



A Nova Scotia Provincial Council Challenge

Developed by the 2021-2022 Provincial Youth Forum

Guide/Pathfinder/Ranger Challenge

The goal of the Full STEAM Ahead Challenge is to use science, technology, engineering, arts, and mathematics to learn about the issues our world is facing and how we can help our world by changing some everyday things in our lives. For this particular challenge, you can work with your Guiders to select activities that best fit your interests and the resources you have available. ***In order to complete the challenge, you must complete at least four of the challenge activities***

Who we are

This challenge was designed by Emma, Isla, Paige and Shabad, four members of the 2021-2022 Youth Forum cohort.



Land acknowledgement

Nova Scotia is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaw people (L'nu). Therefore, all Girl Guide meetings, events, and camps in Nova Scotia take place on Mi'kmaw Land. We hope that while you are working on this challenge, you take the time to reflect on how we can all be better stewards of the land so that future generations can enjoy nature in the way we do today.

Challenge crests can be ordered at [NS Provincial Challenges](#)

Science

Bee The Change



Come join us and explore the impact that bees and other pollinators make every day.

Did you know that 80% of the world's pollinators are bees? As bees gather pollen and nectar for their survival, they also pollinate crops of our favorite fruits, such as apples, cranberries and melons. Other crops, like blueberries, are 90% dependent on bee pollination!

But sadly, bees are dropping at an rapid rate. Why? Well, scientists are still working on this, but we do know humans are largely responsible for the two most prominent causes: pesticides and habitat loss. (source: Save the Bees - Greenpeace USA) In this challenge, we will learn how we can help.

What you'll need

- Pollinators Scavenger Hunt Sheet or Nature Bingo Sheet (appendix)
 - A walking trail of some sort with lots of nature (For example, a community trail or provincial hiking trails)
 - Pens, pencils, markers, etc (enough to share)
-

Before you start

- Print off the Pollinator Scavenger Hunt Sheet or the Pollinators Bingo Sheet.
- If you chose the Scavenger Hunt, complete the activity in groups of 2.
- If you chose the Bingo Sheet, complete the activity in teams of 3 or 4.
- Decide on a trail for your hike.
- Look up plants to be weary of in your area and inform your unit of them (ie. poison ivy)

What to do

1. Once you've printed either one of the templates, divide into teams (check the recommended number for each activity).
 2. Pass out the sheet that you've decided to use and a writing utensil or two for each team.
 3. Select a leader who the teams can go to when they are finished. If you decide to give out a prize to whatever team finishes first, make sure to have that on hand.
 4. Send the teams off on their way!
 5. After everyone has completed the activity, have everybody sit down and share something interesting that they've discovered (ex. bird tracks, a nest or hive, etc.)
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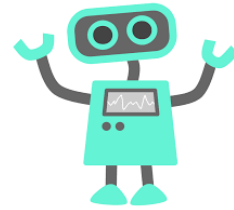
Tips, tricks and more

Here are some awesome websites to go to if you are more interested in learning more about pollinators:

- [Grown a pollinator garden Girls First activity](#)
- David Suzuki Foundation [introduction to pollinators](#)
- Ontario Nature [introduction to pollinators](#)
- [Bumble bees of Unama'ki: A guide to becoming a buzzing naturalist](#)

Technology

Cyber Canvas



Become a digital designer! Use technology to inspire change in this graphic design activity.

The world is rapidly changing and our climate is too. Things like industrial agriculture, deforestation, overfishing, and the fossil fuel industry all harm the planet and it is up to climate change makers like you to tell the people in power we need to do better.

Using your tech-savvy skillset, design a poster, brochure, social media graphic, video, or another form of media to educate your friends, family, and community about an environmental issue you think is important and tell them what they can do to help.

What you'll need

In person, virtual or anytime:

- Cameras and editing apps
- Laptops, tablets or smart phones with internet access
- Free graphic design or videography program (ie. Canva, Microsoft PowerPoint, iMovie, Windows Movie Maker)

Before you start

- Depending on the graphic design platform you choose to use you may need to download the program beforehand.

