Bureau of Land Management

Junior Explorer

Colorado High Desert and Canyon Country

JOIN THE ADVENTURE

Activity Book

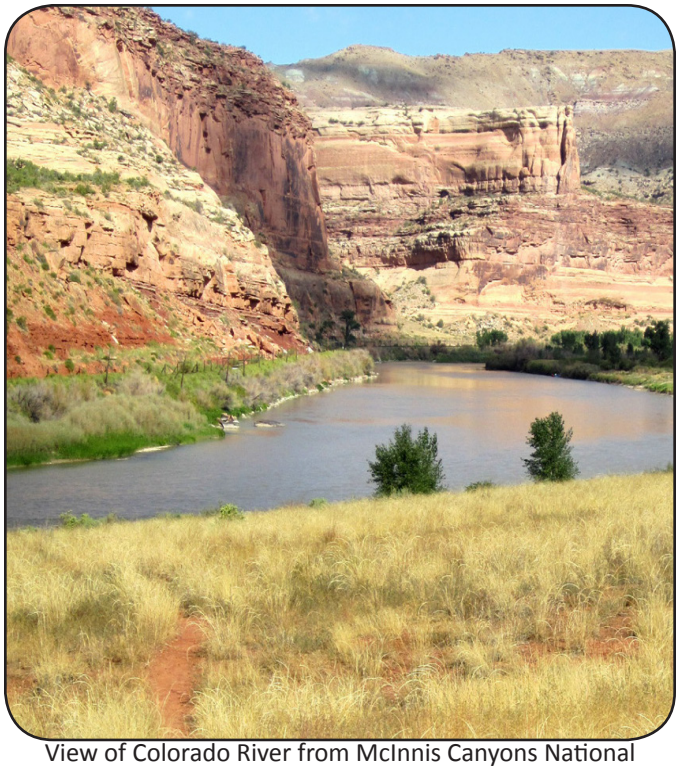
2815 H Road
Grand Junction, CO 81506
(970) 244-3000
http://www.co.blm.gov

National Landscape Conservation System (National Conservation Lands

The BLM manages the largest amount of public lands in the United States. This land belongs to all Americans and is managed for public use. Public lands are a place where people can be stewards of the environment and enjoy their favorite outdoor activities. The land supplies natural resources, like the coal and oil that power our everyday lives. These lands also provide habitats for many plants and animals. The land contains pieces of the history of humans and our planet, like fossils and Native American artifacts.

The Grand Junction Field Office manages more than one million acres of land in western Colorado including the McInnis Canyons National Conservation Area and Dominguez-Escalante National Conservation Area. These are part of the National Landscape Conservation System which conserves and protects particularly special areas. They have special management plans to protect the unique landscapes of these areas.

McInnis Canyons National Conservation Area. Photo By BLM Staff



View of Colorado River from McInnis Canyons National Conservation Area. Photo by BLM Staff

Junior Explorers

You can work through these activity pages on your own, or ask a parent or adult to help you. When you are done, check your answers with the Answer Key in the back of this booklet. Then say the Junior Ranger pledge, sign your certificate, and you'll be an official Junior Explorer!

As a Junior Explorer, you will be ready to explore and protect America's public lands. Respect wildlife by leaving them alone. Leave plants and artifacts where you find them. Stay on trails when you hike. Clean up after your dog. Public land is for you to use responsibly and have fun!

Public Lands Around Grand Junction

North Fruita Desert: This area pictured here is maintained specifically for fun. The network of trails is perfect for anyone interested in hiking, mountain biking and horseback riding and OHV (off-highway vehicle, like an ATV) opportunities. Camp at the North Fruita Desert Campground for extended fun.

Mountain Biking in North Fruita Desert. Photo by BLM Staff

Colorado River view from Rabbit Valley. Photo by BLM Staff

McInnis Canyons National Conservation Area: Bordering the Colorado National Monument, this area depicted to the left is home to several canyons with natural bridges, arches, dinosaur tracks and several paleontological sites. Pick any of the dozens of hiking, mountain biking or horseback riding trails and go explore the beautiful

Wild horses at the Little Book Cliffs Wild Horse Range. Photo by BLM Staff

Little Bookcliffs Wild Horse Range: This area protects about 36,000 acres of rugged canyons and plateaus in the Book Cliffs specifically for a herd of 90-150 free-roaming horses. Driving to this area from Grand Junction takes about two hours one-way but the beautiful scenery makes it well worth the trip. You may see the same horses pictured here.

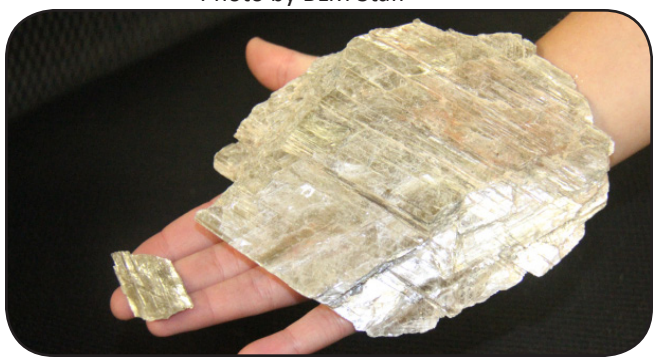
Dominguez-Escalante National Conservation Area: Red-rock canyons and bluffs in this remarkable landscape are quickly becoming famous. This area is home to the Gunnison River and still holds evidence of Native Americans, which you can see from many of the hiking, mountain biking, and OHV trails. Check out the Big Dominguez Campground for some family adventures.

