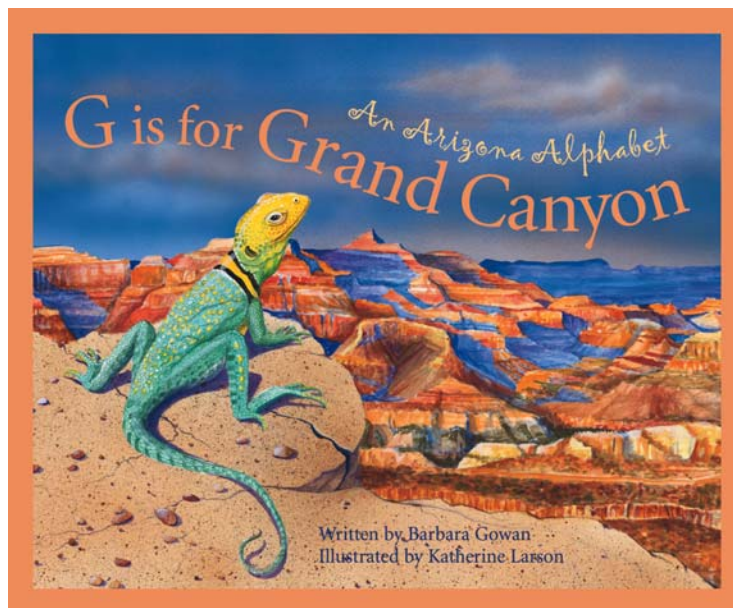


A Teacher's Guide



Written by
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Based on the book *G is for Grand Canyon: A Arizona Alphabet*

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ARIZONA

Arizona, the Grand Canyon State, became the 48th state on February 14, 1912. Read *G is for Grand Canyon* and search for Arizona's state facts. Write your answers and draw illustrations in the spaces below.



State Seal



State Flag

State Capital _____

Official Piece of Clothing _____

State Fossil _____

State Gem _____

State Reptile _____

State Mammal _____

State Flower _____

State Tree _____



State Bird _____



Arizona

The Astronomy Capital of the World

Read page A of *G is for Grand Canyon* to learn why Arizona is regarded as the astronomy capital of the world.

Visit www.skymaps.com for constellation maps and enjoy an evening of stargazing.

Classroom Activity - Draw A Star

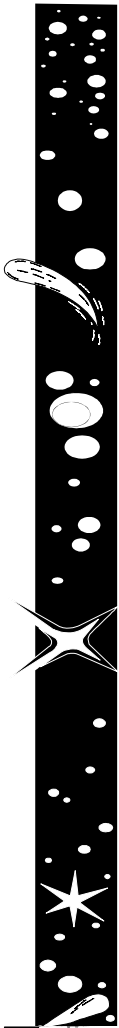
Discuss stargazing and allow students to share experiences such as locating the Big Dipper or wishing upon a shooting star. Discuss how stars look like little white lights in the dark sky.

Instruct students to draw and color stars. As students are drawing and coloring, draw several spherical shapes on a piece of chart paper. Color the shapes with bluish, reddish and yellowish shades. Label one of the yellowish stars as the sun.

Compare your stars to the students' stars and discuss the differences. Inform your students that the sun is a star and that stars are really spherical in shape like the sun. Further explain that the color of stars varies from white to yellowish, reddish and bluish tints depending on the temperature of the stars. View <http://spaceplace.jpl.nasa.gov/spacepl.htm> for additional information and activities.

Bulletin Board Display

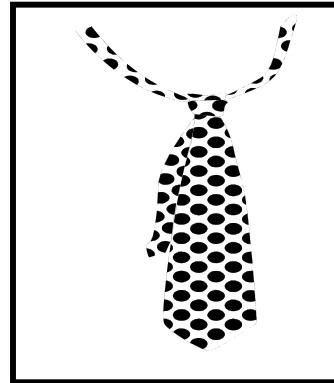
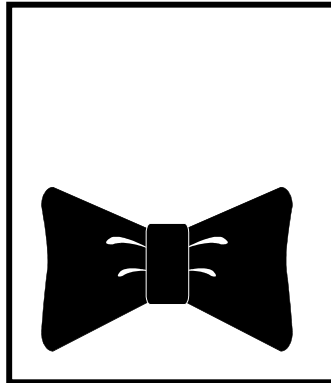
Display students' stories about stargazing on a "star light" bulletin board display. Tape a string of white, yellow, red, and blue Christmas lights to the back of a piece of black bulletin board paper. Poke the bulbs through the paper to create a star-filled background.



The Bola Tie

Arizona's official piece of clothing is the bola tie. Read page B of *G is for Grand Canyon* and choose which bola tie is your favorite.

Other fashion neckwear items are necklaces, bow ties, and neckties. Organize your thoughts using the chart below, then write a paragraph comparing the bola tie to a necklace, bow tie, or necktie.



Similarities

Differences



Copper

Arizona's Valuable Metal

Arizona is the largest producer of copper in the nation. Copper has important characteristics that make it a valuable metal in many industries.



Copper is an excellent conductor of electricity.



Copper is recyclable. It can be used over and over again.



Copper is biostatic. This means bacteria will not grow on it.

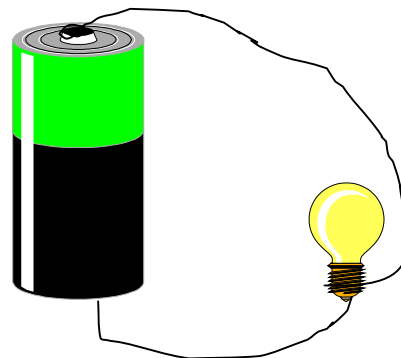
Thomas Edison's discovery of copper's ability to conduct electricity greatly impacted the use of copper in our everyday life. Copper is important in electronic devices and power generation. It is used in the manufacture of machinery to make almost everything we eat, wear, ride in, work with and use everyday.



Try It!

Materials

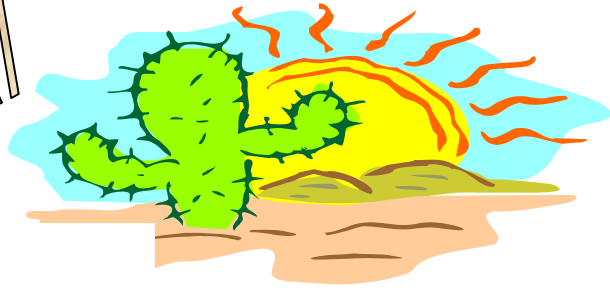
- 1 C cell battery
- 1 flashlight bulb
- 1 piece of copper wiring
- 1 piece of string
- 1 rubber band



Directions

1. Connect the wires to the battery and bulb with the copper wiring. Explain that the electric current is conducted (traveling through) the copper wiring.
2. Follow the same procedure with the piece of string and rubber band. Explain that these materials are unable to conduct the electric current.

Desert Survival



Read page D of *G is for Grand Canyon* to learn about the survival adaptations of desert plants and animals.

Plants and animals that live in the desert need to be able to survive with very little water. Try this activity to increase your understanding of how your life would be if you had a limited water supply.

Materials

One-quart container of water, notepad and pencil

Directions

The quart container of water will be your water supply for the day. Use this water supply every time you drink water or use water, such as washing your hands/face or brushing your teeth. Other drinks, such as soda or juice, are not allowed for the day because these drinks are not available in the desert.

Record your water usage and experiences throughout the day.

How did you feel?

Did you adapt or change your water usage or habits?

Were you more careful and aware of your water usage?

