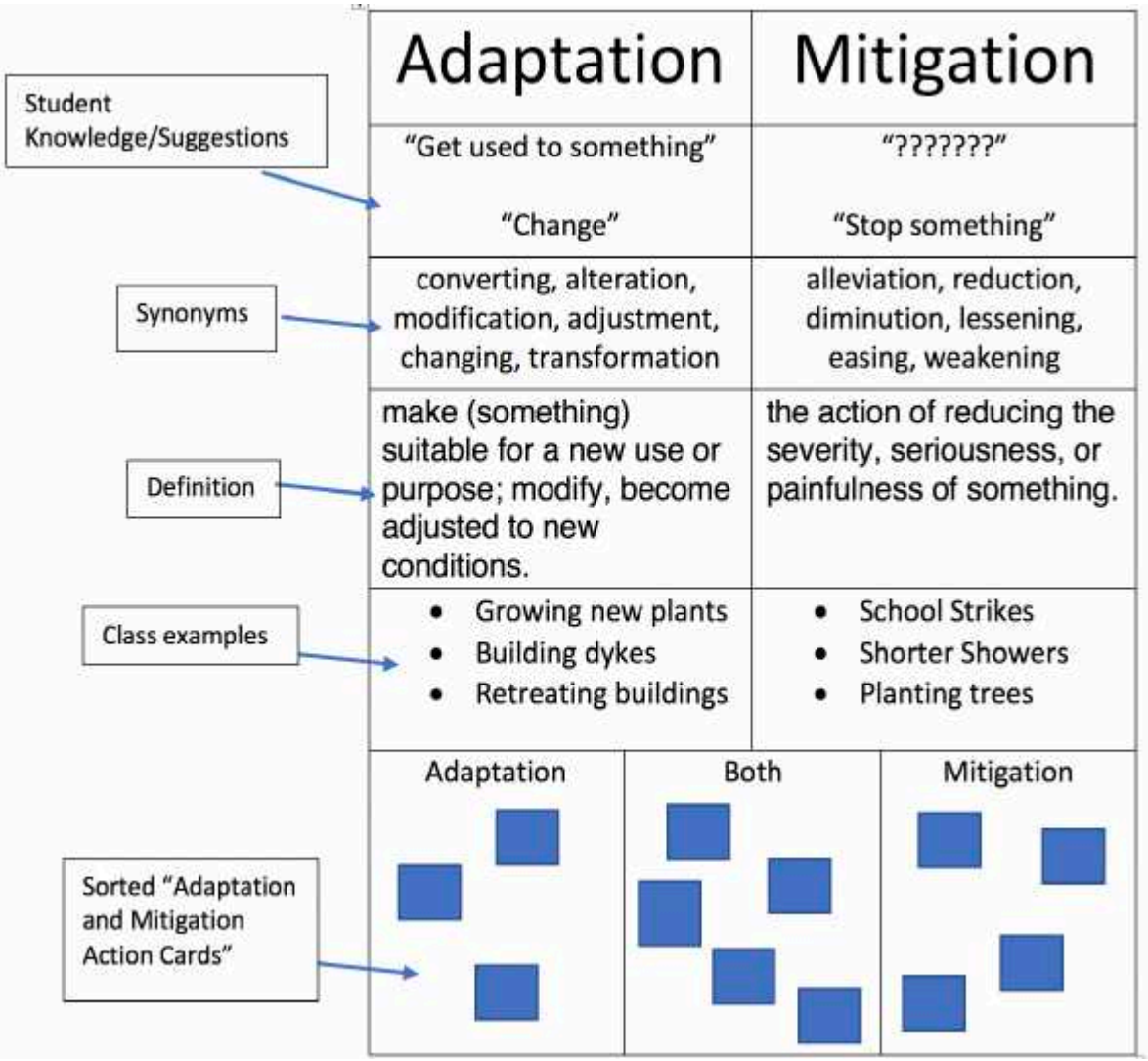
Note:
It can be confusing to explain the difference between Adaptation and Mitigation as they share many elements. Using synonyms and being specific can help clarify these grey areas. When talking about Mitigation be specific and note that these examples are about mitigating, reducing and slowing down climate change. Adaptation is about changing the way we do things, so we are more resilient to the impacts of climate change. We need moth mitigation (emissions reduction) and adaptation measures to deal with climate change. Even with reducing emissions, there will still be climate change impacts for some time, so we all need to learn how to adapt. This said, be flexible with students and allow them to explain why they might see an action as Mitigation, Adaptation, or both.

New Brunswick Government Global Competencies

- Understand ecological, economic, and social forces, their interconnectedness, and how they affect individuals, societies, and countries.
- Learns from, and contributes to, the learning of others.
- Voices opinions and advocates for ideas.
- Sees patterns, makes connections, and transfers learning from one situation to another, including real world applications.

Example of How to Set up the Reporting Template

(Use a Black Board, White Board or Flip Chart)



Adaptation and Mitigation Action Cards

Cut down greenhouse gas emissions from vehicles.	Increase species' capacity to adapt.	Trap greenhouse gas emissions.	Eating less meat.
Build infrastructure to facilitate animals' migration across changed habitats.	Build resilience to extreme weather and climate changes.	Improve the ability of animals and plants to thrive under different climate conditions.	Plant native tree species to re-establish forested areas.
Promote water and energy conservation.	Protect homes and buildings from flooding.	Improve roads, bridges and building design to resist weather damage.	Designate more forests as protected areas.
Increase sources of renewable energy like wind and solar.	Promote cycling, walking and taking transit as alternatives to driving.	Invest in or provide rebates for energy-efficient fridges, furnaces, and appliances.	Invest in ways to absorb rainwater, like « green » roofs and porous driveways.
Improve industrial processes to use less energy and materials.	Host a draft-proofing party to seal drafts in your home and save energy.	Plant a rain garden that will reduce flooding and hold lots of water.	Add a rain barrel to your yard to save water.

