

Hike Activities

Hand Shale Fossils:

- **Time & Place:** (10 min.) At shale outcrop near PFL trailhead.
- **Materials:** Ink pads, foam leaf & insect shapes. Stored in Ranger Hike Kits.
- **Ages:** All ages
- **Procedure:** Divide kids into small groups, 4-6 students per group, and have them sit or stand in small circles. Tell the story about sedimentation in the ancient Lake Florissant, and have each group of kids act out the story using their hands to represent layers of sediments.
 - *“Once there was a lake here, with an active volcano nearby. Volcanic ash fell into the lake, fertilizing the water with mineral nutrients like silica.”* Sprinkle a small amount of sand into the middle of each circle of students.
 - *“Guess what grew in the warm, nutrient rich water? Thick mats of slimy green algae grew on the lake’s surface!”* Have one student in each group hold a hand out, above the middle circle.
 - *“Eventually, the algae would use up all of the available nutrients and die. The mat of dead algae would sink to the bottom of the lake, along with weathered ash, and become a layer of mud.”* Bring the hand down to waist level (or to the ground if sitting) to show the algae mat sinking.
 - *“Season after season, new mats of algae grew on the surface, died, and sank to the bottom of the lake, building up layer upon layer of mud.”* Repeat previous steps, with each new hand being stacked on top of the previous hands, until every student has at least one hand in stack.
 - *“Sometimes, a leaf or insect would fall into the lake. It would sink down to the mud, and then get buried by more layers of mud above it.”* Use an ink pad to cover both sides of a foam shape in ink, place it on top of the sediment (hand stack), then add more layers (hands) on top.
 - *“Eventually the lake drained, but the layers of mud were buried deep underground. They were squeezed and compressed for millions of years to become a layered rock called shale.”* Have kids squeeze their stacks of hands together.
 - *“After 34 million years, scientists came along and dug up the shale rocks, and split the layers apart. The soft bodies of the leaves and insect had broken down, but all of the carbon and organic materials in them had left a stain on the layers of rock- a fossil.”* Have kids separate their hands, remove the foam stamp and check for an ink “fossil”. Note that each fossil appears twice, on the layer above and the layer below the leaf or insect.
- **Tip:** Make the story exciting! Dramatize and embellish as needed.
- **Tip:** Keep control of the ink! You, as the story-teller, get to ink up the stamps and hand them out. There are 5 foam shapes in each set, stored in the ink pad case. Make sure each circle of students gets one.
- **Heads up:** Ink fossils can get smeary! After the hike, the student can wash their hands as best as they can with soap and water or keep it as a little souvenir from the park.

Twisted Bandana Tree:

- **Time & Place:** (5 min.) At dead Ponderosa Pine tree on PFL.
- **Materials:** Bandana. Stored in Ranger Hike Kits.
- **Ages:** All ages
- **Procedure:** Use a bandana to demonstrate why the Ponderosa Pine has twisted heartwood. Loosely roll the bandana to form a “tree trunk” and have students try to bend it. Then, twist the bandana into a tight spiral and have kids try to bend it again. The twisted shape adds a lot of structural support. For

Height of an Ancient Redwood (aka: If a Redwood falls in the forest, will it squish you?):

- **Time & Place:** (10 min.) At the Big Stump, continuing ~250 ft. down trail.
- **Materials:** None.
- **Ages:** All ages
- **Procedure:** Have students look at the size of the Big Stump, and think about how tall the original tree might have been. Do not give answers right away. Ask students to imagine that the tree is still alive and still at its original height, but it is about to fall over onto the trail. How far down the trail would they have to stand, to avoid getting squished by the falling tree?
 - Have students walk ahead of you and each pick a spot along the trail to stand starting from the fence around the Big Stump. Challenge them to be the closest to where the top of the tree would land... WITHOUT it landing on them!
 - Once everyone has chosen their spots, measure the distance. Starting at the Big Stump and pace off 80 large paces down the trail. Assuming each pace is 3 feet, 80 paces = 240 feet, approximately the estimated original height of the tree. If still available, the wayside exhibit on the trail in the middle of the valley is about 250 ft.
 - Any kids you pass while measuring paces are “squished” by the falling tree. When you finish 80 paces (or make it to the wayside exhibit), whoever is closest but still beyond you “wins” the challenge.
 - Gather up the group at the 80 paces mark (or at the next stump, wherever there is ample space) and look back at the Big Stump. Ask kids to again visualize the height of the original redwood tree.