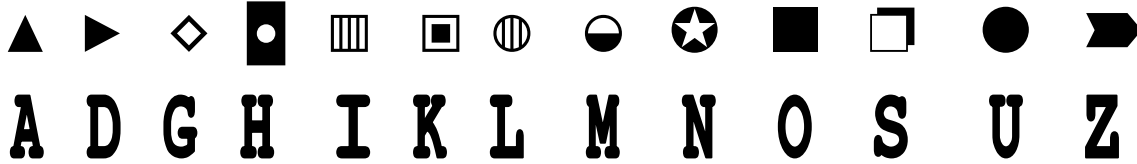
Did you notice others around you wasting water?

Did you spill or waste any water?

If you were to repeat the activity, what would you do differently?

Early People of Arizona

Read page E of *G is for Grand Canyon*. Use the code and read the clues to list the names of the early people of Arizona.



1. Mountain people who lived in pithouses



2. Designed a system of irrigation ditches



3. Grew corn, beans and squash in volcanic soil



4. Known as the ancient ones



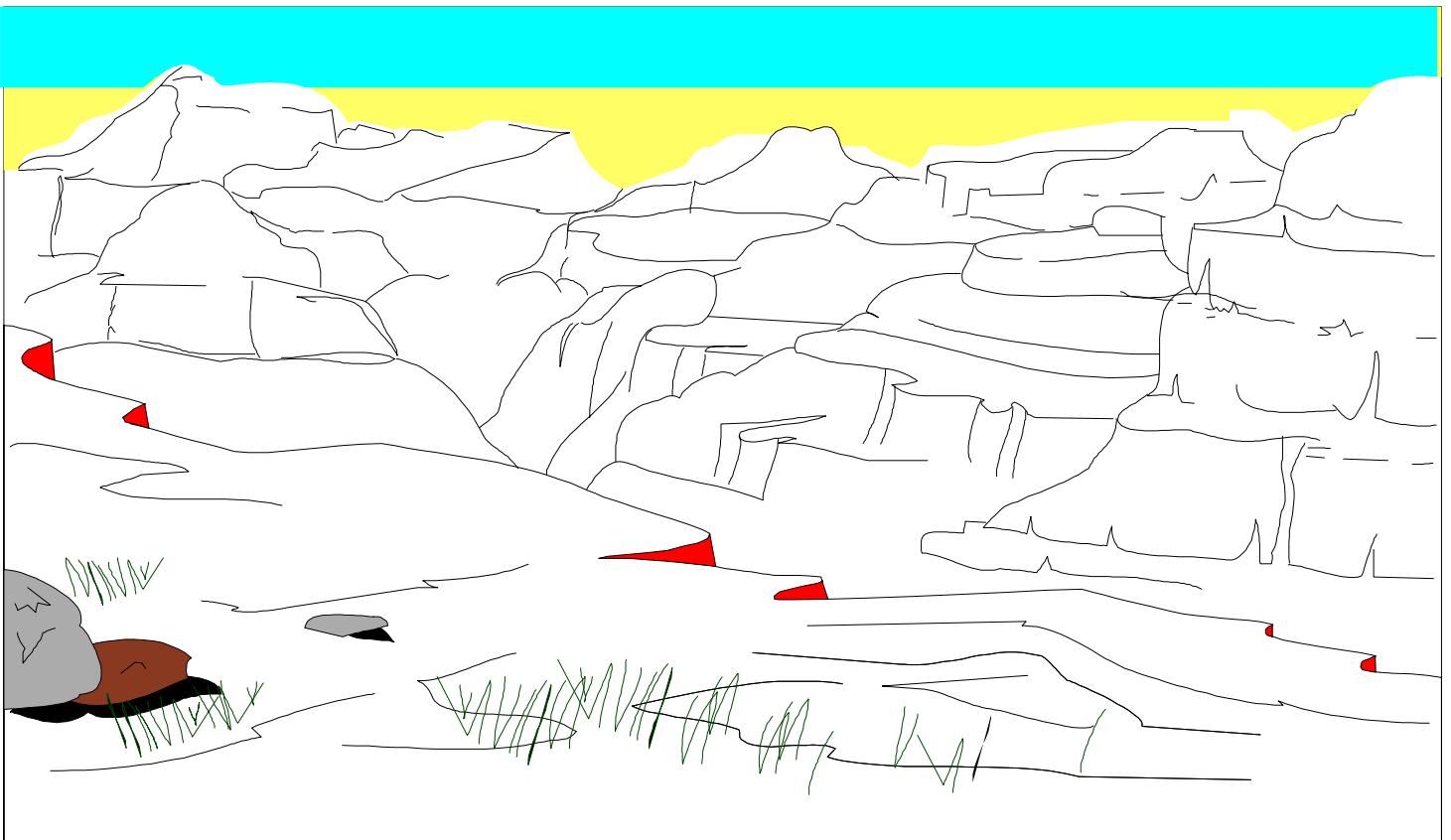
5. Known for their trading along the river corridors



