H2O4U

Individual Scholarship Activity for Grades 9-12

Is this the right activity for you?

This H2O4U activity is for students in grades 9-12 who are not participating as part of a class. This is an individual activity to complete on your own or with the help of a parent or teacher.

How to enter the scholarship drawing.

Students who live in Maricopa, Pima or Pinal County and complete the activity by March 26, 2010 can be entered in a $1,000 scholarship drawing. There will be one middle school winner and one high school winner in each county (six total). In addition, the winners' schools will receive a new, state-of-the-art computer and flat screen monitor. The scholarship drawing will be held April 1, 2010.

Important: First, students must complete this activity. Next, students must enter the answers into the online form with the help of a parent or guardian. On the form a parent or guardian must consent to providing student information to be included in the drawing. The online registration form can be found at: www.caph2o4u.com/forstudents/drawing

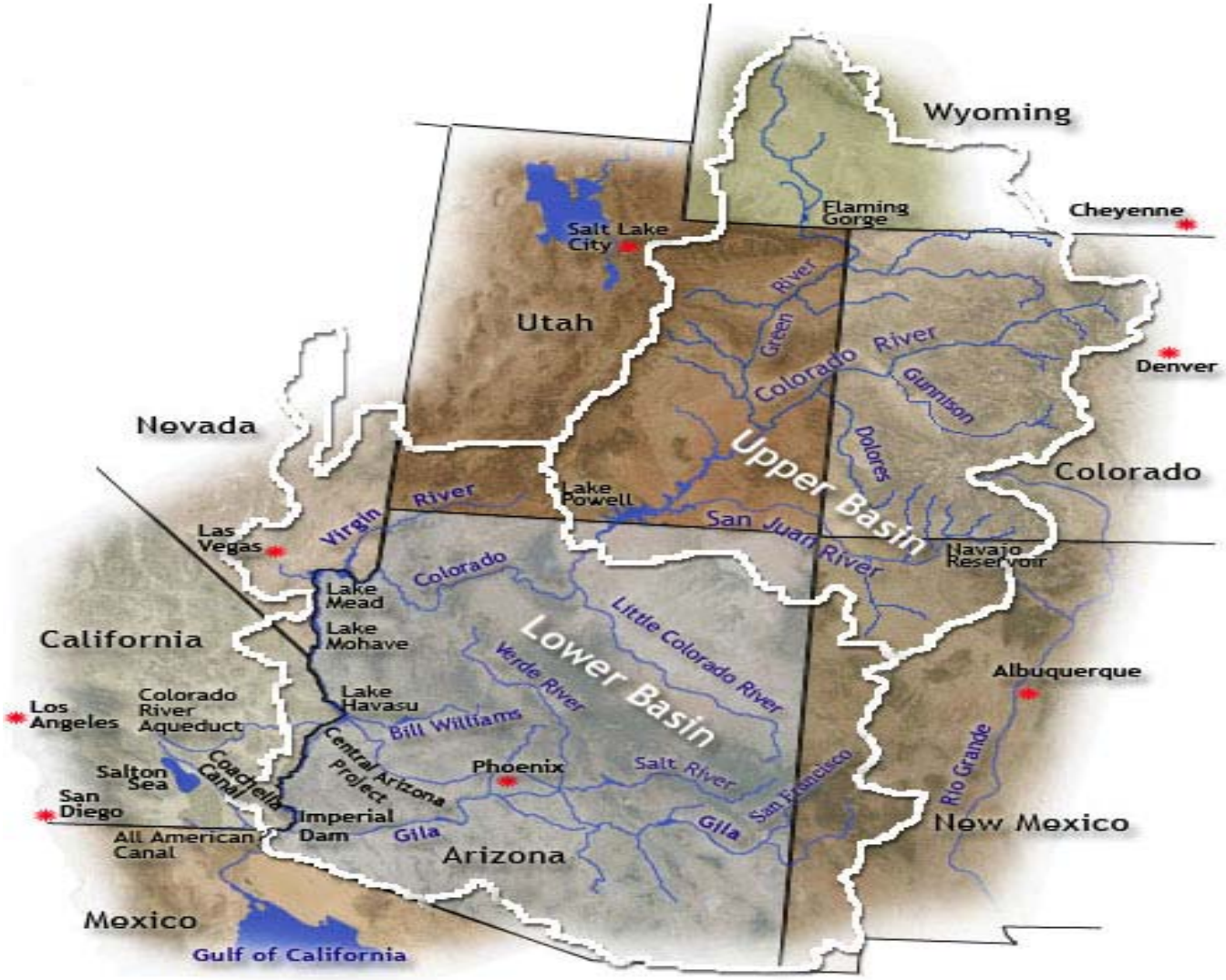
How to use this activity.

