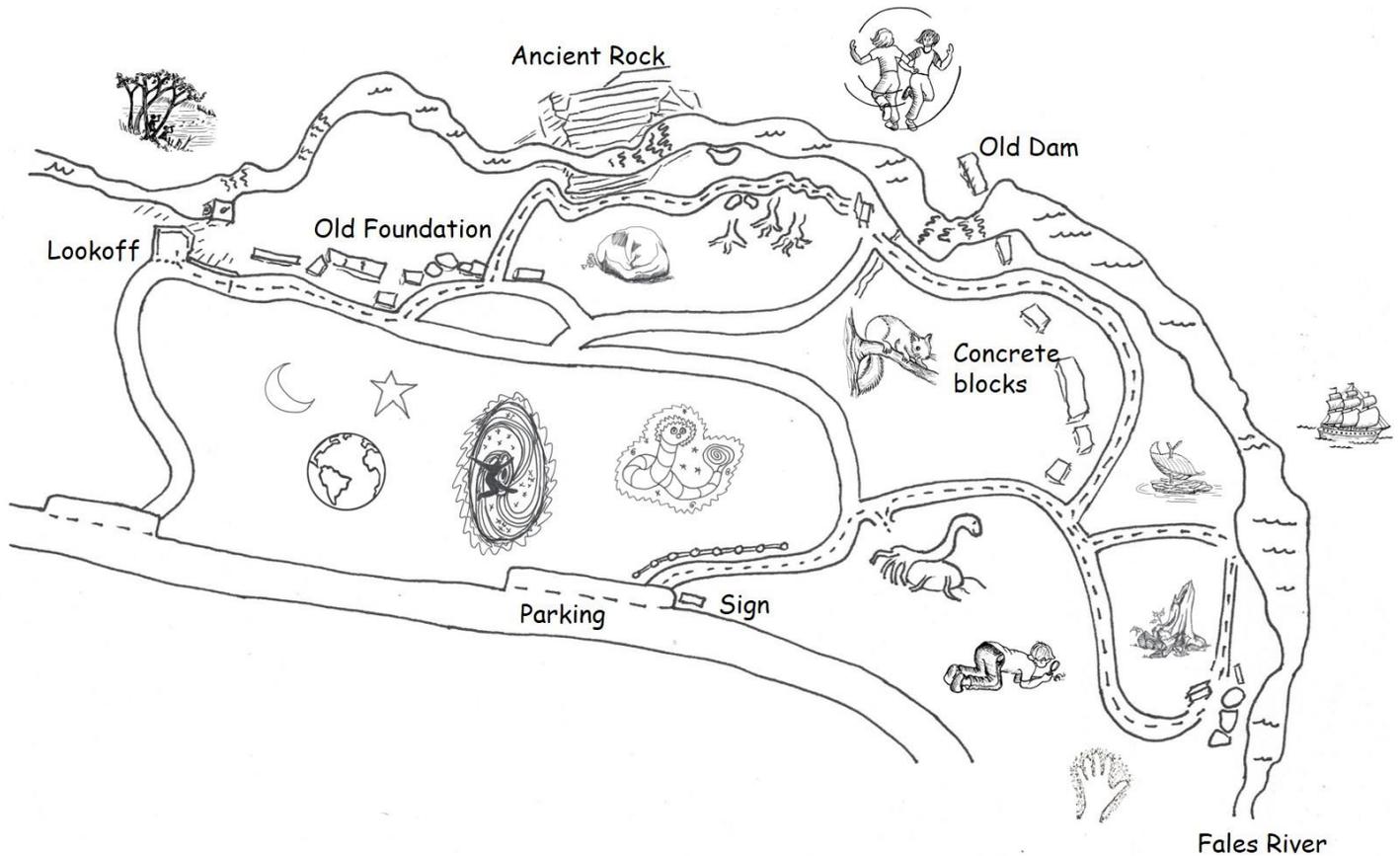


Time Travel Detectives: A McMaster Mill Park Adventure



Distance: 0.5 km return

Approx. Time: 1 hr 10 min

Trail Info: This trail is a short array of loops and intersecting trails that occupies less than 1 acre of land. There are extremely steep and slippery slopes leading to a deep rocky gorge below. Stay on the trail close to the gorge and heed the warning signs provided. During the Adventure, there is some uneven ground, roots and inclines just off the trail but the groomed trail is flat. These trails were developed as an interpretive park for the historic McMaster Mill that once ran here from the mid 1800's to the mid 1900's. Because there are interpretive signs to read along the way, you might want to begin with a preliminary walk through the park to learn about the significance of this site. After this you can begin the Adventure at the map.

Directions: From Halifax take Highway 101 west to the Annapolis Valley. Take Exit 17E towards Kingston/ Greenwood, turning left at the end of the ramp onto Maple St. Drive 850m and turn right onto the Number 1 Hwy. Drive 1km into Kingston and turn left at the lights onto Bridge Street. Drive 2.2km and turn left at the lights onto Central Ave. Drive 450m and turn right at the lights to stay on Central Ave. Drive 1.2km past the shopping malls and turn right onto Rocknotch Rd. Drive 1.5km and turn left onto Meadowvale Rd. briefly for 170m, and then turn right back onto Rocknotch Rd again. Drive another 3 km on Rocknotch Rd and park on the side of the road at the McMaster Mill Park sign on the left. Start at the sign.

Trail Tools: Bring a daypack with water, snacks, first aid kit and anything else you need. Prepare and gather these tools for each person.

- Pencil and this sheet.
- Snack and water (Sailor's Ration)
- Magnifying lenses (optional)
- Paintbrushes or Q-tips (optional)
- Straw
- Water

Time Travel Detectives Wanted

