

The Flood Control District of Maricopa County presents

FLOOD SAFETY



With

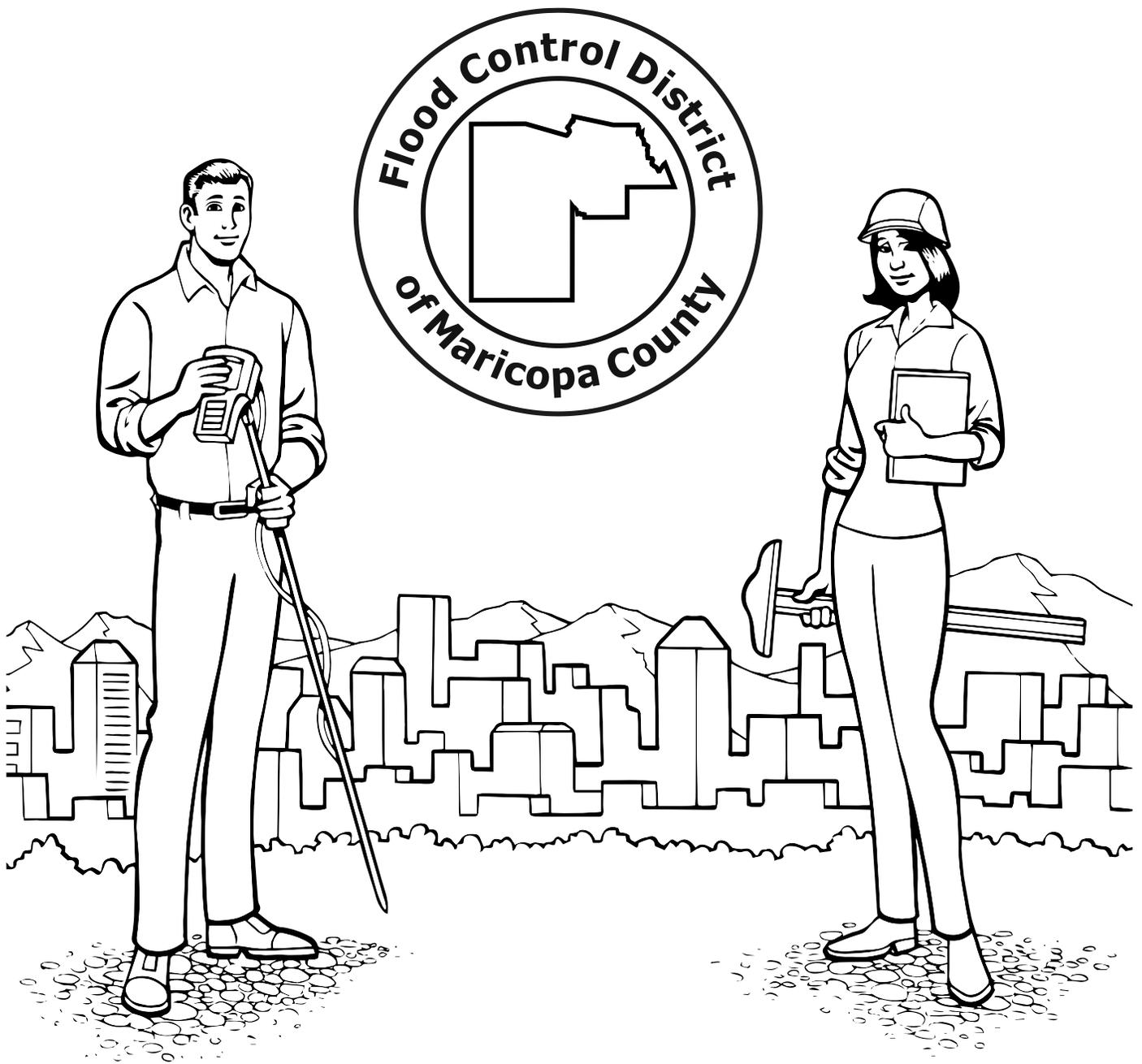
GAGE AND JET



The Flood Control District of Maricopa County

During the early history of Maricopa County, there were large floods that would destroy homes, roads and even schools! The water that caused these floods would come from large rain events or melted snow that came down from the mountains and into the valley. To protect people from the floods, the Arizona Legislature created the Flood Control District of Maricopa County (District).

The District is made up of professionals that study the flow of water and then build different types of structures, like dams and channels, to direct and store the water. **Hydrology** is the study of the movement, distribution, and quality of water; a person who studies hydrology is called a **hydrologist**. A **civil engineer** is a person who designs and maintains roads, bridges, dams, and similar structures. Hydrologists and civil engineers are only a few of the people who work together at the District.



Meet Our Desert Super Friends

Gage and Jet help the District teach and protect Maricopa County residents. Let's meet them:



Beaver	ANIMAL	Mexican Free-tailed Bat
Male	GENDER	Female
Castor Canadensis	SCIENTIFIC NAME	Tadarida Brasiliensis
Engineer/District Ambassador/Safety Hero	OCCUPATION	Hydrologist/ Safety Hero
Super strength, speed, and teeth	SUPER POWERS	Super speed, echolocation, and strength
ALERT Center	SECRET DWELLING	Arizona Canal Diversion Channel (ACDC)
Mammal	TYPE	Mammal
Herbivore: Tree bark, Willow, Water lily	DIET	Insectivore: moths, beetles, dragonflies, flies, wasps, and ants.
31 in–47 in	HEIGHT	3.5 in
35 lbs–60 lbs	WEIGHT	0.43 oz
8 mph	TOP SPEED	25 mph
15–20 years	LIFE SPAN	8–12 years
Transparent eyelids big, flat tail	DISTINCTIVE FEATURES	Wingspan of 12–14 in "jet" of the bat world

Yes, it Does Flood in the Desert!

