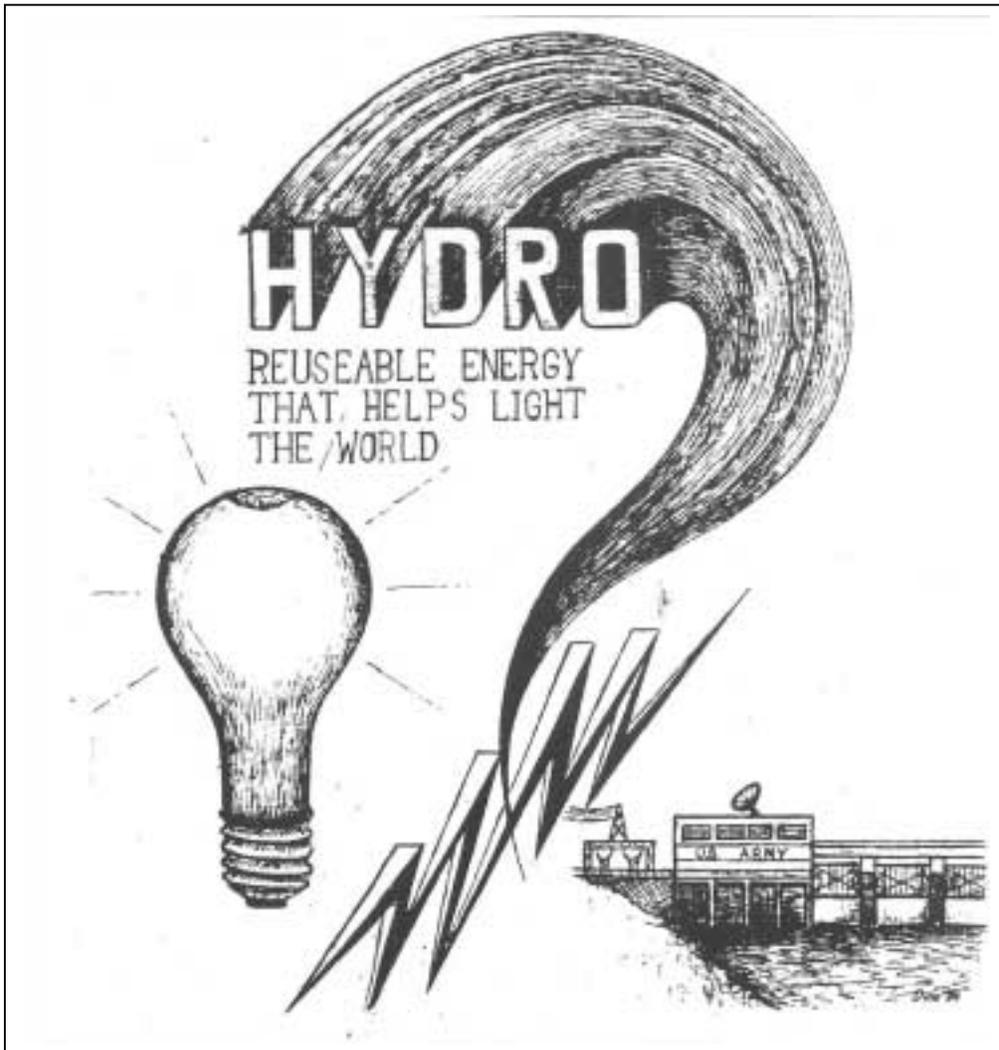


DALE HOLLOW

DAM

LEARNING PACKET



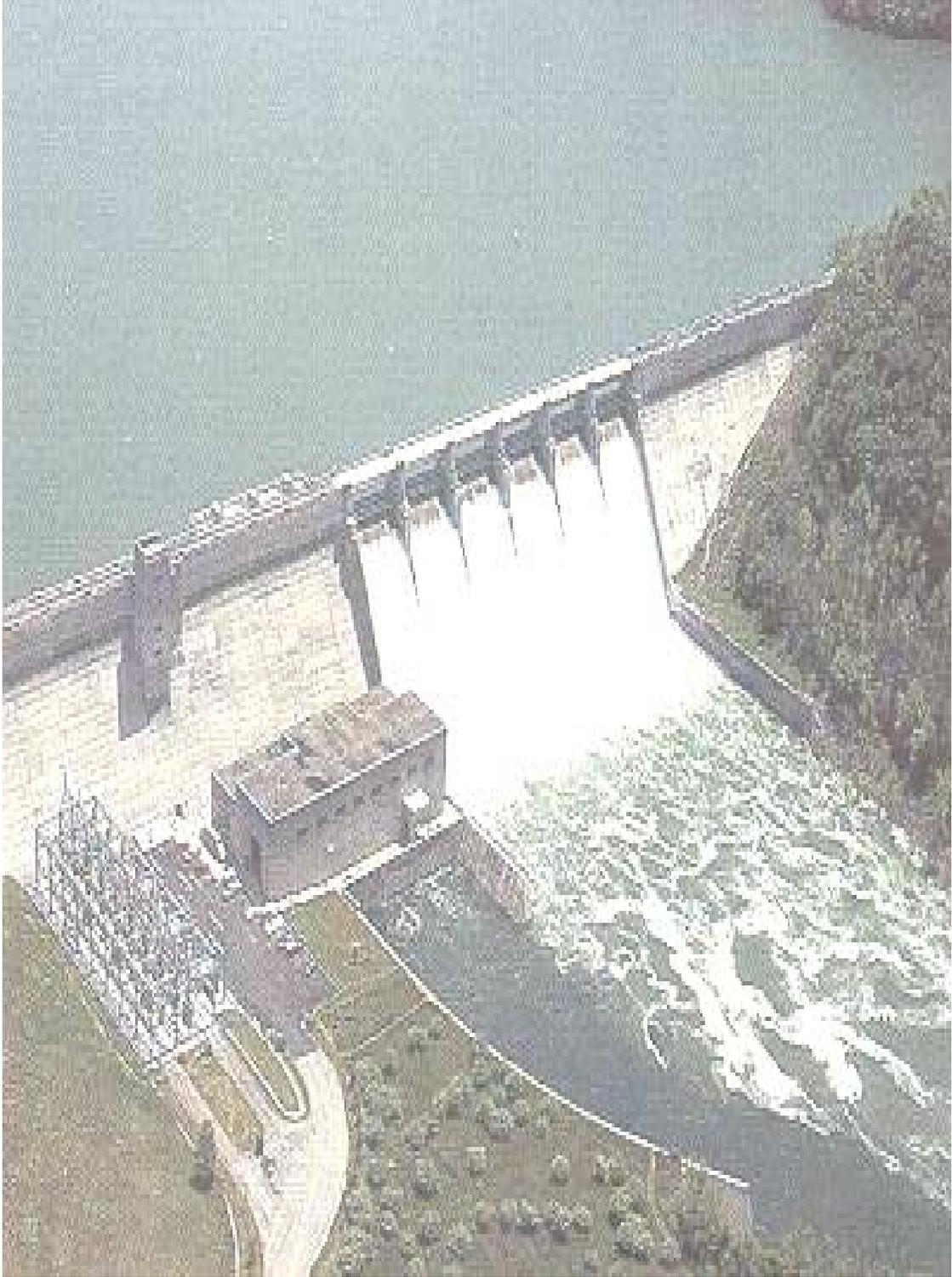


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INTRODUCTION

PURPOSE OF TEACHER/STUDENT LEARNING PACKET:

This packet has been prepared to provide background information about Dale Hollow Dam and the surrounding area. It includes learning activities to promote understanding of Dale Hollow Dam's impact on the environment, and its technical and historical significance for the Cumberland River Valley. The student activities may be used either alone or in conjunction with a visit to Dale Hollow Dam. Please feel free to reproduce and share the information in this packet. This information can be accessed through our Internet address:

<http://www.lrn.usace.army.mil/op/DAL/rec/>

CONTENTS:

The information has been separated into four main sections: History; Wildlife; Water Resources; and Hydroelectricity. Within each section you will find the concepts that are stressed by the material, background information for learners, suggested activities to aid learning and understanding, and puzzles.

DALE HOLLOW DAM - MISSION STATEMENT:

Dale Hollow Dam is a project of the US Army Corps of Engineers, Nashville District. The Nashville District's mission is to develop, manage, restore, and protect the waters and related resources of the Cumberland River and its tributaries, in an environmentally and economically sound manner for the benefit of its customers.

This educational information will further the Nashville District's mission goals by helping the students of today understand how the decisions and sacrifices of the past have helped to shape their lives and the future.

HISTORY

CONCEPTS:

1. People lived in this area hundreds, possibly thousands, of years. Cave Dwellers settled along the river because fish and wildlife were plentiful and overhanging cliffs afforded natural dwellings.
2. Lands before construction of Dale Hollow Dam afforded many small communities a prosperous and quiet way of life nestled along the river.
3. The building of Dale Hollow Dam changed the area in large and important ways.
4. People still live in this area because of the river and the lake, many in ways different than before the construction of Dale Hollow Dam.
5. Dale Hollow Dam was a significant accomplishment for the people of this area.

INTRODUCTION:

