

Garden of the Gods Park
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Garden of the Gods Experience Program

Welcome! We look forward to sharing the Garden of the Gods with you and your students. Here are a few things to bear in mind as you prepare for the field trip:

- Your field trip begins at the Garden of the Gods Visitor & Nature Center.
1805 N. 30th St. Colorado Springs, CO 80904
- Your field trip ends inside the Garden of the Gods Park at our **North Main Parking Lot (Lot #2)**. Maps are available in the Visitor and Nature Center. Our staff will coordinate with your bus driver on the pick-up location the day of your visit.
- This is a large group event intended for one class to participate together. Our posted maximum of 30 students is flexible. Details can be addressed at registration.
- Our curriculum can be tailored within the scope of earth science, life science, and history to fit the needs of your class. Details can be addressed at registration.
- All attending should be prepared to walk roughly two miles on a mix of dirt, gravel, and paved surface during their visit.
- Check the weather forecast and dress appropriately! This is a two-hour, outdoor experience. We will end your adventure early if students are improperly dressed for the weather conditions.
- Please, let us know in advance if you have any students with special needs (e.g. wheelchairs, crutches, medical conditions, etc.).
- Parent chaperones are welcome, but not required.
- Please, no pets or student siblings allowed.
- Students, chaperones and teachers are asked to silence cell phones during the field trip. Students should refrain from using any electronic device save to take pictures or videos. Taking photos is acceptable provided it is not distracting.
- Payment is due the day of your trip. Cash, credit card, and checks accepted. The cost is \$2 per student. No cost for adults, but donations are recommended. Please, make checks out to:

Garden of the Gods Visitor and Nature Center

Garden of the Gods Experience Program Description

We align with National STEM standards for grades 9-12 Life Science, Earth Systems, and Earth and Human Activity

We align with Colorado State Standards for Science: Life Science and Earth Systems Science and for Social Studies: History

Goals:

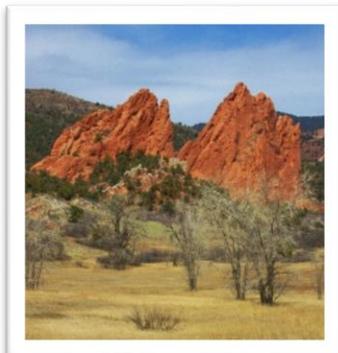
- Students become invested in understanding and caring for the exceptional wonder of the Garden of the Gods and the world around them
- Students gain an understanding of the various forces at work that shape and color the natural world
- Students gain an understanding of how humans use and shape natural surroundings
- Students are familiarized with the park's six ecosystems, how organisms have adapted to the conditions of these ecosystems, and how introduced species and human activity impact ecological balance
- Students understand the geological timeline of the region and how ancient events impact today's world and can be used to predict future outcomes
- Students understand responsible citizenship bolstered by knowledge of the region's history and how it shaped the world they've inherited

Schedule:

- Field trips run Tuesday thru Thursday from 9:30-11:30 AM or 12:00-2:00 PM. We will not start earlier or run later than scheduled times.
- Programs are available September 27, 2016 through May 11, 2017.
- We follow Colorado Springs School District 11 schedule for Holiday and Spring Break closures. There are no programs offered in January and February.

Daily Agenda:

- Staff members greet you outside the Visitor & Nature Center near the flagpole at Bus Loading Zone #1. Teacher is escorted inside to complete payment for the program.
- After a brief orientation, your class is guided into the Park where staff and volunteer docents will address the area's geology, ecosystems, history, and student questions. This is a walking tour on concrete and gravel surfaces.



- The format is very open, allowing students to engage at their interest level.
- Your program ends at the Park's North Main Parking Lot (lot #2) off Juniper Way Loop. Staff will direct your bus driver where to park.
- If you need to depart the Garden earlier than your scheduled time, please let us know as soon as possible and we can adjust your program accordingly.

