

Junior Forest Ranger Guide

Sandia Mountains



This guide belongs to:



Forest Service
U.S. DEPARTMENT OF AGRICULTURE



Welcome to the Cibola National Forest



Have you ever noticed the big mountains to the east of Albuquerque? Those are the Sandia Mountains and they are open for you to explore and enjoy! The Sandia Mountains are part of a larger forest known as the Cibola National Forest and National Grasslands, which includes 1.9 million acres of land in New Mexico. The Sandia Mountains are open for everyone to explore and enjoy.

Why are they called the Sandia Mountains?

Take a look at the Sandia Mountains when the sun is setting and you may notice that they turn pink! When the Spanish first arrived in New Mexico in the early 1500s, they named the mountains “sandia” which in Spanish means “watermelon”



because of their pink color. These mountains are sacred to many Puebloan peoples today and have traditional names as well. In the Tiwa language spoken by the Isleta and Sandia Pueblos, the mountains are called Oku Pin (turtle mountain). In the related Tewa language spoken by many pueblos in the Rio Grande Valley, they are called Bien Mur (big mountain).

Become A Junior Forest Ranger

Follow these steps to become a Junior Forest Ranger and help preserve and protect the Sandia Mountains.

1. Complete **six or more** activities in the booklet
2. Bring your booklet to a Forest Service Ranger at a district office or visitor center
3. Take the Junior Forest Ranger Pledge!

If you can't visit in-person, ask your parent or guardian to mail in your booklet and make sure your name is on it. Mailing instructions are on the back cover.



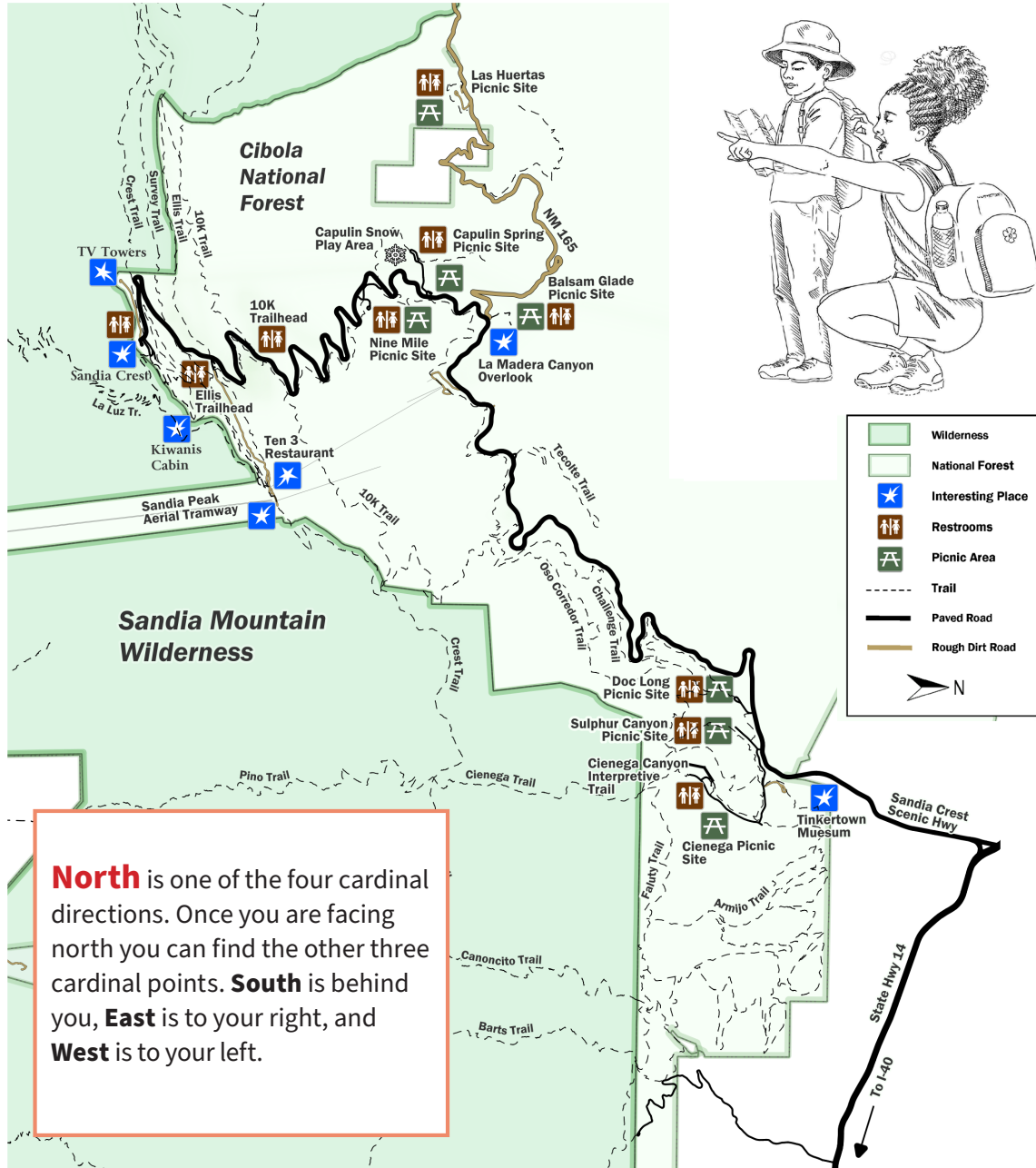
HAVE FUN!! • BE SAFE!! • LEAVE NO TRACE!!