Activity 5: Community Role Playing Game – The Story of Floodmore

Background:
As coastal communities feel the effects of climate change, they will be faced with difficult community decisions related to adaptation. One major threat is sea level rise and increased storms and flooding events. This community planning activity requires students to take on various roles to solve a complicated and reality-based problem that many municipalities face. Having students role-play encourages them to inhabit various characters with various points of view. This reflects the complexity of group problem solving in the real-world and the multi-faceted nature of climate change decisions. Student will have to negotiate respectfully to come to a decision and learn skills to concisely and clearly convey their characters' needs and interests.

Every voice makes a difference. It is important for all concerned citizens to have an opportunity to talk about and have input into the future of their community. For successful sustainable development, citizens must be committed to working together for the benefit of everyone. We must also take into consideration our needs for healthy environmental ecosystems both now and into the future. When land use decisions are made, there should be compromises in order to obtain an outcome that serves the greatest good for both human and nature communities. This activity is open ended and allows participants to develop their own ending.

Objective:
Students will work through a real-world climate change adaptation dilemma at the community level. They will work on consensus building and decision-making as well as gaining an understanding of the social, political and human impacts on ecosystems and areas vulnerable to climate change.

Length: 1 hour **Ages:** 10 and up

Materials:
- Story and list of characters (see next pages) cut up and in a hat/bag/container
- Name tags or place cards with character names
- Costumes (optional)

Preparation:
To add to the atmosphere of a town meeting, consider setting your classroom up in a circle. You could also use the board or a flip chart and have a student record meeting notes and summarize the final decision visually. You many also want to watch this video from the United Nations on community adaptation with your class to provide some context and background on community adaptation:
http://resources4rethinking.ca/en/resource/adapting-to-a-changing-climate

Instructions:
Assign roles to students; there should be one Mayor and a group of town councilors (2-5), and a variety of other roles. Extra students can be town residents, or some positions can be doubled up. Costumes can help identify which students are playing which roles, alternatively consider adding name tags or place markers so everyone can remember who is who. Read the story of Floodmore to students. And then have students introduce themselves, begin voicing the opinions and information on their character cards and work together to decide what action the Mayor and Council should take.

The Story of Floodmoore
By Amelia Moore, EOS Eco-Energy

A housing developer is looking to build a large subdivision on the coast in South-East New Brunswick, in a (fictional) town called Floodmore. The houses are near a coastline and some locals have expressed concern that the buildings will be too near the ocean. With sea levels predicted to rise in the coming decades, developments along the coast may be threatened and increased development could speed-up erosion and habitat loss. More housing is needed in this small town as more people are moving here because it is a beautiful community. Some residents want to live near the water, enjoy the view and are in favour of this development. The town of Floodmore must make a decision about how best to proceed. As a group you have one major question to answer: Will the Mayor and Town Council offer the developer a permit for the development? But you can adapt the building plan to better suit your community, consider all the factors presented by those involved in the discussion to create your community plan for the building development. Working together and giving everyone a chance to speak, make a plan for how the town will respond to this developer. You can come to a decision unanimously or your community can hold a vote to decide between options that have been presented. All concerned residents have gathered for a town hall meeting.

Note: This story has been tailored to fit the climate change challenges of coastal New Brunswick but can be adapted and changed to fit other environmental issues.

Take it Further:

For a similar activity focused on Wetland protection and tourism check out Nature NB's Wetland Debate: http://www.naturenb.ca/wp-content/uploads/2013/01/Activity-5-Wetland-Debate.pdf. For a role-playing game around a sustainable development dilemma check out Mount Allison University's Rural and Small Town Program's SPY Camp Program guide, available by request from EOS Eco-Energy.

New Brunswick Government Global Competencies

- Understand ecological, economic, and social forces, their interconnectedness, and how they affect individuals, societies, and countries.
- Voices opinions and advocates for ideas
- Sees patterns, makes connections, and transfers learning from one situation to another, including real world applications
- Connects, constructs, relates, and applies knowledge to all domains of life such as school, home, work, friends, and community
- Makes discoveries through inquiry research
- Asks effective questions to acquire knowledge
- Listens and shows empathy to understand all points of view
- Acts responsibly and ethically in building sustainable communities

Characters in the Community of Floodmore

(Cut out and give to each student)

1. Secretary

The secretary has a very important role in recording the proceedings of the town discussion. You can either take these notes on loose leaf paper, a white board or a flip chart at the front of the room. Consider taking notes about Concerns and Advantages to the development project and being able to put all these thoughts together later in the discussion.

2. Town Council

You are a newly elected town council and depend on the support of municipal residents for their future votes. Groups who wish to preserve the coastline are pressuring you. Other interest groups see the housing development as a source of employment and residence for community members. You will decide on how the area is to be developed, based on the debate amongst the different interest groups. At the end, you will decide if the land will be zoned as a protected coastal zone or for residential purposes.

3. Developers

You have been in the housing business for over 50 years and have provided many jobs during that time. You are convinced that wealthy people are looking for a Maritime housing development near the coast. Your residential development will greatly help the local community by providing housing and construction jobs. By enticing more people to move to Floodmore, the tax base or revenue for the community will increase too. You want the area zoned for residential development. You promise to make as many of the jobs as local as you possibly can.

4. Landowner

Your family owns the land proposed for the housing development. You are willing to sell this land to the housing developer. You worry that your land will lose value if it is protected from valuable coastal landscape. However, you are also concerned about selling your land to a company that isn't committed to your community.

5. Builders (Carpenter, Electrician, Plumber as needed)

You represent the largest construction companies in the municipality. If the land is sold to the developer, you would like to bid on the contract to build the houses. You are in favour of the housing development, but also do not want your hard work threatened by sea level rise. As experts in infrastructure and building, you can also suggest ways to adapt this building project to potentially avoid environmental concerns.

6. Environmentalists

You are environmentalists who have been involved in trying to protect the coastline, salt marshes and other ecosystems in the province. In the past, you have seen cottages and housing developments encroach on important habitat. You have lobbied the government to support your cause. You feel that the proposed building site should be zoned as a protected area.

