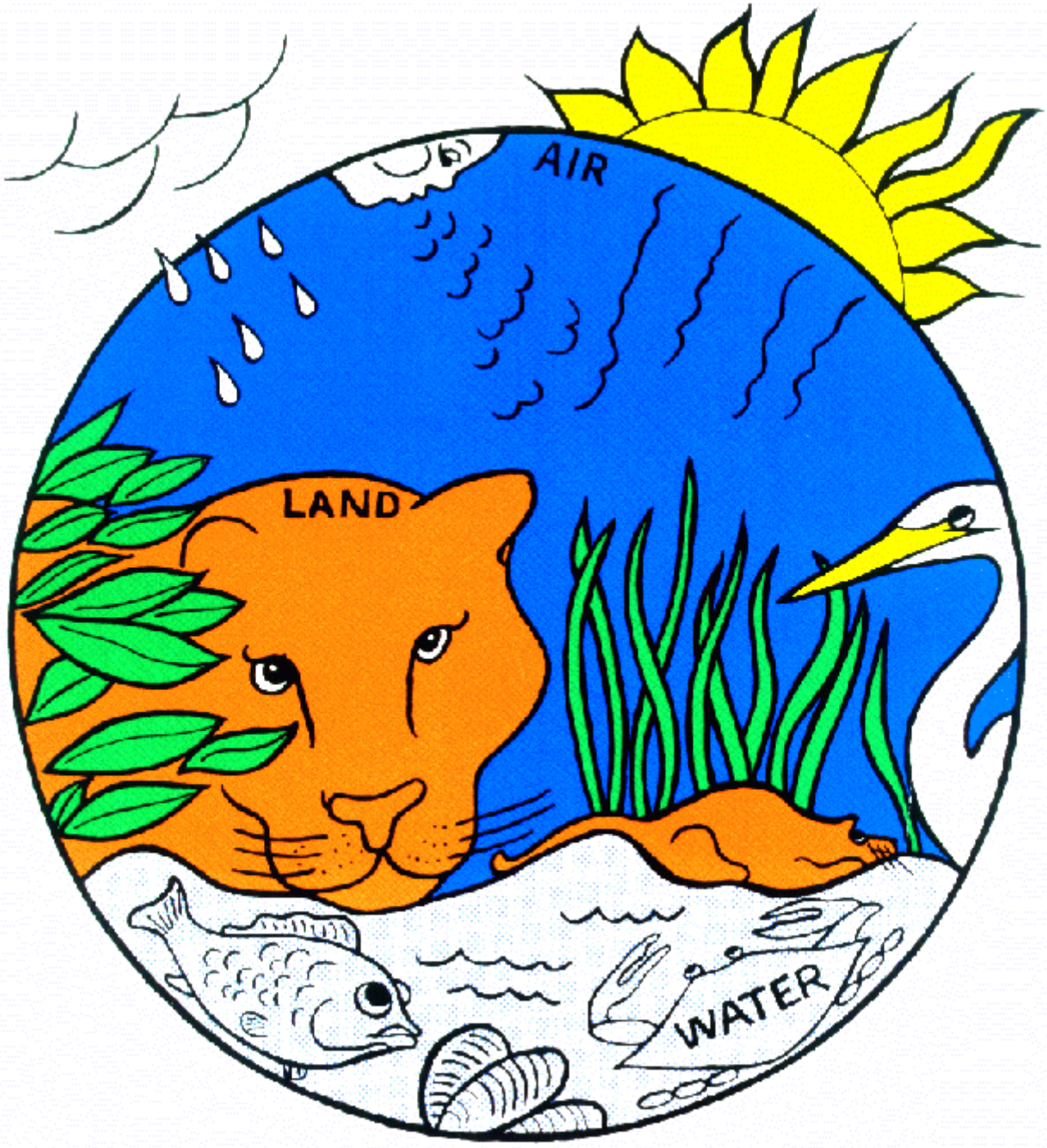
4-H ESM 50

Earth Connections II



Florida 4-H Environmental Sciences Program

Member Manual

UNIVERSITY OF FLORIDA
IFAS EXTENSION

Our Natural World

Special Thanks...

This 4-H Environmental Education Project was funded from the Save Our State Environmental Education Trust Fund Grant Program, Florida Advisory Council on Environmental Education, Tallahassee, Florida.

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Acknowledgments...

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The authors wish to also acknowledge the many contributions of ideas, concepts, and activities made by the Design Team Members.

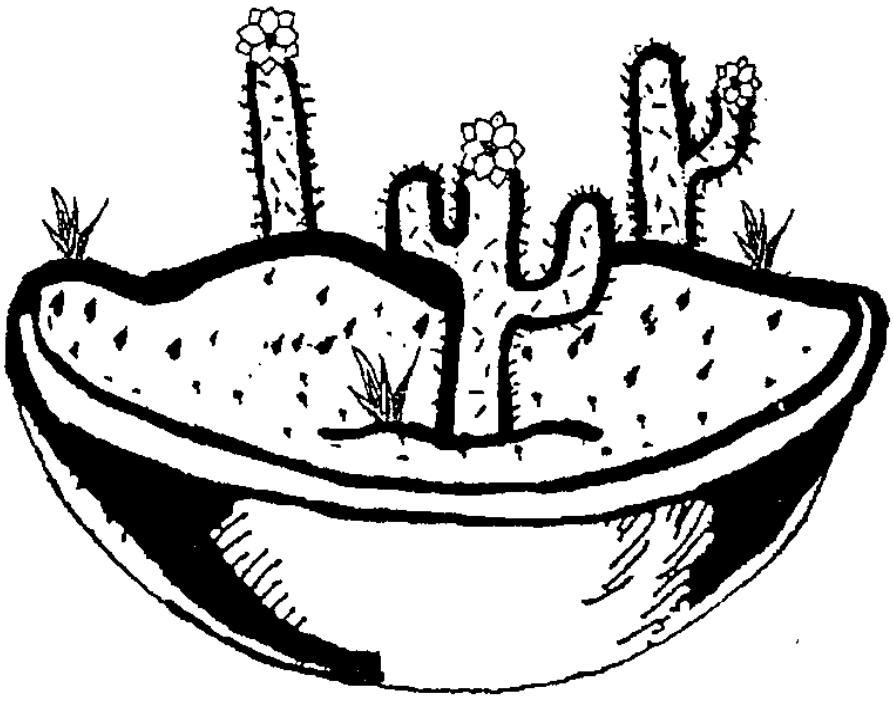
CREATE A DESERT ECOSYSTEM

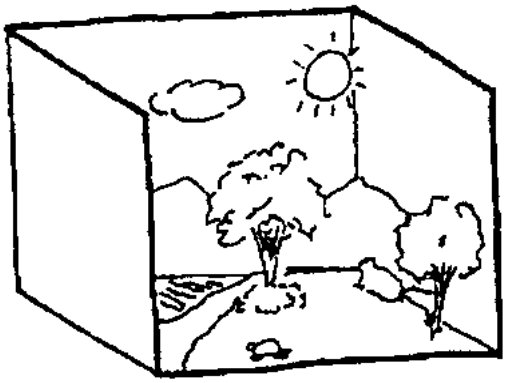
You will need:

- large dish or jar
- soil suited for a desert (very sandy soil with some organic matter)
- small plants suited for desert life - cacti and succulents

What to do:

- Place the desert soil in the dish or jar.
- Plant the desert plants in the sandy soil, making sure to press the soil around the plants to keep them in place.
- Give the plants a small amount of water and put the desert ecosystem in a sunny location.
- Water about once a month and transplant the plants when they get too large for the dish!





DIORAMA

You will need:

- Ž a cardboard box
- Ž various craft supplies or natural things to use (bits of sponges, moss, sand, twigs, felt, pipe cleaners)
- Ž scissors and glue

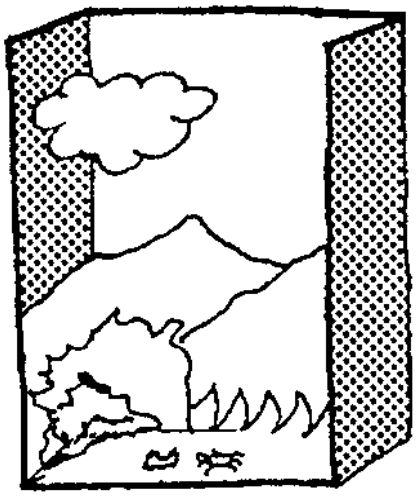
What you do:

- Ž Cut one side from box.
- Ž Create scene of your ecosystem using things you've collected.
- Ž Prepare backgrounds scenes, floor, and add trees, animals, etc.

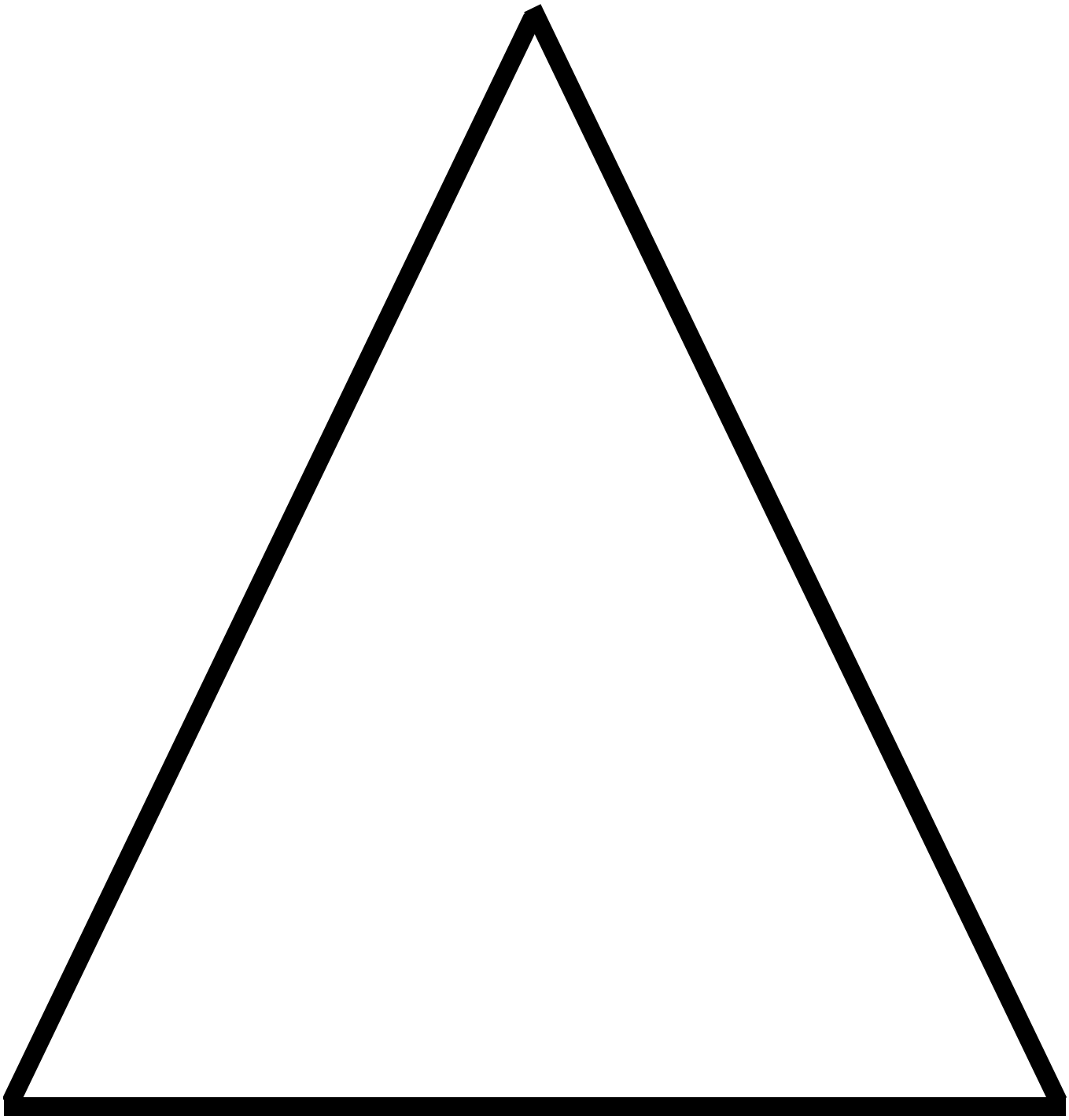
What effects would man have on your ecosystem?

Positive:_____

Negative:_____



THE PYRAMID OF LIFE!



Draw a Pyramid of Life where a human (you) are at the top. Add pictures of plant and animal life to complete your food chain picture.