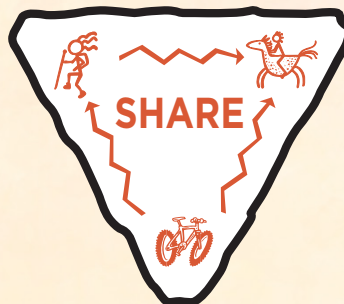
Don't Forget to Bring Your Map!

The Sandia Mountains are BIG at approximately 17 miles long and 10,678 feet high! When you head out on your next adventure, it's important to know where you are going. Use the map below to learn about important trails and landmarks that you can visit!





Recreation in the Sandia Mountains



When you're walking on a trail, you are probably not the only one! If you pass someone, remember to follow the Yield Triangle, so you know who is allowed to pass first. With the Yield Triangle, horseback riders go first, then hikers, then bikers. When you yield to others, you help keep everyone safe and protect the land on either side of the trail.

ACTIVITY:

Play Outside in the Sandia Mountains!

The Sandia Mountains are the most visited mountains in New Mexico. Each year, millions of people hike, bike, ride horses, hunt, picnic, and more! The next time you visit, use the checklist below to track which activities you did on your trip and to reflect on which one was your favorite! When I visited the Sandia Mountains, I did the following:

☐

Walked a trail

☐

Watched for birds

☐

Smelled a wildflower

☐

Hugged a tree

☐

Took a photo

☐

Rode my bike

☐

Camped overnight

☐

Climbed over rocks

☐

Had a picnic

☐

Saw wildlife

MY favorite activity was _____

because _____





Leave No Trace

As a Junior Forest Ranger, you can help keep the Sandia Mountains healthy by following Leave No Trace Principles. These seven steps help us have fun outside while protecting the local plants and wildlife.

Seven Leave No Trace Principles

1. Know Before You Go

Bring the right supplies with you and tell others where you are going and when you are coming home.

2. Stay on the Trail

Leaving the trail can cause damage to the land and it can make it hard for you to find your way back.

3. Pack It In, Pack It Out

Don't leave trash behind and remember to pick up any trash that you find along the way.

4. Leave What You Find

Don't take home what belongs in the forest, like plants, rocks, or artifacts.

5. Be Careful with Fire

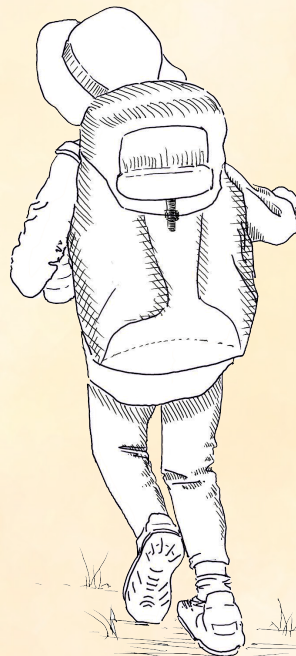
Always make fires inside fire rings and remember to put fires 'dead out' by stirring dirt and water.

6. Respect Wildlife

Look at wildlife from a distance and never feed them. Even a small amount of "human food" is unsafe for wildlife to eat.

7. Be Kind to Others

Avoid making loud noises and show respect to other visitors.



ACTIVITY:

Unscramble the words to reveal the proper gear you should pack on your adventure.

ATH _____

ATEWR _____

SCKNAS _____

IKNGHI OBTOS

PMA _____



A Sacred and Special Place

The Sandia Mountains have been a resource and home for **indigenous**, or native people for thousands of years. These people traditionally were hunters and gatherers. Later they grew crops as well. Today, indigenous families continue to live in the surrounding communities in villages or **pueblos**.



Stories from the Past

Sandia Cave on the northern side of the mountains was likely inhabited as early as 10,700 B.P. **Archaeologists** who study human and prehuman activities know this because they found Folsom projectile points from that time period inside the cave.



Tijeras Pueblo is on the east side of the mountains. Archaeologists believe the pueblo began in 1313 A.D. and had about 200 rooms. While the site is not lived in today, it is important to the Isleta Pueblo who are connected to it through their family lines. They call Tijeras Pueblo the *Maud'-hued* (The Seashell Place).





Pueblo Pottery Throughout Time



Got Style?