Human beings have lived along the Obey and Cumberland Rivers for hundreds, possibly thousands, of years. The evidence for this is the pottery and other relics such as two Mississippian Indian statues dating between 1000 and 1400 AD discovered near the Cumberland River near Celina. Other Indian tribes known to this area were the Shawnee, the Cherokee, and the Iroquois. Human skeletons have been found near the Willow Grove area known as "Skull Bluff". This indicates that the early inhabitants used caves for burial purposes.

White settlers came to the area in the mid 1700's to live along the river where fish and game were plentiful and fertile river bottoms produced good crops. These early settlers were very industrious and self-supporting. They lived in houses built of hewn logs, often with a packed dirt floor, and a large rock fireplace used for cooking as well as heating. They raised and preserved fruits and vegetables and raised livestock or hunted for wild meat. Herbal or home remedies becoming the alternative medicine of today were the only medicines available to these early settlers. These remedies were made from hickory bark, slippery elm, mullein, Jerusalem oak, snakeroot, honey and whiskey, turpentine and sugar, and beet poultices.

The earliest industry was the tanning of the hides of cattle, deer, raccoons and hogs. Next came the manufacturing of whiskey, the making of gunpowder, and the installation of water mills for grinding cornmeal. In the early 1800's flatboats were built and used for shipping cured meats, hides, hemp, cotton, tallow, beeswax, and other produce down the river to New Orleans for sale. Later steamboats began to travel the river opening the area for industrial development.

Flooding was a major threat to the people living along the Cumberland and Obey Rivers and with the River and Harbor Act of 1938 came the plan for Dale Hollow Dam. At first devastating to the families who had built homes, schools, churches, and communities along the Obey River, the construction of Dale Hollow Dam and the impoundment of the lake helped tame the wild flood waters of the rivers, provided a cheap, clean source of electricity, and opened the way for industry to provide jobs for thousands of people.

Construction of the dam began in early 1942 and was completed by the end of 1943. During this time Celina experienced what is known as a "boom" period. As workers moved to the area to fill hundreds of jobs created by the around the clock construction, small business thrived. Due to World War II the dam was completed but it was 1948 before the power plant was constructed and put into operation. The power plant has three generators with 20,000 megawatts each capacity. At full load capacity the plant can produce enough electricity to power the needs of a city of 45,000 people.

