

BOSQUE SCHOOL

Sandia Mountain Wildlife Adventure

From Foothills to Crest



Written and Illustrated By: Donny KC

Sandia Mountain Adventure:

From Foothills to Crest

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BOSQUE SCHOOL
Challenging Education



**Field &
Community
Science**

wildlife@bosqueschool.org



Dedication:

Jerome Ginsberg (1937-2023)

Defender of and advocate for wild nature,
human rights, and environmental education.



~ Dedicated to my grandma, forever and always my biggest fan ~ Donny KC

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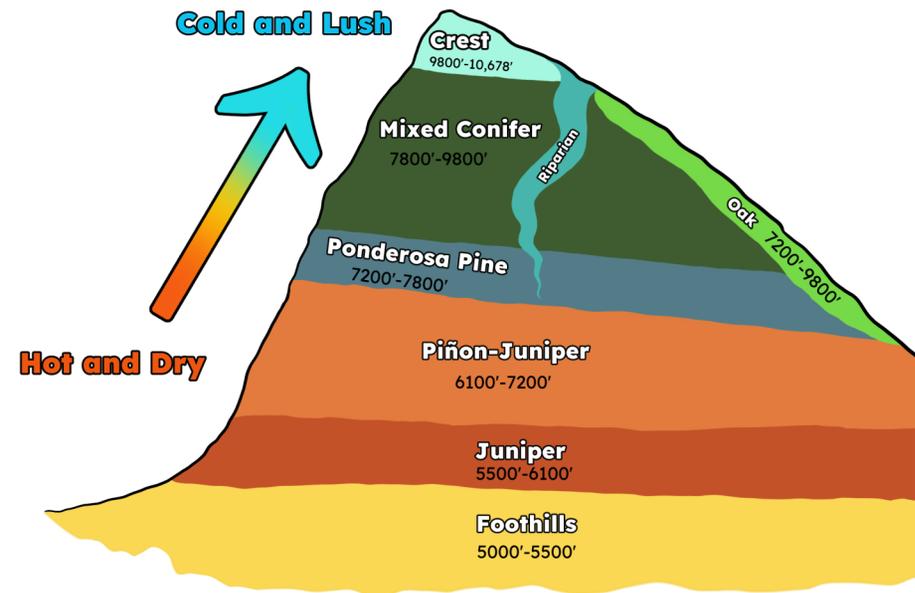
Welcome to the Sandia Mountains!

Albuquerque isn't Albuquerque without the Sandia Mountains. From anywhere in the city, you can count on them to show you which way is east. *Sandia* is Spanish for watermelon. Often, at sunset, the mountains turn pink. At those times, they look like giant slices of watermelon.

The Sandias are home to all sorts of wildlife. They include big lizards that run like T. rex to endangered pink birds that play in the snow! When you read this book, you'll travel up in elevation, across habitats, and through time as you learn about the wildlife living here today and those that have left their fossils behind. Some of these animals can be found all across the country and others are so rare that you can only see them in these mountains.

Each time you turn a page, you will be in a different life zone. You'll start out in a hot and dry foothill habitat. You'll end up in a cold and lush crest habitat. Along the way you will discover which animals are adapted to live in which life zones.

The Sandia Mountains aren't just a place you can read about in a book. They are a place you can visit! In this book, each life zone includes trail names. Those trails are open to the public. You, your friends, and family can visit those trails to find every single one of the animals that were drawn and filmed for this book.



Wildlife Hike

A group of fourth graders went for a hike in the rolling foothills. They recorded all of the animals they saw along the way. By the end of the hike, they wrote down these animals in their field journals:

- Cactus Wrens: 12
- Texas Antelope Squirrels: 2
- Sandia Hairstreak Butterflies: 3
- Collared Lizards: 5



A: What is the total number of animals seen on the hike?

B: If each animal represents part of the total, what fraction of the total is each species? (example: if there were 9 species total and 5 of them were frogs, then the answer would be 5/9 of the animals were frogs.)

A Collared Lizard was hunting for insects in the granite rocks. It takes 1 hour for the lizard to explore 7 rocks. The lizard spent 6 hours hunting in one day.

C: How many rocks did the lizard explore?

Foothills

Elevation: 5,000' – 5,500'

The foothills are the hottest, driest, and lowest part of the Sandia Mountains. Here, many animals find shelter from the sun in rocky burrows and the shade of spiny plants.

Albuquerque's largest lizard looks like it is wearing a necklace. The **Collared Lizard's** black and white scales around its neck look like part of a fancy suit. It can run on its hind legs. When it does, it looks like a T. rex dinosaur!

The **Texas Antelope Squirrel** has a bushy tail. The tail points in whatever direction it's going. The Sandias are home to many different types of squirrels. Look through this book to see how they change as you go higher up the mountain!

Cholla Cactus (*pronounced: choy-ah*) spines keep most animals away. However, the **Cactus Wren** is a bird that lives and builds its nests on these prickly plants. The thorns keep out predators. Cholla Cacti give this bird a safe place to raise its babies.