Well, It's About Time

Indigenous people made pottery for use in every day life and for sacred ceremonies. Just as clothing styles change throughout time, designs on pottery also have changed.

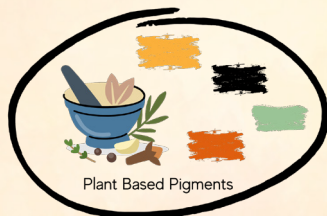


Pueblo Potters Today

Modern lineages of Pueblo potters continues to evolve with each new generation.

ACTIVITY:

Design and draw your own pottery. What designs would you use?



People used native plants to make pigments for painting pottery. Plants were dried and ground into pigments or boiled to make the paints. Yucca stems were also used to make paint brushes.

Did You Know?

Tijeras Pueblo has some of the earliest known examples of Rio Grande Glaze Ware pottery. To the left are some designs typical of the period.



(left) This piece is titled "Thunder Clouds" and was created by Franklin Peters, a potter from Acoma Pueblo.



(right) This piece is titled "Seeds of Our Ancestors" and was created by Caroline Lucero-Carpio, a potter from Isleta Pueblo.





We Depend on Native Plants

Birds, mammals, insects, and microbes depend on plants for survival, and so do we! Throughout time, our understanding of the uses of plants has been essential to providing us with food, medicine, and as a source of inspiration. Read the descriptions below of plants that exist in the Sandia Mountains and see if you can match them to their uses.

Piñon Pine:

New Mexico's state tree and widely known for its edible pine nuts. The nuts are a good source of protein for animals and humans which can be harvested in the fall.



Juniper:

This tree's leaves and berries can be made into a tea or an oil to help with an upset stomach and achy muscles. The tree bark can also be soaked to soothe itchy bug bites.



Prickly Pear Cactus:

The brightly-colored fruit are called tunas and are used to make lemonade, candy, and jelly. The juice can also be used as a dye or for paint.



Banana Yucca:

This plant is traditionally used as a source for food and medicine. The fiber of the leaves is used for rope, baskets, and paint brushes. The roots are used for soap and shampoo.



ACTIVITY:

Fill in the blanks of the boxes with the correct plant name.

1. My fruit yields brightly-colored juice that can be made into snacks and treats.

I am a

2. I am the New Mexico state tree. I have cones that have edible nuts inside.

I am a

3. I am very useful! You can make rope, soap, and paintbrushes from me. My flowers, fruits, and stems can be eaten.

I am a

4. I have berries and leaves that can be used for medicine and oils.

I am a

IMPORTANT REMINDER:

If you are harvesting any plant it is important to practice responsible harvesting. Leave the roots so the plant can regrow. Only take what you need and don't over pick.





How Can We Keep the Forest Healthy?

As a Junior Forest Ranger you can help keep the Sandia Mountains and the forest healthy through the act of **stewardship** which means to take care of it by working together.

A healthy forest allows people, plants, and animals to exist in a balanced way. The Forest Service manages the forest and protects it from being developed with too many roads or buildings. The Forest Service also helps the plants and wildlife survive wildfires and extreme weather events.

When you visit the Sandia Mountains, you can show acts of stewardship to keep the forest healthy by following Leave No Trace Principles and doing your part to keep the forest clean.

Remember: Pack it In, Pack it Out!

Our friend Woodsy Owl reminds us to “Lend a Hand—Care for the Land!” One way we can lend a hand is by following the Leave No Trace Principle, “Pack it In, Pack it Out!”



ACTIVITY:

Take a look at the things below and sort the items that belong in the trash, recycle, or should be left in the forest. Circle the items that stay. Draw a line to the correct bin for things that should be disposed.





Geology of the Sandias

Mountains are millions of years old and can form in different ways; some are built by volcanoes, while others are made by folding and crumpling. 30 million years ago, the Sandia Mountains were formed by a rift in the land as the Earth's crust began to pull apart. This is known as the Rio Grande Rift. During this event, the land that is now the Sandia Mountains was lifted up and tilted toward the east.

This Rock Has Layers

Like layers of a cake, there are many layers of rock that can be found in the Sandia Mountains. The main types of rocks are Sandia Granite, limestone, and sandstone. Each rock layer is from a different time period and was formed very slowly over time.