Dominguez-Escalante National Conservation Area Photo by BLM Staff

Things To Do On Your Public Lands

View of Colorado River along Ruby-Horsethief float.
Photo by BLM Staff

Colorado River - Ruby-Horsethief float: This is a peaceful 25-mile stretch of the Colorado River with lots of wildlife, especially bald eagles and bighorn sheep, as well as hiking opportunities up several side canyons. Camp overnight or float straight through to Westwater, Utah.



Mica Mine Trail: At 2.6 miles round trip, this easy hike through the Bangs Canyon Recreation Area takes you to the historic Mica Mine, an area used in Grand Junction's past to collect valuable minerals for producing historic windows and other necessities. See mica specimen picture here to the left.

The Lunch Loops: Pictured here, this is a very popular hiking and mountain biking trail system for kids of all ages and experience levels. Pick one of the trails to do a full loop, or just bits and pieces for a shorter hike. Keep your eyes open for dinosaur tracks and bone casts and make sure you grab a trail map and plenty of water.

Lunch Loops. Photo by BLM Staff

McDonald Creek Canyon: This moderate trail in the Rabbit Valley area is about 4 miles round trip and takes you right to the Colorado River with Fremont Indian rock art along the way. Bring your camera and make sure you respect the cultural heritage visible along this trail.

McDonald Creek Canyon. Photo by BLM Staff

There are dozens of other trails and trail systems in the BLM land around Grand Junction. Make sure you stop in the Field Office to get maps and directions to wherever you want to go. Check out our website at http://www.blm.gov/co/st/en/fo/gjfo/recreation.html for more hiking, mountain biking and other recreation ideas in the area.

Who Lives On Your Public Lands?

Ecology (ee-call-oh-gee) is the study of the relationships between living things. The study of Ecology helps us understand how plants and animals live and interact together in an environment. In the Grand Junction area, there are desert, riparian and forest ecosystems that each have distinct characteristics.

Desert Bighorn Sheep

Collared Lizard

Saw Whet Owl

Canyon Treefrog

Bald Eagle

Wildlife Word Search

Use the word bank at the bottom of the page to complete this wildlife word search, and learn some of the special animals found on our BLM land!

L	E	O	F	V	K	E	Q	Q	W	H	Z	J	U	D	B	J	C	D	L
H	W	B	Q	B	F	R	M	D	D	D	I	H	C	N	A	J	R	K	W
X	A	T	R	A	T	T	L	E	S	N	A	K	E	S	R	A	F	M	O
O	L	B	U	R	R	O	W	I	N	G	O	W	L	A	Z	A	O	G	T
M	T	G	E	G	O	D	E	I	R	I	A	R	P	I	L	U	T	M	E
D	J	U	Z	O	P	B	A	L	D	E	A	G	L	E	N	S	P	O	H
G	L	K	H	M	G	P	X	L	G	O	J	D	Z	T	D	A	E	F	W
O	C	E	V	I	J	Z	Z	L	L	P	E	I	A	B	E	G	E	T	W
R	P	K	O	O	J	B	A	T	R	R	V	I	E	Q	C	E	H	N	A
F	R	D	N	P	T	J	I	O	A	T	N	A	B	M	P	G	S	L	S
E	R	C	R	J	A	B	A	L	A	L	V	V	Z	G	E	R	N	I	G
E	D	P	N	T	B	R	L	B	I	E	S	G	D	P	I	O	R	L	E
R	C	X	S	A	R	O	D	O	R	I	S	B	B	V	T	U	O	Q	N
T	X	E	R	U	C	E	N	L	I	E	C	L	E	X	Q	S	H	N	N
N	J	E	H	X	T	S	Y	X	I	T	R	R	Z	V	O	E	G	E	T
V	B	O	H	T	E	V	T	U	V	Z	O	D	A	S	J	T	I	R	N
M	A	I	O	B	Y	V	U	Y	U	T	A	V	Z	E	A	N	B	F	P
T	L	P	I	S	N	S	O	L	T	G	B	R	O	O	C	Z	U	O	E
M	S	E	Z	K	B	D	W	E	K	H	N	X	D	A	W	F	B	V	L
Z	W	P	U	N	L	O	R	X	P	M	R	R	S	N	O	B	O	L	C

Find words Forward, Backward, Up, Down, Diagonal

Collared Lizard	Beaver	Bighorn Sheep	Bald Eagle	Sage Grouse
Leopard Lizard	Treefrog	River Otter	Spotted Bat	Prairie Dog
Rattlesnake	Rabbit	Mountain Lion	Saw Whet Owl	Burrowing Owl

Riparian Ecology

If you've ever looked out over the Grand Valley from a high viewpoint, you've probably noticed the green, winding corridor of the Colorado River. This is an example of a riparian ecosystem, a place where water-loving plants and animals interact. Many of the trees here are cottonwoods, a key species in riparian ecosystems. They need a lot of water to survive, so they grow along river banks or above underground water. As pioneers traveled west, they often used cottonwood trees to determine where water might be. Bald eagles also prefer cottonwoods for nesting.

Boat ramp in Loma. Photo by BLM Staff

To the left, tamarisk trees need a lot of water to survive. They were introduced more than a century ago to help stabilize canal and river banks because they grow very quickly and have deep roots. But tamarisk spread rapidly across the western United States, pushing out cottonwoods and other native plants.

The BLM introduced the tamarisk beetle in order to manage the tamarisk and help cottonwoods reclaim their natural habitat. Shown to the right, this little insect eats only tamarisk trees without threatening any native plants. The relationship between the cottonwoods, tamarisk and tamarisk beetles is just one example of how delicate ecosystems are and how plants and animals interact

Cottonwood Bench on Colorado River. Photo by BLM Staff

Take It Outside!

If you see buckets like this hanging off a sign along the trail or river, stop and water the baby cottonwood nearby! The BLM has been planting cottonwoods to try and help them recover.