The foothills habitat is home to our state butterfly, the **Sandia Hairstreak**. This little green and orange butterfly lays its eggs on a plant called **Bear Grass**. This grass is the only thing its caterpillars will eat. As adults, they drink the same plant's nectar.

For a place to visit in the foothills, see #1 on the map on page 18.

To watch a video about these desert animals found in the Sandia Mountains, scan this QR code. 







Hunting Territory

In the quiet piñon-juniper forest, a Gray Fox is roaming her territory. She is looking for food. Her favorite hunting area is shaped like a big square that is 10 miles on each side. She often rests in the center when she is tired.

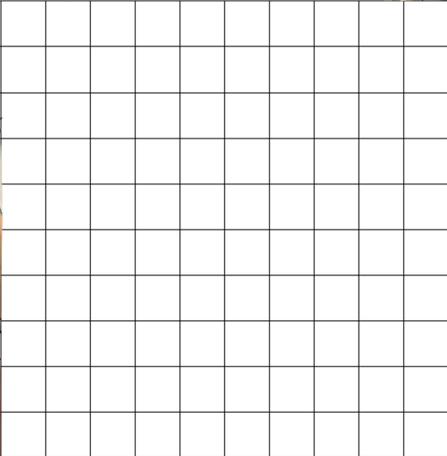
It takes her a long time to cover the whole space. In the morning, she explores 1/4 of the hunting area. In the afternoon, she covers 1/2.

A: How much space is left to explore in the evening?

B: What is the TOTAL area of her hunting grounds?

Hint: length x width = area

1 square = 1 mile



- Color her morning 1/4 in **Green**
- Color her afternoon 1/2 in **Red**
- Color her evening exploration in **Blue**

Piñon-Juniper

Elevation: 5,500'–7,200'

Piñon Pine and **Juniper** trees make a special habitat. It is where the desert starts to become a forest. The Piñon Pine is New Mexico's state tree, but it's having a hard time due to stress from heat and drought caused by climate change. **Bark Beetles** also cause many Piñon Pine trees to die.

The **Hairy Woodpecker** helps take care of the Bark Beetle problem by eating them. It drills into trees with its chisel-like bill to find the tasty larvae. Look in this book for other woodpeckers that live in the Sandias.

Western Bluebirds often depend upon woodpeckers. Bluebirds nest in woodpecker holes (cavities). Males are bright blue with an orange chest while females are duller. Their eggs are as blue as the males.

Piñon Pine nuts are a favorite **Wild Turkey** food. This large bird was wiped out from the Sandias in the 1800s because of over-hunting. In 2004, scientists brought turkeys back to the Sandias. As they travel in groups, the turkeys look for fruit, insects, and Piñon Pine nuts. In the fall, when the piñon crop is good, New Mexico families also go out to gather these tasty seeds.

Gray Foxes can climb trees. They eat meat, juniper berries, and prickly pear cactus fruit. So, trees provide them with both food and shelter. If you go into the forest and eat Piñon Pine nuts, leave most behind for animals to eat and for new trees to grow from.

For a place to visit in Piñon-Juniper habitat, see #4 on the map on page 18.

To watch a video about these hungry animals found in the Sandia Mountains, scan this QR code. 



Mule Deer Ups and Downs

A group of wildlife biologists have been studying a mule deer herd over time. In 2024, they counted 30 deer living in the forest. In 2025:

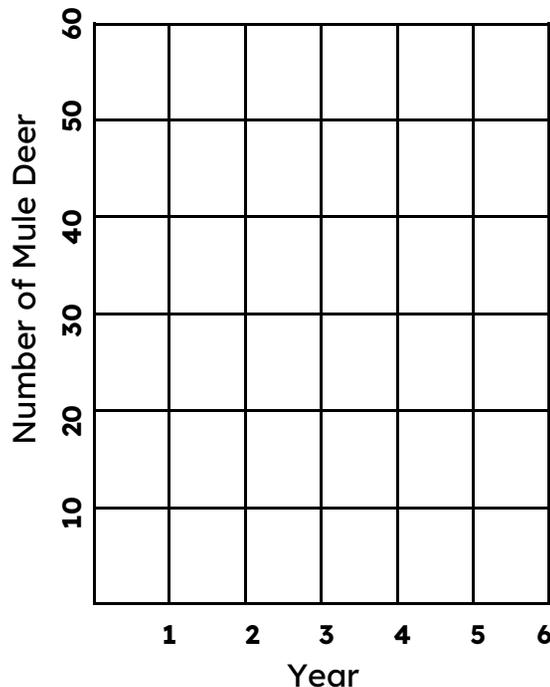
- 11 baby fawns were born.
- 8 deer wandered off and never came back.
- 5 deer didn't survive the harsh winter.

A: How many mule deer are in the forest in 2025?

B: If their population doubles from 2025 to 2026, how many will there be?

C: Look below for the number of deer counted during different years. Create a line graph showing how they have changed over time.

- Year 1: 25 deer
- Year 2: 19 deer
- Year 3: 45 deer
- Year 4: 30 deer
- Year 5: graph your answer from question 'A'
- Year 6: graph your answer from question 'B'



Ponderosa Pine

Elevation: 7,200'–7,800'

The **Ponderosa Pine** habitat is found halfway up the Sandia Mountains. It is home to many creatures. The **Steller's Jay**, a colorful blue and black bird, has a tall crest on its head. It uses its long beak to reach into Ponderosa Pine cones to pull out seeds and to make its loud, nasal call.

