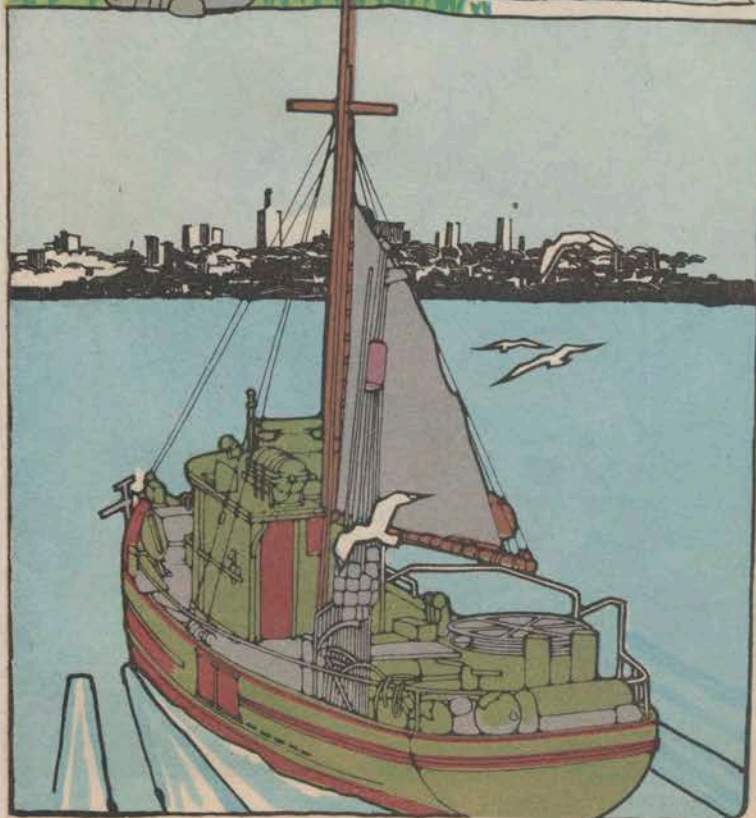
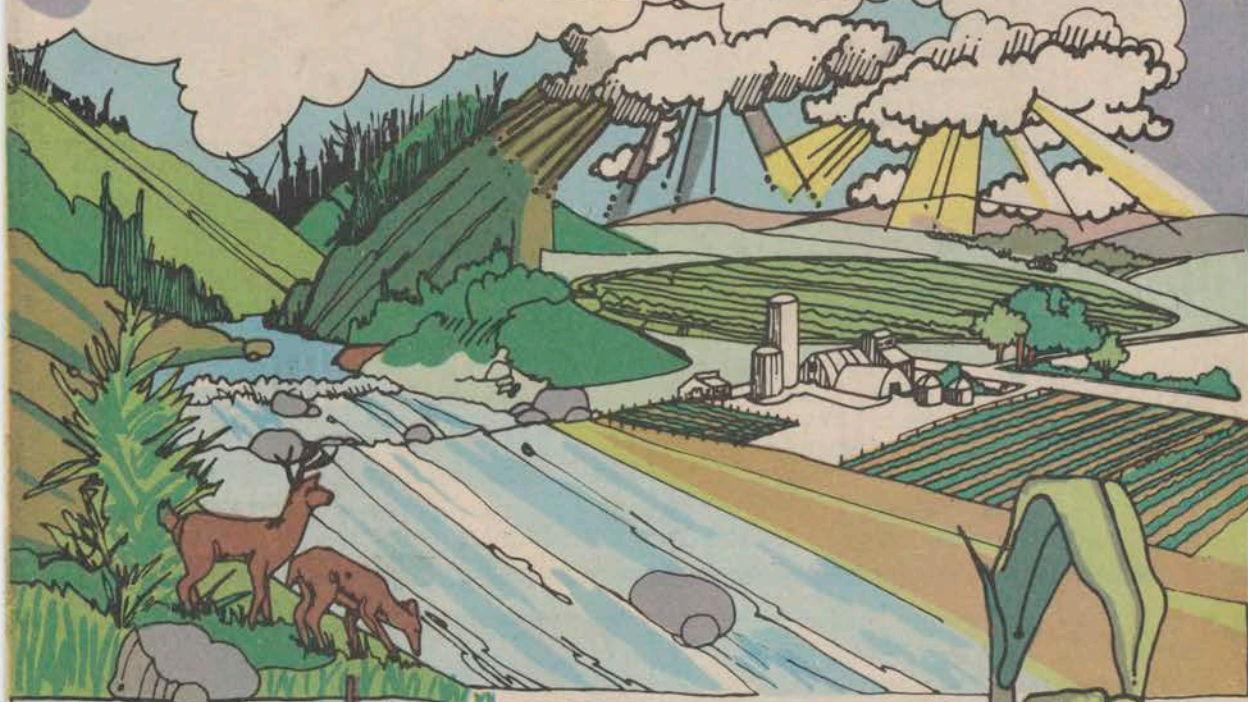
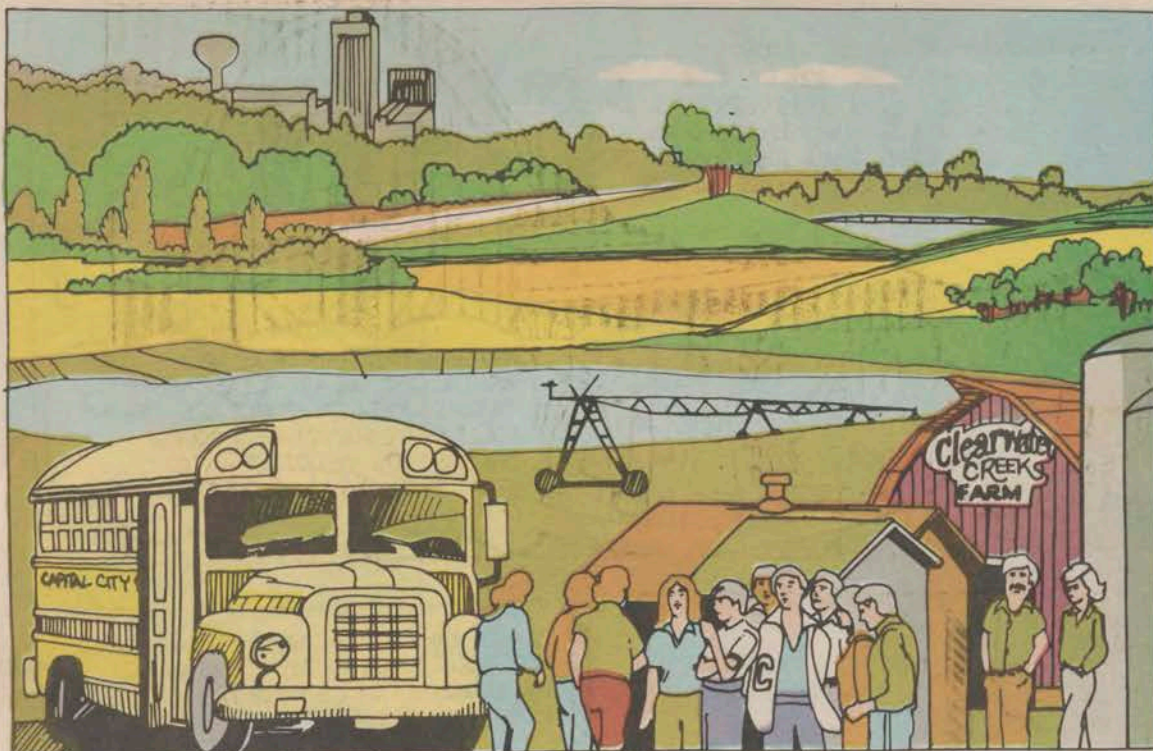


WATER

"the basis of life"





MR. TROXEL'S SCIENCE CLASS FROM CAPITAL CITY SCHOOL IS VISITING THE FARM OF MR. JOHNSON. MR. MILLS, DISTRICT CONSERVATIONIST FOR THE SOIL CONSERVATION SERVICE, IS ALSO ON HAND FOR THE VISIT.

