American Museum of Natural History

Museum IN A BOX

DINOSAURS

User's Guide

Box Set 2

Museum IN A BOX

Contents

RESOURCES
All lesson plans, slideshows, worksheets, and videos are available online.

www.amnh.org/museum-in-a-box

Welcome to Museum in a Box

Museum in a Box brings real dinosaur fossils—paired with hands-on, inquiry-based activities—directly into your classroom. Your students will conduct the same kinds of investigations carried out by paleontologists at the American Museum of Natural History.

Museum in a Box was developed by educators with decades of experience using the Museum's vast collections as primary teaching tools to inspire learners of all ages and backgrounds. The learning experience is further enriched by a carefully curated selection of scientific specimens, and exhibition elements that bring the objects to life, developed in partnership with scientists who are passionate about sharing their discoveries.

Museum in a Box Prototyping and Testing

Museum in a Box is currently in a prototype phase, and your feedback is an important part of its development. You may be contacted to participate in a brief interview, online focus group, or in-school observation. We are interested in how the box works operationally, how the activities function in the classroom, how useful the preparation materials are, and your overall experience. Your feedback will directly shape the final version of Museum in a Box, and we are grateful for your partnership.

Questions

If you have questions, please reach out to us at museuminabox@amnh.org.

Museum IN A BOX

SECTION 1

Quick Start

ONLINE RESOURCES
All lesson plans, slideshows, worksheets, and videos are available online.

www.amnh.org/museum-in-a-box

Online Resource Guide Contents:

- Teacher Intro Videos
- Lesson Plans
- Slide Shows
- Extension Materials
- Museum in Box User's Guide

Receiving Museum in a Box

- You will receive 2 shipping crates
- Crates are 34" x 20" x 15"
- Crates weigh approximately 70lbs each
- 3 ways to move your crates:
  - Shipping crates contain wheels that can be attached, see this link for details
  - Use an available dolly
  - Two people can carry each crate

Museum in a Box Contents

- Crate 1: Backdrop, tablecloth, How do we Know Birds are Dinosaurs?
- Crate 2: What is a Fossil?, Who Walked Here?, Mystery Fossil

Activity Boxes

- Each activity box = 1 class period activity
- All materials included (except activity handouts, writing and drawing utensils)
- Links to online resources for each activity

How to Use Museum in a Box

1. Decide on how your BOCES/school will set up Museum in a Box: 1 or multiple locations
2. Put museum display up depending on use preference
3. Select activity box
4. Download activity lesson plan and print handouts
5. Teach (one class period)
6. Repeat in any order

SECTION 2

Operations

Receiving Museum in a Box

Crate Delivery

- Inspect crates on arrival; note any visible damage to the outside before opening

Moving the Crates

- Attach the wheels stored inside the crate to the base to move (see diagram in box or watch demo)
- Use a dolly or hand truck OR
- Carry with two people by its handles

Crate Contents

Shipping Crate 1: Backdrop, tablecloth, How do we Know Birds are Dinosaurs? Activity Box
Shipping Crate 2: What is a Fossil? Who Walked Here? Mystery Fossil Activity Boxes

Unpacking

Unpack the crates in a large, clear space. Lay out items on a table so you can check them against the inventory list in Section 3.

1. Open Crate 1 first. Remove the backdrop and tablecloth (stored on top) if using
2. Remove Activity Boxes
3. Open each activity box and use its internal foam packing guide to verify all objects are present

Storage

- Store crates and unpacked boxes in a secure location until ready to set up
- Keep activity boxes closed and objects inside until setup
- Store in dry, secure and pest-free location that is not exposed to with extreme temperature or humidity

Repacking & Return

Repacking Activity Boxes

- Open the activity box and refer to the packing guide on the box exterior
- Place each object in its labeled foam cutout, every object has a dedicated space
- If an object doesn't seem to fit check if another object is in the wrong spot
- Confirm that all objects have been replaced by checking against the object list in the activity box, and looking for any unfilled spaces in foam packing
- Once all objects are in place, close and latch the box

Repacking Crates

- Ensure the correct inner boxes are put into the right crate:
  - Shipping Crate 1: Backdrop, tablecloth, How do we Know Birds are Dinosaurs?
  - Shipping Crate 2: What is a Fossil? Who Walked Here? Mystery Fossil
- Follow any packing instructions written on inner boxes
- If attached, detach wheels and store inside the crate

Scheduling Pickup

- Contact your BOCES coordinator to arrange pickup

Activity Box Inventories

ACTIVITY BOX 1 INVENTORY
What is a Fossil?

