CLIMATE PREPARED YEG

TEACHER'S GUIDE

Inside education

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The Climate Prepared YEG Poster was created with support from the City of Edmonton, in alignment with the Neighbouring for Climate program and Change for Climate initiative.

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INTRODUCTION

Using this Resource:
Climate Prepared YEG is designed to help students in Grades 3 through 10 identify ways we can reduce our environmental impact while preparing and adapting our communities to function in the midst of a changing climate.

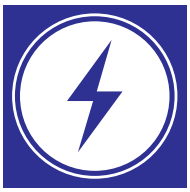
About the Poster:
The illustration depicts content discussed within the City of Edmonton's Neighboring for Climate Toolkit. It is meant to depict what a community prepared for climate change could look like. The activities portrayed within the illustration fall into 5 categories that are discussed within the Neighboring for Climate Toolkit and are identified by an icon.

The following legend indicates what each icon shown in the poster represents:

Emergency Preparedness

Nature & Plants

Food Security



Energy & Fuel Savings

Waste & Water

The illustration also depicts activities that do not demonstrate climate change mitigation or preparedness and are marked by a question mark icon.

While these actions are not necessarily bad, we want students to think about alternatives to these activities that are more climate friendly, safer, and easier!

About this Teacher's Guide:

This Teacher's Guide contains lessons and supplementary activities that can be completed with the Climate Prepared YEG poster. Each of the lessons enhances the Alberta Program of Studies.
Through the activities in the Teacher's Guide, students are encouraged to look at their own lives and examine where they can make changes to become more climate friendly and impact resilient.

UNDERSTANDING CLIMATE CHANGE IMPACTS, MITIGATION, AND RESILIENCE

What is Climate Change?

Climate change is a large-scale change in average weather over a time period of at least 30 years. It occurs naturally due to factors such as changes in the Earth's orbit, volcanic eruptions, or variations in solar energy. However, human activities also significantly influence climate. Activities like the combustion of fossil fuels for energy and electricity, industrial activity, forest fires, and deforestation release greenhouse gasses into the atmosphere. This increased concentration of greenhouse gasses accelerates the greenhouse effect, trapping more heat in the Earth's atmosphere. Consequently, the average global temperature is rising and will continue to do so as long as human activities continue to emit greenhouse gasses.

In addition to rising global temperatures, climate change can be characterized by extreme weather events such as floods, droughts, hurricane-force winds, extreme cold, and seasonal shifts. The terms "climate change" and "global warming" are often used interchangeably, but while global warming specifically refers to the increase in the Earth's surface temperature, climate change encompasses a broader spectrum of changes in weather patterns, including temperature and precipitation variations.

Climate Change Mitigation

Climate Change Mitigation addresses the cause of climate change by reducing the amount of greenhouse gasses emitted as a result of human activities. A pivotal step in mitigation is the **Energy Transition**, where individuals, organizations, and governments shift from fossil fuels to sustainable, less carbon-intensive energy sources like renewables. **Edmonton's Community Energy Transition Strategy and Action Plan** is an example of a local climate change mitigation initiative, in which the City has outlined specific actions it will implement in regards to energy conservation, efficiency, and renewable resource projects and how the broader community can support this transition.

Climate Change Adaptation

Climate Change Adaptation seeks to minimize risks and adverse impacts associated with a changing climate. It helps individuals, communities, and ecosystems adapt and become more resilient to projected climate impacts such as temperature and precipitation changes, seasonal fluctuations, and extreme weather events. Adaptation and resilience efforts prepare us to embrace potential opportunities arising from a changing climate.

Our lifestyles and infrastructure are designed for a particular climate and may need to adjust under changing climatic conditions. As an example, the drainage system across Edmonton is designed for a certain amount of snowmelt and rain. While the amount of rainfall we receive is not projected to change significantly, we may see precipitation events as short-lived downpours that could cause flooding. Such challenges highlight the need to redesign or rethink how we manage large volumes of water in a short period of time. This is just one example of what it means to adapt and become resilient to a changing climate, and there are many simple actions we can take at home or in our communities to become better prepared.

Climate change is already underway and is happening quickly. Recognizing this, the City of Edmonton has developed **Climate Resilient Edmonton: Adaptation Strategy and Action Plan**. This comprehensive plan identifies climate risks and outlines responses to ensure the city thrives under changing conditions. A climate-resilient Edmonton aims to swiftly recover from disruptions and maintain essential function and services for its residents.

ALBERTA CURRICULUM CONNECTIONS

Grade 3 Science

Guiding Question: What visible changes can be identified by examining Earth's surface?

Knowledge: Human activities that can change Earth's surface include: Living on the land, building towns and cities, getting and using resources, growing crops and farming, polluting, and stewardship.

Skills & Procedures: Discuss the interconnectedness between human activities and responsibilities for maintaining Earth.

Grade 4 Science

Guiding Question: How can materials be managed safely?

Knowledge: Methods of waste management that can negatively impact the environment include using landfills and burning. Methods of waste management that can reduce negative environmental impacts include: Reducing, reusing, recycling, repurposing, repairing, and composting. Increased production and consumption of materials leads to increased production of waste materials.

Understanding: Responsible methods of waste management can reduce negative environmental impacts.

Guiding Question: How does Earth sustain life?

Knowledge: Conservation can be practised through personal actions, including:

- Use of electricity; e.g., turning off lights when leaving a room
- Use of water; e.g., taking shorter showers
- Reducing waste; e.g., using reusable containers

Conservation can be practised through community or global actions, such as:

- Use of energy-efficient alternatives; e.g., solar panels
- Community recycling or composting programs

Understanding: Conservation of Earth's systems involves personal, community, and global action.

Grade 5 Science:

Guiding Question: How are energy resources understood?

Knowledge: Renewable energy resources are not depleted over time as they can be naturally replenished if handled responsibly.

Understanding: Humans rely on energy resources to fulfill energy needs.

Guiding Question: How can climate and its effects be understood?

Knowledge: Climate affects various aspects of human activity, including agriculture, infrastructure, clothing, transportation, and recreation.

ALBERTA CURRICULUM CONNECTIONS

Grade 6 Science:

Guiding Question: How are energy resources used?

Knowledge: Factors that influence selection of energy resources include availability and accessibility, societal impacts, economic impacts and environmental impact.

Understanding: The advantages and disadvantages of several factors influence selection of energy resources.

Guiding Question: What relationships exist between climate and changes on Earth?

Knowledge: Changes in climate can be caused by human activities, including industrialization and pollution. Clean energy production has the potential to reduce net greenhouse gas production. Some personal actions that can help address human causes of global climate change include reducing personal consumption and waste, planting a garden or buying local produce, using clean, affordable, and reliable energy sources responsibly.

Climate change can affect:

- Weather and extreme weather events
- Migration patterns
- Water resources
- Frequency of forest fires

Grade 7 Science:

Unit A: Interactions & Ecosystems

Investigate and describe relationships between humans and their environments, and identify related issues and scientific questions.

- Identify examples of human impacts on ecosystems, and investigate and analyze the link between these impacts and the human wants and needs that give rise to them.