Dale Hollow Lake offers recreation and industry that brings in millions of visitors and tourism money to the area each year. The US Army Corps of Engineers developed and maintains campgrounds and other recreational facilities. Privately owned boat docks and resorts offer jobs for locals as well as services to the millions of visitors to the lake annually. In this, the 21st century, people are still drawn to the area because of the river and the lake.

ACTIVITIES

Grades 1-4

1. Make a mural showing all of the different people who have lived in the Cumberland River Valley.
2. Make a model (clay, paper or cardboard) of an Indian village or community along the river.
3. Write a story such as: life along the river; a Native American Indian; a community ravaged by floodwaters; or (your choice).
4. Write a poem or song on the life of early settlers; life on the river; or a future opened by the construction of Dale Hollow Dam

Grades 5-8

1. Research: Do any descendants of early settlers in the area live as their ancestors lived?
2. Write: The lives of the people in the Cumberland River Valley have changed, the struggles they faced, and the opportunities provided since the lake impoundment.
3. Create: A painting of a local scene or person (current or historic); a reproduction of an artifact (Native American or early settler) in clay, wood, stone or other medium; a poem or song about the life today or yesterday on the Cumberland River or Obey River.
4. Research: Which of your favorite foods did native people or early settlers also enjoy?

Wildlife of the Area

CONCEPTS:

1. Learners will be able to identify several types of local plant life, fish and animal life.
2. Learners will recognize the "food chain" concept.
3. Learners will recognize factors important to the survival of wildlife.

WILDLIFE AROUND DALE HOLLOW LAKE

Listed below are just a few of the many species that can be found in this area.

GREAT HORNED OWL

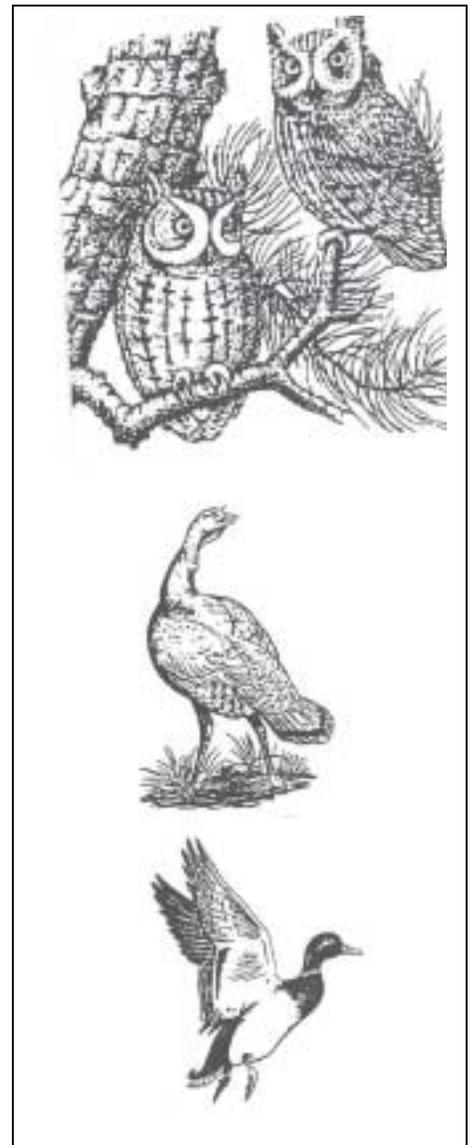
The Great Horned Owl is the largest owl in North America. It is nocturnal (most active at night). Owls use a keen sense of sight to find prey in the dark. They also have an acute sense of hearing, which helps in finding their meals. Owls are stealth hunters; they can easily sneak up on their prey since their fluffy feathers give them almost silent flight.

WILD TURKEY

Turkeys forage on the ground in flocks, occasionally mounting shrubs and small trees. Acorns, beechnuts, cherries, and ash seeds are their primary food sources. Adults eat 90% plant matter and 10% insects. Turkeys are active during the day, roosting in trees from sundown until sunrise.

MALLARD DUCK

Mallard ducks are common wild ducks that live in wetlands. Males are brightly colored, having a green head, a white collar, and a bright yellow bill. Females are a mottled brown, with a brown bill. They eat insects, worms, frogs, snails, slugs, small shellfish, grasses, and other plants that grow near shore.



PILEATED WOODPECKER

These large woodpeckers range from 16 to 19 ½ inches, which is approximately the size of a crow. The crimson crest and black/white stripes make it an easily recognizable bird. Their preferred habitat is unlogged, old growth forests, but they can also be found in young forests or even in urban areas if there are enough dead trees.

RUBY-THROATED HUMMINGBIRD

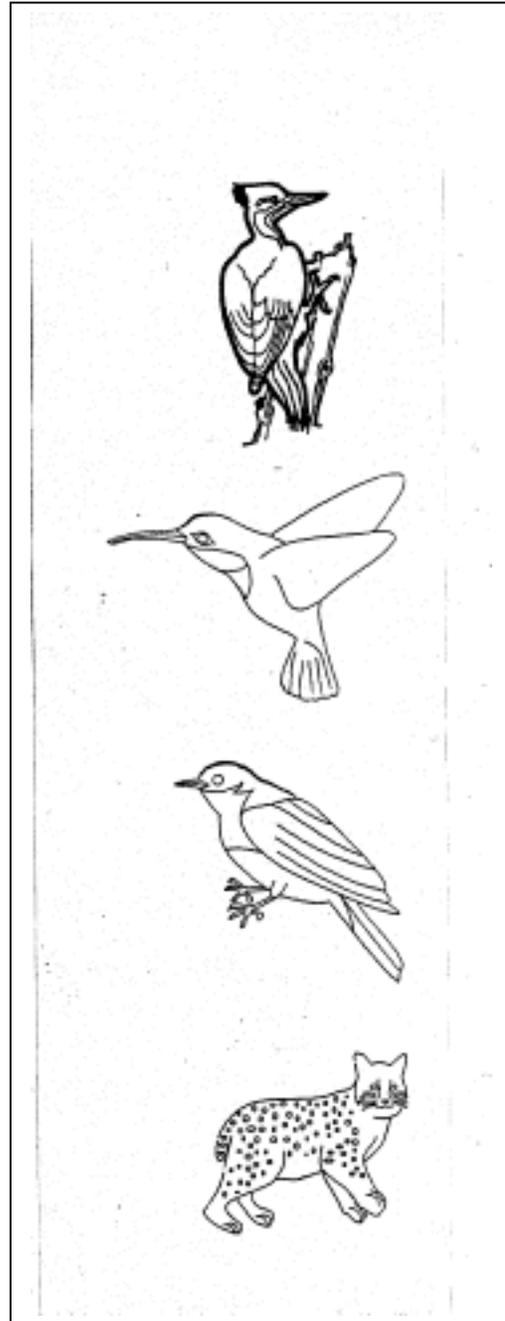
Hummingbirds are tiny birds that can fly forwards and also hover in mid-air. Their tiny wings beat about 55 to 75 times each second. The average life span of a hummingbird is 3 years. Hummingbirds sip sweet nectar from flowers and eat some tiny bugs. They use their long tongue to lap up nectar.

