

# Life Blood of the Earth Westcave Program

**Summary:** Students will learn about water and examine our most precious resource. Students will learn about the hydrologic (water) cycle, watersheds, surface water, groundwater aquifers, and nonpoint source (NPS) versus point source pollution. Students will also examine Westcave Preserve's rainwater collection system and observe the natural spring-fed waterfall and other water sources on a guided hike to Westcave's Grotto, discussing the importance of conservation

**Age Range Recommended:** 3<sup>rd</sup> Grade and up

**Program Length:** 3 hours

## **Learning Objectives: (work in progress)**

Understand that water is a limited and valuable resource and there is not much available for use as freshwater versus saltwater (recreational, drinking, showering, and cooking).

Learn what a watershed is and that we all live in a watershed.

Learn about Point and Non-Point source pollution and the effects of every day actions on our own water source and others "downstream"

Learn about the difference between surface water and groundwater, as well as where our water in Austin comes from.

The effects of flooding not only to the landscape, habitat and ecological communities but our transportation and our own livelihood.

Observe Westcave's lush plant life and understand the importance of water on different ecological habitats (Canyon and Savanna).

Experience the sounds of nature without urban background noises (Canyon Tour).

Understand the importance of conservation at Westcave and their own communities, especially water conservation (Canyon Tour).

Gain an awareness of the historical use of Westcave Preserve and the surrounding area by people (Canyon Tour).



# Water: Lifeblood of the Earth Key Terms:

Water Cycle

Water

Limestone

Watershed

Surface Water

Ground Water

Aquifer

Spring

Filtration

Point Source Pollution

Non-Point Source Pollution

Permeable

Impermeable

Stalagmites

Stalactites

Erosion

Deposition

Surface Runoff

Precipitation

Infiltration

Water Cycle: The name of the process by which water circulates between the earth's oceans, atmosphere, and land.

Water: A unique substance that can exist as a solid, liquid, and gas.

Limestone: A hard yet porous sedimentary rock found at the surface in central Texas. Made of calcium carbonate.

Watershed: An area of land where all the water collects.

Surface Water: Water located on the surface, like in a river, stream, pond, or lake.

Ground Water: Water located underground.

Aquifer: Underground layer of permeable, porous, or fractured rock that holds and moves water.

Spring: A place where groundwater flows to the surface.

Filtration: Removal of solid material from a liquid through the use of small pores.

Point Source Pollution: A type of pollution that can be traced back to a single source.

Non-Point Source Pollution: A type of pollution that cannot be traced back to a single source.

Permeable: Description of something that allows liquid to pass through it.

Impermeable: Description of something that does not allow liquid to pass through it.

Stalagmites: A type of cave formation made up of calcium carbonate that grows on the floor.

Stalactites: A type of cave formation made up of calcium carbonate that grows on the ceiling.

Erosion: The process of removing material (soil, rocks, sediments) from one location and moving it to another location, which can be done by natural process like water, wind, ice, or gravity.

Deposition: The process in which material removed by erosion builds up in another location.