Describe the relationships among knowledge, decisions, and actions in maintaining life-supporting environments.

- Identify intended and unintended consequences of human activities within local and global environments.

Science 10:

Unit D: Energy Flow in Global Systems

Key Concepts:

- Explain how climate affects the lives of people and other species, and explain the need to investigate climate change (e.g., describe the responses of humans to extreme climatic conditions; describe housing designs and clothing requirements in conditions of extreme heat, cold, dryness or humidity, wind).
- Investigate and identify human actions affecting biomes that have a potential to change climate (e.g., emission of greenhouse gasses, draining of wetlands, forest fires, deforestation).
- Assess, from a variety of perspectives, the risks and benefits of human activity, and its impact on the biosphere and the climate (e.g., identify and analyze various perspectives on reducing the impact of human activity on the global climate).
- Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., recognize that human actions today may affect the sustainability of biomes for future generations; identify, without bias, potential conflicts between responding to human wants and needs and protecting the environment).

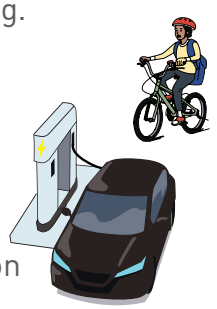
NEGATIVE IMPACT ACTIONS GUIDE

While we strive for sustainability, environmental stewardship, and climate resilience, adopting new habits isn't always easy. This poster highlights common actions that may not align with these goals. It's crucial to understand why these actions happen and explore ways to improve and transition towards more climate-friendly practices.

Exhaust: When a vehicle burns fuel, such as gasoline or diesel, the exhaust contains greenhouse gasses like carbon dioxide, nitrous oxide, methane, and other contaminants. These emissions can affect human health as well as the environment.

What can we do?

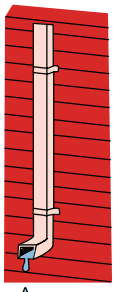
- Drive less or choose sustainable transportation like carpooling, bussing, cycling or walking.
- Don't idle.
- Choose a fuel efficient vehicle and adopt fuel efficient driving habits (avoid sudden braking or accelerating, plan route ahead of time, maintain vehicle tire pressure).
- Drive an electric vehicle and use charging stations that are supplied by renewable energy sources like solar or wind.



Improper downspout placement: Downspouts transport water collected in gutters away from building foundations. Improper downspout positioning can cause water accumulation and potential flooding risk, especially in periods of heavy precipitation.

What can we do?

- Ensure downspouts direct water away from a building. Placing them downslope and in an area where the water can quickly infiltrate the ground (e.g., not on concrete surfaces) can prevent building flooding.
- Directing downspouts into rain barrels is a great way to prevent pooling while saving water for plants & gardens!



Pooled water: The location of a building can impact how susceptible it is to flooding. Buildings that are downslope can accumulate water around their foundations during periods of heavy precipitation.

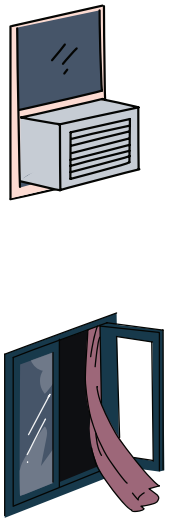
What can we do?

- Regularly check and clean storm drains and gutters so they are clear of debris.
- When purchasing a home, avoid areas that are downslope or adjacent to a river or large water body.
- Increase green space around your home! Water can infiltrate the soil, unlike concrete.

Air conditioner: While air conditioners are useful for keeping us cool in hot summer months, they use a lot of electricity, emitting more greenhouse gasses into the environment.

What can we do?

- Keep blinds or curtains closed on hot days to keep it cool inside.
- Open your windows in the early morning or at night when the day is typically at its coolest.
- Use fans, as they consume less electricity than an air conditioner.
- On hot days, cool down in a basement or a shaded spot.
- Look into an *air source heat pump* to warm your house when it's cool outside, and cool your home when it's hot outside.

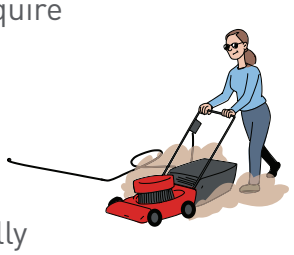


NEGATIVE IMPACT ACTIONS GUIDE

Gas lawn mower: In addition to air pollution through the release of greenhouse gasses, gas lawn mowers also contribute to noise pollution which can be disruptive to humans and wildlife.

What can we do?

- Naturalize spaces of your yard with drought tolerant or native plant species that require little maintenance and no mowing.
- Use a push mower for smaller spaces.
- Switch to an battery-powered lawn mower, which is quieter and does not create greenhouse gasses when charged using renewable resources.



Bagged leaves: It is common to bag up leaves and plant debris that have accumulated in our yards over the fall and spring, but it might not always be the most environmentally friendly option.

What can we do?

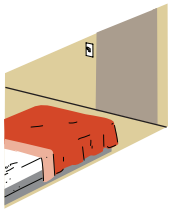
- Leaves are basically free fertilizer for your yard! Leave them on the ground or mulch them up into smaller pieces if you prefer a cleaner look.
- Add leaves into a compost bin or pile along with grass clippings and other organic yard waste.

Leaky faucet: While it may not seem like much, over time leaky faucets can waste significant amounts of water!

What can we do?

- Ensure leaky faucets are fixed or replaced once the leak is detected.
- Always turn off faucets when not in use (e.g., When brushing your teeth or in between rinsing the dishes).

Light on in house: Leaving lights on when not using a room wastes electricity!



What can we do?

- Always turn off the lights when you leave a room.
- Instead of turning on the lights during the day, open the blinds or curtains and use natural sunlight.

Tree through power line: Overgrown trees within your neighbourhood can present a risk, especially during periods of extreme weather. Trees touching power lines have been known to catch fire.

What can we do?

- Check your neighbourhood for overgrown trees that appear to be touching power lines.
- Check your neighbourhood for broken or dead branches that may fall in extreme winds.
- If on private property, call an arborist, or on public property, call the City to report hazardous branches.

NEGATIVE IMPACT ACTIONS GUIDE

Hand washing car: Washing your car at home often wastes water, takes a lot of time, and may not be as effective at cleaning.

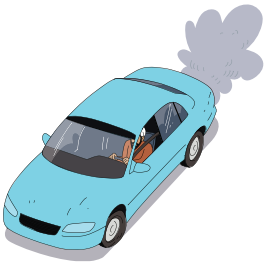
What can we do?

- Take your car to a car wash. Car washes recycle water, and on average use about one third of the water that would be used at home.

Using a hose: Using a watering can, rather than a garden hose allows for more precise water delivery directly to plants, minimizing waste and conserving water resources. It also promotes healthier plant growth by avoiding overwatering.

What can we do?

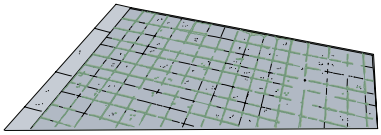
- Install a rain barrel. Watering plants with a rain barrel reduces water waste by collecting and using precipitation directly.



