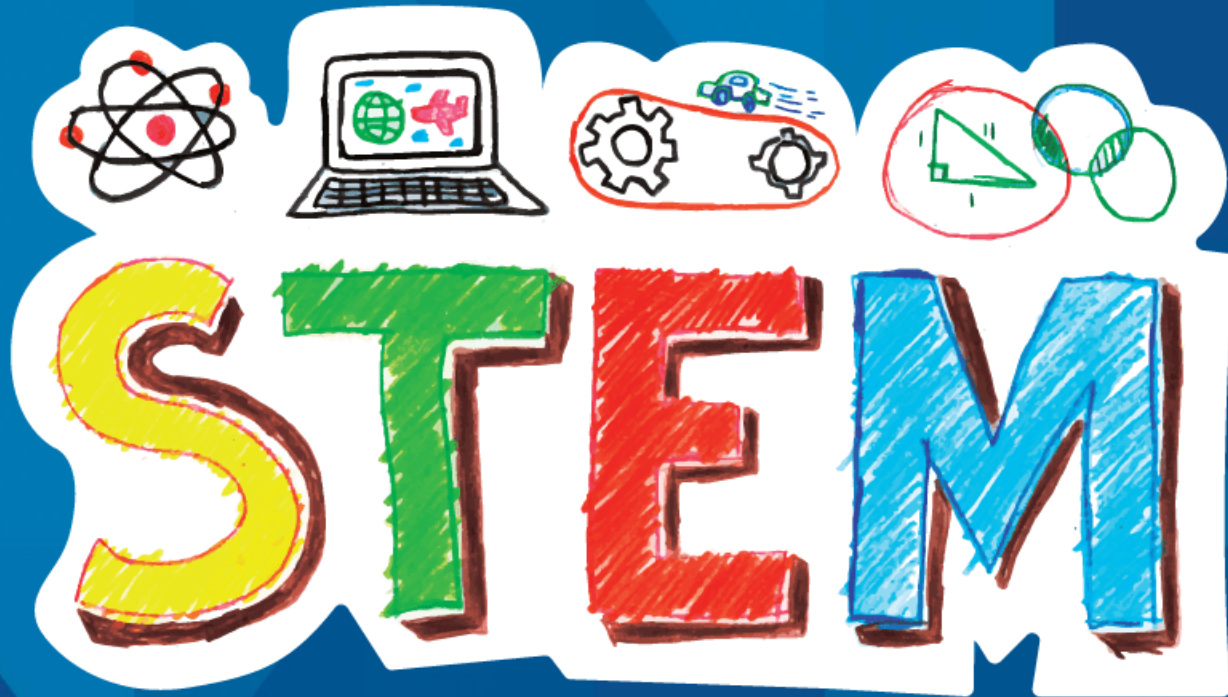


# Sunrise Session STEM In the Classroom



Friday, December 1, 2023



# Grand Erie Land Acknowledgement



**Grand Erie District School Board** recognizes  
**Six Nations of the Grand River** and **Mississaugas of the Credit First Nation**,  
as the longstanding peoples of this territory.

We honour, recognize, and respect these communities as well as all  
**First Nations, Métis** and **Inuit Peoples** who reside within  
Grand Erie District School Board.

We are all stewards of these lands and waters where we now gather, learn  
and play, and commit to working together in the spirit of Reconciliation.



math





STEM has grown to represent a unique approach to teaching and learning one that:

- Centers around individual students' learning styles and interests. It has something to offer every student.
- Integrates subjects in ways that connect disciplines and relate them to each other.
- Allows for students to see innovation from different viewpoints.
- Links Elementary subject and skill development to Secondary Pathway opportunities to post-secondary education and careers.



## Deep Learning Competencies – 6 C's

### CREATIVITY

Having an 'entrepreneurial eye' for economic and social opportunities, asking the right inquiry questions to generate novel ideas, and leadership to pursue those ideas and turn them into action.



### CRITICAL THINKING

Critically evaluating information and arguments, seeing patterns and connections, constructing meaningful knowledge, and applying it in the real world.



### COMMUNICATION

Communicating effectively with a variety of styles, modes, and tools (including digital tools), tailored for a range of audiences.



### CHARACTER

Learning to deep learn, armed with the essential character traits of grit, tenacity, perseverance, and resilience; and the ability to make learning an integral part of living.



### CITIZENSHIP

Thinking like global citizens, considering global issues based on a deep understanding of diverse values and worldviews, and with a genuine interest and ability to solve ambiguous and complex real-world problems that impact human and environmental sustainability.



### COLLABORATION

Work interdependently and synergistically in teams with strong interpersonal and team-related skills including effective management of team dynamics and challenges, making substantive decisions together, and learning from and contributing to the learning of others.