The Planet Earth has a secret message for its passengers. The challenge is that our 4.5-billion-year-old planet left the clues for us at 7 different times in history! To figure out the secret message, walk through this time-travel adventure. Use this clue box to place the seven clue words discovered on your adventure. When you have them all, then write the letters from the grey boxes into the Earth's message on top that corresponds with the Clue #.

Time travel works well here because of its unique location and the presence of artifacts from many different times in history. Transporter Worms will take you back in time. Worms have the ability to travel through Worm-holes in spacetime and they can take you along!

Before we go, we will need to give a gift along the way. Look at the ground and find something natural that is small, no bigger than your thumb nail, that looks like a neat gift. Put it in your pocket for later.

Ready to go on a time-travel quest for Earth? Ok, here we go ...

- 1) Walk down to the last railing pole and find a nice moist patch of earth off the trail.
- 2) Look for worms under the leaves and in the dirt.
- 3) If you find a worm then touch it gently. What does it feel like? If you don't find a worm then stick your finger into the moist soil, like it is a worm moving through the earth.
- 4) Say these magic words together...

**Space
Time
Einstein
Wiggle Like a Worm
Take us back to places past
JUMP UP SPIN AND SQUIRM!**



Jump up and spin in the air like you are spinning through space and time down a worm-hole!

Now you are back in time. But, where in the past are you?... You have gone back to 150 million years ago! Hear the roaring in the background? Maybe it's a waterfall, or maybe it's a... dinosaur?

1. Go on a Dinosaur Ride

⇒ Walk along the path 17m until you reach a Y and go right 2m.

Look up into the woods to the right of the path. Do you see the big dinosaur neck reaching for the leaves in the trees? This dino is a huge Seisamosaurus. It only eats plants so it is safe to climb onto its neck and go for a ride!

Earth's Message: **5 7 4 2 1 6 3**

Clue # 1: _ _ _ _ _

Clue # 2: _ _ _ _ _

Clue # 3: _ _ _ _ _

Clue # 4: _ _ _ _ _

Clue # 5: _ _ _ _ _

Clue # 6: _ _ _ _ _

Clue # 7: _ _ _ _ _

ALBERT EINSTEIN'S THEORY AT WORK!