What to do

1. Choose an environmental issue that you are interested in. This could be an issue that specifically impacts your community or perhaps something that is a problem in another part of the world. Here is a quick list of ideas to get you started:

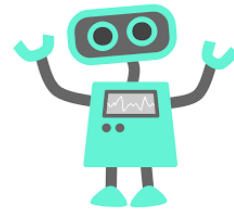
- Ocean plastics
- Loss of species
- Deforestation
- Industrial agriculture (large scale farming)
- Pollution
- Food waste
- Overfishing
- Fossil fuels



2. Investigate your chosen topic using whatever tools you have at your disposal. This could include books, internet sources, or chatting with a local expert.
3. Choose your audience. Who do you want to teach more about this topic? Friends? Politicians? Your community?
4. What type of media do you think your audience would respond to best? Trying to engage a younger audience? Consider making a short video on your chosen topic. Looking to bring this topic to the attention of a local politician? Try making a striking infographic to accompany a formal written letter.
5. Using a graphic design platform, design your eye-catching graphic to educate your audience about your chosen topic.
6. Share your work with your unit and beyond!
7. Think or talk about the impact you hope your graphic will make!

Technology

Cyber Canvas



Tips, tricks and more

- Looking to get more involved in environmental education and graphic design? Consider reaching out to a local environmental non-profit and offer your services as a volunteer.

Resources

New to the world of graphic design? Check out [Canva resources](#) to learn more about captivating your audience and using Canva tools.



Want to take your designs to the next level? Consider transforming a local community space with your techy art! Check out this cool art installation at the Vancouver Aquarium.

Engineering

Devotion to our oceans



What's the solution to pollution? Design a device to help reduce waste in our oceans!

Whether it is from trash such as grocery-store plastic bags or chemical waste, our oceans have been and continue to be polluted. This is caused by littering, oil spills, mining in the oceans, and many other factors that unfortunately have no limit.

All these types of pollutants harm aquatic environments, kill ocean life, and even take a toll on human health. But what is the solution? There have been many different inventions such as nets that are used to collect marine plastics but this solution has shown to pose harm to aquatic organisms.

In this activity, expand on your creative engineering skills to help solve a detrimental issue affecting the world's oceans...pollution! Using recyclable items, create or design a contraption that can be used to clear water pollution in your community.

What you'll need

- Any (used) recycled materials such as
 - Plastic bottles
 - Straws
 - String
 - Plastic bags
 - Non-reusable masks
 - Tape and scissors

Feel free to use any materials that you believe are used as garbage pollutants in the ocean.

Before you start

- Gather the materials needed
- Make sure you have a reasonably large amount of space to work with

What to do

1. Start brainstorming ideas for what types of machines could help the issue.
2. Draw a prototype considering the materials you have
3. Construct the contraption/machine with the materials
4. Come up with real-life situations that the machine will work with
5. Present the idea and your engineered machine to your fellow Guides/Pathfinders/Rangers

Stuff to talk about

- What are some ways or steps that you can take on reducing the pollution in our oceans?
- What are some ways considering cost and resources, that these contraptions could become localized into your community?
- What do you think is more difficult to get rid of, garbage pollution or chemical pollution in our oceans?
- What type of engineers dedicate their jobs to construct these types of solutions?

Engineering

Devotion to our oceans



Tips, tricks and more

- Look at some of the new inventions that many environmentalists have encountered and created. Why have they worked or not worked?
- Look in Appendix for example

Resources

- National Geographic [information about marine pollution](#)
- NOAA information on [ocean pollution and marine debris](#)
- [Everyday products made of recycled materials](#)
- [Ocean pollution: causes, effects, and solutions](#)



Here is an example of a magnetic claw design that can remove harmful metal trash without disturbing aquatic organisms!

Arts

Alternate World



Want to learn about climate change and how we can help? Dive in and explore the ways we can change our everyday lives to help our world.

Thinking of the world without climate change could spark new ways of helping the planet. We can't change and control everything, but there are lots of ways to change our everyday lives that can help our world little by little.

In this activity, you'll design your ideal world using recycled materials such as scraps of paper, bottles, and cardboard to show what the world could look like without climate change. Don't be afraid to let your imagination run wild! If in your ideal world there are unicorns and dragons, include them! Or if your world has flying cars and technology that allows you to teleport, include that!