7. Climate Scientist(s)

You are the scientist(s) who has expertise in climate change and coastal environments. You are concerned about the proximity of the housing development to the coastline and are knowledgeable in rising sea levels and the dangers of coastal erosion to infrastructure. You do not feel like an expert in housing policy and economic issues but are opposed to the housing development given its vulnerable position.

8. Residents

Residents of the town may have a variety of opinions, concerns or reasons for support. You may be unhappy because you like visiting the undeveloped natural beach. You or your relatives may want to move into the housing development. You may be able to get employment from the project. You may have climate change related stress and this project is making you anxious as you have many concerns about the future of Floodmore.

9. Town Emergency Services

You are the employees of the town who respond to emergencies and coordinate emergency services. There are rules and safety precautions for all the buildings built in your town and you are sure the building would be safe, but you are concerned about the proximity of the building to the coast. During intense coastal storms and coastal storm surge flooding (which are forecasted to happen more often with climate change), the area could be cut off from town and make it difficult or impossible to reach residents. This makes you very nervous.

Additional Activities and Resources for Middle School Climate Change Adaptation

- Climate Change Lesson Plans and Resources - https://energy.techno-science.ca/en/resources/climate-change-lesson-plans.php
- Movies about Climate Change - https://www.commonsensemedia.org/lists/movies-that-teach-kids-about-climate-change
- Human Impact Videos – Global Oneness Project - https://www.globalonenessproject.org/library/collections/climate-change
- Earth Temperature Timeline Cartoon - https://xkcd.com/1732/
- Canadian Geographic Climate Activities - http://www.canadiangeographic.com/educational_products/activities/climate_change_lesson_plans/EN/Living_World%20_Activities/Climate-Change-Lesson-Plan_Living_World_Teachers_Guide.pdf
- Climate Atlas Link - https://climateatlas.ca/map/canada/plus30_2060_85
- Canadian Geographic - http://www.canadiangeographic.com/educational_products/activities/climate_change_lesson_plans/EN/Society_and_Economy_Activities/Climate_Change_Lesson_Plan_Society_and_Economy_Activity_3.pdf
- Nature NB - http://www.naturenb.ca/wp-content/uploads/2013/01/Activity-5-Wetland-Debate.pdf
- ESRI GeoMentors - https://community.esri.com/groups/geomentors
- National Geographic Elementary Map Skills - https://www.nationalgeographic.org/education/map-skills-elementary-students/?ar_a=1
- The Green Design Lab - https://www.thegreendesignlab.org/wp-content/uploads/2015/10/SchoolEnergyAudit.pdf
- Climate Change Lesson Plans and Resources - https://energy.techno-science.ca/en/resources/climate-change-lesson-plans.php
- Climate Change Movies - https://www.commonsensemedia.org/lists/movies-that-teach-kids-about-climate-change
- Climate Atlas Videos - https://www.youtube.com/channel/UC7G1kgcoCiW60ZofImvukyw/videos
- Human Impact Videos - https://www.globalonenessproject.org/library/collections/climate-change
- Climate Change Explainer Comic - https://xkcd.com/1732/
- Canadian Geographic Teacher's Resource - http://www.canadiangeographic.com/educational_products/activities/climate_change_lesson_plans/EN/Living_World%20_Activities/Climate-Change-Lesson-Plan_Living_World_Teachers_Guide.pdf
- NBEN Community Hub for Climate Change Educators: English - climateeducation.nben.ca and French - educationclimat.renb.ca

High School Lesson Plans: Climate Change, Mental Health and Personal Resiliency

Background:

Climate change is the leading challenge of our time and we must equip the next generation with the skills to not only survive but thrive in a changing climate and uncertain times. Teens today can struggle with a number of anxieties and mental health is a growing focus in high schools. The activities in this high school level lesson plan address climate change stress and anxiety and offer students ways to cope, learn self-sufficiency skills, and also learn how to be global citizens and contribute to climate change adaptation planning locally. Activities range from short videos and discussions to longer, more in-depth investigations.

Objective:

Our high school lesson plan focuses on activities for building personal resiliency to climate change, including dealing with climate stress or eco-anxiety and learning traditional skills. The final activities build on everything in this guide (elementary and middle school lesson plans too) to culminate in learning about and creating community adaptation plans.

Disclaimer:

The activities and lesson plans below were reviewed by certified counselling therapists, school counsellors and former teachers, and climate change adaptation experts. EOS encourages you to reach out to local environmental organizations, the school guidance counsellor or mental health staff to help lead the mental health related activities or to lend additional expertise.

Activity 1: Start with Videos and Discussions on Adaptation and Resiliency

Background:
Begin the exploration of adaptation and personal resiliency with some pertinent videos and discussion ideas. Discussions could take place in geography or science classes or New Brunswick teachers could use the 30-minute ELP period at the beginning of the day to feature videos and have discussions about climate change issues.

Objectives:
By watching videos and participating in classroom discussions, students will learn how to build resiliency, while exploring climate change concerns, actions and real-world solutions.

Length: 30 minutes or more **Ages:** 15 and up

Materials:
A computer/laptop, video screen, speakers, and an internet connection to access the video links.

Instructions:
Select a video(s) from the list below and start a classroom discussion using the suggested questions or others of your choosing.

Video #1 *On the Rise – Conservation and Sea Level Rise in Atlantic Canada*
This 2019 video by Ducks Unlimited Canada showcases collaborative approaches to climate adaptation in Atlantic Canada, especially in the Chignecto border region. It highlights EOS' Chignecto Climate Change Collaborative. Watch the six minute video at: https://www.youtube.com/watch?v=qW5RcMUIQsU (available in English only). Explore these discussion questions:

- What is the history of the dykes in Tantramar? How do they work?
- Why are the dykes at risk? What do they protect? What is the worst-case scenario for the dykes?
- How do wetlands help adapt to sea level rise?
- Why do we need to adapt?
- What are the benefits of collaboration when adapting to climate change?