DISPLAY FOSSIL: *T. rex* Tooth Cast

1

with 2 labels and 2 stands (**Museum Display**)

2

OBJECT BOX 1: Ammonites

3

Left: 80 mya
Middle: 195 mya
Right: 180 mya

OBJECT BOX 2: Dino Bone Fossils

4

Hypacrosaurus jaw, 68 mya, *Edmontosaurus humerus, 70 mya (**Museum Display**), Hadrosaurus finger bone, 70 mya

OBJECT BOX 3: Petrified Wood

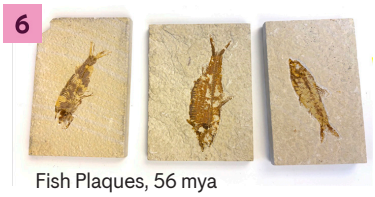
5

Left: 50 mya
Middle: 30 mya
Right: 225 mya

mya = million years ago

OBJECT BOX 4: Fossil Fish

6



Fish Plaques, 56 mya (**Museum Display**)

OBJECT BOX 5: Trace Fossils

7

Dinosaur Track Cast (Theropod) = Quantity 3

Fish Coprolites, 70 mya (**Museum Display**)

OBJECT BOX 6: Fossil Teeth & Plants

Shark Teeth, 25 - 2.6 mya

Cave Bear Teeth, 24,000 ya

8

Leaf Plaques, 56 mya

OBJECT BOX 7: Marine Fossils

9

Brachiopod Fossil (shell) 385 mya

Crinoid Fossil (coral) 385 mya

Trilobites 521 mya

mya = million years ago

Top Layer

Lower Layer

*Object Boxes labeled for inventory

Museum IN A BOX

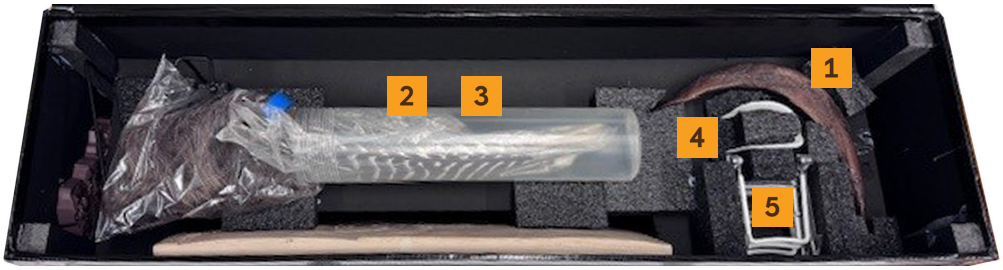
ACTIVITY BOX 2 INVENTORY
How Do We Know Birds Are Dinosaurs?

1. T. rex Furcula Cast
2. Turkey Feathers, Q=6
3. Ostrich Feathers, Q=6
4. Goose Furcula 3D Print
5. Label and Display Stands for Museum Display
6. Archaeopteryx Plaque Cast
7. Pigeon Skeleton
8. Velicoraptor Skull Cast
9. Velicoraptor Foot Cast
10. Golden Eagle Skull Cast
11. T. Rex Scale Model
12. Bald Eagle Foot Cast
13. Labels and Images for Museum Display
14. Laminated Sheets for Activities

Museum IN A BOX

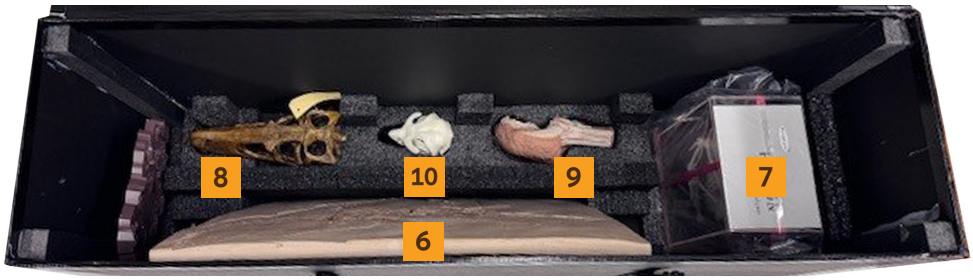
ACTIVITY BOX 2 INVENTORY
How Do We Know Birds Are Dinosaurs?