Garden of the Gods Experience: Overview

- Ideal for students in grades 9-12 engaged in Earth Science, Life Science, or History coursework
- We guide students in exploring the vast resource that is Garden of the Gods Park
 - History of human use dating back 12,000 years
 - Ancient Peoples, American Indian Nations, European/American Exploration, Prospectors and Pioneers, Growth of Colorado Springs, Recent History
 - Geology of the Park
 - 1 billion years of geological history, plate tectonics, rock formations, geological forces, fossils, climate change, human impact
 - Ecology
 - Multiple ecosystems, climate, weather, disease, food web, natural crossroads, human impact
- At registration, teachers may request specific emphasis on topic areas (i.e. a focus on the Park's geology, etc.)
- The program takes place entirely outdoors. You are welcome to arrive early or stay late to let students explore the Visitor and Nature Center.
- Please call ahead if you need to cancel due to inclement weather. We will not cancel a scheduled program on our own. District closures due to weather will result in cancellation of your trip.
- Should students prove inappropriately dressed for weather conditions, we reserve the right to end your visit early and return students to their bus/cars.

Teacher Reference Guide:

Geology of Garden of the Gods

The Pike's Peak region has been shaped by millions of years of mountain building and erosion. There have been three different mountain building events in the geological history of this area:

1. *The Ancestral Rockies* (290-320 million years ago). The erosion of these first Rocky Mountains formed the sedimentary Fountain Formation and the Lyons Sandstone layers.
2. *The Laramide Orogeny* (70-40 million years ago). This process uplifted the Front Range. The layers seen in the Garden were forced upright as the land broke apart creating the Rampart Range Faulting System. These mountains still exist as the upper half of mountains along the current Front Range.
3. *Late Tertiary Uplift* (5 million years ago). Ongoing erosion and uplift has spread Pike's Peak granite throughout western Colorado Springs. Pikes Peak granite has been dated at over 1 billion years in age using geologic radiometric dating methods.

The erosion of this time period exposed the upright fins (hogbacks) seen in the Park today. The bowls on Pikes Peak were scoured out by glaciers during the last Ice Age that ended 10,000 years ago.

The Garden of the Gods Park is composed of sedimentary rock layers. They are geologically remarkable due to their vertical and in some cases beyond vertical positions. This allows study of rock that in other areas has been buried by layers of sediment nearly a mile thick. Students will explore some of these:

Pierre Shale (73-70 million years old): Formed when Colorado was beneath the Western Interior Seaway. Composed primarily of shale with layering of marl, sandstone, and clay in certain regions. Natural and artificial fracturing (fracking) has produced hydrocarbons in Fremont and Boulder Counties and the Raton Basin, Colorado. Pierre Shale exists in our Park between the Visitor and Nature Center and Rattlesnake Ridge.

Niobrara Formation (88-70 million years old): Also formed beneath the Western Interior Seaway of the late Cretaceous at a time of deepening seas. Composed primarily of limestone and chalk sometimes separated by layers of shale. Holds excellent examples of marine fossils. Exposed in our Park along Niobrara Ridge and Rattlesnake Ridge.

Dakota Sandstone (112-100 million years old): Shallow marine formation from river deltas, beaches, etc. as the Cretaceous Seaway was forming. Composed primarily of sandstone with layers of shale and limestone in areas. Differs in composition from Dakota Group found in the Midwest (eastern side of Cretaceous Seaway). Exposed in the Park between Rattlesnake Ridge and Juniper Way Loop.

Lyons Formations (300-260 million years old): The local climate changed and this part of Colorado became a windswept desert filled with sand dunes. The formation is composed of three layers, two of which are visible in the Park (upper member and lower member). The red color is from iron becoming iron oxide (rust), which helps cement the grains together. The Lyons formations are the tallest rocks in the Park and include: North Gateway Rock, South Gateway Rock, White Rock and Gray Rock.

