

EDUCATOR'S GUIDE

An exhibition created by



SOMETHING **BIG**
IS HERE...



TYRANNOSAURS

MEET THE FAMILY

OCTOBER 11, 2025 – APRIL 26, 2026

GRAND RAPIDS
PUBLIC MUSEUM

Be curious.



grpm.org

EXCURSION ESSENTIALS

Scheduling

- Visit grpm.org/group-visits for details about pricing and group scheduling.
- Contact group scheduling office by phone at 616.929.1734 or submit a group reservation form online at grpm.org/group-reservation-form/

Accessibility

- The GRPM respects, values and honors the unique attributes, characteristics and perspectives that make each person who they are. We strive to prioritize both physical and cognitive accessibility in all programming, designing experiences that are inclusive to the broadest range of people in the communities we serve.
- Wheelchairs: Available free of charge near the front desk on a first-come basis. All entrances, exhibits and restrooms are wheelchair accessible, with an elevator accessible to all floors located in the middle of each floor.
- For visitors who are blind or have low vision: The Museum provides Aira, an app-based verbal description service that connects people who are blind or have low vision to remote agents to guide them through the Museum.
- For visitors who are Deaf or hard of hearing: The Museum offers hearing-assist technology in the Chaffee Planetarium and the Meijer Theater.
- The Quiet Room: The GRPM's Quiet Room is a small, private room, available for visitor use. This room is family friendly, and a space that allows for low sensory needs, and for anyone who needs a private area to be away from crowds.
- Sensory accommodations: The Museum has partnered with KultureCity to train team members to assist guests with sensory needs. Sensory tools such as noise-canceling headphones, weighted lap pads and fidget spinners can be checked out at the front desk. Social stories and a communication book are published online to help prepare for an enjoyable visit.
- Visit grpm.org/accessibility for a complete list of accessibility features.

Making Connections

- Think about how the exhibit fits into unit plans and yearly themes. Integrate the exhibit into your classroom to make your field trip essential, not auxiliary. This will help your students see the Museum as a valuable resource for learning that is related to classroom goals.

Researching Ahead of Time

- Consider the logistics; get to know the Museum, what it has to offer, and how to use it effectively.
- If possible, visit the Museum and the exhibit ahead of your trip. Consider what you will focus on and how students will move through the exhibit.
- Interact with Museum staff to ask questions; the more comfortable you are, the more effective the learning environment will be when your students come to visit.
- **Teacher Resource Folder:** The GRPM has compiled resources for you and your students before, during and after your trip to the Museum. From Discovery Kits that bring artifacts into your classroom to scavenger hunts and reflection activities, these resources will help you make the most out of your experience.

Preparing Students

- Orient the students to the learning space; reducing the novelty of the Museum will help prevent "cognitive overload" that might interfere with the tasks you would like students to complete.
- Preparation strategies may include showing students pictures of the Museum or exhibit, providing them with an agenda of the day's activities, and even allowing time for exploration upon arrival.

Preparing Chaperones

- Secure the proper number of chaperones your institution requires. The Museum recommends one adult for every five children, and allows groups to bring this ratio (of adults to students) complementary when booking through group scheduling.
- Chaperones and teachers are responsible for supervising children at all times while at the GRPM and ensuring they adhere to this [Group Visit Code of Conduct](#). Prior to your visit, make sure you have read the visitor code of conduct document and provide each of your chaperones with a copy.

Creating a Plan

- Decide what experiences you want for your students. When planning consider:
 - What experiences are not available in the classroom?
 - What opportunities in the Museum would best suit the needs of your students?
 - You may want to limit the scope of your experience; attempting to see the entire Museum in two hours guarantees only a glossing over with little chance for students to deeply engage.
- A well-made worksheet may help facilitate purposeful student observation and critical thinking. The GRPM has a variety of [scavenger hunts](#), [exhibit resources](#), and tools made [For Teachers By Teachers](#) that may be of use!

Following Up

- Follow up refers to the next lesson or project that builds on the Museum experience. This component is critical, as it helps reinforce the concepts students developed during the trip.
- A strong connection between the curriculum and a field trip allows students to see the Museum as an integral part of their learning; it helps them not only remember what they did, but why they did it.

GUIDED EDUCATION PROGRAM AND PLANETARIUM CONNECTIONS

The Museum's education department is offering the following guided programs and planetarium shows for groups that will allow students opportunities to further engage with concepts from *Tyrannosaurs: Meet the Family*.

Visit grpm.org/group-visits for more information or to inquire about reserving a program/planetarium show.

