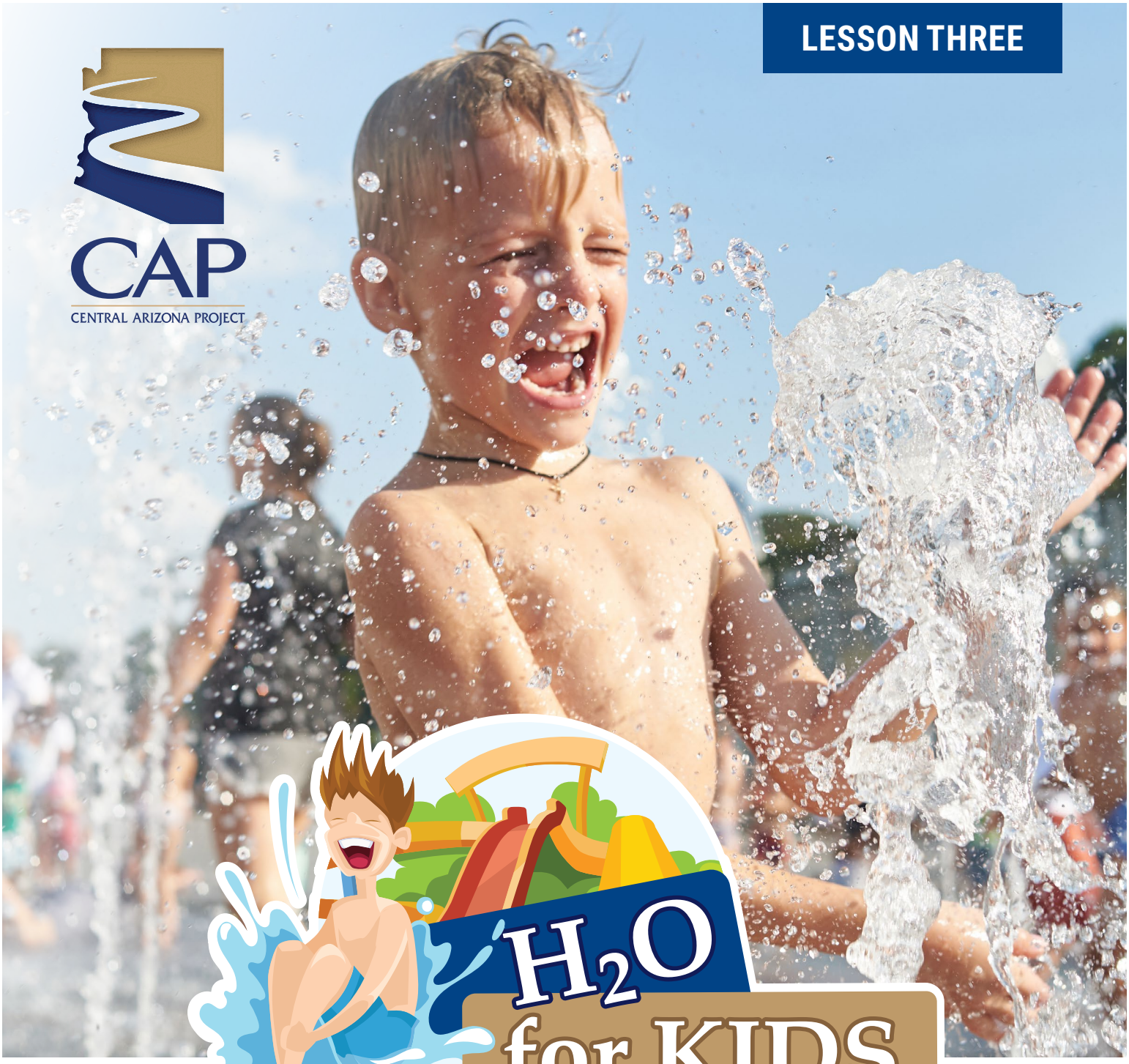
LESSON THREE

CAP
CENTRAL ARIZONA PROJECT



H_2O for KIDS

CENTRAL ARIZONA PROJECT

3-5 ELEMENTARY SCHOOL UNIT OF STUDY

Teacher's Guide

LESSON 3:
ARIZONA'S WATER STORY

Lesson 3 – Cross-Curricular Lesson Plan
ELA, Science (STEM), and Social Science
IDM Model - Inquiry Design Model

Third Grade Standards Taught

ELA: 3.RI.1 / 3.RI.2 / 3.RI.3 / 3.RI.4 / 3.RI.7 / 3.RI.8 / 3.W.2 / 3.W.3 / 3.SL.1 / 3.SL.4
Social Studies: 3.SP4.1 / 3.SP3.1 / 3.SP3.3 / 3.SP3.5 / 3.SP3.7 3.HI.1 / 3.H2.1 / 3.G1.1 / 3.G2.1 / 3.G4.1 / 3.E2.1 / 3.E2.2
Science: 3.LIU1.5 / 3.L2U1.8

Fourth Grade Standards Taught

ELA: 4.RI.1 / 4.RI.2 / 4.RI.3 / 4.RI.4 / 4.RI.7 / 4.RI.9 / 4.W.2 / 4.W.3 4.SL.1 / 4.SL.4
Science: 4.L4U1.11 / 4.E1.U3.9 / 4.E1U2.10
Social Studies: 4.SP1.2 / 4.SP1.3 / 4.SP4.1 / 4.SP4.3 / 4.G2.1 4.G3.1

Fifth Grade Standards Taught

ELA: 5.R1.1 / 5.RI.2 / 5.RI.3 / 5.RI.4 / 5.RI.7 / 5.RI.9 / 5.W.2 5.W.3 / 5.SL.1 / 5.SL.4
Social Studies: 5.SP3.6 / 5.SP3.7 / 5.SP4.2 / 5.G2.1
Science: 5.L4U3.11

Essential Question

How has the availability of water affected Arizona?