The Fountain Formation (320-300 million years old): Composed of sand, gravel, and mud that washed down from the Ancestral Rockies in alluvial fans. These sediments compacted and cemented into the conglomerates, sandstone, and mudstone (shale) of the Fountain Formation. This layer is over 4,500 feet thick. Formations in the western part of the Garden are made up of Fountain Formation: Balanced Rock, Three Graces and Sentinel Spires.

There are other rock formations in the Park, including the Lykins and Morrison Formations, and the Benton Group. However, these exist in parts of the park that will not be experienced close-up during this field trip.

All the various sedimentary layers were gradually compacted and cemented into rock. Beginning about 70 million years ago these layers were broken and tilted upright. Erosion has exposed the ridges and carved out the valleys to what we see today.

Fossil evidence of dinosaurs and ancient marine animals has been found in the Park. The skull of a dinosaur named *Theiophytalia kerri*, a type of iguanodon, was found in the Garden of the Gods in 1878 by Colorado College Professor, James Kerr. The fossil dates to the early Cretaceous period and is the only evidence this species found anywhere in the world

Ecology of the Garden of the Gods

The Garden of the Gods is a tapestry of plants and animals from six different ecosystems.

- Prairie Grasslands
 - Animals – Prairie Rattlesnake, Coyote, Striped Skunk, Mule Deer, Magpie, Red-Tailed Hawk
 - Plants – Prickly-Pear Cactus, Yucca, Paintbrush, Buffalo Grass
- Wetlands
 - Animals – Black Bear, Red Fox, Gray Fox, Magpie, Red-Winged Blackbird, Prairie Rattlesnake
 - Plants – Common Fireweed, Cottonwood Tree, Cattail
- Mountain Shrublands
 - Animals – Rocky Mountain Bighorn Sheep, Cottontail Rabbit, Bobcat, Prairie Falcon, Wild Turkey, Eastern Fence Lizard, Honeybee
 - Plants – Wild Rose, Mountain Mahogany, Piñon Pine, Three-Leaf Sumac, One-Seed Juniper
- Piñon and Juniper Woodlands
 - Animals – Mountain Lion, Mule Deer, Least Chipmunk, Spotted Towhee, Scrub Jay, Honey Ant
 - Plants – Prairie Coneflower, Pasque Flower, One-Seed Juniper, Gambel Oak, Piñon Pine, Rocky Mountain Juniper
- Cliff Islands
 - Animals – Least Chipmunk, Rock Pigeon, White-Throated Swift, Violet-Green Swallow, Northern Goshawk
 - Plants – Yucca, Three-Leaf Sumac, One-Seed Juniper, Ponderosa Pine
- Montane Forests
 - Animals – Little Brown Bat, Pack Rat, Red-Tailed Hawk, Mule Deer, Mountain Lion, Prairie Falcon, Tiger Swallowtail Butterfly
 - Plants – Rocky Mountain Penstemon, Butterfly Weed, Ponderosa Pine, Chokecherry, Mountain Mahogany

Ecosystems are influenced by biotic and abiotic factors including: climate, weather, disease, population density, resource availability, predators, competition, and human impact. Human impact greatly affects the health of an ecosystem and our park holds many examples of this.

Animals and plants in the Garden exist as part of delicate food webs, and numerous other forms of relationships, such as symbiosis. Organisms adapt to the unique conditions

of their environments and ecosystems and develop intriguing survival strategies. All compete for resources. Some organisms have developed cooperative relationships to better survive. For example:

The Tiger Swallowtail Butterfly (Colorado's largest) lays its eggs on the chokecherry shrub. The chokecherry's poisonous nature make it an ideal *host plant* for the butterfly as browsing animals won't eat egg-bearing leaves. The eggs hatch, the larvae feeds on the leaves, and then they spin their chrysalis on this same plant. The adult butterfly pollenates the plant allowing it to reproduce. This relationship is an example of *symbiosis*. Loss of the chokecherry can result in a loss of the butterfly and vice versa.