EARTH CONNECTIONS SEARCH

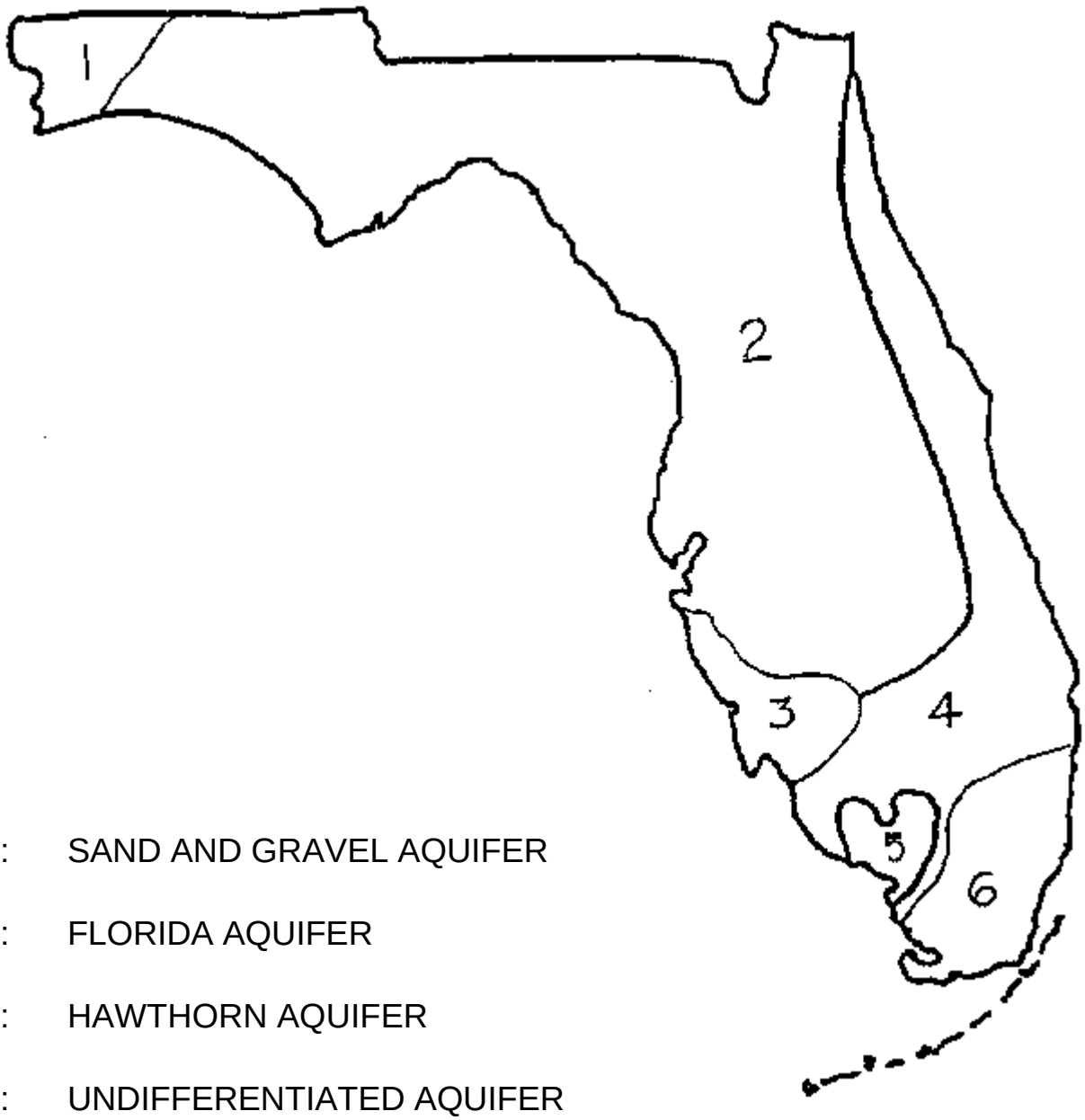
How many of the following words can you find in this puzzle? Each word may be spelled forwards, backwards, downward, or diagonally.

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

ENVIRONMENT
POLLUTION
FOOD CHAIN
WATER
EARTH
HABITAT
SOIL
SUN
AIR
LAND
RAIN
PESTICIDE
ECOSYSTEM
DESERT
OCEAN
FORESTS
PLANTS
HERBIVORE
ANIMALS
CONNECTIONS
INTERDEPENDENT
CLIMATE
CARNIVORE

FLORIDA'S HIDDEN WATERS!

Match and color FLORIDA'S HIDDEN AQUIFERS, our major water source.