Supporting Questions

1. How has working together throughout history helped Arizona become the state it has become today?
2. How is Arizona's water supply connected to other states?
3. Where are Arizona's water sources located?
4. How does the availability of water affect decision making?
5. How have people in Arizona modified and adapted to the Arizona climate?
6. What does the future of Arizona's water supply look like?

Supporting Question #1

How has the availability of water changed over time?

Concept: History of Water

AZ Science Standards - Life Science 4.E1U3.9

3D Science Crosscutting Concept: Cause and Effect/Structure and Function

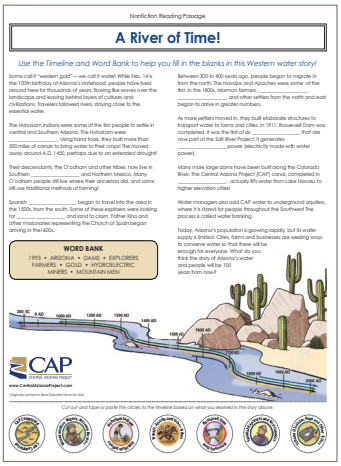
Science and Engineering Concept: Obtain, evaluate, and communicate information

Lesson Objective

Students will be able to explain the availability of water and how it has changed over time.

Materials:

1. Read the passage, "A River of Time." With a partner, decide which terms would fit best in the passage using the context clues within the text. Take turns reading the passage with your partner to make sure the passage makes sense.



Nonfiction Reading Passage

A River of Time!

Use the Timeline and Word Bank to help you fill in the blanks in this Western water story!

Some call it "western gold"—we call it water! While Feb. 14 is the 100th birthday of Arizona's statehood, people have lived around here for thousands of years, flowing like waves over the landscape and leaving behind layers of cultures and civilizations. Travelers followed rivers, staying close to the essential water.

The Hohokam Indians were some of the first people to settle in central and Southern Arizona. The Hohokam were _____. Using hand tools, they built more than 500 miles of canals to bring water to their crops! The moved away around A.D. 1450, perhaps due to an extended drought!

Their descendants, the O'odham and other tribes, now live in Southern _____ and Northern Mexico. Many O'odham people still live where their ancestors did, and some still use traditional methods of farming!

Spanish _____ began to travel into the area in the 1500s, from the south. Some of these explorers were looking for _____ and land to claim. Father Kino and other missionaries representing the Church of Spain began arriving in the 1600s.

Between 300 to 400 years ago, people began to migrate in from the north. The Navajos and Apaches were some of the first. In the 1800s, Mormon farmers, _____ and other settlers from the north and east began to arrive in greater numbers.

As more settlers moved in, they built elaborate structures to transport water to farms and cities. In 1911, Roosevelt Dam was completed. It was the first of six _____ that are now part of the Salt River Project. It generates _____ power (electricity made with water power).

Many more large dams have been built along the Colorado River. The Central Arizona Project (CAP) canal, completed in _____, actually lifts water from Lake Havasu to higher elevation cities!

Water managers also add CAP water to underground aquifers, where it is stored for people throughout the Southwest The process is called water banking.

Today, Arizona's population is growing rapidly, but its water supply is limited. Cities, farms and businesses are seeking ways to conserve water so that there will be enough for everyone. What do you think the story of Arizona's water and people will be 100 years from now?

WORD BANK

1993 • ARIZONA • DAMS • EXPLORERS
FARMERS • GOLD • HYDROELECTRIC
MINERS • MOUNTAIN MEN

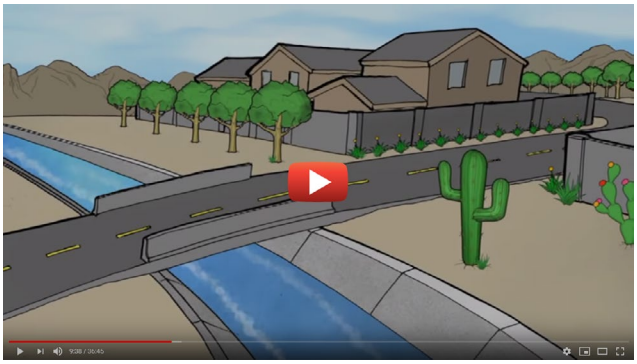
CAP

www.CentralArizonaProject.com

Cut out and tape or paste the circles to the timeline based on what you learned in the story above.

ACTIVITY WORKSHEET:
https://library.cap-az.com/documents/education/A-River-of-Time.pdf

2. Timeline Assembly – Using the images and dates, create a timeline using the information from the passage.
3. Video and Discussion – Watch the CAP video from YouTube about the History of Arizona Water.