Video #2 How to Prepare for Flooding at Home

Watch this 26-minute video on preparing for flooding at home in New Brunswick by EOS Eco-Energy. It explains flood risk, how to prepare both inside and outside your home, what to do after a flood and why it's important to be prepare, not scared. It can be viewed (in English only) at:
https://www.youtube.com/watch?v=dlaxqMno9MI&t=19s

Discussion questions:
What do you think are some of the best ways to reduce flood risk at home? Why?
What else could be done to help prepare and reduce a person's flood risk?
Who needs to be concerned and prepared for flooding?
Have you been impacted by flooding?
What actions have you and your family taken to prepare for flooding?
How concerned are you about flooding?
What could be done to ease your concerns?
Why do you think being prepared for flood events helps reduces stress?
How can preparing for flooding help people be resilient (or bounce back after disasters)?
What could students do at their school to help reduce flood risk? (Eg. if you want to plant a rain garden, EOS can help, get in touch)

Video #3 Draft-Proofing Work Parties

EOS produced a video about its draft-proofing work party program to help lower-income homeowners save energy and be more comfortable in their homes. Work parties are similar to old-fashioned barn raisings where people come together to help those in need. Everyone works together to help seal air leaks in the home, reducing emissions. They all learn lifelong home improvement skills and make new friends too. Watch the 4-minute video (English only) at:
https://www.youtube.com/watch?v=HfGgw6_6NTY&t=129s

Discussion questions:
What is a draft-proofing work party?
Why is it important?
How does it make the homeowner feel?
Why do you think the homeowner would like to volunteer at future parties?
How does a work party bring people together?
How does a draft-proofing party build personal and community resiliency?
What else could be done to help homeowners be more comfortable in their homes?
Could students help at a local draft-proofing party? (Get in touch with EOS.)

Take it Further - More Videos to Kick off Discussions:
There are many more videos that could help launch interesting classroom discussions. A couple that have been created by other New Brunswick non-profits are listed below.

Adaptation in Atlantic Canada by the Fundy Biosphere Reserve
The FBR has a series of excellent videos on climate adaptation issues with corresponding lesson plans and discussion questions for each province in Atlantic Canada. Visit the FBR's video page at: http://www.fundy-biosphere.ca/en/projects-and-initiatives/education.html

Kokota: Islet of Hope by Community Forests International
CFI has produced an impressive video which tells the incredible story of the resilient people living on a tiny islet in the Indian Ocean, and Mbarouk Mussa Omar's journey to help them adapt and thrive in a changing world. Watch the CFI video at the following links:

English version (15 minutes)
https://www.youtube.com/watch?v=pPbicgrKAIc

French version (15 minutes)
https://vimeo.com/294216717/1518f8742a

And English teacher's guide is available at: https://planetinfocus.org/wp-content/uploads/2015/08/A-Teachers-Guide-to-Kokota-Islet-of-Hope.pdf

United Nations Video on Adapting to a Changing Climate (20 minutes)
http://resources4rethinking.ca/en/resource/adapting-to-a-changing-climate
The video with a global focus is available in both French and English and has connections to grade 10 and 12 science curriculum in New Brunswick. Discussion questions are not included so we have listed some for you:

- Why must we adapt to climate change?
- What makes adaptation strategies successful? (Hint – resilience and sustainability)
- Do we need to know everything about climate change to start adapting?
- How do poverty and human rights affect the ability to adapt? (Vulnerable populations are impacted most.)
- What do communities need to be climate resilient? (Hint – data, planning, safe infrastructure, financial resources, resilient people, etc.)
- Why is planning for climate change important for infrastructure projects?
- How much can adaptation investment save us in response later?

New Brunswick Government Global Competencies

- Solving real world complex problems.
- Asks effective questions to acquire knowledge; listens and shows empathy to understand all points of view; voices opinions and advocates for ideas; communicates affectively.
- Cultivates emotional intelligence to understand self and others

Activity 2: Addressing Climate Stress and Eco-Anxiety

Background:

Climate change and environmental issues are weighty topics and related stress and eco-anxiety are common among teenagers. Worrying about a future that can appear bleak and frustration from insufficient government action can take its toll on youth. Some have also experienced impacts from increasingly severe floods, storms, power outages, etc. Climate stress can include feelings of anger, frustration, hopelessness, guilt, dread, fear, depression, despair, etc. As students learn more about climate change, stress can easily develop. Stress can be a good thing as it shows we care and are concerned but it is what we do with the stress that is key. Do we turn it into action like starting a school eco club, or does it get the better of us and lead to more severe mental health challenges? It is important to support students in learning ways to address and manage stress, learn effective self-care techniques and identify when more help may be needed. Sometimes just talking with others can help. Addressing climate stress also allows us not to feel burned out, hopeless or to want to disengage from the issues. The climate change challenge requires everyone's ongoing efforts so it is important to learn strategies from a young age to help address and manage stress. The teenage years are a pivotal time as students gain more independence and need to care for themselves. EOS Eco-Energy and IRIS Community Counselling and Consulting out of Sackville, NB partner to offer workshops on how to cope with climate stress for adults and youth. This activity is based off the youth workshop and is suitable for youth of any age.

Objectives:

Students will learn how to express their thoughts, feelings and concerns about climate change while listening to others. They will learn a variety of coping strategies for dealing with climate stress and eco anxiety and create a group art piece to put on display in their school.

Length: 60 minutes **Ages:** 11 and up

Materials:

- Download and print EOS Climate Stress Bookmarks with lots of tips on ways to cope with climate stress for teens as well as actions teens can take to help address climate change. Find it on EOS website at: https://eosecoenergy.com/en/wp-content/uploads/2018/11/Kids-climate-stress-bookmark-copy-2.pdf
- A large round fabric tablecloth (or large round piece of paper)
- Black, green and blue markers (fabric markers may be needed for the fabric)

Instructions:

Draw an image of planet earth on the tablecloth or paper. Have students sit in a circle to face each other (best for facilitating discussion). Begin a discussion with the following questions (and add others as you wish):

- What is one word that comes to mind when you think of climate change?
- How does climate change make you feel?
- What concerns you about climate change?
- What can students do to create positive impacts for climate action?
- What are some ways that we can take care of ourselves (or self-care) to help deal with climate stress?
- What else might you need in order to feel less stressed about climate change (eg. emergency kit, survival skills, seeing governments take more action, etc.).
- What is a takeaway from today? How do you plan to take care of yourself? How to plan to help address climate change in your school or community?

