

Fundy Geological Museum: Fossil Trackways

Parrsboro, Nova Scotia is the home to some of the smallest known dinosaur footprints. They are likely from a theropod dinosaur. Theropod dinosaurs include *T. rex* and *Velociraptor*. These footprints may have belonged to a juvenile *Coelophysis*, a theropod dinosaur that roamed Nova Scotia 200 million years ago. In this activity you will use the above image along with a trackway you make yourself, to learn about the relationship between trackways and the size of the dinosaurs that made them.

Activity 1- How big were the smallest dinosaurs?

Scientists have extrapolated formulas to help estimate the size of dinosaurs based on the size of their footprints. Using the picture below, determine how big the dinosaurs were that left behind fossil footprints in Nova Scotia.

- **Step 1** Multiply the length of the footprint by 4 to get the hip height.
- **Step 2** Multiply the length of the footprint by 10 to get the head-to-tail length



Image: Smallest known dinosaur footprints, from near Parrsboro, Nova Scotia.

Footprint length

Multiplied times 4

Equals the Hip Height

	X 4	
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Footprint length

Multiplied times 10

Equals the Dinosaur Length

	X 10	
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Activity 2 - How big is the dinosaur from your trackway?

- Use attached Dinosaur Footprints of NOVA SCOTIA worksheet starting on page 5 to make a trackway.

Footprint length

Multiplied times 4

Equals the Hip Height

	X 4	
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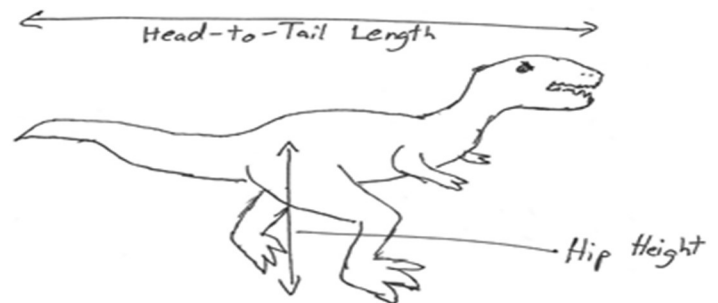
Footprint length

Multiplied times 10

Equals the Dinosaur Length

	X 10	
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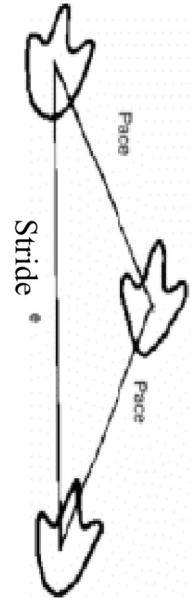
Using the information above, was the dinosaur from the trackway you made smaller, bigger, or about the same size as you?



Activity 3- Running or walking?

Scientists have extrapolated formulas to help estimate whether or not a dinosaur was walking, trotting, or running based on a ratio of stride lengths to hip heights.

- **Step 1** Determine the length of a dinosaur footprint. Measure the length from the back of the heel to the tip of its center claw.
- **Step 2** Multiply the length of the footprint by 4 to get the hip height.
- **Step 3** Determine the stride length, distance between one “left footprint” and the next “left footprint”.
- **Step 4** Calculate ratio to determine relative rate of dinosaur movement, divide the stride length by the hip height. *Keep in mind: that when you are running, your stride is longer.*
 - o If the ratio is less than 2.0, the dinosaur was walking
 - o If the ratio is between 2.0 and 2.9, the dinosaur was trotting
 - o If the ratio is greater than 2.9, the dinosaur was running



Was the smallest dinosaur running or walking?

Footprint length	Multiplied times 4	Equals the Hip Height
	X 4	

Stride length	Hip Height	Equals Ratio
	÷	

Was the dinosaur from Nova Scotia walking, jogging, or running?

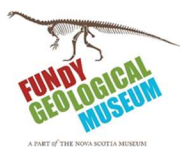
Was the dinosaur from the trackway you made running?