"MR. JOHNSON, I WANT TO INTRODUCE YOU TO OUR SCIENCE CLASS FROM CAPITAL CITY SCHOOL. SOME OF THE STUDENTS WILL TELL YOU WHY WE ARE INTERESTED IN VISITING YOUR FARM."

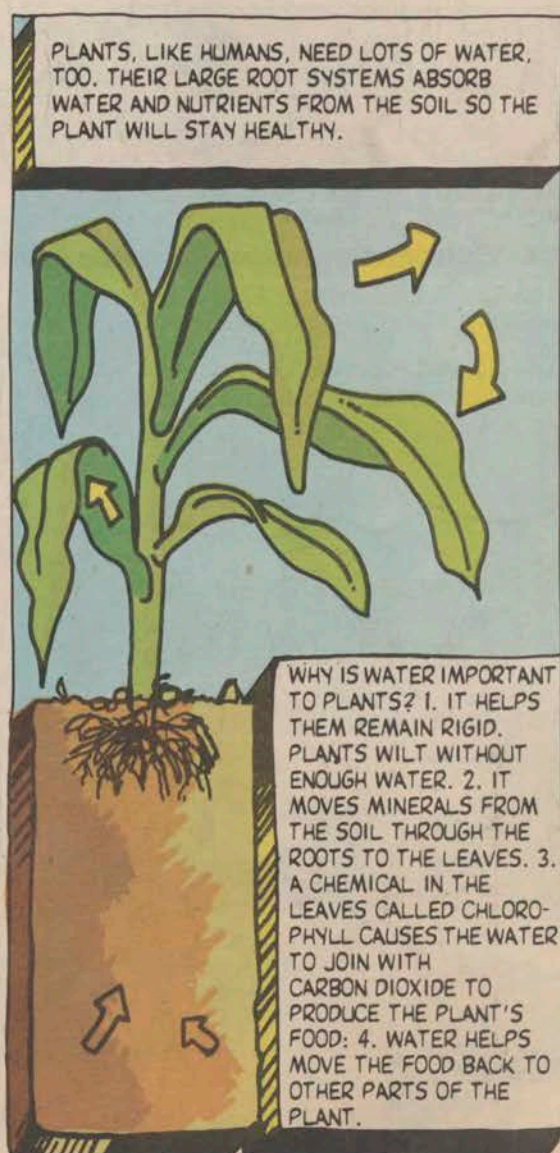
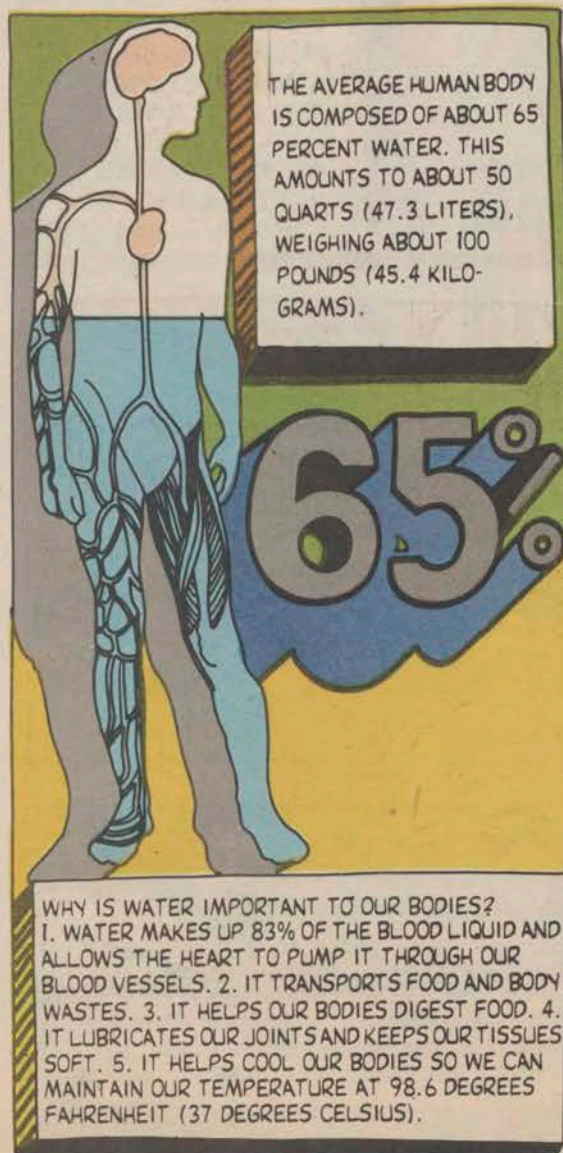


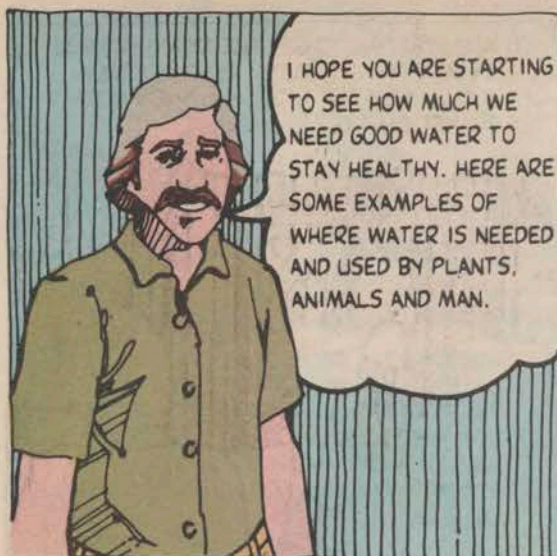
MY NAME IS SUE JORDAN. OUR CLASS IS STUDYING WATER AND ITS MANAGEMENT.

I'M BILL SMITH, AND IT SEEMS THAT WATER IS IN THE NEWS EVERYDAY...TOO WET, TOO DRY, TOO POLLUTED.



WE HAVE HEARD OF YOUR INTEREST AND WORK AS A CONSERVATION LEADER AND WE WOULD LIKE TO LEARN WHAT IS BEING DONE ABOUT WATER MANAGEMENT IN OUR COMMUNITY.

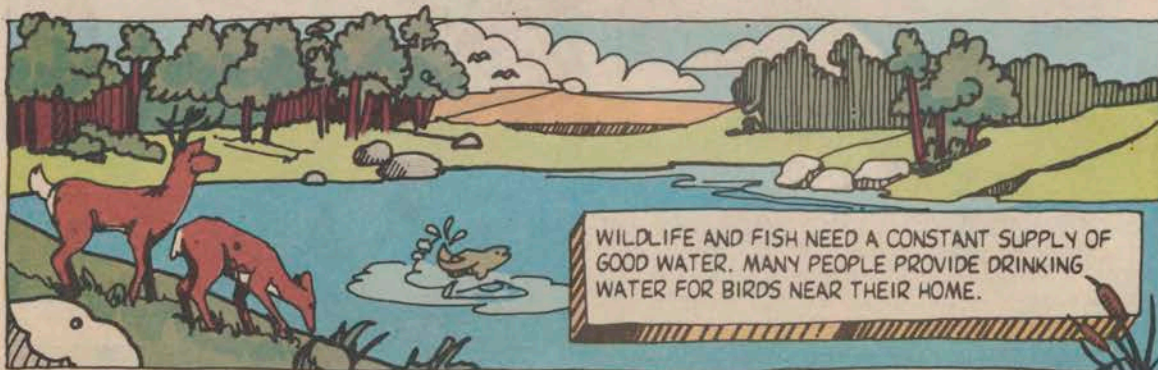
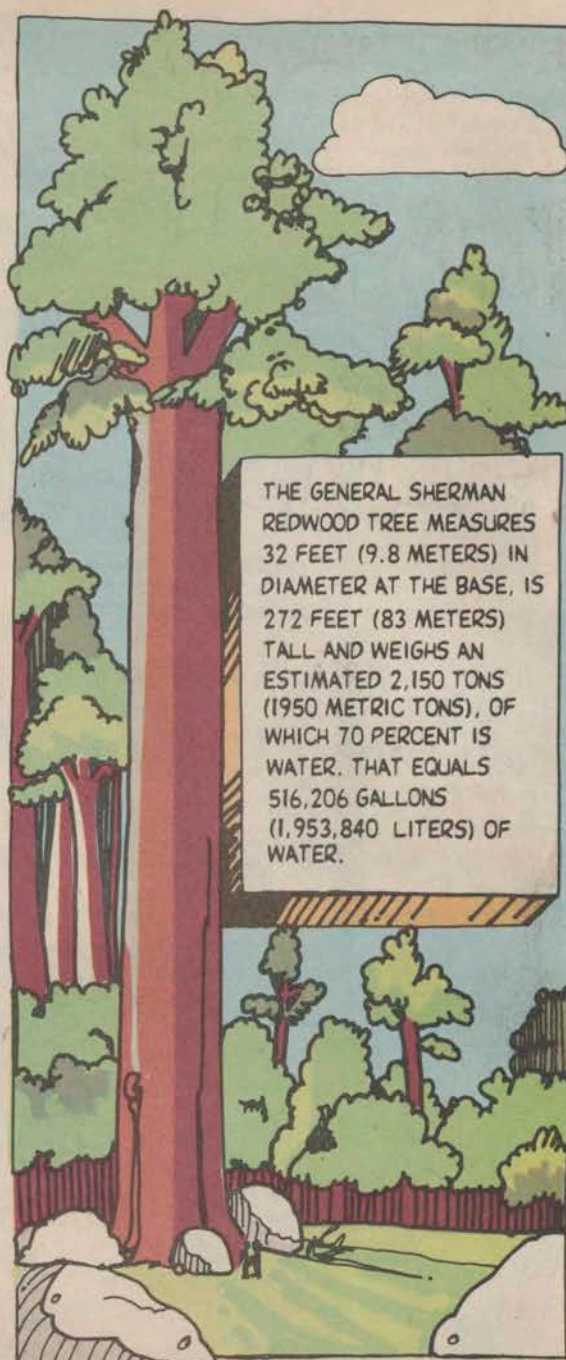