After the discussion, get students to fill in the planet with two kinds of actions. Actions that can help the environment and address climate change go on the landmasses (written in green), and actions that help with self-care go in the water (written in blue). Actions that help both the planet and humans to feel better (like biking) could be written in black along the outlines of the continents. Display the earth and all the actions in a prominent place in your school as a reminder for everyone (students and adults) to care for the planet and for themselves. This activity could also be a launching off point for further climate change actions for your school.

Take it Further:

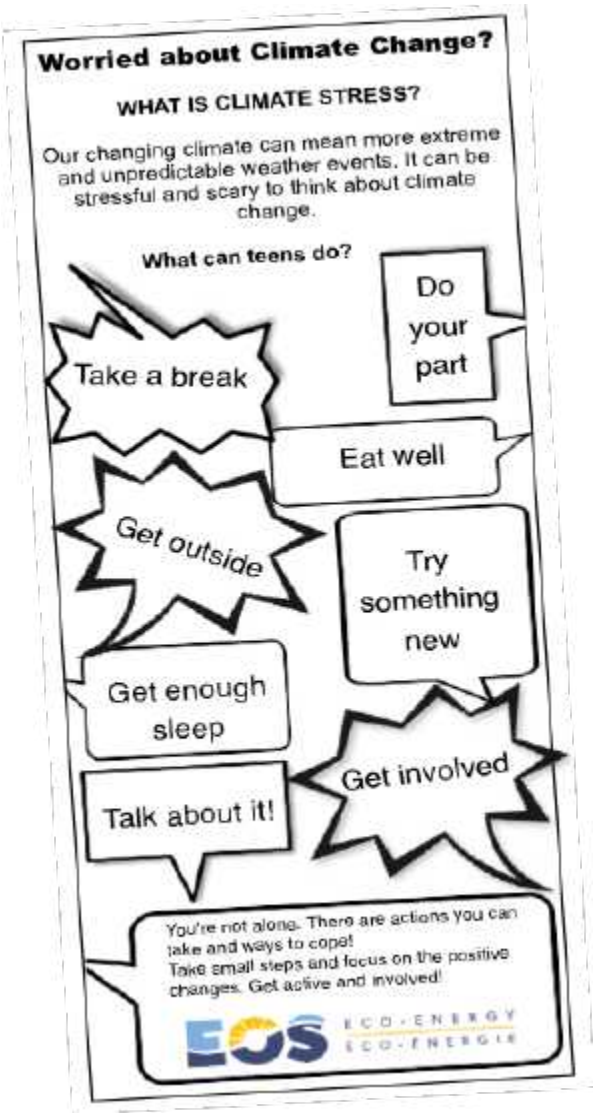
- Investigate mental health services in your area.
- Contact IRIS Community Counselling and EOS to visit your school or summer camp and coordinate a climate stress session.
- Seek out additional training for teachers and staff in mental health and climate stress.

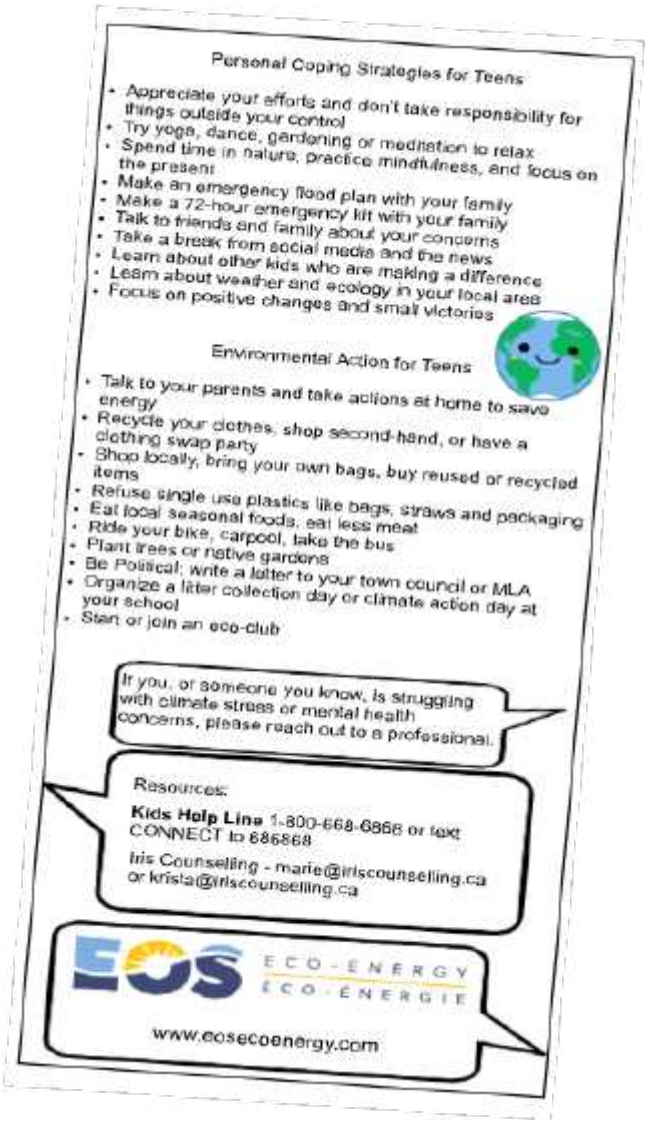
New Brunswick Government Global Competencies

- Adapts to change and is resilient in adverse situations.
- Aware of, manages, and expresses their emotions, thoughts, and actions in order to understand themselves and others.
- Manages their holistic well-being (e.g., mental, physical, and spiritual).
- Listens and shows empathy to understand all points of view; voices opinions.