VIDEO:
http://bit.ly/WaterStoryVideo2

VIDEO (extended version):
http://bit.ly/WaterStoryVideo

A video script of the video can be accessed at: http://bit.ly/CAPWaterStory

4. Discuss – How did people in the past help Arizona create the water system it has today?

Formative Assessment:

Write an informative essay about the history of water. Be sure to include:

1. Examples of people in history that made our current water system possible
2. At least 3-4 important events leading up to the creation of Central Arizona Project (CAP)
3. How the history of water has impacted Arizona today

Supporting Question 2

How is Arizona's water supply connected to other states?

AZ Science Standards - Life Science

3D Science Crosscutting Concept: Structure and Function

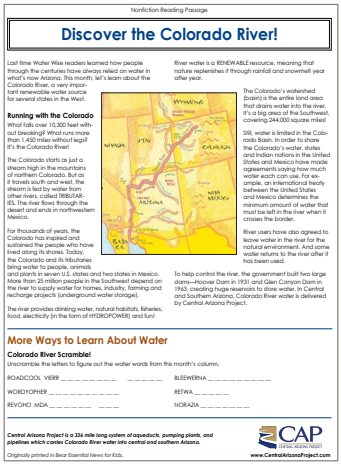
Science and Engineering Concept: Obtain, evaluate, and communicate information

Lesson Objective

Students will be able to explain how Arizona's water supply is connected to other states.

Materials:

1. Articles 1 and 2
2. Video access
3. Interactive map
4. Arizona map worksheet
5. Writing paper



Nonfiction Reading Passage

Discover the Colorado River!

Last time Water Wise readers learned how people through the centuries have always relied on water in what's now Arizona. This month, let's learn about the Colorado River, a very important renewable water source for several states in the West.

Running with the Colorado

What falls over 10,300 feet without breaking? What runs more than 1,450 miles without legs? It's the Colorado River!

The Colorado starts as just a stream high in the mountains of northern Colorado. But as it travels south and west, the stream is fed by water from other rivers, called TRIBUTARIES. The river flows through the desert and ends in northwestern Mexico.

For thousands of years, the Colorado has inspired and sustained the people who have lived along its shores. Today, the Colorado and its tributaries bring water to people, animals and plants in seven U.S. states and two states in Mexico. More than 25 million people in the Southwest depend on the river to supply water for homes, industry, farming and recharge projects (underground water storage).

The river provides drinking water, natural habitats, fisheries, food, electricity (in the form of HYDROPOWER) and fun!

River water is a RENEWABLE resource, meaning that nature replenishes it through rainfall and snowmelt year after year.

The Colorado's watershed (basin) is the entire land area that drains water into the river. It's a big area of the Southwest, covering 244,000 square miles!

Still, water is limited in the Colorado Basin. In order to share the Colorado's water, states and Indian nations in the United States and Mexico have made agreements saying how much water each can use. For example, an international treaty between the United States and Mexico determines the minimum amount of water that must be left in the river when it crosses the border.

River users have also agreed to leave water in the river for the natural environment. And some water returns to the river after it has been used.

To help control the river, the government built two large dams—Hoover Dam in 1931 and Glen Canyon Dam in 1963, creating huge reservoirs to store water. In Central and Southern Arizona, Colorado River water is delivered by Central Arizona Project.

More Ways to Learn About Water

Colorado River Scramble!

Unscramble the letters to figure out the water words from this month's column.

ROADCOOL VIERR _____ _____

BLEEWERNA _____

WORDYOPHER _____

RETWA _____

REVOHO MDA _____ ___

NORAZIA _____

Central Arizona Project is a 336 mile long system of aqueducts, pumping plants, and pipelines which carries Colorado River water into central and southern Arizona.

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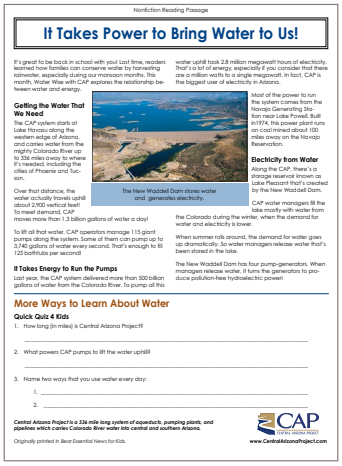

Nonfiction Reading Passage

It Takes Power to Bring Water to Us!

It's great to be back in school with you! Last time, readers learned how families can conserve water by harvesting rainwater, especially during our monsoon months. This month, Water Wise with CAP explores the relationship between water and energy.

Getting the Water That We Need

The CAP system starts at Lake Havasu along the western edge of Arizona, and carries water from the mighty Colorado River up to 336 miles away to where it's needed, including the cities of Phoenix and Tucson.

Over that distance, the water actually travels uphill about 2,900 vertical feet! To meet demand, CAP moves more than 1.3 billion gallons of water a day!

To lift all that water, CAP operators manage 115 giant pumps along the system. Some of them can pump up to 3,740 gallons of water every second. That's enough to fill 103 bathtubs per second!

It Takes Energy to Run the Pumps

Last year, the CAP system delivered more than 500 billion gallons of water from the Colorado River. To pump all this water uphill took 2.8 million megawatt hours of electricity. That's a lot of energy, especially if you consider that there are a million watts to a single megawatt. In fact, CAP is the biggest user of electricity in Arizona.

The New Waddell Dam stores water and generates electricity.

Most of the power to run the system comes from the Navajo Generating Station near Lake Powell. Built in1974, this power plant runs on coal mined about 100 miles away on the Navajo Reservation.

Electricity from Water

Along the CAP, there's a storage reservoir known as Lake Pleasant that's created by the New Waddell Dam.

