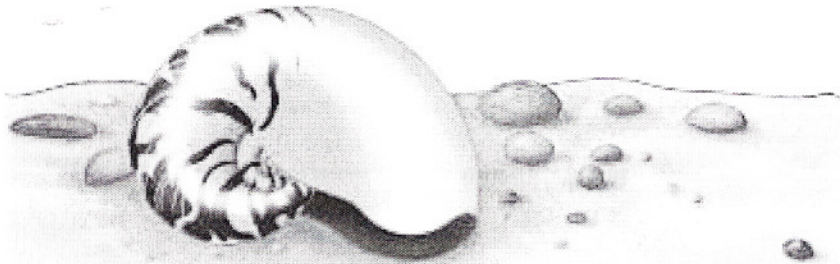


# Reinforcement Fossils and Evolution

**Directions:** Complete the following sequencing activity.

1. Put the following fossil-forming events in the order in which they occurred by writing the numbers 1–6 on lines provided.



- \_\_\_\_\_ A. The sediment is squeezed and cemented together into rock.
- \_\_\_\_\_ B. The seashell becomes buried in sediment.
- \_\_\_\_\_ C. Other sediments fill the hollow place and harden into rock.
- \_\_\_\_\_ D. A seashell falls into the mud.
- \_\_\_\_\_ E. Someone finds the fossil of a seashell buried in sediment and rock.
- \_\_\_\_\_ F. Holes in the rock let water and air reach the seashell and dissolve it, leaving behind a hollow place in the rock.

**Directions:** Answer the following questions using complete sentences.

- 2. Why is an organism with hard structures more likely to become a fossil?  
\_\_\_\_\_  
\_\_\_\_\_
- 3. How are permineralization and replacement similar?  
\_\_\_\_\_  
\_\_\_\_\_
- 4. Why is an original material fossil so valuable to a paleontologist?  
\_\_\_\_\_  
\_\_\_\_\_

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# *Enrichment*      **A Petrified Forest**

In the permineralization and replacement processes, mineral-carrying water seeps into empty spaces in once-living organisms. When the water leaves, the minerals are left behind. Over time the deposited minerals form a hard, rocklike fossil. At the Petrified Forest in Calistoga, California, these processes have created an entire forest of petrified wood.

**How it Happened**

Imagine standing in a grove of redwoods about 3.4 million years ago. In the near distance you see a puff of smoke from a nearby volcano. Next you hear a thundering noise. A huge dark cloud comes billowing toward you. You are knocked to the ground by a tremendous blast. You can hear tree trunks cracking and snapping, and limbs are falling all around. You smell the stench of hot sulfurous gas as things around you suddenly begin to burst into flame. The sky darkens as the entire area is engulfed by ash.

The fire calms down and a steady "rain" of ash falls to the ground. You escape, but soon ash begins to bury all of the trees—those knocked to the ground and those still standing.

The eruptions continue for a million years or so, laying down layer upon layer of ash. Stream-carried sediments also deposit layers of mud.

In time, the ground becomes saturated with water that contains dissolved silica from the layers of ash. The silica is carried by water through the ash and mud to the buried forest below. The water seeps into the trees, and molecules of silica seep into the wood. The silica replaces the wood and eventually the wood becomes solid silica and solid quartz. The once wooden forest has been turned to solid stone.

Over time, the layers of ash and mud erode away, leaving the petrified forest exposed again. The petrification process in Calistoga occurred under very favorable conditions. To this day, sections of the petrified wood can be examined under a microscope, and the details of the wood's structure can be observed. Because of its uniqueness, the Petrified Forest in Calistoga is a popular tourist attraction.

**Directions:** *Respond to each statement or question in the space provided.*

**1. Analyze** How were the conditions in the Calistoga area favorable for the formation of fossils?  
\_\_\_\_\_  
\_\_\_\_\_

**2. Indicate** the source of the silica that seeped into the wood.  
\_\_\_\_\_

**3. Infer** the types of information scientists can obtain from the "trees" in the Petrified Forest.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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