Print these Climate Stress Bookmarks and share with your class:

Find it a printable version online at:
https://eosecoenergy.com/en/wp-content/uploads/2018/11/Kids-climate-stress-bookmark-copy-2.pdf





Activity 3: Learning Traditional Skills

Background:

Teenagers may not have a lot of control over what is purchased for them or the lifestyle and energy consumption/environmental impacts of their family. This may contribute to their eco anxiety and feeling they are contributing to the problem of climate change. They may not realize their power to create change and have a positive and measurable impact. One area that they may be able to control, or influence is the clothing they purchase and wear. The "fast fashion" industry uses a lot of water and energy and creates a lot of waste. Teens and other consumers have a lot of power to change this and can re-use and upcycle clothing to create new fashions.

Objectives:

Students will learn how to upcycle clothing into new, one-of-a kind pieces while keeping clothing out of the landfill, reducing the need for fast fashion and its environmental impact. Students will learn sewing and mending which are important traditional skills. This activity would be suitable in a home economics class, technology class, art class, social studies, etc.

Length: 4 to 6 hours **Ages:** 12 and up

Materials:

- Sewing machines
- Thread, needles, measuring tapes, fabric scissors, zippers, and accessories as needed
- Pieces of clothing to refashion or upcycle (students can bring in pieces, or clothing could be donated to the class)
- If you do not possess sewing or fashion design skills, you may want to bring in a local resource person

Instructions:

Have students explore unique fashion designs online. Provide a basic lesson on how to use a sewing machine and how to do basic mending (thread a needle, hand stitches, etc.). Let students explore their creativity and try different designs, constructions, etc. This activity could take 4 to 6 one-hour class sessions. Students could work alone or in pairs or teams collaboratively.

Take it further:

A refashion show: Students could showcase their creations in a "ReFashion Show" for the rest of the school and/or local community as EOS did during its annual Climate Change Week (see photo below). A creation of note was a dress made from an umbrella!

Research projects on traditional skills: Students could explore other traditional skills to increase personal resiliency to climate change such as gardening, canning, preserving, dehydrating, root cellars, wild edibles, ham radio communication, etc. These traditional skills can help during power outages and help make people more self-sufficient in times of emergencies. They also result in less waste and save energy. Class research projects and presentations could be performed on these and other skills.

Student entrepreneurs: Students could also sell their creations (clothing, preserves, etc.) to explore creative and ethical entrepreneurship (a global competency!)

New Brunswick Government Global Competencies

- Designs and manages projects.
- Contributes solutions to complex social, economic, and environmental problems; enhances a concept, idea or product through a creative process, takes risks in thinking and creating, tests hypotheses and experiments with new techniques; makes discoveries through inquiry research; demonstrates imagination, creativity and ingenuity; ethical entrepreneurship.
- Takes the past into account to understand the present and approach the future.
- Understands ecological, economic and social forces, their interconnectedness and how they affect individuals, societies and countries.
- Participates in teams and acts cooperatively.
- Has self-efficacy, sees themselves as learners, and believes that they can make life better for themselves and others.
- Turns ideas into value for others by enhancing ideas or products to provide new-to-the-world or improved solutions to complex social, ecological, and economic problems or to meet a need in a community.

Activity 4: Adaptation Planning Part 1 - Explore Local Climate Impacts

Background:

Now that students have learned some background about local climate change impacts, how to cope with climate stress and how they can make some personal changes that have positive impacts on the environment and climate change, it is now time work toward a community climate change adaptation plan. This is the first of a three-part process to create a climate adaptation plan. Climate change can seem like a faraway issue, but it is impacting Canada and New Brunswick already. In New Brunswick we have and will continue to see sea level rise, more frequent and more intense storms, more precipitation but falling less often in more intense events, and warmer temperatures. These impacts are leading to coastal and inland flooding, more erosion, more power outages, etc. What will be impacted? Who will be impacted? This activity will explore local climate impacts and projections.

Objective:

Students will learn about local climate change impacts and what and who are at risk.

Length: 60-90 minutes or more **Ages:** 15 and up

Materials:

- Paper and Markers
- Flood risk or regular maps for your town

Instructions:

Begin by watching a 10 minute video about climate change impacts in New Brunswick from the Fundy Biosphere reserve: http://www.fundy-biosphere.ca/en/projects-and-initiatives/education.html (scroll down to the New Brunswick video).

Bring in local resource people to chat about local climate change impacts and projections. Examples include:

- Emergency measures organizations or local fire chief
- Environmental non-profit organizations (like EOS Eco-Energy)
- Local government representatives
- Provincial Department of Environment representatives
- Community planners (see if they have flood risk maps for your community)
- Other local experts

If no local resource people exist, students could be asked to research local climate change impacts. Here are some good sources:

- Geo NB, Service NB (for flood maps and more) - http://www.snb.ca/geonb1/e/index-E.asp
- Atlantic Climate Adaptation Solutions Association (for lots of local research projects) - https://atlanticadaptation.ca
- EOS Eco-Energy's Climate Adaptation Toolkit - http://eosecoenergy.com/en/climate-change-adaptation-toolkit-2/

Have students get into small groups. Hand out paper and pens and ask students to think about climate impacts in their community. Provide each group with a map of the community.

Using what they learned from videos, presentations by local experts, and/or from online research, ask students to think about and record:

- Have they seen flooding? From fresh water? From the coast? Circle areas on the map.
- What other climate impacts might affect their community? (Example: blizzards, ice storms, heat waves, droughts, rising sea levels, rising temperatures, changes in precipitation patterns, etc.)
- What weather events might happen as climate change continues?

On a map of the community have students circle areas of concern or vulnerability:

- What things/spaces/buildings/etc. are important in their community?
- Who lives in their community? Where do vulnerable groups live? (Day cares, seniors' homes, etc.)
- Who is at risk? (Examples: farmers, businesses, children, elderly, people in certain parts of town?)
- What is at risk? (Example: roads, bridges, buildings, farms, businesses, homes, power grids, communications, etc.?)