EASTERN BLUEBIRD

The Eastern Bluebird is the most colorful member of the thrush family. The male appears brilliant blue, and the female is a softer gray-blue. They eat most insects (especially grasshoppers, crickets, katydids, and beetles), worms, snails, spiders, and fruit. Their nests are built in holes in trees and rotted tree stumps.

BOBCAT

Bobcats are fierce cats that are nocturnal (night animals), and spend the day in their den (a cave, hollow log or rock crevice). The long tufts of hair at the tip of the ears improve their hearing. Bobcats are carnivores. These fast, solitary hunters eat small mammals (like rabbits, rats, squirrels), ground birds, turkeys, fish, and eggs.



BATS

Bats are the only flying mammals. Bats are nocturnal; they are most active at night and sleep during the day hanging upside-down. Some bats (like the brown bat) hibernate during the cold of winter, sleeping very deeply until warm weather arrives. These bats use echolocation to find insects to eat. While flying, these bats send out high-pitched sounds that bounce off other objects. The bat listens for the bounced sound, and can determine where objects are located.

WHITETAIL DEER

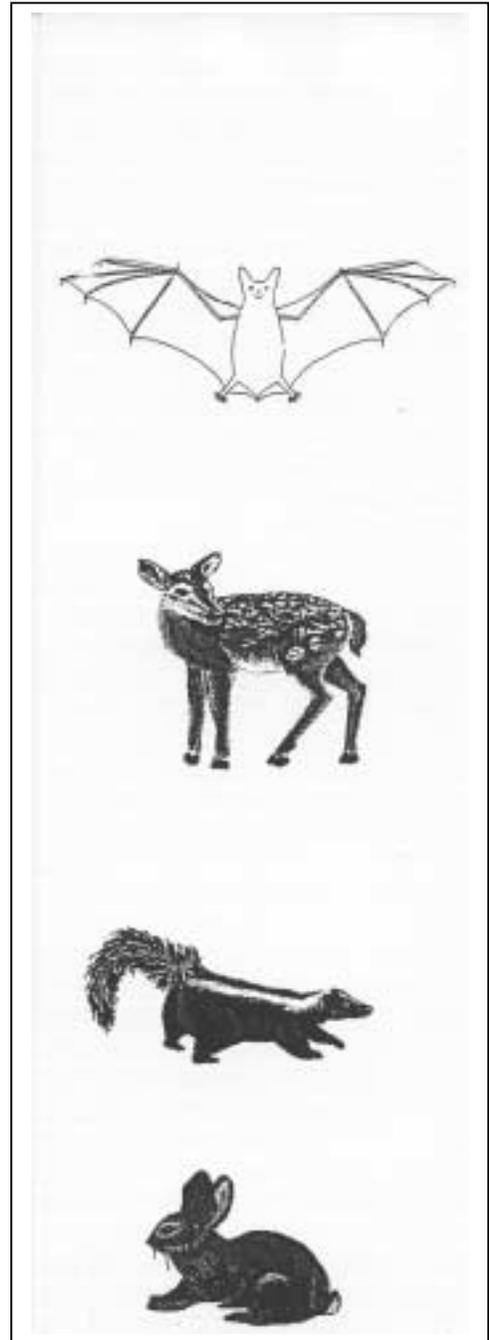
Whitetail Deer can be found in forests, wetlands, and open brushy areas. They are active at night, preferring to feed and mingle under a cloak of darkness. Deer typically bed down at midday. They do not sleep for long periods of time. Instead, they doze, always trying to stay alert.

SKUNKS

Skunks use their musk for defense, not attacking. This spray can reach an enemy 10 to 15 feet away. Often little or no musk gets on the skunk's fur. Skunks apparently try to avoid getting ANY musk on their fur. Their average weight is between 7 and 10 pounds.

EASTERN COTTONTAIL

Eastern cottontails have a brownish or grayish body, and are active from early evening to late morning. They spend the day concealed in slight depressions or burrows in the ground, or beneath brush piles. They feed on green vegetation during the summer, and bark and twigs during the winter.



RACCOONS

The raccoon is the state animal of Tennessee. Raccoons are usually solitary, and tend to be most active at night. They are opportunistic omnivores (both meat-eater and plant-eater). Raccoons do not hibernate, and are very inquisitive. They will seldom pass up the opportunity to investigate an interesting smell or crevice.



Common Fish of the Area:

Many types of fish inhabit the streams, rivers and lakes of Middle Tennessee. Listed below are just a few of the more common types of fish that are found in Dale Hollow Lake.