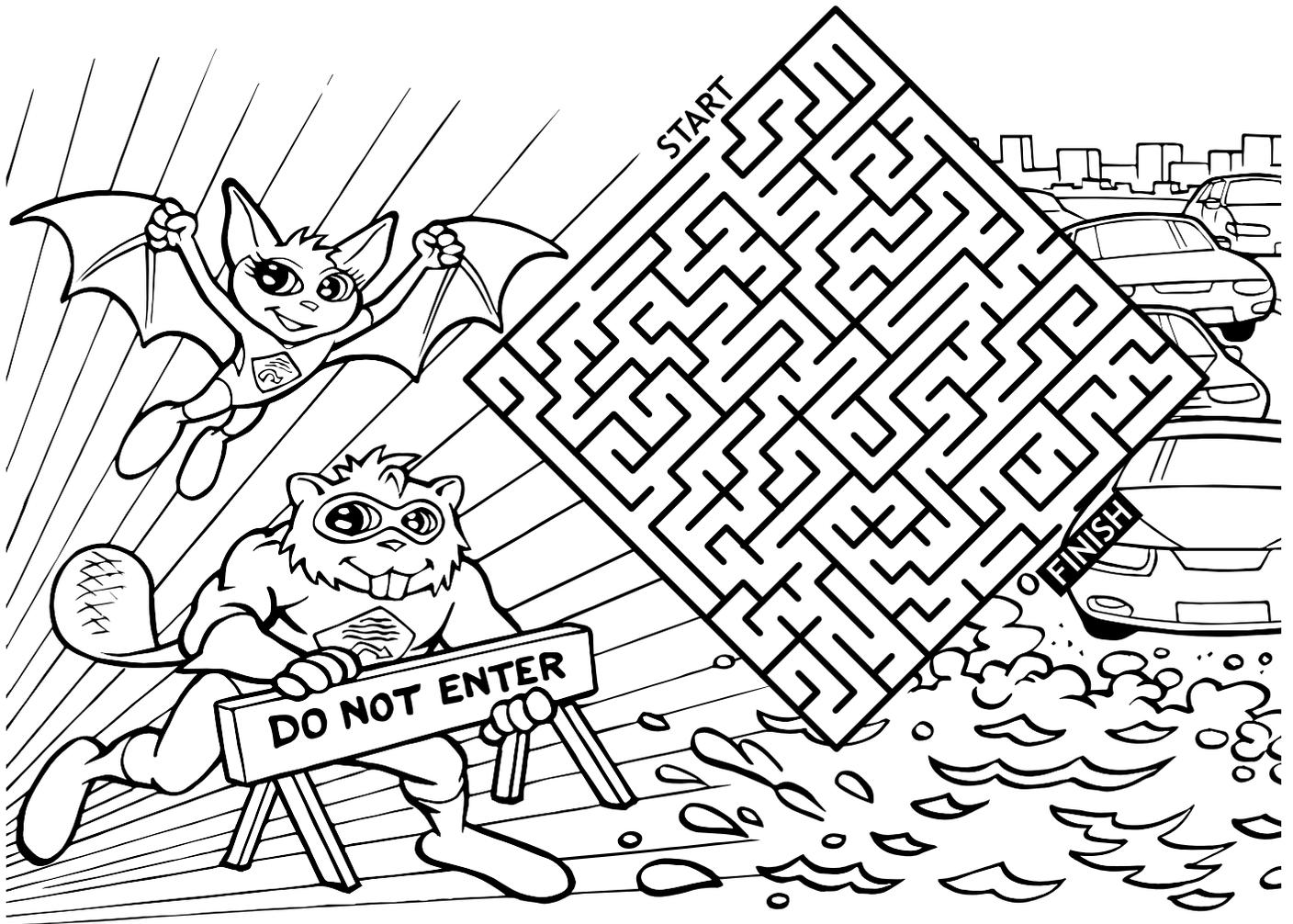
Before people settled in Maricopa County, water was able to flow in natural washes. Whenever it rained or snow melted in the mountains to the north of Maricopa County, the water that was not absorbed into the ground (known as **runoff**) would carve **floodways**. Floodways are the deepest part of the channel of a river or stream. The floodway carries most of the water downstream and is usually the area where water speeds and forces are the greatest. Once a floodway is created, water will continue to follow that same path.

When there is too much water in a floodway, it will spill over into a **floodplain**. A floodplain is an area of low-lying ground next to a floodway or river. Sometimes, the early settlers would build their homes in floodways and floodplains which was very dangerous. During storms with heavy rainfall, **flash floods** would bring large amounts of water, mud, rocks and other debris, rushing down floodways. Flash floods are sudden floods of great volume and speed that form in a matter of minutes during heavy rain storms. These flash floods would destroy the settlers' homes and properties.

Today, the District studies floodways and floodplains throughout Maricopa County to identify areas that could be in danger of flooding.

Activity

Help Gage and Jet reach the intersection to set up barricades before the cars do!