Commuting separately: Carpooling reduces traffic congestion, saves energy, and cuts greenhouse gas emissions by sharing rides among participants. It also promotes cost savings and social interaction, and reduces parking demand in urban areas.

What can we do?

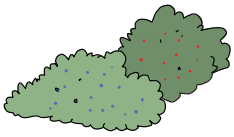
- Discuss commuting options with classmates, coworkers, or friends who share the same destination.
- Create a "walking school bus" in your neighbourhood where many students walk to school together, for safety, healthy living and social interaction.

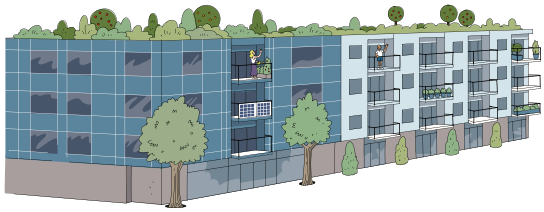


Parking lots and sidewalks: Paved areas increase runoff by preventing water absorption into the soil, leading to increased flood risks and negatively impacting local ecosystems by disrupting natural water cycles.

What can we do?

- Use permeable pavement to allow water to infiltrate the ground rather than run off as shown in the farmers market on the poster.
- Plant native vegetation in urban areas to enhance water absorption while supporting local wildlife
- Install bioswales, or vegetated ditches along roadways to manage runoff and promote infiltration
- Incorporate green roofs on buildings to absorb rainwater and reduce runoff.





EYE SPY (ELEMENTARY)

Description:

This is a fun eye spy game that can be played with students across many grade levels. Students will identify actions they can take at home or in their school.

Objective:

To familiarize students with the Climate Prepared YEG poster and to set groundwork for future discussions of climate change mitigation, adaptation, and resilience within our communities.

Duration:

~15 minutes

Materials:

Climate Prepared YEG Posters; Climate Community Riddles

PROCEDURE:

PART 1:

Divide students into small groups, providing each group with a copy of the Climate Prepared YEG Poster. Have each group come up with a sound they might hear if they were out in nature. It might be the sound of the wind (whsssssh) or an animal call (caw of a crow). This will be their "buzzer" sound when they have a correct answer. Read the riddles on the next page aloud and award points to the team with the correct answer.

PART 2:

Have the students in their groups try to make their own riddles for 4 different icons and submit them to you. Play the same game again, using their clues! If you would like to share the creative clues that your students have come up with, feel free to send them to info@insideeducation.ca.

PART 3:

Have students identify at least 5 different actions that represent climate change mitigation, and 5 actions that represent climate adaptation. Identify 3 question mark icons, and discuss what could be a better alternative.

Discuss:

Are any of these actions currently being done in your school? What about at home or within the community?

CLIMATE COMMUNITY RIDDLES

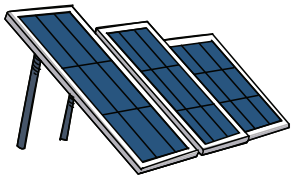
Energy & Fuel Savings:

When you come to school on me, you'll often wear a pack.
But make sure when you park, you put me in the rack! — What am I?

Answer: Bicycle

I'm shiny and sit on a roof up high, absorbing sunlight from the sky.
I turn it into electricity bright, helping homes and cities with my light — What am I?

Answer: Solar Panel



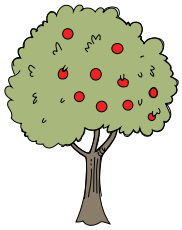
Food Security:

I'm a colorful spot where plants grow tall, neighbours gather, big and small.
Tomatoes, carrots, flowers in bloom, in this shared space there's plenty of room. — What am I?

Answer: Community Garden

My leaves are green while the weather is warm, and in spring lots of blossoms add to my charm.
Bees visit me with buzzing glee, turning flowers into fruit for you and me. — What am I?

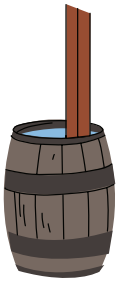
Answer: Fruit Tree



Waste & Water:

When clouds gather and skies turn gray, I collect rain to store away.
When it comes time to water garden rows, I'm much more effective than a tap and a hose. — What am I?

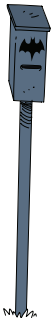
Answer: Rain Barrel



You might find your old toys here at bargain prices.
Buying cool used stuff is sometimes the nicest! — Where am I?

Answer: Yard Sale

CLIMATE COMMUNITY RIDDLES



Nature & Plants:

I'm a small house up high, hidden away, where creatures rest by the light of day.
At night they emerge, wings aflutter, pollinating plants, it's no small matter. — What am I?

Answer: Bat Box

We gather as volunteers, gloves in hand, to rid gardens of invaders, a labour so grand.
With determination, we pull and clear invasive species, unwanted and near. — What am I?

Answer: Invasive Weed Pulling

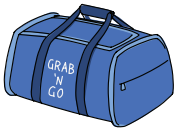
Emergency Prep:

I'm a cool place on a hot day, with branches wide and leaves that sway.
Under my shade you'll want to be, when the sun's too hot, come find me!
— What am I?

Answer: Under a Shady Tree

I'm packed with essentials for when you must flee,
from emergencies to disasters, I'll keep you ready. — What am I?

Answer: Emergency Kit or "Go Bag"



Negative Impact Actions:

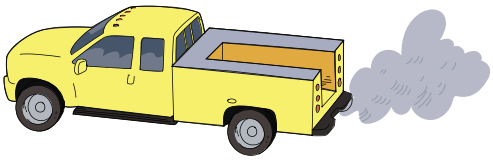
I'm a chore done by hand, under the sun's bright beam, using suds and water to make my paint gleam.

Yet car washes, they do boast, recycling water to save the most. — What am I?

Answer: Hand Washing a Car

I emerge from engines, darkening skies, born from fossil fuels that humanity supplies.
I rise in curls, sometimes white or gray, polluting the air in my own way — What am I?

Answer: Exhaust



EYE SPY (JR/SR HIGH)

Description:

In this Eye Spy game, students are challenged to spot various climate-friendly actions and solutions, uncovering how they can actively contribute to a healthier environment and prepare for climate change within their community.

Objective:

To familiarize students with the Climate Prepared YEG poster and to set groundwork for future discussions of climate change mitigation, adaptation, and resilience within our communities.

Duration:

~15 minutes

Materials:

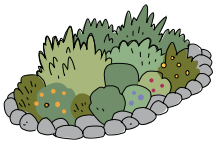
Climate Prepared YEG Posters; Climate Community Questions

PROCEDURE:

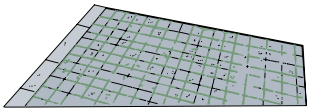
Divide the class into small groups and provide each group with a copy of the poster (digital or hard copy). Read the questions one by one and have students share what they find.

CLIMATE COMMUNITY QUESTIONS

How is the community preparing for heavy rain?