Top Layer



Middle Layer

Lower Layer

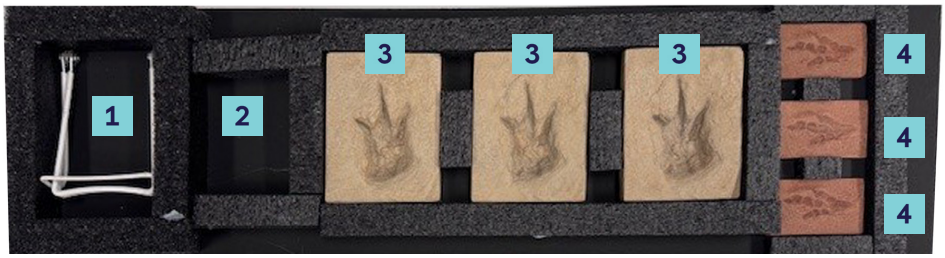


Museum IN A BOX

Museum IN A BOX

ACTIVITY BOX 3 INVENTORY
Who Walked Here?

Layer 1 - top



1. Stand for Museum Display Trackway
2. Label for Museum Display (reference to right)
3. Theropod Dinosaur Cast Track 6, quantity=3
4. Theropod Dinosaur Cast Track 2, quantity=3

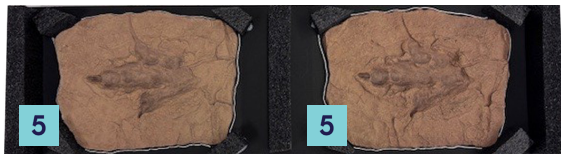
Layer 2

8. Theropod Dinosaur Cast Track 4, quantity=2 of 3

Layer 3

6. Theropod Dinosaur Cast Track 5 , quantity=1 of 3
7. Orinthopod Dinosaur Cast Track 3, quantity=3

Layer 4



5. Theropod Dinosaur Cast Track 5, quantity=2 of 3

Layer 5 - lowest

9. Orinthopod Dinosaur Trackway cast - (**Museum Display**)

Trackway Activity 10

3 SETS total (54 pcs)

breakdown per set (18):
Sauropod (blue) = 8 pcs
Ornithopod (green) 6 pcs
Theropod (orange) 4 pcs

10. 3 Sets of 18 Dinosaur Footprints, plus **trackway** and **footprint key** laminated handouts.

Museum IN A BOX

ACTIVITY BOX 4 INVENTORY
Mystery Fossil

1. Goat Horn
2. Sperm Whale Tooth
3. Steenbok Horn
4. Giant Anteater Claw
5. Alligator Tooth
6. Grizzly Bear Tooth
7. Harpy Eagle Talon
8. Porcupine Quills
9. Iguanadon Thumb Spike (Alt Mystery Fossil)
10. Display Stand for Museum Display
11. Label for Museum Display (pictured below)
12. Stegosaur Spike (Museum Display, Mystery Fossil)
13. Hippopotamus Incisor
14. Triceratops Horn Spike (Alt Mystery Fossil)

Top Layer

11

What am I?

Lower Layer

SECTION 3

Object Care and Inventory

Object Care

The objects in Museum in a Box are a combination of fossil and natural materials, and casts. Please encourage your students to handle all the objects in Museum in a Box with care and while seated, the same way a scientist would as they studied it since they can all have delicate parts.

If Something Breaks or is Lost

- Document the damage with a photo if possible
- Keep all broken pieces — do not discard
- Note the item name and which box it belongs to
- Contact us at museuminabox@amnh.org

Object Types

Museum in a Box contains a combination of real fossils and high-quality casts. Please handle all objects with care and ask students to stay seated while handling the objects, regardless of type.

TYPE	WHAT IT IS
Fossil	Actual prehistoric material that is over 10,000 years old.
Cast	High-quality replica made from molds of real specimens.
Model	Artistic/educational reconstruction (e.g., T. rex skeleton model).

Taking Inventory

Object inventory lists for each box follow and appear on the Activity Boxes themselves. Before beginning any activity, please check all components and objects against the inventory checklist, and when you complete an activity, please repeat the inventory checklist to ensure a full set of objects for the next user.