Discover: Habitat Connections

- **Exhibit connection:** Search a variety of animal specimens for clues on how each creature survives different local environments in the program, then apply that knowledge to life-sized dinosaur skeletons to discover how this group survived prehistoric habitats in the *Tyrannosaurs: Meet the Family* exhibit.
- **Description:** Learners will explore the *West Michigan Habitats* exhibit to uncover hidden connections in our state's varied ecosystems. This exhibit program allows students to examine fascinating dioramas and scientific specimens to discover relationships among plants, animals and humans. Students will consider curriculum-based life science concepts including predator/prey relationships, adaptations and human impacts on natural environments.
- **Age level:** Grades K-5

Investigate: Plant and Animal Adaptations

- **Exhibit connection:** Closely observe the special features of several plants and animals in the program, then investigate the adaptations that helped mini carnivorous dinosaurs transform into massive apex predators in the *Tyrannosaurs: Meet the Family* exhibit.
- **Description:** Students will examine a variety of specimens to learn about how plants and animals adapt to their environment in order to survive. Students will explore aspects of camouflage, how vision influences the predator/prey relationship, seed dispersal for plant reproduction, mimicry for symbiosis and connections between tooth structure and diet.
- **Age level:** Grades 3-8

Dinosaurs: A Story of Survival

- **Exhibit connection:** Time travel to the Mesozoic Era to witness the reptiles that roamed Earth millions of years ago in the show, then uncover the hidden connection that still exists between ancient dinosaurs and modern birds in the *Tyrannosaurs: Meet the Family* exhibit.
- **Description:** "A chicken? What does a chicken have to do with a dinosaur?" Follow Celeste and Moon as they explore Earth when the dinosaurs roamed and discover that perhaps not all dinosaurs went extinct. They will see the fascinating transformations that these animals underwent over millions of years, creating giant creatures, armored beasts and super predators, until the day that a cataclysmic impact event caused a mass extinction on Earth. But all is not lost. Celeste will discover the key to their survival.
- **Age level:** All Ages