1: SAND AND GRAVEL AQUIFER

2: FLORIDA AQUIFER

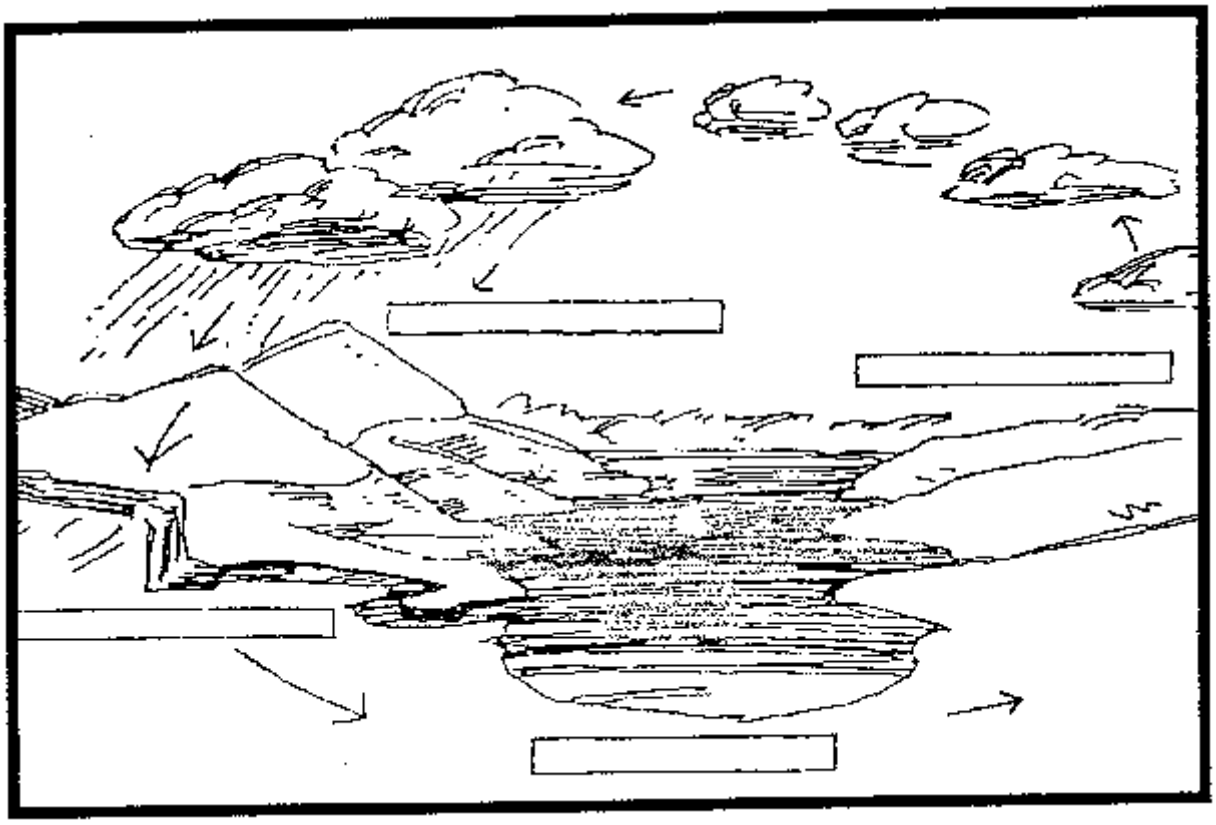
3: HAWTHORN AQUIFER

4: UNDIFFERENTIATED AQUIFER

5: CHOKOLOSKEE

6: BISCAYNE

NATURE'S WATERWHEEL



Label the following parts of the Water Cycle

HYDROLOGIC CYCLE: Process involving the circulation and distribution of water on Earth.

CONDENSATION: The changing of water vapor to liquid.

EVAPORATION: The changing of water into water vapor.

INFILTRATION: The process by which water seeps into the soil.

PRECIPITATION: Forms of condensed water vapor that are heavy enough to fall to the Earth's surface, such as rain, snow, sleet, hail, and fog.

GROUNDWATER: Water found below the surface of the Earth.

HOW MUCH OF YOU IS WATER?

1. How many gallons of water are you?

   a. Weigh yourself. _____ pounds.

   b. Multiply your weight by 2.

   c. Divide your answer by 3. This answer is the approximate number of pounds of water in your body.

   d. A quart of water weighs about 2 pounds, so divide your last answer by 2.

   e. There are 4 quarts in a gallon, so divide again by 4. Therefore, there are _____ gallons of water in your body.

2. On the back of this worksheet or on a separate sheet of paper, list 20 ways you use water. Underline the 10 uses that are most important to you. Then circle the uses that you couldn't live without.

3. Why do people use more water today per person than was used 50 years ago?_____
   _____

4. Scientists have determined that it takes about 1,400 gallons of water to make a meal of a hamburger, french fries, and a soft drink. List at least four ways that water is used to produce this meal.
   a. _____
   b. _____
   c. _____
   d. _____

WET WONDER QUIZ

How many answers do you know? How many can you guess? Try the quiz on someone else!

		TRUE	FALSE
1.	We don't have to worry about water. There will always be more.	_____	_____
2.	A dinosaur could have walked in some of the water you drank today.	_____	_____
3.	You'll drink enough water in your lifetime to fill over 300 bathtubs.	_____	_____
4.	Industries use lots of water to make their products. How much water is used to refine one gallon of gasoline? a. 10 gallons b. 32 gallons c. 70 gallons		

WET WONDER QUIZ

ANSWERS

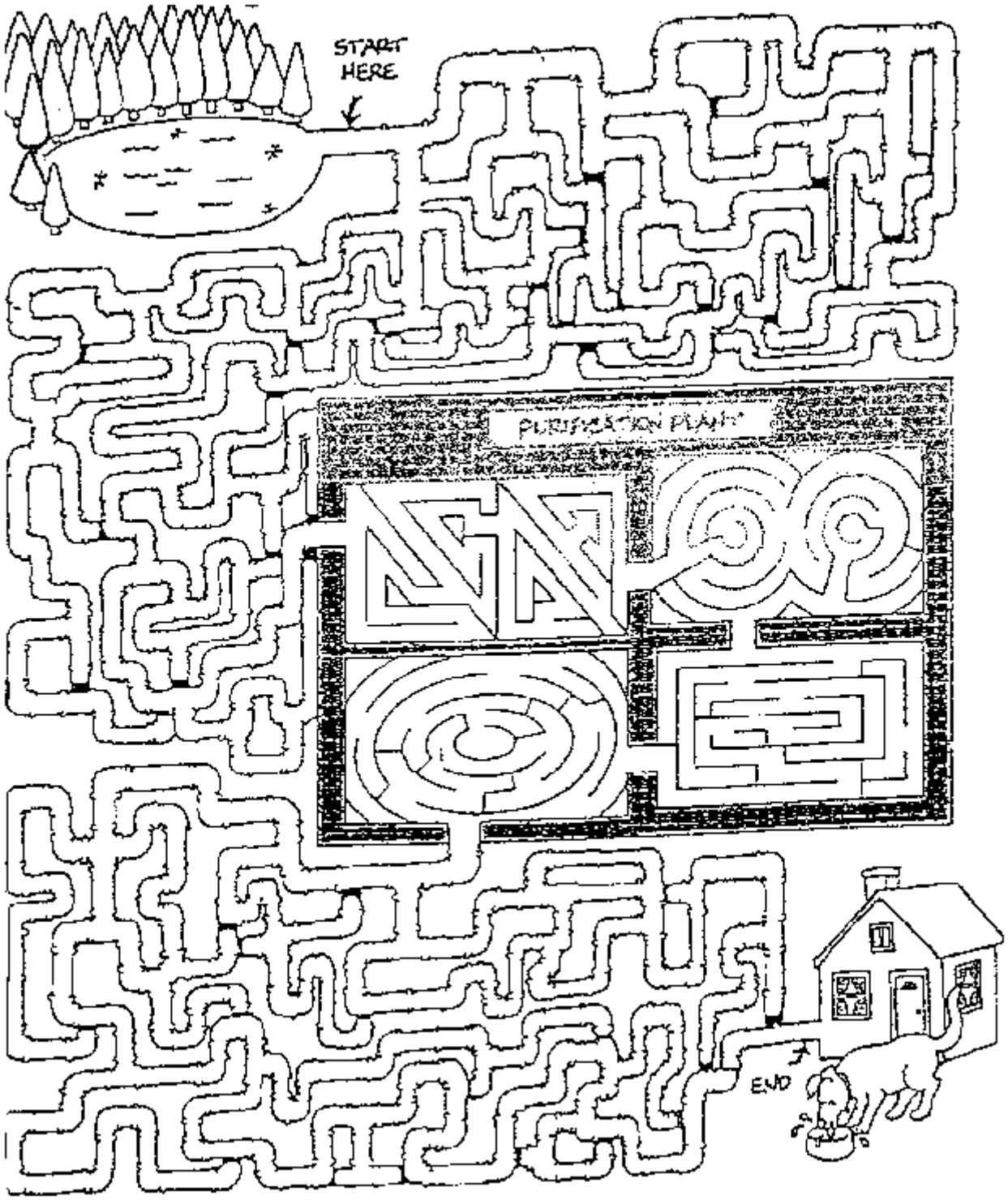
1. False. The total amount f water in the world is the same as it was millions of years ago. But there are more people using more water than ever before. Fresh water is running short in some areas. Saving water is important so we don't run short in more areas.