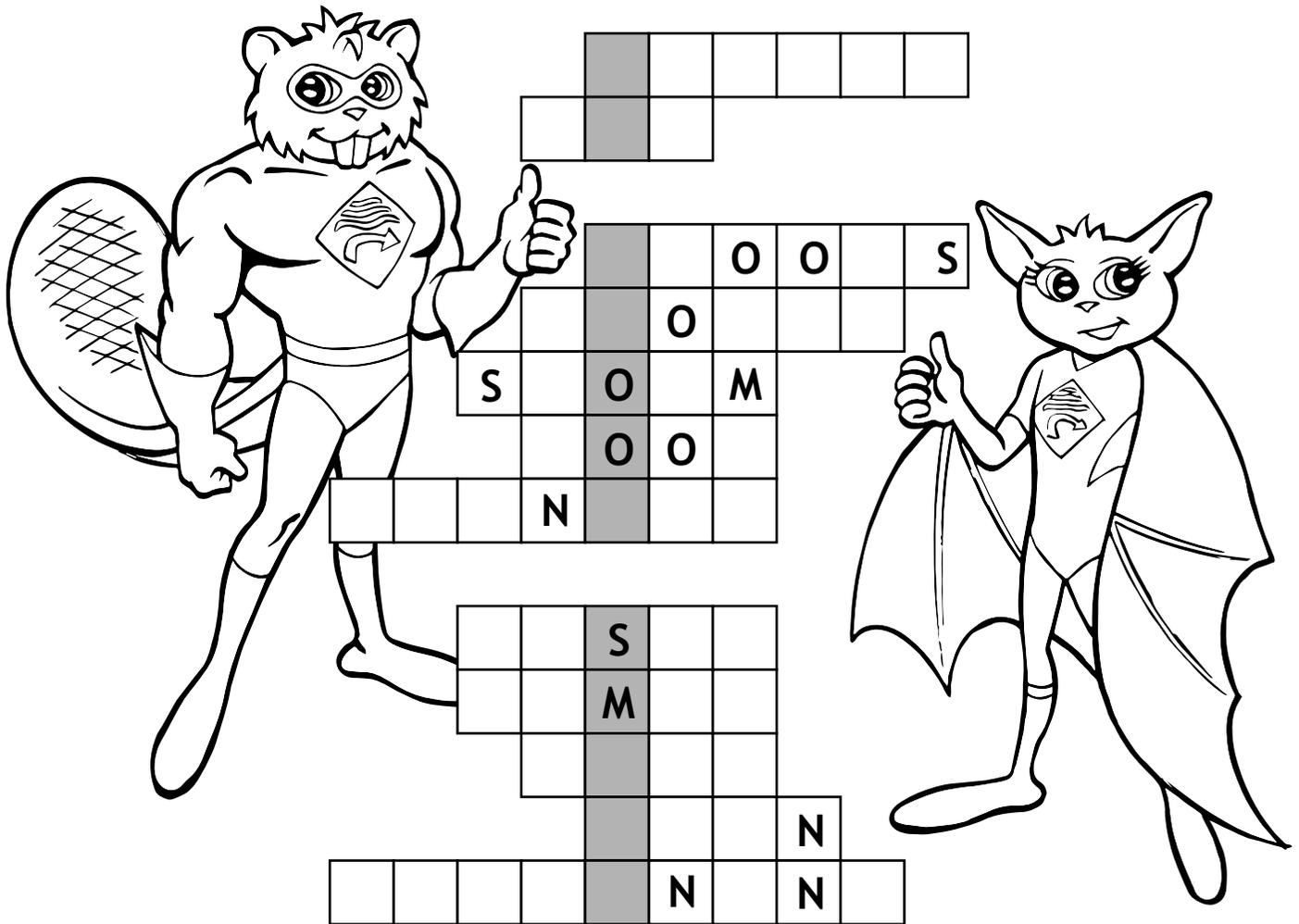


How is Water Redirected?

Although nature constructs its own washes, sometimes it needs a little help from engineers. A wash is usually a dry river, creek or stream that temporarily or seasonally fills and flows after enough rain. Engineers design structures that behave like washes to direct water away from homes.

Activity

Fit the 12 words that describe monsoons into the grid. When you are done, read down the shaded column to find the answer to the question. We left M-O-N-S-O-O-N to help!



DARK
STORM
COOL

WET
HUMID
LIGHTNING

THUNDER
FLOODS
BREEZY

CLOUDY
DUSTY
RAIN

Gage and Jet love to help people be safe,

be ready and _____ during storms.

Rivers Rivers Everywhere!

It may seem like there is very little water in Arizona, but there are actually over 11,000 miles of rivers, streams, and washes that run through Maricopa County alone! In fact, all of the major rivers in the lower 2/3 of the state join and drain through our county.

The rivers in Maricopa County play an important role in our ecosystem. Rivers provide benefits such as water supply, recreation, soil fertilization for agriculture, wildlife habitats and much more! People, plants, and animals need healthy rivers in order to survive. Gage, Jet, and all of their desert friends want you to appreciate the beauty and power of the rivers, washes, and streams in Maricopa County and be safe.

Activity

Use the hints to label the name of each river, creek or wash below:

NAME BANK

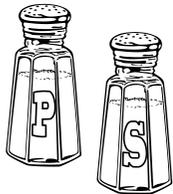
Agua Fria
Cave

Centennial
Gila

Salt
New

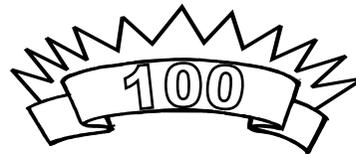
Skunk
Verde

1. Pepper's best friend:



_____ River

5. Another name for a "100 year anniversary":



_____ Wash

2. Spanish translation for "cold water":



_____ River

6. An animal with a horribly stinky repellent:



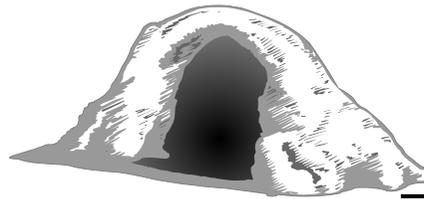
_____ Creek

3. A popular native Arizonan lizard:



_____ River

7. A cool dark place that houses bats:



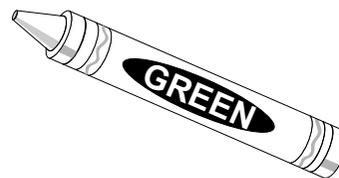
_____ Creek

4. Opposite of old:



_____ River

8. Spanish word for "green":



_____ River

How is Water Stored?

