

SECOND GRADE SCIENCE SAMPLER

CLASS: SCIENCE SAMPLER: ARTHROPODS

Students will learn the primary characteristics of arthropods and meet some arthropods from the Palo Alto Junior Museum and Zoo.

Pre Activity:

Do!

Arthropod Origami

Provide each student with a piece of paper. Instruct the student to fold it in half. Point out that, when you open the paper, the two sides look exactly the same. Define this as (bilateral) symmetry. Explain that many creatures have (bilateral) symmetry and that you are going to make one using the folded paper. Re-fold the paper and help students draw half an arthropod's body along the folded side. (Suggestions: crab, spider, butterfly, and ant.) It may help to provide samples of half-bug templates to assist struggling students. (see below) Instruct students to cut along the lines they've drawn. Open up the paper to see the perfectly symmetrical arthropod! (For classes that struggle with cutting, consider doing the same lesson using paint on one side along the central fold of the opened paper. Simply fold the clean side over the paint, press, and open to see your full arthropod.)

Think! Discuss or Write

Why do we have skeletons? How would a skeleton's job change if, instead of being on the inside of our bodies, it covered the outside of our bodies?

Post Activity:

Do!

Egg Carton Arthropods

Put your old egg cartons to good use! Ask students to design their own arthropods. Remind them to include segmented bodies and pairs of legs. Be creative in material options. For bodies, offer bits of egg cartons (1, 2, 3 or more lumps!), a mound of clay, or sticks. Pipe cleaners make great, bendable legs. Use tissue paper glued or taped between pipe cleaners to make wings. Have students introduce their creations to the class, explaining how many body segments and legs their creature has. If time or resources are an issue, simply use markers or crayons to create arthropods on paper.

Learning Goals Reinforced:

- Arthropods have segmented bodies.
- Arthropods have pairs of jointed legs.

Think! Discuss or Write

What makes exoskeletons so special and great for these little animals? Do exoskeletons have any drawbacks?

Link:

http://www.globio.org/glossopedia/article.aspx?art_id=15

SECOND GRADE SCIENCE SAMPLER

CLASS: SCIENCE SAMPLER: ROLLER COASTERS

Students will learn about energy, friction, gravity, and traction as they build roller coasters with bendable tubing around the classroom.

Pre Activity:

Do!

Ramps and Rolls

Experiment with energy! Get a small ramp and three marbles of varying size. (For a makeshift ramp, lean one end of a long book on a short stack of books.) Place an empty juice or milk carton at the end of the ramp (cut the top off and face the opening to the bottom of the ramp.) Place the marble in the middle of the ramp and let go! Have students watch the marble push the juice carton with the energy it gathers from the ramp. Measure the distance the juice carton moves. Repeat the experiment from the same height on the ramp with a smaller marble and a larger marble. Which marble has the most energy and pushes the juice carton farthest? For a fun variation, pick one marble and drop it from different heights on the ramp. Will that affect how far the box moves?

Think! Discuss or Write

We need to eat food so that we have energy to do work. Pose thought experiments for your class. What would their school day be like if they stopped eating meals? What if they ate only candy for breakfast and lunch?

Post Activity:

Do!

Online Roller Coaster Making

Let your students' imaginations run wild in designing their own roller coasters online! Check out the following fun websites that test your students' abilities to problem solve and use basic science principles to make fun and safe rides.

Beginner: <http://www.funderstanding.com/coaster>

Advanced: <http://www.learner.org/interactives/parkphysics/coaster/>

Learning Goals Reinforced:

- Rollercoaster science involves energy, gravity, friction, traction, and many other physics concepts.

Think! Discuss or Write

Have you ever been on a roller coaster? Which part was the scariest for you? Why?

Try to relate students' feelings about a roller coaster ride to the speed and energy produced during that part of the ride.

Link:

<http://www.learner.org/interactives/parkphysics/>

SECOND GRADE SCIENCE SAMPLER

CLASS: SCIENCE SAMPLER: SAND

Students will learn how sand is formed. They will observe samples of sand with special characteristics and make a small sand collection to take home.

Pre Activity:

Do!

