



A GUMBOOT KIDS CURRICULUM

AS SEEN ON



CBC Kids



LEARN ABOUT FOSSILS

AGES 4-8



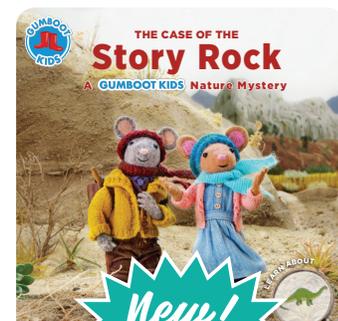
 curio.ca

GUMBOOTKIDS.COM

This teacher guide supports the following Gumboot Kids episodes about fossils found on CBC Curio:

- [The Case of The Story Rock](#) (Scout & the Gumboot Kids)
- [Nature Rubbing](#) (Daisy & the Gumboot Kids)

Please refer to [General Considerations for Educators](#) for more insights.



BOOK AVAILABLE

IN THIS EPISODE SCOUT GOES TO THE HILLS TO PAINT AND DIGS UP AN EXTRAORDINARY ROCK THAT TELLS A STORY, BUT HOW CAN A ROCK TELL A STORY? THE GUMBOOT KIDS LEARN ABOUT FOSSILS.

Vocabulary: fossil, ancient, compress, thousands, millions, valley, dinosaur, archaeologist, patience

POST VIEWING QUESTIONS/ PROMPTS

After viewing *The Case of The Story Rock* have students think about what they have viewed by responding to some, or all, of the following prompts. Children could respond in a variety of ways either individually or as a large group. For example, children could respond by making something with loose parts, sharing their ideas verbally with a friend, drawing a picture, recording a video on a tablet, or creating a brief written response.

- Did you solve the mystery before Scout? Which clue was the most useful for you to solve the nature mystery?
- Definition of a fossil: “Fossils are the remains or traces of plants and animals that lived long ago. They usually formed from the hard parts—such as shells or bones—of living things.
- How do fossils teach us about dinosaurs? What do you already know about dinosaurs? What are some names of different types of dinosaurs? What features do they have?
- What is a question you have about dinosaurs? Do you think a fossil could answer this question? Why?
- Do you think fossils could be found near where you live? Why or why not?
- Why does Scout call fossils story rocks?



LET'S GO OUTSIDE!

Fossil Hunter

In this activity children head outdoors to collect rocks to use for some imaginative play as well as creating fossils in a later activity.

Before beginning allow the children to move their bodies for awhile before settling down to focus on the activity. They could imagine they are dinosaurs roaming the area lumbering from foot to foot like a Brontosaurus, swooping through the air like a Pterodactyl, or running fast like a Dromiceiomimus (which could probably run at speeds of up to 60 kilometres per hour!).

After an appropriate amount of time bring the group together to sit or stand in a circle. Have the children tune into their senses. This will help them settle down and get ready to move mindfully through the outdoor space. Ask them to close their eyes (if they choose) and take some slow, deep breaths. Take your time with this activity to allow the children to fully, mindfully tune in to each sensation.

- Notice the temperature of the air as you breathe.
- Notice how the air smells.
- Now focus on the sounds around you. Notice the different sounds. Focus on sounds in the distance. Focus on sounds that are near. What do you hear?



- Notice how you feel in this environment. Is it hot or cold. What different textures do you feel (i.e. the grass they are sitting on)?

After a few moments of calm, quiet observation ask the children to slowly open their eyes and stand up. Some children may wish to stretch.

Now it is time to explore your surroundings and look for natural elements that could be used to make a fossil imprint (See Hands-On Learning section) or a nature rubbing (see Nature Craft section). Before beginning you may wish to discuss the process for making a fossil (see Hands-On Learning) so that children can make an informed choice about what might make a good fossil. Have the children continue to focus on their senses as they explore the environment. Try these provocations to guide their exploration:

- Can you find natural elements that might have been around when the dinosaurs roamed the earth? How do you know they are old?
- Notice different textures of the objects? Find something smooth. Something rough.

- Can you find something that tells a story?
- What types of natural elements are interesting to you? Why?