The Grand Canyon

Nine separate rock layers can be seen toward the eastern end of the Grand Canyon. The topmost layer is limestone. The layers in between contain additional limestone, sandstone, and shale rock. The colors vary from shades of brown, light gray-blue, and red. The Redwall limestone is easily identified and is 500 feet thick. The bottom rock layer is half a billion to a billion years old!

Read page G of *G is for Grand Canyon* to learn more interesting facts. Refer to the illustration as you color your own picture of the Grand Canyon.



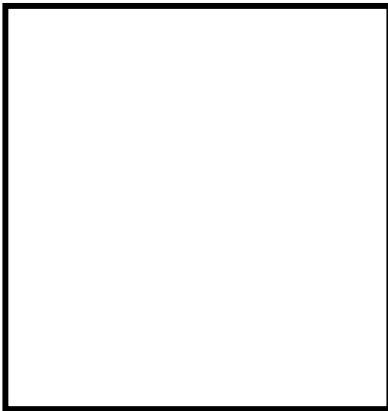
I is for Inde'

Read page I of *G is for Grand Canyon* to learn about the lifestyle of the Inde' or Apache.

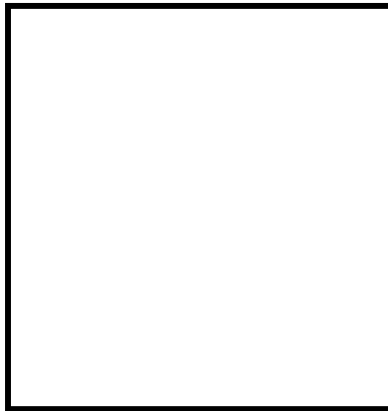
Shelter

Refer to pages E, I and N for illustrations of the different types of shelters used by Native Americans. Draw an example of each shelter in the boxes below.

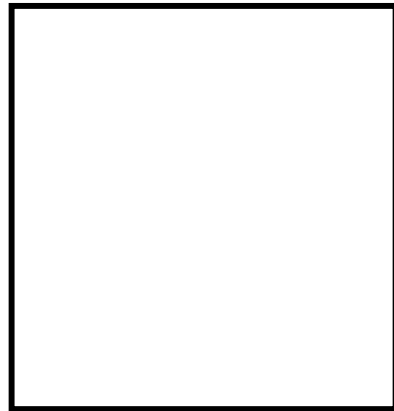
Pueblo



Wickiup



Hogan



Recreation

An important part of the Inde' or Apache lifestyle was playing games. Games taught teamwork, strategy and increased hunting skills.

List games you enjoy playing and how they increase skills you need for everyday life.

Games

Skills

**Extra! Extra!
Read All About It!**



Make the events of Jerome, Arizona, front-page news! Write a headline and news article describing a past or current event of Jerome.