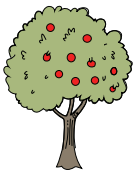
- Storm Water Ponds: Designed to manage and absorb excess rainwater.
- Eavestrough Maintenance: Regular cleaning and proper placement to ensure effective water flow.
- Rain Gardens: Specially created gardens that absorb and filter stormwater.
- Permeable Concrete: Allows water to seep through, reducing runoff.
- Green Spaces: Parks, green roofs, and bioswales enhance water absorption and help prevent flooding.



In extreme heat, how are community members staying cool?

- Seeking Shade: Finding relief under large trees or shelters.
- Cooling Stations: Using pools or misting stations to cool down.
- Hydration: Frequently refilling water bottles to stay hydrated.
- Ventilation: Opening windows during cooler hours to promote airflow and reduce indoor temperatures.

In what ways are community members growing their own produce?



- Community Gardens: Shared spaces for growing fruits and vegetables.
- Home Gardens: Personal plots for cultivating produce.
- Fruit Trees: Planting trees to harvest fresh fruit.
- Vertical Gardens: Growing produce on vertical spaces like school walls to save space and maximize yield.
- Patio Pots: Using containers on apartment patios to grow herbs and vegetables.

What are the community's water conservation practices?

- Drought-Tolerant Landscaping: Implementing xeriscape, or water wise landscaping techniques to minimize water use.
- Rain Barrels: Collecting and storing rainwater for garden irrigation.
- Low-Flow Shower Heads: Reducing water consumption in showers.

What are some examples of community stewardship?

- Volunteer Activities: Participating in weed pulls, community cleanups, or tree planting.
- Neighbourly Care: Checking in on neighbors to ensure their well-being.

How are community members reducing waste?

- Repair: Fixing broken or damaged items at the "Fix-It Shed" to prolong their lifespan.
- Reuse: Purchasing goods second hand at places like garage sales.
- Proper Sorting: Separating waste into recycling, compost, and garbage categories.

How are community members commuting sustainably?

- Walking: Opting to walk to reduce carbon footprint and promote health.
- Scooters and Bikes: Using scooters and bikes for convenient, low-impact travel.
- Electric Vehicles: Driving electric cars with access to solar-powered charging stations.
- Public Transportation: Taking advantage of both traditional and electric buses for efficient travel.

CARBON IN YOUR COMMUNITY FOREST (JR/SR HIGH)

Description:

This activity asks students to go outside and measure some trees in their community. Students use measurements to come up with a rough estimate of the carbon that is stored within these trees. They will also explore how the amount of carbon stored in trees relates to the amount of carbon emitted by day-to-day activities and the co-benefits of urban forests.

Objective:

- Take measurements of trees to estimate the amount of CO_2 stored
- Recognize the role that trees play in carbon storage
- Understand the relationship between carbon emissions of daily activities and carbon storage in trees
- Explore their community and recognize the co-benefits of urban forests

Materials:

- Student Instruction Pages
- Student Activity Sheet
- Tape Measure or Ruler and String

CARBON IN YOUR COMMUNITY FOREST

Instructions

Trees have many important roles in our ecosystem. Through this activity, you will get to know some of the trees in your community and understand a little bit more about the roles that they have.

Before you begin, you may find it helpful to watch part one of our **It's Our Forest** video series.

During photosynthesis, a tree takes in Carbon Dioxide (CO_2) and water and uses the energy of the sun to create food and oxygen. This is beneficial for people for two reasons. First, we all need oxygen to live, so you can think of the trees around you the next time you take a breath of fresh air. Second, the CO_2 that trees make their food out of gets stored in their roots, trunks, and branches. This is important because many human activities release CO_2 into the atmosphere, and CO_2 is a greenhouse gas that contributes to climate change by absorbing the heat that reflects off the earth!

Get to know the trees in your community by following the instructions below.

What you need:

- Measuring tape or ruler
- A piece of String or Ribbon 1 to 2 metres long
- Pencil
- A tall straight object like a hockey stick or ski pole
- Journal or the attached activity sheet to record your findings.

CARBON IN YOUR COMMUNITY FOREST (JR/SR HIGH)

Instructions cont...

Measuring Trees

Take a walk around your community and notice all the different trees. Choose **three** trees of different sizes to measure.

Step 1: Find the Circumference

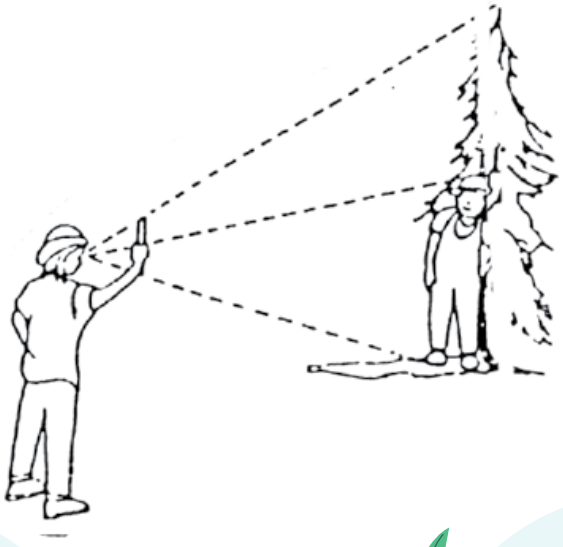
The circumference of a tree is a measurement of how big it is around the trunk - measuring it is easy! Simply, wrap a flexible measuring tape around the tree at **chest height**. Or use a string and measure how much of the string wraps around the tree with a ruler. Don't forget to record your results in **metres**.

Step 2: Find the Height

Most trees are very tall, so measuring the height without a special tool can be tricky. We are going to estimate the height using an object as a reference.

Use a long object such as a hockey stick, or a ski pole. Measure the height of your object, and stand it up at the base of your tree. Stand far enough from the tree so that you easily see it from top to bottom and then estimate how many times your object would fit into the height of the tree.

Now you just have to do some math! Multiply the height of your object by the number of times it fits into the tree. For example, if your hockey stick is 1.25 m tall, and you could stack approximately 10 hockey sticks to reach the top of the tree, your tree is approximately 12.5 metres tall (10 X 1.25 = 12.5 m). Alternatively, there is a chart on the activity sheet which will help you calculate the height of your tree.



CARBON IN YOUR COMMUNITY FOREST (JR/SR HIGH)

Calculating Carbon

Once you have the height and circumference of your trees you can estimate how much carbon is stored in each tree. Use the chart below to find the equivalent weight in kilograms (kg) of CO_2 that is stored in your trees. If the height/circumference of your tree is in between the numbers on the table either round up/down or use a range. For example, if your tree has a circumference of 0.9 metres and a height of 11 metres your tree would have a range from 181 to 338 kg of CO_2 stored in its body.