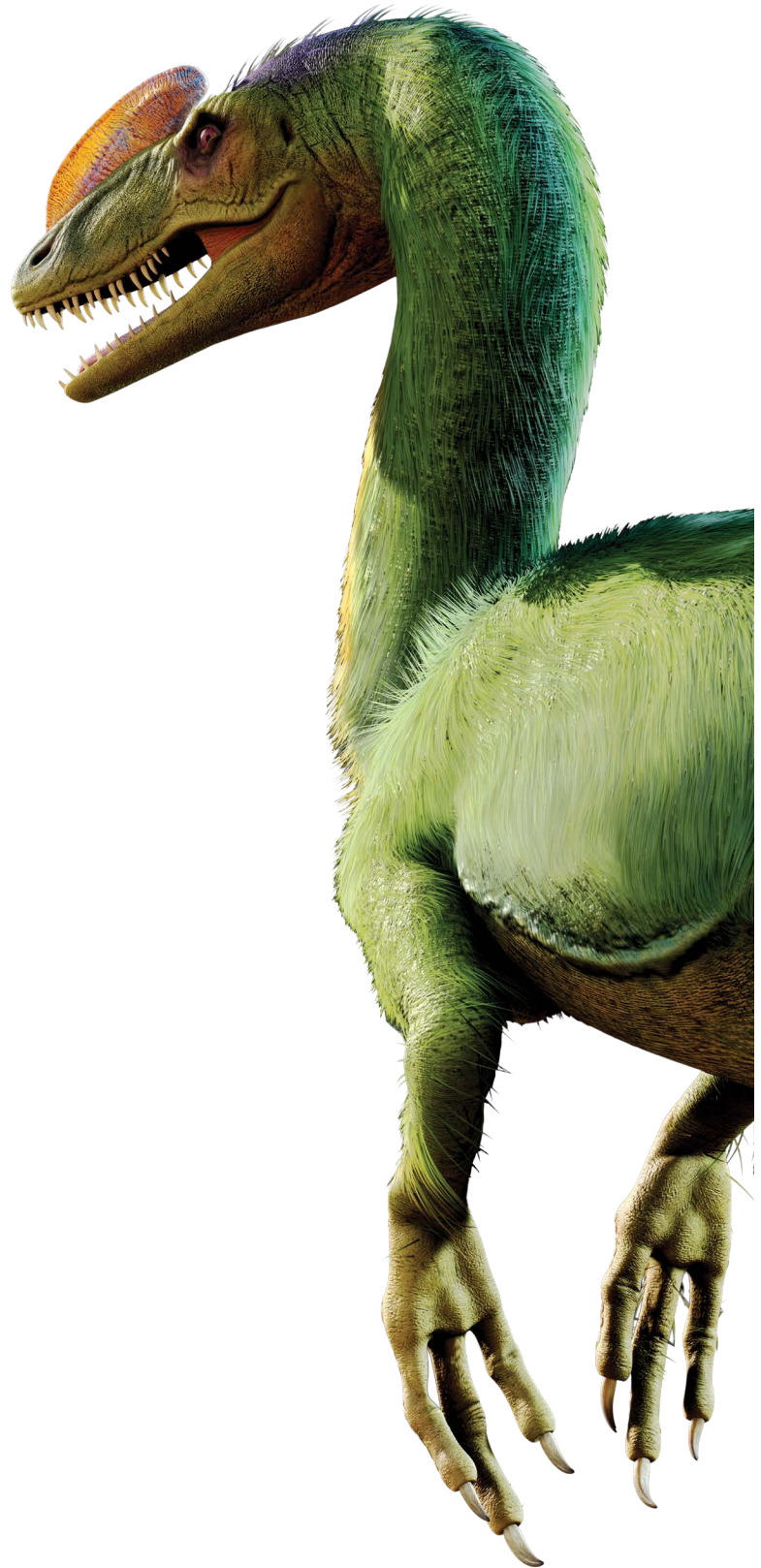
SYLLABUS LINKS

A Framework for K-12 Science Education

- NGSS Crosscutting Concepts
 - Patterns
 - Cause and Effect
 - Scale, Proportion and Quantity
 - Systems and System Models
 - Structure and Function
 - Stability and Change
- NGSS Disciplinary Core Ideas
 - From Molecules to Organisms: Structures and Processes
 - Biological Evolution: Unity and Diversity
- NGSS Science and Engineering Practices
 - Asking Questions and Defining Problems
 - Developing and Using Models
 - Analyzing and Interpreting Data
 - Constructing Explanations and Designing Solutions
 - Obtaining, Evaluating, and Communicating Information

Michigan K-12 Social Studies Standards

- G1: The World in Spatial Terms
- G2: Places and Regions
- P1: Reading and Communication
- P2: Inquiry, Research and Analysis



ABOUT THE EXHIBITION

The exhibition tells the story of the Tyrannosaurs: their evolutionary history, the habitats they evolved in and their distribution in space and time – in other words, what makes them such fascinating and special creatures.

Tyrannosaurs: Meet the Family, is an innovative, multimedia experience showcasing the newly-revised Tyrannosaur family tree. There are over 10 life-sized dinosaur specimens on display, including one of the oldest Tyrannosaurs, *Guanlong wucaii*. Showcasing a dramatic array of fossils and casts of Tyrannosaur specimens, including never-before-seen specimens from China, the exhibition is designed to provide a snapshot of dinosaur life and show how this group became the world's top predators with their massive skulls, powerful jaws, and bone-crunching teeth.

Key highlights of the exhibition:

- An immersive multimedia experience featuring large-scale projections of dinosaurs running through Grand Rapids.
- The first exhibition to showcase the revised Tyrannosaur family tree.
- A chance to meet *Guanlong wucaii* – the newly discovered feathery relative of *T. rex*.
- Discover and learn how recent scientific findings confirm the links between dinosaurs and birds.
- Use of multi-touch technologies for guests to compare their own arm strength to that of a mighty *T. rex*.
- Grasp the enormous scale of geological time in the context of human evolution.

This exhibition is divided into six sections:

1. **What is a Tyrannosaur?** Explores the features that define a Tyrannosaur.
2. **Meet the Family.** There were many Tyrannosaurs and at least two families.
3. **Explore the Family.** Compares and contrasts Tyrannosaur's relatives.
4. **T-Rex: The Ultimate.** How T-Rex evolved as the top-end predator.
5. **T-Rex: Alive.** Augmented reality interactive experience.
6. **T-Rex: The Legacy.** Evolution, survival, and extinction.

Important notes about the exhibition:

- Photography is allowed in *Tyrannosaurs: Meet the Family*.
- Food and drink is not allowed in the exhibition.

EDUCATION RESOURCES

The Australian Museum's website offers resources that provide a scaffolded approach to exploring a topic, both at the Museum and in the classroom. Follow the learning journeys below to deepen your students' understanding of Tyrannosaurs.

Visit the Touring Exhibition: *Tyrannosaurs: Meet the Family* website and click on the Education Resources tab.

<https://australian.museum/get-involved/services/touring-exhibits/touring-exhibition-tyrannosaurs/>

Directly access resources for specific grades with the following links:

- Primary (Grades 1-6)
<https://australian.museum/get-involved/services/touring-exhibits/touring-exhibition-tyrannosaurs/tyrannosaurs-primary/>
- Secondary (Grades 7-12)
<https://australian.museum/get-involved/services/touring-exhibits/touring-exhibition-tyrannosaurs/tyrannosaurs-secondary/>

BACKGROUND INFORMATION

What is a Dinosaur?