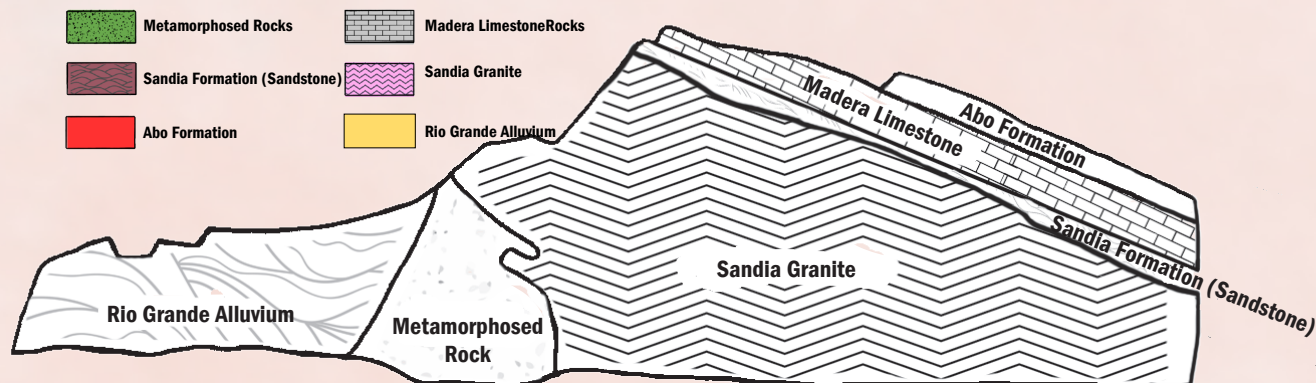


Sandia Granite Makes the Mountains Pink!

Earlier in this booklet, we talked about how the Sandia Mountains can turn pink at sunset. The reason they turn pink is because there are pink crystals called potassium feldspar (*K-spar*) embedded in the Sandia Granite layer. Sandia granite is one of the oldest rocks visible in New Mexico and is around 1.4 billion years old!

ACTIVITY:

Color the different rock layers using the guide below.





Let's Take a Look Under the Surface

We can see signs of what used to live in the Sandia Mountains by looking at fossils inside the rock layers. Fossils are the preserved remains of plant and animal life. When a plant or animal dies, it can become buried in the mud. The muscle, skin or other soft tissues or plant material that remains are eaten by bacteria and only the bones or skeletal fibers are left. Over time, the mud turns into rock. After millions of years, the earth shifts and moves, exposing the rock with the fossils inside!

Sandia Fossils

Many of the fossils you will find in the Sandia Mountains are of seashells and from marine animals, from a time when this area was part of an underwater sea about 300 million years ago. Let's take a look at some of the common fossils in the area.



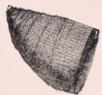
- **CRINOIDS:** are also called sea lilies. They are animals with stalks that look like stacked round chips.



- **BRACHIOPODS:** are similar to clam shells but their shells have a different pattern.



- **GASTROPODS:** are a diverse group of animals and include snails and slugs.



- **HORN CORALS:** are less than an inch tall and their fossils look round with curves and grooves.

Different Types of Fossils

Not only can fossils tell us what lived here, some can tell us *how* they lived here! There are two different types of fossils called **body fossils** and trace fossils. Body fossils are plant and animal remains, like leaves, teeth, shells and bones. **Trace fossils** are evidence left behind by animals, like footprints, burrows, and even poop!

ACTIVITY:

Make Your Own Fossils at Home!

What You Will Need:

- 1 cup of salt
- 2 cups of flour
- $\frac{3}{4}$ cup of water
- Shells, plastic knife, other utensils to carve out designs



Directions:

1. Mix salt, flour, and water in a bowl.
2. When the dough forms, pinch off small amounts and shape the dough into thin flattened circles.
3. Once you have your circles, make your fossils! You can press shells, plants, or draw your own fossil using a plastic knife into the dough.
4. Bake your fossils at 250° Fahrenheit until they are dry, which will take about 1 hour. Baking times vary depending on the thickness of your fossil. You can also dry your fossils by placing them outside in the sun.
5. Once they are dry, you can be like a paleontologist and observe your fossil! Think about all the life that was once roaming the earth and how we can learn about them using their fossils.

Prep Time: 8 minutes

Makes: 6-12 round discs



Life Zones in the Sandia Mountains

The Sandia Mountains range from about 5,700 feet in the foothills to 10,678 feet in height at the top. This range in elevation provides different types of habitat where plants and animals can live. From Grasslands at the lowest point all the way up to Spruce-Fir at the highest, each area or life zone has a range of temperatures and moisture to provide for various types of plants and animals.

Look at the image below to learn about the different life zones and see where plants and animals live.



SPRUCE-FIR

Spruce and fir trees are cone-shaped and have needles attached to the branches individually. Spruce needles are sharply pointed and square while fir needles are softer and flat. Fir needles don't prick your fingers when you touch them. Remember spikey spruce, friendly fir when touching their needles.



PONDEROSA PINE

A tall pine tree with long needles. Three needles are attached to the stem. These trees have a thick brown bark that smells like vanilla or maybe butterscotch.