Ecosystem Crossword Puzzle

In an ecosystem, a community of living organisms, each plant and animal has a role to play. Some plants serve as food and shelter for animals while others stabilize river banks and soil for more plants to grow in. Some animals even serve as food for others.

Use the word bank at the bottom of the next page and learn about some of the relationships between plants and animals found on BLM land surrounding Grand Junction.

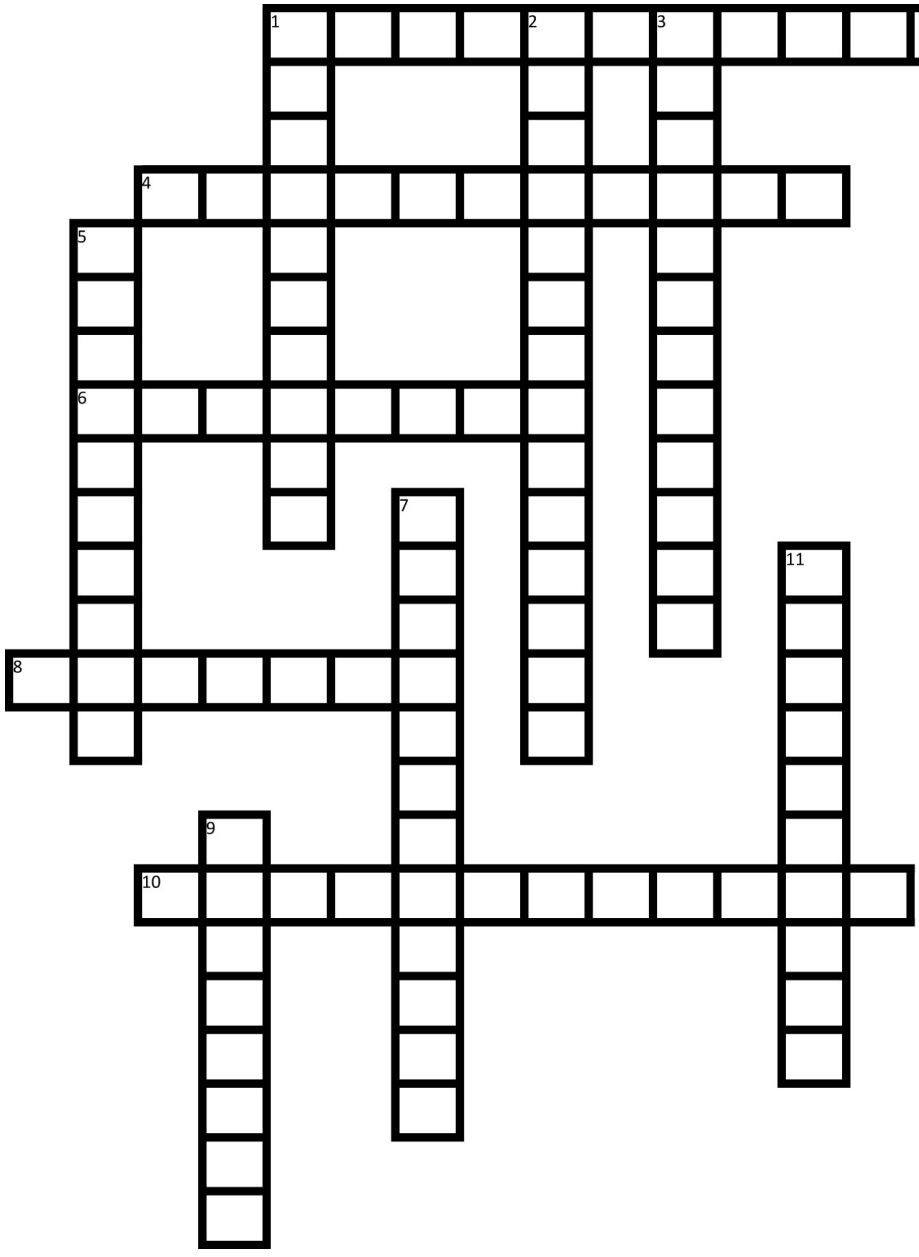
Down

1. I am an invasive species and spread rapidly because my seeds are carried by the wind and small rodents.
2. I am an insect that only eats the plants I am named after, while helping keep the plant under control.
3. Unlike most of my kind, I am active during the day. I also like to eat prairie dogs and will sometimes live in their burrows.
5. I usually grow along river banks and can be very tall. Tamarisk has pushed me away from my habitat but I am starting to grow back.
7. I have long roots that stabilize river banks and am considered invasive because I spread rapidly and push out other plants.
9. In the past, mica from me was used to make windows because it is a mineral that forms in clear, flexible and thin sheets.
11. My family and I live in an underground burrow and will squeak and chirp to warn the neighbors when predators are around.

Across

1. I am not a plant or animal, but I stabilize sand and dirt for plants to grow in. I am also very fragile and can take as long as 100 years to recover from a single footprint.
4. I was formed by a stream and am the only natural bridge in the state of Colorado.
6. I am another invasive tree that grows on river banks and threatens cottonwood trees.
8. I can be found in rocks and am the imprint or remnant of a plant, animal or bug from many years ago.
10. I use my agility to find food on steep cliffs, and my excellent eyesight to identify predators. My large horns grow in a circle, but sometimes get so big they block my vision and have to be broken off.

Ecosystem Crossword Puzzle



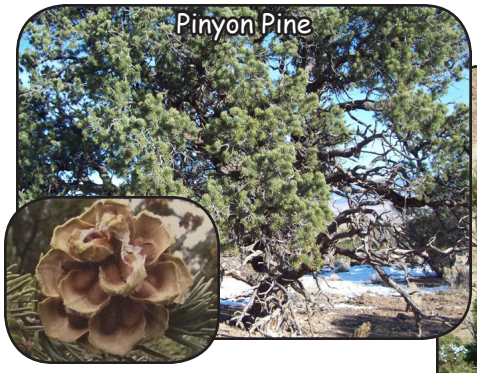
Tamarisk	Bighorn Sheep	Prairie Dog	Juanita Arch
Cheatgrass	Tamarisk Beetle	Cottonwood	Burrowing Owl
Russian Olive	Cryptobiotic Soil	Mica Mine	Fossils

Desert Ecology

Most of the land around Grand Junction is considered a desert ecosystem. This means that there is very little rain and lots of sun. The plants and animals living here must be very adapted to drought and fire conditions. Animals you might see include snakes, lizards, rabbits and desert bighorn sheep because they can all survive with limited food and water. You might also see plants like cactus and Indian rice grass because their root systems grow out instead of down to capture as much moisture as possible.

Some trees you will see while out hiking are pinyon pines and junipers. These are very hardy trees, capable of surviving intense wildfires and without water for long periods of time. Even though wildfires are not common in desert ecosystems, they are still important. Fires clear space for new trees to grow and the ash left behind refertilizes the soil. This creates a healthier environment for pinyon pines and junipers.

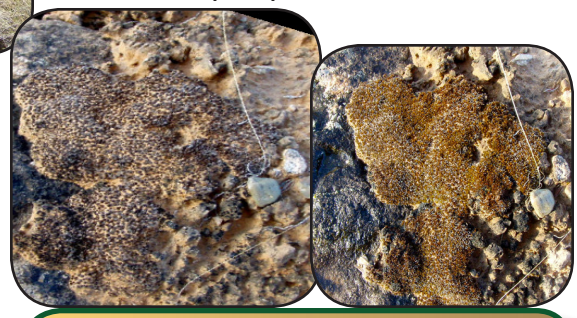
Pine Ridge Fire. Photo by BLM Staff



Take It Outside!
The next time you go hiking with an adult, see if you can find a pinyon pine cone or nut!

Native American people who lived here had to be creative to find enough food to eat. Pinyon pines produce a nut that has been collected for food for hundreds of years. Many people still collect pinyon nuts today and you can find them in the grocery store! Junipers were also an important source of firewood and bedding for Native American people.

Be careful where you walk! You may find cryptobiotic soil along the trail. Cryptobiotic soil is not just a soil, but a living thing. It is made from bacteria, moss, and lichens and is only found in arid regions like Grand Junction. It holds together loose soil and absorbs water, allowing other plants to grow around it. Be careful that you don't step on it - it's very fragile and can take as long as 100 years to recover from just one footprint!

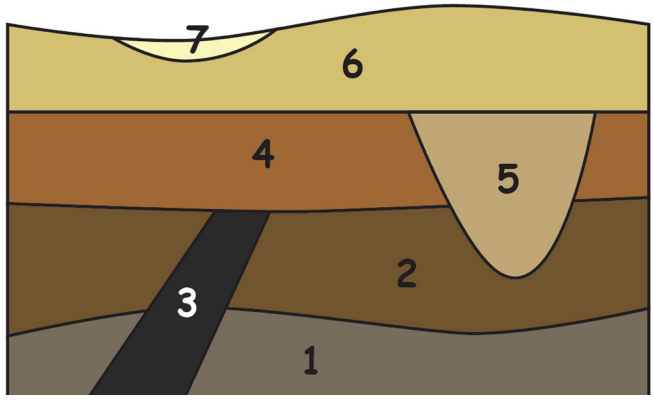


Take It Outside!
Find a mossy bit of cryptobiotic soil and pour water on it. Then watch it absorb the water, swell, and turn green! Remember, don't step on it!

Grand Valley Geology

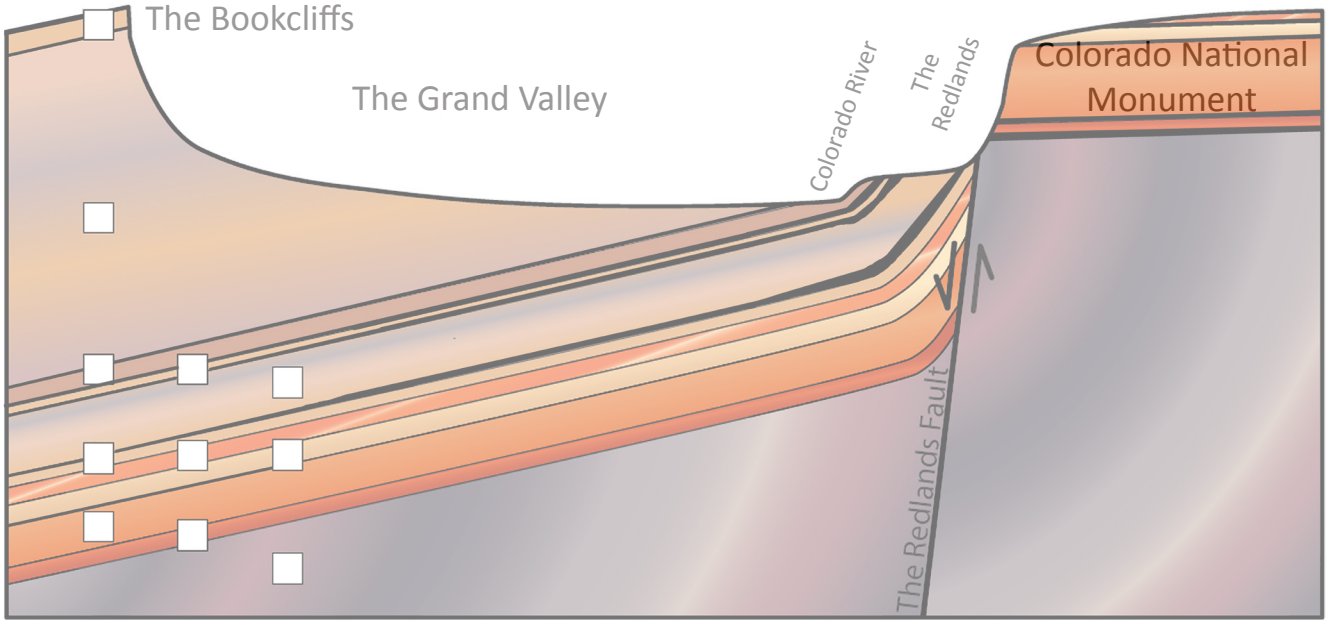
Geology is the study of the earth. Animals, plants, humans and all other living beings depend on the resources the earth provides to survive. Geologists are people who study the earth and find resources that we use everyday.