Circumference (metres)

Height (m)	0.25	0.5	0.8	1	1.2	1.5	1.75	2	2.5
2	3.54	14.15	36.22	56.60	81.50	127.34	173.32	226.38	353.72
4	7.07	28.30	72.44	113.19	162.99	254.68	346.65	452.76	707.44
6	10.61	42.45	108.66	169.79	244.49	382.02	519.97	679.14	1061.16
8	14.15	56.60	144.88	226.38	325.99	509.36	693.29	905.53	1414.88
10	17.69	70.74	181.11	282.98	407.49	636.7	866.62	1131.91	1768.61
12	21.22	84.89	217.33	339.57	488.98	764.04	1039.94	1358.29	2122.33
14	24.76	99.04	253.55	396.17	570.48	891.38	1213.26	1584.67	2476.05
16	28.30	113.19	289.77	452.76	651.98	1018.72	1386.59	1811.05	2829.77
18	31.83	127.34	325.99	509.36	733.48	1146.06	1559.91	2037.43	3183.49
20	35.37	141.49	362.21	565.95	814.97	1273.40	1733.23	2263.82	3537.21

These values are calculated with the following formula $M_{co2}=3.67(0.5(0.55(1.2(a(D2h)))))$. M_{co2} is the mass of CO_2 sequestered by the tree. 3.67 represents the ratio of atomic mass for carbon and CO_2. 0.5 represents the knowledge that approximately 50% of the biomass of a tree is carbon atoms. 0.55 represents an assumption that 45% of the mass of the tree is water. 1.2 represents an assumption that the roots make up 20% of the mass of a tree. a is a coefficient that varies on growing conditions and tree species, a value of 0.1 was chosen based on a comparison of results with values of known trees. D represents diameter (in inches) and h represents the height in feet. M_{co2} converted from lbs to kg.

Sources:

http://www.unm.edu/~jbrink/365/Documents/Calculating_tree_carbon.pdf
https://serc.carleton.edu/eslabs/carbon/1b.html
https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/oee/pdf/transportation/fuel-efficient-technologies/autosmart_factsheet_6_e.pdf
https://maps.calgary.ca/TreeSchedule/

CARBON IN YOUR COMMUNITY FOREST (JR/SR HIGH)

Releasing Carbon

Carbon Dioxide (CO_2) is released when we burn fuel for energy and heat, as well as when we make changes to landscapes. CO_2 is even emitted by the chemical reactions that occur when we make things. So whenever you drive a vehicle that is powered by gasoline or use electricity that is generated from coal you are emitting CO_2, but just how much? Use the chart below to discover how much CO_2 in kilograms (kg) certain activities release.

Activity	CO_2 Emissions (kg)
Running 1 cycle on a Dishwasher[2][7]	1.896
Driving a car 5 km[6]	1.024
Using the lights in your home for 1 day[3][7]	0.647
Watching Netflix for 1 hour[4][7]	0.390
Playing an Xbox for 1 hour[4][5][7]	0.141

**CO_2 emissions calculated based on average wattage[2][3][4][5], fuel economy[6], and carbon intensity[7]*

[2]*Dishwasher cycle of 2 hours. Average wattage of dishwasher. Source: https://www.directenergy.com/learning-center/energy-efficiency/how-much-energy-dishwasher-use*

[3]*Percentage of home electricity used on lighting and electricity consumption in Alberta. Sources: https://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-products/product-information/lighting/13730 & https://efficiencyalberta.ca/about/blog/whats-your-number*

[4]*Based on efficiency of a 50 inch LED TV, Wifi Data Transmission and Data centre. Source: https://www.carbonbrief.org/factcheck-what-is-the-carbon-footprint-of-streaming-video-on-netflix*

[5]*Based on gaming wattage of an Xbox One plus a 50 inch LED TV. Sources: https://www.nrdc.org/sites/default/files/video-game-consoles-IP.pdf & https://www.carbonbrief.org/factcheck-what-is-the-carbon-footprint-of-streaming-video-on-netflix*

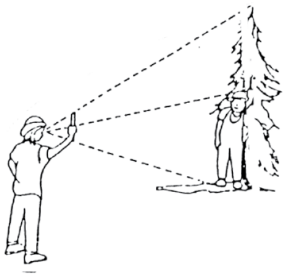
[6]*Average fuel economy of Canadian vehicles and 2.3 kg of CO_2 per litre of Gasoline. Sources: https://www.cer-rec.gc.ca/nrg/ntgrtd/mrkt/snpsht/2019/07-05hwdscndrnk-eng.html & https://www.nrcan.gc.ca/files/oee/pdf/transportation/fuel-efficient-technologies/autosmart_factsheet_6_e.pdf*

[7]*Carbon Intensity of electricity generated in Alberta. Source: https://www.cer-rec.gc.ca/nrg/sttstc/lctrct/rprt/2017cndrnwblpwr/ghgmssn-eng.html*

CARBON IN YOUR COMMUNITY FOREST (JR/SR HIGH)

Activity Sheet

Follow the instructions from Step 1 & Step 2 of **Measuring Trees** to estimate the height and record the circumference. You can use the **Estimating Height** table below to help you calculate how many times your helper/object fits into the tree. Remember to record your results in metres, not centimeters.



Estimating Height

Number of times your helper/object could fit into your tree

Height of your helper or object (m)	3	4	5	6	7	8	9	10	12
0.5	1.5	2	2.5	3	3.5	4	4.5	5	6
0.75	2.25	3	3.75	4.5	5.25	6	6.75	7.5	9
1.0	3	4	5	6	7	8	9	10	12
1.25	3.75	5	6.25	7.5	8.75	10	11.25	12.5	15
1.5	4.5	6	7.5	9	10.5	12	13.5	15	18
1.75	5.25	7	8.75	10.5	12.25	14	15.75	17.5	21

Tree Measurements

Measurements	Tree #1	Tree#2	Tree #3
Circumference at Chest Height (m)			
Estimated Height of Trees (m)			

Height of your Helper or Object (m)	

CARBON IN YOUR COMMUNITY FOREST (JR/SR HIGH)

Calculating Carbon

Use the charts from calculating carbon to find the amount of CO_2 your tree has stored. Look at the releasing carbon chart. Pick one activity and estimate how much CO_2

	Tree #1	Tree #2	Tree #3
CO_2 Stored (kg)			

Questions

1. Choose an activity from the Releasing Carbon chart. Calculate how many trees you would need to offset the CO2 emitted by that activity over the course of a week.

2. Trees don't grow overnight! It takes time for a tree to grow big and absorb CO_2 from the atmosphere. A tree in Alberta has an average lifespan of 80 to 150 years. If your trees are 80 years old, how much CO_2 does it store every year? (Hint: divide your CO_2 result by 80)

3. How else are trees valuable to humans? List some examples of how a tree in your neighbourhood benefits you. How about a tree out in the forest?

WASTE WORD SEARCH (ELEMENTARY/JR HIGH)

Description:

In this word search, students discover key terms related to waste reduction and recycling. As they find each word, they learn practical ways to minimize waste and support sustainability, empowering them to make a positive impact on their environment and community.

Objective:

To familiarize students with the principles of the 3Rs—Reduce, Reuse, Recycle—and to lay the foundation for future discussions on effective waste management and sustainable practices within our communities.

Duration:

~15 minutes

Materials:

Waste Word Search Sheet

PROCEDURE:

Give each student a copy of the Waste Word Search sheet. If students are unfamiliar with a term they find, research it as a class! Once the word search is complete, challenge the students to think about examples of the 3 R's they complete in their everyday life!