Tip: Set rules and boundaries before allowing students to go pick their spots on the trail. Remind students to walk, not run – the imaginary tree isn’t falling that fast! The students will not need to pass the bend on the trail where the next petrified stump is. Stay on the trail. Be respectful of other visitors and park staff that may be on the trail.

Petrified Tree Rings (aka: how old was this tree?):

- **Time & Place:** (10 min.) At one or more short stumps, on east half of PFL.
- **Materials:** Measuring tape, string, small ruler, sliced petrified wood specimen with visible tree rings, and tree cookie of modern wood. Stored in Ranger Hike Kits.
- **Ages:** 3rd grade and older

- **Procedure:** The goal of this activity is to determine how old trees were before they were buried and petrified. Students should collect and analyze their own data to figure out the answer for themselves.
 - Explain what tree rings are, and how they can be counted to determine the age of a tree. Use a tree cookie from a modern tree to demonstrate.
 - Since not all of the rings are visible on top of a petrified stump, we have to estimate based on a small sample. Using a ruler and a sliced specimen of petrified wood, have a kid measure the average number of tree rings per inch. (Answer: approx.. 15 rings/inch on most samples.)
 - Measure the diameter of the stump... WITHOUT crossing the fence! To do this, attach a string to the end of the measuring tape. Have one student hold the tape measure, while a second student holds the string and stands on the opposite side of the fence circle. Pull the string until the "0" mark hovers over one edge of the stump, with the measuring tape stretched across the diameter of the stump. Read the measurement above the other edge of the stump.
 - Calculate the radius of the stump, by dividing the diameter by 2. Remind everyone that tree rings start at the center of the tree, not the far edge.
 - Have students multiply the radius by the number of tree rings per inch. This will give you an estimate of the total number of tree rings, and therefore the age of the tree.
 - Example: For the small stump with the most visible rings (first one after the Big Stump):
 - 80 inches diameter \div 2 = 40 inches radius
 - 40 inches radius X 15 rings/inch = 600 rings = approx. 600 years old.
- **Optional Extension:** Compare the number of tree rings per inch, for a petrified wood specimen versus a modern day tree cookie. Which has thicker rings (i.e. fewer rings per inch)? Which had more ideal growing conditions (i.e. thicker rings = more ideal growing conditions)?
- **Tip:** Remind students that this activity measures the age of the individual tree when it was alive, BEFORE it was buried by the lahar. It does not tell us how long ago the tree was buried. Scientists use other methods (like radiometric dating) to determine that.

Ranger Hike Kit Supplies:

1. (1) Tape Measure, with Parachute Cord
2. (1) Polished Petrified Wood Specimen
3. (1) Modern Tree Cookie
4. (2) Mini Rulers
5. (2) Ink Pads
6. (5) Foam Stamps
7. (1) Bandana
8. (1) Caprock Conglomerate Sample
9. (1) Shale Sample
10. (1) Pikes Peak Granite Sample
11. (1) Mudstone Sample

12. (2) Magnifying Lens
13. (1) Lesson Plan Sheet
14. (11) Laminated sheets
 - a. Mesohippus
 - b. Hornbek Homestead
 - c. Artist rendition of the lahar
 - d. Aberts Squirrel
 - e. Brontothere
 - f. Fossil of the *Podryas Persephone* (butterfly)
 - g. Artist rendition of the ancient lake
 - h. The Big Stump
 - i. Fossil of the *Paleovespa* (Yellow Jacket Wasp)
 - j. Giant Sequoias size card
 - k. Mt. St. Helens card

*Please make sure Ranger Hike Kit Supplies are all in the box before returning the box the visitor center

** If you notice an issue with your box, please address it with a ranger **before** starting your activities. In the event something does happen to your supplies/box while on the trail, please let the ranger know.