Sandy Spots

Encourage students to think of all the environments in which they might find sand. Provide groups of students paper and coloring supplies. Instruct students to select and draw a sandy environment, leaving an empty space for the sand deposit, but coloring amazing environmental details with their paints or crayons. When ready, provide each group with white glue and a cup of sand. Show students how to cover their empty sandy spots with glue (a paintbrush might be helpful) and then sprinkle sand on top. Let students share their sandy environments with one another!

Think! Discuss or Write

Ask your class to list as many words as they can to describe sand: its color, smell, shape, texture, and movement.

Post Activity:

Do!

Sand Making

Help your students make sand from local rocks! Remind students that weathering happens as a result of wind, water, and heat. Set up three stations to explore these ideas. At station one, put two rocks in a bucket of water to sit for a short while next to a black piece of paper. At station two, leave two rocks sitting outside in the sun next to a black piece of paper. At station three, simply place two rocks on a black piece of paper. Invite students to rub the rocks together over the paper at each station. At station three, give them the extra job of blowing on the rocks as they rub! After students get to try each station, take a tour and examine how much sand was left on the black papers. Which station made the most sand?

Learning Goals Reinforced:

- Sand is often made from rocks.
- Rocks are weathered into small pieces by sun, wind, and rain.

Think! Discuss or Write

Why do you think some sand grains are finer, or smaller, than others?

Link:

<http://www.sand4students.net/en/textbook/text02.html>

SECOND GRADE SCIENCE SAMPLER

CLASS: SCIENCE SAMPLER: FOSSILS

Students will learn that fossils are made in a variety of ways. Students will touch fossils from our collection and make casts to take home.

Pre Activity:

Do!

Get Digging!

Scientists who study living things in the environment around them need to be excellent observers. Take the class on a walk around the schoolyard. Ask students to look for signs of living things: birds, nests, tracks, flowers, fallen leaves, etc. Back in the classroom, create a list of the plants and creatures that live around your classroom. Ask students what you would have to do if you wanted to go outside and learn about plants and animals that lived in the schoolyard long ago. (Dig down deep!) If time permits, allow students to dig in a bucketful of dirt from outside. (Some teachers even like to hide toy fossils or dinosaurs or leaves for students to find.) Explain that this hard digging and searching is how scientists have learned about all the dinosaurs and creatures that lived on the planet long ago.

Think! Discuss or Write

What do you think our world looked like a long, long time ago? Ask students to think about the land, water, plants, and other living things that were on our planet long ago.

Post Activity:

Do!

Fossil Making Comic Strips

Here's a fun test to see what students remember about the fossilization process. Give each student a copy of the comic strip template (see below). Instruct students to draw the process of fossilization, beginning with a living creature in the panel number 1. Encourage students to draw as many steps as they can remember in the correct order. Can anyone fill all eight panels?

Learning Goals Reinforced:

- Fossils are often made through the process of replacement mineralization.
- Scientists use fossils to learn about the history of the world.

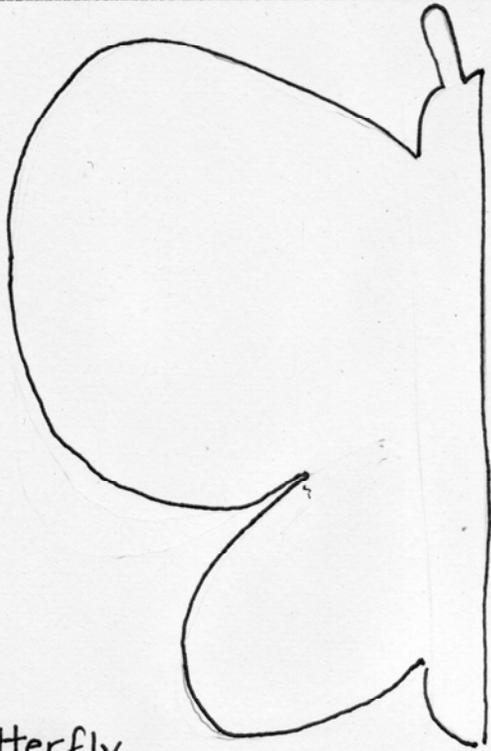
Think! Discuss or Write

How do you think scientists can make such great guesses about what dinosaurs looked like?

