Palaeo Presentation Teachers' Guide

Centres

Palaeo Art

The main purpose of this activity is to have the students combine the scientific (what do we know about extinct creatures in Alberta?) with the creative. While we know a lot about dinosaurs, there is also a lot that we don't know, and hence need to extrapolate from other sources of information. Creating a piece of palaeoart is a marriage of the scientific and the creative.

Palaeo Puzzles

The main purpose of this activity is to have the students experience the frustration of not having all of the pieces of a fossil and having to figure out what an animal looked like from incomplete evidence!

Trackways

The main purpose for this centre is to have the students think about dinosaurs and other extinct creatures as living, breathing animals with a wide variety of behaviours, not just as fossils!

Sillhouettes for the identification guide (as well as the turtle in Trackway F) are from Phylopic (https://phylopic.org):

- Edmontonia: https://www.phylopic.org/images/af64af4c-5a03-4218-b9fe-440253fd51ae/edmontonia-rugosidens
- Edmontosaurus: https://www.phylopic.org/images/77d954c4-88d2-4a38-818d-eb5fd7a88846/edmontosaurus-regalis
- Albertosaurus: https://www.phylopic.org/images/02e30c15-3233-449b-a623-85314f79e870/albertosaurus-sarcophagus
- Turtle: https://www.phylopic.org/images/b6ecdbb6-1cf1-4361-89b9-8da0aacef3ea/chelydra-serpentina

The actual trackways are based off of a variety of sources:

- Hadrosaur back feet are from Powers, M. J., Rhodes, M. M., Dyer, A. D., Mendonca, S. E., Wilkinson, R., Hudgins, M. N., Pruden, M. J., Currie, P. J., & Funston, G. F. (2024). The first hadrosaurid trackway from the horseshoe canyon formation (campanian/maastrichtian) of Alberta, Canada. *Ichnos*, *0*(0), 1–28. https://doi.org/10.1080/10420940.2024.2307069
  - Describes a new trackway from near Drumheller
- Hadrosaur front tracks, along with the ankylosaur and theropod (tyrannosaur) tracks, are from Martin, A. (2011, January 9). The Great Cretaceous Walk: Who Made the Three-Toed Dinosaur Track? *The Great Cretaceous Walk*. https://greatcretaceouswalk.blogspot.com/2011/01/who-made-three-toed-dinosaur-track.html. This blog post has a great discussion about dinosaur tracks in general.

- Baby tyrannosaur tracks are from Henderson, D. M., Borkovic, B., Sanchez, J., & Kowalchuk, A. L. (2022). A busy time at the beach: Multiple examples of gregarious dinosaur behaviour inferred from a set of trackways from the Late Cretaceous of Alberta, Canada. *Canadian Journal of Earth Sciences*, *59*(9), 608–622. https://doi.org/10.1139/cjes-2021-0069
  - This describes a block of stone containing multiple tracks from near the St. Mary reservoir

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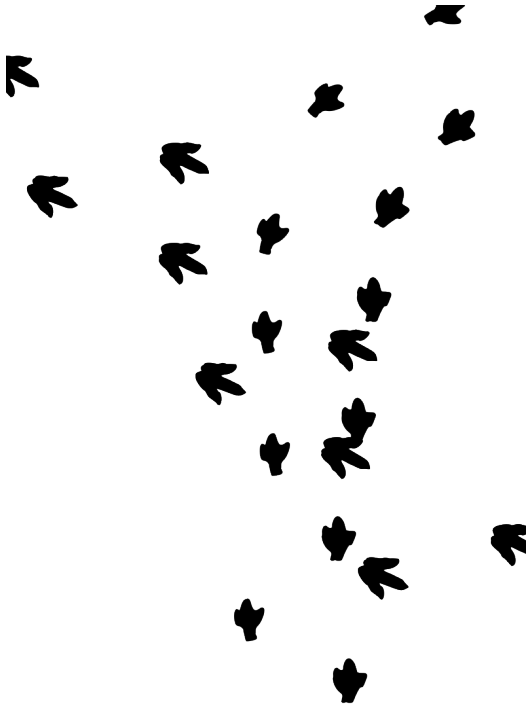
Trackway A



This trackway show a hadrosaur heading north and a tyrannosaur heading south-east. There is no evidence of interaction, and it is unclear which one came after the other. The front tracks of the hadrosaur have probably been weathered away.