# STEM and Pathways



CONSTRUCTION  
TECHNOLOGY

TCJ

COMMUNICATIONS  
TECHNOLOGY

TGJ

COMPUTER  
TECHNOLOGY

TEJ

HAIRSTYLING &  
TECHNOLOGY

TXJ

HEALTH  
CARE

TPJ

GREEN  
TECHNOLOGY

THJ

HOSPITALITY &  
TOURISM

TFJ

MANUFACTURING  
TECHNOLOGY

TMJ

TECHNOLOGICAL  
DESIGN

TDJ

TRANSPORTATION  
TECHNOLOGY

TTJ



[Ontario.ca/SHSM](http://Ontario.ca/SHSM)

# Vertical Classroom Activity



Where do you see STEM?

What skills were needed to create this project?

[Indigenous thinkers reinvigorate STEM with traditional knowledge | CBC Radio](#)



# Ready, Set, Design – Design Thinking



Challenge: I need to collect and carry water.



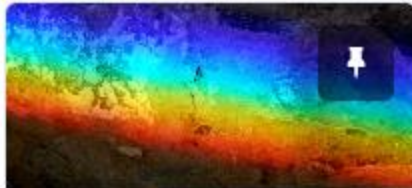
no glue, tape or scissors are allowed. excluding these items forces participants to use materials more creatively!

In the paper lunch bags

- \* Challenge cards (can be a slip of paper or an index card)
- \* Fastener items (for example, pipe cleaners, rubber bands, paper clips, string)
- \* Surface items (for example, coffee filters, cardboard squares, balloons, paper)
- \* Structure items (for example, straws, tongue depressors, wood skewers, tin foil)



# GEDSB STEM Resource Exploration



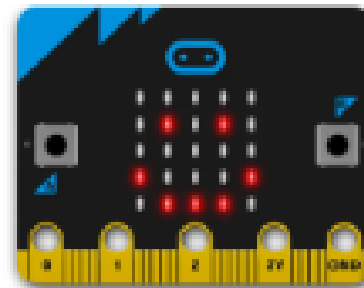
STEM Education Toolkit



Digital Resource Binder - Coding Resources



PLE: Technology for Innovation and Learning



# Digital Resources for Students to Explore STEM





# Curriculum Support Resources for Educators

Ontario Science Centre



Let's Talk Science



Science North



K2i (Grade 9 )



Sustain Ontario



First Robotics



FNMIEO Ways of Knowing



UN Sustainability Goals



STAO Lesson Plans



TVO Learn







# Indigenous Knowledge and Western Science

## FNMI – Introduction to Indigenous Knowledge and Western Science

- [Indigenous Knowledge – Preamble](#)
- [Indigenous Knowledge – Understandings and Considerations](#)
- [Indigenous Science in the Classroom](#)
- [Pedagogy – Ways of Teaching](#)

### FNMI – Elementary Curriculum Resources

- [Tree of Life](#)
- [Grades 1, 3, 4 – Lessons in Balance and Respect](#)
- Wild Rice Activities
  - [Wild Rice Primary/Junior](#)
  - [Wild Rice Junior/Intermediate](#)
  - [Wild Rice Resources](#)
- Grades 1-3 – Primary
  - [Intermediate](#)
  - [Manoomin \(Anishinabe\) or Manomin \(Cre\)](#)
  - [Wild Rice](#)

### • [Grades 4, 5, 6, 7 – Our Relationship with Mother Earth](#)

- Grades 4-6 – Our Relationship with Celestial Bodies
  - [Our Relationship with the Stars](#)
- Grade 5 – Fire Keeping
  - [Fire Keeping-Oshkaabewis](#)
  - [Fire Keeping Matter](#)
- Grade 8 – Water Systems
  - [Water Unit task slides](#)
  - [Grade 8 Science – Water Unit](#)
  - [Presentation Slides](#)
  - [Resource Articles](#)
  - [Guide sheets](#)

