



Dinomike and Tzeasaura Find a Plesiosaur Study Guide

Introduction

Dinosaurs and prehistoric animals are topics that seem to fascinate children. In *Dinomike and Tzeasaura Find a Plesiosaur*, I try to capitalize on young children's natural curiosity about fossils to help them develop an interest in science and the world around them. Through a fossil hunt with her Uncle Dinomike, Tzeasaura learns about fossils and what they tell us about the past. The book, combined with this study guide, will help parents and teachers motivate children and help teach them important information about how the world works.

The content explored in this book includes:

- The definition of fossil
- Where to look for fossils
- What some common fossils look like and what animal they came from
- That the earth is always changing
- How to look for fossils
- Where to look for information about fossils
- What happens when an animal becomes extinct
- That some animals are extinct and only lived in the past
- How paleontologists work with fossils

Children's Literature and Prehistoric Life

Much of the literature on prehistoric life presents the animals as if they were still around. Trade books on dinosaurs provide information about what they looked like and what they ate as if they were studied and photographed yesterday. With modern animation and movies, children have a hard time distinguishing fiction from fact. After reading *Dinomike and Tzeasaura Find a Plesiosaur*, children will have a more realistic understanding of prehistoric life. They will begin to understand how scientists learn about extinct animals such as plesiosaurs by studying fossils. Children will also discover that they too can be scientists.

Learning about Plesiosaurs on the Internet

The web site Oceans of Kansas (www.oceansofkansas.com) is an excellent site to learn about plesiosaurs and other prehistoric marine creatures. Mike Everhart has done exceptional work collecting information on some of the incredible animals that lived during the Mesozoic era in the inland sea. -Mike's website also has many other links for those interested in Plesiosaurs.

The story *Dinomike and Tzeasaura Find a Plesiosaur* is loosely based on my own discovery of a plesiosaur fossil in Nebraska. The University of Nebraska State Museum has done a wonderful job of documenting the dig from the first shovel to the careful preparation of the skeleton. If you want to see how real paleontology is done, this is an excellent example. The web site is located at <http://www.museum.unl.edu/research/vertpaleo/Ples/BaldwinPlesPg1.htm>.

Collecting Fossils

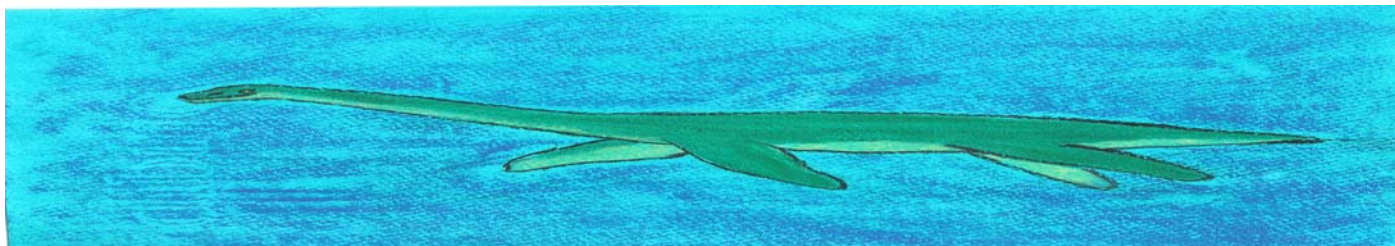
Where to Look: Fossils can be fun to collect if a person looks in the right place. The best way to find out where to collect fossils is to join a fossil club or visit a museum in your area. Many high school science teachers and college geology teachers are good sources of information. Sometimes libraries and bookstores have books on where to collect fossils. Ask your librarian or search the Internet.

Fossils can be found where buried sediments and rocks are exposed on the surface. Shallow streams and riverbanks can be good locations to look. Sometimes plowed fields and road cuts are great places. Gravel pits and quarries often contain fossils, but can be very dangerous. Always get permission before looking for fossils on private land. Look for unusual rocks or rocks with rounded or regular patterns. Find someone who knows where to look and go with them. Once you learn how to spot fossils, it will be very easy.

Safety: You should consider all the safety precautions that would be necessary with a similar outdoor activity such as camping or hiking. Always take the same precautions that a professional hiker or rock climber might take. There are many excellent safety resources available for these sports at your library or bookstore. Always consider the location and the weather when going outside. Learn about the dangers that are unique to your area. If you are going to look along a road, make sure that your car is parked in a location that is not going to interfere with traffic. Be very careful when stopping and when getting out of your car. Know where your friends are and avoid looking under cliffs and overhangs. It can be very dangerous to dig under a steep bank or walk below or above another rock hunter. Falling rocks are very dangerous. Also snakes and biting insects can be hidden under rocks. Wear a hat and gloves. Carry a first aid kit and use sunscreen. Know where your children are and make sure that they understand safety rules and set guidelines for their behavior. Unsupervised or poorly supervised children can easily become injured. Nothing is worth injuring your child!

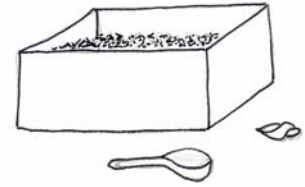
Tools: The easiest way to find fossils is to look for rocks that have weathered out of the ground. Digging is usually not a good way to find fossils. The main tools you will need are plastic bags to put the rocks in, a strong bag or pack to carry them, and a notebook to write down the locations. Toilet paper is great for wrapping delicate fossils and a paintbrush might be needed to brush off rocks to get a better look. You shouldn't need to pick or dig holes to find fossils. If you do, use a rock hammer and wear goggles!

Laws and Collecting Etiquette: Make sure you know the laws for your state for collecting fossils. There are usually restrictions for collecting on state and federal lands. Always get permission before collecting rocks or fossils on private property. Riverbanks and road cuts are often good locations for collecting fossils. Try not to dig or disturb the area too much. You are responsible to leave an area looking the same way it did before you came. Always write down the location of every fossil that you find. If it turns out to be special, you will want as much information as possible. You should be especially careful about collecting vertebrate fossils. If you find a fossil skeleton or several bones of an animal, it might be better to take a picture and show it to a paleontologist before picking up the bones. Fossils are less useful to paleontologists if they do not know the exact location where the fossil came from. Many times fossil bones are cracked or in pieces, and can be ruined if they are picked up. So call an expert if you think you found a plesiosaur!

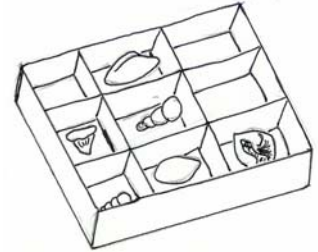


Paleontology Activities

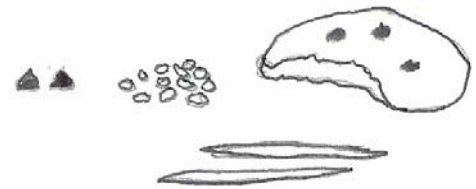
Fossil Hunt: Fossils can be hidden in a shoebox full of gravel. Children can use plastic spoons to search for fossils. When a fossil is found, the children can glue the fossil to a card. On the card, the children should write the date and write the name of the fossil. If you don't have real fossils, use seashells or make your own fossils out of clay.



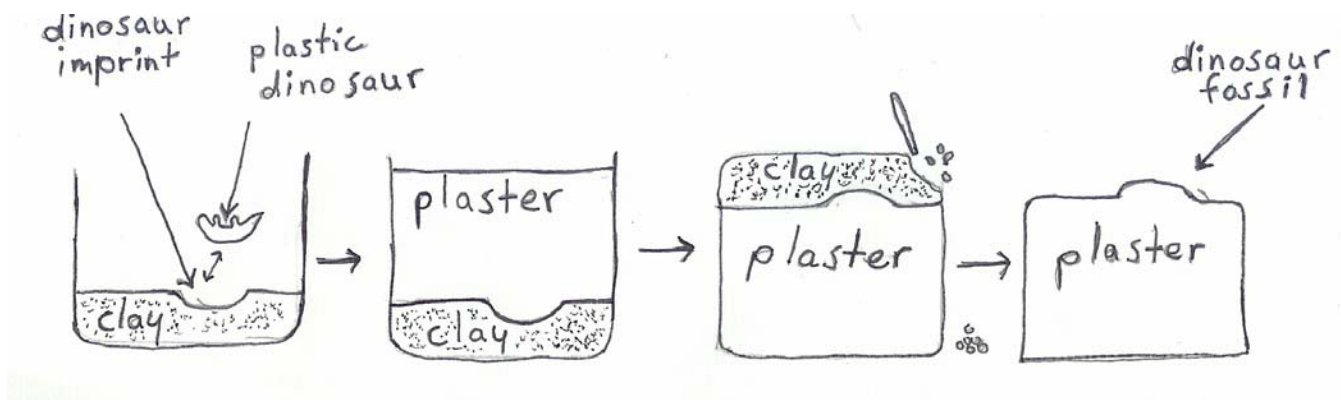
Fossil Collection: Fossils are much more fun to collect if they are organized into a collection. Get a box or display with several sections where you can display your rocks. Riker mounts and plastic cases can be found at craft and container stores. Hardware stores sell tackle boxes or plastic cases that have drawers for nails and screws. These cases are excellent for starting a rock collection. Label each rock with a number that goes along with your notes in your notebook. Write the location and what kind of fossil you think you found on a small card or label for each fossil.



Chocolate Chip Cookies: This activity introduces the children to how paleontologists work. Children are each given a cookie and the cookie represents a rock. The pieces inside the cookie (raisins, chocolate chips, nuts, and so on) represent fossils. The children become paleontologists and remove the "fossils" from the cookies. The children break their cookies apart and using toothpicks to separate the "fossils" into piles. The students are then asked to compare a cookie to a real rock.



Plaster of Paris molds: Place a thin layer (1/2" to 1") of clay in the bottom of a plastic bowl. Press a seashell or other object into the clay to make a print. You might use toy dinosaurs to make dinosaur footprints or lay the dinosaur on its side to make a dinosaur print. Remove the object or objects. Pour Plaster of Paris, plasticene or liquid latex over the clay so that it covers the print. When the plaster hardens, turn the bowl over. Children can use toothpicks, brushes, and spoons to carefully scrape the clay away to uncover the fossil just like real paleontologists!



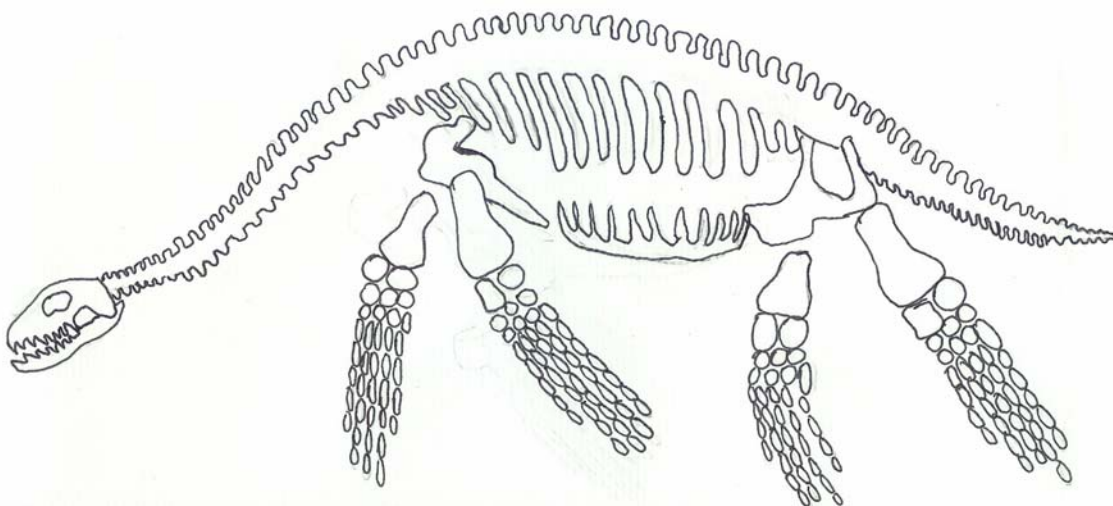
Owl Pellets: Owl pellets are an excellent way to introduce children to the way that paleontologists investigate fossil bones and the basic arrangement of mammal skeletons. Owls swallow their prey whole and then expel the contents after they have been digested. These pellets contain the bones of a mouse or other animal. Both adults and children love studying pellets because of the mystery of what they might discover. Owl pellet kits usually cover how the pellets are made and what might be found in the pellets. Children should separate the bones and fur from the other material and then arrange the bones to form as many complete skeletons as possible. The skeletons can be glued to construction paper for labeling and display. Owl pellet kits can be purchased through biological supply companies and through the Internet. Owl pellets that are commercially sold have been sterilized and are very safe. Nevertheless, children should wash their hands before and after working with the owl pellets.