2. True. The water cycle recycles the same water over and over again. Water is never destroyed but it can get polluted.

3. True. That's a good reason to keep our water clean and safe!

4. C. Most of this water can be cleaned up and used over again. But if poisonous wastes leak into water supplies, it's almost impossible to make it clean again.

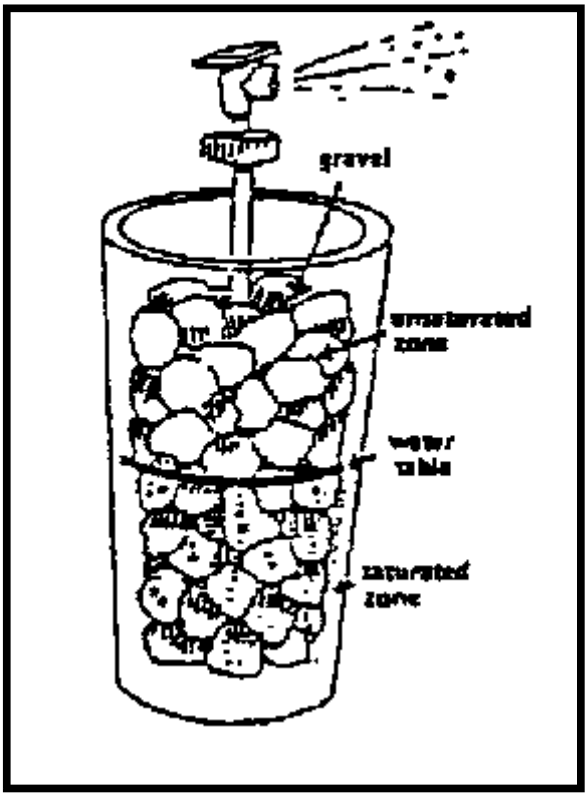
HOW WATER GETS TO YOUR **HOME!**



UNDERGROUND DISCOVERIES...

What you need:

- 10 oz. clear plastic cup
- Spray pump
- Pea gravel or aquarium stones
- Sand
- Filter
- Small 8 oz. can or paper cup with holes in bottom
- Water
- Food Coloring



What you do:

- Arrange a layer of sand, filter, and then gravel in the plastic cups.
- Mix food coloring in a glass of water and then pour it through the can to drip on the layers in the Earth.
- Have youth observe the flow of “rain” water through the layers.
- Push a spray pump (“well”) into the layers below the water table.

What happened?

1. What did you observe happening?

   _____

2. Why doesn’t the colored water go to the bottom of the container?

   _____

LET'S MAKE SOIL!

Do you know how soil is made?

It takes hundreds of years to build up just one inch of soil. Soil is formed from rocks very slowly. Here are some of the ways nature does its job of making soil.

Glaciers. Glaciers are huge blocks of ice on land. During thousands of years, the glaciers moved over land and rubbed off vast amounts of rock particles. The rock particles became soil.

Heat and cold. The sun warms rocks during the day. This makes the rocks get bigger (expand). At night the rocks cool and get smaller (contract). Small pieces of rock break off as the rock expands and contracts. The small pieces of rock become soil.

Wind. The wind breaks rocks into smaller pieces.

Water. Water gets into small crack sin rocks. When the water freezes it expands and breaks rocks into small pieces. Rocks also tumble into streams. The moving water rubs rocks and pebbles together. The rubbed off pieces become soil. This makes up the mineral or non-living part of the soil.

Living things. When plants and animals die, they decay and turn into siol particles, making up the organic part of the soil.

Try making a compost pile with your family. Use the soil you make on a garden.

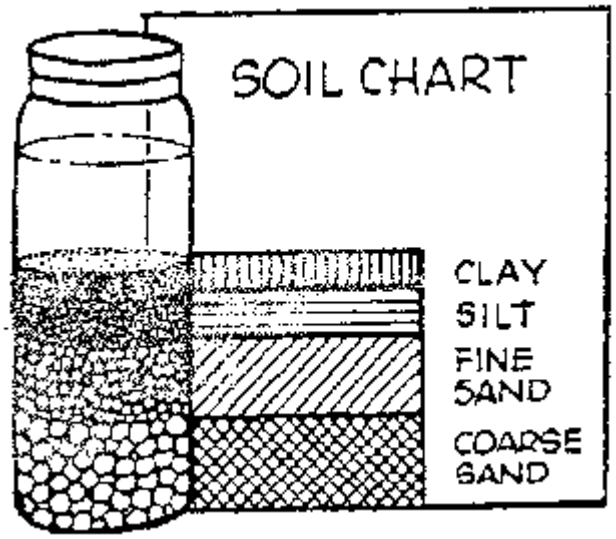
YOU CAN MAKE SOIL!

- Get two pieces of stone.
- If you do not have natural stone, pieces of building brick or concrete will do.
- Rub the stones together to make one teaspoonful of soil.

How long did it take? _____

WHAT'S YOUR TYPE?

Try this!



You will need:

- Some soil from garden, flower bed or field
- Glass jar

What you do:

- Fill jar 2/3 full with water.
- Pour in soil until the jar is almost full.
- Replace the lid and shake very hard.
- Let the jar sit until the soil settles. (Allow lots of time – at least 1 hour!)
- Draw a picture and label each layer.

How many layers are there?