Museum IN A BOX

Box #	Item Name	Image	Object Information	Description
Box 1: What Is a Fossil?				
Set 1: Plants				
1	Plant Plaque		Left: *Cedrelospermum nervosum* Middle: *Lygodium kaulfussii* Right: *Persea coriacea* 56 mya Green River Formation, Utah	Fossil leaves from the Green River Formation show that Earth's climate was consistently warmer 56 million years ago, allowing a wider variety of plants and animals to thrive.
1	Petrified Wood		Left: Blue Forest Petrified Wood Branch, 50 mya, Eden, Wyoming Middle: Metasequoia, sp, 30 mya, South Ridge, Oregon Right: Conifer Petrified Wood Slice, 225 mya, Madagascar	Trees can become fossils too. Petrified wood forms when a plant is buried in sediment and its organic material is slowly replaced by minerals over millions of years, preserving the tree's rings and other features.
Set 2: Ammonites, Trilobites & Crinoids				
1	Trilobite		*Elrathia kingi* 521 mya Antelope Springs, Utah	Trilobites were among the most successful creatures on Earth, surviving for nearly 300 million years before going extinct in a mass extinction event 250 million years ago — before the first dinosaur evolved.
1	Ammonite		Left: *Hoploscaphities (Jeletzkytes) crassus*, 80 mya, Garfield County, MT Middle: *Promicroceras planicosta*, 195 mya, Lyme Regis, England Right: *Dactylioceras commune*, 180 mya, Whitby, England	Ammonites were highly successful cephalopods — most closely related to squid, octopus, and cuttlefish — that lived and evolved for 350 million years until they went extinct around the end of the age of dinosaurs.
1	Devonian Fossils		Top row: Brachiopod Bottom row: Horn coral 385 mya New York State	These Devonian brachiopods and corals are frequently found in New York State and the Midwest, both of which were once covered by shallow seas.
Set 3: Animal				
1	Dinosaur Bone (variety)		Edmontosaurus Humerus 70 mya Dinosaur, Wyoming	Dinosaurs lived from approximately 230 to 66 million years ago. Scientists can learn a great deal from even a small piece of bone, including how the animal grew and its overall size.
1	Dinosaur Bone (variety)		Hadrosaurus Finger Bone 70 mya Montana	Dinosaurs lived from approximately 230 to 66 million years ago. Scientists can learn a great deal from even a small piece of bone, including how the animal grew and its overall size.
1	Dinosaur Bone (variety)		Hypacrosaurus Jaw Section 68 mya Montana	Dinosaurs lived from approximately 230 to 66 million years ago. Scientists can learn a great deal from even a small piece of bone, including how the animal grew and its overall size.
1	Fish Plaque		*Knightia eocaena* 48 mya Kemmerer, Wyoming	These fish come from the Green River Formation, one of the most important Eocene fossil sites. The variety of animal and plant fossils found there helps scientists reconstruct the climate and environment of that period.