### FNMI – Secondary Curriculum Resources

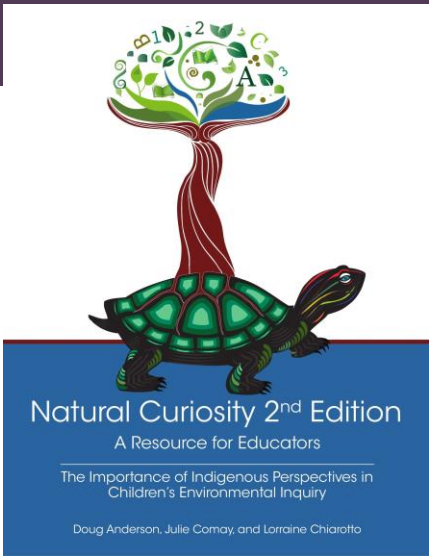
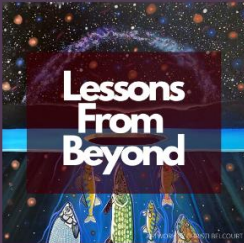
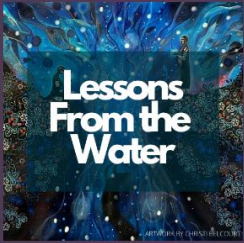
- [Grade 9 Science](#)
- [Grades 9, 10 Science \(Grassy Narrows Study\)](#)
- [Grade 11 Science – Biodiversity](#)
- [Grade 11 Biology](#)
- [Grade 9-12 Science \(Profiles of Indigenous Scientists\)](#)
- Grades 10, 11, 12 Science
  - [Case Studies for Indigenous Science](#)
  - [Climate Change in the Arctic Study](#)

# Indigenous Knowledge and Math



## LESSONS FROM THE EARTH & BEYOND

Click on the links below to access



### Indigenous Knowledge & Mathematics Community of...

FNMI EAO

5 videos 8,082 views Last updated on Jun 10, 2018

+

↗

⋮

▶ Play all

↺ Shuffle

- 1

**Trailer: Indigenous Knowledge & Mathematics Community of Practice**  
TVO Digital Learning Outreach • 3.9K views • 5 years ago

⋮
- 2

**Exploring Math Through the Construction of a Lodge Part 1**  
FNMI EAO • 2.1K views • 5 years ago

⋮
- 3

**Exploring Math Through Drumming**  
FNMI EAO • 1.5K views • 5 years ago

⋮
- 4

**Exploring Math On the Land**  
FNMI EAO • 1.9K views • 5 years ago

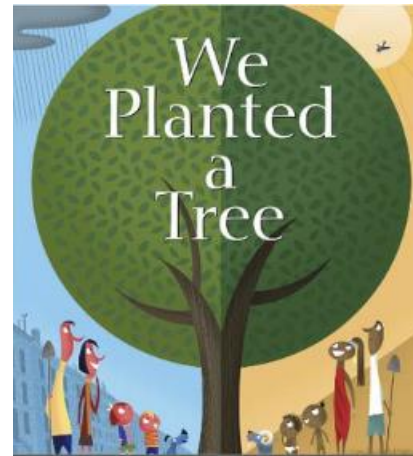
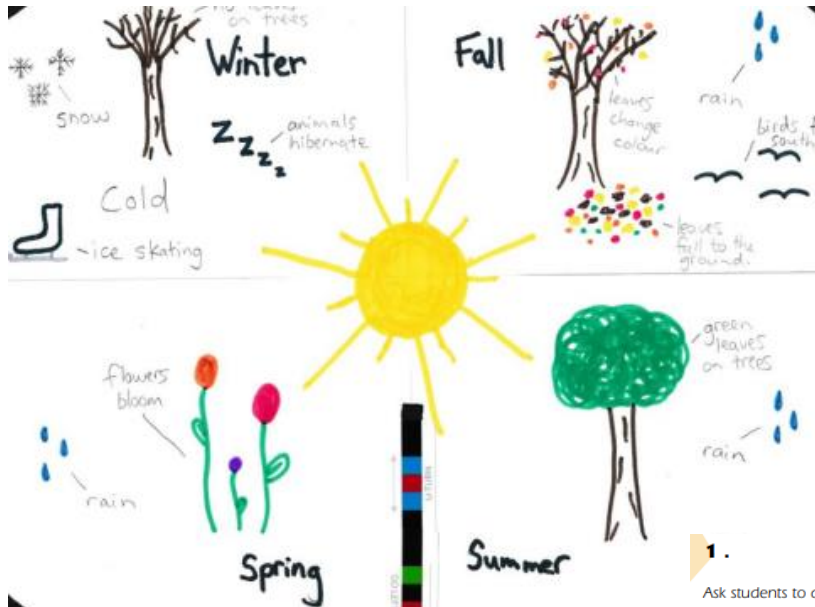
⋮
- 5