Dinosaurs are a group of animals that share the identifiable features in the diagram below.

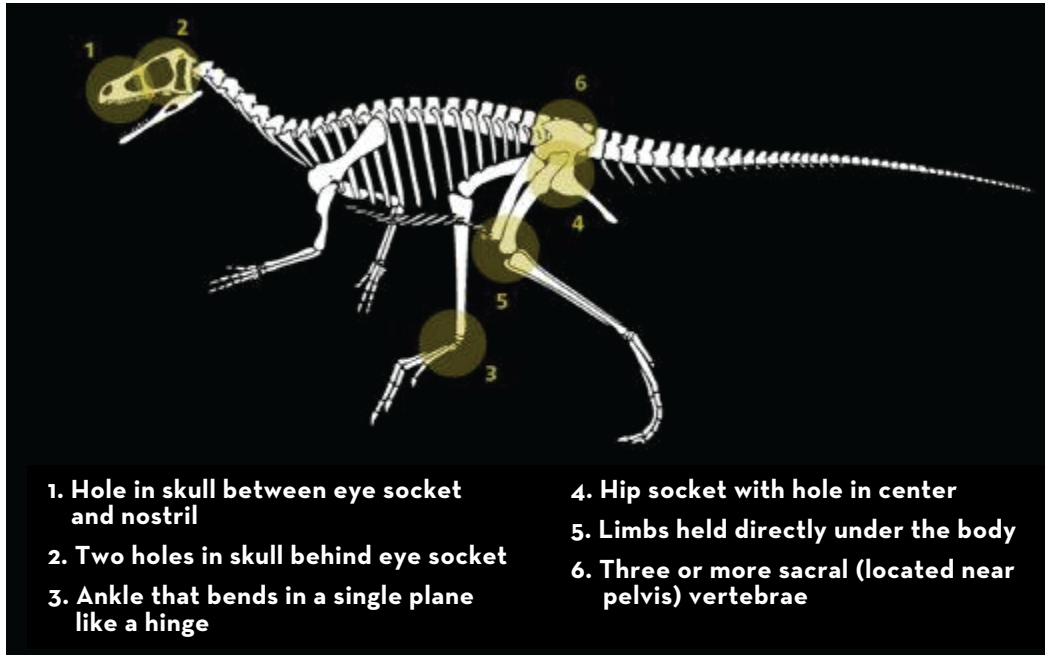


Diagram of *Eoraptor* skeleton showing the main physical features that all dinosaurs share.

We know about dinosaurs from finding and examining their fossils.

What are fossils?

- Fossils are the remains or traces of plants or animals preserved in rocks, soil, ice, or amber.
- Fossilization is the process of forming a fossil. Fossilization of a whole plant or animal is very rare. Usually only the hard parts of plants such as seeds and wood and the bones and teeth of animals become fossilized.

What main types of fossils are there?

- **Imprints** occur when specimens (animals or plants) die and leave impressions of their bodies or leave marks (such as footprints) in an area which is then covered by sediment. Over time the sediment sets to become rock, leaving imprints that are still there long after the original material has disappeared. Raindrops and ripple marks can also make impressions in mud and sand which can be fossilized.
- **Mineralized fossils** occur when specimens are encased in, replaced by, or have absorbed minerals from the surrounding rock or underground water to fossilize them. Examples of mineralization include: fossilized bones, shells, and petrified wood
 - where the original material is replaced by minerals; opalized fossils - where silica fossilizes the specimen; and limestone fossils - where calcium carbonate has replaced or filled porous gaps in the specimen.

How are fossils found?

- By accident
- By looking or digging on the surface in a likely area
- By systematic searching with large digging equipment and explosives

How do you get bones out of stone?

- By chipping fossils out of rocks with chisels and hammers
- By dissolving rocks in acid baths, leaving the bones intact
- By splitting rocks open along their layers

How are fossils identified?

- By comparing them to something that is alive today
- By comparing them with other fossils
- By making educated guesses as to the relatives of the fossilized specimen and extrapolating

How are fossils dated?

- By radiometric dating – a technique which measures the amount of a particular radioactive element in the rock or fossil
- By comparing the fossils in one layer of rock with the fossils in another layer of rock at the same site which have already been dated by radiometric dating
- By comparing the fossils at one site with similar fossils at another site which have already been dated by radiometric dating

What are fossils used for?

- To find out about the plants and animals that lived a long time ago and are now extinct
- To find out about the world's environment a long time ago
- To date rocks by comparing with fossils found at other sites

How do fossils form?