SMALLMOUTH BASS

Smallmouth bass are abundant in some areas and rare in others. This species is found in most reservoirs such as Dale Hollow Lake, near ledges and rocky areas where the water is usually clear.

WALLEYE

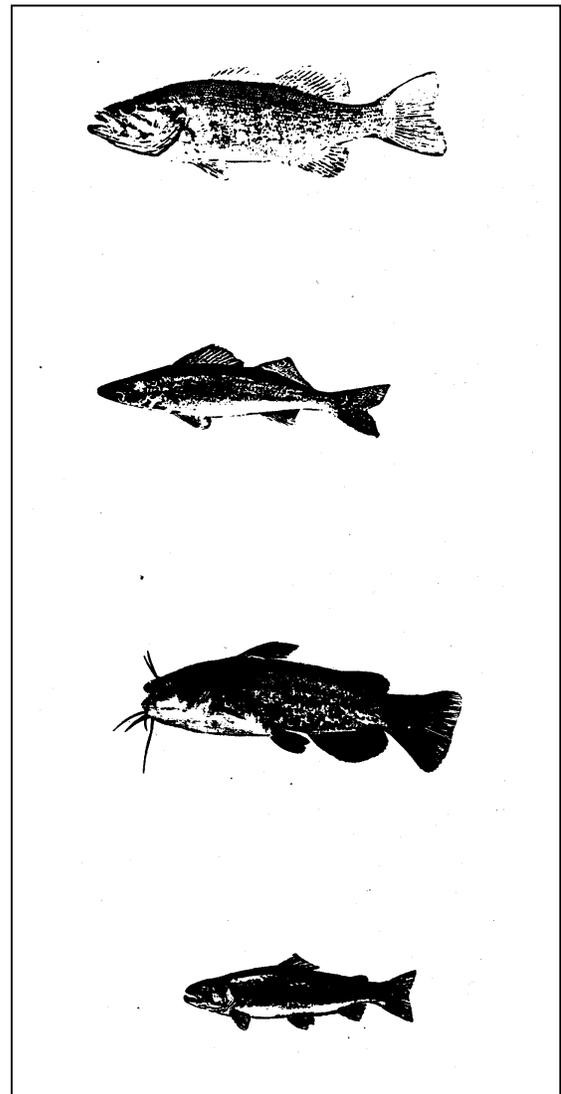
Walleye prefer clear, deep streams and rivers, and are found in many of the reservoirs in Tennessee. They feed mostly on other fishes, such as shad, sunfish, shiners, and other small fishes.

BLACK BULLHEAD

Black bullhead are usually found in ponds and small to medium-sized streams and in silty, soft-bottomed areas of lakes and reservoirs. They feed on immature insects, snails, crustaceans, and plant material.

RAINBOW TROUT

Although rainbow trout are not native to Tennessee, they've been stocked extensively in the state. They are usually found in cold water rivers and streams where the temperature stays cooler than 70 degrees F. Rainbow trout eat insects, crayfish, fishes and fish eggs.



GAR

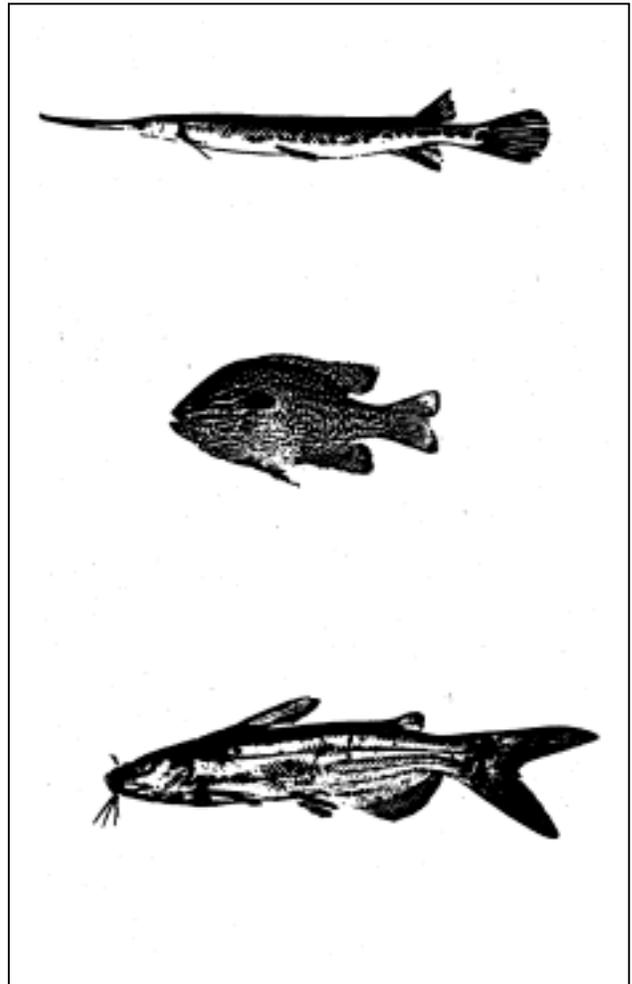
Gar prefer weedy waters where food is abundant. Gar eat fish such as minnows and small sunfish.

LONGEAR SUNFISH

Longear sunfish feed on immature aquatic insects, worms, crayfish, small fish and fish eggs. They are one of the most colorful fish seen by Tennessee fishermen.

CHANNEL CATFISH

Channel catfish are common and will eat almost anything, preferring insects, worms, fish eggs, and crayfish.



Plants of the Area

THISTLES

Thistles have a mauve, reddish-purple bristly flower head, and usually grow between 2 and 4 ft. tall. They are found in waste places, on roadsides, and in fields and pastures.



BLACK-EYED SUSAN

Black-eyed Susans have a single flower on long stems. The stems and leaves are all covered with bristly hairs. This common wildflower can be found along roadsides and in fields and meadows.