CAP water managers fill the lake mostly with water from the Colorado during the winter, when the demand for water and electricity is lower.

When summer rolls around, the demand for water goes up dramatically. So water managers release water that's been stored in the lake.

The New Waddell Dam has four pump-generators. When managers release water, it turns the generators to produce pollution-free hydroelectric power!

More Ways to Learn About Water

Quick Quiz 4 Kids

1. How long (in miles) is Central Arizona Project?

2. What powers CAP pumps to lift the water uphill?

3. Name two ways that you use water every day:
   1. _____
   2. _____

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Originally printed in Bear Essential News for Kids.

www.CentralArizonaProject.com

ARTICLE 1
Discover the Colorado River
https://library.cap-az.com/documents/education/Discover-the-Colorado-River.pdf

ARTICLE 2
It Takes Power to Bring Water to Us
https://library.cap-az.com/documents/education/It-Takes-Power-to-Bring-Water-to-Us.pdf

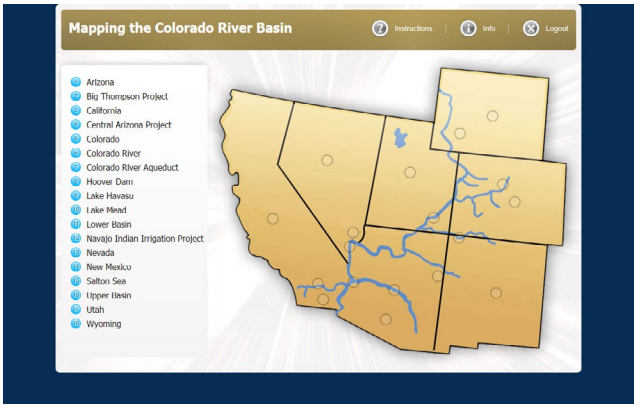
Formative Assessment:

Using the resources, have students write a multi-paragraph informative essay about how Arizona is connected to other states through a shared water supply. Be sure to include:

- The states that the Colorado River provides water for (Article 1)
- The ways that the water is used (Article 1)
- The importance of the CAP system in obtaining water (Article 2)

Formative Assessment:

Mapping the Colorado River Basin



INTERACTIVE MAP:
https://library.cap-az.com/documents/education/games/activity-1.html

Quiz:

Name the states on the map that are connected by the Colorado River.

Supporting Question 3

Where are Arizona's water sources located?

AZ Science Standards - Life Science

3D Science Crosscutting Concept: Cause and Effect/Structure and Function

Science and Engineering Concept: Obtain, evaluate, and communicate information

Vocabulary Review:

Materials

1. Vocabulary cards
2. Tri-folded paper (brochure)
3. Crayons, colored pencils, or markers

Lesson Objective

Students will be able to identify and describe the importance of Arizona's water sources.

Since this lesson contains references to various water structures and places in Arizona, it will need a review of basic vocabulary to understand this part of the lesson. Have students make vocabulary cards on index cards with the word and a corresponding picture or definition. They can refer to these terms throughout the lesson.

Vocabulary Matching Game:

Students will sort the vocabulary terms, definitions, and pictures by identifying important features about the Arizona landmarks. Discuss unique qualities about each landmark.

1. **TRIBUTARY:** A tributary is a stream or river that flows into a larger stream or main stem (or parent) river or a lake.
2. **HOOVER DAM:** The Hoover Dam was completed in 1936. It is located along the Colorado River between Nevada and Arizona. It forms the largest reservoir in the U.S., Lake Mead.
3. **SALT RIVER:** The largest tributary in the state of Arizona, which is about 200 miles long.
4. **GILA RIVER:** Almost every major river in Arizona eventually flows to the Gila, which along with its tributaries has irrigated lands from the time of the Hohokam people to the present day.
5. **ROOSEVELT DAM:** Theodore Roosevelt Dam was constructed between 1905 and 1911 to control the flow of the Salt River and to harness the water for irrigation. The dam turned the Arizona desert into land that could be farmed.
6. **IRRIGATION:** To irrigate is to water crops by bringing in water from pipes, canals, sprinklers, or other man-made means, rather than relying on rainfall alone.
7. **CANAL:** An artificial waterway.
8. **COLORADO RIVER:** Also called the "lifeline of the Southwest," provides water to more than 40 million people and 4 million acres of farmland over 246,000 square miles. Its tributaries pass through Arizona, California, Colorado, New Mexico, Nevada, Utah and Wyoming.

TRIBUTARY

HOOVER DAM

SALT RIVER

GILA RIVER

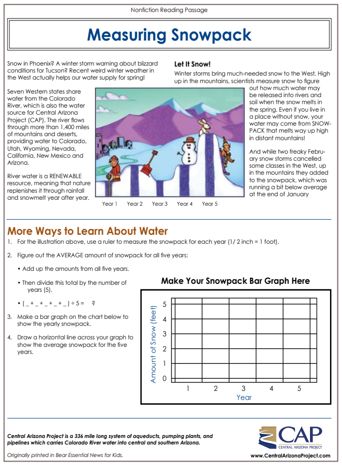
ROOSEVELT DAM

IRRIGATION

CANAL

COLORADO RIVER

Read the following article, “Measuring Snowpack”


Nonfiction Reading Passage

Measuring Snowpack

More Ways to Learn About Water

Make Your Snowpack Bar Graph Here

ARTICLE
Measuring Snowpack
https://library.cap-az.com/documents/education/Measuring-Snowpack.pdf

- Discuss the way that Arizona gets water from renewable resources such as rainfall and snowmelt.
- Do the graphing activity and discuss the amount of water that comes from snowpack.