**Exploring Math Through the Construction of a Lodge Part 2**  
FNMI EAO • 1.5K views • 5 years ago

⋮

# Grade 1- Sequential Events

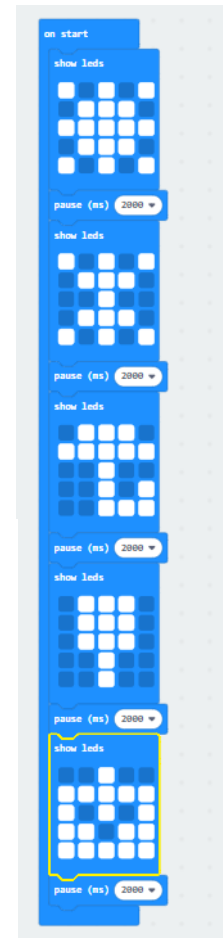
creating clear and precise  
instructions for simple  
algorithms



## 1. A TREE'S FEELINGS

Ask students to dramatize how a tree would "feel," using large and small muscle movements to move like a tree under the following conditions:

- a gentle spring breeze
- a violent autumn windstorm
- pelting rain
- a summer forest fire
- having bare limbs in the winter
- a squirrel running up its trunk
- a bird nesting in its branches
- a person climbing it
- someone cutting it down

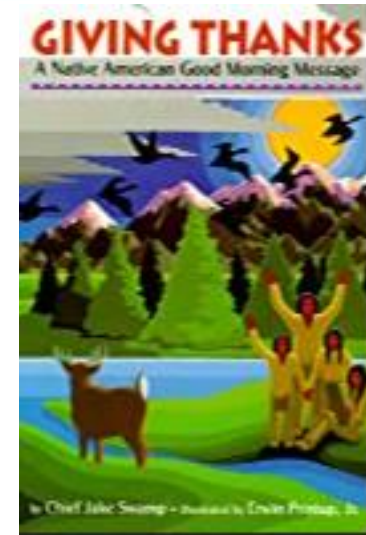


[Creating Patterns and Code, and Making Predictions about them Grade 1 - Teaching and Learning Math: Long Range Plans - GEDSB](#)



# Grade 2- Concurrent Events

decomposing problems into  
smaller steps



[Using Coding to Show Equivalent Relationships Grade 2 - Teaching and Learning Math: Long Range Plans - GEDSB](#)

[Growing Poems \(kidsgardening.org\)](http://kidsgardening.org)

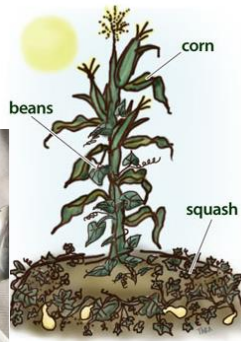
# Grade 3- Repeating Events

testing, debugging, and refining  
programs



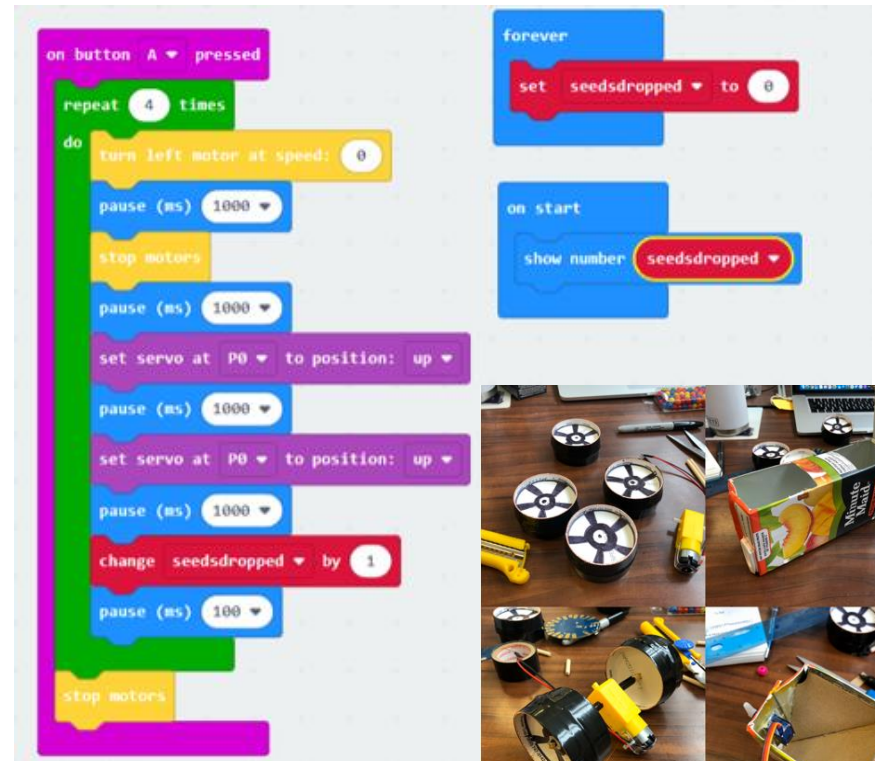
[Happy Maps](#)

[Using Coding to show  
Equivalent Relationships  
Grade 3 - Teaching and  
Learning Math: Long  
Range Plans - GEDSB](#)



[Three Sisters](#)

Meal 1: Breakfast		Meal 2: Lunch		Meal 3: Dinner		Snacks	
Dish	Ingredients	Dish	Ingredients	Dish	Ingredients	Dish	Ingredients
Porridge	Oats						
	Milk						
	Raspberries						
	Brown sugar						
Fruit salad	Orange						
	Apple						
	Watermelon						
Toast	Whole wheat bread						
	Peanut butter						
Water	Water						
...							