As sediment builds up over long periods of time, it forms layers of rock. Geologists use these layers to discover the age of the rocks. Layers are built up from the bottom, so the highest layers are the youngest. When natural events like erosion, volcanic eruptions, and earthquakes occur, layers can be disrupted and bent. The layers to the right are numbered from oldest (1) to youngest (7).



The Grand Valley is on the northern edge of an ancient mountain range called the Uncompahgre. Over time the Uncompahgre was pushed up by faults, eroded, had more rocks deposited on top, and finally was pushed up again to form the Colorado National Monument and its surroundings. The last time it was pushed up, the rocks on top draped over the edges and the softer rocks eroded to form the Grand Valley.

Can you be a Geologist? Use the example above to number the layers of the Grand Valley from oldest to youngest. Use 1 for the oldestlayer and 11 for the youngest layer.



History in the Rocks!

Rocks can preserve pieces of creatures that lived millions of years ago. These pieces are called fossils, and can be from animals, plants, fish or even insects. Paleontologists, the people who study fossils, piece together what animals looked like and what kind of environment they lived in millions of years ago.

The rocks around Grand Junction contain many fossils. Some are even of dinosaurs! In fact, the original skeleton of *Brachiosaurus* was found here, and later remains of *Apatosaurus* (also called *Brontosaurus)*, *Stegosaurus* and the carnivorous *Allosaurus* were uncovered. There are lots of places where you can find dinosaur tracks, and many other trace fossils are still being discovered here on your public lands.

Remember, public lands are for everyone to enjoy. You can take fossils of plants, bugs and shells home, but leave all others where you find them so future visitors can see them too. If you're not sure what it is, just take a picture. Someone at the BLM office might be able to tell you!

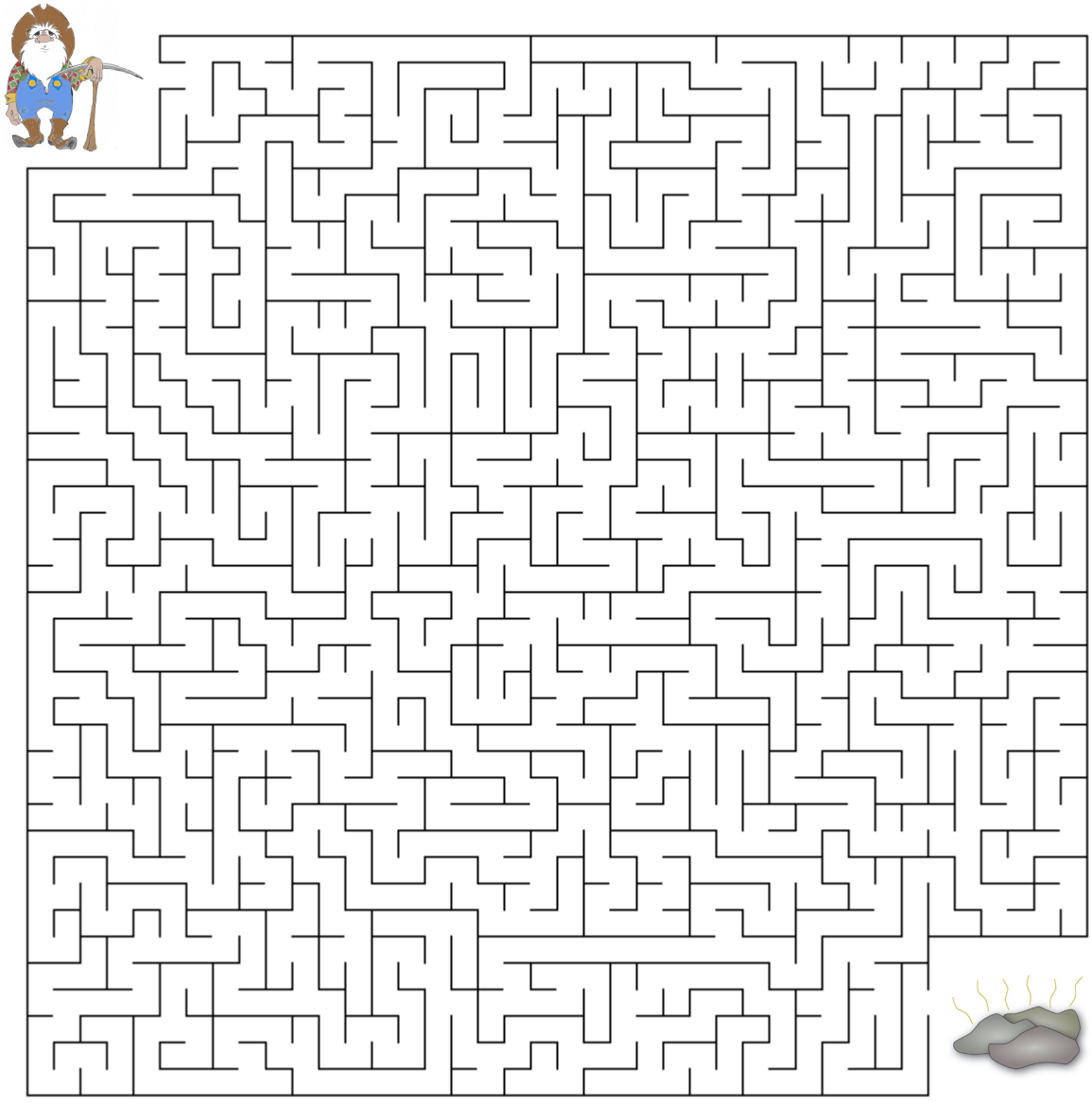
Take It Outside!
Go hike around Dinosaur Hill in Fruita and take a picture with yourself as scale next to one of the giant dinosaur bones!