Mule Deer have giant ears like the animal they're named after. They nibble on tree leaves. Ponderosa Pine needles are a favorite snack. Although they are big, Mule Deer move quietly so predators don't hear them.

The dark gray **Abert's Squirrel** has fluffy ears. In the Sandia Mountains, they have black bellies and are sometimes mistaken for skunks. In other mountains, they have white bellies. Ponderosa Pine trees are their favorite food. They eat the cones, needles, seeds, and even fungi that grow on their roots! These squirrels need the trees to survive, but the trees also need them. The squirrels bury their seeds in the ground to save for later. If they forget to dig them up for a snack, new trees grow.

The **Grace's Warbler** also lives in these pine forests. It is a tiny yellow gem of a bird. It nests and finds yummy insects on Ponderosa Pines. When we protect Ponderosa Pines, we protect habitat for Grace's Warblers and other animals.

To visit a Ponderosa Pine forest, see #5 on the map on page 18.

To watch a video about these pine-loving animals found in the Sandia Mountains, scan this QR code. 





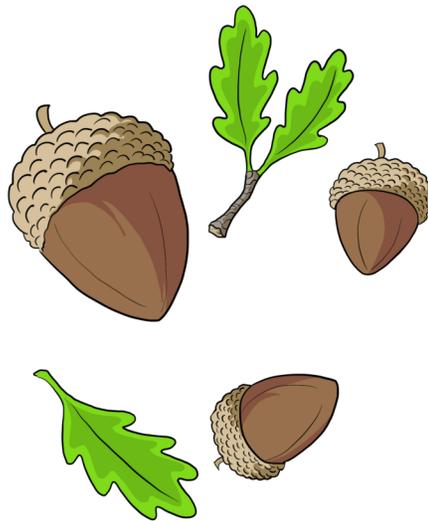


Yummy Acorns

In a sunny Gambel Oak forest, a Black Bear was eating acorns from her favorite bunch of trees. By the end of the day, she ate 300 acorns! This was $\frac{2}{5}$ of the total amount of acorns in the trees. She'll save the rest for tomorrow.

A: How many acorns did she save for tomorrow?

B: A sneaky Acorn Woodpecker found the Black Bear's saved acorns and stole half of them! How many acorns are remaining?



Oak Zone

Elevation: 7,200'–9,800'

The Sandia Mountain's oak zone is found on its northeast facing slopes. This zone spreads across most of the mountain's top half. The **Gambel Oak** provides food and shelter for animals big and small.

The **Acorn Woodpecker** spends much of its time collecting acorns from Gambel Oak trees. It stores them in holes pecked into trees to eat later. This bird also eats ants and other insects.

The **Greater Short-horned Lizard** is often seen on the ground. When threatened, they have a strange trick. They scare off predators by spraying bad-smelling blood from their eyes!

The Sandia Mountains are home to the **Zephyr-eyed Silkmoth**. They are rarely seen elsewhere. Gambel Oak is a favorite food. As caterpillars, their venomous spines protect them. As adults, two fake eye spots on their wings scare off predators.

The **Black Bear** is New Mexico's state mammal. In the Sandia Mountains, they are usually more brown than black. They can weigh up to 500 pounds! Even so, they like to eat tiny things like insects and acorns. It takes a lot of little foods to fatten them up for winter. It is best for bears and people if we do not feed them, even when wild food is scarce. Bears that get used to people food become dangerous. Keep wild animals wild.

If you want to explore the Oak Zone, find #6 on the map on page 18.

To watch a video about these oak zone animals found in the Sandia Mountains, scan this QR code. 



Water Matters

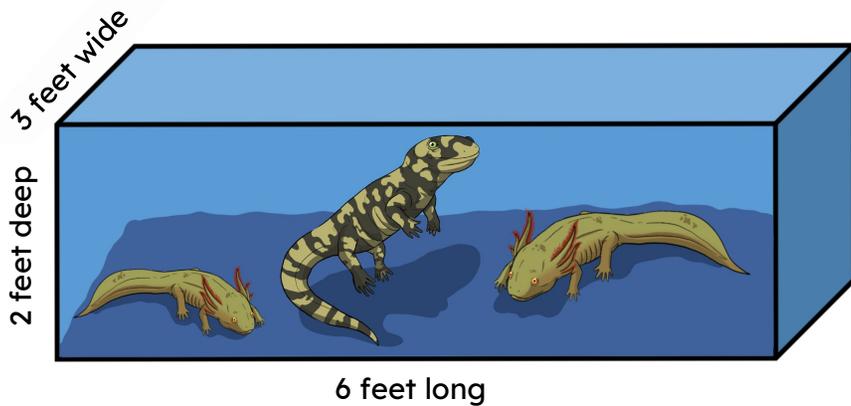
A group of Tiger Salamanders live together in a ponded area of the mountain stream. Each salamander needs two gallons of water in order to stay healthy. This pond is shaped like a deep rectangle. It is 6-feet long, 3-feet wide and 2-feet deep.

