

DIG THOSE DINOS

A LEGOLAND® California Educational Resource Guide K-3



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Welcome to LEGOLAND California!

Education Programs

"Dig Those Dinos" has been reviewed for content accuracy by the San Diego Natural History Museum. For information on LEGOLAND Education programs, visit www.LEGOLAND.com/edu.

Directions: From Interstate 5, buses exit Palomar Airport Road East. Turn LEFT on Hidden Valley Road, and LEFT into LEGOLAND. Cars exit Cannon Road East and turn RIGHT on LEGOLAND Drive.

Arrival and Entry

Instructional Programs Please arrive 30 minutes before your program. Teachers must be present during the 45-minute program. Materials provided.

Self-Guided Programs may enter at 10:00 a.m. Bring your own trowels and brushes, or rent them at the Dino Island attraction.

Lunches: School groups may bring lunches in disposable containers and use self-storage bins. Lunches may be pre-ordered when you book your program, or purchased at LEGOLAND restaurants.

Safety

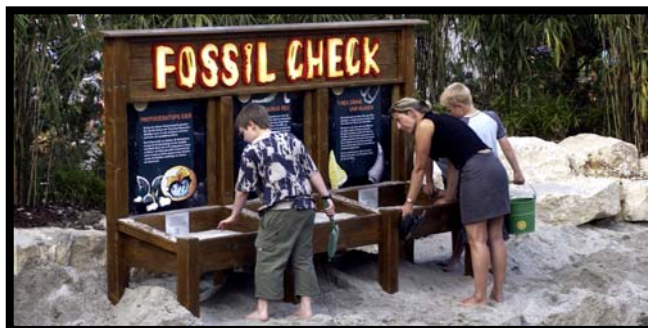
LEGOLAND Parks are built to the highest standards of quality and safety. Height restrictions apply on selected attractions throughout the park.

Background Information

Before you Dig those Dinos, Find Out About Fossils!

What is a paleontologist?

A **paleontologist** is a scientist who studies ancient plants and animals. They also study layers of rock where remains of ancient plants and animals are found. They try to find out where ancient plants and animals lived, and when they lived.



What is a fossil?

Fossils are the remains or traces of prehistoric animals and plants that lived over 10,000 years ago.

How are fossils formed?

Fossils are formed in many ways. Some fossils hardly change at all, like mammoths frozen in the Arctic tundra. Other fossils are hard and mineralized, like petrified wood. After millions of years, bones and teeth of dead animals are buried underground and there is much pressure from layers of dirt and rock over them. The great pressure causes the bones to mineralize.

What is a trace fossil?

A **trace fossil** is an impression, such as a footprint, preserved in sedimentary rock.

What is a mold?

A **mold** is the hollowed out place in sedimentary rock, where a living thing stepped or was buried. If the living thing's remains decomposed over time, all that is left is the mold.

What is a cast?

A **cast** is material, like plaster, that scientists pour into a natural mold. When the cast hardens, scientists take it out of the mold, and the scientist can see the shape of the plant or animal that made the hollow shape of the mold millions of years ago.

Other good things to know:

Extinct plants and animals no longer live anywhere on earth; every one of their kind has died.

Herbivores are animals that only eat plants. Styracosaurus was an herbivore.

Carnivores are animals that eat meat. Velociraptor was a carnivore.

A **scavenger** is an animal that does not hunt for food, but finds food, such as dead animals.

Additional Resources

San Diego Natural History Museum website. www.sdnhm.org

US Fish and Wildlife Website. <http://endangered.fws.gov/kids/whatyoucando.pdf> and <http://endangered.fws.gov/kids/heyteach.htm>

Before and After the Visit: Minds-On Activities

Make Impressions of “Prehistoric” Creatures!

Materials

Modeling clay, plaster of Paris, small shells, 3 oz. paper cups with bottoms cut out

What to Do

1. Soften and flatten a small piece of modeling clay. This will be “mud” for your prehistoric environment.
2. Press a shell into the clay. This will be the ancient animal, shell, or plant that steps or is buried in mud.
3. Remove the shell. This shows that the living thing decomposes.
The remaining clay, with the hollowed out place, is called a “mold.”
4. Put a bottomless paper cup around the clay.
5. Mix 2 parts Plaster of Paris to 1 part water. Pour the mixture into the cup over the clay.
Let it set a few minutes. You are making a “cast.”
6. Walk a plastic dinosaur into the moist plaster of Paris. This will create a footprint impression or “trace fossil”.
7. When the plaster is hard, peel off the paper cup. Separate the clay from the hardened plaster of Paris. The plaster is a cast of the shell.
On the other side of the plaster is a trace, or footprint impression. Good job!

Paleontology Puzzle

Here is what a paleontologist does to find and preserve the remains of ancient plants and animals. Number the steps in order. Or cut out and glue them in order on paper.