Einstein's theory of General Relativity predicts the presence of **wormholes** linking the past to the present. Some starry night, look up into the sky. You are really looking back into time billions of years! Your eyes are time-traveling! COOL! So, let's use these wormholes to travel back in time!

The space worms were just here! They speed through time and are difficult to spot. They want to help you find the clues by giving you a hint at each time stop. Here is a note they left to help you with the first clue, they have filled in some letters to help you guess:

Watch out for the giants! Dinosaurs were able to grow really big during this time in Earth's history. One theory speculates that the development of a bird-like lungs would have allowed more O _ Y _ _ _ (CLUE # 1) to enter their lungs and help them breathe better.

Oh no! Here comes a meat-eating Allosaurus. You had better hide!

- 1) Find a hiding spot and quietly listen for 30 seconds.
- 2) Make a dinosaur call to signal to your team when it is safe to continue.

It might be good to use a different call at each stop through time as a signal to the others in your team when there is danger and when it is safe. Make sure your calls are appropriate to the time period so you don't draw too much attention to yourself.

Back to the trail. This is a really dangerous place to be a small mammal. You had better get away now that you have the first clue. Plug your finger into the earth like a worm digging into the soil and say...

Space
Time
Einstein
Wiggle Like a Worm
Spinning, swirling, leaping, twirling
JUMP UP SPIN AND SQUIRM



Jump up and spin in the air through space and time down a worm-hole! Where are you now?

2. *Be a Cave-Person Artist*

- ⇒ Walk 15m to the next Y in the road and go right 100m until you get to three rocks ahead of you and a bench to the left.

It is 200 thousand years ago, early humans are running about. We know from fossils that they looked like us, wore clothing, and made tools from stone. They also made cave art.

The Worms have another clue for you to discover:

Early humans lived in caves and drew pictures on stone. Archeologists have found engravings and P _ _ _ _ _ N _ S (Clue # 2) on the walls of caves in Africa and Asia.

Be a cave person and decorate your cave wall with art. Decorate the 3 rocks in front of you by dipping your finger, paintbrush or Q-tip in water and making a design. You can try making hand stencil prints, which were very popular back then.

- 1) Fill your mouth with water and practice spraying it out through a straw as a fine mist (shooting away from others).
- 2) Place your hand with fingers spread in the rock with your arm straight and spray your hand with water to leave a dry hand print. You have left your mark!

We shouldn't stay much longer here though, we don't want to frighten the inhabitants when they get home. On to the next clue!

Crouch down and plug into the Earth again like a worm and say...

Space
Time
Einstein
Wiggle Like a Worm
Squeeze us through a tiny place
RISE UP AND SQUIRM!



From crouching, straighten your legs slowly with your body hanging down and role your back up to standing while slowly reaching for the sky like an un-furling plant reaching for the sun We now squeeze ourselves out of the wormhole! Where are we?

3. *Explore the Land of Mi'kma'ki*

⇒ To the right of the bench, walk to the top of the little hill 6m.



This is Nova Scotia 500 years ago when the Mi'kmaq were the only people living here. The land provided everything to the people; food, shelter, fun and adventure! Children explored with all of their senses every day and got really good at reading the Book of Nature all around them. Let's read a page from the Book of Nature together! We are going to explore the mini-world of the decaying tree in front of you.

- 1) Take out your magnifying lenses and crawl on the ground over to the decaying wood.
- 2) Look for the little creatures that call this mini-world home. Do you see any worms, woodbugs or ants? Try not to disturb their homes too much.
- 3) These creatures are decomposers, an important part of the nutrient cycle in the forest. What other decomposers do you see?
- 4) How do the creatures find what they need: food, water, shelter?