MILKWEEDS

Milkweeds have a flowering period between May and August. The stem of this perennial plant has a thick, milky sap. It is often found in open woodland or on dry open ground.



GOLDENRODS

Goldenrods have yellow, spray-like blooms from July through October. They can be found in many habitats, including open woods, marshes, dry open ground, and along roadsides.

YELLOW LADY'S SLIPPER

The Yellow Lady's Slipper produces one or two large flowers with a yellow, pouched lip. It has a flowering period between April and July, and is found in rich, moist woods and mossy bogs.

COMMON MORNING GLORY

The common morning glory has blue, purple, or pink funnel-shaped flowers between July and frost. The common morning glory has heart-shaped leaves and will twine around other plants. It can be found along roadsides, and in waste places, fields, and thickets.

COLUMBINE

This flowering perennial plant has long stalks and colorful red petals on yellow stamens. Columbine is found in damp woodlands and moist rocky places.



The surrounding Dale Hollow Lake area contains 24,842 acres of land for wildlife habitat. The lake covers at maximum pool, elevation 651, 27,700 acres; at minimum pool, elevation 631, 21,880 acres. Dale Hollow area is fortunate to have a rich abundance and variety of wildlife due to its moderate climate and lush habitat. This environment meets the needs of wildlife for:

FOOD - Each type animal will only eat certain foods. Some plants provide more nutritional value than others. Both the quantity and quality of the food are important.

WATER - All wildlife needs water. There are many water sources such as rain, dew, snow, moisture in food, and the many tributaries that flow into Dale Hollow Lake.

SHELTER - All wildlife needs cover for protection while feeding, sleeping, playing, traveling, etc. Cover can come in many forms, for example: vegetation, rocks, burrows, etc.

SPACE - Overcrowding leads to competition among animals for food, water, and shelter. For this reason, only a set number of animals can live in an area. Fishing and hunting in the areas near Dale Hollow Lake, in accordance with the Tennessee Wildlife Regulations, help maintain this delicate balance.

ACTIVITIES

ART:

Bring into class a dried tree branch common to the Dale Hollow area. This branch can be posted on a bulletin board or planted in a container. The student will draw, color and cut out a bird found in the region. A report on their habitat might be presented orally to the class.

Create a model of a wildlife scene from clay, paper, Styrofoam, etc. Include birds, mammals, and reptiles in as many habitats as possible. Create a large lake scene featuring fish common to the waters of Dale Hollow Lake.

MATH:

Compare the required food supply area for an animal and determine how many of the species can survive within the Dale Hollow Lake area.

SCIENCE:

Discuss the concept of the "food web". Follow up this study by collecting pictures of native animals. Collect smaller pictures of plants, insects, and other animals and create a display of how the food chain works for a specific animal.

Create mobiles of food chains for various species. This activity can be done independently or with a small group. Cut plants and animals from magazines and post on cardboard, or the students may do original artwork. Each mobile must follow a food chain for a single animal.

LANGUAGE ARTS:

Use pictures (animals, fish, birds) to introduce wildlife specific to the area. Groups of students are to select two animals to investigate and tell about:

1. The survival rate of each animal.
2. What may have contributed to this animal's success or failure?

Each group may present their findings to the class by means of skits, debates, discussions, puppet shows or reports.

CROSSWORD PUZZLE ACTIVITY

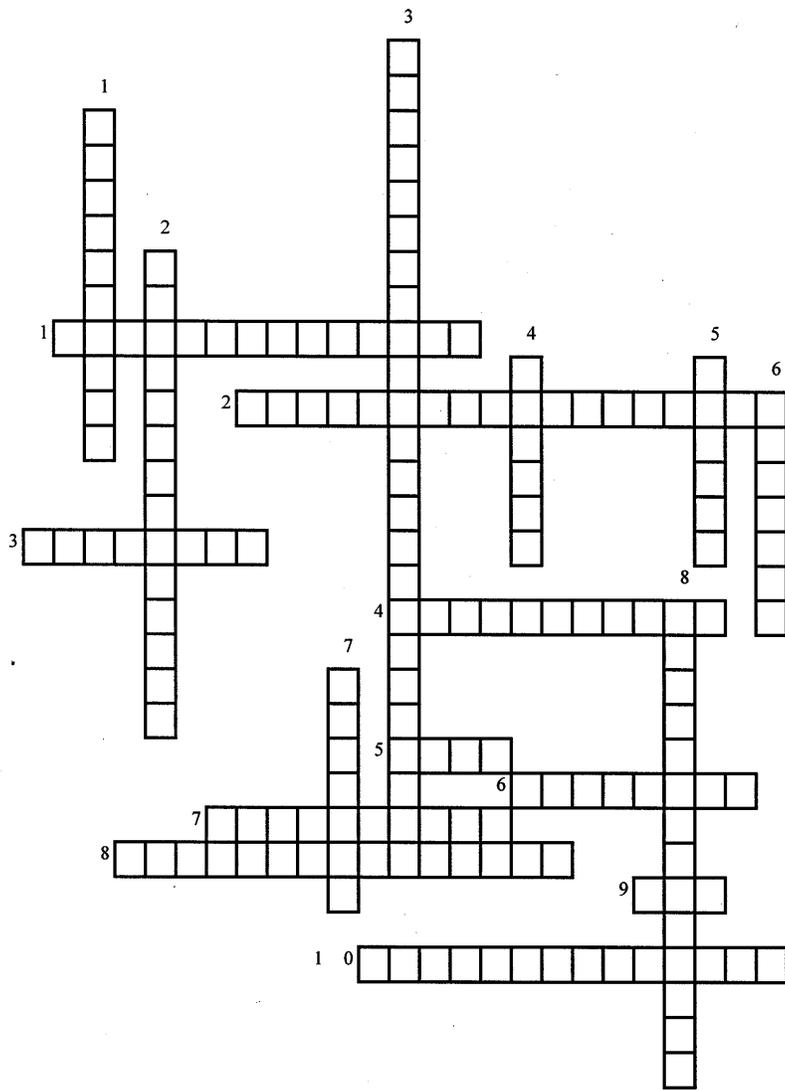
WILDLIFE, FISH, AND PLANT

ACROSS:

1. Largest owl in North America
2. The crimson crest and black/white stripes make it an easily recognizable bird.
3. Have a mauve, reddish-purple bristly flower head
4. Common wild duck that lives in wetlands
5. The only flying mammals
6. Its stem has a thick, milky sap
7. Have yellow, spray-like blooms from July through October
8. Has stem and leaves covered with bristly hairs
9. Prefer weedy waters where food is abundant
10. One of the most colorful fish seen by Tennessee fishermen

DOWN:

1. Forages on the ground in flocks, occasionally mounting shrubs and small trees
2. Found in most reservoirs near ledges and rocky areas where the water is usually clear
3. Tiny birds with tiny wings that beat about 55 to 75 times each second
4. Fierce cat that is nocturnal (night animals), and spend the day in their den
5. Use their musk for defense, not attacking
6. Trout found in cold water rivers and streams
7. Feed mostly on other fishes, such as shad, sunfish, shiners, and other small fishes
8. Will eat almost anything, preferring insects, worms, fish eggs, and crayfish.



WATER RESOURCES

CONCEPTS:

The purpose of this unit is to give the student a general overview of water; how it relates to the earth and more specifically the Dale Hollow area. This will be achieved by:

1. A summary view of the Dale Hollow watershed and the purpose of Dale Hollow Dam.
2. Activities designed to introduce the student to water quality, water quantity, water related vocabulary, and conservation of water resources.

INTRODUCTION:

Before the construction of Dale Hollow Dam, floodwaters ravaged the Cumberland River Valley leaving paths of destruction. Dale Hollow Dam is one of 11 dams constructed since 1939 for flood control and water storage along the Cumberland River. The dam also helps to settle out silt and reduce the amount of sediment sent down the river.

The clear, pristine water is a top priority at Dale Hollow. Without the water, hydroelectric power, a cheap, environmentally safe source of electricity, recreation and the abundance of area wildlife would be lost.

The total storage capacity of Dale Hollow Lake is 1,706,000 acre-feet. The term "acre-feet" is the amount of water that will cover an acre 1 foot in depth. The lake is 61 miles long with 620 miles of shoreline. The drainage area for the lake covers 935 square miles. The maximum depth of Dale Hollow Lake is 150 feet.

The lake is an important source of water to seven counties in two states, Tennessee and Kentucky. Along the way it is used for irrigation, domestic water, recreation and hydroelectric power.

LEARNING ACTIVITIES:

#1 - WATER ON THE GO

Water is all around us, in many forms. It can be held in the clouds or fog, in the form of vapor. It can fall from the clouds as a liquid, like rain, or be solid like hail and snow. Once it has fallen, it can lay in a lake, flow in a stream, sit in a snow pack, or travel through the soil (percolate) to an underground reservoir called an aquifer. The water on the surface may be evaporated (turned back into vapor), form a cloud and continue on its journey. This continuous recycling of water is known as the Hydrologic Cycle.

You can create your own Hydrologic Cycle. For this you will need:

1. A 2 liter clear plastic soda bottle
2. Sand to fill bottle to about 1/4 full
3. A piece of plastic wrap (about 1 foot square)
4. A rubber band

Cut the top off of the soda bottle, below the narrow neck. Pour the sand into the bottle, create your own hills, valley, and lake, you can even put in a small plant, if you like. Give your ecosystem a drink of water, about 1 cup. Next, cover the top of the bottle with the sheet of plastic wrap and keep it in place with the rubber band. Set your mini-earth in a sunny window and observe what happens.

It won't take long, especially if the day is warm, for things to start happening. Do you observe any water collecting on the underside of the plastic wrap? This is called condensation and is a result of water molecules warming up enough to evaporate and become vapor.

The vapor will naturally rise until it meets with the plastic wrap at the top of the bottle where the air is cooler. In the Earth system, this vapor will rise until it meets the impermeable layer in the stratosphere. Since the vapor can't move through the plastic it condenses or changes back to its liquid form. When enough collects, it will drop back down to the sand, much as rain would. You may even see small lakes or streams form where the water drops back to your mini-earth.

There is as much water in the earth's system today as there was when the earth was formed. At any given time, more water may be locked up in icepacks or caught up in weather systems. That is why we have cycles of drought and flooding. During the last ice age, large quantities of water were contained in icepacks, which reduced the amount of water available to the oceans. Ocean levels dropped and more shoreline became exposed. When earth's temperatures increased by a few degrees and the icepacks melted, more water was freed up and the water levels in the ocean again rose. The water levels at Dale Hollow can also be altered due to the climatic changes. At times there seems to be more water than we can use. At other times

we can't seem to find a drop. But, as we found out, there is always some out there somewhere!

#2 - SEDIMENTATION: THE NITTY GRITTY

Before Dale Hollow Dam the Cumberland River was a much different river than we see today. In the place of the silt-laden stream of pre-dam days now lies a cool, clear river. In its journey down from the mountains, through eastern Kentucky and middle Tennessee, it would pick up a tremendous load of topsoil, silt, and other debris, called sediment. This sediment load would then be carried down stream, only to be dropped out (deposited) when the water slowed down. This sediment would usually end up in the bottom of the river or along the sides.

To examine how this process, called sedimentation, works you will need a few simple supplies:

1. A 1 or 2 liter plastic soda bottle, with cap
2. Water to fill the bottle 2/3 full
3. One to two cups of dirt from your schoolyard or backyard

Pour the water into the bottle. Carefully pour the dirt into the bottle, put on the cap, and then shake it up. Wait a while for the dirt to settle. It might take about 5 to 15 minutes. Now, take a close look and examine what you see in the bottom of the bottle.