- A. ____ Take the fossil to the lab and remove the plaster jacket.
- B. ____ First, find a dig site, a place where you can see sedimentary rocks.
- C. ____ Finally, fit the bones together. Think about how this animal might have lived.
- D. ____ Third, draw and describe the site before you dig.
- E. ____ Second, use string to make a box, or grid, around the dig site.
- F. ____ Dig to find fossils.
- G. ____ When you find a fossil, place a plaster jacket around it to protect it.
- H. ____ In the lab, glue any broken pieces of the fossil.

Answer key: A. 6 B.1 C.8 D.3 E. 2 F.4 G.5 H 7

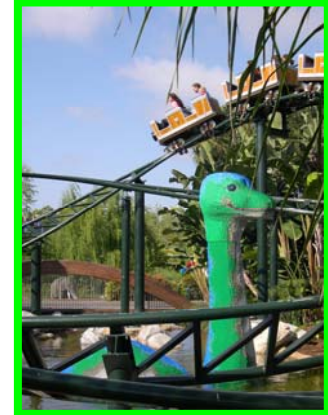
Discovery Worksheet



The Dragon and Coastersaurus

A dragon is a make-believe creature.

Dinosaurs were real creatures that lived millions of years ago, but are now extinct.



- Look at a LEGO® model of a dragon.
- In what ways does the LEGO dragon look different than dinosaurs?
- Would you say that dragons are extinct? Why or why not?
- What are some make-believe actions of dragons that are different from the ways dinosaurs behaved?
- How is the Coastersaurus ride different than The Dragon coaster? How are they similar?

Safari Trek

LEGO animals have a nice home in Safari trek, but some real animals are threatened or endangered, and might become extinct, like the dinosaurs. **Threatened** means the animal could become endangered in the future. **Endangered** means the animal is in immediate danger of extinction.

At LEGOLAND

Ride the Safari Trek and find LEGO models of endangered animals.

Back in class

Draw an endangered animal and tell how the world would be different if it was extinct.
Match these animals with their home on a world map.

<u>Animal</u>	<u>Threatened or Endangered?</u>	<u>Home</u>
Asiatic Lion	Endangered	Turkey to India
Chimpanzee	Endangered	Africa
African Elephant	Threatened	Africa
Gorilla	Endangered	Central and West Africa
Zebra (3 kinds)	Endangered and Threatened	South Africa, Namibia, Angola
Parrot (11 kinds)	Endangered	Australia, Brazil, Argentina, Mexico Caribbean, New Mexico, Arizona

Hands-On Activities

Our First Discovery: Dino Footprints!

1. Name the dinosaur and describe the shape and size of each footprint.
2. How is the Velociraptor's footprint different? How would this type of foot help him survive?
3. Which dinosaur weighed the most? Why do you think so?



Styracosaurus and Tyrannosaurus Rex



1. What do you notice about the Styracosaurus head and body? How do you think it used its horns?
2. How do we know the Tyrannosaurus Rex model is a female? How would T-Rex defend her nest? How would this be different from the way Styracosaurus might have defended a nest?



Fossil Station

1. Compare the impression of a Protoceratops egg with the size of a Tyrannosaurus Rex LEGO® egg.
2. Look at the T-Rex bone impression. What part of the T-rex body might this be?
3. Look at the T-rex tooth. Do you think T-rex ate meat or plants? Why?
4. Look at the T-rex claw. How do you think T-rex used its claws?
5. Scientists now think T-rex was a scavenger, not a ferocious hunter. Why do they think this?

Dig Site

1. Find out more about prehistoric life by reading the display boards, and digging for buried "fossils."
2. Remember, paleontologists do not always each find a fossil. They often work together.
3. Fossils and LEGOLAND trowels and brushes will be collected at the end of the class.
4. Back in class: Draw and describe the fossil you found. Tell something you learned about dinosaur life.

About Dig Those Dinos

Educational Objectives

- Learn paleontology vocabulary.
- Observe and describe models, pictures, fossil casts, and impressions.
- Identify dinosaurs by name and physical characteristics.
- Dig for simulated fossils with trowels and brushes.
- Find out more about dinosaurs and prehistoric life by using worksheets and posted information.
- Relate Hands-On activities to other LEGOLAND attractions.



California Content Standards for Science Addressed

Kindergarten

Life Sciences

- 2a. Students know how to observe and describe similarities and differences in the appearance...of ...animals.
2b. Students know stories sometimes give plants and animals attributes they do not really have.
2c. Students know how to identify major structures of ...animals.

Investigation and Experimentation

- 4a. Observe common objects by using the five senses.
4e. Communicate observations orally and through drawings.

Grade One

Life Sciences

- 2a. Students know different plants and animals...have external features that help them thrive....
2c. Students know animals eat plants or other animals for food....

Investigation and Experimentation

- 4b. Record observations and data with pictures, numbers, or written statements.

Grade Two

Earth Sciences

- 3d. Students know that fossils provide evidence about the plants and animals that lived long ago and that scientists learn about the past history of Earth by studying fossils.

Grade Three

Life Sciences

- 3a. Students know...animals have structures that serve different functions....
3e. Students know that some kinds of organisms that once lived...have completely disappeared....

Investigation and Experimentation

- 5b. Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations....