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LESSON 2: EGG SHAPES

LESSON OBJECTIVES

1. Students will study fossilized dinosaur eggs and nests.
2. Students will identify general dinosaur egg shapes.
3. Students will match shapes with likely dinosaur types.

* Note: Student activities associated with this lesson plan can be found in the Nests and Nurturing section of the Dino Lab, as well as in Collections by clicking on the Dinosaur eggs case. Click [here](#) to view the student activity associated with this lesson plan.

TOOLS AND MATERIALS NEEDED

1. Images of a variety of dinosaur eggs
2. Student journal. Click [here](#) to download a blank journal page PDF.
3. Student activity sheet for matching egg shapes with probable dinosaur type. Click [here](#) to download.

ESTIMATED TIME TO COMPLETE LESSON

This lesson takes approximately 45 minutes to complete the observation part. This time may vary, however, depending on your students' computer skills, as there are several parts to the Collections Room that they will need to access. You might need to split it into two lesson periods and view part of the fossils one time and the others the next. If photos are downloaded and printed, it may take less time. The follow-up activity sheet should take no more than 15 minutes.

TEACHING STRATEGY

• Background Information

There are two basic dinosaur egg shapes: round (spherical) and oval (elongate). For each shape, sizes vary from only a few inches, up to 21 inches in length. Common round eggs tend to range from the size of an orange to the size of a cantaloupe. Among elongated eggs, the very long ones are more unusual. Eggs that measure 3 to 7 inches are more numerous. Some 18-inch eggs of a large *Oviraptor* were recently found in China and are unusually large for this kind of dinosaur egg.

Paleontologists cannot identify the species of dinosaur that laid the eggs just from the shape. Fossilized hatchling bones in a nest or adult dinosaurs found near eggs and nests are sometimes used to create hypotheses as to what animal might have laid the eggs, but this isn't always accurate, since they may represent predators or the egg-laying dinosaur's prey. The only way to be certain is to identify embryonic bones found in the egg. This has been done in some cases, but for many egg finds there is no definite identification.

Some general conclusions can be drawn from egg and nest evidence. Sauropods, like *Brachiosaurus*, and hadrosaurs, the duck-billed dinosaurs, laid round eggs, with the relative size of the eggs being dependent on the size of the adult. Theropods, the two-legged, meat-eating dinosaurs laid elongated or oval eggs.

Paleontologists also use eggshell texture and microscopic features to help them study and identify eggs. You can find more information about dinosaur eggs and egg identification in some of the books listed below.

Since this lesson introduces students to real fossils and how paleontologists study them, you may want to spend some time with students in the Dinosaur Academy's **Dino Hunters** section. There is a great deal of information and activities contained within Dino Hunters that will teach students about paleontology and what it means to be a paleontologist. Check out **Meet the Experts**, **Field Notes**, **Tools**, **How Dinosaurs are Named**, **Grant Writing**, **What is Paleontology?**, and **Famous Dino Hunters**.

- Procedure

1. Dino Lab Collections Room

- Students go to the Dino Lab Collections Room and locate the Dinosaur Eggs display case. Students study the eggs and read the labels that provide information.
- Students sketch the eggs in their journals and take notes from the labels, concentrating on the egg's shape and size. They should use the measuring tool and magnifying glass provided on the screen.

2. Egg Matching Game

- **Online** - Students try to determine which kinds of dinosaurs most likely laid each of the eggs presented by playing the Online Egg Matching Game. Once they have successfully completed the game, they then must download and print it.
- **Offline** - If the student cannot participate in the Online Egg Matching Game, click **here** to download a reproducible version that you and your students can complete in class. The eggs and dinosaurs are identical in both exercises.

- Discussion Questions

1. What egg characteristics did you observe?
2. If you were going to put eggs that are alike into groups, how many groups would you have and what would they be?
3. What differences can you see between eggs that have the same shape?
4. Why can't scientists be sure all the time about which dinosaur laid which egg? What aids them in making a determination?
5. Can you think of other evidence that might help identify the dinosaurs that laid the eggs?

- Resources

For information on specific dinosaurs, check out the **Dinopedia** on the JPI web site. If students inquire about dinosaur names, send them to **How Dinosaurs are Named** in the section entitled Dino Hunters.