Have students share their answers and their maps with the rest of the class. Have students keep their information for parts 2 and 3 on the next pages.

Take it Further:

The posters could also be posted in the school or community for further educational value.

New Brunswick Government Global Competencies

- Engages in an inquiry process to solve problems.
- Acquires, processes, interprets, synthesizes, and critically analyzes information to make informed decisions (i.e., critical and digital literacy).
- Solves meaningful, real-life, and complex problems by taking concrete steps to address issues and design and manage projects.
- Participates in teams by establishing positive and respectful relationships, developing trust, and acting interdependently and with integrity.
- Analyzes the functions and interconnections of social, ecological, and economic systems.

Activity 5: Adaptation Planning Part 2 - Adaptation Investigation

Background:
Now that students know what climate change impacts are or will affect their community, as well as who and what are at risk, they can now start to think about what could be done locally to adapt to climate change and build resiliency to bounce back. For inspiration students will research adaptation plans and community projects from across Canada and around the world.

Objectives:
Students learn about adaptation options, plans and community projects from around the world and share their findings.

Length: 60 minutes or more **Ages:** 15 and up

Instructions:
If your class did not already watch the 20 minute video (available bilingually) from the United Nations on community adaptation in an earlier activity, watch it now:
http://resources4rethinking.ca/en/resource/adapting-to-a-changing-climate

Students then conduct research projects and write reports on climate adaptation plans and community climate adaptation projects from around the world. All the while with an eye to what might be beneficial in their community. Topics to choose from could be divided in different ways:

1. By country (example: Canada, United States, Australia, UK, island nations, Tanzania, etc.)
2. By province in Canada (learn what other regions are doing to adapt in Canada)
3. By impact (sea level rise, coastal flooding, freshwater flooding, winter storms/blizzards, ice storms, droughts, heat waves, etc.)
4. By adaptation approach - engineering options (raising roads, moving buildings, planting trees, gardens, stormwater ponds, etc.), land use planning (different zones for different uses, rules for different zones such as not building in flood zones, or raising buildings, etc.), and private actions by citizens (energy preparation, etc.)

Students share their findings in oral presentations or a poster session/info fair.

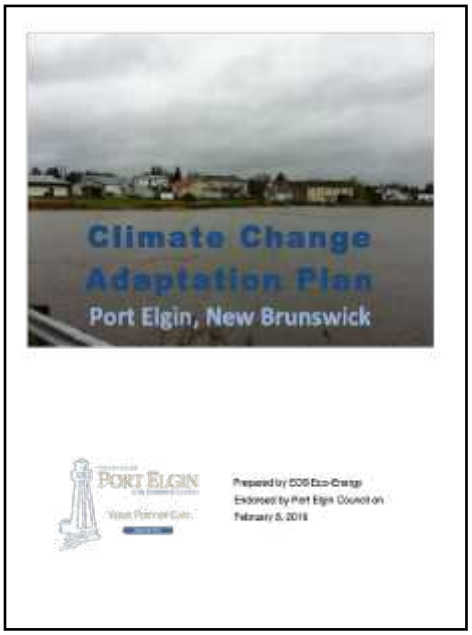
Take it Further:
The poster session or info fair could be open to the general public or local officials could be invited to hear presentations or visit posters or booths at an info fair. Posters could be put on display in the school.

New Brunswick Government Global Competencies

- Engages in an inquiry process to solve problems.
- Acquires, processes, interprets, synthesizes, and critically analyzes information to make informed decisions.
- Selects strategies, resources, and tools to support their learning, thinking, and problem-solving.
- Sees patterns, makes connections, and transfers their learning from one situation to another, including real-world applications.
- Constructs, relates and applies knowledge to all domains of life, such as school, home, work, friends, and community.
- Solves meaningful, real-life, and complex problems by taking concrete steps to address issues and design and manage projects.
- Formulates and expresses questions to further their understanding, thinking, and problem-solving.
- Participates in teams by establishing positive and respectful relationships, developing trust, and acting interdependently and with integrity.
- Learns from and contributes to the learning of others by co-constructing knowledge, meaning, and content.
- Networks with a variety of communities/groups.
- Demonstrates empathy for others in a variety of contexts.
- Understands the interconnectedness of social, ecological, and economic forces, and how they affect individuals, societies, and countries.
- Expresses themselves using the appropriate communication tools for the intended audience.
- Discovers through inquiry research, hypothesizing, and experimenting with new strategies or techniques.
- Adapts to change and is resilient in adverse situations.

Activity 6: Adaptation Planning Part 3 - Community Adaptation Planning

Background:
This final activity brings together everything learned in the elementary, middle and high school activities and has students work in groups to develop climate change adaptation plans for their community. Adaptation planning is an important part of our towns and cities. Adaptation plans are meant to prepare us for challenges in the future so that as communities we can be proactive before problems arise and bounce back more easily after disaster strikes. These plans include local climate impacts and predicted impacts, a vulnerability assessment of people and places in our communities and a list of adaptation actions.



Objective:
Students will use what they have learned about storm preparedness, community adaptation, and personal resiliency throughout various grade levels in this lesson plan guide to create a community adaptation plan for their community.

Length: 60 minutes or more **Ages:** 15 and up

Instructions:
Place students in small groups and explain that they need to help prepare their community for climate change. Have students pretend they are members of a community planning committee and have them think about the following questions and work together to fill in the Adaptation Plan Template below.

- What might be done to adapt to the climate impacts you identified? What have other communities done? What did you learn in Part 2 (Adaptation Investigation)?
- What and who are vulnerable in your community? How might you help them?
- What engineering options might be needed? (Example raising roads, enlarging culverts?
- What ways could nature help? (Plant more trees, plant a rain garden to absorb rainwater, etc.)
- How could your community support mental health and mental resiliency to climate change?
- How can residents be more resilient at home? What will they need to be able to adapt to climate changes? (Examples: traditional skills, alternative energy, flood risk reduction, what will people do if there's no power for long periods, etc.?)