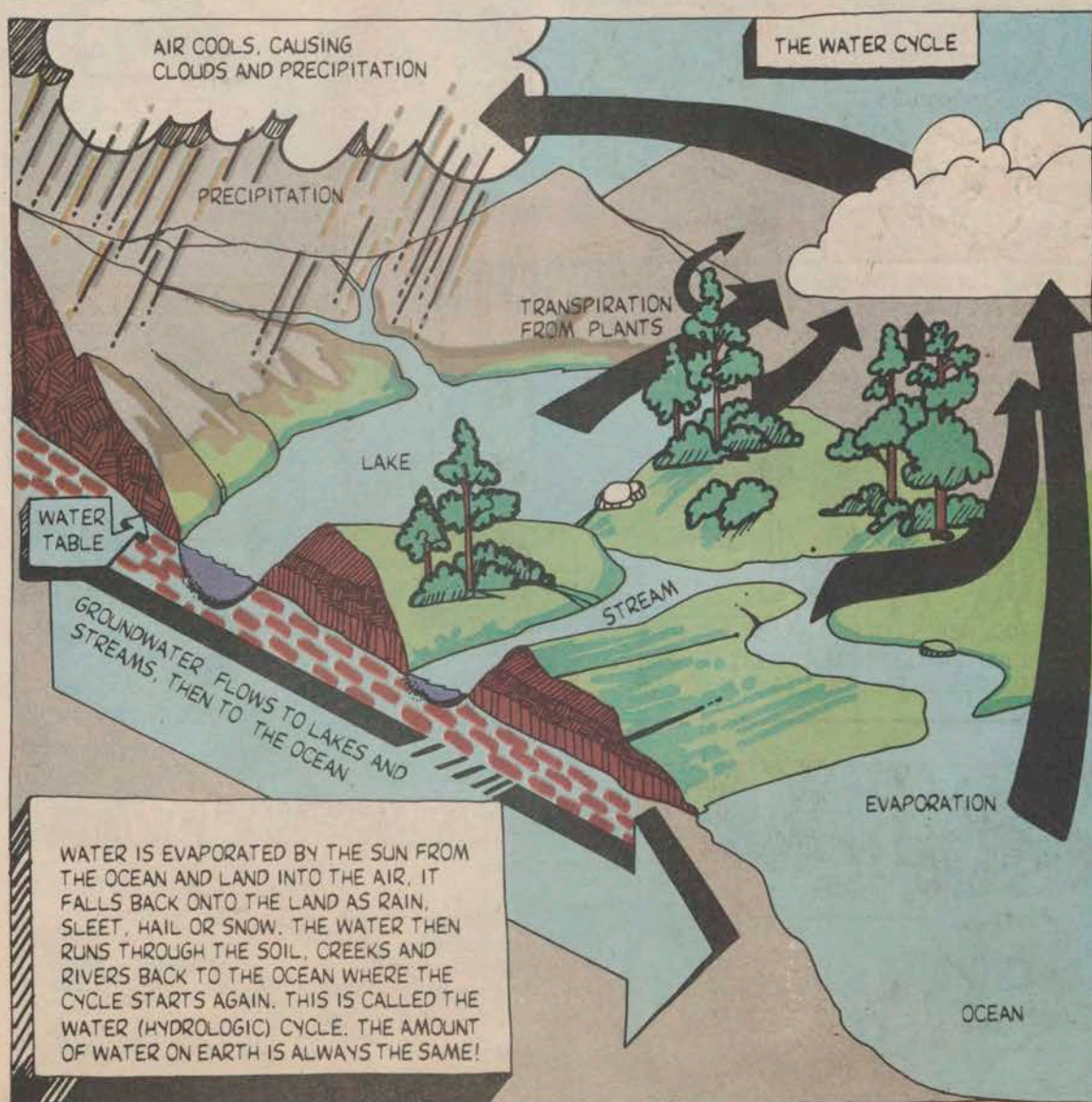


PEOPLE CAN LIVE WITHOUT FOOD FOR SEVERAL WEEKS BUT WOULD PROBABLY DIE IN A FEW DAYS WITHOUT WATER. WE OBTAIN WATER BY DRINKING AND THROUGH THE FOOD WE EAT.



LIVESTOCK NEEDS LOTS OF WATER. A DAIRY COW PRODUCING 12 GALLONS (45.4 LITERS) OF MILK PER DAY REQUIRES 36 GALLONS (136.5 LITERS) OF WATER.



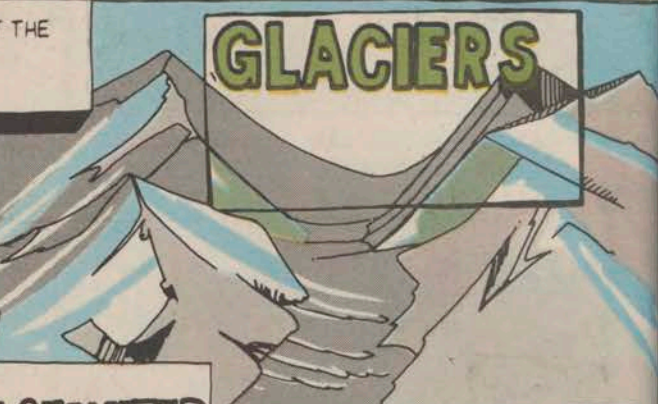




WHEN WE TALK OF GOOD WATER MANAGEMENT THERE ARE TWO BASIC CONCEPTS THAT MUST BE KEPT IN MIND: (1) IS THERE WATER AVAILABLE TO DO WHAT WE WANT? IN OTHER WORDS, IS THERE ENOUGH? (2) ALSO, WHEN WE GET WATER, WE WANT IT TO BE GOOD QUALITY. SO, AS WE DISCUSS WATER, KEEP "QUANTITY" AND "QUALITY" IN MIND.



THE HYDROLOGIC CYCLE SHOWED US THAT THE EARTH'S WATER CAN BE FOUND IN MANY DIFFERENT PLACES.