Match the following fossils that have been found in areas managed by the Grand Junction Field Office to its descriptions.

FOSSILS	DESCRIPTIONS
Allosaurus	– I was one of the largest land animals known to exist, averaging 75 ft in length with a long neck and tail.
Apatosaurus	– I am a two-legged carnivore, a lot like the T-Rex.
Brachiosaurus	– I lived in the seas long ago. Many people have called me Nessie, after the Loch Ness monster.
Crocodile	– I was a large, long-necked herbivore. My original skeleton was found here in the Grand Valley.
Fern	– I am a leafy green plant that is still around and often grows in forests.
Plesiosaur	– I have diamond-shaped plates in a spine along my back and a clubbed tail.
Stegosaurus	– I live in swamps and am still around today, but I used to grow a lot bigger!

Riches from the Earth

Help the miner find the uranium deposit by completing the maze!



We depend on a lot of resources from the earth. Metal, minerals, oil and gas, all come from the earth. Grand Junction's history is full of periods when extracting minerals has been very important. During the mid-1900s, the mineral carnotite became very important to Grand Junction's economy because it contains the elements radium, vanadium and uranium, which are radioactive. The U.S. Government wanted uranium in particular to build atomic bombs during the Cold War, and later to fuel nuclear power plants. Many uranium mines were near the area of Gateway, Colorado.

Today, the area around Grand Junction is very important for drilling for oil and natural gas. Oil and gas are produced when living things from millions of years ago are buried and decay over many years. We use oil to make gasoline and motor oil for our cars. It is also used to make plastic. Natural gas is used to heat our homes in the winter.

Archaeology and YOU!

Archaeology is the study of people from the past. Through archaeology, we can learn about the differences and similarities between people throughout time. We learn how others lived and adapted to their environments. If you find an archaeological site, or evidence of Native Americans, here are ways to protect them for the future:

1. Leave everything in place. Take pictures of fun or interesting items, but don't touch! The oil from you fingers destroys these fragile remnants.
2. Tell an archaeologist. You might be the first one to discover this site, so make sure you come back to the Grand Junction Field Office and tell us what you saw and where.
3. If you see someone vandalizing, picking up items or digging, tell the nearest adult and encourage them to contact law enforcement to protect the site.

Calamity Camp. Photo by BLM Staff

Rremember, you are not the first person to visit this land, and you won't be the last! The things you can see along many hiking trails, like rock art panels and fossils of ancient creatures, are thousands of years old. They have been preserved and protected so that you can see them today, but we also want people to be able to see them thousands of years from now. Remember to stay on the trail so you don't crush things like cryptobiotic soil. Leave things like fossils and arrowheads where you find them so someone else can see it too.

Most importantly, have fun!

Archaeology in the Area

People have been living in the land around Grand Junction for thousands of years. The first people, called Paleoindians, lived here between 14,000 and 6,500 years ago. They were hunter-gatherer people, which means their food came from animals they killed and plants they collected. Between 4,500 BC and AD 0, people continued to hunt and gather but began settling into permanent villages and groups. This time period, known as the Archaic period, is when baskets, spears and darts start to appear. During the Fremont period from AD 0 to AD 1300, people began to live in large villages, built houses, and even began to farm. Their main crops were squash and corn, but they still hunted animals in the area. This is also when pottery began to be used for food storage and when the bow and arrow became a popular weapon. After the Fremont period came the Ute people, or Nuche in their language. They lived in temporary shelters called wickiups and around AD 1600, began using horses left by the Spanish. This changed their way of life, allowing them to move greater distances and carry heavier items. The Utes lived in this area until they were forced on to reservations in 1881 as western settlers moved into this area for homesteading, ranching, and mining.

