

Using Natural History Collections to Engage Young Learners in Science Practices

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Incorporating K-12 Outreach Into Digitized Collections
Programs Workshop, December 5-6, 2016

Q?rius Collections Zone



Q?rius Collections Zone



Q?rius Collections-Based Learning

Learning Goals –

Use collections to:

- ❖ Inspire learners to explore the natural world
- ❖ Guide learners to explore the natural world as scientists do – through close observation, generating questions, drawing connections, constructing explanations, incorporating new information, refining ideas, etc.
- ❖ Invite learners to use these practices to investigate natural history concepts, particularly form and function, causal relationships, process and change over time

Our Target Audience

- ❖ Tweens and teens and the people who care for them (families, teachers, etc.)

Collections Challenge School Program



Train Your Expert Eye Activity



Train Your Expert Eye Activity



What Happened Here?

Digital Module

Use the field guide to determine what animals these fossils are from.



NAME OF ANIMAL |

	TEETH	LIMBS	VERTEBRAE	SHELLS	DERMAL/SCALES	OTHER	
Vertebrae	1 mm	Front	Rear	Left side	Top	Animal	Description
	I						Bowfin: carnivorous fish living in freshwater and in somewhat salty waters
	I						Gar: carnivorous fish living in freshwater and in somewhat salty waters
	I						Teleost: fish inhabiting fresh and salty waters
	I						Salamander: carnivorous amphibian (spends different parts of its life in freshwater and on land)
	I						Lizard: carnivorous reptile
	I						Snake: carnivorous reptile
	I						Champsosaur: semi-aquatic, carnivorous reptile; body is crocodile-like, but lacks scutes; all champsosaurs are extinct
I						Crocodilian: semi-aquatic, carnivorous reptile; species include <i>Brachychampsia</i> and <i>Borealosuchus</i>	

It's a Date – Digital Module

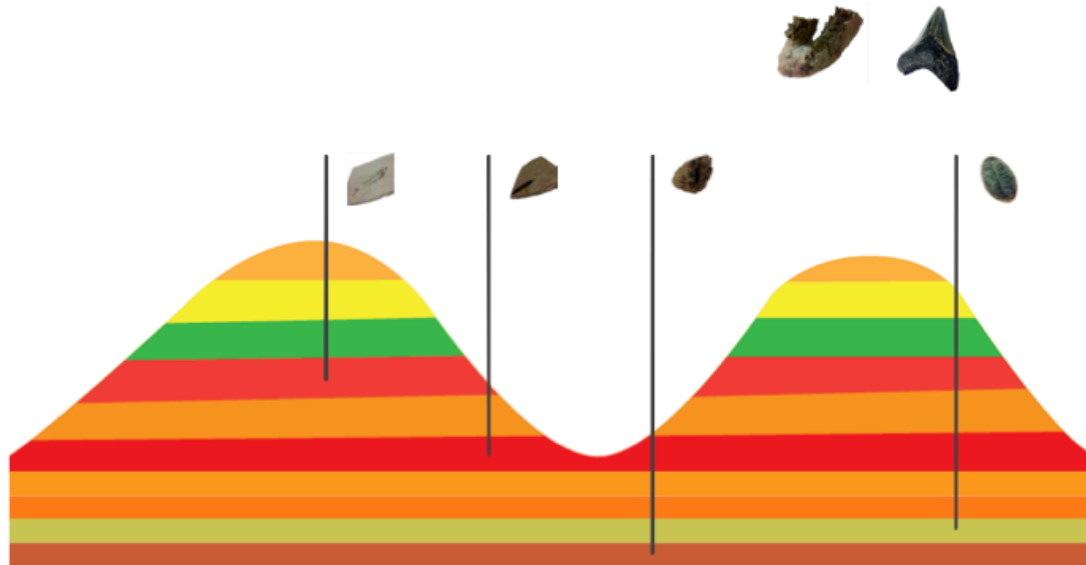
Arrange fossils from oldest to youngest.

Drag the fossils onto the timeline from oldest to youngest.

Use what you have learned to put these fossils in order.

OLDEST

YOUNGEST



Trait Tracker – Digital Module



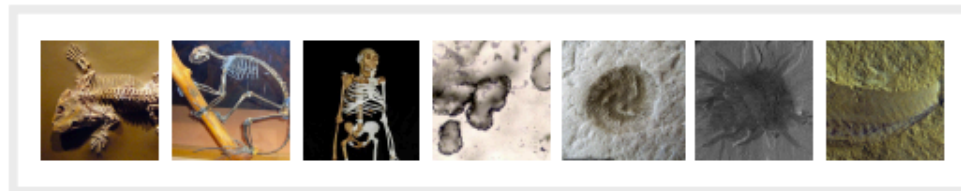
DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK

Write explanation here...

What fossils show evidence for these traits?

The study of fossils is one of the ways scientists can track evolution through time.

Find the fossil that shows the earliest evidence for each of the traits and drag it to that space.



Trait Tracker – Digital Module

Scientist check-in

✓ = SCIENTIST ○ = YOU

How did you do? Do you want to try again? YES NO

If you are confused, hover over answers for explanations.

	CELLULAR	MULTI-CELLULAR	BILATERAL SYMMETRY	VERTEBRATE	TETRAPOD	OPPOSABLE THUMBS	BIPEDALISM
Bacteria <i>Escherichia coli</i> 	✓	○					
Ring-tailed lemur <i>Lemur catta</i> 	✓	✓	✓	✓	✓	✓	
Rhino beetle <i>Oryctes nasicornis</i> 	✓	✓	✓	○			
Swordfish <i>Xiphias gladius</i> 	✓	✓	✓	✓	○		
Moon jellyfish <i>Aurelia aurita</i> 	✓	✓	○				
Alligator <i>Alligator mississippiensis</i> 	✓	✓	✓	✓	✓		○

WHAT WE'RE LEARNING

- ❖ Natural history collections objects on their own are highly motivating; they can fill a need to bring more science practices, especially inquiry, into science education
- ❖ Balancing free choice, inquiry-based exploration with concrete learning outcomes is a challenge
- ❖ Scaffolding and context are critical
- ❖ Budget for content development: Writing, photography, illustrations, animations
- ❖ In person experience does not match digital experience; there are trade-offs for each
- ❖ Test frequently
- ❖ Build strong relationships with teachers
- ❖ Don't try to do too much. Keep the learning goals achievable by target audience.

Deep Time Activities

Design Decisions

Roles of Collections for Learning

Tool to ignite interest

Proxy to illustrate a concept

Mnemonic for constructing knowledge

Source of information to explore form and function

Vessel for data used to investigate questions about cause and effect

Curation (choice)

Highly curated, restricted choice

Lightly curated, free choice

Format of the Objects

Touchable original or cast

Boxed original or cast

Touchable model

Visible behind glass

Digital - single view

Digital - multiple views, 3D

Digital - no image, just data

Learning Context

Formal

Informal