Use the information on the following pages to help you complete the activity questions. Additional information about CAP and water issues can be found at:

- www.caph2o4u.com – H2O4U Scholarship Activity
- www.cap-az.com – Central Arizona Project
- www.crwua.org – Colorado River Users Association
- www.usbr.gov/lc – U.S. Department of the Interior Bureau of Reclamation

The activity questions can be found on pages 14-24.

The Colorado River Basin



Arizona Water History

During the early 1900's, the seven states sharing the Colorado River Basin - Arizona, California, Nevada, New Mexico, Wyoming, Colorado, and Utah - debated for shares of Colorado River water. In 1922, representatives from the seven states and the United States government created the Colorado River Compact, which divided the states into upper and lower basins. Each basin had 7.5 million acre-feet of water annually to split amongst themselves.

Interstate political and legal disagreements over Colorado River water dominated the relationship among lower basin states throughout the next 22 years. Arizona was the last state to approve the compact in 1944, ensuring 2.8 million acre-feet of water per year for the state. The Boulder Canyon Project Act of 1928 provides California with 4.4 million acre-feet of water per year and Nevada with an annual allocation of 300,000 acre-feet. Arizona, California, and Nevada comprise the lower basin and are responsible for splitting the 7.5 million acre-feet allotment.

One of the most popular recreation areas in America, Lake Mead, is located in the lower basin state of Nevada. As the Colorado River exits the Grand Canyon it enters Lake Mead created by the Hoover Dam. As the Colorado River travels south it meets the Central Arizona Project's aqueduct and the Colorado River Aqueduct. The Colorado River Aqueduct is 242 miles long and diverts water west over state lines and across the Mojave and Colorado Deserts. To the south of the aqueduct in California is the Salton Sea, an inland salt-water lake.

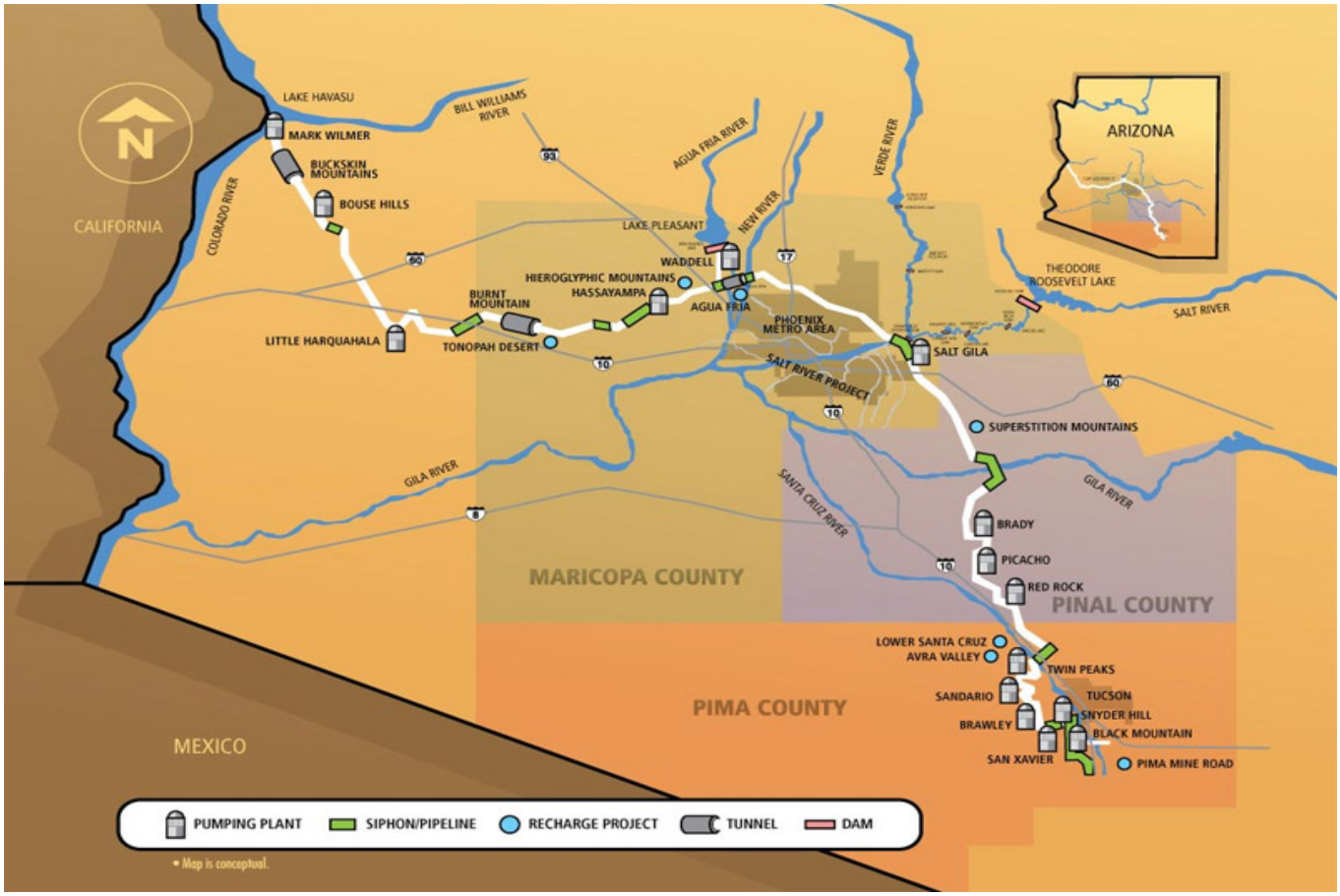
Colorado, Utah, New Mexico and Wyoming make up the four upper basin states. Colorado has the largest share of the of all the upper basin states. Next largest is Utah with 23 percent, Wyoming with 14 percent, and finally New Mexico with 11.25 percent. Located in northern Colorado, the Big Thompson Project stores, regulates, and diverts water from the Colorado River on the western slope of the Continental Divide to the eastern slope of the Rocky Mountains. Also located in the upper basin is the Navajo Indian Irrigation Project. Built by the Bureau of Reclamation in Northwestern New Mexico, it is used exclusively for Navajo lands on or next to the Navajo Reservation.