Native American Word Scramble

Use the word bank below to unscramble these words and learn about different tools that Native American people used in the area!

svratoi _____

wla _____

srhoe _____

mnaoatnemtaed _____

dworabrnawo _____

sdhie _____

piwkiuc _____

WORD BANK:

Awl - used for sewing hides to make clothing

Horse - animal used for traveling and carrying things

Bow and Arrow - used for hunting

Travois - an A-frame device used to help animals carry heavier loads

Hides - comes from animals, this is used for clothing and shelters

Wickiup - a type of house

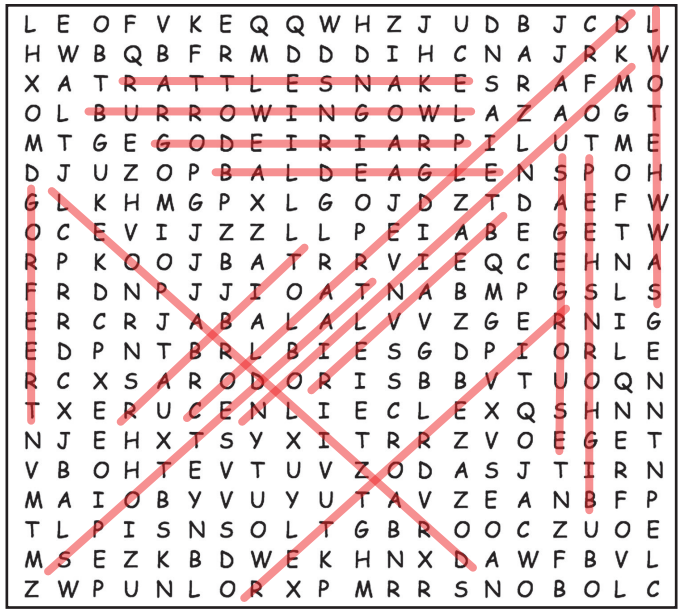
Mano and Metate - used for grinding corn into flour for baking

Journal Page

Use these pages to reflect on your experiences on your public BLM land around Grand Junction. Draw a picture of what you saw, or write a poem about how you felt being outside and enjoying nature!

Journal Page

Answers



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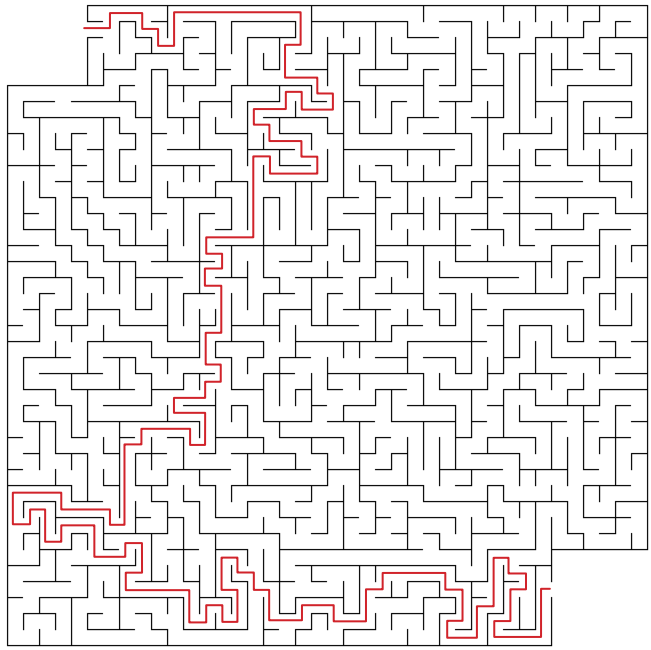

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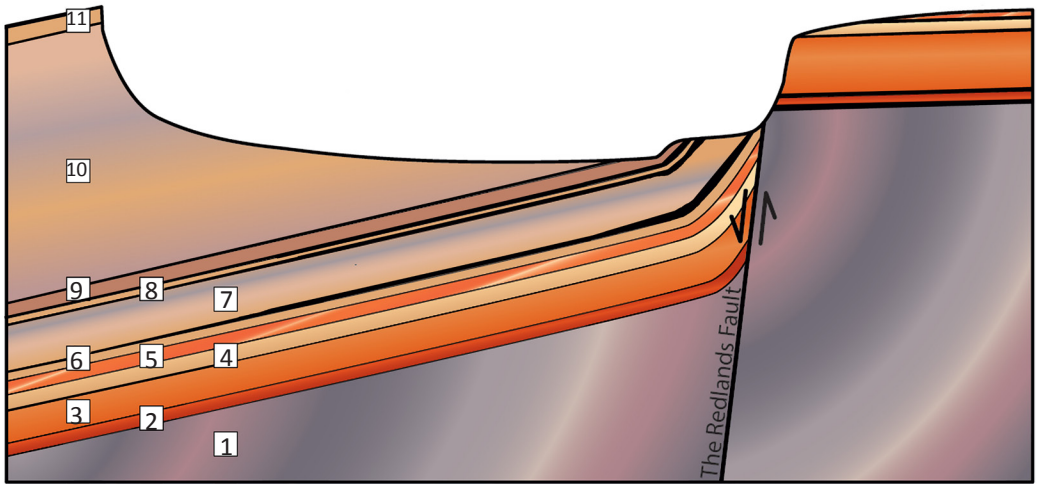
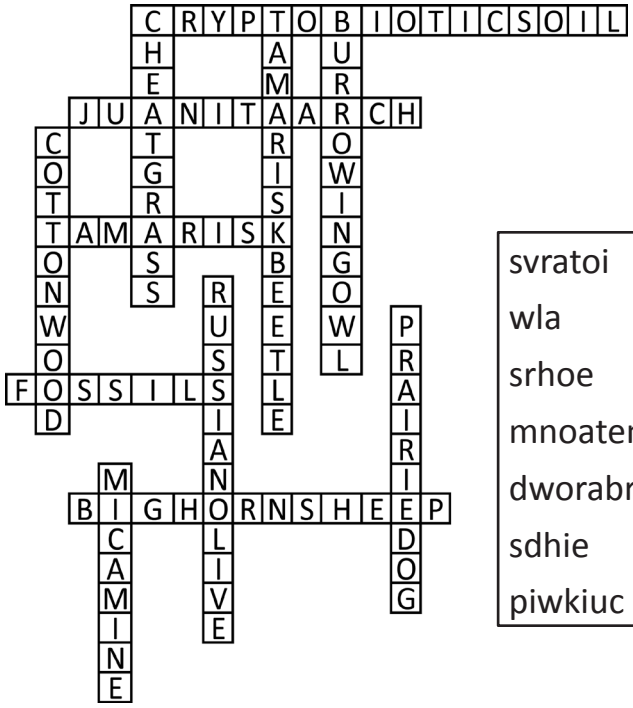