SUBSURFACE WATER

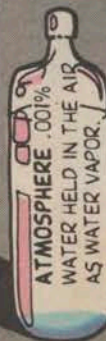
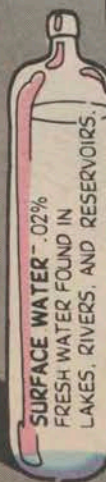
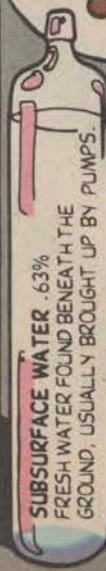
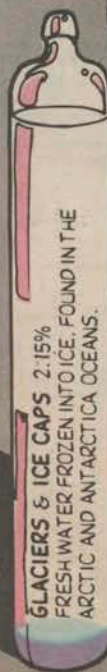
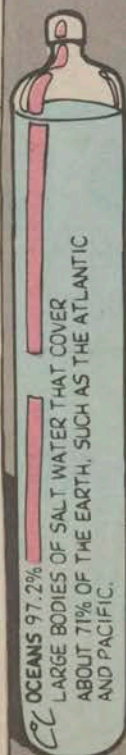
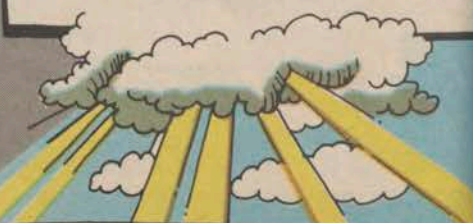


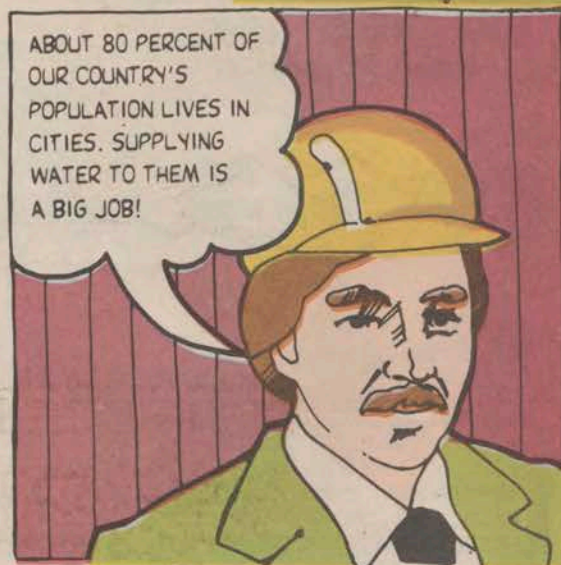
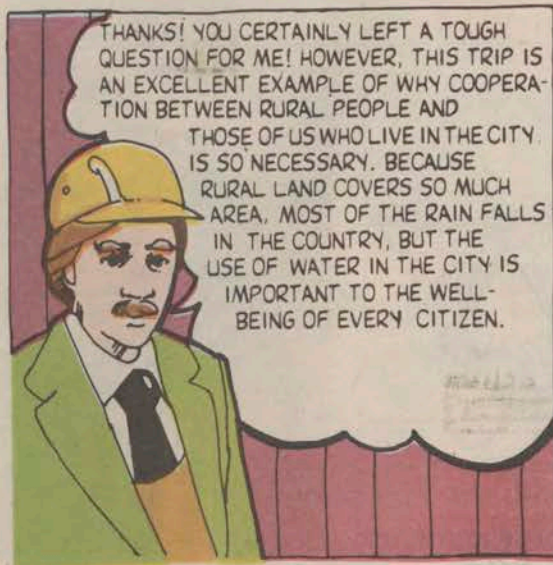
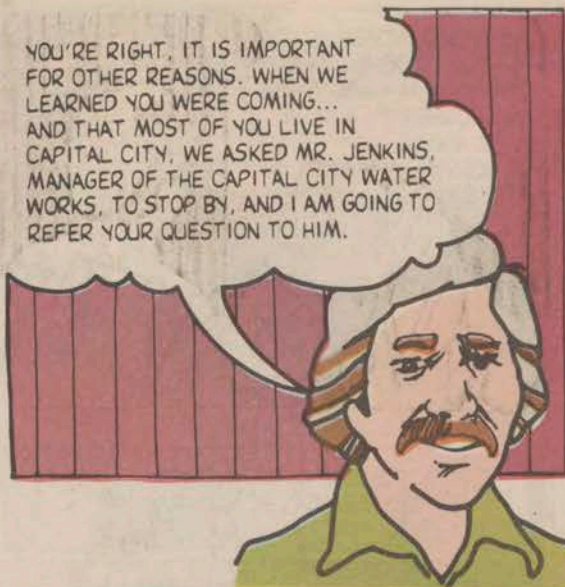
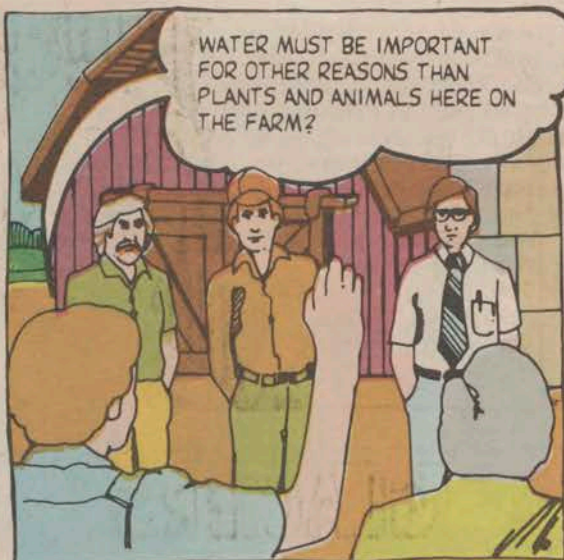
ALTHOUGH MOST OF THE WORLD'S WATER IS FOUND IN THE OCEANS, WE ARE MOST CONCERNED WITH THE RELATIVELY SMALL QUANTITIES OF GROUNDWATER, SURFACE WATER AND ATMOSPHERIC WATER FROM WHICH WE GET OUR WATER SUPPLIES.

SURFACE WATER

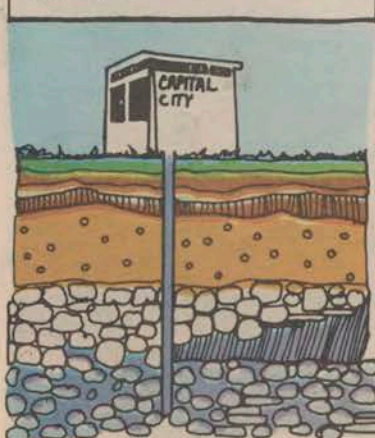


ATMOSPHERIC WATER





WATER FOR THE CITY IS OBTAINED EITHER FROM DEEP WELLS THAT PUMP FROM THE SUBSURFACE SUPPLY...



OR IT IS OBTAINED FROM SURFACE SUPPLIES SUCH AS STREAMS AND RESERVOIRS... OR A COMBINATION OF BOTH.



THE AVERAGE PERSON LIVING IN THE CITY USES ABOUT 150 GALLONS (568 LITERS) OF WATER A DAY.



MR. TROXEL MENTIONED THAT BOTH WATER QUANTITY AND WATER QUALITY ARE IMPORTANT CONSIDERATIONS IN WATER MANAGEMENT. CITIES ARE GOOD EXAMPLES OF WHY THAT IS TRUE.



WE WANT ALL CITIZENS TO HAVE THE QUANTITY OF WATER THEY NEED EACH DAY, AND BECAUSE POOR QUALITY WATER CAUSES MANY KINDS OF ILLNESS... WE WANT PEOPLE TO HAVE GOOD QUALITY WATER. TO PROPERLY MANAGE WATER WE MUST KEEP IN MIND THAT WATER HAS MANY USES WHICH WE MAY NOT ALWAYS THINK ABOUT. WE ALREADY KNOW THE MOST IMPORTANT USE OF WATER IS TO KEEP PLANTS, ANIMALS AND PEOPLE ALIVE. LET'S LOOK NOW AT SOME OF THE OTHER USES.