A: What is the volume of water in the pond in cubic feet?

Hint: volume = length x width x depth

B: There are 7.5 gallons of water in each cubic foot. How many gallons of water does the pond hold?

C: If each salamander needs 2 gallons to survive and be healthy, how many salamanders can live in this pond?



Riparian Habitat

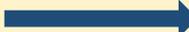
Tucked away in shady canyons, the Sandia Mountains have small streams. The habitat around that water is called *riparian*. In the water, you might see what looks like a walking clump of rocks. Actually, it's a **Caddisfly** larva. It sticks bits of rock and sand together around its body. This helps it blend in and protects it from predators.

Planarians look like tiny underwater black arrows. They are also called *flatworms*. Planarians can heal themselves from injury better than most animals. They can grow back any part of their body.

Slippery **Tiger Salamanders** also live in these watery spots. They are amphibians, like frogs. When young, they have red, feathery gills to help them breathe underwater. As they grow up, the gills disappear. Adults move onto land and breathe air. Like planarians, salamanders can grow back missing body parts.

Some animals just stop by streams for a drink. A **Mountain Lion** drinks water with its tongue just like a house cat. Its tongue has tiny spikes on it that pull the water into its mouth. The Mountain Lion's favorite food is deer, and they travel miles across the mountain hunting them. Since water is rare in the Sandia Mountains, we have to keep all of it clean for the animals that live in it and drink from it.

To see a riparian area in the Sandias, visit #3 on the map on page 18.

To watch a video about these riparian animals found in the Sandia Mountains, scan this QR code. 







Peck Away

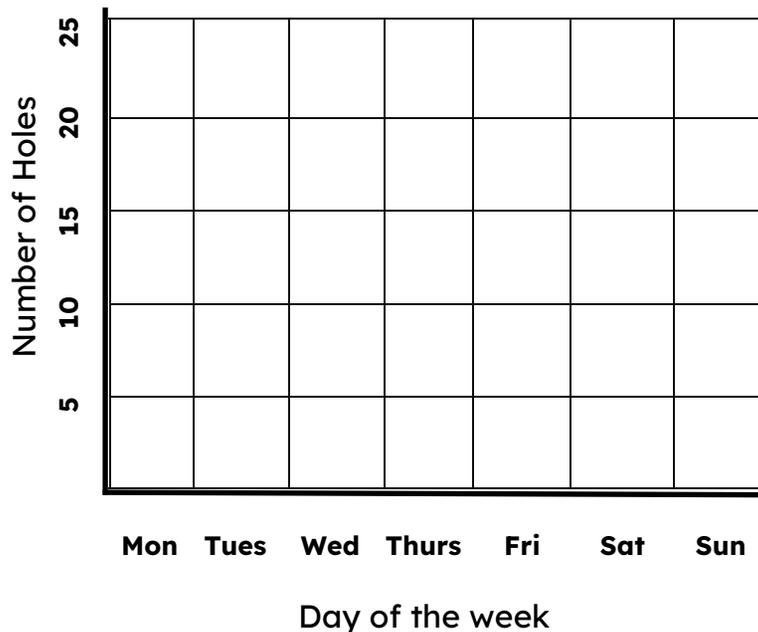
A woodpecker was very busy pecking holes in burned conifer trees. He wants to get at bugs hiding in the bark. Every day, he pecked a different number of holes

Circle the day with the greatest number of holes pecked.

- Monday: 12 holes
- Tuesday: 15 holes
- Wednesday: 10 holes
- Thursday: 17 holes
- Friday: 22 holes
- Saturday: 5 holes
- Sunday: 0 holes

What is the total number of holes pecked this week?

Create a bar graph to represent the number of holes pecked each day.



Mixed Conifer

Elevation: 7,800'—9,800'

High up on the Sandia Mountains, the forest has a mix of different types of evergreens called conifers. So, this area is called the mixed conifer zone.

Forest fires drive many animals out of an area, but not all of them. The **American Three-toed Woodpecker** likes recently burned forests. It hunts deadwood-eating insects. Every other woodpecker here has four toes per foot, but this species has three. This allows it to lean farther back and peck stronger on fire-hardened trees.

The tips of the **Red Crossbill's** beak cross over each other. This helps it open up pine cones to get seeds deep within. Males are bright red and females are pale yellow.

Colorado Chipmunks hop along branches and the forest floor. They eat plants, insects and even bird eggs. Chipmunks are curious. If you see one and stay still, it may come close to check you out.

You might see a fluffy black and yellow flying insect and think it's a bumblebee. If so, you fell for the **Bee-mimic Robber Fly's** trick. It fools other insects into thinking it's a harmless bumblebee. If those other insects let their guard down, it eats them! Robber flies are related to the flies that land on your leftover pizza. They are just bigger and sneakier.

Want to see a mixed conifer forest? Visit #7 on the map on page 18.

To watch a video about these forest animals found in the Sandia Mountains, scan this QR code. 