HANDS-ON LEARNING

Discovery Station

This is not a one-off activity, but rather a learning station that could be created, changed and re-created every few days or weeks for a period of time, perhaps a month or more if there is sustained interest from the children. Use a wash basin or table to create a landscape that might have supported dinosaurs. Some elements you may wish to include would be hills and valleys, a sandy or rocky area where children could dig for fossils, a small water area representing a lake. Be creative and let the children lead the creation of the landscape. Provide some basic items and also encourage the children to bring in items to add to the landscape such as dinosaurs, rocks, leaves, twigs, and shells. You may wish to leave the area as a creative play station for free time or provide a more structured learning opportunity with a new

provocation each week to guide the children's thinking. Provocations that represent the children's true wonders are best so each week you could brainstorm questions with the children to include at the station. For example, a provocation might be "how do dinosaurs live together?" This could lead to creative explorations around predator and prey, carnivores and herbivores and even family groupings versus solitary animals. Where possible leave a bin or display a variety of rich texts near the learning station for children to access when and if necessary. An open-ended learning station is also a great way to have children engage their parents in their learning as they transition into and out of the classroom at the beginning and end of the school day.

Make Your Own Fossil

In this activity children will get a chance to make their own fossil. As it takes thousands of years for fossils to be created it is important to explain to the children that the fossils they are creating are a fun craft that replicates the look and feel of a fossil, but this is not how they would form in nature. If possible you may wish to investigate if a local museum has fossil kits you could borrow to share with the children while doing this activity.

To begin the activity each child needs to select one or two items they wish to use to create the fossil. Ideally, these were collected on a nature walk during the Let's Go Outside activity, but children may wish to supplement with items from home as well. Harder items work best such as shells, rocks, pinecones, sticks or even plastic animals. Once everyone has a few items to use to make their fossils it is time to mix up the dough. Since the dough dries out quickly you will not be able to make the dough ahead of time, but as it is a relatively simple recipe it is something that the children could help make. If you can, you may wish to ask an older buddy class to team up with your children to help mix the dough and make the fossils.

The base recipe for creating the fossil "dough" is as follows, depending on the size and quantity

EXTENSIONS: FOSSIL RESEARCH



Fossils are an incredibly engaging topic for young children. While there is not always a local museum to visit on this topic, there are many websites you may wish to access from dinosaur-themed museums in Canada and abroad which can provide additional information, experiences and images to support the learning taking place in your classroom. Alternately, you may wish to try and arrange a Skype visit with a paleontologist or archaeologist who could talk to your students.

Royal Tyrell Museum

tyrellmuseum.com/index.htm

Philip J. Currie Dinosaur Museum

dinomuseum.ca

Museum Fur Naturkunde

museumfuernaturkunde.berlin/en

American Museum of Natural History

amnh.org/dinosaurs

of fossils you wish to make you will need to adjust the recipe.

Fossil Dough Recipe

- 1 cup flour
- 1 cup used coffee grounds
- ½ cup salt
- ½ cup sand
- Water, as needed for consistency

To make fossil dough mix together all ingredients except water. Then add a little bit of water at a time and stir until you get a thick dough like texture. This will take a little trial and error so you will likely want to make a batch to test before doing it with children.

Once the dough is ready roll or pat it out into individual pieces that are approximately 1 inch thick.

The children can then use their objects to make the indentations of a fossil. Do not leave the fossil items on the dough as it dries or they will stick, simply use them to make an impression and then leave the dough to dry. Depending on the thickness of the dough and how much water you add it could take anywhere from 1-3 days for fossils to fully dry so you will want to consider carefully where you make them as it is best not to move them before they are fully dried. A tip would be to use cookie trays lined with wax paper to make the fossils on and then the trays can be moved to secure-out-of-the-way location to dry. This is a good opportunity to talk about the need for “patience” and compare the time it takes to create fossil dough with the time it takes for a real fossil to form in nature. You could define patience to the children by stating: patience is the quality of waiting calmly without





complaining. An example of patience is someone standing peacefully in a very long line. Once dry the fossil could be used in a variety of ways. For example, you could incorporate them into a sensory play area, use them as a visual storytelling prop (see Visual Storytelling) or a table could be set up with all the fossils and the imprint items and children could be asked to try and match the fossil to the item that created it.

Visual Storytelling

In this activity children will use the fossil they create in the earlier activity, their developing understanding of dinosaurs and their imagination to create a visual story. A visual story would either be acted out with props or a static 3D display that the children could use to tell an oral story.