The worms have another clue for you:

The Mi'kmaq depended on the land and each other for survival. Because it sustained their every need they taught their children about **R E _ P _ _ T (Clue # 3)** for the land and gave gifts and thanks to the creatures that gave their lives so the people could eat.

Do you still have the little gift in your pocket from your time? Let's give this special gift as thanks to the creatures living in this dead wood for all they do to re-cycle nutrients in Nature. Using your magnifying lens, find the perfect place in the wood where the creatures would find and appreciate it.

The Mi'kmaq children want to share the Stick Catch Game with you as a gift to take back.

- 1) Everyone pick up several pencil size sticks.
- 2) Starting with a single stick, balance the stick on the top of your hand with palm down.
- 3) Quickly drop your hand and grab the stick out of the air before it hits the ground.
- 4) When you can catch one stick add another stick and try.

5) Who can catch the most sticks at once!

It's time to move to the next time. Plug into the earth like a worm and read together:

Space
Time
Einstein
Wiggle Like a Worm
Forward into time and space
WRIGGLE UP AND SQUIRM!!



From crouching, make your whole body wiggle like Jelly as you slowly stand up and then jump up and say *POP!* What time have we landed in now?

4. *Be Sea Explorers*

⇒ Carefully walk down the steep hill, holding onto the trees for support, and stand on the shore.

It is 400 years ago. Explorers from Italy, France, England and Spain have just come to these lands for the first time. Their governments want the land for themselves even though the Mi'kmaw already live here. In the end the Europeans are more powerful and take the land from the Mi'kmaw even though some explorers tried to get along. In our own time, the Canadian government is seeking to heal the wrongs of the past between the European settlers and indigenous peoples.



The worms have another clue for you to discover here:

400 years ago there were no motors so the sea explorers came across the Atlantic Ocean by S _ _ _ (Clue # 4) boat, which took around 30 days from England. Imagine a month at sea in the middle of the ocean with no fresh food, just pickled meat and hardtack biscuits. Yuck!

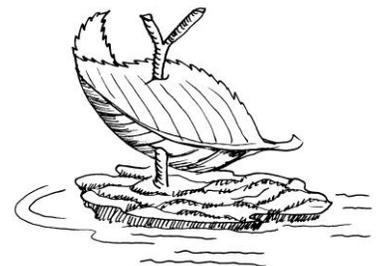
To be a European explorer, you need a boat:

Find some dry wood or sticks and make a boat and decorate it as you like. You can make a raft type boat by using long grass to tie twigs together. See if you can make a sail out of a twig mast and a leaf sail. Let your boats go and see who's is the fastest.

Phew! Time travel is tiring! Time to eat your sailor's rations before you travel any further. Open your backpack and have a snack and drink.

Let's keep going! Just 3 more words to go and we can solve the message from Earth. Plug yourself into the Earth with your wormy little fingers and say:

Space
Time
Einstein
Wiggle Like a Worm
Let's hope someone's steering this thing
JUMP UP, SPIN AND SQUIRM!



From crouching, jump and spin one way, land and spin the other while yelling like you are on a rollercoaster!
Wonder where we are in time now?

5. *Make Machines*

- ⇒ Walk 4m down the shore and turn left, walking up the path 15m through dense vegetation back to the main trail. Turn right and walk 15m.

These big slabs of concrete hold back the water of the Fales river, watch out for the large pond they make and don't get swept away! We are in the year 1930 and the McMaster Mill is sawing logs and grinding grain using the energy of fast flowing water to run an engine and move saws and grinders. But there is a new invention just around the corner that would shape the future of human society.

The worms have another clue for you:



Oil lamps and candles light up the evenings in the small community here at Rocknotch back in the early 1900's. Then the discovery and harnessing of **E _ E _ _ _ ! _ ! _ Y (Clue # 5)** made it possible to just flip a switch and light up the houses.

How does a water turbine or water wheel make a saw mill cut logs or how does a flour mill grind grain? Use your bodies to make machines! You are all machine parts of a watermill.