In many areas of Arizona, people pump more water from the ground than nature can replenish, so Central Arizona Project (CAP) was built to help conserve groundwater supplies. CAP's aqueduct system is 336 miles long and delivers 1.5 million acre-feet of water to its customers in Maricopa, Pima and Pinal counties annually. Central Arizona Project has more than 80 customers which fall into three groups: municipal, agricultural, and Indian users. Agriculture uses about eighty percent of the water resources in Arizona. CAP's vision includes delivering its full allocation of Colorado River water to central Arizona reliably, cost effectively and in an environmentally sound manner with the highest regard for employee safety and health, evolving public needs and customer satisfaction.

The CAP water intake at Lake Havasu is located in a bay-like feature that is the mouth of the Bill Williams River. CAP then moves water through the system by lifting the water using pumping plants and then releasing the water to flow through the canal by gravity. The power to operate CAP's pumping plants comes primarily from the Navajo Generating Station. CAP stores water in Lake Pleasant, filling the lake during the winter months and releasing water during the dry, hot summer generating hydroelectricity. The lake level fluctuates 75 feet in an average year.

The Lower Santa Cruz Recharge Project was developed in a partnership between Central Arizona Project and Pima County Department of Transportation and Flood Control District (Pima County). The project is located in Marana. Mark Wilmer Pumping Plant contains six, 60,000 horsepower pumps which lift the water 824 feet up Buckskin Mountain. The Santa Cruz River flows out of the Santa Rita Mountains, into Mexico and back north towards Tucson. Sabino Creek flows out of the Santa Catalina Mountains into Tucson.

The Central Arizona Project Water Delivery System



CAP History

Arizona's early business and government leaders dreamt of creating desert oases that would attract both people and prosperity to the state. In order to accomplish their ambitious goals, they understood that abundant and reliable supplies of fresh water would be needed. They set to work developing a plan to build an impressive aqueduct

that would stretch some 336 miles. It would be designed to deliver reliable and plentiful supplies of Colorado River water to industry, agriculture and the residents of the most populous central and southern portions of Arizona. Though it required half a century, intense legal wrangling and nearly four billion dollars in construction costs, our forefathers' vision has become reality and continues to benefit millions of Arizonans every day.

Today, Central Arizona Project delivers more than 1.5 million acre-feet of Colorado River water to 57 large wholesale water providers. An acre-foot of water equals about 326,000 gallons, roughly enough water to serve two families for one year. About 35% of deliveries are to municipal and industrial users, 25% of the water goes to agriculture, 10% to Indian communities and 30% is banked underground for the future. At any given moment, nearly 8 billion gallons of water are managed by CAP.