Have you ever wondered how floodwater is stored after a large rain storm? Well, the District uses structures like dams, storm drains and basins to trap the water.

When most people think of dams, they think of massive structures of concrete like the Hoover Dam which is 726 ft. high and 1,244 ft. long. However dams can be all heights and lengths. Small dams can be 10 ft. high and one mile or less in length whereas large dams can be 15+ ft. high and 2+ miles in length.

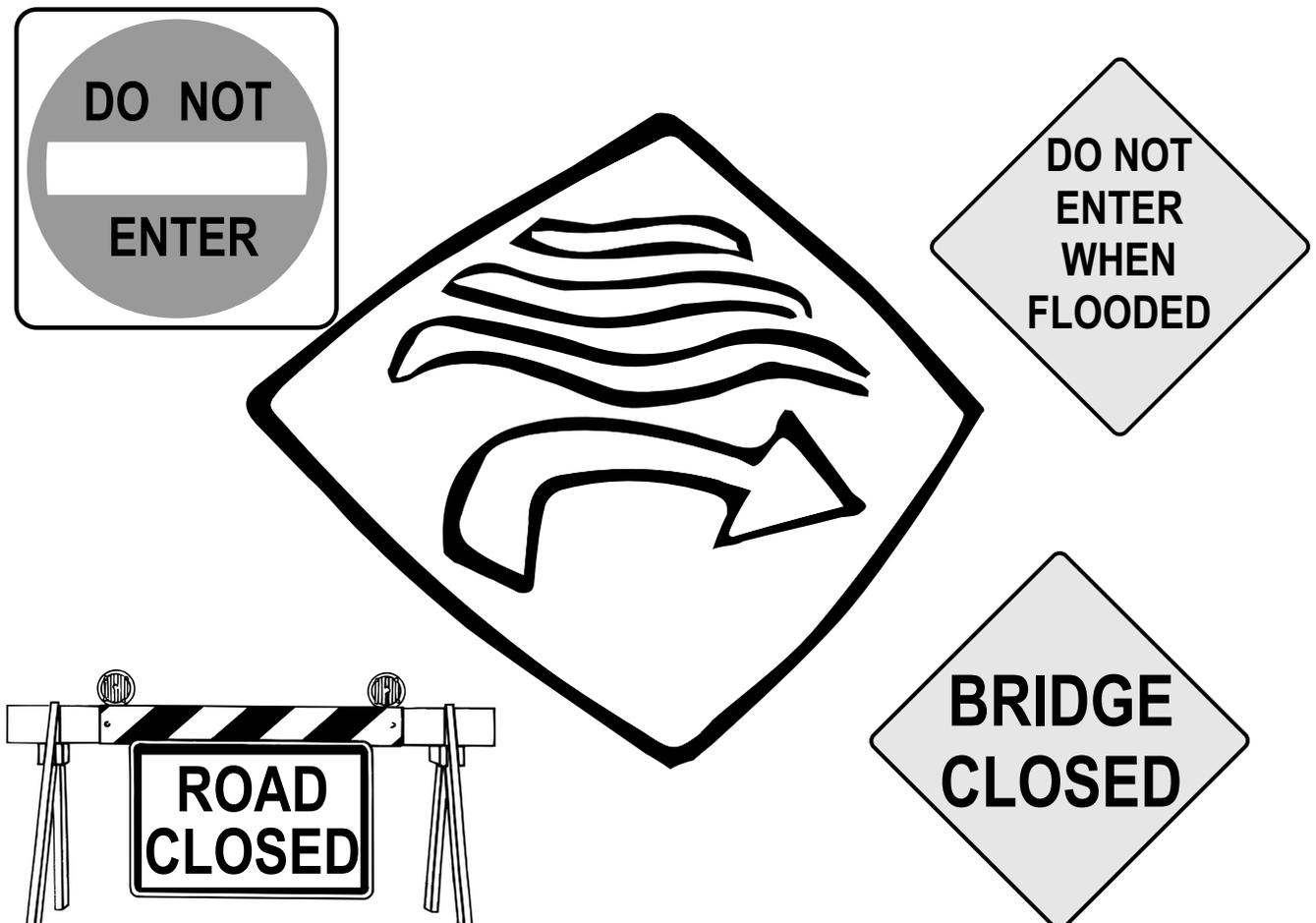
The Flood Control District maintains 22 dams in Maricopa County. You may be asking yourself, what does a dam really do? Well, a dam is a barrier built across a stream or river to store water for such uses as human consumption, irrigation, flood control, and electric-power generation. Some dams even have **reservoirs**! A reservoir is an artificial lake where water is collected and kept in quantity for use.

The District also designs **storage basins** to hold water. Storage basins are deep open areas where flood waters are held during rain storms. When it's not raining, storage basins are often used as recreational spaces. For example, many basins have basketball courts, baseball fields, soccer fields, playgrounds and bike trails.