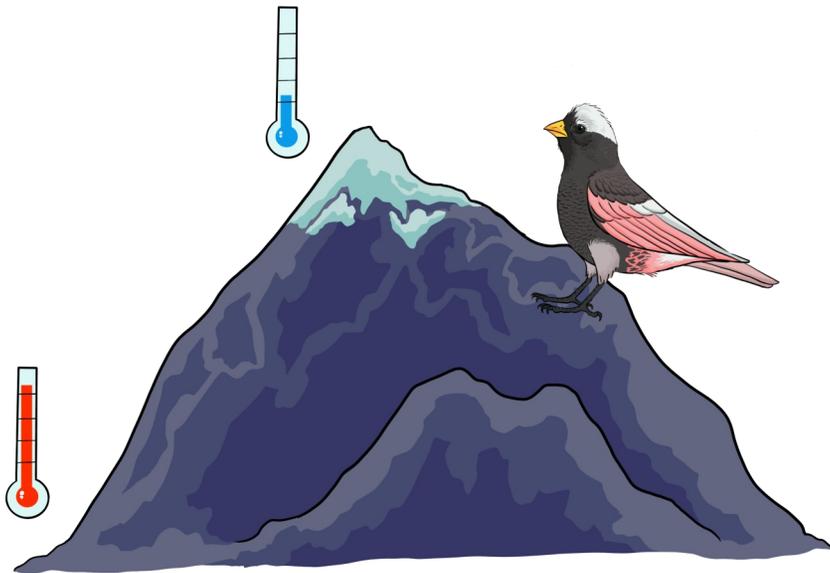


Rosy Finches—Elevation

A pair of rosy finches are migrating south for the winter. They start their day in a cozy Ponderosa Pine tree located 2,000 feet up the mountain, where the temperature was 50 °F. As the sun rises, they decide to fly to a riparian stream at 3,000 feet where they stop for a drink. Finally, they reach the top of the mountain at 5,000 feet. Every time they travel up 1,000 feet in elevation, the temperature *decreases* by 3.5 °F.

A: What is the temperature near the stream at 3,000 feet?

B: What is the temperature at the top of the mountain at 5,000 feet?



Crest

Elevation: 9800'—10,768'

The Sandia Crest is the highest and coldest part of the mountain. Even in summer, there can be snow on it. Because of this, the crest is home to cold-loving animals.

This book has four types of squirrels. The **Southwestern Red Squirrel** likes cold weather the most. The higher in elevation you go, the better your chances of seeing or hearing one. This squirrel makes a loud *trilling* sound when you get too close to its tree!

In winter, people from all over the world go to the Sandia Crest. They go to see three different types of rosy finch birds. They are very hard to see together anywhere else on Earth.

During winter, **Black Rosy-Finches** are dark brown with a yellow beak. In summer, their feathers and beak become dark black. They also grow a throat pouch to store food for their chicks.

The **Gray-crowned Rosy-Finch's** colorful feathers look like Neapolitan ice cream. Some of these birds migrate to Alaska's highest mountains. These birds breed in higher elevations than any other bird in the entire country!

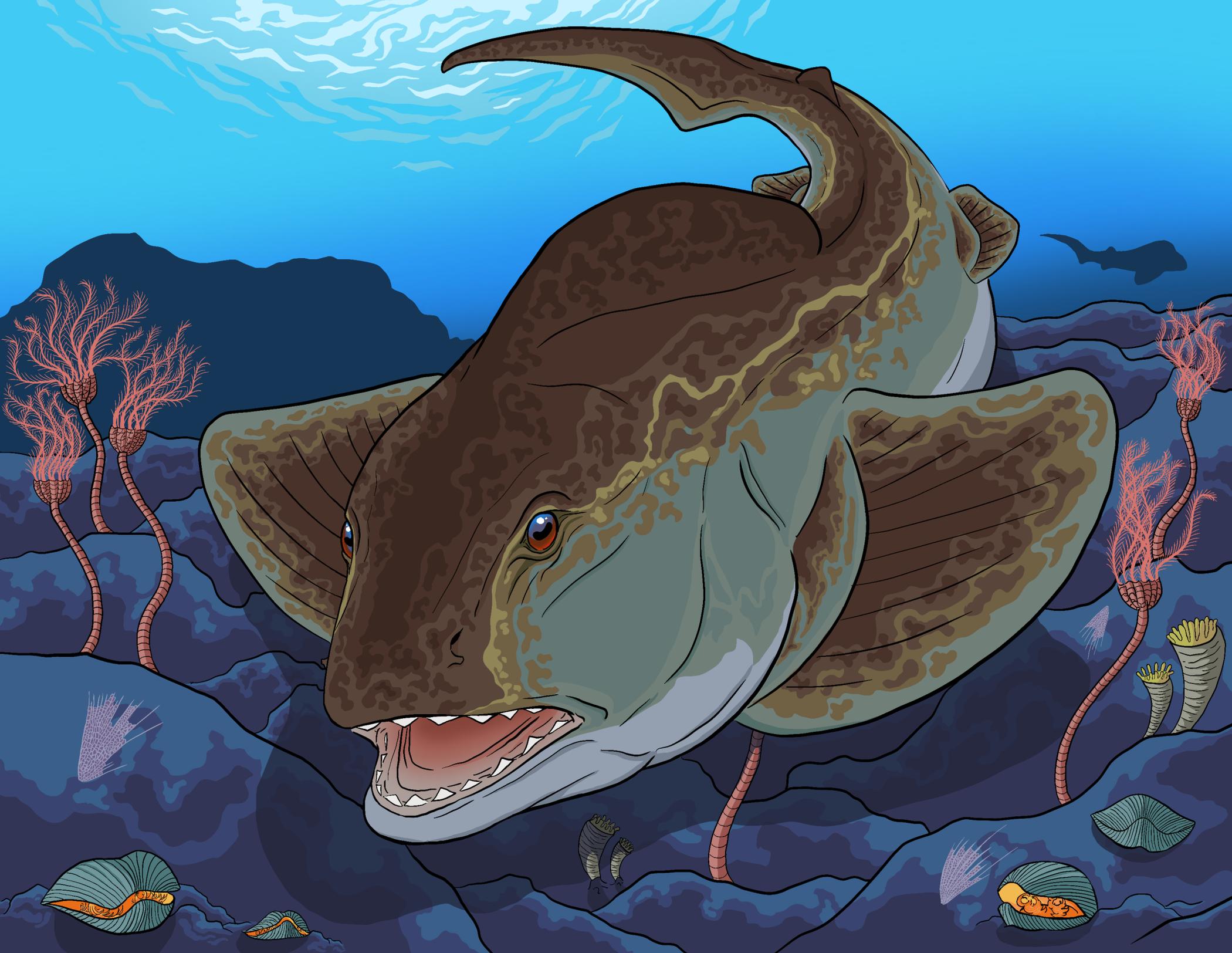
The **Brown-capped Rosy-Finch** is only found in a few places in Colorado and New Mexico. This is because, as the world warms, the summer snowfields they use are shrinking. Little is known about these birds. Research done at the Sandia Crest is important for the future of this species.