WASTE WORD SEARCH (ELEMENTARY/JR HIGH)

C V V D J P J D R T
V O Y D L W N R O S
A N M P R U D E B R
U T R P C P O F U E
P H E R O L N U Y P
C R C E S S A R B A
Y I Y U W E T B U I
C F C S A R E I L R
L T L E P U Z S K U
E L E Q L U Q H H E

Buy Bulk
Compost
Donate
Refurbish
Recycle
Reuse
Repair
Swap
Thrift
Upcycle

CLIMATE PREPARED SCHOOLS SCAVENGER HUNT (JR/SR HIGH)

Description:

Students identify climate mitigation or adaptation actions in their surrounding communities, and identify potential risks and solutions.

Objective:

Familiarize students with climate friendly initiatives and preparation techniques in and around their school. This activity will challenge students to also identify risks or hazards that may be amplified by climate change, and brainstorm potential solutions.

Duration:

15 - 30 minutes

Materials:

Climate Prepared Schools - Scavenger Hunt Sheet (1 per group or 1 per student, depending on facilitation)
Pencils or pens
Optional: Clipboards
Whistle or signal noise to regroup students

PROCEDURE:

As a class or in small groups, let students go for a walk in your schoolyard or surrounding community to find the items on the list. If a list item is currently not visible due to seasonal changes but has been there in the past (e.g., pooled water), check it off.

Debrief/Discussion:

How could the items on this list prepare us for the following climate change conditions?

- Drought
- Flooding
- Wildfire
- Extreme heat
- Strong Wind
- Freezing Rain

What items on this list could become hazardous during the above climate change conditions? How can we better manage or prepare for these hazards?

Are there any items on this list that could be added to your schoolyard to increase sustainability and climate change resilience? What would be the potential barriers or challenges to adding these items?

CLIMATE PREPARED SCHOOLS SCAVENGER HUNT (JR/SR HIGH)

Instructions: Go for a walk in your neighbourhood or schoolyard to find the items on the list. In the "answer" column, you will be writing down the settings you've found or items you've counted. If you don't see an item, check it off if you have seen it around the area in the past!

Find:	✓ or X	Notes:
Pooled water		*Low-lying areas in your school yard may accumulate more water during heavy rains. Check to see if these low lying areas are close to your school or other buildings!*
Bus stop		*Riding public transit reduces the amount of cars on the road, and is therefore a great way to save energy!*
Downspout		*Downspouts carry water away from a house or building where they can be emptied safely. Downspouts should be clean of debris to prevent potential flooding, and far enough away from a building to prevent water pooling!*
Bike rack		*Riding your bike or walking around is an easy and fun way to save energy!*
Solar panel		*Solar energy currently makes up only about 0.2% of electricity generation in Alberta, but solar panels are steadily becoming a cheaper and more viable option!*
Secured garbage bins (Hint: Look for chains holding them down!)		*Garbage bins and all other outdoor items should be secured to prevent them from blowing away in extreme winds.*
Electric vehicle charging station		*Electric vehicles are becoming increasingly popular. Many parking lots now have electric vehicle charging stations.*

CLIMATE PREPARED SCHOOLS SCAVENGER HUNT (JR/SR HIGH)

Find:	✓ or X	Notes:
Large trees		*Old trees are a great place to get some shade and cool down on hot days!*
Stormwater pond		*Storm water ponds hold excess precipitation and help to prevent flooding, especially in areas where there is a lot of concrete!*
Community or school garden		*Gardening at home is a great way to save money, lower stress, reduce the amount of packaging waste.*
Mulch or decaying wood		*Excess wood laying around can burn easily, creating a fire hazard!*
Loose tree branches		*Loose branches can blow away easily in the wind, creating a hazard for people standing close by!*
Rain barrel		*Storing rainwater and using it for your yard or plants is a great way to save water and energy!*
Compost bins		*Composting can reduce the amount of waste entering our landfills.*
Garage sale (or garage sale sign)		*Instead of throwing away our old things, we can sell them or lend or give them to a friend to continue using! This reduces the amount of waste in our landfill, and energy required to create our items!*
Birdhouse		*Providing habitat for birds is a great way to support natural diversity, as birds play an important role in pollination, seed dispersal, and rodent/insect control!*

MAKING A DIFFERENCE (JR/SR HIGH)

Objective:

Students will identify a local issue in their community with regards to climate change mitigation or adaptation, form an action plan to influence local community and/or government and execute their action plan.

Duration:

Several class periods, plus time outside of class.

Materials:

Internet access, other materials will depend on the action chosen.

Background:

While government, corporations, and various organizations have a large influence on climate change mitigation, there is a lot we can do at home, in our school, or in our communities to lessen our environmental impact and better prepare for a changing climate! Students will be challenged with finding issues within their community, and encouraged to develop and implement solutions. This will allow students the opportunity to become active members within their community, address and evaluate potential barriers or challenges to certain local issues, and demonstrate the importance of individual stewardship in the face of climate change! Encouraging students to think critically and take action on environmental topics that matter to them can be an important part of developing citizenship.

PROCEDURE:

1. As a class, brainstorm local issues regarding climate stewardship. Use the Climate Prepared YEG Poster to help spark some ideas! Decide on an issue – local in your school or local in your community – on which your class will take action. Possible approaches include:

Encouraging your school to:

- Reduce the furnace's temperature at night, while no one is in the school
- Retrofit water fountains so water bottles can be easily refilled
- Place signs up outside the school, asking drivers not to idle their engines while picking up and dropping off students.
- Participate in a citizen science activity
- Start a walk/bike/carpool to school initiative
- Begin a compost program

Encouraging your community to:

- Take part in volunteer tree planting, or green space naturalization
- Start a community garden
- Take part in Neighbourhood swaps to reduce yard waste
- Host community clean up days
- Start an energy saving campaign

2. Decide which form of action will be most effective for your local issue. If your idea requires money, are you able to fundraise? In what ways might you and your community/school go about fundraising? Do you have enough people to organize it? Will your class need more help? Can you ask other classes or students to help you?

3. Have the students thoroughly research the issue. Who and what might be affected? What are the potential impacts - socially, environmentally, and economically? Students should understand all the perspectives and demonstrate they have considered all sides of an issue. A well-researched and presented case is more likely to be successful.

4. As a class, create a list of everything that needs to be done and a timeline for when they will be completed. Determine the list of supplies. Is the timeline realistic and achievable? What do you need to carry out your action plan? Assign tasks to individuals or small groups. Make sure to have regular check-ins to be sure everyone is on track.

Discuss/Debrief

At the end of the project, have a debriefing session to discuss how it went. Were you successful? Why or why not? Were there things that could have been done differently?

TIPS FOR SUCCESS

When deciding upon a local issue, maximize the chances of success of the campaign by directing students toward very specific actions, like promoting an idle-free campaign rather than large general ideas that are very complex, such as trying to stop global warming.