  Extension Compare the snowmelt from other states, such as Colorado.

Formative Assessment:

Arizona Brochure: Students will fold a piece of paper 3 times, making a tri-fold. Students are to create a brochure describing an Arizona water source, where it can be found and why it’s important to the state.

Supporting Question 4

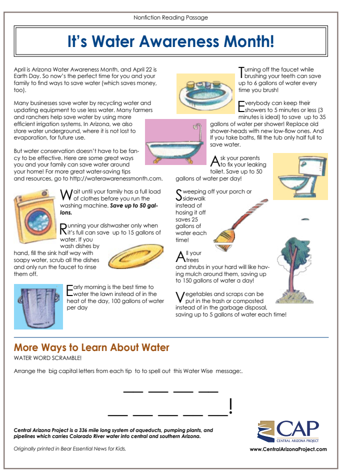
How does the availability of water affect decision making?

AZ Science Standards 3D Science Crosscutting Concept: Cause and Effect/Structure and Function

Science and Engineering - Ask questions and define problems

Materials:

1. Article 1 and 2
2. Activity Worksheet


Nonfiction Reading Passage

It’s Water Awareness Month!

More Ways to Learn About Water

Lesson Objective:

Students will explain the importance of water and its impact on decision making.

ARTICLE 1
Water Awareness Month!
https://library.cap-az.com/documents/education/Water-Awareness-Month.pdf

Discuss the importance of conserving water in the desert.

- Desert Scavenger Hunt
- Walk around the school campus noting how many desert landscaping items you find. Discuss what all the items have in common. Questions you might ask:
  - » What are some similarities and differences between the items on this list?
  - » Why do you think that Arizona uses so many of these items in their landscaping?
  - » How do some of these items help the Arizona environment?
  - » How many of these items are visible where you live? (Give students a copy of the same list to use at home).

Nonfiction Reading Passage

The Importance of Water Conservation in AZ

Water is a very valuable and expensive resource that we use every day. Although 71% of our Earth is water, only 1% is usable freshwater that is contained within the polar ice caps. Water is found in oceans, glaciers, lakes, rivers, streams, and ice caps. As stated previously, not all water is usable freshwater. The tap water that comes to your home has traveled a long distance through surface sources (such as the Colorado River) or from groundwater. In rural areas, wells may bring water from the groundwater in underground aquifers. Water leaving a home is called wastewater and must be cleaned before it can be used again. Wastewater is usually treated by septic systems in rural areas or wastewater treatment plants in urban communities. If septic systems or water treatment plants become overloaded due to the overuse of water, they are not able to clean the wastewater properly. In case of a drought, there may be imposed water restrictions that impact everyone.

We use water for drinking, bathing, cooking, and doing the dishes or washing clothes. We may even use additional water for watering our plants and garden or washing our cars. Also, water is used for recreational purposes, such as swimming in the pool or running through the sprinklers on a hot day. Due to our desert climate, people should become active in conserving water. A good way to start is to simply turn off running water whenever it is not being used, such as when brushing your teeth or washing dishes. Shower times can be shortened and the amount of water used in bathing can be reduced. Households can install special water saving equipment, such as low-flow showerheads that have smaller holes or drip irrigation systems. A good rule of thumb would be to treat water as a precious resource that should only be used when necessary. After all, we live in a desert environment!

Living in a desert means that we must conserve water due to the lack of rainfall. Each year, Arizona receives less than 10 inches of rain each year. Under normal circumstances, many plants and animals would turn out of water quickly. The only way we are able to live here is by carefully using the water from other sources besides rainfall. Fortunately, Arizona is able to get the water it needs through the Central Arizona Project. It allows us to survive in the harsh desert climate with plenty of water.

Central Arizona Project is a 336 mile long system of aqueducts, pumping plants, and pipelines which carries Colorado River water into central and southern Arizona.

Originally printed in Bear Essential News for Kids.

CAP CENTRAL ARIZONA PROJECT www.CentralAzonaProject.com

ARTICLE 2

The Importance of Water Conservation in Arizona

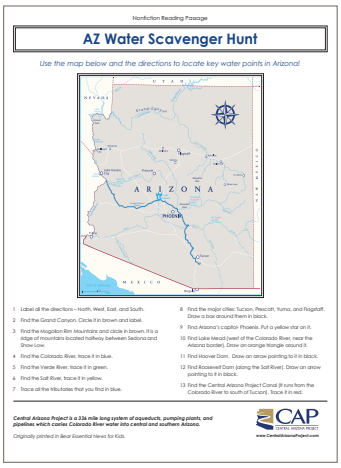
https://library.cap-az.com/documents/education/Importance-Water-Conservation-AZ.pdf

Discuss how the availability of water in the desert impacts one's decision making.

Formative Assessment:

Using the information from Articles 1 and 2, write a persuasive essay stating why it is important to conserve water. Be sure to include:

- At least 3-4 ways to conserve water at home.
- Why it is important to conserve water.
- Your personal opinion about water conservation and why it is important for the future of Arizona.



Nonfiction Reading Passage

AZ Water Scavenger Hunt

Use the map below and the directions to locate key water points in Arizona!