What you'll need

- different sorts of scraps to upcycle (paper, garbage, newspapers, plastic cups, foam, cardboard, etc.)
 - scissors (enough to share)
 - markers or colored pencils
 - pencils (enough to share)
 - paper (enough to share)
-

Before you start

- Make sure to have lots of space for everyone to work.
- Look up photos for inspiration

What to do

1. Have a chat with your unit and discuss what are some things that affect the world positively and negatively.
- How does climate change impact your community and the planet?
- What are some things we can change in our lives to help the world become healthier?
2. Have everyone plan out their ideal world on a piece of paper.
3. Give everyone access to the supplies and let them have fun!
4. Come together as a group and share what you've made.

Stuff to talk about

- What are some things that affect the world negatively?
 - What are some things that affect the world positively?
 - What are some of the things we can't control?
 - What are some things we can control?
-

Resources

- [Creating coal from CO2 - undoing fossil fuel burning to save the climate](#)
- [Deforestation has driven up hottest day temperatures, study says](#)
- [Some forests aren't growing back after wildfires, research finds](#)

Math

Find your footprint



Find your ecological footprint and what you can do to reduce it.

Everyone has an ecological footprint, that is, the impact you have on the world when it comes to the energy you use, how you manage your waste, and the amount of land you use. The Earth has less than 12 billion hectares of land that balance out our ecological footprint, and we have a current population of about 7.9 billion people. That leaves about 1.5 hectares for everyone on Earth to live without hurting the planet. However, Canadians on average need more than 8 hectares to sustain themselves ([source: University of Waterloo](#)). This is equivalent to 5.1 earths if everyone on our planet lived like Canadians ([source: Over Shoot Day](#)).

In this activity, you'll calculate your ecological footprint, discover how many Earths it would take to sustain us if everyone had your footprint, and find out what you can do to reduce your footprint.

What you'll need

- Ecological Footprint Calculator (one per person)
- Writing Utensils (enough to share)
- Calculator or a device with a calculator app
- Sticky notes or device with internet (enough to share)

Before you start

- Print the eco-footprint calculator (appendix)

What to do

1. Write on sticky notes or use Google Jamboard to answer questions. Ask, "What is an ecological footprint and why is it important to reduce yours?" Have everyone write their answers on a sticky note, then read out the answers and talk about them as a group.
2. Fill out the eco-footprint calculator according to what you do on a typical day.
3. Using your results, find out how many Earth's it would take to sustain you if everyone on the planet was like you. To do this, multiply your result by the population of Earth (7.9 billion) then divide your product by 12 billion (the amount of land on Earth that balances things out).
4. Look at your results, in which sections did you score the highest? Go back and see what made them so high. Is there something obvious you can do to reduce it? Make a list of things you can do to reduce your ecological footprint.

Tips, tricks, and more!

- Looking to help other people reduce their footprint? Get friends and family to calculate their footprint and figure out what they can do to reduce it!

Resources

- Printable Eco-footprint Calculator
- [Google Jamboard](#)

Pollinator Scavenger Hunt Sheet

How many pollinators and plants can you spot?

- Bumble Bee
- Butterfly
- Hummingbird
- Blooming Flower
- Budding Flower
- Blooming Tree
- Fragrant Flower
- Honey Bee
- Sunflower
- Moth
- Chickadee

Bonus Challenge:

- A flower with nectar guides
- A seed
- A fly

Reference Image Guide



Bumble bee



Fragrant flower



Butterfly



Honey bee



Hummingbird



Sunflower



Blooming flower



Moth



Budding flower



Chickadee



Blooming tree



Flower with
nectar guides



Fly



Seeds

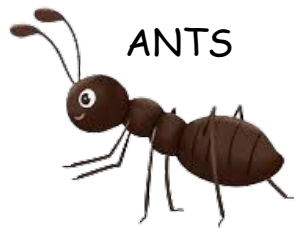
HONEY BEE



BLACKBERRIES



ANTS



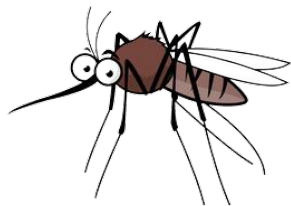
SEEDS



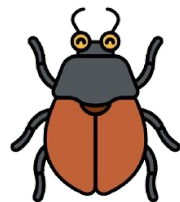
HUMMINGBIRD



MOSQUITO



BETTER



CLOVER



BUTTERFLY



WASP



BLUEBERRIES



FLY



FREE SPACE

LADYBUG



FLOWER WITH NECTAR GUIDES



MUSHROOM



SUNFLOWER



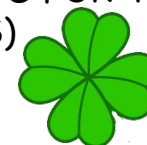
MOTH



FRAGRANT FLOWER



CLOVER (BONUS POINTS FOR 4 LEAF)