- Pure Copper Vein 5 Feet Thick
- Billion Dollar Mines
- Jail Relocates
- Mines Officially Close
- National Historic Landmark Ceremony

Headline _____

Who _____

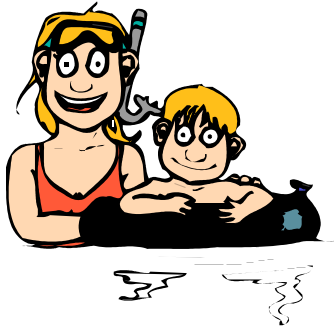
What _____

When _____

Where _____

Why _____

How _____



Lake Powell

Would you and your friends enjoy a vacation at Lake Powell? What is your favorite activity - fishing, swimming or hiking? Survey 10 friends to determine their favorite activity. Record your data and report your results.



Name

Activity



Natural Dyes

The Navajo used plant leaves, flowers, roots and berries to create dyes to change the natural color of wool. Experiment making your own beautiful colors!

Materials

Green - Algae, moss

Purple - blueberries, raspberries, blackberries

Red - beets, cranberries

Yellow - sunflower petals, marigold petals

Cooking pot, water, stove top

Salt and baking soda

Strainer

Eyedropper and coffee filters

Directions

1. Create one dye color at a time. Add plant material of desired color into pot.
2. Add water and boil. Add additional plant material to increase color intensity.
3. Strain out the plant material.
4. Add a small amount of salt and baking soda to the colored water.
5. Repeat this procedure for each color.
6. Use the eyedropper and dispense a small amount of dye on a coffee filter.
7. Continue to experiment creating colors! Consider dyeing a handkerchief or T-shirt.

Ringtail

Gambel's Quail

Ridgenose Rattlesnake

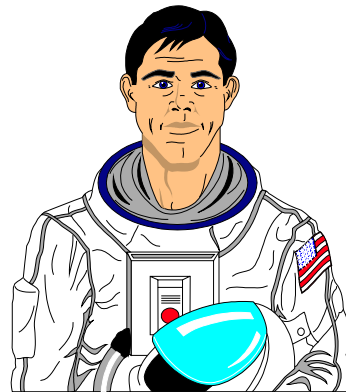
Read about the Gambel's Quail, Ringtail and Ridgenose Rattlesnake on pages Q and R of *G is for Grand Canyon*. Determine which facts describe each animal and list the facts below on the appropriate charts.

Gambel's Quail

Ridgenose Rattlesnake

Ringtail

Meteor Crater



How deep is Meteor Crater?

How wide is Meteor Crater?

What famous astronauts trained there?

Find the answers to these questions and other interesting facts on page M of *G is for Grand Canyon*.

CREATE YOUR OWN JET PACK

Materials

Scissors and tape
Medium size cardboard box
Aluminum foil
Silver dryer vent exhaust hose
Wrapping paper tube
2 Pieces of wide black ribbon