Certain plants and animals in our Park serve as *keystone species*. That means that their presence is of primary importance to the Garden's biodiversity. For example:

The Gambel's Oak provides shelter and nesting sites for many of the Park's birds. It provides forage for mule deer, black bear, and many rodent species. Since they grow in wide stands, they provide excellent erosion control. The loss of this species in the Park would drastically alter our landscape and many animals would no longer live here.

The relationships between plants and animals in Garden of the Gods allow students to investigate food webs and food chains, trophic levels, and apex predators. Students will also study invasive species, and how they impact native species in our park.

History of the Garden of the Gods

Colorado has evidence of human use for the past 12,000 years. Three categories of prehistoric peoples occupied the American Southwest.

- Clovis People (9000-1100 BC)
- Folsom people (9000-7500 BC)
- Plano People (8200-5300 BC)

Following these Paleoindian groups, came cliff dwelling people. Archaeologists labelled them *Ancestral Puebloans*. Their culture has been identified by artifacts such as baskets, pottery, sandals, tools, and their incredible architecture on display in Mesa Verde National Park and other sites. There is little evidence of Ancestral Puebloan presence in our park. The Anasazi lived in the area between 1500 BC and 1300 AD. Theories vary as to what happened to these people.

People of the Ute Nation have a long-standing association with the Garden of the Gods. Two bands in particular, the Tabeguache and Mouache, spent time here, typically wintering among the shelter of the rocks. Archaeological evidence shows that these people lived here prior to the disappearance of the Anasazi. Ute history says they have always lived in central Colorado. The Tabeguache, which means "people of Sun Mountain", held Pike's Peak (called *tava*) sacred and offered gifts to spirits of the fountains in Manitou.

Other American Indian nations frequented the Garden area, to include the Jicarilla Apache, Arapahoe, Cheyenne, Comanche, Navajo, and Kiowa. Relations between these peoples changed at different times in history. At times they traded together, allied against common enemies, or fought for resources such as hunting grounds, horses, and firearms. Some, such as the Kiowa, Arapaho, and Cheyenne considered the Garden a sacred place.

The first Europeans to arrive were Spanish explores in the mid-1600's. In the 1700's French explorers and fur trappers came through. In fact the oldest evidence of European visitation to the Garden is the signature of a Frenchman named Ketner whose name and "1731" are carved into one of the park's rocks. Both nations claimed the land until France and America concluded the Louisiana Purchase in 1803 and Spain signed the Adams-Onis Treaty of 1819.

Captain Zebulon Montgomery Pike led the first American expedition to the area in 1806. He did not visit the Garden nor did he climb Pike's Peak. He reached the summit of Mt. Rosa, west of Fort Carson, before adverse weather drove him back to his main camp near where Fountain Creek flows into the Arkansas River. The name Pike's Peak became commonplace after Dr. John H. Robinson, a member of Pike's expedition, published a map of the west in 1818. This was the first document to label the mountain Pike's Peak.

Other significant American expeditions came through this area in the following decades. Major Stephen Long's Expedition of 1820 followed Fountain Creek to the location of present day Manitou Springs. The bubbling springs earned the area the name *Fontaine qui Bouille*, French for "boiling fountain." This expedition recorded sightings of giant fins of rock (the Garden) and the first recorded ascent of Pike's Peak by Dr. Edwin James and three other men. Long named the mountain James Peak, but the name did not hold.

In the 1830's, American fur trapper were collecting pelts throughout the Colorado Rockies, following rivers like the South Platte, Arkansas, and Fountain Creek. They operated using a Rendezvous System which greatly improved logistics and set up several blockhouse-style forts for trade. A prime example of this is Bent's Fort near La Junta.

The 1840 expedition of Brevet Captain John C. Fremont started the migration of pioneers and homesteaders to Colorado. He wrote of the land's suitability for ranching and farming. He also discovered gold in several creeks along the Front Range.