Answers

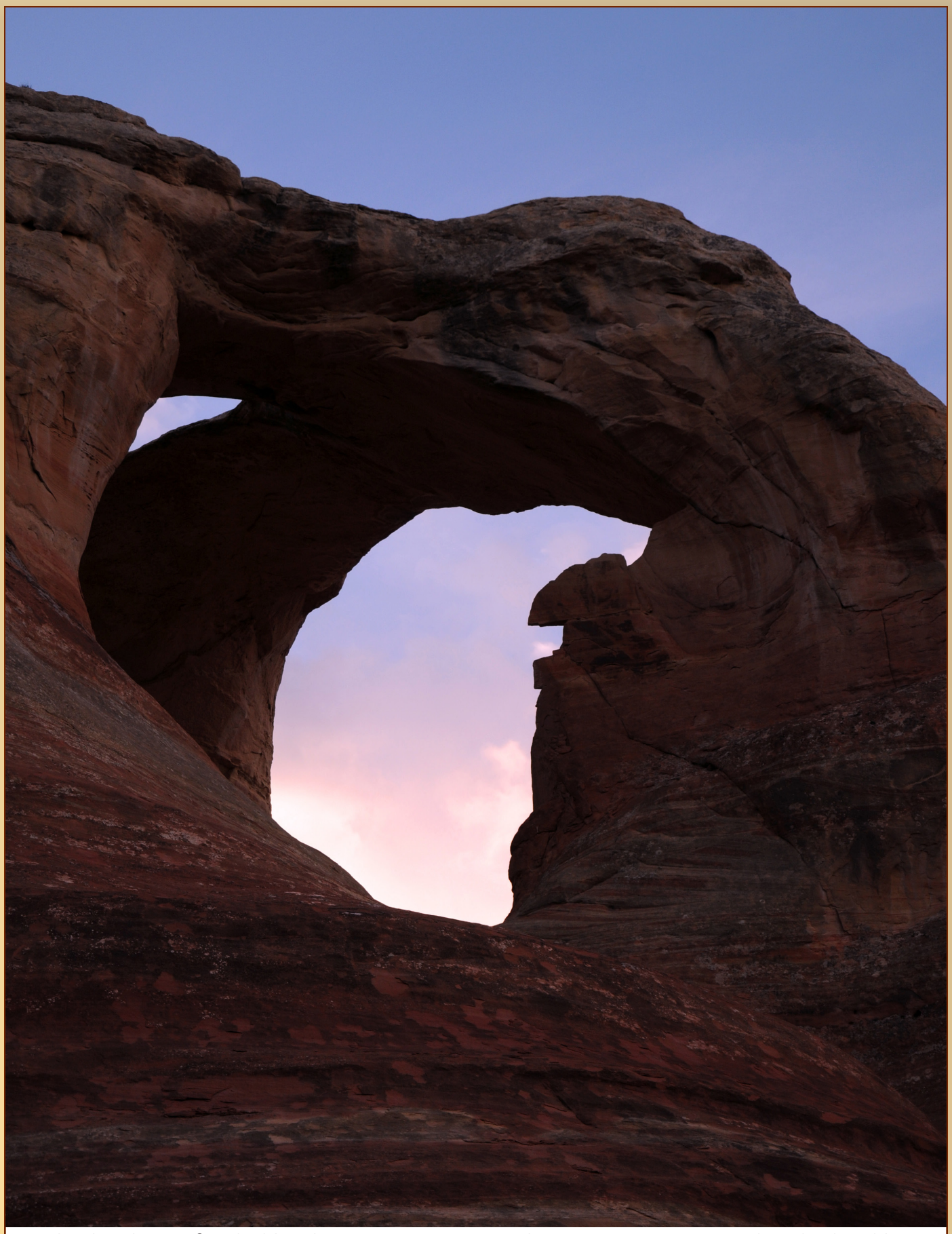
From Page 9



svratoi	=	travois
wla	=	awl
srhoe	=	horse
mnoatemtae	=	mano metate
dworabrnawo	=	bow and arrow
sdhie	=	hides
piwkiuc	=	wikiup

From Page 12

FOSSILS	DESCRIPTIONS
Allosaurus	I was one of the largest land animals known to exist, averaging 75 ft in length with a long neck and tail.
Apatosaurus	I am a two-legged carnivore, a lot like the T-Rex.
Brachiosaurus	I lived in the seas long ago. Many people have called me Nessie, after the Loch Ness monster.
Crocodile	I was a large, long-necked herbivore. My original skeleton was found here in the Grand Valley.
Fern	I am a leafy green plant that is still around and often grows in forests.
Plesiosaur	I have diamond-shaped plates in a spine along my back and a clubbed tail.
Stegosaurus	I live in swamps and am still around today, but I used to grow a lot bigger!



This book was funded by the Junior Ranger Explorer program. Created and edited by Chris Joyner. Written and designed by Jennifer Spinelli and Carmen Winn. All images were captured by BLM employees.

Cut Here

JUNIOR EXPLORER CERTIFICATE

As a Bureau of Land Management Junior Explorer, I promise to:

- Do all I can to help preserve and protect the natural and cultural resources on our public lands.
- Be aware of how my actions can affect other living things and the evidence of our past.
- Keep learning about the importance of nature and our heritage.
- Share what I have learned with others!

Explorer Signature

Date

BLM Official Signature

Date

Cut Here