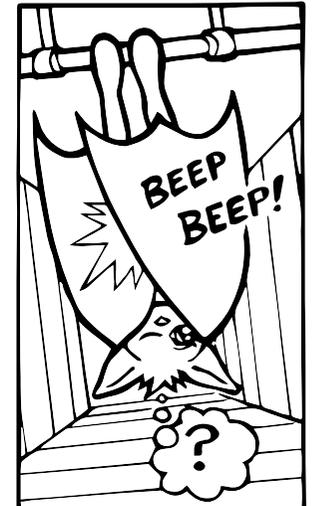
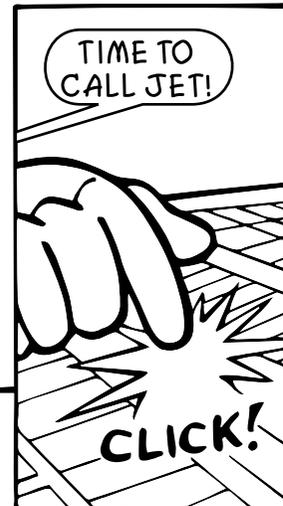
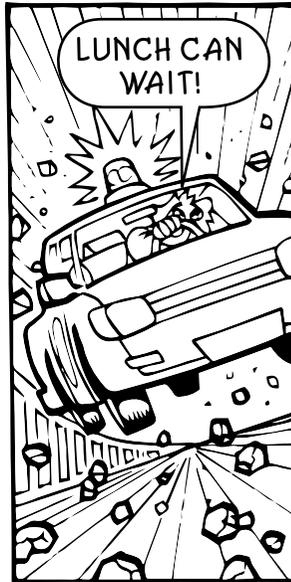
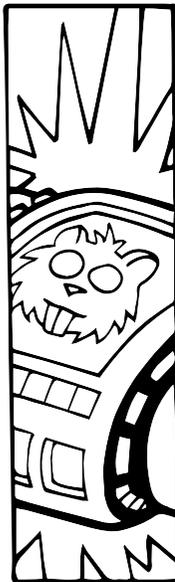
Activity

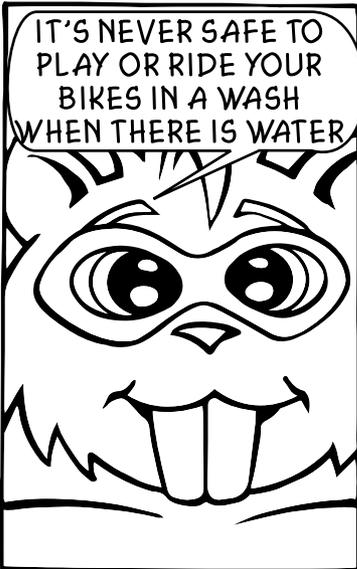
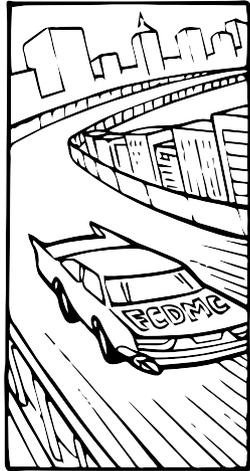
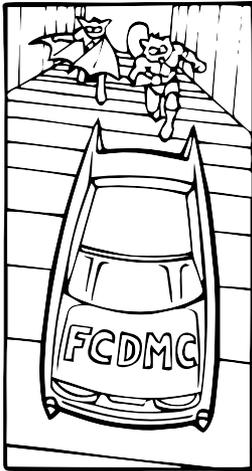
Read Your Warnings!

When you see one of these warnings on a flood control structure or at an intersection, remember Gage and Jet's Safety Symbol and turn around! You don't want to drown!



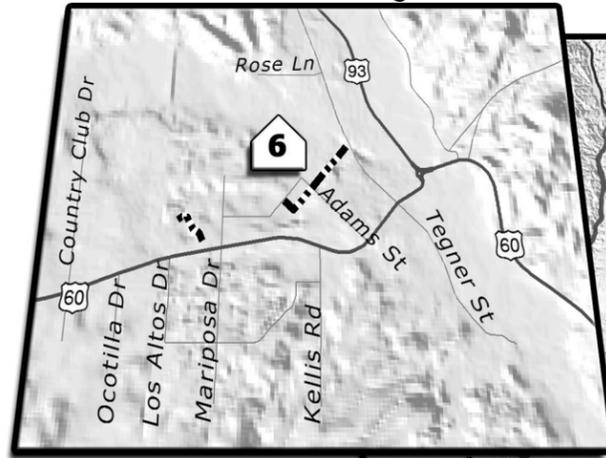
Rainy Day Rescue





Phoenix: The Valley of the Sun

Town of Wickenburg



A map is a model, or representation, of the Earth's surface. This map is a representation of the greater Phoenix area, also known as "The Valley of the Sun" and the Town of Wickenburg.

Can you find your home on this map?