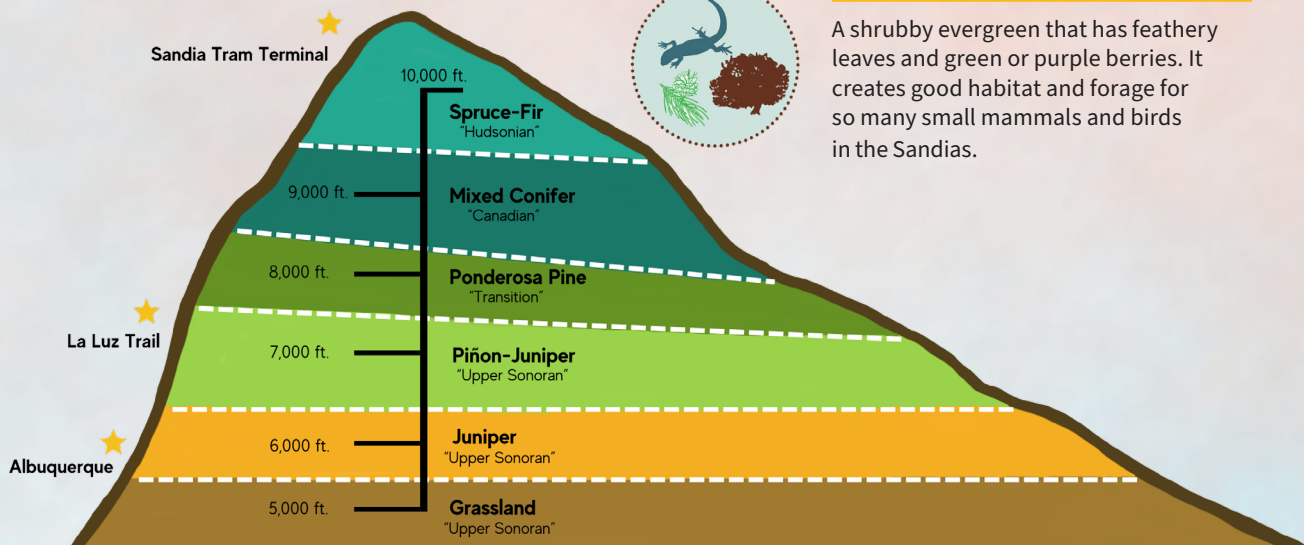
PIÑON PINE

A shrubby pine that has two sets of needles growing from the stem. Piñon trees produce edible nuts that provide food for wildlife and people.



JUNIPER

A shrubby evergreen that has feathery leaves and green or purple berries. It creates good habitat and forage for so many small mammals and birds in the Sandias.





Much of the Sandia Mountains are protected as wilderness to help plants and animals thrive. In 1978, the US Congress designated more than 37,000 acres in the mountains as wilderness to make sure the area is protected for future generations.



My Silly Sandia Story

Pick a word from the red box using the pictures as your guide to fill in the blanks below and complete the story.

WORD LIST



mooring
seeing
walking
hiding
running
hopping

dinosaur
lizard
crayon
tree
forest
hike

scare
spin
see
read
eat
go

One day I was  _____ in the  _____
when I saw a  _____. It was  _____
and I almost didn't  _____ it. It was near a
juniper  _____. I watched as it went
 _____ away. I like  _____ different
animals when I go on a  _____. I know that I
should never  _____ near them because I
might  _____ them.



Wildlife

A safe wildlife habitat provides food, water, shelter, and a place to raise young animals in a healthy environment. Most wild animals are very difficult to find because they try to stay away from humans. This is for their own protection.

They usually will:

- See, hear and smell you first
- Keep from showing themselves, AND
- Wait quietly for you to move on

Mountain Lion

Mountain Lions are a large, tan-colored mammals species with long tails. These strong and fast predators hunt mule deer and may hide their prey to snack on later. If you cross paths with a big cat make sure to stay calm, back away slowly, and make yourself look big!



Abert's Squirrel

This fluffy-tailed squirrel species is grey and white with a reddish-strip down its back. They also have long pointy hairs at the tops of their ears and love to eat pinecones, tree sap, and mushrooms! They can be found in ponderosa pine trees or near picnic areas in the Sandia Mountains.

New Mexico Whiptail Lizard

This super cool lizard has an all female species! When attacked by predators, her brightly colored turquoise tail is designed to break off as a distraction so she can escape.





When hiking in the Sandias, you can usually find evidence or clues that an animal has been there by looking for animal tracks or scat.

Let's take a look at some of the wildlife you might see while hiking.

Ringtail

The Ringtail is a mammal and a member of the raccoon family. These excellent climbers live in many different life zones in the Sandias. They are most active at night and are very rare to see. They have big eyes and a black and white striped tail.



Mountain Bluebird

This bird species is found perched on fences, wire, and small trees. A female chooses her mate based on how close he is to a good nesting site instead of how he looks or sings (like most bird species do!). These quick moving birds like to eat insects and juniper berries.

Mule Deer

Mule Deer are common in the Sandia Mountains and are known for their big, mule-like ears. Sometimes, people confuse them with white-tailed deer but mule deer are larger and more grey-colored.



ACTIVITY:

Which animal am I?

Read each list and match the animal to the correct character traits. When finished, think about which animal trait is most like you.