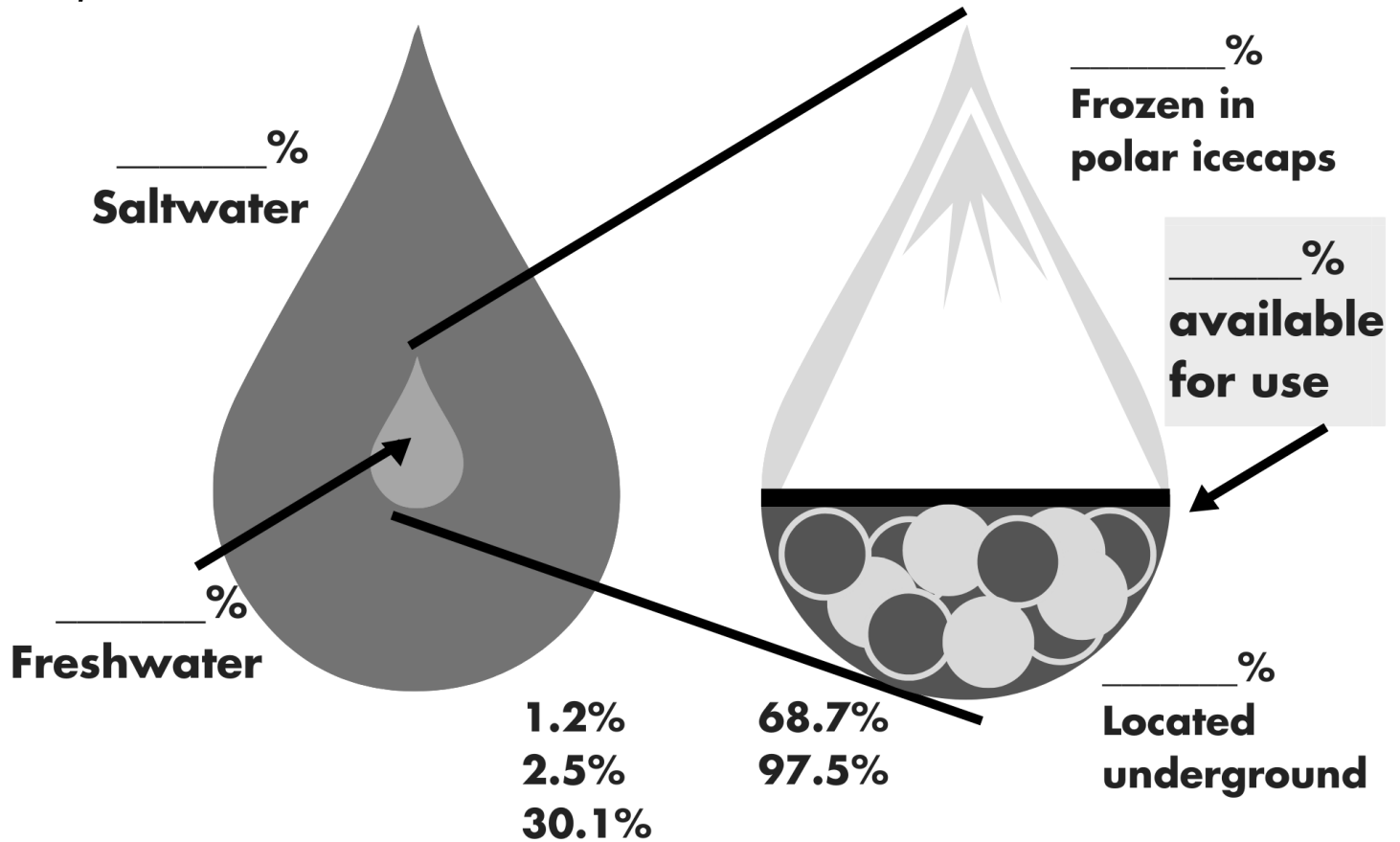
Precipitation: A weather condition where some form of water (ie. rain, snow, sleet, or hail) falls from the sky.

Infiltration: The process by which precipitation/water moves into underground rock through cracks and holes.

Surface Run-off: Water from rain, snow, or other sources that flows over the land. The area of land that creates this runoff is called a watershed.