Recharge

In 1996 Central Arizona Project began recharging water in an effort to increase the reliability of long-term water supplies. The recharging process involves systematically flooding a site and allowing water to percolate down through the soil, replenishing underground aquifers. This "recharged" water may then be pumped out and used at a later date. There are a number of issues involved in identifying an appropriate underground storage site and CAP evaluates each site thoroughly before making a selection. CAP tests and confirms that the soil is not contaminated and that it has adequate permeability. In addition, the site's proximity to the canal and the storage capacity of the local aquifer are also considered. CAP operates more than half a dozen underground storage projects which can store more than 300,000 acre feet of surplus water underground per year. These sites are an important component of operations and will provide Arizonans with a water supply they can rely on for years to come.

Since Colorado River water is available to Arizona farmers, they can use surface water supplies instead of groundwater to irrigate farmland. This means less groundwater is pumped by farmers for watering their crops. Cities are treating Central Arizona Project water for drinking and reducing groundwater pumping.

Reclaimed Water

Reclaimed water is treated wastewater from homes and businesses. It is the water that has already been used and can be collected and treated so it is usable once again. The reclaimed water is delivered through a separate system. It is usually used for grass facilities like parks and golf courses. It can also be used to cool power plants and irrigate agriculture.

Emerging Water Issues

The Colorado River Basin is one of the fastest growing regions in the country and it depends on the river's bounty to support its large population and dynamic economy. However, the Colorado River is stretched to its limits: over allocation, drought, and ever increasing demands mean that action must be taken now to prevent harmful shortages in the future. Augmentation, which means adding to the amount of water available by getting it from other sources, is one of several solutions.

Personal Water Conservation

Individual people can also conserve water in many ways. Look for leaks in toilets and sinks and fix them. Use water efficient plumbing fixtures and appliances that use less water than older fixtures. Take shorter showers. Turn off the tap when you are brushing your teeth. Keep a jug of water cooling in the refrigerator rather than running water from the tap until it turns cool. Running the dishwasher only when it is full can save a household 10-20 gallons of water per day. Outdoors, savings of water can result from sweeping sidewalks and driveways instead of hosing them down. In addition, desert landscaping can reduce outdoor water use by 50 percent. On average, desert landscaping needs about 15 gallons of water per square foot each year while grass needs about 27 gallons.

Water Quality

Central Arizona Project delivers raw, untreated water to its customers. Although it does not own or operate any treatment plants, CAP developed a water quality testing program as a service to the cities and utilities that treat the water and the millions of people who drink it. Results from CAP's weekly, monthly, and quarterly water quality tests not only help CAP's customers adjust their water treatment systems, the results are used to protect the quality of the water used for recharge so it can be safely retrieved for the future.

Like most river water, CAP water displays characteristics of hard water and can cause spots on dishes or scale to form on showerheads and appliances like coffee makers. High levels of calcium and magnesium contribute to water's "hardness." Hard water can be beneficial because high levels of calcium often create a natural protective coating on pipes, preventing lead and copper from entering the water supply. A lot of scientific information also indicates that high levels of hardness contribute to the development of stronger bone structure and low incidence of heart disease.

CAP invests a lot of time and money to minimize manmade pollutants in the water. This is good for water quality as well as for the environment. To clean grass out of the recharge basins, goats are used to eat grass and weeds which would otherwise impede flow of water into the ground. In some places, vegetable oil is used instead of petroleum based oil to lubricate machinery which comes into direct contact with water.

Many times, CAP stocks the aqueduct with algae eating fish rather than using chemicals to clean the canal. CAP has a license to stock $100,000 worth of white amurs or "grass carp" in the canal. CAP has also stocked red eared sunfish to eat clams and mussels.

Ecology

Damming rivers and taking water out of rivers for agriculture and cities does cause environmental change. Central Arizona Project has tried to do whatever it can to lessen the impact of the system on the environment. For instance, before CAP was constructed many archaeological and biological studies were conducted to identify animal migration patterns. Bridges were built in the places identified so deer, kit foxes and desert tortoises can get across.

Six-foot high fences also have been built along the canal to keep people and large animals safe from drowning. Wildlife watering sites were also built away from the canal. Construction near bald eagle nests was scheduled to avoid nesting season. Cacti and other native plants were saved and moved from construction sites to create wildlife habitat in other places in the desert.