- Most animals and plants that become fossilized either lived in water or were washed into it after they died, then:
 1. The soft parts of the plant or animal rot away, leaving the woody parts or bones, teeth, or shell
 2. The hard parts are buried under layers of sediment, sand, mud, or lime; usually in a lake, swamp, or cave
 3. The sand, mud, or lime that covered the plants and animals was turned into sandstone, shale, or limestone
 4. The layers became very deep and compressed to become rock over millions of years
 5. During rock formation, all parts of the plants or animals are replaced by minerals
 6. The rocks are uplifted during movements of the Earth's surface
 7. The rocks may be weathered by wind, rain, and sun
 8. The fossils may become exposed and able to be seen
 9. The fossils may be dug out by a collector or a paleontologist

What is a Tyrannosaur?

- There are 4 main features that distinguish Tyrannosaurs from other dinosaurs.

Four features specific to Tyrannosaurs	
Fused nasal bones in skull	Only Tyrannosaurs had fused nasal bones in their skulls. This strengthened their snouts and gave them a stronger bite.
Teeth	Only Tyrannosaurs had D-shaped teeth at the front of their upper jaws. These were good for scraping and pulling, while other teeth could slice, tear, and crush.
Hip features	Only Tyrannosaurs had a rib of bone at the top of their hips, where their strong leg muscles attached.
Hind limb	Tyrannosaurs had relatively long hind limbs compared to other theropods (meat-eating dinosaurs).

Features other dinosaurs shared	
Stands on two legs	All Tyrannosaurs stood on two legs but so did many other dinosaurs.
Tail	All Tyrannosaurs had tails but so did every other dinosaur.
Small arms	Most Tyrannosaurs had small arms but so did many other dinosaurs.
Ribs and torso	All Tyrannosaurs had ribs but so did every other dinosaur.



EDUCATOR'S GUIDE

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Tyrannosaurs featured in the *Tyrannosaurs: Meet the Family* exhibition:

Tyrannosaur Common Name	Tyrannosaur Genus Name (species when known)	Time Period	Time (Million Years Ago)	Body Length (meters)	Region
Proceratosaurus	<i>Proceratosaurus bradleyi</i>	Mid Jurassic	168-166 mya	2-3 m	Europe
Kileskus	<i>Kileskus aristotocus</i>	Mid Jurassic	168-166 mya	3 m	Asia
Guanlong	<i>Guanlong wucaii</i>	Late Jurassic	163-158 mya	4 m	Asia
Aviatyrannus	<i>Aviatyrannus jurassica</i>	Late Jurassic	157-152 mya	1 m	Europe
Stokesosaurus	<i>Stokesosaurus clevelandi</i>	Late Jurassic	152-148 mya	3-4 m	North America
Juratyran	<i>Juratyran langhami</i>	Late Jurassic	152-148 mya	4-5 m	Europe
Yutyrannus	<i>Yutyrannus huali</i>	Early Cretaceous	131-120 mya	9 m	Asia
Dilong	<i>Dilong paradoxus</i>	Early Cretaceous	138-129 mya	1.6-2 m	Asia
Raptorex	<i>Raptorex kriegsteini</i>	Early Cretaceous	131-113 mya	3 m	Asia
Xiongguanlong	<i>Xiongguanlong baimoensis</i>	Early Cretaceous	113-100 mya	4-5 m	Asia
Eotyrannus	<i>Eotyrannus lengi</i>	Early Cretaceous	131-126 mya	4 m	Europe
Sinotyrannus	<i>Sinotyrannus kazuoensis</i>	Early Cretaceous	121-119 mya	9-10 m	Asia
Appalachiosaurus	<i>Appalachiosaurus montgomeriensis</i>	Late Cretaceous	80-76 mya	7-8 m	North America
Daspletosaurus	<i>Daspletosaurus torosus</i>	Late Cretaceous	77-74 mya	9 m	North America
Gorgosaurus	<i>Gorgosaurus libratus</i>	Late Cretaceous	76.5-75 mya	8-9 m	North America
Bistahieversor	<i>Bistahieversor sealeyi</i>	Late Cretaceous	76-72 mya	9 m	North America
Teratophoneus	<i>Teratophoneus curriei</i>	Late Cretaceous	76-72 mya	6 m	North America
Zhuchengtyrannus	<i>Zhuchengtyrannus magnus</i>	Late Cretaceous	80-76 mya	10-12 m (est)	Asia
Tarbosaurus	<i>Tarbosaurus bataar</i>	Late Cretaceous	72-68 mya	10-12 m	Asia
Albertosaurus	<i>Albertosaurus sarcophagus</i>	Late Cretaceous	74-70 mya	10 m	North America
Alioramus	<i>Alioramus altai</i>	Late Cretaceous	72-66 mya	6 m	Asia
Dryptosaurus	<i>Dryptosaurus aquilunguis</i>	Late Cretaceous	72-66 mya	6.5-7.5 m	North America
Nanotyrannus	<i>Nanotyrannus lancensis</i>	Late Cretaceous	68-66 mya	5-6 m	North America
T-Rex	<i>Tyrannosaurus rex</i>	Late Cretaceous	68-66 mya	12.5 m	North America

PRE-VISIT ACTIVITIES

To make the most of your visit to the exhibition, we recommend that you prepare your students before their excursion with some of the following suggested activities.