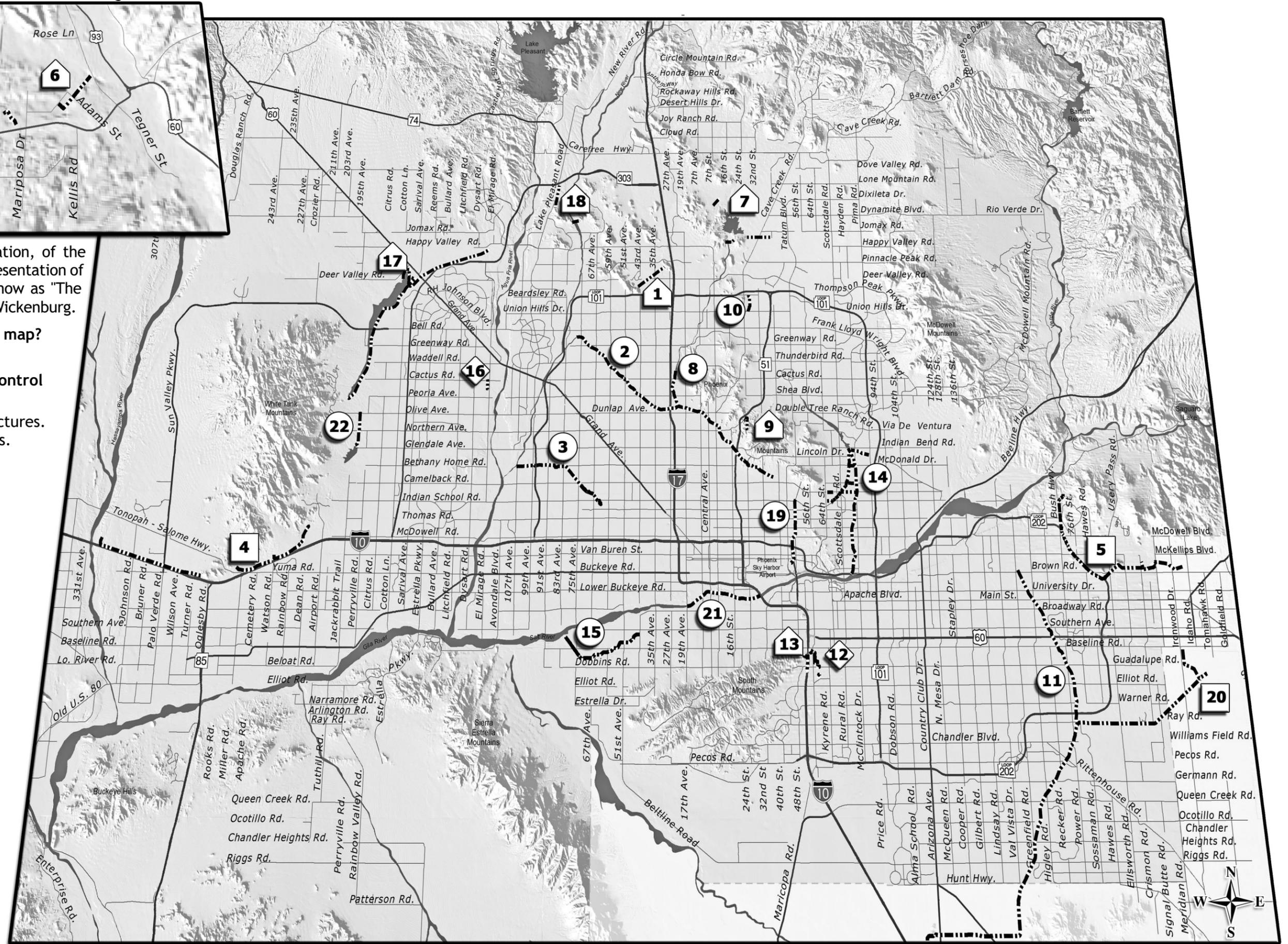
How about your school?

Are you near any of the flood control structures on this map?

Here is a list of some of the structures. Check the map for their locations.

1. Adobe Dam
2. Arizona Canal Diversion Channel
3. Bethany Home Outfall Channel
4. Buckeye FRS No.1, 2, and 3
5. Buckhorn Mesa Projects
6. Cassandro Dam
7. Cave Buttes Dam
8. Cave Creek Channelization
9. Dreamy Draw Dam
10. East Fork Cave Creek
11. East Maricopa Floodway
12. Guadalupe Basin
13. Guadalupe Dam
14. Indian Bend Wash
15. Laveen Area Conveyance Channel
16. Lower El Mirage Wash Basin
17. McMicken Dam
18. New River Dam
19. Old Cross Cut Canal
20. Powerline Dam
21. Salt River Lower Flow Channel
22. White Tanks FRS No.3 Inlet channel

-  Channel
-  Dam
-  Flood Retarding Structure
-  Basin



Flood Safety Word Search

AGUA
BASIN
BEAVER
BRIDGE
CANAL
CENTENNIAL
CHANNEL
DAM
DISTRICT
ECHOLOCATION
ECOSYSTEM
ENGINEER
FLASH
FLOODPLAIN
FLOODWAY
HYDROLOGY
JET
LEVEE
MONSOON
RAIN
RIVER
RUNOFF
SAFETY
SALT
SMART
STORE
STORM
STREAM
WASH



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

Don't Be Stupid!

Did you know that Arizona has a Stupid Motorist Law?

The definition of stupid is “lacking intelligence or common sense,” so the law can also be thought of as ‘the lacking common sense law!’

If a motorist comes to a flooded road that has traffic barricades but continues to enter the area, they are breaking the law! The barricades are warnings so people know that it is dangerous to enter the intersection and they could get stuck or drown. It is not very smart to ignore warning signs, in fact, it's quite stupid!

A motorist that goes around barricades and must be rescued not only puts himself in danger but the water rescuers that must save them as well. For this reason, a person that must be rescued has to pay up to \$2,000 for their rescue.

Gage and Jet want to help everyone be Flood Smart! If you're in a car and come to a flooded intersection remind the driver to have common sense and turn around, even if it doesn't have barricades yet! It costs too much money to be Stupid!



What should you remind your friends and family during monsoon storms?

To find the answer to this question, think of a word that best fits each of the descriptions below. Write the words on the numbered lines, and then transfer each letter into the numbered grid. The black boxes are the spaces between words.

1. Jet's food

6 5 16 10 11 7 16

6. Dam-building mammal

12 10 9 20 10 1

2. Person who designs flood structures

10 5 13 6 5 10 10 1

7. Unabsorbed water

1 15 5 3 8 8

3. Fast flood

8 17 9 16 19

8. Your County

18 9 1 6 11 3 21 9

4. Deepest part of the channel

8 17 3 3 4 2 9 14

9. Dry Bed of a stream

2 9 16 19

5. Flood Control

4 6 16 7 1 6 11 7

10. Person who studies water

19 14 4 1 3 17 3 13 6 16 7

	5	10	20	10	1		10	5	7	10	1		9	
8	17	3	3	4	10	4		1	3	9	4		3	1
					2	9	16	19	!					
		7	15	1	5		9	1	3	15	5	4		
		4	3	5	,	7		4	1	3	2	5	!	