1. Label all the directions - North, West, East, and South.
2. Find the Grand Canyon. Circle it in brown and label.
3. Find the Mogollon Rim Mountains and circle in brown. It is a ridge of mountains located halfway between Sedona and Show Low.
4. Find the Colorado River, trace it in blue.
5. Find the Verde River, trace it in green.
6. Find the Salt River, trace it in yellow.
7. Trace all the tributaries that you find in blue.
8. Find the major cities: Tucson, Prescott, Yuma, and Flagstaff. Draw a box around them in black.
9. Find Arizona's capital- Phoenix. Put a yellow star on it.
10. Find Lake Mead (west of the Colorado River, near the Arizona border). Draw an orange triangle around it.
11. Find Hoover Dam. Draw an arrow pointing to it in black.
12. Find Roosevelt Dam (along the Salt River). Draw an arrow pointing to it in black.
13. Find the Central Arizona Project Canal (It runs from the Colorado River to south of Tucson). Trace it in red.

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ACTIVITY WORKSHEET

Arizona Water Scavenger Hunt

https://library.cap-az.com/documents/education/AZ-Water-Scavenger-Hunt.pdf

Formative Assessment:

After finding all of the important water points in Arizona, discuss the following points:

- Why is knowing where water sources are located in Arizona important? Give at least 3 reasons.
- Find the location where you live. Are there any water sources nearby? What is the closest water source? Where do you think your water comes from?
- Looking at the map, discuss the importance of the Central Arizona Project (the 336-mile system of aqueducts, pumping plants, and pipelines which carries Colorado River water into central and southern Arizona). Why is it necessary? (It is the state's largest renewable water supply that serves 80% of the population in Arizona).
- Estimate how many people the Central Arizona Project served as of 2019. (5,737,316 based on current population of 7.21 million people according to the U.S. Census Bureau, 2019) Was your estimate close to the actual number?

  source: https://www.census.gov/quickfacts/AZ

Supporting Question 5

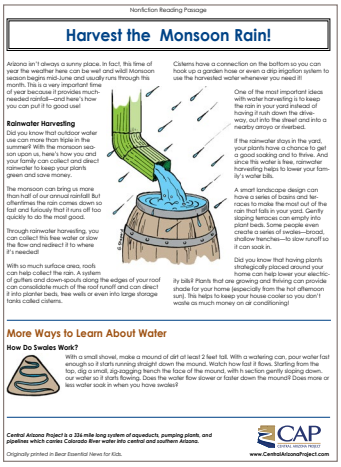
How have people, plants, and animals in Arizona modified and adapted to the Arizona climate?

AZ Science Standards 3D Science Crosscutting Concept: Cause and Effect

Science and Engineering - Ask questions and define problems

Objective:

Students will explain how people, plants and animals in Arizona modify and adapt to the Arizona climate.



Nonfiction Reading Passage

Harvest the Monsoon Rain!

Arizona isn't always a sunny place. In fact, this time of year the weather here can be wet and wild! Monsoon season begins mid-June and usually runs through this month. This is a very important time of year because it provides much-needed rainfall—and here's how you can put it to good use!

Rainwater Harvesting

Did you know that outdoor water use can more than triple in the summer? With the monsoon season upon us, here's how you and your family can collect and direct rainwater to keep your plants green and save money.

The monsoon can bring us more than half of our annual rainfall! But oftentimes the rain comes down so fast and furiously that it runs off too quickly to do the most good.

Through rainwater harvesting, you can collect this free water or slow the flow and redirect it to where it's needed!

With so much surface area, roofs can help collect the rain. A system of gutters and down-spouts along the edges of your roof can consolidate much of the roof runoff and can direct it into planter beds, tree wells or even into large storage tanks called cisterns.

Cisterns have a connection on the bottom so you can hook up a garden hose or even a drip irrigation system to use the harvested water whenever you need it!

One of the most important ideas with water harvesting is to keep the rain in your yard instead of having it rush down the driveway, out into the street and into a nearby arroyo or riverbed.

If the rainwater stays in the yard, your plants have a chance to get a good soaking and to thrive. And since this water is free, rainwater harvesting helps to lower your family's water bills.

A smart landscape design can have a series of basins and terraces to make the most out of the rain that falls in your yard. Gently sloping terraces can empty into plant beds. Some people even create a series of swales—broad, shallow trenches—to slow runoff so it can soak in.

Did you know that having plants strategically placed around your home can help lower your electric-ity bills? Plants that are growing and thriving can provide shade for your home (especially from the hot afternoon sun). This helps to keep your house cooler so you don't waste as much money on air conditioning!

More Ways to Learn About Water

How Do Swales Work?

With a small shovel, make a mound of dirt at least 2 feet tall. With a watering can, pour water fast enough so it starts running straight down the mound. Watch how fast it flows. Starting from the top, dig a small, zig-zagging trench the face of the mound, with h section gently sloping down, our water so it starts flowing. Does the water flow slower or faster down the mound? Does more or less water soak in when you have swales?

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www.CentralArizonaProject.com

ARTICLE
Harvest the Monsoon Rain
https://library.cap-az.com/documents/education/Harvest-the-Monsoon-Rain.pdf

- Discuss how these adaptations have helped plants survive in the desert.