[Deforestation- Background Information](#)

[Deforestation- Coding a Tree Planter](#)

WHAT DOES BIODIVERSITY HAVE TO DO WITH THE FOOD WE  
EAT?



# Grade 4- Nested Events

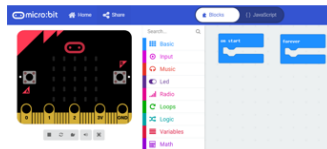
producing different types of output for a variety of purposes



[Creating Patterns and Code, and Making Predictions about them Grade 4 - Teaching and Learning Math: Long Range Plans - GEDSB](#)

## Creating LED nature art

- We will create LED representations of some plants/animals we found on our nature walk.
- What steps will we need to take to create our LED nature art?



## Nature Art with Micro:bits



## Patterns in Nature

Certain shapes or designs seem to repeat themselves throughout nature. Shown below are examples of four such patterns. See if you can find any examples of these four patterns in our garden.

### Spirals



### Concentric Circles (circles sharing the same center)



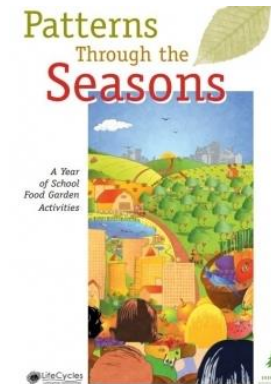
### Stars



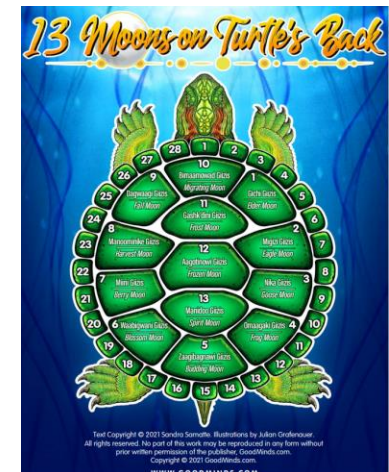
### Branching



[Patterns-Seasons.pdf \(evergreen.ca\)](#)



[Garden project in Six Nations connects youth with land and each other | CBC News](#)

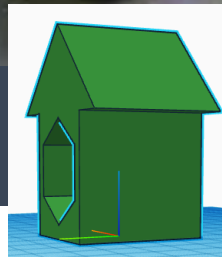




using different methods to store and process data for a variety of purposes



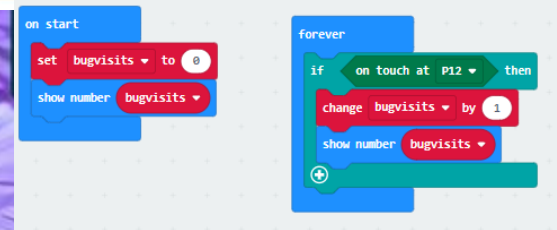
# Grade 5- Conditional Statements



## New Plants and Pollinators

### [Plants and Pollinators- Background Information](#)

### [Plants and Pollinators- Coding a Bee Sensor](#)



## Earth: It's Everybody's Home

A Look at How Young People Are Protecting Our Planet



## [Creating, Describing, and Performing Transformations](#) [Grade 5 - Teaching and Learning Math: Long Range Plans - GEDSB](#)