# Where is all the Water

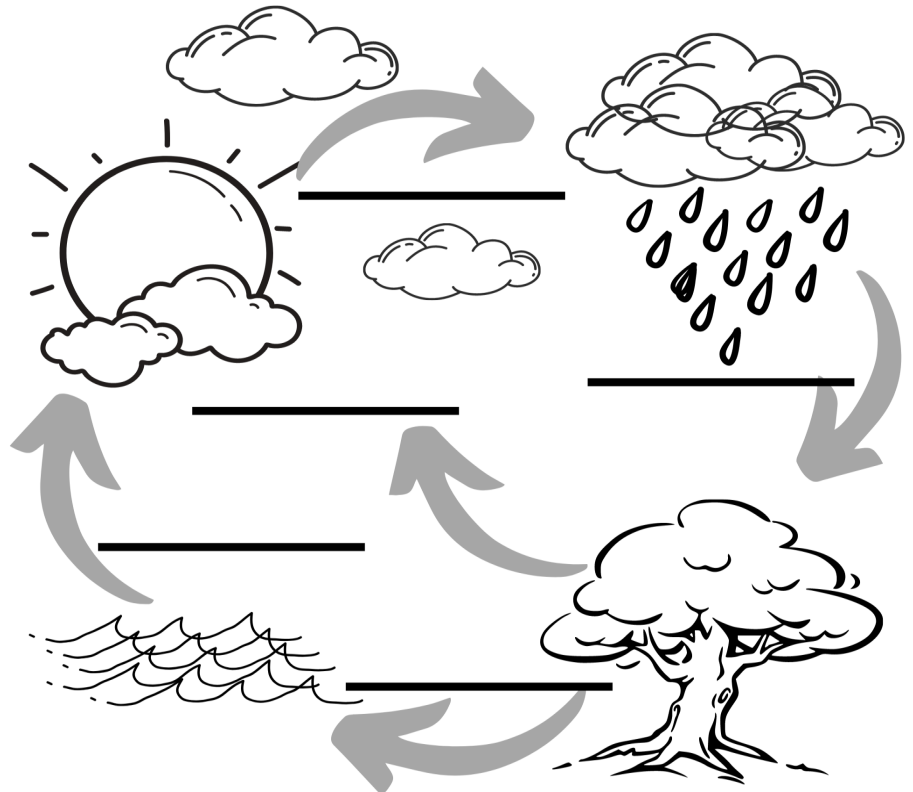
Water is unique. Unfortunately, there is a limited amount of water on earth that has been here since the planet formed a few billion years ago. There is no new water. *Fill in the break down of the water on our planet below:*



(C) USGS

## Fill in the Water Cycle:

- Condensation
- Evaporation
- Percolation
- Precipitation
- Transpiration



# Water, Life Blood of the Earth

## Word Search

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

### Word Bank

Aquifer  
Deposition  
Erosion  
Filtration  
Ground Water  
Impermeable  
Infiltration

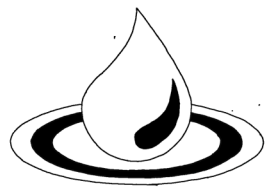
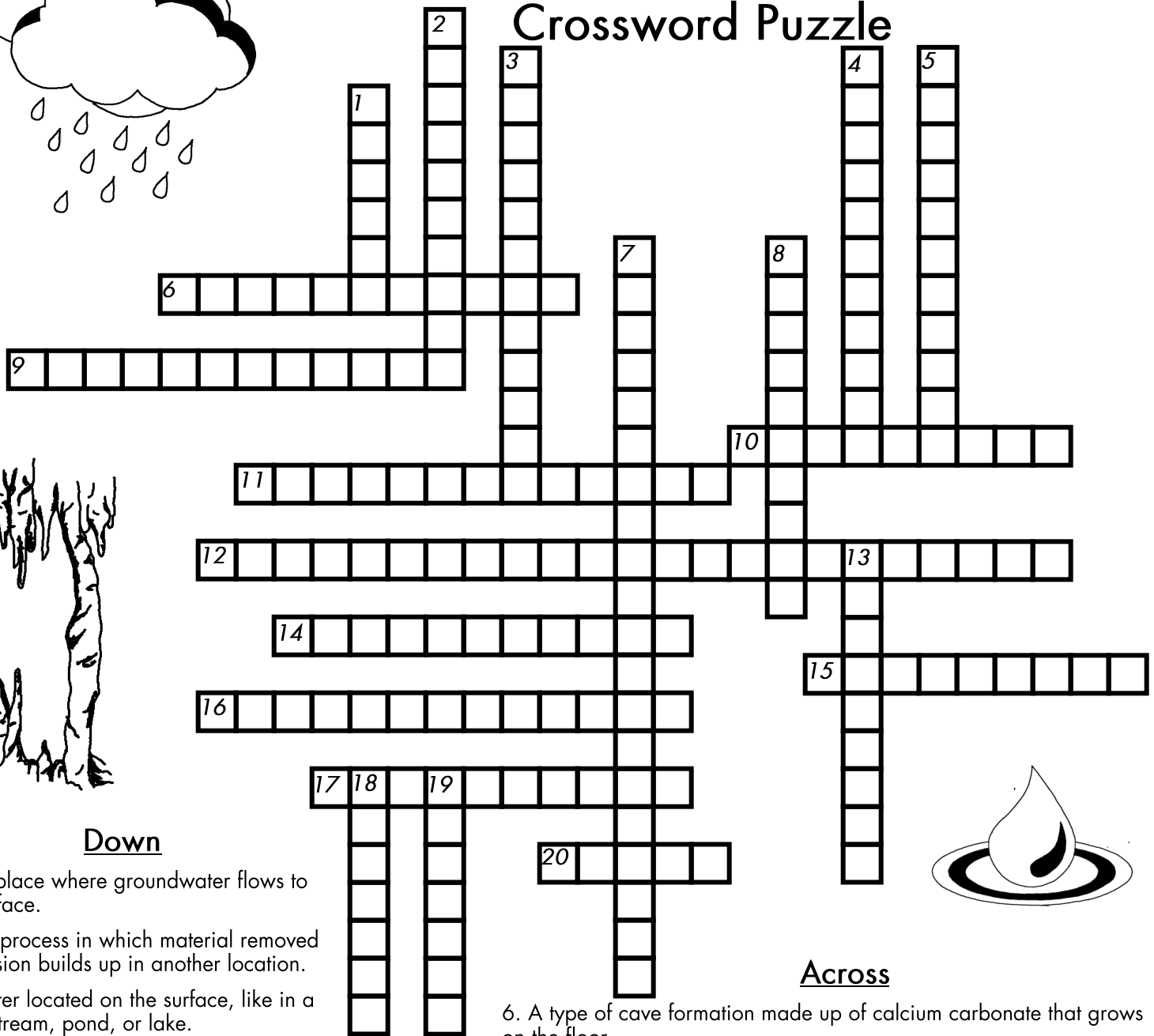
Limestone  
Non-Point Source Pollution  
Permeable  
Point Source Pollution  
Precipitation  
Spring  
Stalactites

Stalagmites  
Surface Runoff  
Surface Water  
Water  
Water Cycle  
Watershed

# Water: Life Blood of the Earth



## Crossword Puzzle



### Down

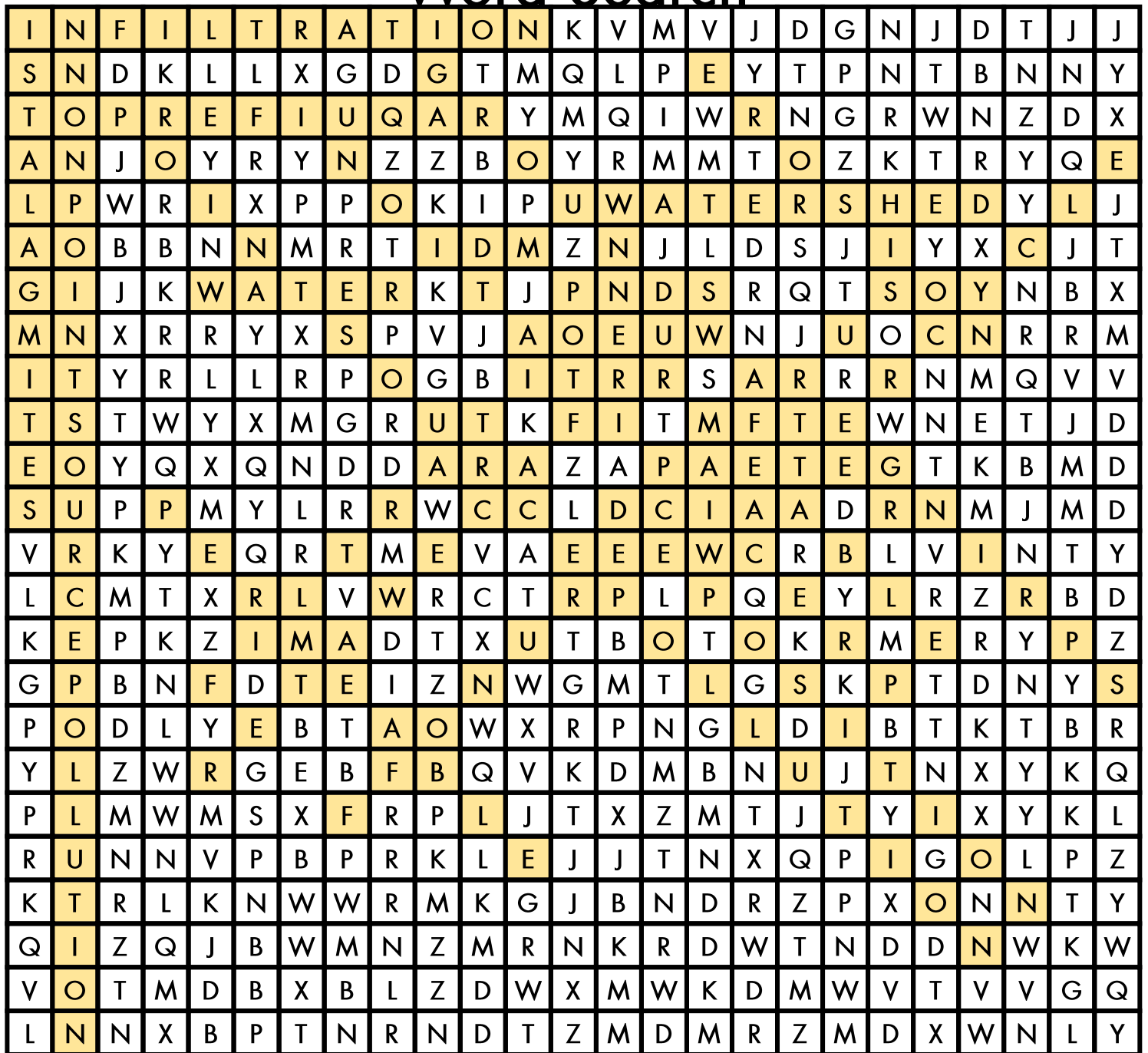
1. A place where groundwater flows to the surface.
2. The process in which material removed by erosion builds up in another location.
3. Water located on the surface, like in a river, stream, pond, or lake.
4. Description of something that does not allow liquid to pass through it.
5. A type of cave formation made up of calcium carbonate that grows on the ceiling.
7. A type of pollution that can be traced back to a single source.
8. Removal of solid material from a liquid through the use of small pores.
13. A hard yet porous sedimentary rock found at the surface in central Texas. Made of calcium carbonate.
18. Underground layer of permeable, porous, or fractured rock that holds and moves water.
19. The process of removing material (soil, rocks, sediments) from one location and moving it to another location, which can be done by natural process like water, wind, ice, or gravity.

### Across

6. A type of cave formation made up of calcium carbonate that grows on the floor.
9. The process by which precipitation/water moves into underground rock through cracks and holes.
10. An area of land where all the water collects.
11. Water from rain, snow, or other sources that flows over the land. The area of land that creates this runoff is called a watershed.
12. A type of pollution that cannot be traced back to a single source.
14. Water located underground.
15. Description of something that allows liquid to pass through it.
16. A weather condition where some form of water (ie. rain, snow, sleet, or hail) falls from the sky.
17. The name of the process by which water circulates between the earth's oceans, atmosphere, and land.
20. A unique substance that can exist as a solid, liquid, and gas.