Many species of fish are also supported by CAP's system. The Lake Pleasant Striped Bass Project found carp, threadfin shad, channel catfish, largemouth bass, white bass, striped bass, and crappie. One way fish are tracked on an ongoing basis is by implanted sonic tags. As recently as 2006 10 implanted striped bass were monitored on a bi-weekly basis.

Canal Safety

The Central Arizona Project canal can be very dangerous. For instance, an average freight train weighs 12 million pounds while the water in the canal weighs an average of 1.9 billion pounds per 7-mile pool. The amount of power required to stop the train going 50 miles per hours is 1.6 million horsepower, while it takes 12.3 million horsepower to stop the water in the canal flowing at a mere 2.4 miles per hour.

While some canal banks are open for walking, running and bicycling, anyone using canal banks should always keep in mind that the canals and associated facilities are maintained for the primary purpose of water distribution. If you are going to walk, jog, or bike along the canal, you should always keep a distance from the edge of the canal and stay away from automated equipment at water delivery gates. Avoid the canals concrete sidewalls, as they can be very slick.

Canal Challenges

The Lands Department is responsible for managing all the properties owned and operated by CAP. Such properties include: remote, mountainous terrain; vast open deserts; farm and grazing land, and suburban environments. Originally constructed in rural areas, canals are now being surrounded by urban growth and development. This growth and development has presented the Lands Department with challenges, including: trespassing, illegal dumping, off-road ATV, dust control, target shooting, graffiti and encroachments.

Water Careers: What does a hydrologist do?

A love of nature, passion for the environment and concern for how precious water resources are monitored and maintained are just some of the characteristics of Hydrologic Technicians. Managing water in lakes, rivers, and oceans, among others, requires dedication and skill. Ignorance in the care and maintenance of these water sources can lead to much larger repercussions, making Hydrologic Technicians vital to the health and sustainability of water resources.

One great aspect of a career as a Hydrologic Technician is that in order to monitor water, you have to be where the water is! This means many professionals spend most of their time working outside in the field, and not a lot of time sitting behind a desk or in a cramped cubicle.

Hydrologic Technicians primary job duties are to monitor the quality and quantity of surface and ground water, take samples and flow measurements, install gauges and survey cross sections of water ways. Data is then recorded and analyzed to determine if the water meets national and state standards, and for historical records.

What career options are there in this field?

With a two year degree, a hydrologic technician can work for all levels of the government from Federal to city as well as for engineering firms. With a four year

degree, hydrologists also can work for all levels of the government from Federal to city as well as engineering firms.

How much money can I make*?*

With ever-increasing population and a constant struggle to preserve quantity and quality of water, particularly in the Southwest of the United States, careers in Hydrology are in demand nationwide. In Arizona, Hydrologic Technician positions are expected to increase 10% or more in the next 10 years. Hydrologic Technicians earn an average of $15.20 to $42.97 an hour for an average salary of $31,610 to $85,940 a year.

What are the working conditions?

Most entry-level environmental scientists and hydrologists spend the majority of their time in the field, while more experienced workers generally devote more of their time to office or laboratory work. Many beginning hydrologists and some environmental scientists, such as environmental ecologists and environmental chemists, often take field trips that involve physical activity. Environmental scientists and hydrologists in the field may work in warm or cold climates, in all kinds of weather. In their research, they may dig or chip with a hammer, scoop with a net, come in contact with water, and carry equipment in a backpack. Travel often is required to meet with prospective clients or investors. Those in laboratories may conduct tests, run experiments, record results, and compile data.

Environmental scientists and hydrologists in research positions with the Federal Government or in colleges and universities frequently are required to design programs and write grant proposals in order to continue their data collection and research. Environmental scientists and hydrologists in consulting jobs face similar pressures to market their skills and write proposals so that they will have steady work. Occasionally, those who write technical reports to business clients and regulators may be under pressure to meet deadlines.

How stable is this career?

Employment of environmental scientists is expected to grow about as fast as the average for all occupations through 2014, while employment of hydrologists should grow much faster than average. Job growth for environmental scientists and hydrologists should be strongest at private-sector consulting firms. Demand for environmental scientists and hydrologists will be spurred largely by public policy, which will oblige companies and organizations to comply with complex environmental laws

and regulations, particularly those regarding ground-water decontamination, clean air, and flood control.

What skills do I need?

Computer skills are essential for prospective environmental scientists and hydrologists. Students who have some experience with computer modeling, data analysis and integration, digital mapping, remote sensing, and geographic information systems will be the most prepared to enter the job market. A knowledge of the Geographic Information System (GIS) and Global Positioning System (GPS)—a locator system that uses satellites—is vital.