Footprint length	Multiplied times 4	Equals the Hip Height
	X 4	

Stride length		Hip Height	Equals Ratio
	÷		

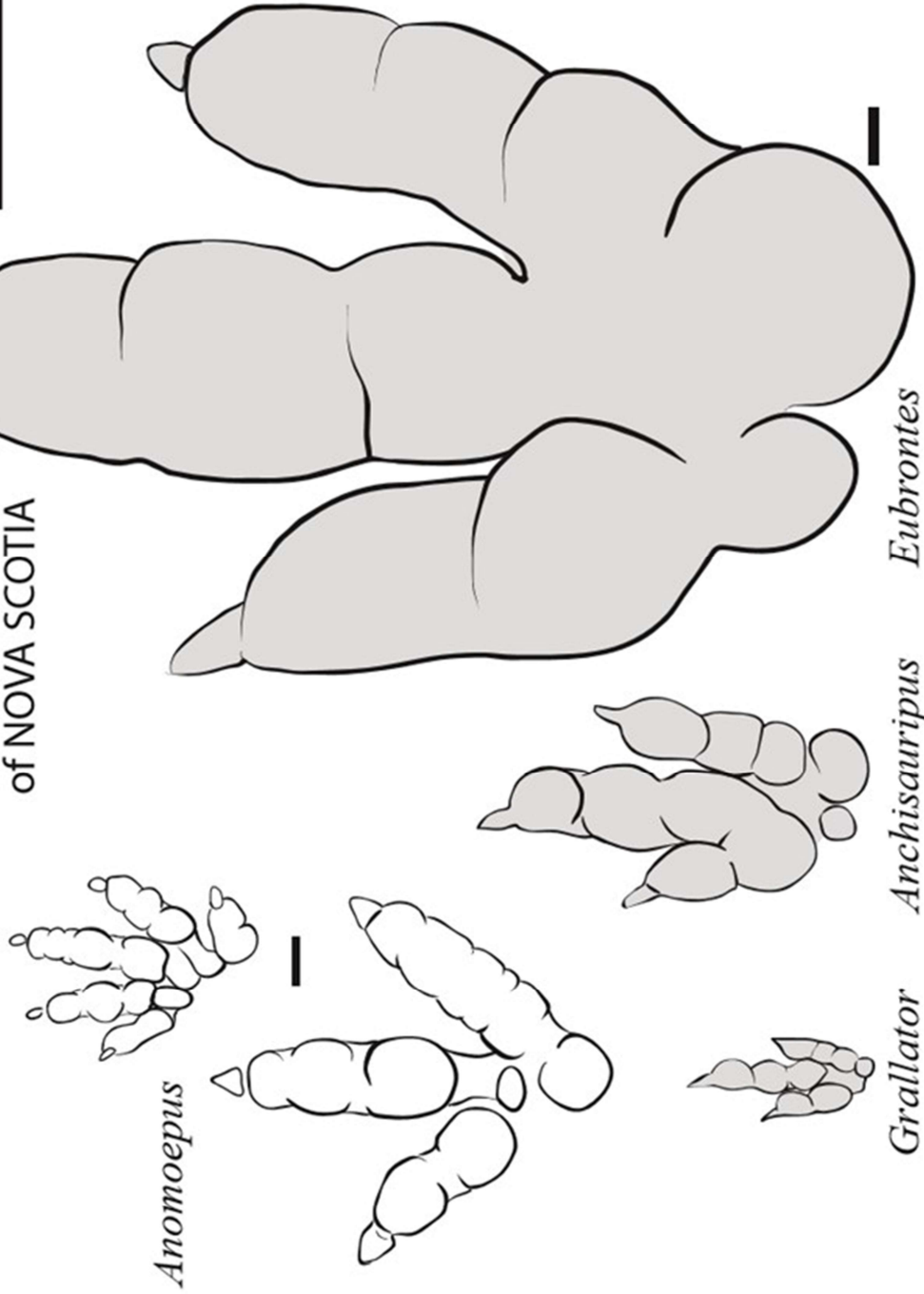
Was your dinosaur from the trackway you made walking, jogging, or running?