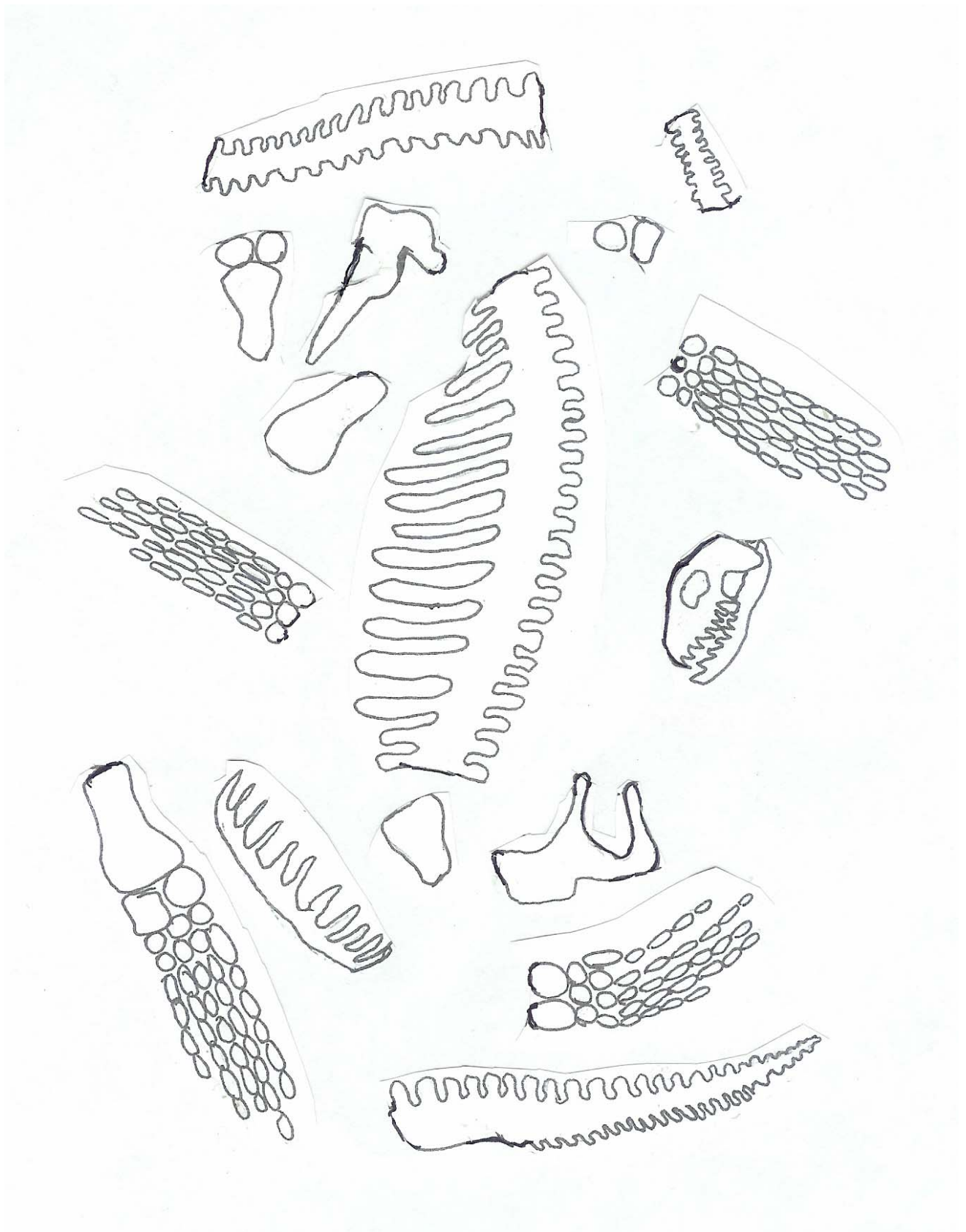
A Fossil Mystery: Although it is very difficult to find a dinosaur or a real mammoth fossil, children can experience the thrill of solving a paleontology mystery through this activity. First find a photograph of a real fossil skeleton from a large animal that lived in your area. Display the fossil picture and explain that this fossil was recently discovered near your house or school. Explain that paleontologists are trying to identify how the animal lived and what the environment must have been like when the animal was alive. Show the children some common fossils and rocks from the area (shells, petrified wood, sandstone or what ever fossils are common to your area). Have the students examine photographs of the teeth and/or claws to determine what the animal ate. Did the animal have flippers or a tail? How did the animal move? What do the other fossils tell you about the environment when the animal lived? Children can draw a picture to show how the animal looked and what the environment was like.