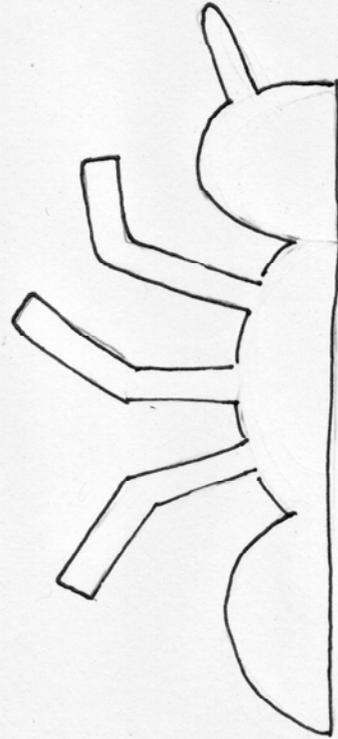
Link:

<http://www.sdnhm.org/kids/fossils/index.html>

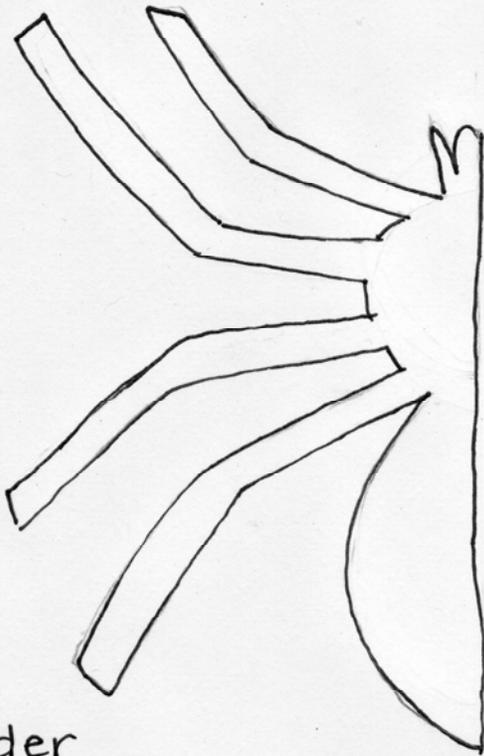
Arthropod Templates for Symmetry Project



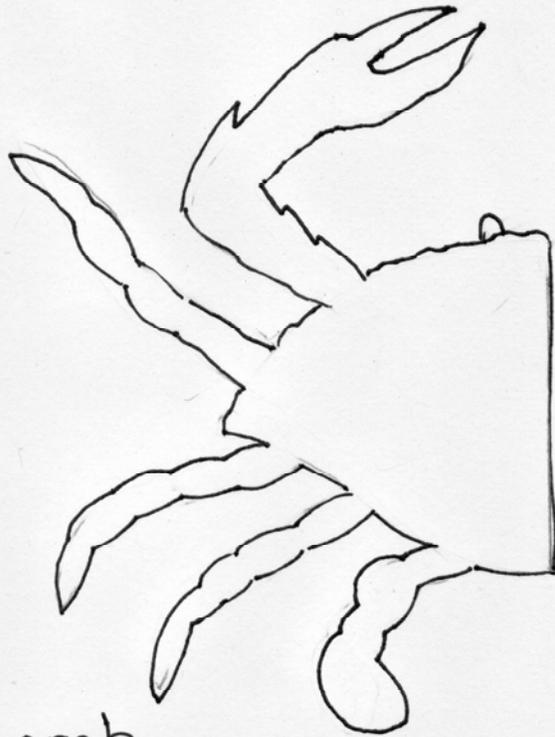
butterfly



ant



spider



crab

Name _____ Date _____

How Fossils Are Made
A Comic Strip Story

Draw the steps of the fossilization process in comic strip form. Begin with a living creature in box one. Continue drawing in the boxes until you are done telling the story of that creature's fossilization. Fill as many boxes as you can!

1	2	3	4
---	---	---	---

Name _____ Date _____

How Fossils Are Made
A Comic Strip Story

Draw the steps of the fossilization process in comic strip form. Begin with a living creature in box one. Continue drawing in the boxes until you are done telling the story of that creature's fossilization. Fill as many boxes as you can!

5	6	7	8