The Lawrence Party of 1858 was a forerunner of the gold rush the following year. This group of 48 prospectors and their families came west to find gold. They camped along Camp Creek (thus the name) and many wrote their names in the soft sandstone of the Garden. Included in this party was suffragette Julia Archibald Homes (aka The Bloomer Girl), the first woman of European descent to summit Pike's Peak. After an unproductive month, most of the party moved elsewhere to find their fortunes.

The Pike's Peak or Bust Gold Rush of 1859 brought thousands of prospectors to the area. Most failed, coining the phrase, "Busted by God." That same year, two men surveying the area for the Colorado City Company gave the Garden its name. Rufus Cable and Melancthon Beach rode through the Garden. Beach told Cable that the area was an

excellent site for a beer garden. To which Cable responded, "Beer garden? Why it is a fit place for the gods to assemble!" The area became referred to as Garden of the Gods from then on.

Homesteaders claimed land in and around the Garden starting in 1858. The Homestead Act of 1861 brought in fresh pioneers looking to make a life for themselves. Between 1858 and 1879 the land surrounding the Garden changed hands many times.

In 1871 Gen. William Jackson Palmer, owner of the Denver & Rio Grande Railroad established Colorado Springs in conjunction with the founding of Manitou Springs by his close friend Dr. William Bell. The next year, Palmer completed his railroad line between Denver and Pueblo. This opened the Pike's Peak region to international tourism.

Palmer prompted his friend Charles E. Perkins to buy 240 acres of land encompassing much of the Central Garden in 1879. Perkins was the CEO of one of the nation's most prominent railroads, the Chicago, Burlington, and Quincy Railroad. Perkins hired a local real estate mogul to maintain his property and keep it open for public use. He bought two additional parcels later, bringing his land holdings to 480 acres.

From 1883-1915 the Park houses various entrepreneurial sites, to include a small, self-styled resort, a series of curio shops, a beer hall, a lemonade stand, and kiosks selling carvings made of local gypsum.

In 1909, the Perkins family deeded their 480 acres of land to the City of Colorado Springs on condition that the park be forever known as "Garden of the Gods" and that it be kept free to the public.

In 1915, the first structure built with city approval was placed in the park. The Hidden Inn was intended to be the home of the caretaker and offer services to visitors.

Other structures and land have been added to the park over the past century. In 1994 the city approved the Master Plan for the Garden of the Gods and most facilities were removed. The current Visitor and Nature Center opened in 1995. It sits on private land just east of the park. Currently the park encompasses over 1334 acres of land.

Supplemental Activities:

- Replicate ice wedging by conducting an “ice power” experiment: Have students fill plastic bottles with water. Seal the bottles and freeze them. What happens? The freezing water may crack the bottles. This shows what the freezing and thawing of water can do to the rocks in our Garden.
- Collect pictures to identify animals, plants, geological specimens, and historical sites from the Garden of the Gods.
- Create a geological or historical timeline of the Pike’s Peak region.
- Complete artwork or creative writing projects based on your experience in the Garden of the Gods.
- Write a thank you letter to the staff member or volunteer who led your adventure.
- Address letters to: Garden of the Gods Visitor & Nature Center

ATTN: Bowen Gillings
1805 N. 30th St.
Colorado Springs, CO 80904

Additional Resources:

Johnson, Kirk R. and Robert G. Reynolds. *Ancient Denvers*. Denver Museum of Nature and Science, 2006.

Johnson, Kirk R. and Richard K. Stucky. *Prehistoric Journey*. Denver Museum of Nature and Science, 1995.

Noblett, Jeffrey B. *A Guide to the Geological History of the Pikes Peak Region*. Colorado College Department of Geology, Colorado Springs, Colorado, 2011.

Official Guide to Garden of the Gods and Rock Ledge Ranch Historic Site. 2012.

www.cspm.org/learn/regional-history/

www.usgs.gov