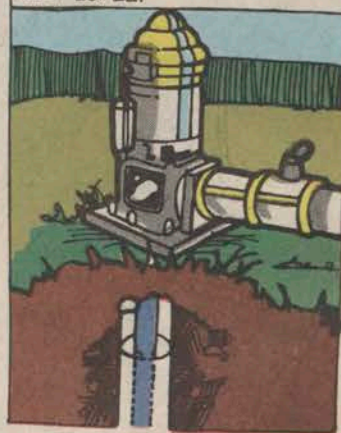


FOR AGRICULTURE

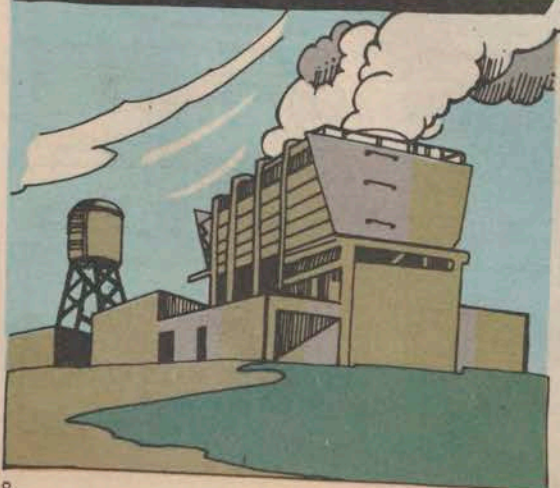


AGRICULTURE IS THE PRODUCTION OF PLANTS AND ANIMALS, MOSTLY FOR FOOD (SUCH AS CORN, WHEAT, LETTUCE, POTATOES, ORANGES, CATTLE AND POULTRY), FIBER (SUCH AS WOOL, HEMP, AND PAPER), AND THINGS NEEDED FOR CONSTRUCTION (SUCH AS LUMBER).

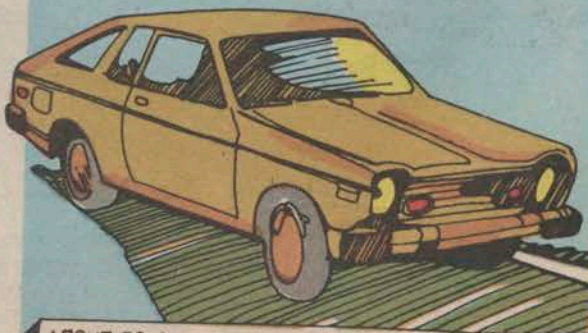
WHEN WATER IS PROPERLY MANAGED, THE FARMERS AND RANCHERS ARE ABLE TO PRODUCE MORE GOOD FOOD FOR YOU AND ALL PEOPLE.



FOR MANUFACTURING

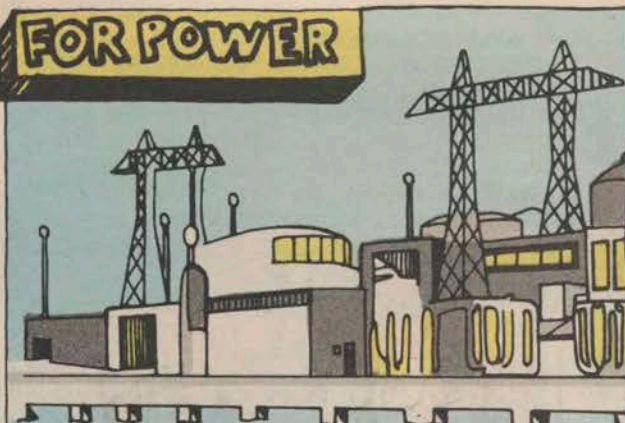


A NEW CAR REQUIRES THE USE OF ABOUT 30,000 GALLONS (113,600 LITERS) OF WATER IN THE MANUFACTURING PROCESS.



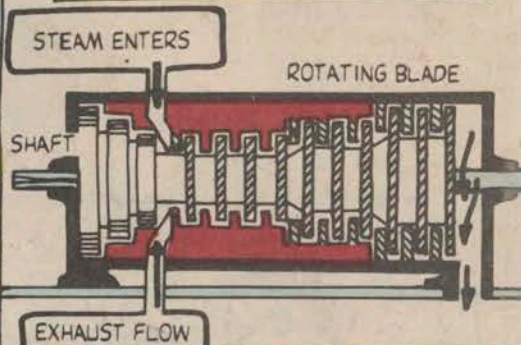
ABOUT 70 GALLONS (265 LITERS) OF WATER IS NEEDED TO PRODUCE EACH GALLON (3.8 LITERS) OF GASOLINE USED IN THE CAR.

FOR POWER



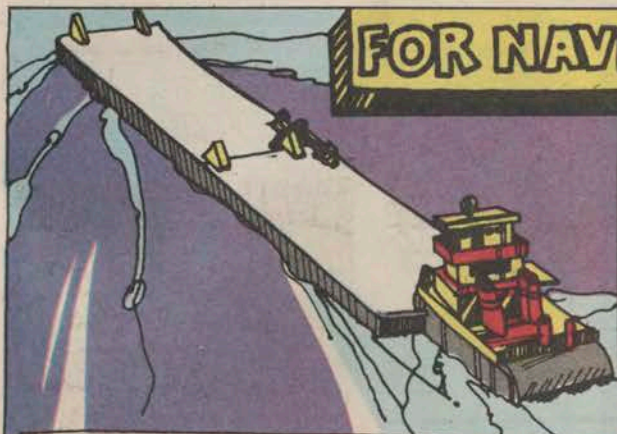
MORE THAN 1,500 POWER PLANTS IN THE U.S. ARE RUN BY DIRECT WATER POWER OR STEAM. THESE PLANTS PRODUCE ELECTRICITY USED ACROSS THE COUNTRY.

STEAM TURBINE

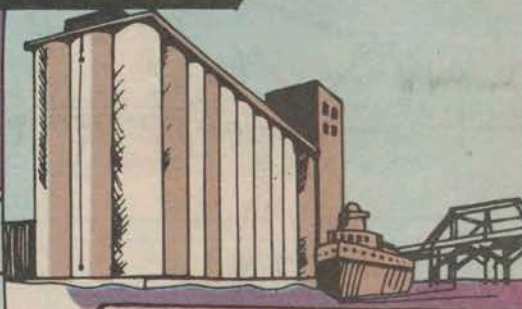


WATER (IN THE FORM OF STEAM) IS USED TO TURN LARGE TURBINES WHICH DRIVE GENERATORS TO PRODUCE OUR ELECTRICITY.

FOR NAVIGATION



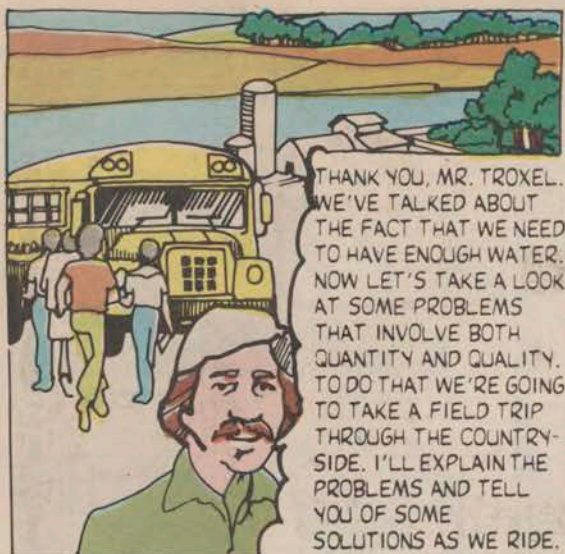
TRANSPORTATION IS A VERY IMPORTANT USE OF OUR NATION'S INLAND WATERWAYS. MORE THAN 20,000 BARGES, MOVED BY TOWBOATS, CARRY AGRICULTURAL AND INDUSTRIAL PRODUCTS.



THESE PRODUCTS INCLUDE GRAIN, FERTILIZERS, COAL, BUILDING MATERIALS, FUEL OIL, GASOLINE AND CHEMICALS.