Jet and the ACDC

It's cool, it's dark, it's the perfect home for bats and it's right in the middle of Phoenix! The Arizona Canal Diversion Channel (ACDC) is a 16.5 mile long channel that traps flood water from about 40th Street to the Skunk Creek.

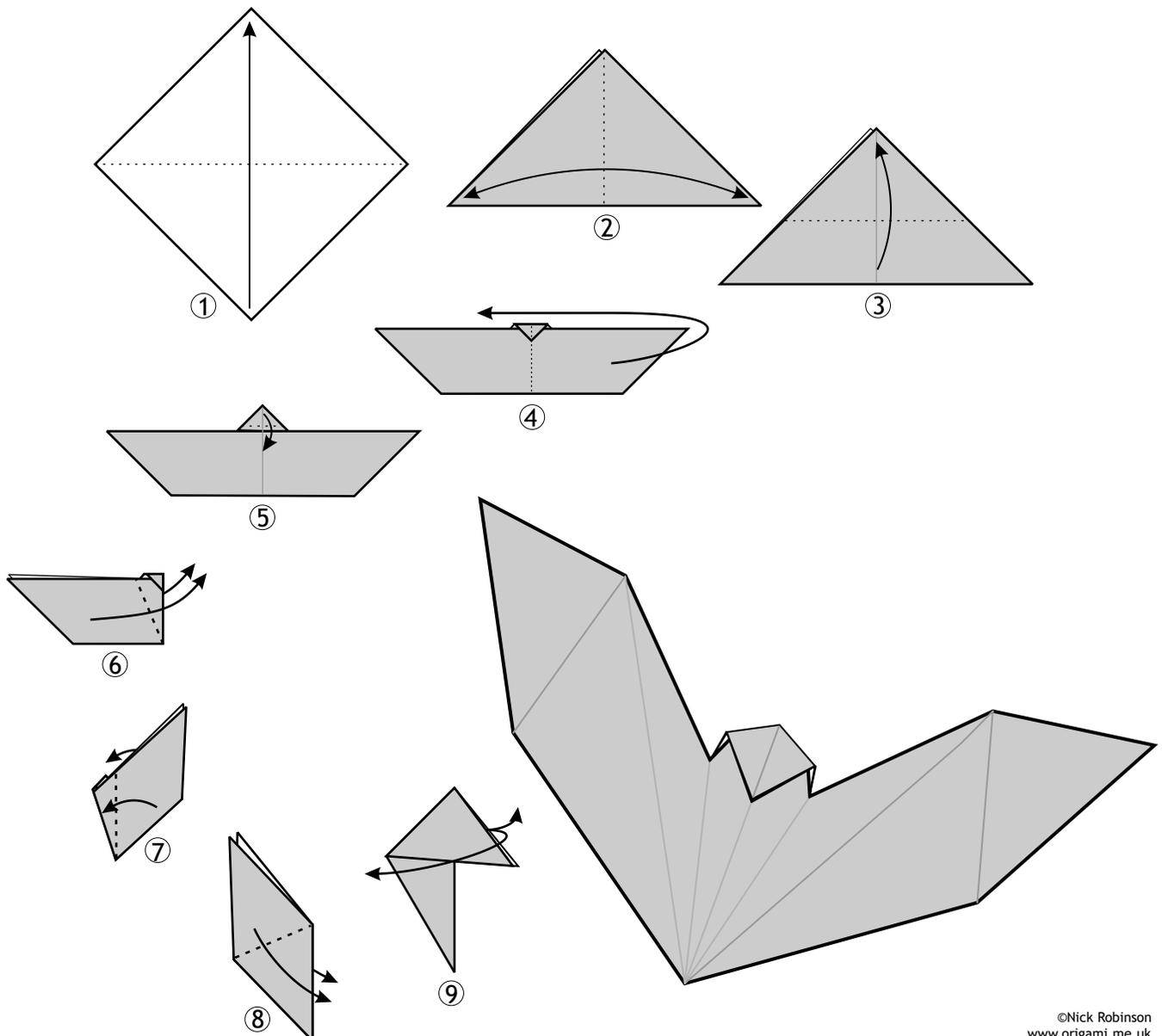
At 40th Street, just north of Camelback Road, the ACDC is home to Jet and approximately 5,000 Mexican free-tailed bats during their maternity season. Maternity season is when female bats have their babies; bats are able to have one baby "pup" at a time. The maternity season for the ACDC Mexican-free tailed bat is from spring through late summer.

Bats are nocturnal so they sleep during the day and then search for insects at night. If you happen to be on the ACDC footpath at dusk right before the sunset, you will see some of the bats exiting to begin their evening hunt.

The Flood Control District and the Arizona Game and Fish Department are happy to provide a safe place for Jet and her family to roost and have their puppies.