CLIMATE ADAPTABILITY CASE STUDIES (SR HIGH)

Case Study 1: 2016 Fort McMurray Wildfire

While forest fires are naturally occurring disturbances and are essential for the health and function of many ecosystems, increased severity and frequency of forest fires has been linked with climate change. Hot and dry conditions with strong wind allow fires to start and spread much quicker. Human caused fires are becoming more common, and may result from unattended campfires, burning of garbage or other waste materials, off-road vehicles, fireworks, and much more.

Procedure:

1. Have students research the 2016 Fort McMurray Wildfire to determine what were the events and influential factors leading up to the wildfire.
2. Following the evacuation order, approximately 90,000 residents evacuated the city and surrounding communities. Have student research and brainstorm some potential challenges evacuees may have faced.
3. Discuss: In the event of a wildfire evacuation, would Edmonton communities be prepared? Are we prepared to assist surrounding communities in the event they undergo a wildfire evacuation?

Follow-up:

This case study presents an opportunity to discuss the importance of having 72-hour emergency supplies ready to "grab and go" that can be very helpful when facing a difficult situation. Facilitate a discussion where the class makes a list of suitable supplies for families to pack in advance should an evacuation order ever occur.

Case Study 2: 2013 Calgary Flood

Floods can occur at any time of the year, and are typically caused by heavy rainfall events, rapid snowmelt, coastal storms, tidal events, and even from rising below ground water tables. Flooding or accumulated water in certain areas may be beneficial, typical in flood plains or rivers, but flooding in urban areas can have devastating effects. Flooding in urban areas may occur more frequently in future years, as climate change is projected to cause more short-lived downpours in the Edmonton region. While Edmonton's river valley is always prone to seasonal flooding, neighborhoods outside of the floodplain are becoming increasingly susceptible to what is commonly termed as "overland" or "urban" flooding due to projected intense rainfalls.

Procedure:

1. Have students research the 2013 Calgary flood to answer the following questions:
    a. What was the initial cause of flooding in Calgary in 2013?
    b. Look at the locations of flooding within the City of Calgary. Why do you think these areas were more prone to heavy flooding?

2. After researching the flood, ask students if they think Calgarians expected and/or were prepared for the 2013 flood.
    a. Have students brainstorm what might make a community or building more susceptible to flooding. (Discuss the following: Slope, concrete ground cover, location of stormwater ponds, improper building drainage, blocked eavestroughs/gutters and improper downspout orientation.)
    b. How could Calgarians better prepare for future floods? What changes would need to be made to reduce the impact of future floods on infrastructure, people, wildlife, etc?

CLIMATE ADAPTABILITY CASE STUDIES (SR HIGH)

3. Discuss: In the event of a flood, such as what occurred in Calgary in 2013, would Edmonton communities be prepared? What communities could be at highest risk in the event of a flood? (e.g., river valley, older communities with shallow storm drains). What resources are available online for individuals to assess flooding potential within their community?

Follow-up:

This case study presents an opportunity to discuss the importance of assessing homes and communities for their susceptibility to flooding. Facilitate a discussion where the class makes a list of ways they might protect personal property from flooding. One simple preparation is to ensure any valuable items in a basement are stored in waterproof containers. Review the short video ***Changing Precipitation***, and accompanying infographic for more ideas, visit:

edmonton.ca/city_government/environmental_stewardship/a-tiny-explanation-how-to-videos-and-infographics

DOES IT MATTER IF THE CLIMATE CHANGES? (JR/SR HIGH)

Objective:

Students will understand how with complex issues such as climate change there are no absolute answers and there are multiple perspectives that must be considered.

Duration:

60 minutes

Materials:

Climate Prepared YEG poster; "Climate Change Impacts" worksheet; Internet connection; projector and/or SMART Board™

Background:

Climate shapes how humans, plants, and animals live across the world. In Canada, it influences our customs, shelter, clothing, food, jobs, and transportation. If Canada's climate changes, it could impact all areas of life. Canada's ecozones, like the Prairies, Boreal Shield, and Northern Arctic, each have unique climates that support different plants, animals, and weather patterns. These ecozones also drive key industries such as farming, fishing, tourism, and energy, all of which depend on the local climate.

Scientists have predicted a large number of impacts that may occur as our climate changes. They include:

- Hotter summers which will increase stress on wildlife, plants and human beings
- Warmer winters which may reduce demand for energy to heat our homes
- Early break up of arctic ice affecting wildlife and Inuit people
- Changes in precipitation patterns, leading to drought, flooding, or severe storms
- Reduced snow in the mountains which could affect the flow of rivers
- Rising sea levels, affecting coastal regions and communities
- Longer growing seasons, allowing for different crops to be grown
- Invasion of pest species
- Increased frequency of severe weather events, such as tornadoes, ice storms and hurricanes
- Reduced ice on rivers and lakes in winter, which reduces winter road access to resources and remote communities
- Drier summers that increase risk of wildfires and affect the growth of food crops (like wheat) and feed crops (like hay).

PROCEDURE:

Working in small groups, have students use the Climate Change Impacts worksheet to work through the list of potential effects climate change may have on plants, wildlife, human health, jobs, settlements, recreation and transportation, and decide whether or not the changes might have a negative, positive, or unknown effect.

Debrief/Discussion:

When students have completed the chart, review it as a class and discuss their responses.

Did everyone come to the same conclusions?
Did group members agree on whether the effects were negative or positive? Why or why not?
Did any impacts have both potentially positive and negative effects?
Did any impacts have only positive or negative effects? Why?

Additional Information:

Those interested in researching climate change in more depth could visit the Climate Atlas of Canada climateatlas.ca or visit the Prairie Climate Centre for climate information focused on Alberta, Saskatchewan and Manitoba, prairieclimatecentre.ca

DOES IT MATTER IF THE CLIMATE CHANGES? (JR/SR HIGH)

CLIMATE CHANGE IMPACTS

Read the list of possible impacts of climate change from the table on the next page and decide for each category whether or not the possible change to the climate would have a positive effect, a negative effect, or an unknown effect. Write a + for positive, - for negative and a ? for unknown.

Extension Questions

Broaden your students' understanding of climate and its impacts with these extension questions. Questions have been taken from the **Climate Conversations: Teacher's Guide to Climate Adaptation and Resilience in Edmonton**, and are intended for Junior & Senior High classes.

1. If the climate becomes warmer in winter, or hotter and drier in the summer, how might this affect you?
2. We could wait until the impacts from climate change are felt more to make changes. Or, we could begin to adapt now. What could we do now to adapt?
3. Why is it important for the City of Edmonton to build energy efficient buildings? (Potential answers: show leadership, good stewards of taxpayer's money, it costs less to operate an energy efficient building)
4. Can you think of any barriers to building "green" in Edmonton? (Potential answers: up front costs, available materials, changing technology, cold weather, expertise required)
5. Why do you think people want to live and work in "green" spaces? Does your school show any examples of green building practices? If not, is this something you feel you could change? and how?
6. "Edmonton is a City of Innovators." How could this slogan be useful for adapting to climate change?
7. What do you think are the main contributors to poor air quality in Edmonton? (Potential answers: refineries, industry, power plants, vehicles, surrounding forest fires)
   a. Observe today's AQHI rating by visiting capitalairshed.ca or airquality.alberta.ca/map. How might this AQHI your daily activities?
   b. Most days in Edmonton range between 2 and 4 on the AQHI scale. However on July 11, 2015 AQHI ratings ranged from 8 to 10 (indicating a high to very high risk). Use your Internet search skills to determine why there was a sharp decline in air quality on this date.
   c. What other dates indicate a high risk? HINT: wildfire in Fort McMurray, May 2016; BC wildfires, July 2017, August 2018; Northern Alberta wildfires, May 2019, May 2023. How high did the AQHI register during these smoke events?
8. The City of Edmonton's Root for Trees program (edmonton.ca/rootfortrees), contributes to the City's goal for a 20% canopy cover.