1. Everyone stand side-by-side in a straight line along the path with your arms out-stretched and hands touching.
2. The person closest to the water starts to turn around in a circle with arms out like their arms are paddles or blades being pushed by flowing water.
3. As their hands push against the person next to them, the next person starts to spin in the direction they are pushed.
4. In turn, the next person spins in the direction their hands are pushed until everyone is spinning in the line.
5. Is everyone spinning in the same direction?

The McMaster Water Mill at the Rockville Notch

The Rockville Company began when a waterwheel was built on the Fales River to saw logs (sawmill) and grind grain into flour (gristmill) in 1858. When more efficient technology was discovered, the company built a water-turbine in 1913 to increase production of sawn wood and to provide electricity for the community. All that is left of the construction are the concrete blocks that formed the dam and the penstock that held the turbine farther down the river. When electricity finally came to the community from other, larger, power stations, the watermill was closed and operations moved to Kingston. Look at the interpretive panels along the trails to learn more.

You are all moving parts, called cogs, of a water wheel that is powered by flowing water.

6. As your arms turn, they can be turning other cogs and moving other machine parts such as saws or grinders to make them work.
7. Can you invent another machine with all of your bodies? An automobile? An airplane? A toaster? Think of the moving parts you will need and be creative! Invent a new machine!

We are on our way to another place in time. Plug yourself into the Earth and say:

**Space
Time
Einstein**

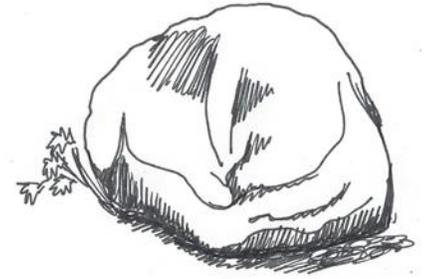
Wiggle Like a Worm
Is it getting cold in here or is it just me
SCUTTLE AND SQUIRM!

Stay crouching and scuttle around on the path like tiny insects and jump up extending arms and legs like a star. Brrrrr... it is unusually cold! Where are we now?

6. *Build Shelters*

- ⇒ Turn left from facing the river and walk 15m past the concrete blocks to the bench. Go around the bench and down the slope 5m.

I'm freezing! We went back in time again. It is 10 thousand years ago when the glaciers were melting at the end of the last Ice Age. What a tough place to live. These scraggly trees and roots are the only shelter the little animals have against the bitter cold and wet. Let's help the animals find shelter by building little homes for them among the roots! You can work together or separately and make a little village. Have a tour of your village when you are through.



Before we forget why we came this far, here is the message from the Worms with clue number 6:

See these big, round granite boulders? These big rocks hitched a ride on the glacier as it moved south across the continent during the Ice Age. Glaciers are large slabs of **! __ (Clue # 6)** that grow slowly and can cover whole continents.

Let's go and find out what our last clue is! Plug into the Earth and say:

Space
Time
Einstein
Wiggle Like a Worm
Zipping, Flipping, Hold On Tight!
JUMP, JUMP AND SQUIRM



Jump up and down from crouching three times as high as you can. Let's look around to see where we are now.

7. *Look for an Amphibian's Lunch*

- ⇒ Walk another 20m through the boulders and trees to where you can see a waterfall to your right around a corner of rock.

Whoow! What a strange place. The rocks are bending and folding under our feet. This is 350 million years ago in the Middle of the Carboniferous Period when the 2 continents of Gondwanan and Laurasia collided to form the Supercontinent Pangea. Hold on tight to something! Here comes an earthquake! Shake and wiggle... What a dangerous place to live!

This is the time of the fishes, and early amphibians are just starting to walk out of the swamps onto land to catch the insects already there. The amphibians during this time looked like giant salamanders with sharp teeth! Let's look for lunch as an amphibian! Maybe you are the giant ancestor of a frog or salamander? COOL!