Museum IN A BOX

Box #	Item Name	Image	Object Information	Description
Set 4: Teeth				
1	Shark Teeth (large)		Left: Broad Tooth "Mako", 2.6 to 15 mya, South Carolina Middle: Serrated Angustidens, 30 mya, South Carolina Right: Juvenile Megalodon Tooth, 25 mya, South Carolina	Fossilized shark teeth are among the most commonly found fossils because they are extremely hard and sharks shed thousands of teeth over a lifetime. Sharks have existed for over 400 million years, surviving five mass extinction events.
1	Cave Bear Tooth		*Ursus spelaeus* 24,000 ya Romania	Despite their fearsome appearance, cave bears were primarily plant-eaters. Their teeth and jaw structure were suited to processing roots, grasses, and other fibrous material — setting them apart from most modern bears.
Set 5: Other				
1	Fish Coprolite		Fish Coprolite 70 mya New Jersey	It is very difficult to identify which animal produced a coprolite, otherwise known as fossilzed poop. These coproloites were produced by fish. We know this because fish coprolites have spirals on the from how they were excreted.
1	Theropod Dinosaur Track (cast)		Theropod Dinosaur Track 195 mya Moab, Utah	This trackway was created by a small meat-eating dinosaur. From its size, it is possible that it was a hatchling.
For Teacher Use				
1	T. rex Tooth (cast)		*Tyrannosaurus rex* cast tooth	This cast was made from a single, rare original T. rex tooth. Casts allow many people to study and handle objects that are too rare or fragile to share otherwise.
Activity Box 2: How do we know Birds are Dinosaurs?				
Station 1				
2	Pigeon Skeleton (articulated)		*Columba livia* skeleton	Pigeons are highly adaptable birds found on every continent except Antarctica, thriving in environments from rural farmland to dense urban centers.
2	T. rex Scale Model		*Tyrannosaurus rex* 1:32 scale model	T. rex was one of the largest land predators ever. It lived 66 million years ago, weighed up to 16,000 pounds, and the largest individuals stood nearly 13 feet tall at the hip and 43 feet long.
Station 2				
2	T. rex Furcula (cast)		*Tyrannosaurus rex* furcula cast 68–66 mya Fort Peck Dam, Montana	T. rex had a small wishbone (furcula) in its chest that helped stabilize its arms. All modern birds also have a furcula, inherited from dinosaur relatives in the same family as T. rex, though T. rex itself is not a direct ancestor of birds.
2	Modern Bird Furcula — Goose (3D print)		*Branta canadensis* furcula cast	The furcula, or wishbone, serves as an attachment site for flight muscles in modern birds. The furcula supported muscles for grasping in non-avian dinosaurs.
Station 3				
2	Velociraptor Claw (foot cast)		*Velociraptor mongoliensis* foot cast 80 mya Mongolia and China	Velociraptor means "speedy thief." This carnivorous dinosaur reached about 6 feet in length and 40 pounds in weight, and had a large, hook-like claw on each foot used for hunting.
2	Bald Eagle Foot (cast)		*Haliaeetus leucocephalus* foot cast	The bald eagle ranges throughout most of North America. With a wingspan reaching 8 feet, it feeds primarily on fish caught with its talons, but will also scavenge and prey on other animals.

Museum IN A BOX

Box #	Item Name	Image	Object Information	Description
Station 4				
2	Velociraptor Skull (cast)		*Velociraptor mongoliensis* skull cast 80 mya Mongolia and China	Velociraptor means "speedy thief." This carnivorous dinosaur reached about 6 feet in length and 40 pounds, and had more than 60 jagged teeth.
2	Golden Eagle Skull (cast)		*Aquila chrysaetos* skull cast	Originally native to much of Eurasia and North America, the golden eagle is now found primarily in mountainous areas of the American West. With a wingspan of up to 7 feet, it feeds mainly on rabbits, large rodents, and carrion.
Station 5				
2	Archaeopteryx Plaque (cast)		*Archaeopteryx lithographica* cast 150 mya Eichstätt, Germany	Archaeopteryx means "ancient wing." It lived during the age of dinosaurs and is widely considered an transitional form between reptiles and birds: it had feathers and was probably capable of powered flight, but also had teeth, clawed forelimbs, and a long bony tail.
2	Wild Turkey Wing Feathers		*Meleagris gallopavo* feather	Wild turkeys are large native North American birds and the ancestors of the domestic turkey. They have keen eyesight and can fly at speeds up to 55 mph. An adult turkey has 5,000–6,000 feathers, used for flight and insulation.
2	Ostrich Feathers		*Struthio camelus* feather	Ostriches are the world's largest and heaviest flightless birds. Living in African savannas, they are the fastest two-legged runners, reaching 43 mph. Their soft feathers aid in temperature regulation, courtship, balance, and sun protection.
Activity Box 3: Who Walked Here?				
It is not always possible to identify the specific dinosaur that made a trackway. Tracks are named based on the type of dinosaur most likely responsible.				
3	Ornithopod Dinosaur Trackway (cast) 1		Ichnospecies: *Anomoepus intermedius* 190 mya Connecticut Valley, Massachusetts	More than one dinosaur made trackways in this cast. The upper left shallower trackway would have been made when the mud was firmer, and this dinosaur did not sink as much under its weight.
3	Theropod Dinosaur Trackway (cast) 2		Ichnogenus: Grallator (possibly Coelophysis) 200 mya Connecticut Valley, Massachusetts	Grallator is a small, three-toed track type associated with early theropod dinosaurs. Although this track only shows three toes, Grallator had a fourth toe that rarely touched the ground.
3	Orinthopod Dinosaur Trackway (cast) 3		Ichonospecies: *Anomoepus curvatus* 190 mya Gill, Massachusetts	This trackway was created by a small, herbivorous dinosaur. These trackways are commonly found in the Connecticut River Valley in Massachusetts.
3	Theropod Dinosaur Footprint (cast) 4		Theropod print, possibly Dilophosaurs 200 mya Moab, Utah	Left rear theropod print
3	Theropod Dinosaur Trackway (cast)		Ichnospecies: *Grallator cuneatus* 205 mya Mesa County, Colorado	The shape of this track indicate that it was made when the upper layer of mud started to dry, but the lower layer was still soft.