YOU SHOULD NOW UNDERSTAND HOW IMPORTANT WATER IS TO US. WE RELY ON IT FOR MANY THINGS, AND WE MUST ALWAYS TRY TO CONSERVE AND MANAGE IT PROPERLY. NOW THAT WE'VE DISCUSSED SOME OF THE USES OF WATER, LET'S ASK MR. MILLS TO EXPLAIN SOME WATER PROBLEMS AND HOW WE MIGHT SOLVE THEM.



THANK YOU, MR. TROXEL. WE'VE TALKED ABOUT THE FACT THAT WE NEED TO HAVE ENOUGH WATER. NOW LET'S TAKE A LOOK AT SOME PROBLEMS THAT INVOLVE BOTH QUANTITY AND QUALITY. TO DO THAT WE'RE GOING TO TAKE A FIELD TRIP THROUGH THE COUNTRY-SIDE. I'LL EXPLAIN THE PROBLEMS AND TELL YOU OF SOME SOLUTIONS AS WE RIDE.

I'M SURE YOU HAVE HEARD THAT PEOPLE ARE VERY CONCERNED ABOUT HAVING ENOUGH GOOD WATER. THIS HAS LED THE GOVERNMENT TO CREATE NEW LAWS TO HELP REDUCE POLLUTION OF OUR WATER SUPPLIES FROM CITY SEWAGE, INDUSTRIAL WASTES, FARM PESTICIDES, FERTILIZERS, AND OTHER POLLUTANTS. TODAY I WANT TO SHOW SOME OF THE PROBLEMS IN RURAL AND CITY AREAS.



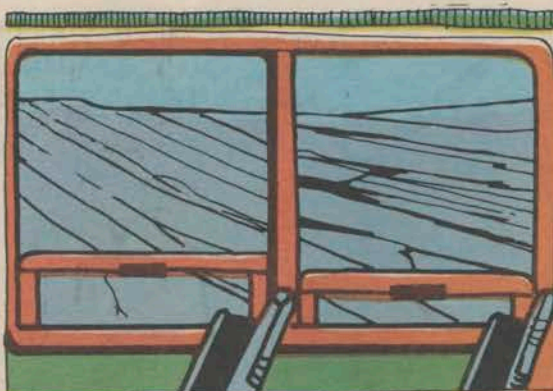
THERE ARE TWO BASIC KINDS OF WATER POLLUTION—ONE IS CALLED POINT AND THE OTHER NON-POINT.

POINT

POINT POLLUTION IS A SPECIFIC SOURCE OF POLLUTION, SUCH AS A SEWAGE DISCHARGE PIPE, THAT DUMPS POLLUTANTS INTO OUR LAKES AND STREAMS.

NON-POINT

NON-POINT POLLUTION IS THE TYPE OF SOURCE THAT CANNOT GENERALLY BE PINPOINTED, SUCH AS POLLUTION CAUSED BY RUNOFF, WHICH CARRIES CHEMICALS FROM LARGE AGRICULTURAL AND URBAN AREAS INTO OUR LAKES AND STREAMS.



IF YOU LOOK OUT THE WINDOW, YOU WILL SEE ONE OF THE MAJOR NON-POINT POLLUTION PROBLEMS - SOIL EROSION. THIS FIELD IS AN EXAMPLE OF SHEET AND RILL EROSION WHERE SOIL IS WASHED AWAY BY WATER MOVING OVER THE ENTIRE SURFACE.



THE NEXT FIELD IS AN EXAMPLE OF SERIOUS GULLEY EROSION, WHERE THE CONCENTRATION OF WATER WASHES OUT DEEP CHANNELS THAT MAKE IT ALMOST IMPOSSIBLE TO FARM THE LAND.

EROSION OF SOIL CREATES POLLUTION. WHEN SOIL PARTICLES MOVE BECAUSE OF FLOWING WATER, THEY ARE CALLED SEDIMENT. WHEN SEDIMENT LEAVES THE FIELD, PROBLEMS RESULT.



1. THE LAND LOSES NUTRIENTS AND PRODUCES FEWER CROPS.
2. THE SEDIMENT FILLS UP PONDS AND RESERVOIRS.
3. CITIES HAVE TO SPEND MORE TO CLEAN UP THEIR DRINKING WATER.
4. SEDIMENT MAY CARRY OTHER POLLUTANTS, SUCH AS CHEMICALS, THAT CAN GET IN WATER SUPPLIES.
5. SEDIMENT ALSO HARMS FISH AND WILDLIFE.

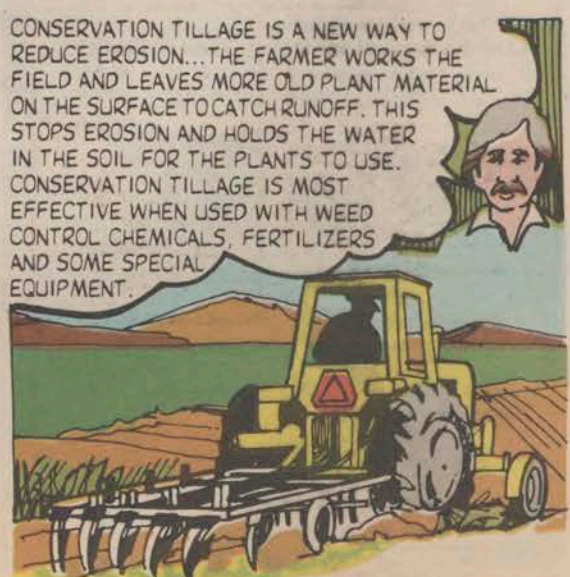
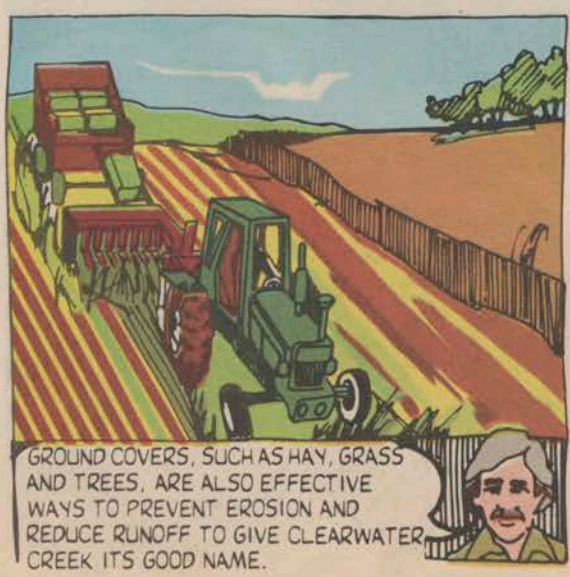
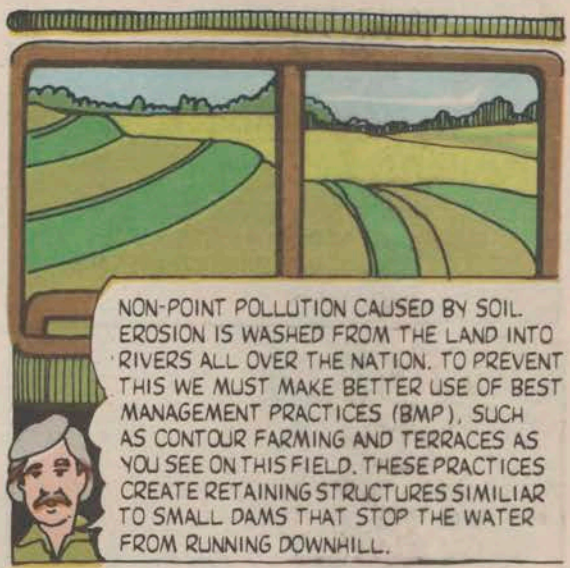
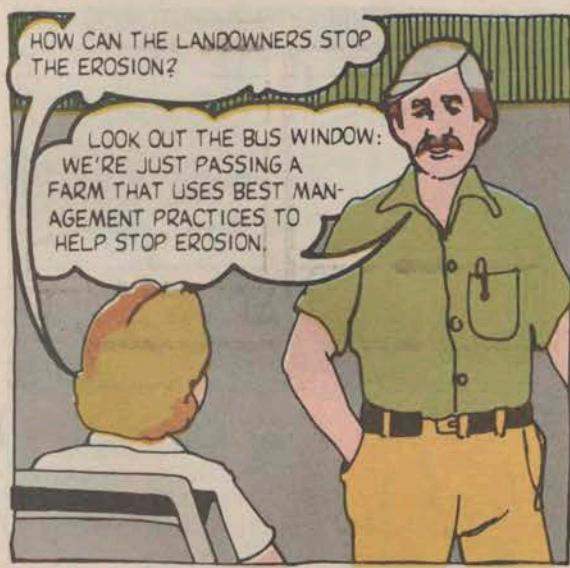
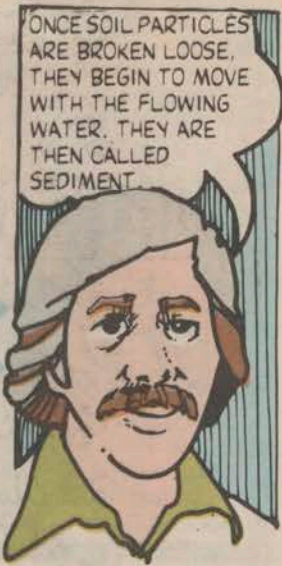
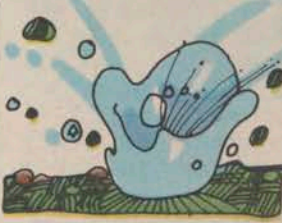