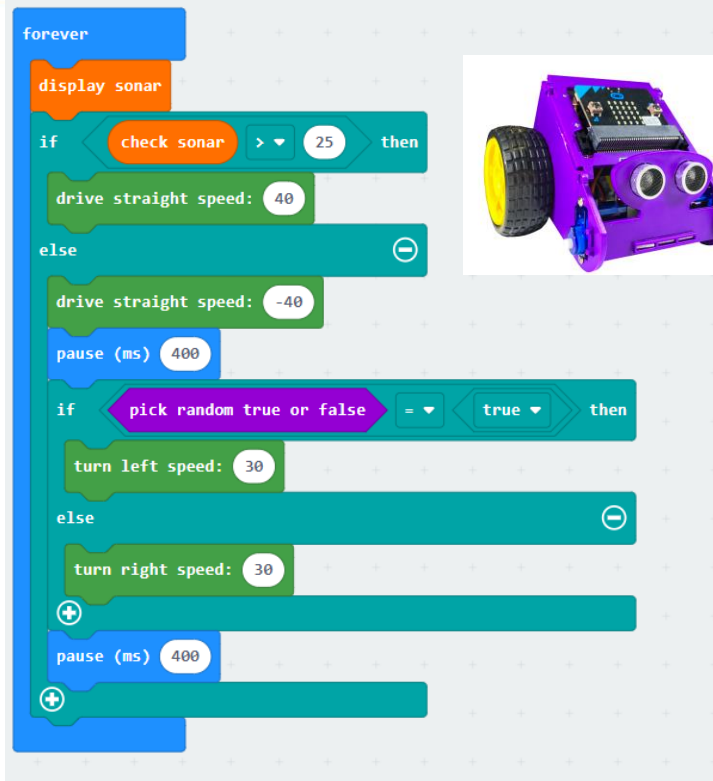


## [Earth is Everyone's Home](#)

Make space for Indigenous knowledge keepers, Elders, and community partners in your schools. Value stories and the importance of oral tradition, many of the “whys” are taught to us through stories. Give yourself time to reflect and make your own meaning from the stories Elders and knowledge keepers share with you. Remain open to other perspectives and worldviews, we exist together (e.g., [Two Row Wampum](#) and [Dish With One Spoon](#)). **Source:** [ETFO Learning From the Land Resource](#)

# Grade 6- Efficient Code

obtaining input in different ways for a variety of purposes



[Bats \(nwf.org\)](http://nwf.org)

[Ontario Bat Guide](#)

[Indigenous research into little brown bats aims to help species survive | CBC News](#)

[Coding can be used to create patterns, check predictions, and simulate probabilities Grade 6 - Teaching and Learning Math: Long Range Plans - GEDSB](#)

## Build a Bat House!

ACTIVITY  
6

**Summary:**  
Students build a bat house for their Backyard Wildlife Habitat™ or Schoolyard Habitat® Site.

**Grade Level:**  
2-8

**Time:**  
2 hours (plus painting and installation time)

**Subject:**  
science, art, math

**Skills:**  
construction, description, analysis

**Learning Objectives:**  
Students will be able to:

- Identify reasons for building a bat house.
- Demonstrate a method for building a bat house.
- Identify key criteria for successful bat houses.

**Materials:** (for each house)

- 1/4 sheet (2' x 4') 1/2" CDX (outdoor grade) plywood
- No pressure- or chemically-treated wood
- One piece 1" x 2" (3/4" x 1 3/4" finished) x 8' (one flurring strip)
- 20 to 30 1 1/4" coated deck or exterior-grade Phillips screws
- One pint black, water-based stain, exterior-grade
- One pint water-based primer, exterior-grade
- One quart flat water-based paint or stain, exterior-grade\*
- One tube paintable latex caulk
- 1" x 3" x 28" board for roof
- 6 to 10 7/8" roofing nails

\*Years of research have shown that bat houses are far more successful at attracting bats if they are painted or stained. Painting helps maintain the proper internal temperature for bats and also increases the life span of the bat house. Appropriate color depends upon geographic location and amount of sun exposure. Adjust as



design colors for less sun. Use exterior-quality, water-based stain or latex paint, and choose flat paint rather than gloss or semi-gloss.

**Recommended Tools**

- table saw (for adults only) or handsaw,
- caulking gun,
- variable speed reversing drill
- paintbrushes
- Phillips bit for drill