If you want to visit the Sandia Crest, see #8 on the map on page 18.

To watch a video about these cold-loving animals found in the Sandia Mountains, scan this QR code. 







Prehistoric Timeline

Just how long ago were there sharks in the Sandias? It's longer than you might think!

T. rex was stomping around New Mexico **65 million years ago**.

Petalodus was swimming here **325 million years ago**.

A: How many years were there between the times of Petalodus and T. rex?

B: Petalodus lived so long ago that dinosaurs like T. rex lived closer to us than to this shark! How many times longer has Petalodus been extinct than T. rex?

To find out: divide 325 by 65!



Sandia Fossils

You can find sharks in the Sandia Mountains. It's true! But to see one alive, you're about 300 million years too late. At that time, the land that the Sandias are on was under an ocean. You won't see a live shark now, but you can find their fossils. Found in rocks, fossils are the remains and signs of ancient living things.

The Sandia Mountains' most common fossils are **Crinoids**. Crinoids used feather-like arms to catch sea-floating plankton. The fossils that you are most likely to find are crinoid stem remains. They look like a stack of tiny coins or donuts.

Some fossils look like shed lizard skin stuck to a rock. They are **Bryozoans**, or moss animals. Each Bryozoan starts from a single tiny oval and then clones itself over and over to form a sheet.

