Change Over Time

Geologic History

ROCKS ROCK!

Objective: Intro to geology, students learn to differentiate between rocks and can later learn to identify using certain characteristics.

Materials: Students bring in their own rocks, mineral/rock keys for further identification

Procedure:

1. Have each student collect as many different rocks as possible, either brought into class or walk around campus)
2. Back in the classroom, divide the class into four teams. Let the students pool their rocks and arrange them in various ways: from smallest to largest, lightest to darkest, by sharpness and smoothness, etc. If the students have learned to identify rocks and minerals, let them group them by kind. Any rocks that cannot be identified could be set aside. As a special challenge, these might be identified using rock and mineral keys.

Tectonic Plates

Objective: Intro to the Earth's structure, plate tectonics, and Pangaea.

Materials: Colored craft foam sheets, construction paper, play dough, and scissors

Procedure:

1. Have students/partners cut out craft foam to create South America and Africa (print out traceables). Then fold a piece of construction paper into an accordion. First set continents close together placing a piece of play dough to weigh them down. Then as they pull each side of the construction paper, see the continents move!
2. What does the construction paper represent? Do the continents move slow or fast? What will the earth look like in the future?

Plants and Animal Adaptations

Seeing/Drawing Leaves

Objective: Understand leaf structure (shape, edges, veins, etc.) and practice leaf data collection.

Materials: Leaf per student, paper, and pencils

Procedure:

1. Have children draw leaf shapes looking closely at a leaf. Try different perspectives. How does a leaf on the ground look from the top of a skyscraper? From standing up above it? From on your hands and knees? From a bug walking on it? From a cell inside it?
2. Distribute a leaf to each student. (Choose leaves that have a very simple form, smooth edges, simple vein structure and one that lies reasonably flat on the table. California Bay Laurel is a good start.)
   Have students hold the leaf in one hand, and feel all around the edge of the leaf with the other hand. Then pick up a pencil and trace the shape of the leaf in the air. Practice several times. Add veins, brown spots, etc. Now draw on paper. Then try a more complicated leaf such as a leaf that has jagged edges or inter-connecting veins. Emphasize that when students are in the field (if time permits), the plant holds the leaf for them. They do not pick it to sketch it.

Hello Flower!

Objective: Become familiar with wild flowers in the Marin Headlands.

Materials: Flower cards and nerf ball

Procedure:

1. Find large pictures of flowers that would be found in the Headlands. The flower cards should be easily visible from across the room. Picture should cover most of the card, with the name at the bottom.
2. Sitting in a circle, each child holds a flower picture with the name showing. The game is played by throwing a nerf ball to one child, singing the name of his plant: "Hello, Lupine!" as the ball is thrown to him. He then throws the nerf ball to another cardholder, singing the name of her card: "Hello, Poppy!" and so on around the circle. Once the game has been played with all flowers showing, the names are folded under, with just the picture of the flower showing, and the game continues in the same manner.
3. This game can be used for any aspect of natural history…mammals, rocks, etc. After the trip, a game might include names of animals, plants, marine invertebrates, etc.

Birds and Worms

Objective: Understand the purpose of camouflage and why it benefits the organism.

Materials: Colored toothpicks and a lawn area.

Procedure:

1. "Worms", 10-15 toothpicks each of four different colors, are spread out over about 200 square feet of lawn.
2. Participants become birds looking for worms to eat. They first guess which "worms" will be easiest to find, then they make the first flight for about 30-45 seconds. Talk about the results and compare them to you guess. Try a second flight.
3. Talk about what you have learned about protective coloration. Of you were a worm, what color would help you survive?
4. Try the exercise again with red cellophane over the birds eyes.