_____

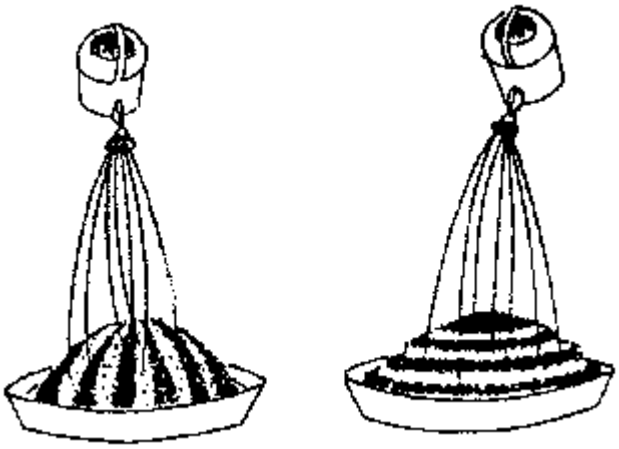
Try it again with different soil samples and compare them!

SOIL STOPPERS!

Try this and see which one helps to stop soil erosion!

You will need:

- 2 large round low dishpans
- 2 watering cans
- soil
- pencil



What you do:

- Put an equal amount of soil in the dishpans and form a mound (hill) in each.
- With a pencil or finger make rows up and down one hill and circles around the other hill.
- Sprinkle an equal amount of water (from the same height) on each hill. Look at the water at the bottom of the hills.

Which hill had the least erosion? Why?

_____

_____

AIR LABS

Does air take up space?

What you need:

- 2 clear glasses or jars
- Large container of water (Or fish tank)
- 2 plastic bendable straws
- Tape

EXPERIMENT #1

What you do:

- Plunge the mouth of the lass into the water.
- Check level of water in glass.
- Tip it lightly to let the gas bubble upward out of the glass.

Does the water mob up into the glass? _____

Can you push the glass to the bottom of the container without any water getting inside? _____

What's in the glass?_____

Is the glass empty of full?_____

EXPERIMENT #2

What you do:

- Put a piece of tape on the inside of a glass.
- Plunge it's mouth down into a tank of water.
- Test the tape to see if it got wet.
- Repeat and this time tilt the glass.

What happens when you tilt the glass?_____

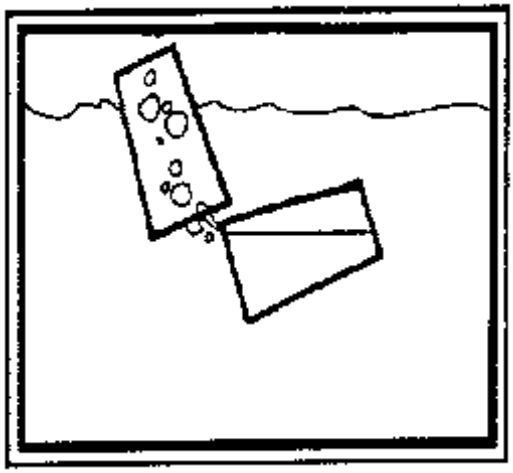
Is the glass empty or full? _____

Did the tape get wet?_____

EXPERIMENT #3

Can you catch the air from the glass?

What you do:



- Push one glass under the water and let it tip to fill with water.
- Push second glass straight down into the water. This glass should be deeper than the on full of water.
- Tilt the glass of air so that the air bubbles go out and are caught in the other glass ful of water.
- Hold the two glasses close together.

What happens when the air bubbles go into the water-filled glass?

_____

_____

EXPERIMENT #4

Can you remove the air from the glass?

What you do:

- Connect your two straws together by inserting one into the other about 1 ½ inches. It should bend to make a V.
- Push the glass into the water.
- Place one end of the straw into the glass.
- Inhale the air from the glass into your mouth through the other end of your straw.

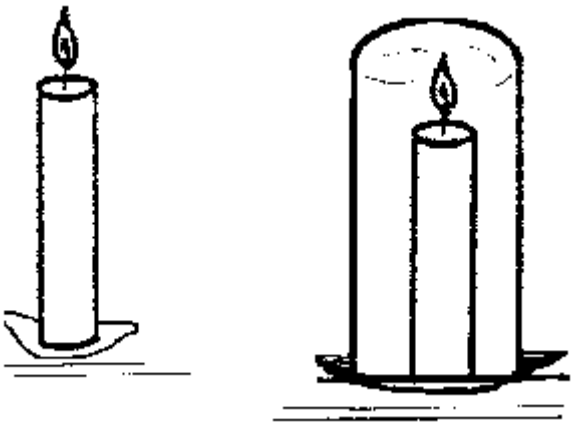
What happened to the level of water in the glass? _____

Does air take up space? _____

How do you know?_____

THE DYING CANDLE!

You will need:



- Several different size jars
- 2 candles and holders
- Matches

What you do:

- Place candles in holder.
- Light both candles.
- Cover one candle with a jar.
- Record observations in chart.
- Repeat using different jars.

TIME	CANDLE IN THE OPEN	CANDLE UNDER JAR
10 seconds		
20 seconds		
30 seconds		
60 seconds		

Why did the candle stop burning? _____

Does the size of the jar make a difference in how fast the candle stops burning?_____
Why?_____

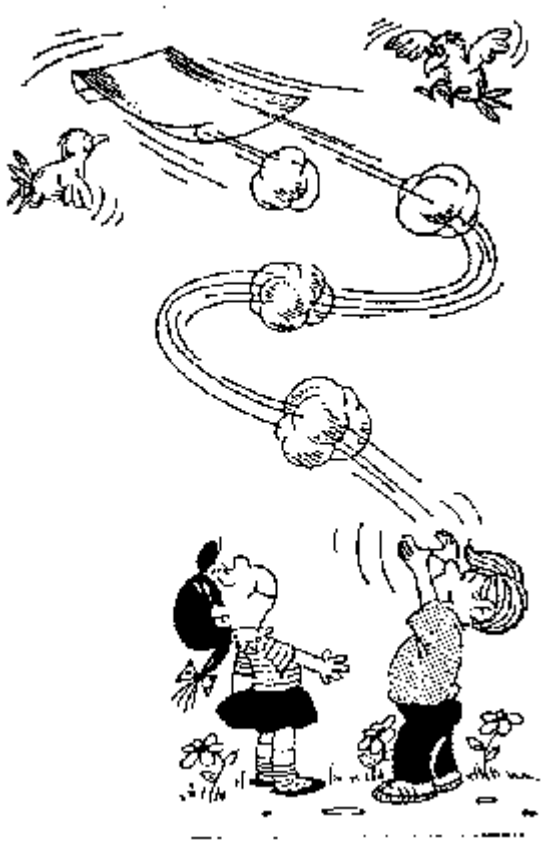
Is there a limit amount of oxygen in the air?_____

What would happen if we chopped down all the trees and green plants on Earth?_____

GLIDER SLIDERS

What you need:

- Sheet of typing paper



What you do:

- Hold an 8 ½ x 11 inch sheet of typing paper high above our head. Use both hands to grasp the paper. Let go. The paper will scoot in various directions and probably turn over.