- Fast
- Enjoy sun
- High energy

- Shy
- Like lots of different foods
- Good climber

- Stealthy
- Quiet
- Likes dawn and dusk

- Sharp teeth
- Talkative
- Clever

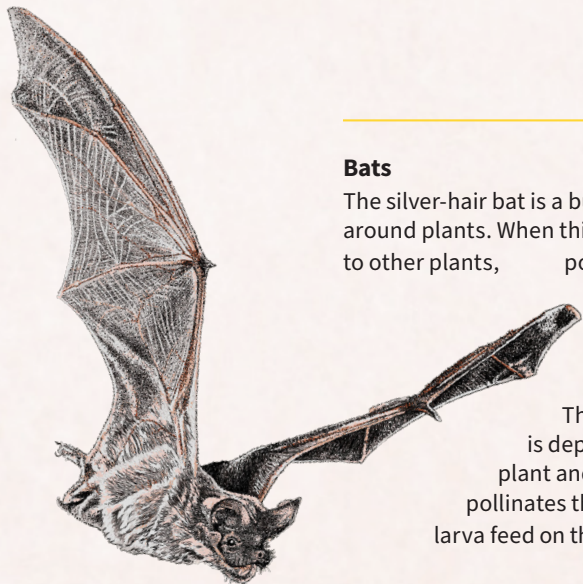
The animal that is most like me:



Pollination in the Sandias

Pollination is how plants reproduce. Almost all plants depend on pollination in some form. Many different types of animals and insects help plants pollinate.

Whether we see it or not, animals are constantly pollinating native plants in the Sandias to help the ecosystem be strong and balanced!



Bats

The silver-hair bat is a bug eating critter that swoops in and grabs insects hanging around plants. When this happens pollen sticks to their fur and gets spread around to other plants, pollinating them.

Yucca Moth

This small white moth is dependent on the yucca plant and vice versa. The moth pollinates the yucca and the moth's larva feed on the yucca.



FUN FACT

Pollinators help bears! A black bear's diet is mostly plant based. Pollinators provide important food sources for the bears. If there are not enough pollinators, bears will look through campsites and will eat garbage, which can make them very sick!



Butterflies

The Hairstreak butterfly can be found around juniper trees and other shrubs in the spring. Their bright colors are easy to spot, they drink the rich nectar inside of flowers and carry pollen from one flower to the next. The Hairstreak is also our state butterfly!

Bees

A well known native bee in the Sandias is the Squash bee. This native bee species builds small colonies in the ground and they don't produce honey, but they are more effective at pollinating plants compared to honeybees.





Many animals migrate, which means they will move from one habitat to another habitat to look for food, better weather conditions, and mating opportunities. In the Sandia Mountains there are several bird species that pass through New Mexico during the changing of seasons.



Northern Goshawk

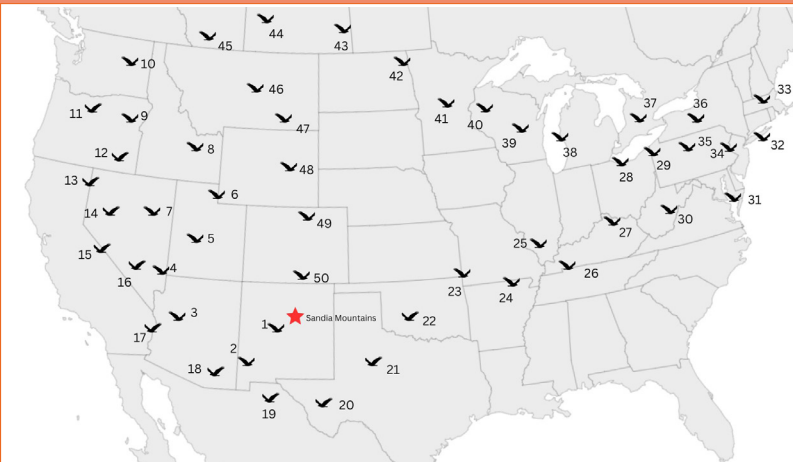
This bird species is a raptor with a black and white striped chest. It can easily be identified by its eyebrow band and its red eyes. They are very territorial and nest in ponderosa pine trees.



Rosy Finch

There are three species of Rosy Finch that are found in the Sandias from late November to March. They are easy to find at the top of the Crest. Their brightly rose colored feathers makes them easy to spot.

ACTIVITY:

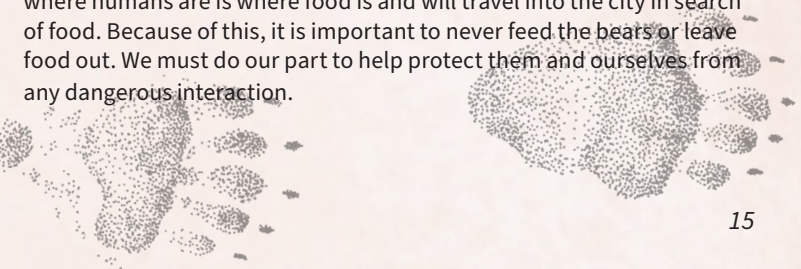


Can you trace the migration route of Northern goshawk? Connect the bird symbols to follow their route.