Environmental scientists and hydrologists must have excellent interpersonal skills, because they usually work as part of a team with other scientists, engineers, and technicians. Strong oral and written communication skills also are essential, because writing technical reports and research proposals and communicating technical and research results to company managers, regulators, and the public are important aspects of the work. Those involved in fieldwork must have physical stamina.

What steps do I need to take to get a job in this field?

Students interested in the field of hydrology should take courses in the physical sciences, geophysics, chemistry, engineering science, soil science, mathematics, aquatic biology, atmospheric science, geology, oceanography, hydrogeology, and the management or conservation of water resources. In some cases, graduates with a bachelor's degree in a hydrologic science are qualified for positions in environmental consulting and planning regarding water quality or wastewater treatment. Curricula for advanced degrees often emphasize the natural sciences, but not all universities offer all curricula.

Water Careers: What does a water operator do?

Operators read, interpret, and adjust meters and gauges to make sure that plant equipment and processes are working properly. Operators operate chemical-feeding devices, take samples of the water or wastewater, perform chemical and biological laboratory analyses, and adjust the amounts of chemicals, such as chlorine, in the water. They use a variety of instruments to sample and measure water quality and they utilize common hand and power tools to make repairs to valves, pumps, and other equipment.

Water and wastewater treatment plant and system operators increasingly rely on computers to help monitor equipment, store the results of sampling, make process-control decisions, schedule and record maintenance activities, and produce reports. When equipment malfunctions, operators also may use computers to determine the cause of the malfunction and seek its solution.

What do water operators do at the plant?

The specific duties of plant operators depend on the type and size of the plant. In smaller plants, one operator may control all of the machinery, perform tests, keep records, handle complaints, and perform repairs and maintenance. A few operators may handle both a water treatment and a wastewater treatment plant. In larger plants with many employees, operators may be more specialized and monitor only one process. The staff also may include chemists, engineers, laboratory technicians, mechanics, helpers, supervisors, and a superintendent.

Water Vocabulary

Acre-Foot – amount of water it takes to cover one acre of land (about the size of a football field) one foot deep, equal to about 326,000 gallons

Agriculture – farming, producing crops, raising animals

Aqueduct – a canal or pipe that carries water, CAP's aqueduct system is 336 miles long

Aquifer – rocks, sand or gravel that holds water in the spaces between the particles

Artificial Recharge – used to store extra water underground

Atmosphere – the mass of air surrounding the Earth

Canal – an artificial waterway for navigation or for draining or irrigating land

Colorado River – provides water to the upper basin and lower basin states, Arizona receives 2.8 million acre-feet per year

Condensation – water vapor turning from gas into a liquid

Dam – a structure built to hold water back, usually on a river

Drought – a period of dryness especially when prolonged and causing extensive damage to crops or preventing their successful growth

Elevation – height above sea level

Flood – a rising and overflowing of a body of water especially onto normally dry land

Generator – a machine by which mechanical energy is changed into electrical energy

Groundwater – water found under the surface of the ground in the spaces between the sands, gravels or silts, or cracks in rocks

Hydropower – the making of electricity by water falling through a dam, turning turbines which generate power in the form of electricity

Kinetic Energy – the energy of motion determined by an object's mass and speed

Overdraft – pumping more water out of an aquifer than is replaced by recharge (water soaking into the ground)

Pollutant – any substance introduced into the environment that adversely affects the usefulness of a resource

Precipitation – a deposit on Earth of hail, mist, rain, sleet, or snow; also the quantity of water deposited

Recharge – water soaking into the ground to be stored in the spaces in the aquifer in the form of groundwater

Reservoir – an artificial lake formed behind a dam where water is stored

Resource – an available material that can be used, like water

Ridge Lines – points of higher ground that separate two adjacent streams or watersheds

Saturated – when all the spaces in an aquifer are filled with groundwater

Snowmelt – runoff produced by the melting of snow

Spillway – a passage for surplus water to run over or around a dam

Subsidence – when the ground level sinks because the spaces between dirt particles in an aquifer collapse

Toxin – poisonous materials harmful to humans, plants and animals

Tributaries – river or stream flowing into a larger river or lake

Voltage – electric pressure that exists between two points and is capable of producing a flow of current when a closed circuit is connected between the two points

Water Cycle – made up of evaporation, condensation, precipitation, and collection

Water Table – the top level of the groundwater, below which the ground is saturated with water

Watershed – a region of land where water runs off the land and drains into a series of streams and eventually, a river

1. Which of the following make up the lower Colorado River Basin states?

A Arizona, Colorado, Wyoming

B California, Arizona, Nevada

C Utah, New Mexico, Wyoming

D California, Nevada, Colorado

2. What was built by The Bureau of Reclamation in the upper basin area of Northwestern New Mexico?

A Colorado River Aqueduct

B Hoover Dam

C Big Thompson Project

D Navajo Indian Irrigation Project

3. As the Colorado River exits the Grand Canyon it enters Lake Mead, one of the most popular recreation areas in America. In what state is Lake Mead located?