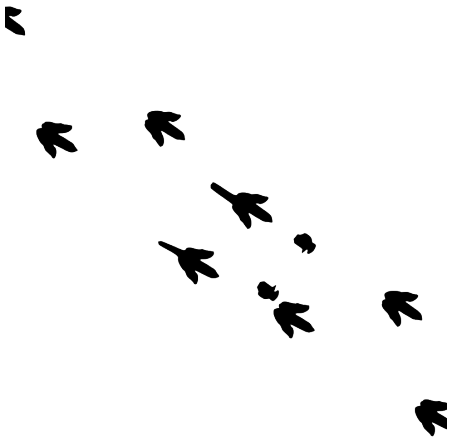
Trackway B

This trackway shows evidence of interaction! The hadrosaur (heading north-west) is initially moving slowly (tracks are close together). Then something happens, and it quickly turns (splotch in the middle) and moves more quickly (trackways are more spaced out) to the north east. Probably it is because of the tyrannosaur (tracks heading north-east)!

Trackway C

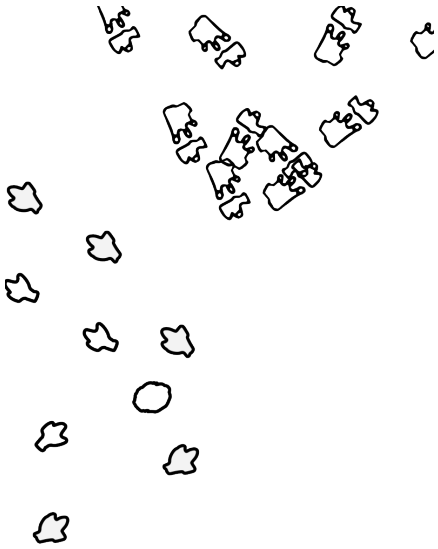
This trackway appears to show a family group of tyrannosaurs. The parent is moving in a straight line north-west, while the two juveniles are moving in the same direction but with more variation. The smaller one is moving more directly, while the larger one is doing more exploring - perhaps they are the more bold one. The juvenile tracks are based on a real trackway from the St. Mary formation (described in Henderson, D. M., Borkovic, B., Sanchez, J., & Kowalchuk, A. L. (2022). A busy time at the beach: Multiple examples of gregarious dinosaur behaviour inferred from a set of trackways from the Late Cretaceous of Alberta, Canada. *Canadian Journal of Earth Sciences*, *59*(9), 608–622. https://doi.org/10.1139/cjes-2021-0069). The trackway as a whole was inspired by the first scene in the Apple TV series “Prehistoric Planet” S01E01:

Trackway D



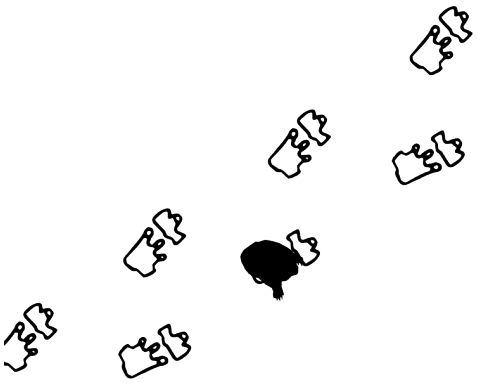
This one is a bit subtle! It shows a tyrannosaur moving, then settling down on its haunches, then getting up and continuing on its way. The settling down happens in the middle - the extensions on the back of the tracks are the metatarsals (lower part of the leg) and the little blobs ahead of those tracks are the forelimbs as it rests. This trackway is based on a very similar trackway described in Milner, A. R. C., Harris, J. D., Lockley, M. G., Kirkland, J. I., & Matthews, N. A. (2009). Bird-Like Anatomy, Posture, and Behavior Revealed by an Early Jurassic Theropod Dinosaur Resting Trace. *PLOS ONE*, *4*(3), e4591. https://doi.org/10.1371/journal.pone.0004591.

Trackway E



This trackway may show some evidence of a watering hole or other resource. There are two herbivorous animal trackways here: a hadrosaur (lower) and a nodosaur (upper). They both approach something, stop for a bit, then head away. It is unclear what they are both approaching, but a good guess would be a watering hole, particularly succulent patch of greenery, or other such resource.

Trackway F



This trackway shows a very tragic situation - a turtle being crushed by a nodosaur! This trackway is based on Püntener, C., Billon-Bruyat, J.-P., Marty, D., & Paratte, G. (2019). Under the feet of sauropods: A trampled coastal marine turtle from the Late Jurassic of Switzerland? *Swiss Journal of Geosciences*, *112*(2), Article 2. https://doi.org/10.1007/s00015-019-00347-0, which describes a turtle which was crushed under a sauropod (long-necked dinosaur).

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