Box #	Item Name	Image	Object Information	Description
3	Theropod Dinosaur Footprint (cast) 6		*Skartopus australis* 98 mya Wintonshire, Australia	Small theropod track with heel impression
Activity Box 4: Mystery Fossil				
4	Mystery Fossil 1: Stegosaurus Tail Spike (cast)		*Stegosaurus stenops* tail spike cast 140 mya United States	Stegosaurus stenops, meaning "roof lizard," was a 28-foot-long, 6,000-pound herbivore with a brain the size of a walnut. The triangular plates along its back may have been used for display or to help regulate body temperature. Its flexible tail carried eight spikes, likely used for defense.
4	African Crested Porcupine Quills		*Hystrix cristata* quills	Porcupines use their quills primarily for defense. An adult African crested porcupine can have up to 30,000 quills. When threatened, the quills are raised; each one has microscopic backward-facing barbs that lock into a predator.
4	Sperm Whale Tooth (cast)		*Physeter macrocephalus* tooth cast	Sperm whales are the largest toothed predators on Earth, found in all the world's oceans. They reach up to 60 feet in length and 45 tons. Teeth appear only on the lower jaw and are used to grasp prey or for defense.
4	Harpy Eagle Talon (cast)		*Harpia harpyja* tooth cast	Harpy eagles are among the world's largest and most powerful eagles, living in the rainforests of Central and South America. Their rear talons are comparable in size to a grizzly bear's claws, used to catch prey including sloths, monkeys, and large birds.
4	Domestic Goat Horn		*Capra aegagrus* hircus horn	Domestic goats are highly adaptable animals found in diverse environments worldwide. Goats use their horns to regulate body heat, establish social hierarchy, and defend against predators.
4	Giant Anteater Claw (cast)		*Myrmecophaga tridactyla* claw cast	Giant anteaters reach 7 feet in length (including a 3-foot bushy tail) and are closely related to sloths and armadillos. Found in Central and South America, they use their powerful claws to tear into termite mounds and anthills, and to defend themselves against predators including jaguars.
4	Grizzly Bear Claw (cast)		*Ursus arctos horribilis* claw cast	Grizzly bears are found in Alaska, much of western Canada, and isolated areas of Montana, Idaho, and Wyoming. They can stand up to 8 feet tall and weigh over 800 pounds, feeding on large prey, carrion, and smaller mammals.
4	American Alligator Tooth (cast)		*Alligator mississippiensis* claw cast	American alligators are found from coastal Virginia south through the Gulf States into Texas. They can reach nearly 15 feet in length and weigh over 1,000 pounds. As carnivores, they feed on fish, turtles, birds, and mammals, and use their claws to build nests.
4	Steenbok Horn		*Raphicerus campestris* horn	The steenbok is a small antelope of southern and eastern Africa, weighing up to 45 pounds and standing about 3 feet tall. It rarely drinks water, obtaining moisture almost entirely from its food. Only males have horns, which are used for defense and to establish dominance.
4	Hippopotamus Incisor (cast)		Hippopotamus amphibius	Hippos are semi-aquatic mammals found in Africa, weighing over 3,000 pounds and reaching 15 feet in length. Theirr long incisors are not used for eating but for defense, territorial combat, and display.
Alternate Mystery Fossils				
4	Iguanodon Thumb Spike (cast)		*Iguanodon bernissartensis* thumb spike cast 120 mya Belgium	Scientists originally thought this spike sat on the nose of Iguanodon like a rhinoceros horn. Later study revealed it was on the hand, and was likely used for defense and combat.
4	Triceratops Brow Horn (cast)		*Triceratops horridus* brow horn cast 66 mya South Dakota	Triceratops, meaning "three-horned face," was among the last non-bird dinosaurs on Earth, reaching 28 feet in length and over 15,000 pounds. When its horns were first discovered, scientists mistook them for those of an extinct bisonTriceratops horns were likely used for mating displays, combat, and possibly defense.