Be Bear Aware in the Sandias!



In New Mexico we only have American black bears (no grizzlies), which is also our state mammal. Black bears are omnivores which means they eat both plants and meat. Unfortunately, bears have learned that where humans are is where food is and will travel into the city in search of food. Because of this, it is important to never feed the bears or leave food out. We must do our part to help protect them and ourselves from any dangerous interaction.





Wildfire Prevention

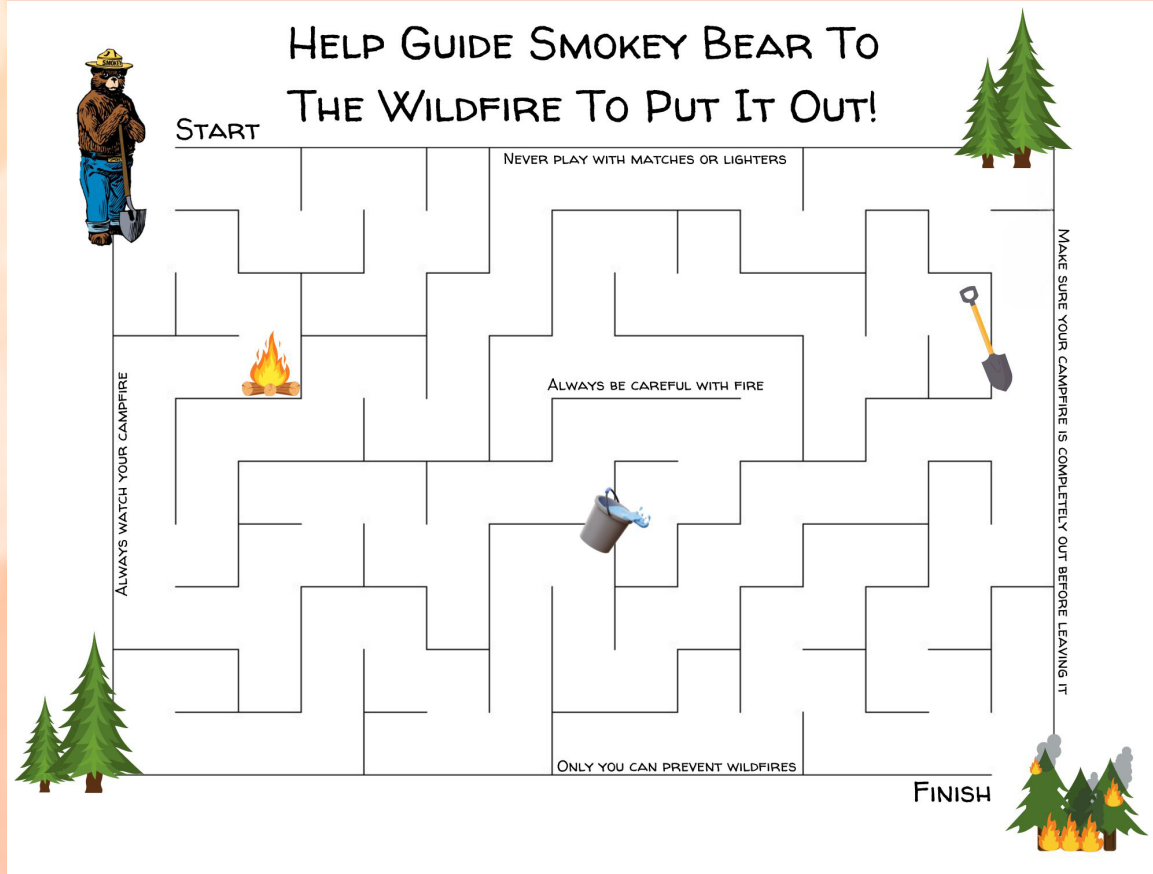


A forest fire can start by lightning striking a tree but nine out of ten fires are caused by humans. Accidental wildfires start when people carelessly burn trash, leaves, pine needles, branches, or toss out cigarette butts called **fuels**.

In the Sandias, keeping the forest floor clear of too much organic debris is important because that could fuel intense fires. The Forest Service is working to build spaces for people that are resistant to flooding and erosion, due to wildfires.



ACTIVITY:





Fire can also be healthy for a forest and can help plant and animal populations. It allows new plants and trees to grow, which provides food for many insects and animals.

Wildland firefighters around the country still work to reduce fuels. They clean up the forest by cutting and trimming trees of dead branches, making piles of wood, and burning them in the winter to make the forest safe and free of fuel.