After filling in the template on the next page (or creating their own), students then can share their plans and explain what they imagine their community will look like in the future.

Take it further:

- Invite local experts such as local Emergency Measures organization or coordinator, local municipal staff, members of the planning department, or local environmental non-profits to watch the presentations.

Climate Change Adaptation Plan Template

Community Name: _____

Student names: _____

Date: _____

Climate Impact(s) this Plan Addresses:

_____

_____

Impact or Issue	Adaptation Action	Lead and Partners	Resources Needed	Timeline/Priority
Ex: Freshwater flooding	Plant rain gardens to help absorb rainwater naturally	Municipality and EOS Eco-Energy	Plants, compost, mulch, tools, volunteers, funding	High priority To be completed summer 2020

New Brunswick Government Global Competencies

- Selects strategies, resources, and tools to support their learning, thinking, and problem-solving.
- Sees patterns, makes connections, and transfers their learning from one situation to another, including real-world applications.
- Constructs, relates and applies knowledge to all domains of life, such as school, home, work, friends, and community.
- Solves meaningful, real-life, and complex problems by taking concrete steps to address issues and design and manage projects.
- Formulates and expresses questions to further their understanding, thinking, and problem-solving.
- Participates in teams by establishing positive and respectful relationships, developing trust, and acting interdependently and with integrity.
- Learns from and contributes to the learning of others by co-constructing knowledge, meaning, and content.
- Networks with a variety of communities/groups.
- Demonstrates empathy for others in a variety of contexts.
- Understands the interconnectedness of social, ecological, and economic forces, and how they affect individuals, societies, and countries.
- Expresses themselves using the appropriate communication tools for the intended audience.
- Discovers through inquiry research, hypothesizing, and experimenting with new strategies or techniques.
- Adapts to change and is resilient in adverse situations.

Additional Activities and Resources for High School Climate Change Adaptation

There is so much that could be done to include more climate change adaptation at the high school level. Here are some ideas:

- Take your class outside because spending time in nature is known to help reduce climate stress and eco-anxiety.
- Host a climate art show and get students to submit art pieces that express their feelings about climate change or how they see their community in the future.
- Start an Eco Club (taking personal actions and encouraging others to do so also helps reduce climate stress)
- Plant a rain garden at your high school. Check out EOS' how-guide here: https://eosecoenergy.com/en/wp-content/uploads/2018/03/sm-Rain-Gardens-How-to-Handout-for-Tantramar.pdf
- Organize a climate actions youth summit and discuss various ways for youth to implement climate actions at their schools; have a competition for school-based climate projects
- Climate stress summit (could be the focus of a mental health summit day)
- Learn about traditional skills for food preservation (canning, dehydrating, root cellars, etc.)
- Learn about survival skills and outdoor skills

Additional Resources:

- Preparing for Home Flooding - https://www.youtube.com/watch?v=dlaxqMno9MI&t=19s
- Draft Proofing Work Parties - https://www.youtube.com/watch?v=HfGgw6_6NTY&t=129s
- Fundy Biosphere Reserve - http://www.fundy-biosphere.ca/en/projects-and-initiatives/education.html
- Kokota English 15 minutes - https://www.youtube.com/watch?v=pPbicgrKAIc
- Kokota French 15 minutes - https://vimeo.com/294216717/1518f8742a
- Kokota English Teachers Guide - https://planetinfocus.org/wp-content/uploads/2015/08/A-Teachers-Guide-to-Kokota-Islet-of-Hope.pdf
- Climate Stress Bookmark - https://eosecoenergy.com/en/wp-content/uploads/2018/11/Kids-climate-stress-bookmark-copy-2.pdf
- Carbon Cycle Video - https://www.youtube.com/watch?v=jOht6qmuG-k
- How we think about climate change - https://www.youtube.com/watch?v=DkZ7BJQupVA
- Climate Atlas tool - https://climateatlas.ca/map/canada/plus30_2030_85
- IRIS Facebook - https://www.facebook.com/iriscommunitycounselling/
- ICLEI - www.icleicanada.org/games
- See list of Additional Resources for Middle School too. Most items are appropriate for a wide range of ages.

More Resources and Links

Climate Change Adaptation Plans

See how municipalities are planning for climate change:

Sackville, NB	https://www.nbse.ca/planning/area/sackville
Port Elgin, NB	https://www.nbse.ca/planning/area/port-elgin
Dorchester, NB	https://www.nbse.ca/planning/area/dorchester

The above links will take you to the Southeast Regional Service Commission where you can find other municipal plans for these communities such as sustainability plans.

Contact your municipality to see if they have an adaptation plan.

Guest Speaker Suggestions

Bring an expert or resource person into your class, no matter what grade:

- Local Emergency Measures Coordinator
- Fire Chief
- A local planner. For example: https://www.nbse.ca/planning/
- Mayor, councilors and/or municipal staff such as the town engineer or sustainability coordinator
- Environmental organizations such as EOS Eco-Energy. Visit the New Brunswick Environmental Network to search for organizations in your region of New Brunswick: https://db.nben.ca
- University professors working on climate adaptation such as: Dr. Mike Fox (Mount Allison University), Dr. Louise Comeau, (University of New Brunswick), Serge Dupuis (Université de Moncton), etc.
- Climate stress and eco anxiety counselling therapists such as IRIS Community Counselling: https://iriscounselling.ca

Field Trip Ideas

Think outside the box and go on a field trip:

- Visit naturalized stormwater retention ponds (contact Ducks Unlimited Canada, Town of Sackville, NB or City of Moncton).
- Go on a rain garden tour with EOS Eco-Energy and learn how nature can help us adapt.
- Visit low lying coastal areas or a river that flooded, check out the landscape, what can you observe?
- Visit the dykes in Tantramar or Albert County in New Brunswick. Learn about their history, how they work and what their future means in the face of climate change. Contact the NB Department of Transportation and Infrastructure to find out more.

Notes