Museum IN A BOX

SECTION 4

Using Museum in Box

RESOURCES
All lesson plans, slideshows, worksheets, and videos are available online.

www.amnh.org/museum-in-a-box

School Configuration

Museum in a Box has two components: the Museum Display and the Activity Boxes. Before your first lesson, decide how your school will use them.

OPTION A: Central Location

Museum Display and all activity boxes are set up together in one classroom, library, or common area. Classes come to the space.

Note: objects from individual activity boxes are used in Museum Display. Thus, Museum Display and activities need to be presented together to ensure a full set of activity materials.

OPTION B: Multiple Locations

Individual activity boxes rotate across classrooms simultaneously. The banner can be moved or placed in a central area or hallway or omitted.

Setting Up the Museum Display

The Museum Display creates a small museum in your classroom or common area. It uses individual objects from the activity boxes to spark curiosity before lessons begin.

NOTE
Because display objects are packed inside their activity boxes, they will need to be removed for the display and returned to their box before that activity is taught.

What You Need

- A 6-foot table (school-provided)
- The banner and its stand hardware (from Crate 1)
- Tablecloth (from Crate 1)
- Object labels and display stands (Activity Boxes)
- Display objects (Activity Boxes, see inventory Museum Display Inventory List)

Assembly Steps

- Assemble the banner stand and attach the banner — 2 people
- Position the table in front of or beside the banner
- Lay the tablecloth on the table
- Remove display objects from their activity boxes — keep careful note of where each came from
- Arrange objects on the table with their labels and display stands
- Objects with "What Am I?" labels are meant to prompt questions — leave them unlabeled until students investigate

Museum Display Components

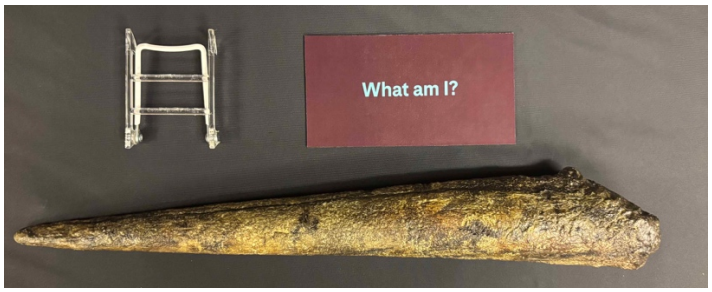
These items create the Museum Display. Objects are returned to activity box or used in activity from the display.

Crate 2, Activity Box 1

- T. rex tooth cast
- Coprolites
- Dinosaur bone fragment
- Fish plaque
- 2 labels and 2 label stands

Crate 1, Activity Box 2: How do we Know Birds are Dinosaurs?

- *Archaeopteryx* cast plaque and 1 display stand
- *Velociraptor* skull cast
- T. rex *furcula cast*
- Pigeon skeleton
- T. rex skeleton scale model
- 3 labels and label stands

	**Crate 2, Activity Box 3: Who Walked Here?** • Trackway cast plaque and 2 display stands • 1 label and label stand
	**Crate 2, Activity Box 4: Mystery Fossil** • Tail spike cast • 1 label and label stand
	**Crate 1, Banner Side 1** • Use with Museum Display table or independently • Use with How do we know Birds are Dinosaurs activity to observe similarities and differences

Crate 1, Banner Side 2

- Use independently if not using museum display
- Use with Who Walked Here? activity or on its own to look at footprint size and patterns, and see how you measure up against some of the largest dinosaur footprints

Crate 1, Tablecloth

- 6’ tablecloth, school to provide 6’ table

The Activities

Below is a summary of each activity. Full lesson plans, station setup diagrams, slideshows, and printable worksheets are available online. Each lesson is designed for one 40-minute class period.

Setting Up Activities

Each activity box contains all physical objects needed for one lesson. Typical setup involves arranging up to 6 stations around the room or tables.

- Review the lesson plan for that activity before setup (available online)
- Download and read the full lesson plan
- Print handouts in the correct version: K–2 or grades 3–5
- Gather writing and drawing utensils (not included in box)
- Set up activity stations 10–15 minutes before class
- Remove any display objects from the activity box and place in the Museum Display, OR return display objects from the Museum Display back to the box if this is the lesson where they're needed

How Long Does Each Activity Take?