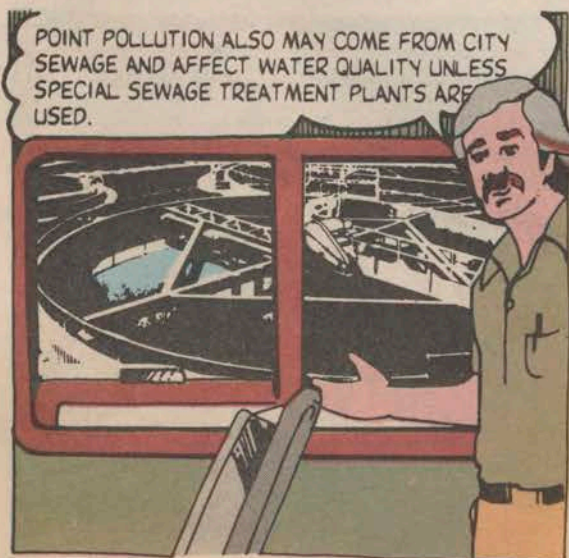
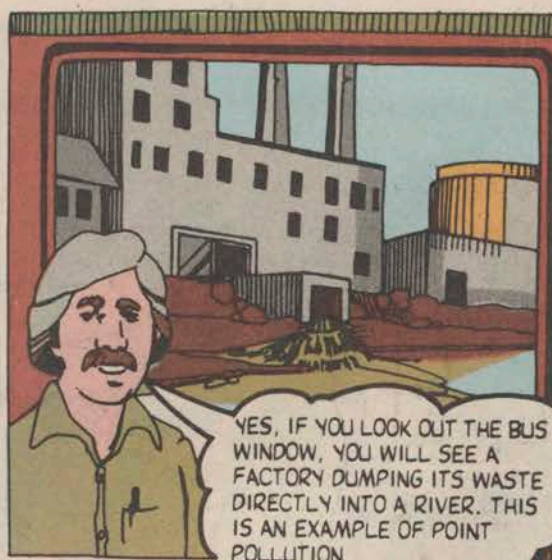
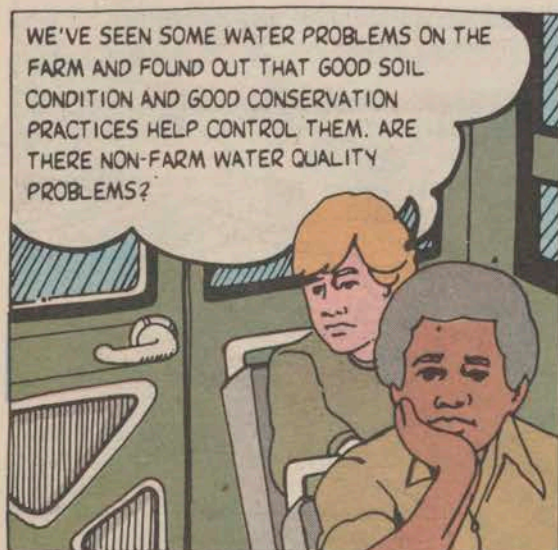
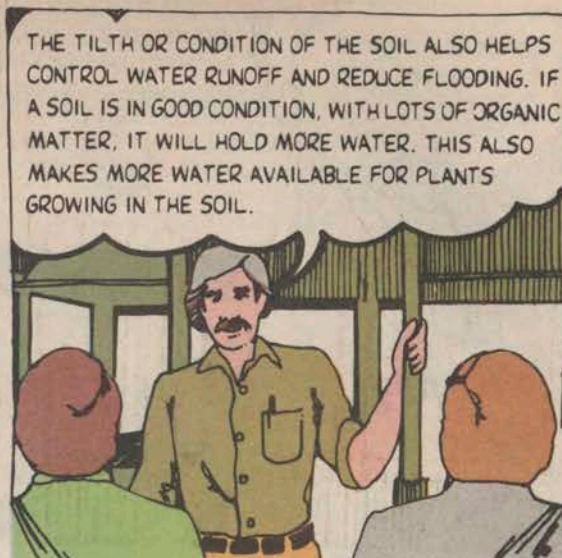
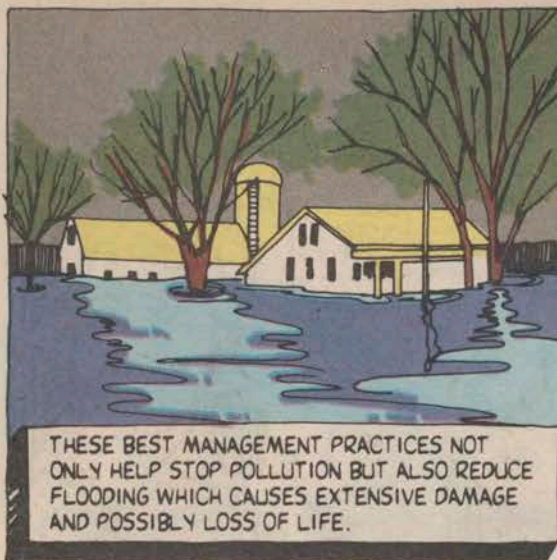
RAINDROPS FALL LONG DISTANCES FROM CLOUDS AND HIT THE EARTH WITH TREMENDOUS FORCE.

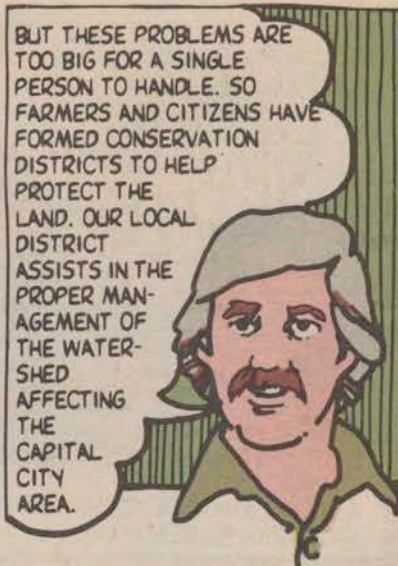
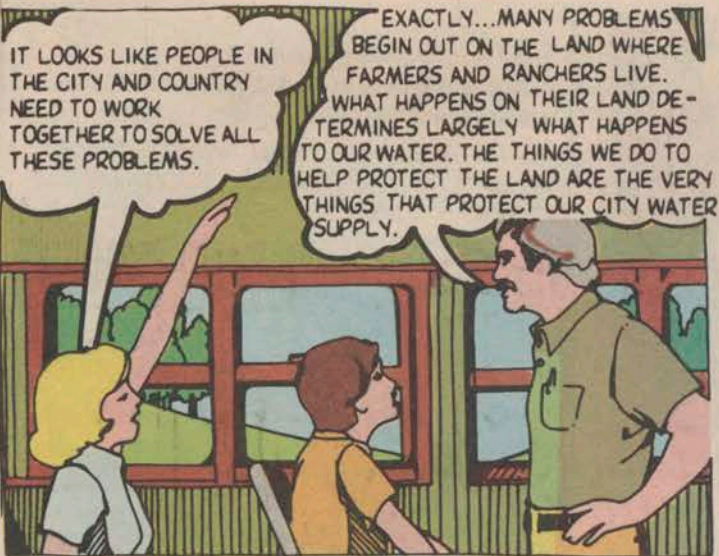


A SINGLE RAIN-DROP STRIKING BARE, UNPRO-TECTED TOP SOIL...