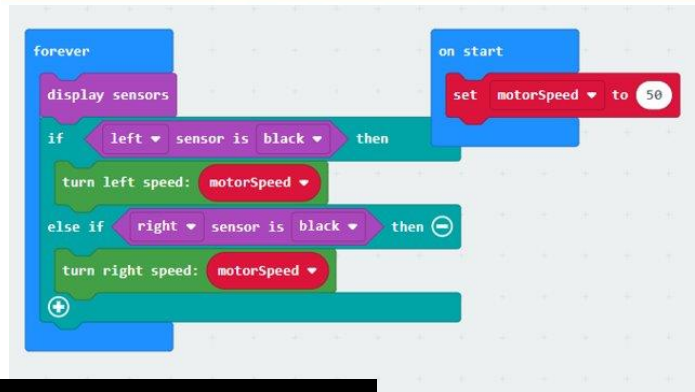
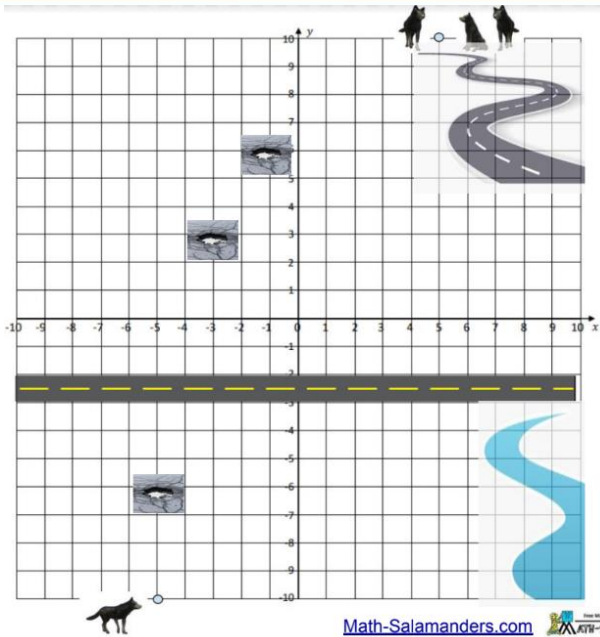


[How do Wind Farms Affect Birds and Bats?](#)

[Night\\_Friends.pdf \(pwnet.org\)](#)

# Grade 7- Subprograms

planning and designing  
programs

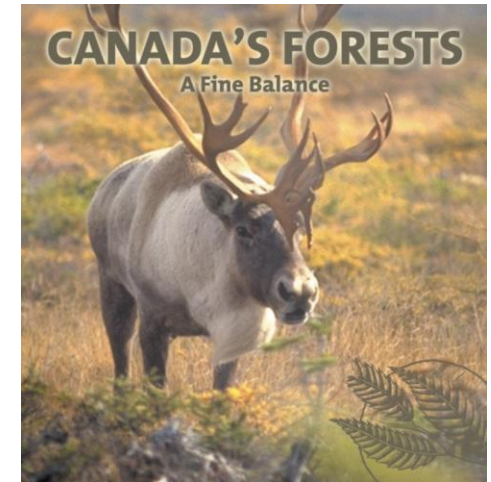


[Lesson and Assessment Plan - Get the Wolf to her Pups](#)

[Creating, describing, and performing transformations Grade 7 - Teaching and Learning Math: Long Range Plans - GEDSB](#)



[How Indigenous land-based learning can help fight climate change | TVO.org](#)



[Canadas Forest Teaching\\_Kit\\_Vol5.pdf \(resources4rethinking.ca\)](#)

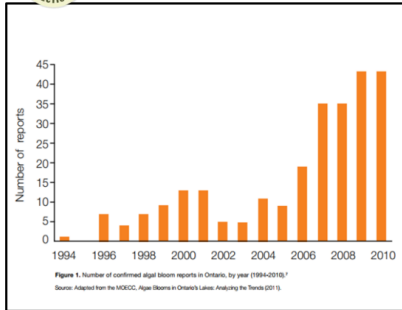


# Grade 8- Data Analysis

automating large  
systems in action

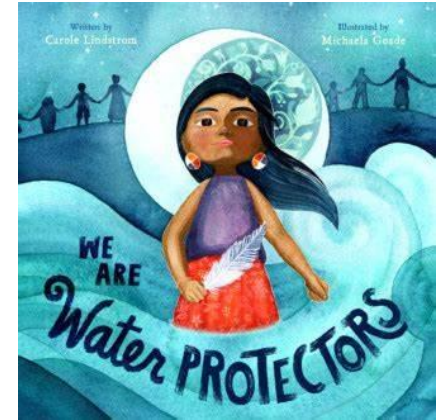
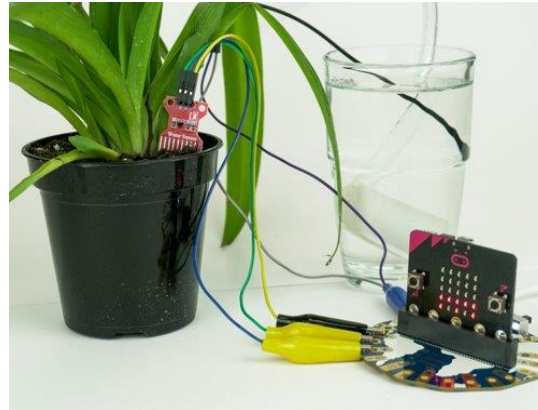


## DATA SCIENCE: ALGAE BLOOM



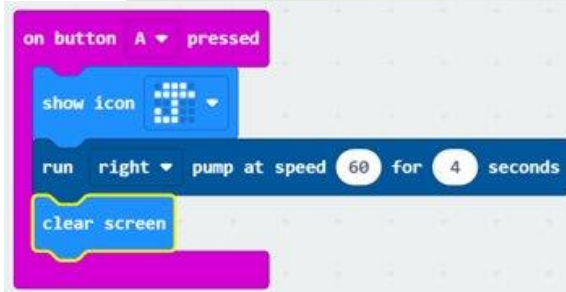
Based on the graph on the left what do you predict occurred between 2010-2020? Why do you think this is happening? Is this a problem? If so, how could we rectify this moving forward?