How Indigenous Peoples Used Fire

Ancient Puebloan tribes in New Mexico used trees from the forest as firewood, food, and shelter-building supplies. Using fire was a normal part of Indigenous people's lives. Besides cooking and heating, they utilized fire to clear areas for growing crops. These small, controlled fires are a good practice because it reduced the fuel load of the forest. The treeless agricultural fields provided provided natural burn breaks that would stop wildfires from spreading and keeping to smaller wildfires.



Can you list three ways we can keep the forest healthy?

1.

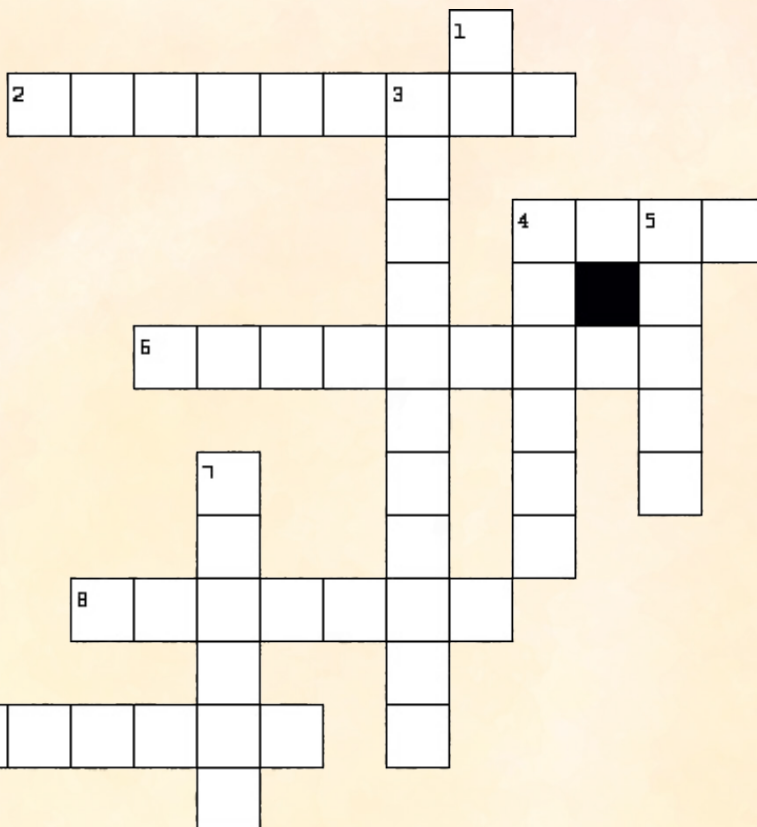
2.

3.





I Know the Sandias!



ACROSS

2. Type of fossil similar to a snail.
4. The color of the granite that makes up much of the Sandia mountains.
6. Large omnivore often mistaken for its cousin, the Grizzly
8. Tree with leaves and berries that can be made into teas and medicinal oils.
9. Taking care of the environment and working together.

DOWN

1. "Know before you ___"
3. Cactus with brightly colored fruit that can be made into sweets.
4. Spanish word for 'village'
5. One of the four cardinal directions
7. Spanish word for 'watermelon'







Junior Forest Ranger Certificate

As a Junior Forest Ranger, I promise to:



Do all I can to help preserve and protect the natural and cultural resources on our public lands



Keep learning about the importance of nature and our heritage



Share what I have learned with others, and



Be aware of how my actions can affect other living things.

Junior Forest Ranger Signature

Date.

US Forest Service Representative



Sandia Ranger District, Cibola National Forest





Find and color the animals in the picture. If you see any plastic bottles, circle them so they can be recycled.

The USDA Forest Service would like to thank the kids and adults who are actively involved in taking care of our beautiful public lands through stewardship, education, and outreach. With your help, we can sustain the health, diversity, and productivity of America's forests and grasslands for generations to come.

If you would like to learn more about the USDA Forest Service, Leave No Trace, and the Public Lands Interpretive Association, check out the websites below.

Public Lands Interpretive Association: publiclands.org

Sandia Ranger District 11776 NM-337, Tijeras, NM 87059
fs.usda.gov

USDA Forest Service kids' pages: www.fs.usda.gov/learn/kids

Leave No Trace: lnt.org



Forest Service
U.S. DEPARTMENT OF AGRICULTURE



ANSWER KEY

Pg. 3 Leave No Trace activity answers: HAT, WATER, SNACKS, HIKING BOOTS, MAP

Pg. 6 Native Plants Usage activity answers:

1. Prickly Pear Cactus
2. Piñon Pine
3. Banana Yucca
4. Juniper

Pg. 7 Healthy Forest trash sorting activity answers:

Trash bin: candy wrapper, banana peel, apple core

Recycle bin: plastic bag, soda can

Leave in the forest: pottery sherd, rocks, flowers, pine cone

Pg. 13 Which Animal Am I answers:

fast= whiptail lizard, shy=ringtail,
stealthy=mountain lion, sharp teeth = squirrel