Part of activity modified from Beneski Museum of Natural History activity, Dinosaur Footprints.
Visit amherst.edu/museums/naturalhistory for more activities.



Dinosaur Footprints of NOVA SCOTIA

NOVA SCOTIA
MUSEUM
The Family of Provincial Museums



Anomoepus

Grallator

Anchisauripus

Eubrontes

Figures redrawn from Olsen and Rainforth 2003.

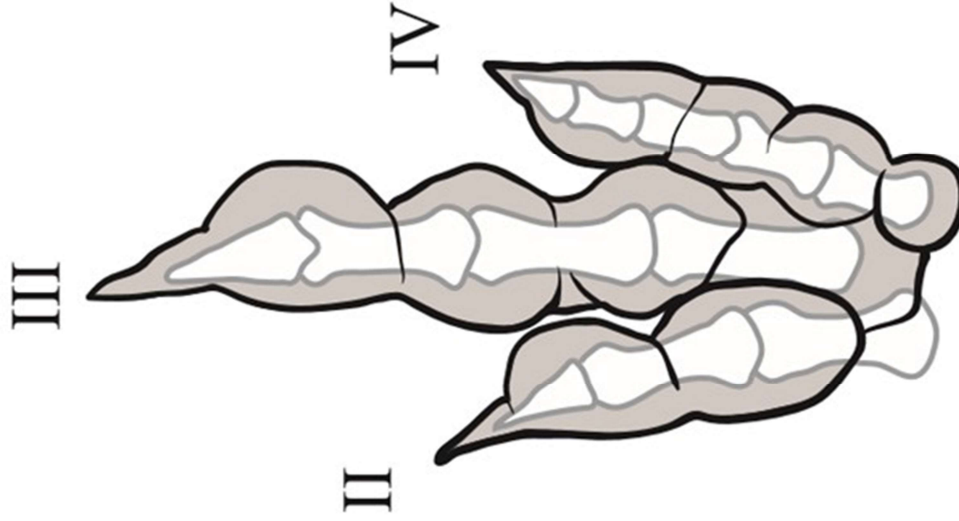
Grallator

A three-toed dinosaur footprint found in Jurassic aged rocks around the Bay of Fundy, Nova Scotia.

The three toes represent the second (II), third (III) and fourth (IV) digits of the back foot.

From the shape of the pads of the footprint, palaeontologists can reconstruct the lengths of the bones of the foot, and match the footprints to skeletons of known dinosaurs.

This is a footprint made by a meat eating theropod dinosaur, such as *Dilophosaurus*.



Right foot from above, or
Left foot from below

Dinosaur Footprints

of NOVA SCOTIA

Print this page (8.5 x 11)

Carefully cut out the *Grallator* footprint with scissors. Your parents may be able to help you.

Position the cut out footprint (grey side up) on a hard surface. This represents the footprint of the dinosaur's right foot.

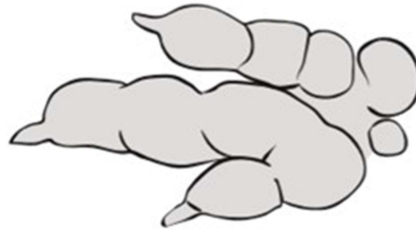
Place a blank page over the footprint, with the footprint under the lower right corner of the page. While carefully holding the upper page in place, create a rubbing with a crayon or soft pencil.

When done the first rubbing, lift the page and turn the cut out footprint over (grey side down). This now represents the footprint of the dinosaur's left foot.

Position rubbing page over the cut out again, with the cut out in front and to the left of the first rubbing.

Create a second rubbing of the left footprint.

Repeat again and make a full trackway.



Grallator
(right foot)