Plesiosaur Puzzle: Paleontologists rarely find complete fossil skeletons with all the bones exactly in the location where they should be. When animals die, their bones get scattered by other animals, water currents, and other natural processes. One of the jobs of paleontologists is to put the skeletons back together in the right order. On the next page you will find a picture of a plesiosaur skeleton. Cut out the bones and put them back together in the correct order. Glue the bones onto another piece of paper in their correct order. Use the picture of the completed skeleton below to help you.



Cut out the plesiosaur skeleton below and place the bones in the correct position. You may wish to glue the skeleton onto another piece of paper.



Dinomike and Tzeasaura Find a Plesiosaur Fact Sheet

Mesozoic Era: This era includes the Triassic, Jurassic, and Cretaceous periods. The Mesozoic, often called the age of dinosaurs, started about 246 million years ago and ended about 65 million years ago.

Cretaceous Period: The last period of the Mesozoic Era, beginning about 144 million years ago and ending about 65 million years ago. Dinosaurs and Plesiosaurs became extinct at the end of the Cretaceous Period.

Fossil: These are the remains of a plant or animal that is preserved in rock or as a single unit. Petrified wood, fossilized shells, animal tracks, teeth, and bones are common fossils.

Plesiosaurs: Marine reptiles that looked a little like dinosaurs with paddle-like flippers. Most early plesiosaurs ate squid, belemnites, and other soft-bodied invertebrates. Some short-necked plesiosaurs had large mouths and ate large animals including other plesiosaurs. The story “*Dinomike and Tzeasaura Find A Plesiosaur*” is about the discovery of a long-necked plesiosaur. These animals are sometimes called ‘elamosaurs’. They had a long neck and a short tail.

Petrified: Petrified is when something that was once alive is turned to rock. The original living material is replaced with minerals when the organic material is dissolved and minerals from ground water take its place.

Prehistoric Sharks: Sharks lose their teeth constantly through out their life and are some times the most common marine fossil in some areas. They are the most common vertebrate fossil found worldwide.

Belemnite: a squid-like (cephalopod) animal of the Cretaceous period. Most of the body was soft and did not fossilize easily except for a hard cigar shaped piece that is often found.

Ammonite: extinct squid-like animals that lived in shells similar to the modern nautilus. Their fossils often resemble large flat snail shells. Some ammonites can be found as large as six feet in diameter.

Other common marine fossils: Snails and clamshells are often common in some areas. In other areas echinoderms such as crinoids, sand dollars and sea biscuits can be found. Trilobites, and some branchiopods and crinoid fossils are found in much older rocks. The kind of fossils we find can help us to determine how old rocks are.

The changing earth: The earth is always changing. Fossils can tell a fascinating story about what things were like a long time ago. The earth is suspected of being about 4.5 billion years old. Most of the fossils we find are millions of years old. It is very hard to comprehend and explain these huge time periods. Separating and organizing your fossil collection based on age of the fossil is an excellent way to begin studying fossils. As you learn more you can expand your research. It is interesting to get world maps that show how the earth looked during the time period of your fossils. Continents move and the sea level goes up and down. Learning about how the earth looked when your fossils were alive can be very interesting.