1. What is a museum?

Discuss with students:

- What is a museum?
- What type of museum is the Grand Rapids Public Museum?
- What do they expect to see there?
- Why do museums collect cultural objects and natural science specimens?

2. Characteristics of dinosaurs

Provide students with pictures or models of dinosaurs. In groups have the students choose one dinosaur and discuss the following questions:

- What do you think it is? How do you know?
- Have you seen one before?
- How do you think this animal moved?
- Did this animal have senses like you?
- What features does this creature have that makes you think it could taste, see, smell, and hear (mouth, eyes, nose, ears)?
- What did it eat?
- How did it find its food?
- What type of habitat would you find this animal in?
- How many years ago did this dinosaur live?
- Did this dinosaur lay eggs? Did it care for its young?
- How did this animal protect itself—with a bite, speed, or camouflage? Did it hide? Did it try to make itself look bigger?

3. What is a dinosaur?

What was a Tyrannosaurus? What features make Tyrannosaurs different from other known dinosaurs? See the 'Background Information' section for detailed information.

Ask students to:

- Find pictures of 5 Tyrannosaurs and 5 dinosaurs that are not Tyrannosaurs.
- Discuss the differences between Tyrannosaurs and other dinosaurs.
- Draw or sketch a scaled drawing of each of the Tyrannosaurs. Scale is 1cm: 1m. Cut them out. Color or paint them.
- Find out where the Tyrannosaur fossils have been found in the world and mark on a world map.
- Decorate the classroom with the scale cut-out Tyrannosaur drawings and the map.
- Read the book *Tyrannosaurus Drip* by Julia Donaldson and David Roberts. What does this book say about Tyrannosaurs? Identify the rhyming words.

4. What do students want to find out?

Ask students to write a list of questions of all the things they would like to find out about Tyrannosaurs when they visit.

ON-SITE STUDENT ACTIVITIES

While visiting the exhibition, we recommend utilizing the following learning steps to engage students with the displays, fossils, and each other.

1. Connect

Explore the dioramas to find the Tyrannosaurs and fossils. Encourage students to look closely at the specimens and connect with what they see, think and feel. Read nearby text panels or touchscreens for extra information.

2. Share

Facilitate opportunities for students to share and discuss their thoughts about the Tyrannosaurs and fossils using the following insight questions:

- Find a fossil skeleton of a tiny Tyrannosaur. What advantages would you have if you were this dinosaur?
- Which Tyrannosaur would you like to ride? How would it move and where would you go on your dinosaur adventure?
- Which Tyrannosaur has the best armor? What is it and how did it protect the dinosaur?
- If you could choose to have a Tyrannosaur as a pet, which one would you pick and why?
- Which Tyrannosaur has the best weapons? What are they and how were they used?
- Which Tyrannosaur would you invite as a dinner guest? What would you both eat and what would its table manners be like?
- Find a fossil skeleton of a giant Tyrannosaur. What advantages would you have if you were this dinosaur?
- If you were a fossil hunter, which of the Tyrannosaurs would you have liked to discover and why?

3. Reflect

Ask students to reflect on their findings from each display. We suggest sharing ideas and observations as a whole group to help refine key messages and learning outcomes.



POST-VISIT ACTIVITIES

After your visit to the exhibition we recommend the following post-visit activities.

1. My Tyrannosaur Party

Prepare a party for all the Tyrannosaurs. Divide the class into groups. During the event planning, each group can consider where to host the party, who to invite, and what food to provide. Prepare an invitation for the party guests. Would an invite to all these species be possible?

Below is a list of the species showcased in the exhibition. Do some background reading on these to help make decisions. Look at <https://australian.museum/learn/dinosaurs/> to find out more about Tyrannosaurs and other dinosaur species.

Albertosaurus	Eotyrannus	Sinotyrannus
Alioramus	Gorgosaurus	Stokesosaurus
Appalachiosaurus	Guanlong	Tarbosaurus
Aviatyrannus	Juratyran	Teratophoneus
Bistahieversor	Kileskus	Tyrannosaurus
Daspletosaurus	Nanotyrannus	Xiongguanlong
Dilong	Proceratosaurus	Yutyrannus
Dryptosaurus	Raptorex	Zhuchengtyrannus

Have the groups present the details of their party to the rest of the class.

2. My Trip to the Grand Rapids Public Museum

Write a short journal entry about the trip to the Museum. What were the two highlights of the excursion? Include any photos of your visit.

3. Big and Small

Have each student choose one of the following pairs of Tyrannosaur species. Create a table to compare each using the table headings: *size, hunting techniques, habitat, treatment of young, eggs or live births*.

Is bigger better? Why or why not?

Aviatyrannus vs. Tyrannosaurus
Guanlong vs. Yutyrannus
Dilong vs. Sinotyrannus
Xiongguanlong vs. Bistahieversor
Aviatyrannus vs. Tarbosaurus

4. Review students understanding of fossils

Discuss with the class what they have learned about fossils.

Write a list of words relating to fossils e.g. **eggs, nests, tracks, coprolites, impressions, bones, amber, footprints, mineralized, petrified, opalized, paleontology, gastrolith, dinosaur.**

Use graph paper to create a find-a-word or crossword with these words.

5. Make a Fossil

Make a cast of a fossil. Use a hand or footprint or another object like a shell and press into modeling clay or plasticine. You could also use chocolate and plastic molds. Write and follow a scientific procedure.

6. Build a Dinosaur

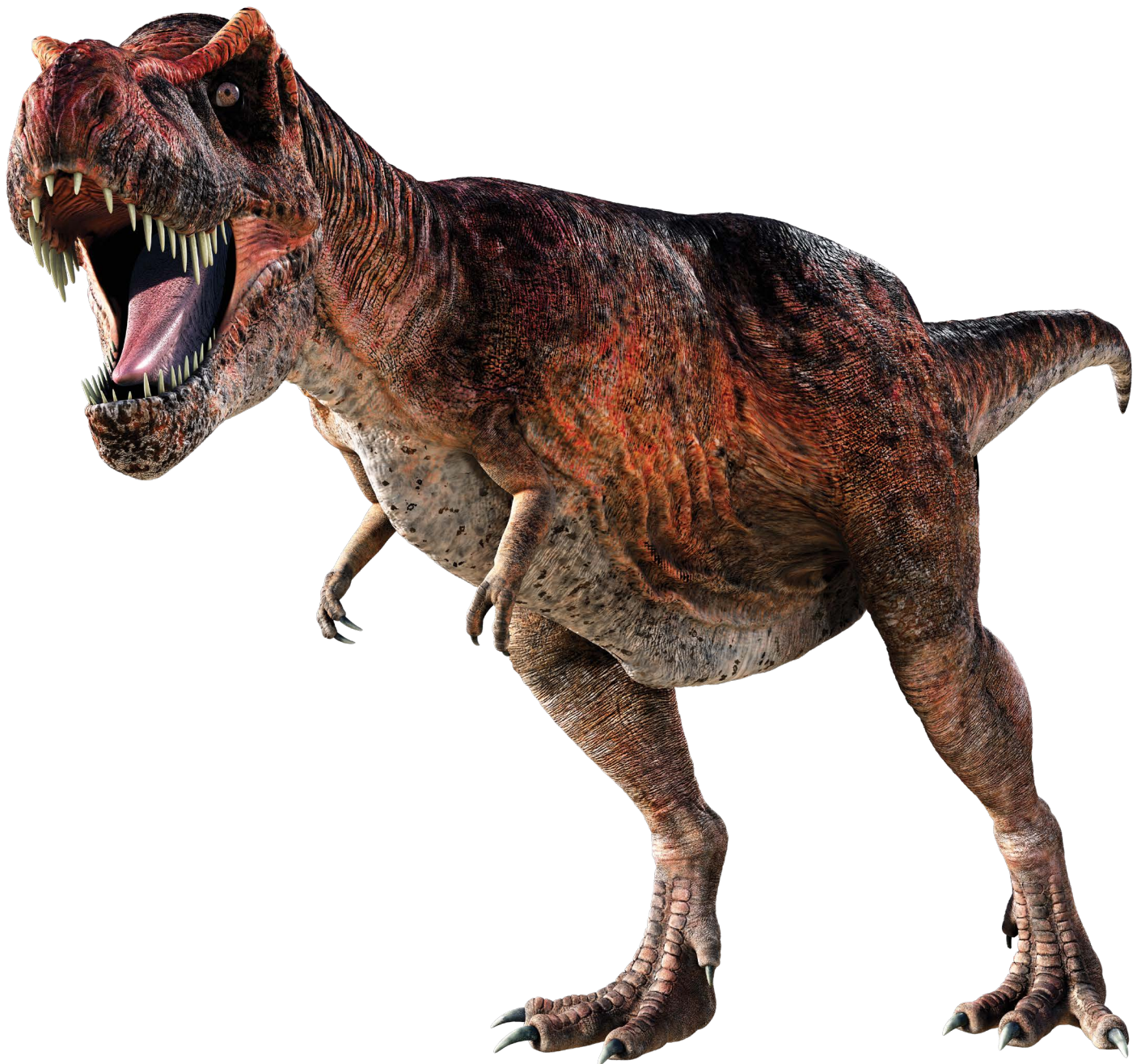
Use recycled materials to make a 3D model of a dinosaur or a diorama of several dinosaurs.