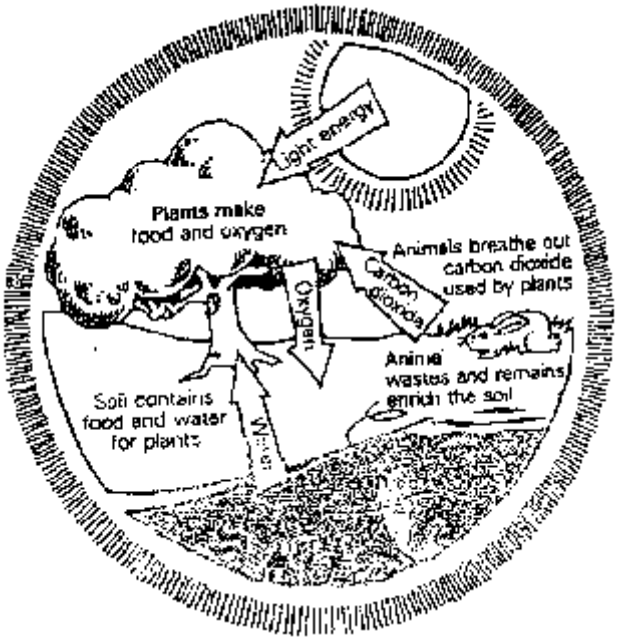
- Now make folds in the long side of the paper, first, 1 inch inward, then, 1 inch again.

- Hold the paper over your head as you did before, but make sure that the folded edge is at the front, and on the underside, of the sheet. Gently push the paper as you release your grip. The paper will not turn over and will glide for some distance before falling to the ground.

This is what happens:

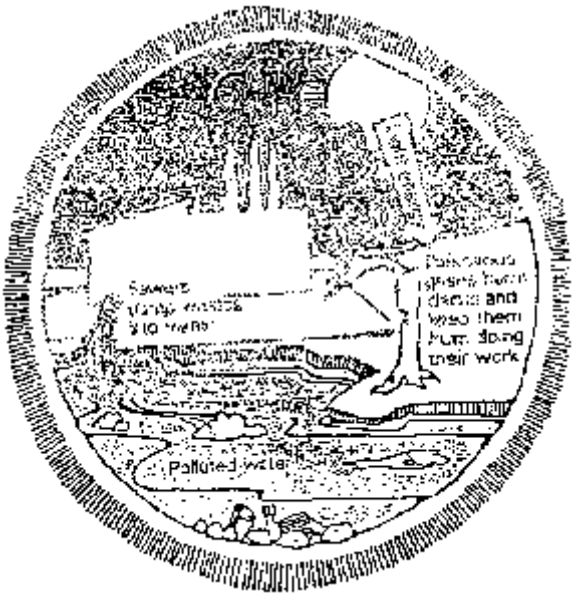
As the plain sheet of paper falls, the force of the rushing air over it causes differences in air pressure over different parts of the paper. The front end tilts up, and the paper may move in a topsy-turvy fashion. However, by folding the edge, you increase the weight that is at the front, and this weight balances the upward force of air, causing the paper to glide smoothly without flipping over. Airplane wings are shaped like this also – they are a little bit heavier in front than they are in the rear – which helps make the ride a smooth one.

IDENTIFY AND LABEL THE ENVIRONMENTS

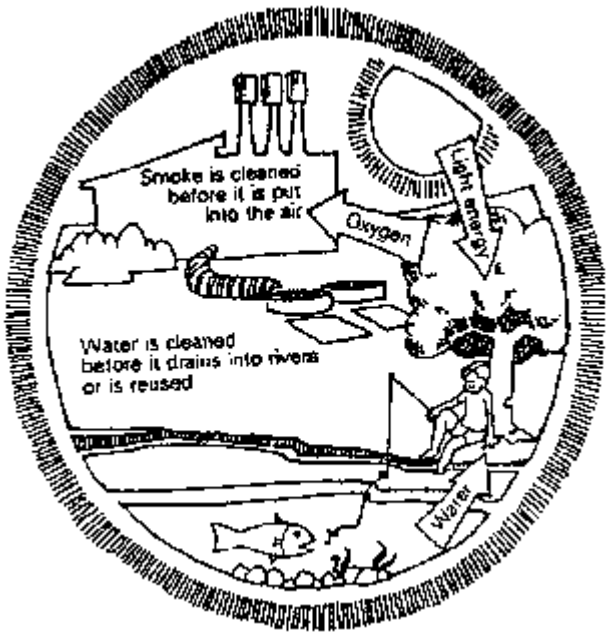


_____ Environment

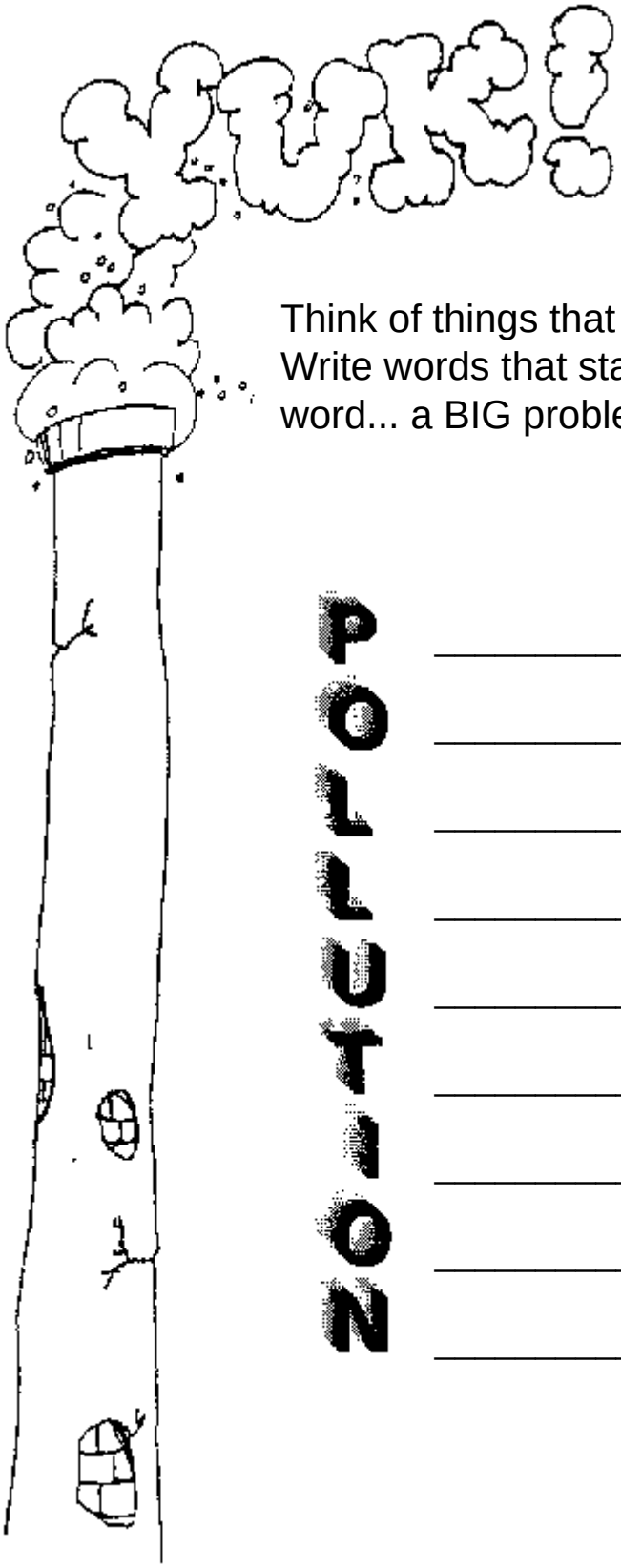
Which is the natural, polluted and clean environments?