# Water, Life Blood of the Earth

## Word Search



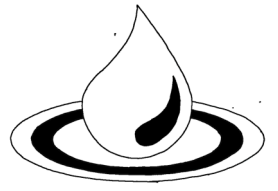
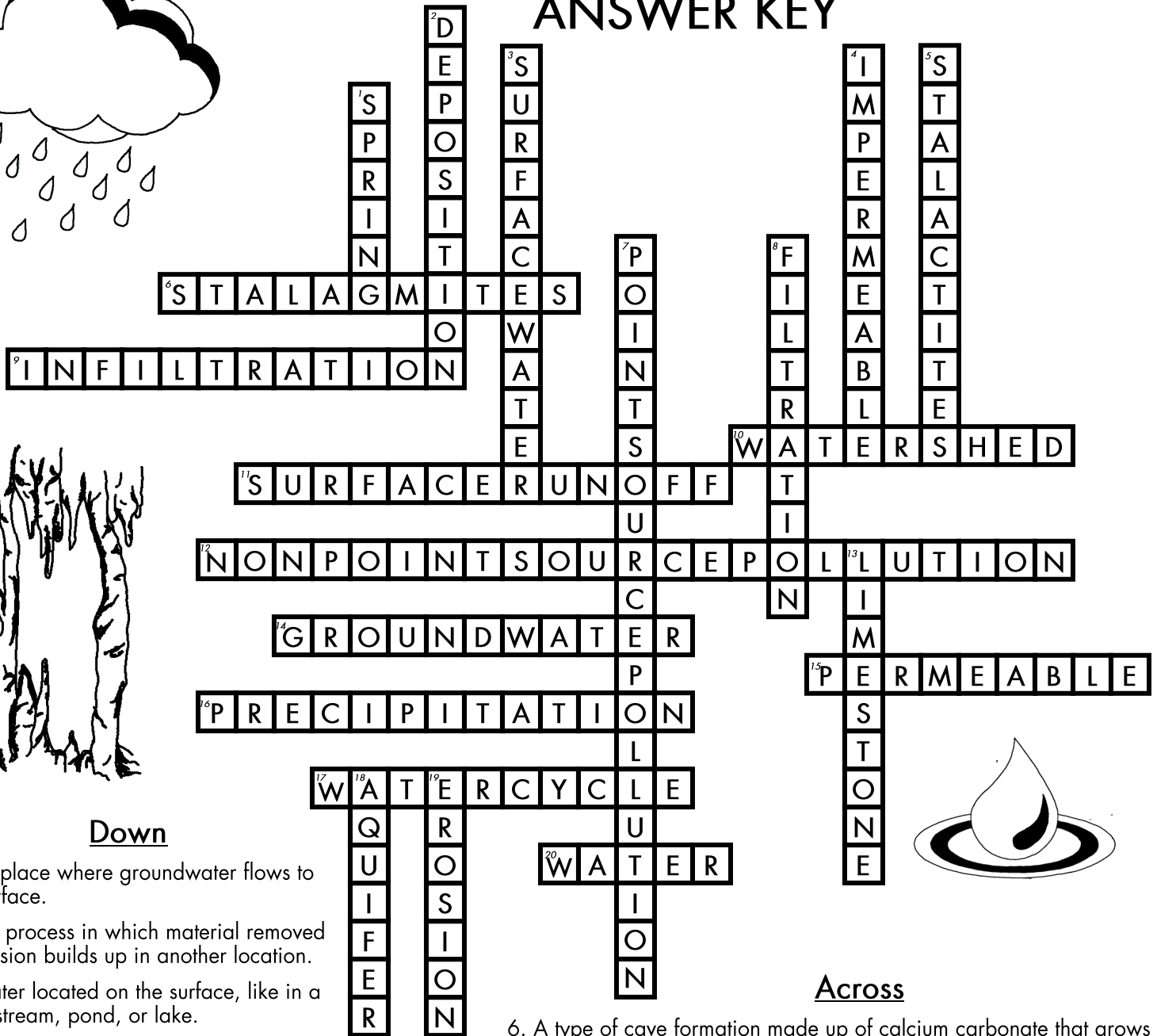
### Word Bank

- |              |                            |                        |
|--------------|----------------------------|------------------------|
| Aquifer      | Impermeable                | Point Source Pollution |
| Deposition   | Infiltration               | Precipitation          |
| Erosion      | Limestone                  | Spring                 |
| Filtration   | Non-Point Source Pollution | Stalactites            |
| Ground Water | Permeable                  | Stalagmites            |



# Water: Life Blood of the Earth

## ANSWER KEY



### Down

1. A place where groundwater flows to the surface.
2. The process in which material removed by erosion builds up in another location.
3. Water located on the surface, like in a river, stream, pond, or lake.
4. Description of something that does not allow liquid to pass through it.
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