A Arizona

B California

C Nevada

D Utah

4. As the Colorado River travels south it meets near this lake and splits to form the Central Arizona Project and Colorado River Aqueducts. What is the name of the lake?

A Lake Powell

B Lake Havasu

C Lake Mead

D Lake Mohave

5. What is **NOT** included in Central Arizona Projects' vision?

A Provide water to California and Nevada

B Provide water in an environmentally sound manner

C Provide water in a reliable manner

D Provide water cost-effectively

6. Central Arizona Projects' customers fall into three groups. Which of the following is **NOT** one of the groups?

A Agricultural Users

B Indian Users

C Foreign Users

D Municipal Users

7. There are many smaller rivers that merge into the Colorado River. What word is used to describe the smaller rivers?

A Spillways

B Reservoirs

C Tributaries

D Turbines

8. What is a responsibility of a water hydrologist?

A Monitor the quality and quantity of surface and ground water

B Install gauges and survey cross sections of water ways

C Take samples and flow measurements

D All of the above

9. The *Colorado River Compact* divided the seven basin states into upper and lower basins. How much water did it allocate for each basin?

A 10 million acre-feet

B 15 million acre-feet

C 2.8 million acre-feet

D 7.5 million acre-feet

10. Central Arizona Project's water canal slopes an average of .00008 feet per foot. With 5280 feet in a mile, what is the average drop of the slope in feet over the span of 50 miles?

A 4224 feet

B 42.24 feet

C 2112 feet

D 21.12 feet

11. What word describes a region of land where water runs off the land and drains into a series of streams and eventually, a river?

A Aqueduct

B Overdraft

C Watershed

D Spillway

12. Which of the *recharge projects* is located closest to Lake Pleasant?

A Tonopah Desert

B Hieroglyphic Mountains

C Superstition Mountains

D Avra Valley

13. Why did Central Arizona Project begin recharging water in 1996?

A To decrease the amount of water delivered to residents

B To teach people about how to conserve water at home

C To confirm the soil is not contaminated with pollutants

D To increase the reliability of long-term water supplies

14. Which of the following is **NOT** part of the "recharge" process?

A Percolating

B Flooding

C Adding chemicals

D Replenishing underground aquifers

15. How are cities reducing groundwater pumping?

A They are treating CAP water for drinking

B They are not allowing people to water their lawns

C They are using water from local ponds

D They are not allowing businesses to use water

16. When driving on Arizona roads you can sometimes see the Central Arizona Project canal. Which roadway does the CAP water delivery system parallel for the greatest distance?

A Interstate-17

B Highway 93

C Highway 8

D Interstate-10

17. If the Central Arizona Project's aqueduct travels almost one and a half times more miles than the 242-mile Colorado River Aqueduct in California, how many miles does it travel?

A 336 miles

B 633 miles

C 161 miles

D 484 miles

18. The CAP canal moves 1,346,400 gallons of water per minute. A local fishing pond holds 807,840 gallons. How long will it take to fill the pond?

A 36 seconds

B 60 seconds

C 6 seconds

D 3 seconds

19. An acre-foot is equal to how many gallons?

A 326 gallons

B 3,260 gallons

C 30,260 gallons

D 326,000 gallons

20. The Central Arizona Project both delivers and banks Colorado River water. If 35% goes to municipal and industrial users, 25% to agriculture, and 10% to Indian communities, what percentage of water is banked underground for future use?

A 50%

B 40%

C 30%

D 20%

21. How much water does the Arizona receive from the Colorado River each year?

A 1.2 million acre-feet

B 4.4 million acre-feet

C 2.8 million acre-feet

D 7.5 million acre-feet

22. CAP measures water in acre-feet. An acre-foot is equal to one foot of water spread over an entire acre of land. This results in 43,560 cubic feet of water in an acre-foot. If there 7.48 gallons in a cubic foot of water, how many gallons are in five acre-feet?