Explore: Desert Adaptations and Water

Materials:

1. Water (in buckets)
2. Paper towels
3. Sun/shade
4. 4-5 sponges

Exploration #1: Evaporation Observations – Animal Adaptations

1. Find an area that contains both sun and shade. Have students use the sponges to squeeze water onto the concrete in both sunny areas and shaded areas. What did they notice? Discuss.
2. Completely wet 3 sponges, put one in the sun, one in the shade, and one in a hole in the ground (cover after putting the sponge in; it does not have to be deep). Put the sponges where they won't be bothered for one hour. Which sponge retained the most moisture? Discuss.
3. At the end of the day, wet a sponge and put it in a safe place where it will not be bothered during the night. What did you find in the morning? Was the sponge wet or dry? Discuss.
4. Using a bucket of water, have students stick one hand in the bucket, while the other remains dry. Have them wave both hands in the air. Which hand feels cooler? Why? Discuss.

Explain:

Using the data from the above observations, what can you conclude about how animals and people adapt to the desert climate? (Stay in shaded areas, go out at night or when it is cooler, sweating/perspiration) How else do people stay cool in the summer? (Go in the pool, use air conditioners, drink cold beverages).

Formative Assessment:

Students will create and present their own desert creature that uses animal adaptations to survive in the desert. The picture must contain:

- At least 3-4 desert adaptations (big ears for listening for predators, eyes with the ability to see at night, arms that fan out to make cool air, multiple humps to collect and store water, etc.)
- Name for the animal
- Habitat for the animal (Where does it live? What does it eat? How much water does it need? How does the habitat keep it safe?)
- *Extension - Write a narrative story about your animal.

Supporting Question 6

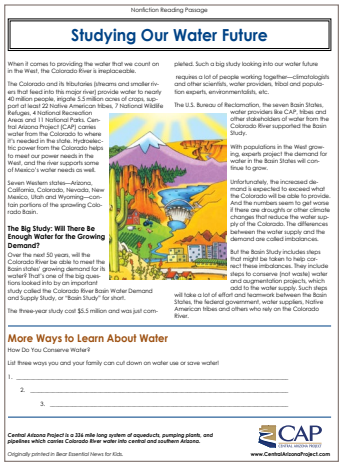
What does the future of Arizona's water supply look like?

AZ Science Standards 3D Science Crosscutting Concept: Cause and Effect

Science and Engineering - Ask questions and define problems

Objective:

Students will explain what Arizona's water supply may look like in the future.



Nonfiction Reading Passage

Studying Our Water Future

When it comes to providing the water that we count on in the West, the Colorado River is irreplaceable.

The Colorado and its tributaries (streams and smaller rivers that feed into this major river) provide water to nearly 40 million people, irrigate 5.5 million acres of crops, support at least 22 Native American tribes, 7 National Wildlife Refuges, 4 National Recreation Areas and 11 National Parks. Central Arizona Project (CAP) carries water from the Colorado to where it's needed in the state. Hydroelectric power from the Colorado helps to meet our power needs in the West, and the river supports some of Mexico's water needs as well.

Seven Western states—Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming—contain portions of the sprawling Colorado Basin.

The Big Study: Will There Be Enough Water for the Growing Demand?

Over the next 50 years, will the Colorado River be able to meet the Basin states' growing demand for its water? That's one of the big questions looked into by an important study called the Colorado River Basin Water Demand and Supply Study, or "Basin Study" for short.

The three-year study cost $5.3 million and was just completed. Such a big study looking into our water future requires a lot of people working together—climatologists and other scientists, water providers, tribal and population experts, environmentalists, etc.

The U.S. Bureau of Reclamation, the seven Basin States, water providers like CAP, tribes and other stakeholders of water from the Colorado River supported the Basin Study.

With populations in the West growing, experts project the demand for water in the Basin States will continue to grow.

Unfortunately, the increased demand is expected to exceed what the Colorado will be able to provide. And the numbers seem to get worse if there are droughts or other climate changes that reduce the water supply of the Colorado. The differences between the water supply and the demand are called imbalances.

But the Basin Study includes steps that might be taken to help correct these imbalances. They include steps to conserve (not waste) water and augmentation projects, which add to the water supply. Such steps will take a lot of effort and teamwork between the Basin States, the federal government, water suppliers, Native American tribes and others who rely on the Colorado River.

More Ways to Learn About Water

How Do You Conserve Water?

List three ways you and your family can cut down on water use or save water!

1. _____
2. _____
3. _____

Central Arizona Project is a 336 mile long system of aqueducts, pumping plants, and pipelines which carries Colorado River water into central and southern Arizona.

Originally printed in Bear Essential News for Kids.

CAP CENTRAL ARIZONA PROJECT

www.CentralArizonaProject.com

ARTICLE
Studying Our Water Future
https://library.cap-az.com/documents/education/Studying-Our-Water-Future.pdf

- Read, "Studying Our Water Future."
- Discuss what could happen if we do not conserve the water that we currently have.

EPA Site:
http://bit.ly/CAPWaterSense

Brainstorm ways to conserve water and get the message out about water conservation awareness.

Formative Assessment:

Create and present a poster that demonstrates the importance of water conservation.