(Type here)



## Advanced Agriculture – Background Information

1. Activity	2. Frequency (# of times) or minutes spent	3. Total frequency or minutes	4. Water use rate	5. Total volume (L) of water used
Shower with regular shower-head (total minutes)			20 L/min	
Shower with low-flow shower-head			10 L/min	
Outdoor hose			35 L / min	
Toilet flushing			17 L / flush	
Hand washing			8 L	
Brushing teeth with tap running			10 L	
Brushing teeth, turning tap off between water use.			0.5 L	
Bath (half full)			30 L	
Bath (1/3 full)			20 L	
Bath (full tub)			60 L	
Washing dishes by hand			35 L	
dishwasher			40 L	
Washing clothes			225 L	
Drinking glass of water				
Sip from water fountain				
Other:				



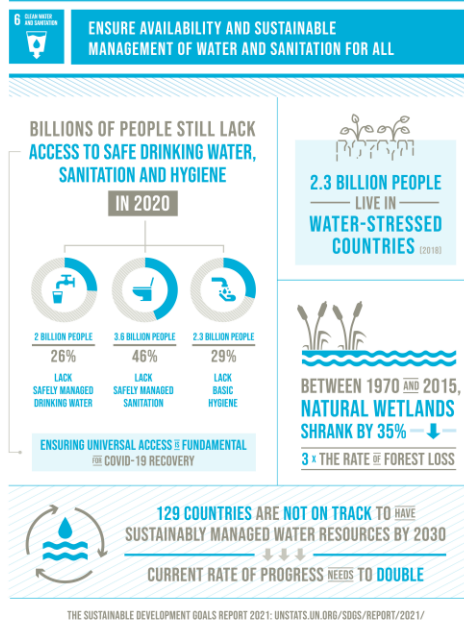
## Advanced Agriculture – Coding for Water Pump

[Safe Water for First Nations | The Council of Canadians](#)

[Nestle-and-First-Nations\\_-3.pdf \(stao.ca\)](#)



# Grade 9 – Cross Curricular



```

on start
  set track distance (m) to 10
  set distance travelled to 0
  set steps to 0
  set length of step (m) to 2

  while distance travelled < track distance (m)
  do
    if distance travelled ≥ track distance (m) then
      show number steps
      show string "Finish!"
    else
      change steps by 1
      change distance travelled by length of step (m)
      show number steps
  
```

[MTH1W - Lesson and Assessment Plan - Taking Steps towards Coding](#)



[Goal 6 | Department of Economic and Social Affairs](#)



## Walking for water

- How do you think walking for 8 hours a day impacts on Aysha's life?
- Why does the 'Water Burden' impact women & girls most?
- Estimate how far Aysha walks every day (8 hours, 4 stops of 15 minutes, average pace of 4k per hour, 1km = approx 1500 steps).

[Walking for water | micro:bit](#)



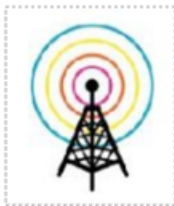
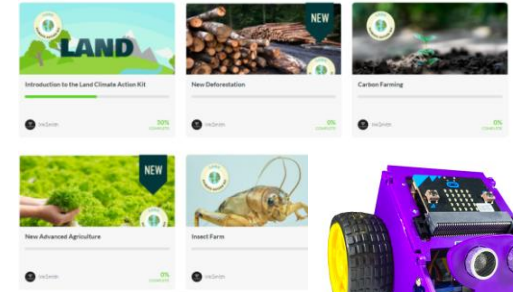
# Grade 9 - Exploring Technologies



[Fatigue Test Case Study Lesson](#)  
[Code for Case Study](#)



[Energy awareness | micro:bit \(microbit.org\)](#)



[Rogers Communication Challenge](#)



[Health tech | micro:bit \(microbit.org\)](#)



[Micro:Music](#)



[Design a Food Temperature Probe](#)



[Night safety | micro:bit \(microbit.org\)](#)



[Build models to Understand and Mitigate Brain Injury](#)



# Have any Questions?



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