CAN SPATTER SOIL PARTICLES MANY INCHES AWAY.

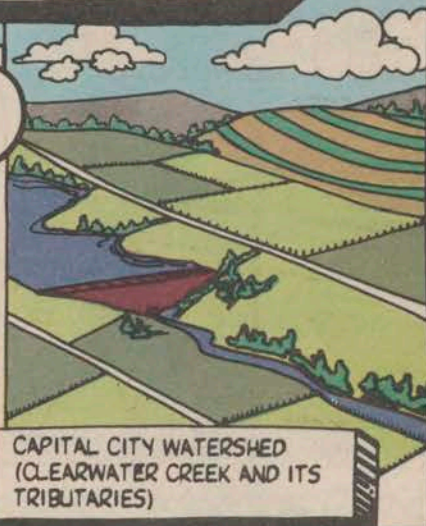






AFTER THE FIELD TRIP, BACK AT THE JOHNSON FARM, MR. MILLS EXPLAINS WATERSHEDS.

A WATERSHED IS ALL THE LAND THAT DRAINS INTO A SINGLE STREAM, LIKE CLEARWATER CREEK...ENOUGH RAIN FALLS ON OUR WATERSHED TO TAKE CARE OF OUR NEEDS EVEN IN SOME DRY YEARS...PROVIDED THE WATERSHED IS PROPERLY MANAGED SO IT WILL STORE WATER FOR THE TIMES WHEN IT DOESN'T RAIN. THE SOIL IS OUR BEST RESERVOIR.



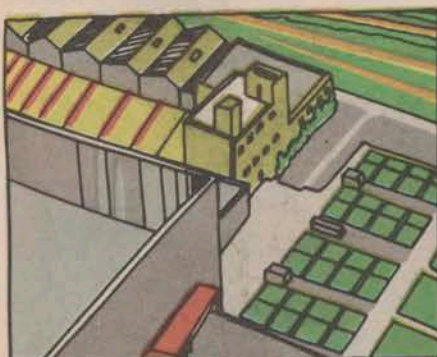
BUT IN A MISMANAGED WATERSHED, MOST OF THE WATER RUNS OFF AND CAN DO A LOT OF DAMAGE, AS THESE PHOTOGRAPHS SHOW...



WATER IS CERTAINLY AN AMAZING RESOURCE! I'VE LEARNED MORE ABOUT WATER THAN I EVER THOUGHT EXISTED. HOW CAN WE HELP WITH SOME OF THE PRACTICES LIKE WE'VE SEEN TODAY?



YOU CAN HELP IN THE FUTURE BY KEEPING UP-TO-DATE WITH THE PROGRAMS OF YOUR CONSERVATION DISTRICT AND ENCOURAGING YOUR PARENTS AND NEIGHBORS TO DO THE SAME.



SCIENTISTS ACROSS THE COUNTRY ARE WORKING AT RESEARCH STATIONS TO DEVELOP NEW AND BETTER WAYS TO USE OUR WATER SUPPLIES WISELY AND TO IMPROVE WATER QUALITY. IT WILL BE UP TO ALL OF US TO MAKE USE OF THE PRACTICES THEY DEVELOP.

WATER MANAGEMENT OF THE KIND WE'VE SEEN HERE TODAY, INCLUDING FLOOD REDUCTION, POLLUTION CONTROL, AND CONTROL OF EROSION, IS ESSENTIAL FOR A BETTER ENVIRONMENT FOR ALL CITIZENS.



THANKS FOR A GREAT FIELD TRIP.



ISN'T WATER WONDERFUL... WHEN THERE'S NOT TOO MUCH OR TOO LITTLE?



Words To Help You Understand Water!

BEST MANAGEMENT PRACTICES (BMP)

CONSERVATION PRACTICES THAT REDUCE
NONPOINT WATER POLLUTION

CONSERVATION TILLAGE

A SPECIAL WAY OF TILLING THE
SOIL THAT REDUCES SOIL
EROSION AND CONSERVES
WATER



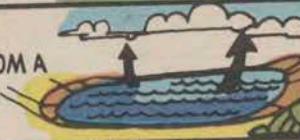
EROSION

THE WEARING AWAY OF
THE EARTH'S SURFACE
BY WATER, WIND OR ICE



EVAPORATION

CHANGE IN WATER FROM A
LIQUID TO A VAPOR



FLOODING

OVERFLOW OF A STREAM OR
OTHER BODY OF WATER



GROUNDCOVER

PLANTS GROWN TO PROTECT SOIL FROM EROSION

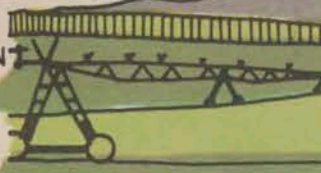
HYDROLOGIC CYCLE

THE PATHWAY WATER FOLLOWS IN
MOVING FROM THE ATMOSPHERE TO
THE EARTH AND BACK TO THE
ATMOSPHERE



IRRIGATION

PUTTING WATER ON
AGRICULTURAL
LAND TO HELP
CROPS GROW

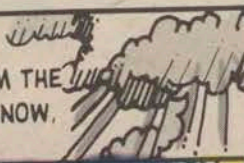


ORGANIC MATTER

DECAYED PLANTS AND ANIMALS THAT HELP
SUPPLY THE SOIL WITH NUTRIENTS AND IMPROVE
ITS TILTH

PRECIPITATION

MOISTURE FALLING FROM THE
ATMOSPHERE AS RAIN, SNOW,
SLEET OR HAIL



RESERVOIR

A MAN-MADE LAKE
TO COLLECT AND
STORE WATER



SEDIMENT

SOIL PARTICLES MOVED
FROM ONE PLACE TO
ANOTHER BY WATER AS A
RESULT OF EROSION



SUBSURFACE WATER

ALL WATER BELOW THE
SURFACE OF THE
EARTH—GROUNDWATER



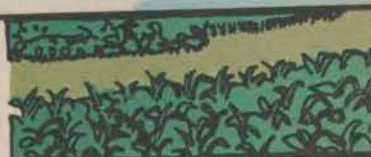
SURFACE WATER

ALL WATER ON THE SURFACE OF THE
EARTH—IN OCEANS, LAKES AND
STREAMS



TILTH

PHYSICAL
CONDITION OF
THE SOIL



TRANSPIRATION

RELEASE OF MOISTURE
FROM PLANTS INTO THE
AIR



WATER

CONSERVATION

PROTECTION AND WISE
USE OF WATER



WATER MANAGEMENT

METHODS USED TO GET
ADDED BENEFITS FROM
WATER



WATER POLLUTION

ADDITION OF MATERIAL THAT
MAKES SURFACE OR
SUBSURFACE WATER UNCLEAN



WATERSHED

ALL THE LAND THAT DRAINS
INTO A SINGLE STREAM



WATER TABLE

LEVEL IN THE EARTH
BELOW WHICH THE SOIL IS
SATURATED WITH
WATER



THIS BOOKLET WAS PUBLISHED BY THE SOIL CONSERVATION SOCIETY OF AMERICA, 7515 NORTHEAST ANKENY ROAD, ANKENY, IOWA 50021. SEND 35¢ FOR SAMPLE COPY OR \$3.00 FOR SAMPLE SET OF SCSA EDUCATIONAL CARTOON BOOKLETS. QUANTITY PRICES ON REQUEST.