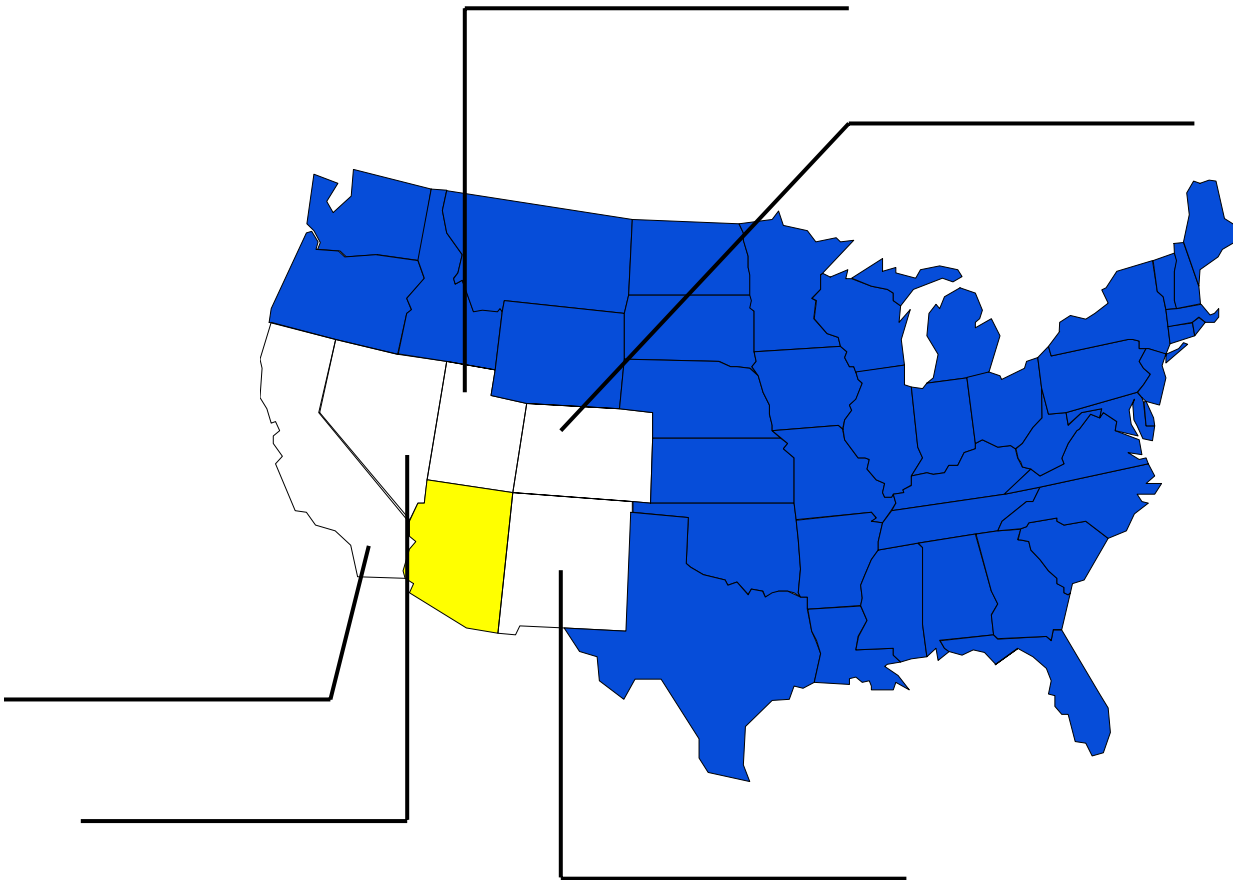
Directions

1. Cut slits the width of the black ribbon at the top and bottom of the cardboard box. Thread the ribbon through the slits and tie together.
2. Repeat step number one with the second ribbon. Your box should resemble a backpack.
3. Cut holes the circumference of the dryer vent hose on the side of the box near the top. Attach with tape.
4. Cut holes the circumference of the wrapping paper tube on the side of the box near the bottom. Push the tube through the box and bend the ends forward for handles.
5. Wrap the "jet pack" with aluminum foil.

Arizona and Its Neighboring States

Label the states bordering Arizona.

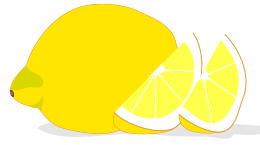
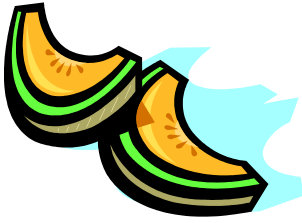
Nevada Colorado New Mexico California Utah



List the states that meet at Four Corners.

Circle Four Corners on the map.

Yuma's Agriculture



Read page Y of *G is for Grand Canyon* to learn about the city of Yuma and its agriculture. Unscramble the crops listed below.