It is preferable to have the children work in groups of two or three to create their story as the conversations and creative process involved in creating a story with peers will be a richer learning experience than working individually and will also provide an excellent opportunity for formative assessment by the teacher. You may wish to support the children in creating their story about dinosaurs

“ If we measured success by longevity, then dinosaurs must rank as the number one success story in the history of land life.”

—ROBERT T. BAKKER, PALEONTOLOGIST

by brainstorming some possible story ideas as a class and also reviewing the basic parts of a story (beginning, middle, end). However, if possible try not to structure the stories too much ahead of time as the idea here is to have the children demonstrate their understanding about dinosaurs and fossils and to also flex their creativity muscles! A great way to help shape the stories, but not influence their content would be to create a simple criteria for the children to follow. For example, you might provide the following criteria. The story has a clear beginning, middle and end. The story includes 3 facts about fossils or dinosaurs. The story is realistic. Each child has their voice/ideas included in their group's story.

Once the ground work is set and the children have their props it is time to get creative! You may wish to circulate and provide formative feedback as the children are working. Depending on how much time you wish to allot to this activity it could

be a quick 30 minute activity or a longer multi-day activity. Either way, it is important children have an opportunity to share their stories once completed. You could have children share their stories with the class one at a time, film their stories using a tablet and upload to an ePortfolio or similar tool, have a buddy class come to watch the stories being performed, or do a gallery walk with many children sharing and performing their stories at one time.

MINDFUL MOMENT

Observations

To begin the activity remind the children that in *The Case of the Story Rock Scout* teaches us that every rock has a story. During this activity children will pause to mindfully observe a rock and consider the story it might tell.

Have the children sit in a circle and provide each child with a rock or have them bring their own from home. Explain that they are going to be mindfully observing their rock. You can change the script of the mindful observation to suit your educational context, but a sample script might go something like this.

“Close your eyes if you wish. I want you to carefully feel your rock. Is it rough or soft? Are there sharp edges or points? Does it have any indentations. Take time to move the rock around in your hands and become familiar with its texture and shape. Now open your eyes. Look closely at your rock and notice its colouring. What colours do you see? Do the colours make a pattern? Perhaps they form rings or maybe they appear more random. What do you think the colours represent? Take a final moment and look over your rock once more. Notice anything different you haven't focussed on yet. When you are ready put your rock down in front of you.”

Once the children have mindfully observed their rock have them turn to a partner and share something unique or interesting about their rock. Do they imagine there is a story about how their rock came to be? If so, they can share it with their partner.

FIELD NOTE INSPIRATION

- A sketch of the natural item the child used to create their fossil along with a short description of why they chose it
- A photo of the child's fossil or a draft idea for their fossil
- A list of new vocabulary words the child has learned





Gumboot Kids' Field Notes

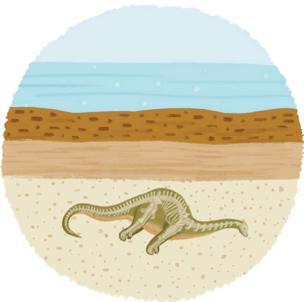
 **How Fossils are formed** curio.ca/en/video/the-case-of-the-story-rock-21428



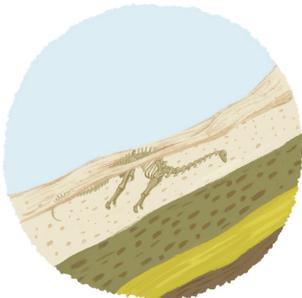
Dinosaur fossils are very rare, but they usually started in watery environments.



First, the dinosaur dies.



Next, the dinosaur is buried in mud and silt.



The dinosaur's soft tissues decompose leaving the hard parts, like bones, behind. Over time sediment builds up over the bones and hardens into rock.



As the encased bones decay, minerals seep in, replacing the bones in a process called "petrification." These petrified bones are the fossils that scientists use to learn about dinosaurs.



Gumboot Kids' Nature Craft

 **Nature Rubbing** curio.ca/en/video/nature-rubbing-21447

Scout and Daisy were so inspired by fossils, they made some nature impressions. Would you like to make nature impressions?

STEP 1

Head outside and collect some things with different textures and patterns like a leaf, shell and tree bark.



STEP 2



Gather your nature craft supplies, you'll need crayons, paper and some tape.

STEP 3

Place a sheet of paper on top of your textured object. Then use your crayons and gently rub back and forth across paper. It helps keep the paper in place if you tape the four corners down onto your craft table. Have fun! There's no right or wrong way to make a nature craft. Creating these works of art is a wonderful way to study the patterns in nature.