- 1) Get down on your hands and knees and search among the leaves, moss and dead wood for tasty insects.
- 2) Take out your magnifying lens and look at them up close. These little insects would have been 20 times the size they are today since there was more oxygen in the atmosphere 350 million years ago, which helped amphibians grow big.
- 3) How many kinds of giant yummy insects can you find? Don't they look delicious!

The worms have the final clue for you:

This exact place on Nova Scotia that you are standing now is the point where the continents collided. The rocks are being squeezed and squished by pressure and **_ E _ T (Clue # 7)** under the ground that melts the rocks and bends them at odd angles.

Look to the left of the waterfall and see the rocks lined like the layers in a cake or the pages of a book. The erosion of soil by water has uncovered these rocks and now we are able to see them. Each layer is like a page in the book of time since the layers are deposited one on top of the other over time.

Let's read the rock book:

- 1) Count the different layers. How many are there?
- 2) Are the layers all the same size?
- 3) Are the layers all the same colour?
- 4) What do you think this says about each layer of rock?

Time to go before another earthquake hits! Plug into the Earth and say:

Space
Time
Einstein
Wiggle Like a Worm
Bridge between the here and then
JUMP UP, SPIN AND SQUIRM!



Spin while jumping high and tuck your knees up in midair. Say "Plop!" when you land.

EARTHWORKS

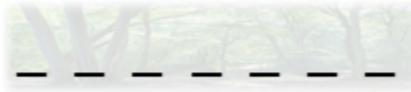


The Earth's ecosystem (the system of life on the planet) is always changing. Each living thing is connected to every other living thing in a great web of exchanges and interactions that effect the whole system. Like a spider's web, if a movement happens in one part of the web it can be felt in the rest of the web. If a part of the web is cut or damaged, this affects the strength of the entire web. Unlike the spider's web, the ecosystem is in constant motion as the creatures move and change over time.

8. Home we go

- ⇒ Walk up hill through the tree roots and rocks 15m until you are back on the main trail. Turn right and walk 40m to the look off.

This place looks familiar! We are back home in our own time and finished our time travel. Thank the worms for taking us through their wormholes across space and time by reaching up wiggling your fingers in a goodbye wave. Now you have all 7-word clues so plug them into the clue box at the beginning of the adventure and write the corresponding letter clue, shaded grey, on the numbers above to discover the secret message from Planet Earth? Write the word below.



This word is a lesson for us all. We have learned though this adventure that the earth _____ (same word) over time and we humans and other creatures living on this earth need to do this as well to adapt to different environments. Humans are changing the environment on this planet and we need to have respect for other creatures with whom we share the Earth. We need to give other species room to adapt and change with us.

Earth Steps

Here are some things that you and your family can do to respect the space that animals need to survive.

- When hiking, pack out what you pack in. Don't litter.
- Stay on the trail in fragile areas.
- Find out about groups you can join to help preserve nature trails by contacting www.novascotiatrials.com

BEYOND THE ADVENTURE

Because this trail is an interpretive historic park, complete with signage, you may want to begin with a walk through the park to see the historic significance of this place.

To learn more about Mi'kmaw culture - <http://www.mikmaweydebert.ca/home/>

To learn more about human evolution - <http://humanorigins.si.edu/evidence/human-evolution-timeline-interactive>

MORE ADVENTURES IN KINGS COUNTY

Go to the Kings County for more trail adventures in the Annapolis Valley. <http://www.countyofkings.ca/common/pars/>

CREDITS:

This document was created by Marina Myra of Wild Roots Nature Education Centre. <https://www.wildrootsnec.com/>. This work was inspired by and adapts material from Earth Adventures in the Halifax Region 3rd Edition, by Alan Warner, Janet Barlow, and George Taylor.



Editing was by Dr. Alan Warner, Department of Community Development, Acadia University.

Illustrations by Marina Myra and Lois Bearden.



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