Adult Books:

Eggs, Nests and Baby Dinosaurs by K. Carpenter
Hunting Dinosaurs by L. Psihoyos

Digging Dinosaurs by J. Horner

Children's Books:

Dragon Bones and Dinosaur Eggs by A. Bausum

The News About Dinosaurs by P. Lauber

Eyewitness books: Dinosaur by D. Norman & A. Milner

Feathered Dinosaurs by C. Sloan

The Handy Dinosaur Answer Book by T. Svarney & P. Barnes-Svarney

Graveyards of the Dinosaurs by S. Tanaka

Dinosaur Parents, Dinosaur Young by K. W. Zoehfeld

Readers' Digest Pathfinders: Dinosaurs

● Vocabulary:

- Paleontologist: Scientist who studies fossilized organisms
- Fossil/Fossilized: Remains of living things that have been changed into rocks through natural earth processes over millions of years
- Spherical: Round, shaped like a ball
- Elongate: Elliptical, shaped like a chicken egg or an avocado, with one axis longer than the other
- Sauropod: Largest land animals ever, plant eaters such as *Brachiosaurus*
- Theropod: Bipedal, meat-eating dinosaurs, such as *Tyrannosaurus rex*
- Hadrosaur: Large, duck-billed plant eaters such as *Maiaasursa*

Check the **Dinopedia** for more information about specific dinosaurs.

EXTENSIONS/ADAPTATIONS

Identify specific dinosaurs that laid round versus elongated eggs by having your students locate 10 dinosaurs from any of the following four taxons (classifications of dinosaurs): sauropoda, hadrosauridae, theropoda, or ceratopsia by using the Dino Cards within Dinopedia.

- a. Just click **here** to go to Dino Cards. Select any dinosaur from a listing of over 200 and click. When the Dino Card opens, click Get It under Fact Card. The last grouping is taxon.
- b. If the dinosaur is from one of the four above-mentioned taxons, Select Click here to print the card. Continue until the student identifies a total of 10 dinosaurs. (As a class, you may want to print out multiple Dino Cards, copy and distribute them to the students and have them work in groups.)
- c. Knowing that sauropods and hadrosaurs laid round eggs and theropods and ceratopsia laid elongated eggs, have the student group the 10 dinosaurs by taxon.

In addition to the shape of their eggs, have students identify other similarities among the dinosaurs within each of the taxons (such as overall shape of the dinosaur).

2. Older students may want to create a presentation about egg shapes and dinosaur adults. This could be in the form of a poster, computer slide show, or models.
3. Models of dinosaur eggs and nests can be built from clay or papier-mâché. Click **here** to view the egg-making activity entitled "Egging Them On."
4. As a class you may want to get an incubator and hatch some chicken or duck eggs.
5. Some students may want to investigate further by studying the dinosaur eggshell texture differences that paleontologists have discovered and described. There is also information in the books listed above about embryonic dinosaur models.

SCIENCE STANDARDS

Unifying concepts and processes in science

- Evidence, models, and explanation
- Form and function
- Evolution and equilibrium

Science as Inquiry

As a result of their activities in grades K-4 and 5-8, all students should develop understanding of:

- Abilities necessary to do scientific inquiry
- Understanding about scientific inquiry

Life Science

As a result of their activities in grades K-4, all students should develop understanding of:

- Characteristics of organisms
- Life cycles of organisms

As a result of activities in grades 5-8, all students should develop understanding of:

- Structure and function in living systems
- Diversity and adaptation of organisms

Earth and Space Science

As a result of their activities in grades K-4 and 5-8, all students should develop understanding of:

- Earth's history

Science in Personal and Social Perspectives

As a result of their activities in grades K-4 and 5-8, all students should develop understanding of:

- Science and technology in society

History and Nature of Science

As a result of their activities in grades K-4, all students should develop understanding of:

- Science as a human endeavor

As a result of activities in grades 5-8, all students should develop understanding of:

- Science as a human endeavor
- Nature of science

ASSESSMENT/EVALUATION RECOMMENDATIONS

Student journal

Student activity sheet

Student-created models or presentations

Lesson Assets for DNA use

1. Pictures – 3D eggs created from Dinosaur Eggs case in Collections
2. PDF Files –
 - Blank journal page

- Reproducible version of online matching game

3. Links

- Associated student activity
- Dino Hunters
- Meet the Experts
- Field Notes
- Tools
- How Dinosaurs are Named
- Grant Writing
- What is Paleontology?
- Famous Dino Hunters
- Dinopedia (<http://www.jpoinstitute.com/dinopedia/index.jsp>)
- How Dinosaurs are Named
- Egging Them On egg-making activity
(<http://www.jpoinstitute.com/activity/activityIns1.jsp>)
- Dino Cards (http://www.jpoinstitute.com/dinopedia/dc_dinocards.jsp)