FRUIT TREE



ACORN



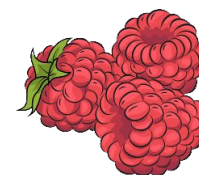
MAPLE LEAF



CHICKADEE



RASPBERRIES



Personal Eco-Footprint Calculator

Procedure: Complete each of the charts for a typical day in your home community. Add the points on each chart to obtain a subtotal for that category, and transfer it to the summary chart. Use the grand total to calculate your ecological footprint.

Water Use

My Score _____

1. My shower (or bath) on a typical day is: _____
 No shower / no bath (0)
 1–2 minutes long / one-fourth full tub (50)
 3–6 minutes long / half full tub (70)
 10 or more minutes long / full tub (90)
2. I flush the toilet: _____
 Every time I use it (40)
 Sometimes (20)
3. When I brush my teeth, I let the water run. (40) _____
4. I washed the car or watered the lawn today. (80) _____
5. We use water-saving toilets (6-9 liters/flush). (-20) _____
6. We use low-flow showerheads (-20) _____
7. I use a dishwasher on a typical day. (50) _____

Subtotal: _____

Food

My Score _____

1. On a typical day, I eat: _____
 Beef (150/portion) _____
 Chicken (100/portion) _____
 Farmed fish (80/portion) _____
 Wild fish (40/portion) _____
 Eggs (40/portion) _____
 Milk/dairy (40/portion) _____
 Fruit (20/portion) _____
 Vegetables (20/portion) _____
 Grains: bread, cereal, rice (20/portion) _____
2. _____ of my food is grown locally. _____
 All (0)
 Some (30)
 None (60)
3. _____ of my food is organic. _____
 All (0)
 Some (30)
 None (60)
4. I compost my fruit/vegetable scraps and peels. _____
 Yes (-20)
 No (60)
5. _____ of my food is processed. _____
 All (100)
 Some (30)
 None (0)
6. _____ of my food has packaging. _____
 All (100)
 Some (30)
 None (0)
7. On a typical day, I waste: _____
 None of my food (0)
 One-fourth of my food (100)
 One-third of my food (150)
 Half of my food (200)

Subtotal: _____

Transportation

My Score _____

1. On a typical day, I travel by: _____
 Foot (0)
 Bike (5 per use)
 Public transit (30 per use)
 Private vehicle (200 per use)
2. Our vehicle's fuel efficiency is _____ liters/100 kilometers (gallons/60 miles). _____
 less than 6 liters / 2 gallons (-50)
 6–9 liters / 2–2½ gallons (50)
 10–13 liters / 3–3½ gallons (100)
 More than 13 liters / 3½ gallons (200)
3. The time I spend in vehicles on a typical day is: _____
 No time (0)
 Less than half an hour (40)
 Half an hour to 1 hour (60)
 More than 1 hour (100)
4. How big is the car in which I travel on a typical day? _____
 No car (-20)
 Small (50)
 Medium (100)
 Large (SUV) (200)
5. Number of cars in our driveway? _____
 No car (-20)
 1 car (50)
 2 cars (100)
 More than 2 cars (200)
6. On a typical day, I walk/run for: _____
 5 hours or more (-75)
 3 to 5 hours (-25)
 1 to 3 hours (0)
 Half an hour to 1 hour (10)
 Less than 10 minutes (100)

Subtotal: _____

Shelter

My Score _____

1. Number of rooms per person (divide number of rooms by number of people living at home) _____
 Fewer than 2 rooms per person (10)
 2 to 3 rooms per person (80)
 4 to 6 rooms per person (140)
 7 or more rooms per person (200)
2. We share our home with nonfamily members. (-50) _____
3. We own a second, or vacation home that is often empty. _____
 No (0)
 We own/use it with others. (200)
 Yes (400)