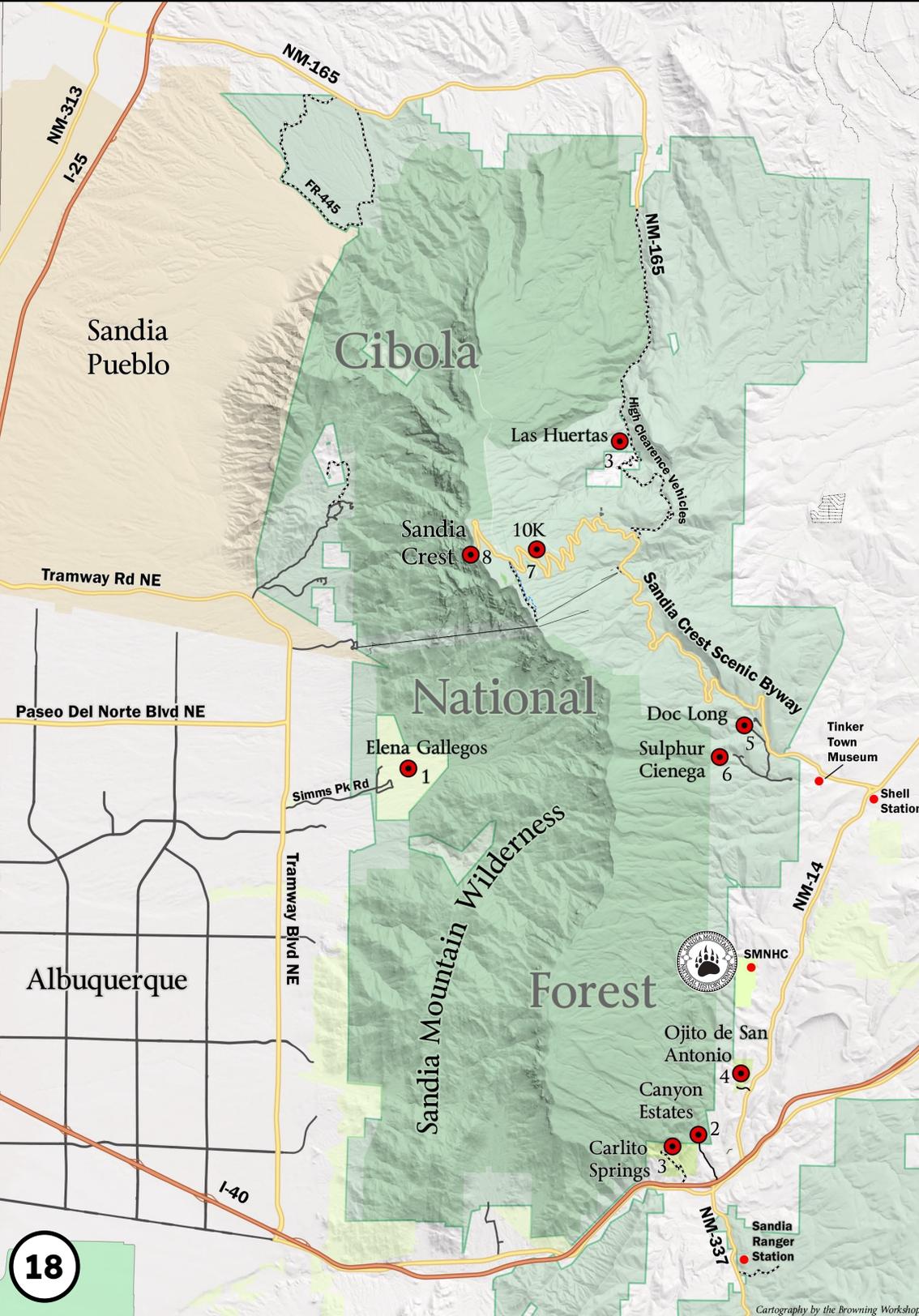
Brachiopods are clam-like. When open, they look like hungry mouths attached to the sea floor. Often you can find fossils of both halves of the shell stuck together.

If you are lucky, you might find ancient **Petalodus** shark teeth. The teeth look like flower petals and were used to tear into prey. Petalodus sharks looked different from the ones we know today. They were still the top predators, and some even reached the size of a modern great white shark.

Want to go on a fossil hunt? Find #2 on the map on page 18.

To watch a video about these ancient fossils found in the Sandia Mountains, scan this QR code. 





Where to Find Wildlife in the Sandias

1. Foothill Habitat:

- Elena Gallegos Open Space. (There is a fee of \$1-2 per vehicle.)

2. Fossil Zone

- Canyon Estates trailhead. Heading here and hiking up to Travertine Falls is a good place for finding fossils!

3. Riparian Habitat

- Carlito Springs Open Space or Las Huertas Picnic Site. Be aware that Las Huertas is on a rough, unmaintained high-clearance road that is not plowed in winter.

4. Piñon-Juniper Habitat

- Ojito de San Antonio Open Space.

5. Ponderosa Pine Habitat

- Doc Long Picnic Area.

6. Oak Zone

- Cienega and Sulphur Canyon's Picnic Sites.

7. Mixed Conifer

- 10K Trailhead.

8. Crest

- To explore the Sandia Crest, you'll need to take a car ride or the tram all the way to the top of the mountain. Check out the Sandia Nordic's Klaus Trail.

10 Tips for Hiking in the Sandias:

1. Always bring plenty of food and water. Staying hydrated is key to keeping you happy and healthy.
2. Leave no trace. Leave only footprints and take only pictures. Throw away your trash and pick up any that you see so that we can keep the mountains clean.
3. Bring layers. The weather can change quickly and will get colder the higher you hike.
4. Bring binoculars. Animals will often run away if you get too close, so these are a great way to observe them from afar.
5. Be respectful of wildlife. Don't touch, feed, or yell at them.
6. Stay on trail. Many habitats are fragile and can be harmed just by walking off trail.
7. Bring a first aid kit.
8. Never go alone, and tell others where you're going and when you expect to return.
9. Be considerate of other visitors.
10. Take a flashlight, even if it is just a day hike. It is better to have it and not need it than need it and not have it.

For more tips on exploring these mountains, check out these videos!



Outdoor Safety



Outdoor Ethics



Animal Signs

Species Checklist

of Plants & Animals in This Book

Take a trip to the Sandía Mountains and check off each animal and plant below as you see them in the wild!