Dinosaurs

Music by Jessie Farrell

Fossils tell a story about
animals and plants
Fossils are imprints kept
on rocks and sand

No if we didn't have fossils
then we wouldn't really have a clue

No if we didn't have fossils
then we wouldn't really have a clue

We wouldn't know about dinosaurs
We wouldn't know about dinosaurs
We wouldn't know about dinosaurs
We wouldn't know about dinosaurs

But we learn from the past
so we know what to do today

Ya we learn from the past
so we know what to do today

(Repeat from the top)

We wouldn't know about dinosaurs
D-I-N-O-S-A-U-R
I said D-I-N-O-S-A-U-R
D-I-N-O-S-A-U-R

AVAILABLE ON:
SPARKLE AND SHINE



 gumbootkids.com/shop





Dinosaurs (Fossils)

As featured on *The Gumboot Kids*

Written by Jessie Farrell

Imagine Create Music Inc. ©

♩ = 155

Intro

4

Verse

5

G

Fo - ssils tell a sto - ry of a - ni - mals and plants

7

Fo - ssils are im - prints kept on rocks__ and sand No, if we

9

C G

did - n't have fo - ssils then we woul - dn't rea - lly have a clue__ No, if we

11

C D

did - n't have fo - ssils then we woul - dn't rea - lly have a clue__ We would - n't know a - bout

Chorus

13

C G D D^b

di - no - ssaur We would - n't know a - bout di - no - saurs We would - n't know a - bout

15

C G D D^b

di - no - saurs We would - n't know a - bout di - no - saurs But we learn



Dinosaurs (Fossils)

17 C G

from the past so we know what to do ___ to - day ___ Yeah, we learn

19 C G **D.S. al Coda**

from the past ___ so we know what to do ___ to - day

21 C G D D^b

di - no - ssaur We would-n't know a - bout di - no - ssaur We would-n't know a - bout

23 C G D D^b

Di - no - saurs We would-n't know a - bout di - no - saurs

25 C G D D^b

di - no - saurs We would-n't know a - bout di - no - saurs

27 C G D D^b

D - I - N - O - S - A - U - R I said, D - I - N - O - S - A - U - R Oh, Oh,

29 C G D D^b

D - I - N - O - S - A - U - R Ah, ah!

Outro

31 **4**

GUMBOOT KIDS TEAM

Created by Eric Hogan & Tara Hungerford

Mindfulness: Molly Stewart Lawlor, Ph.D
Zoologist: Michelle Tseng, Ph.D
Botanist: Loren Rieseberg, Ph.D
Teacher: Sarah Beirsto, MEd

Developed for Television with Cathy Moss
Head of Production Tracey Mack
Music By Jessie Farrell
Illustrations by Kate Jeong
Photography by Michelle Tseng, Annick Violet
Scout & Daisy Animation Deanna Patridge-David
Additional Animation by Affolter Brothers,
Lynn Dana Wilton

We are passionate about connecting children with nature. We also love how nature teaches and reminds us to be mindful.

We would love to hear from you! Let us know if you have any feedback. We hope you stay connected as we continue to add new curriculums to the Gumboot Kids collection.

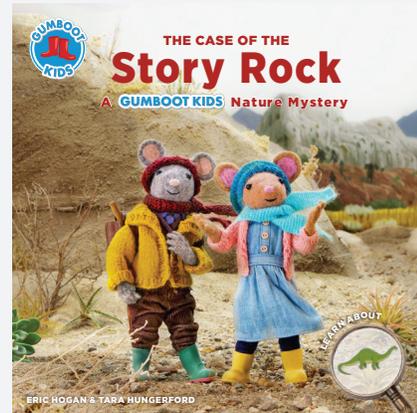
Follow us at [@gumbootkids](https://www.instagram.com/gumbootkids)
Share the joy and wonder [#gumbootkids](https://www.facebook.com/gumbootkids)



[gumbootkids.com](https://www.gumbootkids.com)



Additional Resources



The Case of The Story Rock

By Eric Hogan &
Tara Hungerford



Sparkle and Shine

By Jessie Farrell



VIEW NOW!



FOR MORE INSPIRATION ON FOSSILS:

Visit our Pinterest board at pinterest.ca/gumbootkids/learn-about-fossils