Subtotal: _____

Personal Eco-Footprint Calculator

Energy Use

- | | |
|---|-------|
| 1. In cold months, our house temperature is: | _____ |
| Under 15°C (59°F) (-20) | |
| 15 to 18°C (59 to 64°F) (50) | |
| 19 to 22°C (66 to 71°F) (100) | |
| 22°C (71°F) or more (150) | |
| 2. We dry clothes outdoors or on an indoor rack. | _____ |
| Always (-50) | |
| Sometimes (20) | |
| Never (60) | |
| 3. We use an energy-efficient refrigerator. | _____ |
| Yes (-50) | |
| No (50) | |
| 4. We use compact fluorescent light bulbs. | _____ |
| Yes (-50) | |
| No (50) | |
| 5. I turn off lights, computer, and television when they're not in use. | _____ |
| Yes (0) | |
| No (50) | |
| 6. To cool off, I use: | _____ |
| Air conditioning: car / home (30 for each) | |
| Electric fan (-10) | |
| Nothing (-50) | |
| 7. Outdoors today, I spent: | _____ |
| 7 hours (0) | |
| 4 to 6 hours (10) | |
| 2 to 3 hours (20) | |
| 2 hours or less (100) | |

Subtotal: _____

Clothing

- | | |
|---|-------|
| 1. I change my outfit every day and put it in the laundry. (80) | _____ |
| 2. I am wearing clothes that have been mended or fixed. (-20) | _____ |
| 3. One-fourth of my clothes are handmade or secondhand. (-20) | _____ |
| 4. Most of my clothes are purchased new each year. (120) | _____ |
| 5. I give the local thrift store clothes that I no longer wear. | _____ |
| Yes (0) | |
| No (100) | |
| 6. I buy hemp instead of cotton shirts when I can. (-10) | _____ |
| 7. I never wear ___ % of the clothes in my cupboard. | _____ |
| Less than 25% (25) | |
| 50% (50) | |
| 75% (75) | |
| More than 75% (100) | |
| 8. I have ___ pairs of shoes. | _____ |
| 2 to 3 (20) | |
| 4 to 6 (60) | |
| 7 or more (90) | |

Subtotal: _____

Stuff

- | | |
|--|-------|
| 1. All my garbage from today could fit into a: | _____ |
| Shoebox (20) | |
| Large pail (60) | |
| Garbage can (200) | |
| No garbage created today! (-50) | |
| 2. I reuse items rather than throw them out. (-20) | _____ |
| 3. I repair items rather than throw them out. (-20) | _____ |
| 4. I recycle all my paper, cans, glass, and plastic. (-20) | _____ |
| 5. I avoid disposable items as often as possible. | _____ |
| Yes (-10) | |
| No (60) | |
| 6. I use rechargeable batteries whenever I can. (-30) | _____ |
| 7. Add one point for each dollar you spend in a typical day. | _____ |
| Today was a Buy Nothing Day (0) | _____ |

Subtotal: _____

Fun

- | | |
|---|-------|
| 1. For typical play, the land converted into fields, rinks, pools, gyms, ski slopes, parking lots, etc., added together occupy: | _____ |
| Nothing (0) | |
| Less than 1 hectare / 2½ acres (20) | |
| 1 to 2 hectares / 2½ to 5 acres (60) | |
| 2 or more hectares / 5 or more acres (100) | |
| 2. On a typical day, I use the TV or computer | _____ |
| Not at all (0) | |
| Less than 1 hour (50) | |
| More than 1 hour (80) | |
| 3. How much equipment is needed for typical activities? | _____ |
| None (0) | |
| Very little (20) | |
| Some (60) | |
| A lot (80) | |

Subtotal: _____

Summary

Transfer your subtotals from each section and add them together to obtain the grand total.

- | | |
|----------------|-------|
| Water use | _____ |
| Food | _____ |
| Transportation | _____ |
| Shelter | _____ |
| Energy Use | _____ |
| Clothing | _____ |
| Stuff | _____ |
| Fun | _____ |

Grand Total: _____

My ecological footprint is:

Grand Total divided by 100 = _____ hectares
(To convert to acres, multiply hectares by 2.47)