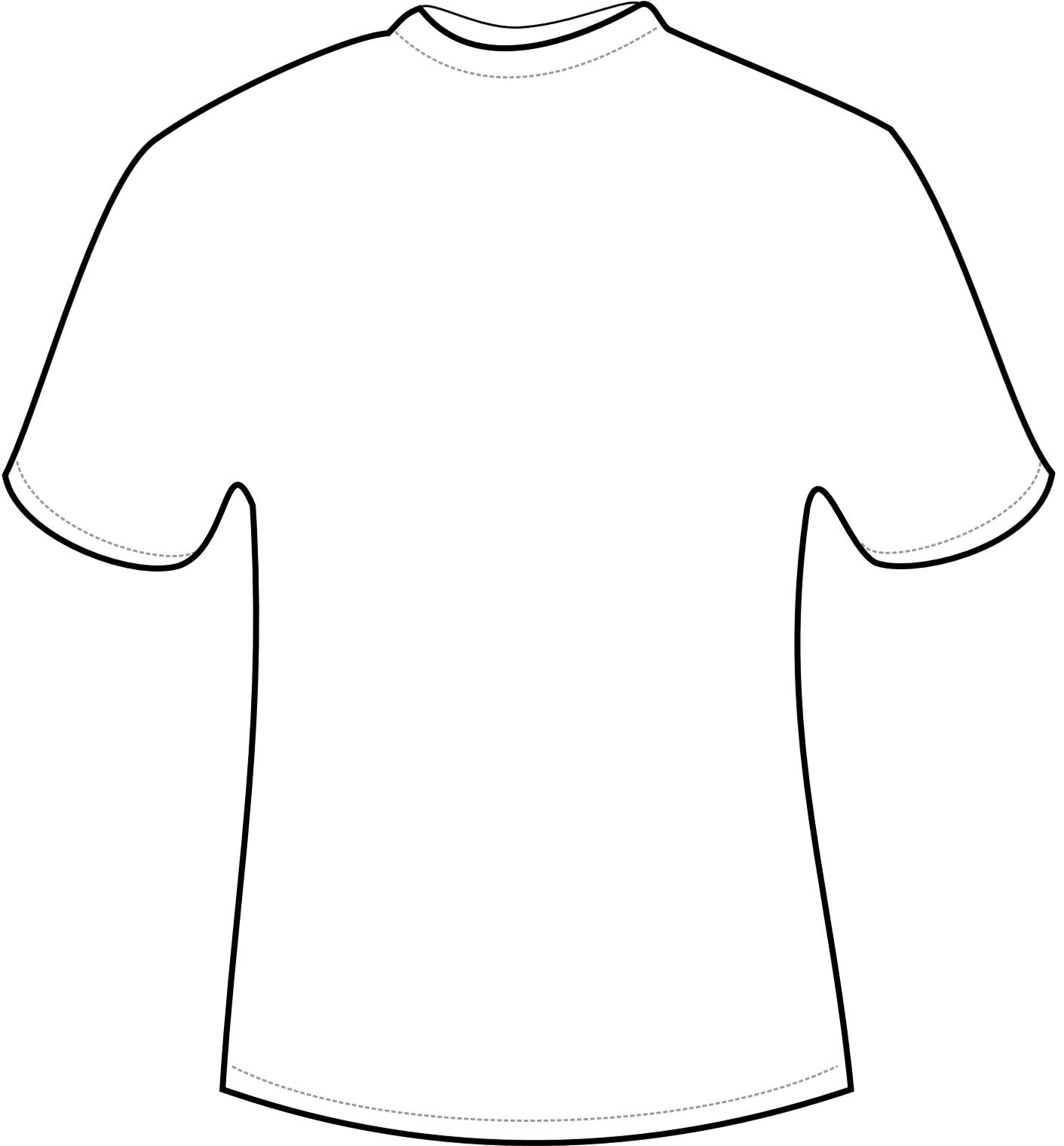
Activity

Use the instructions below to make a bat just like Jet!



What's Your Safety Message?

Now that you have learned about the Flood Control District, Gage and Jet would like your help teaching others about flood safety. On the shirt below, draw a picture that can teach your family and friends about what it means to be flood smart!



Examples:

Be Flood Smart!

Don't play in channels or washes, even when they do not have water!

Your bike is not a boat. It will not float! Turn around, don't drown.



THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

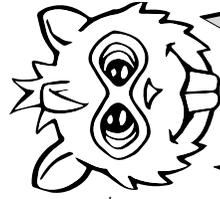
Awards this

FLOOD SAFETY SUPERSTAR

to

Name _____

In recognition of your completion of the Flood Control District's Flood Safety Curriculum



Gage

Flood Safety Superstar
Ambassador



Jet

Flood Safety Superstar
Ambassador

Glossary

Basin: any man-made depression in a land

Canal: an artificial waterway built for transportation, irrigation, water supply, or drainage.

Channel: the bed where a natural stream of water flows. A channel can be designed to divert water for purposes such as prevention of flooding, reduction of erosion, or promotion of infiltration

Civil Engineer: a person who designs roads, bridges, dams, and similar structures

Dam: an artificial barrier capable of storing flood water

Echolocation: the location of objects by reflected sound, in particular that used by animals such as dolphins and bats.

Ecosystem: a community of living organisms (plants, animals and microbes) in conjunction with the nonliving components of their environment (things like air, water and mineral soil), interacting as a system

Flash Flood: a sudden increase in river flow and overland flow due to a violent rainstorm in the upper river basin

Floodplain: an area of low-lying ground next to a floodway or river

Flood Warning: a flood warning is given when flash floods have actually taken place

Flood Watch: a flood watch is issued when weather conditions indicate flash flooding may occur, but has not yet taken place

Floodway: the deepest part of the channel of a river or stream

Hydrologist: a person who studies water

Hydrology: the study of the movement, distribution, and quality of water on Earth

Levee: a bank of earth used to control water

Monsoon: (North American) a pronounced increase in rainfall over large areas of the southwestern United States due to a change in the direction of the wind

Nocturnal: an animal behavior characterized by sleeping during the day and being awake at night

Reservoir: an artificial lake where water is collected

River: a large natural stream of water emptying into an ocean, lake, or other body of water

Runoff: the portion of the precipitation on the land that ultimately reaches streams, especially the water from rain or melted snow that flows over the surface

Sediment: the material resulting from the weathering and erosion of the landscape, which settles to the bottom of a liquid

Structures: a building or other object constructed from several parts

Wash: the dry bed of a stream



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