Plants

- Bear Grass
- Gambel Oak
- Cholla Cactus
- Piñon Pine
- Juniper
- Ponderosa Pine

Invertebrates

- Sandia Hairstreak
- Caddisfly
- Planarian
- Bark Beetle
- Zephyr-eyed Silkmoth
- Bee-mimic Robber Fly

Amphibian

- Tiger Salamander

Reptiles

- Collared Lizard
- Greater Short-horned Lizard

Birds

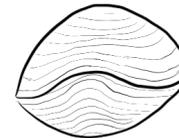
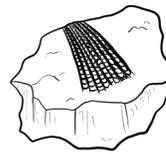
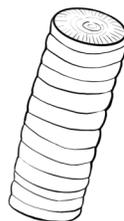
- Cactus Wren
- Hairy Woodpecker
- Acorn Woodpecker
- American Three-toed Woodpecker
- Western Bluebird
- Wild Turkey
- Steller's Jay
- Grace's Warbler
- Brown-capped Rosy-Finch
- Gray-crowned Rosy-Finch
- Black Rosy-Finch
- Red Crossbill

Mammals

- Texas Antelope Squirrel
- Abert's Squirrel
- Southwestern Red Squirrel
- Colorado Chipmunk
- Black Bear
- Mountain Lion
- Gray Fox
- Mule Deer

Fossils

- Crinoid
- Bryozoan
- Brachiopod
- Petalodus



About the Sandia Mountain Natural History Center



The Sandia Mountain Natural History Center (SMNHC) is an environmental education center located in the Sandia Mountains just east of Albuquerque in Cedar Crest, New Mexico. It is owned by Albuquerque Public Schools (APS) and is jointly operated with the New Mexico Museum of Natural History and Science through the State of New Mexico. At 7,000 feet in elevation, the SMNHC has 8 miles of trails crisscrossing multiple life zones, woodlands, canyons and small springs. It borders the Cibola National Forest.

The SMNHC has been teaching the students of New Mexico about their local ecosystems since 1967. All fifth graders in APS, as well as other area schools, have the opportunity to visit the mountains for the Ecology Field Program. Students hike, learn, explore, and do hands-on activities in the ecosystem. SMNHC museum educators also travel around the state to provide the program for students at state parks and other natural areas near them. Students are encouraged to use their senses, record their observations, share what intrigues them, and ask questions that help shape their unique outdoor experience.

The Sandia Mountain Natural History Center is not open to the public, except for a few public events hosted each year. Learn more about the SMNHC and its programs at nmnaturalhistory.org/smnhc. Follow them on social media to stay updated.

For educators, access SMNHC-created environmental education activities and lessons for use with your students in the classroom and outdoors at: <https://www.aps.edu/smnhc/curriculum-activities>

Watch hundreds of videos about ecology and outdoor adventuring in the Sandias and throughout New Mexico on the SMNHC YouTube channel. <https://www.youtube.com/@smnhc1>

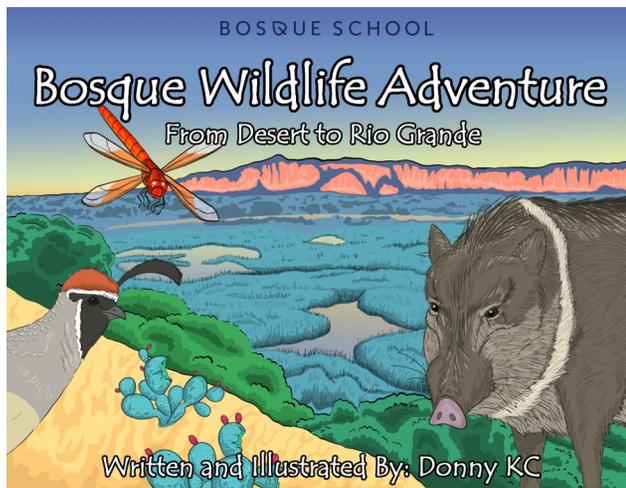


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Bosque School is a college-preparatory, independent school for grades 6-12 where education goes beyond the classroom and students are empowered to thrive. Learn more about Bosque School's commitment to civic engagement through environmental stewardship and academic excellence at: (505) 898-6388 www.bosqueschool.org

Check out other activity books and field science materials from Bosque School, including Donny KC's ***Bosque Wildlife Adventure: From Desert to Rio Grande***



About the author/illustrator: **Donny KC** is a Bosque School alum (class of 2018). He combines his passion for wildlife, a wry sense of humor, and his Biology and Art/Media degrees from Texas Tech University to create original content that is not always easily described but can be experienced at: www.donnykc.com

Bosque School's Field and Community Science Program: ***Doing science that matters beyond the classroom***

In Bosque School's Field and Community Science program, students from K-12 public, charter, home, and other schools are supported as they travel to the Rio Grande's bosque (forest) to engage in actual wildlife and habitat research projects. Participating students do field science, gather and analyze data, and present their findings.

There are no costs for participating students and classes. Bus transportation and other program expenses are paid for by the Cebrian Goodman Youth, Leadership, and the Environment Project and other community partners. For more information about or to sign up to participate in Bosque School's Field and Community Science programs contact: (505) 898-6388 or wildlife@bosqueschool.org

Take a Journey Up the Sandia Mountains!

This book has everything you'll need to start learning about the amazing wildlife that live in the Sandia Mountains of Albuquerque!

- 8 full-color illustrations showing the different habitats and animals you can find here!
- 8 mini-wildlife documentaries featuring the animals you'll see in this book!
- 8 built-in math activities about the wildlife of the Sandia Mountains!
- Map and trails showing you where to explore if you want to find these animals!



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