Poster Rubric:

	4	3	2	1
TOPIC	Details on the poster capture important information and increase understanding of the topic.	Details on the poster capture important information and increase some understanding of the topic.	Details on the poster relate to the topic but are too general or incomplete. More information is needed to understand.	Details on the poster have little or nothing to do with main topic.
GRAPHICS	The graphics make the poster easier to understand. Poster contains at least 3-4 graphics.	The graphics are related to the topic and most make it easier to understand. Poster contains at least 2-3 graphics.	Graphics are related to the topic. Poster contains at least 1 graphic.	Graphics are not related to the topic.
ORGANIZATION	Information is very organized.	Information is somewhat organized.	Information is not organized, but clear.	Information is not organized, nor clear.
INFORMATION	4 or more resource-based facts were included in the poster.	2-3 resource-based facts were included in the poster.	At least one resource-based fact was included in the poster.	No resource-based facts were included in the poster.
MECHANICS	No grammatical, punctuation, or spelling errors.	Only 1-2 grammatical, punctuation, or spelling errors.	More than 3-4 grammatical, punctuation or spelling errors.	More than 5 grammatical, punctuation, or spelling errors.

Summative Performance Tasks

Argument

Since Arizona is located in the desert, being water conscious is important. Construct an argument that is supported with evidence that explains the importance of water in a desert landscape.

Extension

Research and explain the connection between water and electricity and its relation to the CAP system.

Understand

The Central Arizona Project canal system stretches 336-miles and pumps water more than 2,900 feet in elevation in order to bring water to 80% of Arizona. Create a diagram or model that helps to explain how the CAP system works.
Helpful link: https://library.cap-az.com/documents/education/It-Takes-Power-to-Bring-Water-to-Us.pdf

Assess

Create a 2-3 minute presentation that explains how plants, animals, and humans have adapted for survival in the Arizona desert.

Act

Create a poem, illustration, song, poster, diorama, or video to explain the history of water in Arizona.

STANDARDS: THIRD GRADE

H_2O for Kids Standards Correlations — Lesson Three

ELA Standards	
3.RI.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
3.RI.2	Determine the main idea of a text; recount and paraphrase the key details and explain how they support the main idea.
3.RI.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
3.RI.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.
3.RI.7	Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).
3.RI.8	Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).

STANDARDS: THIRD GRADE (CONTINUED...)

H_2O for Kids Standards Correlations — Lesson Three

3.W.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
3.W.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
3.SL.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
3.SL.4	Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

Social Studies Standards	
3.SP4.1	Compare information provided by various sources about Arizona.
3.SP3.1	Develop questions about Arizona history, geography, government, and economics.
3.SP3.3	Identify and use evidence that draws information from multiple sources to answer compelling questions about Arizona.
3.SP3.5	Generate questions about multiple historical sources.
3.SP3.6	Construct arguments and explanations using reasoning, examples, and details from sources.
3.SP3.7	Present summaries of arguments and explanations using print, oral, and digital technologies.
3.H1.1	Utilize a variety of sources to construct a historical narrative exploring Arizona's cultures, civilizations, and innovations.
3.H2.1	Examine how individuals and groups have worked together throughout Arizona's history.
3.G1.1	Use and construct maps and graphs to represent changes in Arizona over time.
3.G2.1	Explain how people modify and adapt to the Arizona environment.
3.G4.1	Describe how Arizona has changed over time.
3.E2.1	Explain how availability of resources affects decision making in Arizona with respect to water and other natural resources.
3.E2.2	Describe how Arizona is connected to other states, Mexico, and other nations by movement of people, goods, and ideas.

Science Standards	
3.LIU1.5	Develop and use models to explain that plants and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.
3.L2U1.8	Construct an argument with evidence that organisms are interdependent.

STANDARDS: FOURTH GRADE

H_2O for Kids Standards Correlations — Lesson Three

ELA Standards	
4.RI.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
4.RI.2	Determine the main idea of a text and explain how it is supported by key details; summarize the text.
4.RI.3	Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
4.RI.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
4.RI.7	Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on webpages) and explain how the information contributes to an understanding of the text in which it appears.
4.RI.9	Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.
4.W.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
4.W.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
4.SL.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
4.SL.4	Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Science Standards	
4.L4U1.11	Analyze and interpret environmental data to demonstrate that species either adapt and survive, or go extinct over time.
4.E1.U3.9	Construct and support an evidence-based argument about the availability of water and its impact on life.
4.E1U2.10	Define problem(s) and design solution(s) to minimize the effects of natural hazards.

Social Studies Standards	
4.SP1.2	Compare life in specific historical time periods to life today.
4.SP1.3	Generate questions about individuals and groups who have shaped significant historical events.
4.SP4.1	Explain probable causes and effects of events and developments.
4.SP4.3	Use evidence from multiple sources to develop and communicate claims about the causes and effects of events.

STANDARDS: FOURTH GRADE (CONTINUED...)

4.G2.1	Compare the diverse ways people or groups of people have impacted, modified, or adapted to the environment of the Americas.
4.G3.1	Explain how the location and use of resources affects human settlement and movement.

STANDARDS: FIFTH GRADE

H_2O for Kids Standards Correlations — Lesson Three

ELA Standards	
5.RI.1	Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
5.RI.2	Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
5.RI.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text, based on specific information in the text.
5.RI.4	Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
5.RI.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
5.RI.9	Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
5.W.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
5.W.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
5.SL.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
5.SL.4	Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Social Studies Standards	
5.SP3.6	Construct and present arguments using claims and evidence from multiple sources.
5.SP3.7	Construct and present explanations using reasoning, correct sequence, examples and details with relevant information and data.
5.SP4.2	Use evidence to develop a claim about the past.
5.G2.1	Describe how natural and human-caused changes to habitats or climate can impact our world.

Science Standards	
5.L4U3.11	Obtain, evaluate, and communicate evidence about how natural and human-caused changes to habitats or climate can impact populations.

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