A 325,929 gallons

B 1,629,144 gallons

C 3,259,290 gallons

D 16,291,440 gallons

23. How many states are a part of the Colorado River Basin?

A 3

B 5

C 7

D 9

24. What word describes what is created when water is released from Lake Pleasant during the hot summer months?

A Hydroelectricity

B Toxin

C Condensation

D Pollutant

25. The Colorado River is stretched to its limits. Which of the following is probably **NOT** a contributing factor to this dilemma?

A Drought

B Over allocation of water

C Population growth

D Soil erosion

26. Which answer **best** describes the how often you should run the dishwasher in order for your household to save 10-20 gallons of water per day?

A Once per week

B Only when it is full

C Every other day

D Every Monday and Tuesday

27. What classes should a future hydrologist take?

A Mathematics and geology

B Physical sciences and geophysics

C Chemistry and engineering science

D All of the above

28. What is reclaimed water?

A Wastewater from homes and businesses that has been treated

B Water taken directly from the Colorado River

C Wastewater from farmers that has been used on their crops

D Water taken directly from aquifers

29. What types of facilities use reclaimed water?

A Parks and golf courses

B Pools and fountains

C Office buildings and homes

D Schools and libraries

30. What are the benefits of CAP's water quality testing program?

A It helps CAP's customers adjust their water treatment systems

B The results are used to protect the quality of the water used for recharge

C It is a helpful service to the cities and utilities that treat the water

D All of the above

31. Why does CAP use goats to clean grass out of the recharge basins and use vegetable oil instead of petroleum based oil to lubricate machinery which comes into direct contact with water?

A To test the water

B To save money

C To minimize manmade pollutants in the water

D To minimize the amount of algae in the canal

32. What steps has CAP taken to protect migration patterns?

A CAP conducted archaeological studies

B CAP conducted biological studies

C CAP built bridges in migration areas

D All of the above

33. Instead of using chemicals, what does CAP use to clean the canal?

A Steel brushes

B Native plants

C Algae eating fish

D Bald eagles

34. Many species of fish are also supported by CAP's system. What type of fish was not found in CAP's system?

A Striped Bass

B Marlin

C Channel Catfish

D Carp

35. What has CAP done to lessen the system's impact on the environment?

A Wildlife watering sites were also built away from the canal

B Cacti and other native plants were saved and moved from construction sites to create wildlife habitat in other places in the desert

C Construction near bald eagle nests was scheduled to avoid nesting season

D All of the above

36. CAP is a partner in a cloud seeding test program. The project involves generators blowing silver iodine, which is a nucleating agent, into clouds. When winter storms pass over the mountain ranges, silver iodine from ground-based generators placed 8,000 feet above sea level can reach the moisture-rich clouds. If this is done at the ideal altitude and temperature, the moisture in the clouds will produce snow more efficiently because of the addition of silver iodine, causing more snow to fall, and increasing the snow pack. Previous testing shows that the increase in snow production can create a 5-10% increase in the runoff. If the increased runoff is at mid-level (7.5%) and the normal runoff is 15 million acre-feet of water, how many acre-feet of runoff will be measured?

A 16,125,000 acre-feet

B 1,612,500 acre-feet

C 161,250 acre-feet

D 16,125 acre-feet

37. Read the information about canal safety. What is the author's main message?

A It takes more energy to stop canal water than to stop a train

B The canal is dangerous and you should be careful if you are around it

C Canals can be popular recreation areas

D The canal sidewalls are slick

38. The CAP canal moves water at a flow rate of 3,000 cubic feet per second. There are 7.48 gallons in a cubic foot of water. How many gallons of water flow through the CAP canal per second?

A 2,240

B 4,010

C 22,400

D 40,100

39. What career prepares people to manage a water treatment plant or a wastewater treatment plant?

A Hydrologist

B Conservationalist

C Engineer

D Water Operator

40. Which of the following **best** identifies a challenge faced by the Lands Department that can potentially contaminate the water?

A Encroachments

B Illegal dumping

C Trespassing

D Vandalism

Congratulations!

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ANSWER SHEET

1_____	**14**_____	**27**_____
2_____	**15**_____	**28**_____
3_____	**16**_____	**29**_____
4_____	**17**_____	**30**_____
5_____	**18**_____	**31**_____
6_____	**19**_____	**32**_____
7_____	**20**_____	**33**_____
8_____	**21**_____	**34**_____
9_____	**22**_____	**35**_____
10_____	**23**_____	**36**_____
11_____	**24**_____	**37**_____
12_____	**25**_____	**38**_____
13_____	**26**_____	**39**_____
		40_____