1. u c e t e t l _____

2. t a l c a n p o u e _____

3. l i f c a u l o w e r _____

4. s l e m n o _____

5. r b o c c l o i _____

6. t t c o o n _____

7. a f l l f a a _____

What river supplies irrigation to Yuma's farmland?

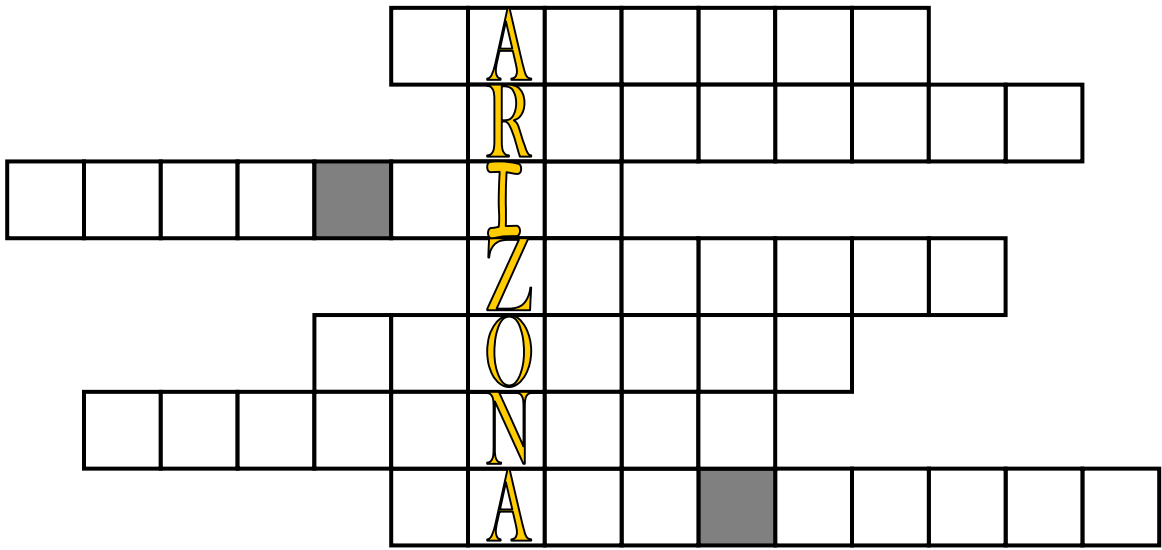
Arizona Word Search

Arizona	Copper	Desert	Katsina
Ringtail	Ridgenose	Saguaro	Tombstone
Phoenix	Yuma	Zanjero	Tucson

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

Arizona Crossword

1. State flower _____ blossom
2. State mammal
3. Official piece of clothing
4. The water master
5. State capital
6. State reptile _____ rattlesnake
7. State tree



Answer Page

Arizona Facts

Capital - Phoenix Clothing - Bola tie Fossil - Petrified wood
Gem - Turquoise Mammal - Ringtail Tree - Palo Verde
Bird - Coues' Cactus Wren
Flower - Saguaro blossom
Reptile - Ridgenose Rattlesnake

Early People of Arizona

1. Mogollon 2. Hohokam 3. Sinagua 4. Anasazi 5. Salado

Ringtail, Gambel's Quail, Ridgenose Rattlesnake

Gambel's Quail - Eats mistletoe berries; chestnut-colored head; can endure dehydration; black, curved plume

Ringtail - Eats mice; nicknamed "miner's cat"; banded bushy tail; cousin of raccoon; active at night

Ridgenose Rattlesnake - Uprturned nose; two feet in length; white strips on face

Yuma's Agriculture

1. Lettuce 2. Cantaloupe 3. Cauliflower 4. Lemons
5. Broccoli 6. Cotton 7. Alfalfa

Arizona Crossword

1. Saguaro
2. Ringtail
3. Bola tie
4. Zanjero
5. Phoenix
6. Ridgenose
7. Palo Verde

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