_____ Environment



_____ Environment



Think of things that can harm our environment. Write words that start with each letter of this word... a BIG problem to our environment.

POLLUTION

_____

_____

_____

_____

_____

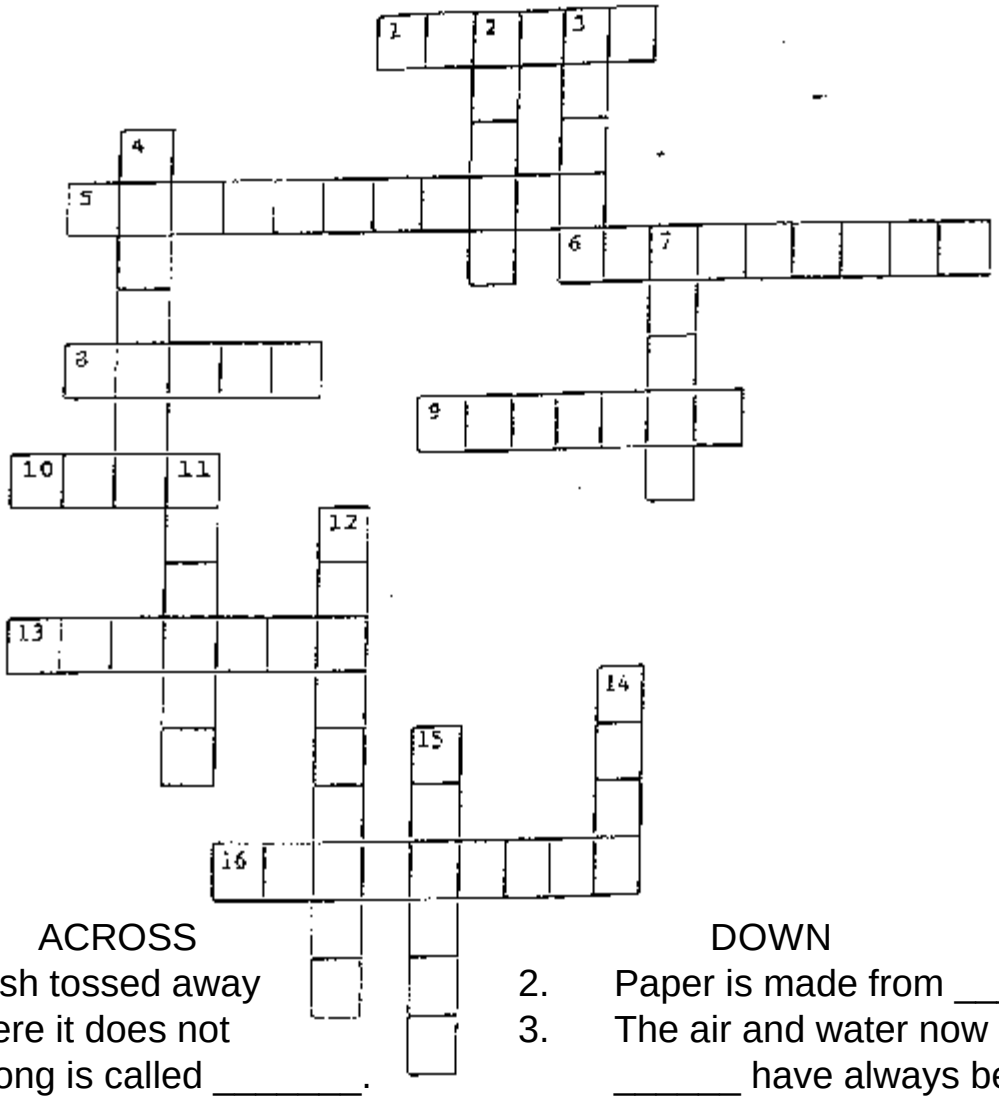
_____

_____

_____

_____

ENVIRONMENT CROSSWORD PUZZLE!



ACROSS

1. Trash tossed away where it does not belong is called _____.
5. The _____ is what every living thing needs for life.
6. A plant eating animal.
8. Each living thing must have _____ to survive.
9. A complex food chain is a _____.
10. Dirty water from factories can kill _____.
13. Ground water is found in the _____.
16. Interaction between living and non-living things in a certain area is an _____.

DOWN

2. Paper is made from ____.
3. The air and water now on _____ have always been here; no new supplies come from space.
4. The environments of many wild _____ have been hurt by man.
7. Hot air _____.
11. _____ is lighter than air.
12. An animal that eats other animals is a _____.
14. Sand, clay and _____ are three soil types.
15. _____ is part of the air.

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Name _____

Address _____

Name of Club/School _____

Leader/Teacher's Name _____

4-H Club Motto

"To make the best better"

4-H Pledge

I Pledge:

My head to clearer thinking
My heart to greater loyalty
My hands to larger service, and
My health to better living
for my club, my community,
my country, and my world.

4-H Colors

Green and White

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