7. Word Fun

Choose 2 of the dinosaur names from the exhibition and create a character and write a story or poem.

8. Play a Game

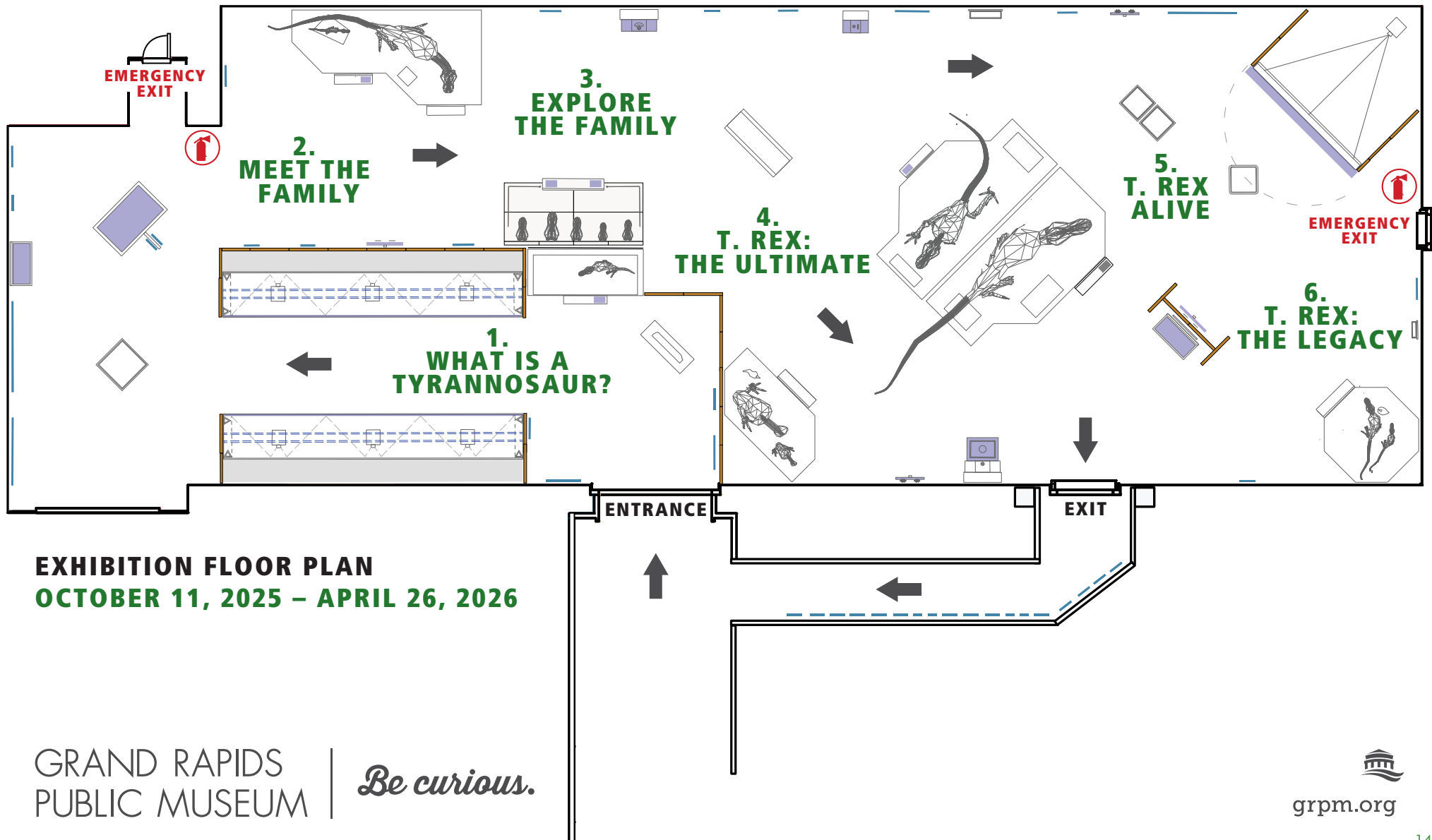
Check out <https://australian.museum/visit/mobile-apps/> and download the Tyrannosaurs app to have fun with Tyrannosaurs.



TYRANNOSAURS

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EXHIBITION FLOOR PLAN
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