- Each activity is designed to fit one 40-minute class period
- The two optional introductory pre-lessons (slides/article) take 20–30 minutes each
- Setup time is approximately 10–15 minutes before class (not included in the 40 minutes)

Recommended Activity Sequence

The activities can be used in any order. We recommend beginning with one or both introductory pre-lessons to give students a shared foundation prior to Museum in a Box arrival, starting with What is a Fossil, and concluding with Mystery Fossil.

ORDER	LESSON / ACTIVITY	FORMAT
1 (Optional)	Pre-Lesson: What is a Dinosaur?	Online slideshow — all grades — no activity box needed
2 (Optional)	Pre-Lesson: What is Paleontology?	Online article — grades 3–5 — no activity box needed
First Activity Box	Box 1: What is a Fossil?	Hands-on — grades K–5, online slideshow, worksheets
Any order	Box 2: How Do We Know Birds Are Dinosaurs?	Hands-on — grades K–5, online slideshow, worksheets
Any order	Box 3: Who Walked Here? (Trackways)	Hands-on — grades K–5, online slideshow, worksheets
Final Activity Box	Box 4: Mystery Fossil	Hands-on — grades K–5, online slideshow, worksheets

Introductory Pre-Lessons (No Activity Box Required)

These two short sessions are optional but recommended. They give students a shared vocabulary and conceptual foundation before the hands-on activities begin.

- What is a Dinosaur? — Online slideshow, all grade levels, approximately 20–30 minutes
- What is Paleontology? — Online article, grades 3–5, approximately 20 minutes

Activity Box 1: What is a Fossil?

Students learn that fossils are evidence of prehistoric life—at least 10,000 years old—and explore the difference between body fossils and trace fossils. They handle real fossils, making this one of the most memorable activities in the program.

Students Will Learn To

- Explain what a fossil is and how fossils form
- Distinguish between body fossils (remains of organisms) and trace fossils (evidence of behavior)
- Observe and describe real fossil specimens

Grade-Level Notes

K–2: Focus on observation and "what do you notice?" questions. Grades 3–5: Students read about fossil formation and connect to the concept of geological time.

Activity Box 2: How Do We Know Birds Are Dinosaurs?

By comparing skeletons of ancient dinosaurs and modern birds, students discover how scientists determined that birds are a kind of dinosaur. This activity builds core skills in observation, comparison, and evidence-based reasoning.

Students Will Learn To

- Observe and compare skeletal structures of birds and non-avian dinosaurs
- Identify shared features (furcula, hollow bones, hip structure) as evidence of evolutionary connection
- Understand how scientists use anatomical comparison to develop hypotheses

Grade-Level Notes

K–2: Focus on hands-on comparison — "Which bones look similar?" Grades 3–5: Introduce the scientific concept of homologous structures and discuss why scientists changed their understanding of bird origins over time.

Activity Box 3: Who Walked Here?

Paleontologists study fossilized footprints—called trackways—for clues about how dinosaurs moved, hunted, and lived in groups. In this activity, students analyze cast trackways to draw conclusions about dinosaur behavior.

Students Will Learn To

- Explain what a trackway is and what it can tell scientists
- Analyze footprint shape, size, and pattern to infer animal movement and behavior
- Practice making evidence-based observations, as paleontologists do

Grade-Level Notes

K–2: Focus on making observations about size, shape, and direction. Grades 3–5: Students calculate stride length, estimate speed, and compare multiple trackways to infer behavior.

Activity Box 4: Mystery Fossil

Scientists study modern animals for clues about how ancient animals lived. In this activity, students rotate through stations examining living animal body parts, then apply what they learned to hypothesize about a mystery fossil. The big reveal at the end is always memorable.

Students Will Learn To

- Examine and describe unfamiliar objects using careful observation
- Compare a mystery fossil with modern animal body parts to develop hypotheses
- Use evidence to construct an explanation — just as paleontologists do

Grade-Level Notes

K–2: Focus on observation and guessing using descriptive language. Grades 3–5: Students write or draw their hypothesis and supporting evidence before the reveal.

Important!

Do not reveal what the mystery fossil is before class. If the mystery fossil has been revealed and students know what it is, there are two alternative mystery fossils in the crate.

Thank you!