   Note: A lamp that shows the current outdoor air quality by colour can be borrowed (upon availability), or you can set up your own AQHI lamp by purchasing a specific lightbulb and following the set-up tutorial: edmonton.ca/airquality.

   a. Do you remember being handed an evergreen tree seedling in Grade 1 to take home to plant?
   b. Will coniferous trees survive in grassland-type conditions?
   c. Do you think a new tree species should be introduced for Grade 1 planting? Why or why not?
   d. What information would you need in order to determine what species of trees to plant as part of the Root for Trees or other naturalization programs in Edmonton?

	Possible Impacts of Climate Change	Positive, Negative or Unknown Effects of Climate Change								
		Plants	Wildlife	Human	Health	Jobs	Towns/Cities	Recreation	Transportation	Agriculture
1.	Hotter temperature during the summer months									
2.	Reduced rainfall and/or snowfall									
3.	Rise in sea levels in coastal regions									
4.	More severe weather events (tornadoes, blizzards, ice storms, etc.)									
5.	Less extreme cold weather in the winter and reduced ice on northern lakes, rivers and oceans									
6.	Increase in the temperature of lakes, rivers and oceans									
7.	Infestations of instect and/ or other pest populations not normally expected in Alberta									
8.	Reduced ice on northern lakes, rivers and oceans									
9.	Warmer temperatures in northern Canada									
10.	Changes to growing seasons									
11.	Increase in the amount of land that can be farmed and crops grown in a season									

GLOSSARY

Adaptation: To become used to a new environment by changing what you do or how you do it.

Atmosphere: The envelope of gasses that surround Earth.

Carbon Dioxide (CO_2): A chemical compound made up of carbon and oxygen most commonly found as a gas.

Climate: General weather patterns observed over long periods of time.

Climate Change: A large-scale change in average weather over a time period of at least 30 years.

Climate Mitigation: Actions that limit the greenhouse gasses released into the atmosphere that cause climate change.

Climate Resilience: The ability to prepare for, adapt to, or recover from climate change impacts.

Conservation: Protecting something from change, loss or damage.

Ecosystem: A group of interdependent organisms and their habitat.

Emission: Substances, like invisible gasses or small particles, that are released from human activities or natural sources.

Energy Transition: A long-term change that shifts us from relying on fossil fuels to relying more on energy sources that are sustainable and low or zero-carbon.

Enhanced Greenhouse Effect: An increase in the natural greenhouse effect resulting from an excess in greenhouse gas concentration likely caused by human activities.

Environment: The natural world which all living things depend upon.

Global Warming: The rise of the average temperature of Earth's atmosphere.

Greenhouse Effect: The natural warming of Earth's atmosphere where the sun's warmth is trapped by gasses in the atmosphere.

Greenhouse Gas: A gas that helps trap the sun's warmth in the atmosphere.

Heat Island: The concentration of heat resulting from infrastructure.

Home Retrofit: Process of making improvements to your home so it becomes more energy efficient with lower emissions.

Invasive Species: An organism that is not indigenous to a particular area, and can cause great economic or environmental harm.

Net Zero: Net zero emissions are achieved when emissions of greenhouse gasses are balanced by removals. Emissions should be reduced as close to zero as possible, and remaining emissions would be balanced by an equivalent amount of carbon removal, through nature based solutions or technology.

Solar Energy: Heat and light energy from the sun.

Stewardship: To look after something that is important to you.

Weather: The state of the atmosphere in a place at any given time, e.g., rain, wind, sunny, overcast.

ADDITIONAL RESOURCES

Inside Education

Canada's largest natural resources and environment education society, with experience supporting teachers and inspiring students since 1985. Inside Education has programs and resources related to energy, water, land and stewardship. We also provide NO-COST school programs, teacher professional development workshops and youth summits related to climate change, energy and other topics.

Visit: www.InsideEducation.ca for more information!

A+ for Energy

Inside Education's A+ for Energy Grants are available to Alberta teachers who develop and deliver innovative energy education programs in their classrooms and schools. Teachers select an energy topic and design education programs for their students – grants of up to $5,000 are available for these innovative projects.

Website: https://www.insideeducation.ca/grants/a-for-energy-grant/

Neighboring for Climate Toolkit

With easy-to-use climate action cards, Neighbouring for Climate provides suggestions and tips for reducing greenhouse gas emissions and adapting our neighbourhoods to a changing climate. Join your neighbours, save money, learn new skills and have fun.

Website: edmonton.ca/neighbouringforclimate

Climate Conversations - Teacher's Guide to Climate Adaptation and Resilience in Edmonton (Junior and Senior High)

The Climate Conversations Teacher's Guide contains information and activities designed to support students in their learning by engaging them in meaningful and timely conversations about being resilient to climate change. It focuses primarily on Edmonton, although teachers across the province may find it useful for discussing municipal climate issues in their local context.

The Way We Green: Classroom Conversations (Grades 10-12)

This guide includes tips and resources to support your understanding of the history, goals and actions in each section of The Way We Green, and to initiate thoughtful conversation within the classroom on important issues.

NOTE: The resource has not been updated to reflect Edmonton's new environmental strategies.

Energy and Climate Change FAQ

This webpage is a short reference guide that looks at some of the key terms related to energy and climate change, and how these two topics are connected.

Website: edmonton.ca/city_government/environmental_stewardship/energy-climate-change-faq

AQHI Light Bulb

The Air Quality Health Index Light Bulb is a digital platform developed by the City of Edmonton that displays current outdoor air quality as reported by the Air Quality Health Index (AQHI) through a colour changing LIFX bulb. The bulb can be linked to the air quality at any monitoring station in Alberta.

Learn more at edmonton.ca/airquality and use this link for a tutorial to set up your own lamp:

https://www.edmonton.ca/sites/default/files/public-files/AQHILightBulb-Tutorial.pdf?cb=1725741325

REFERENCES

City of Edmonton. (January 2024). *Climate Conversations - Teachers Guide to Climate Adaptation and Resilience in Edmonton* (Junior and Senior High).

Website: edmonton.ca/sites/default/files/public-files/documents/ClimateConversations_TeachersGuide.pdf

City of Edmonton. (2024). *Neighbouring for Climate Toolkit.*

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Natural Resources Canada. (2014). *Learn the Facts: Emissions from your vehicle*.

Website: https://natural-resources.canada.ca/sites/nrcan/files/oee/pdf/transportation/fuel-efficient-technologies/autosmart_factsheet_9_e.pdf