As long as the water kept moving, the dirt stayed mixed with the water (in suspension). As the water slows down, it is no longer strong enough to hold the dirt up and the dirt will settle to the bottom.

Depending on the type of dirt that you used, you will see various layers. These layers are comprised of the many types of soil particles that make up dirt or soil. The heaviest of particles, like rocks, will drop out first. Sand may be next, since it's grains are lighter than rocks, but heavier than most other soil. The lightest fragments, such as clay and small pieces of leaves and twigs, will stay in suspension longer and therefore be on top.

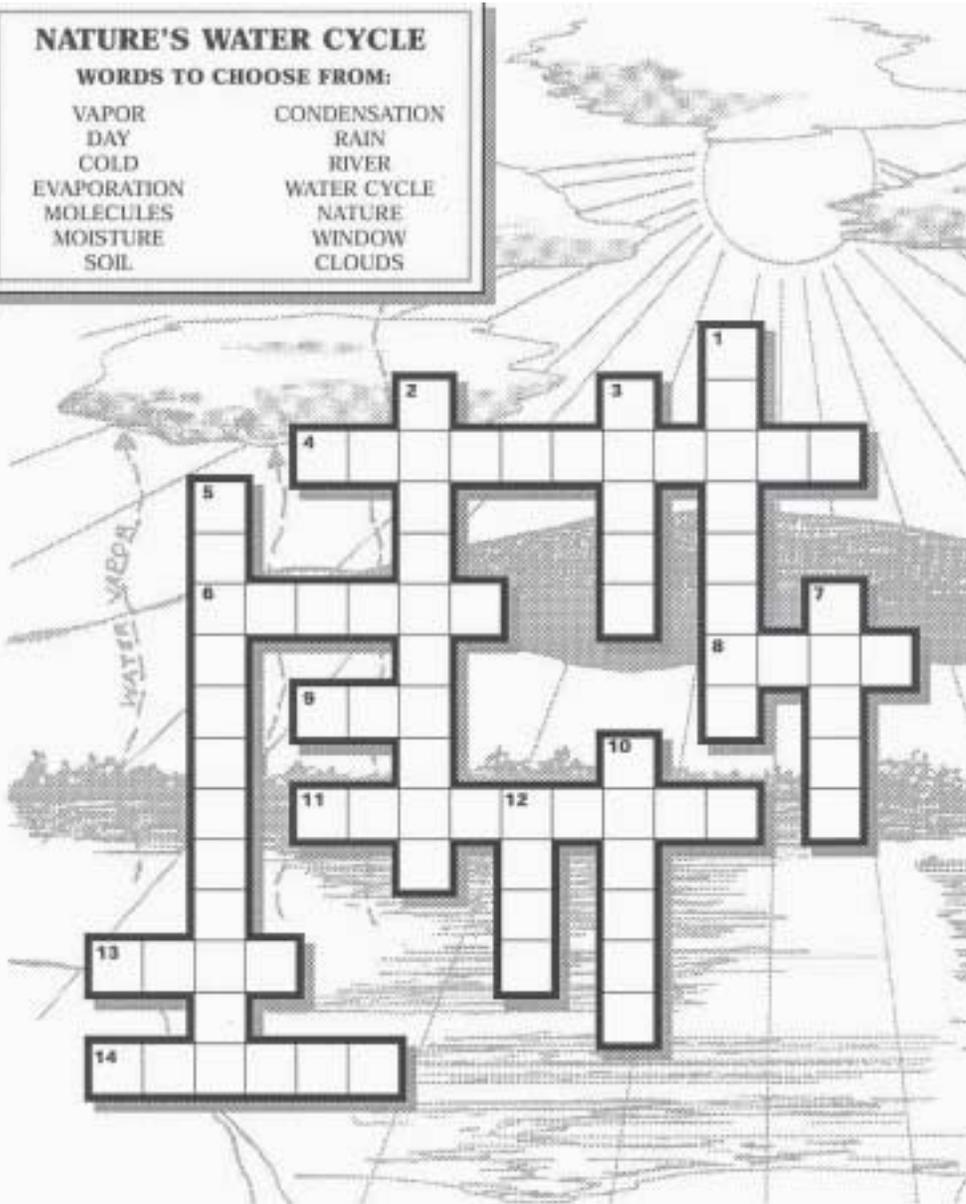
By doing this you can understand how the river works. The river usually flows, or moves, fast enough that it can keep the dirt it picks up along the way in suspension. If the river slows down, as it's going around a bend or coming into a lake, then that sediment will settle to the bottom, much like it did in your bottle.

For now, the dam does its job of slowing down the river so water can be stored in Dale Hollow Lake. As we've seen, this also "cleans" the water by allowing the dirt to settle to the bottom of the lake.

NATURE'S WATER CYCLE

WORDS TO CHOOSE FROM:

VAPOR	CONDENSATION
DAY	RAIN
COLD	RIVER
EVAPORATION	WATER CYCLE
MOLECULES	NATURE
MOISTURE	WINDOW
SOIL	CLOUDS



ACROSS:

4. The process of liquid water changing to vapor is called _____.
6. The water cycle of _____ is very important.
8. Precipitation.
9. Opposite of night.
11. Very small particles.
13. Top layer on our planet's surface.
14. An opening in a wall that allows air or light in.

DOWN:

1. Dumpress
2. The constant movement of water between our atmosphere.
3. The gaseous state of water.
5. The process of water vapor changing to liquid is called _____.
7. A large stream of water.
10. Millions of condensed water droplets floating in the sky.
12. The opposite of hot.

HYDROELECTRICITY

CONCEPTS:

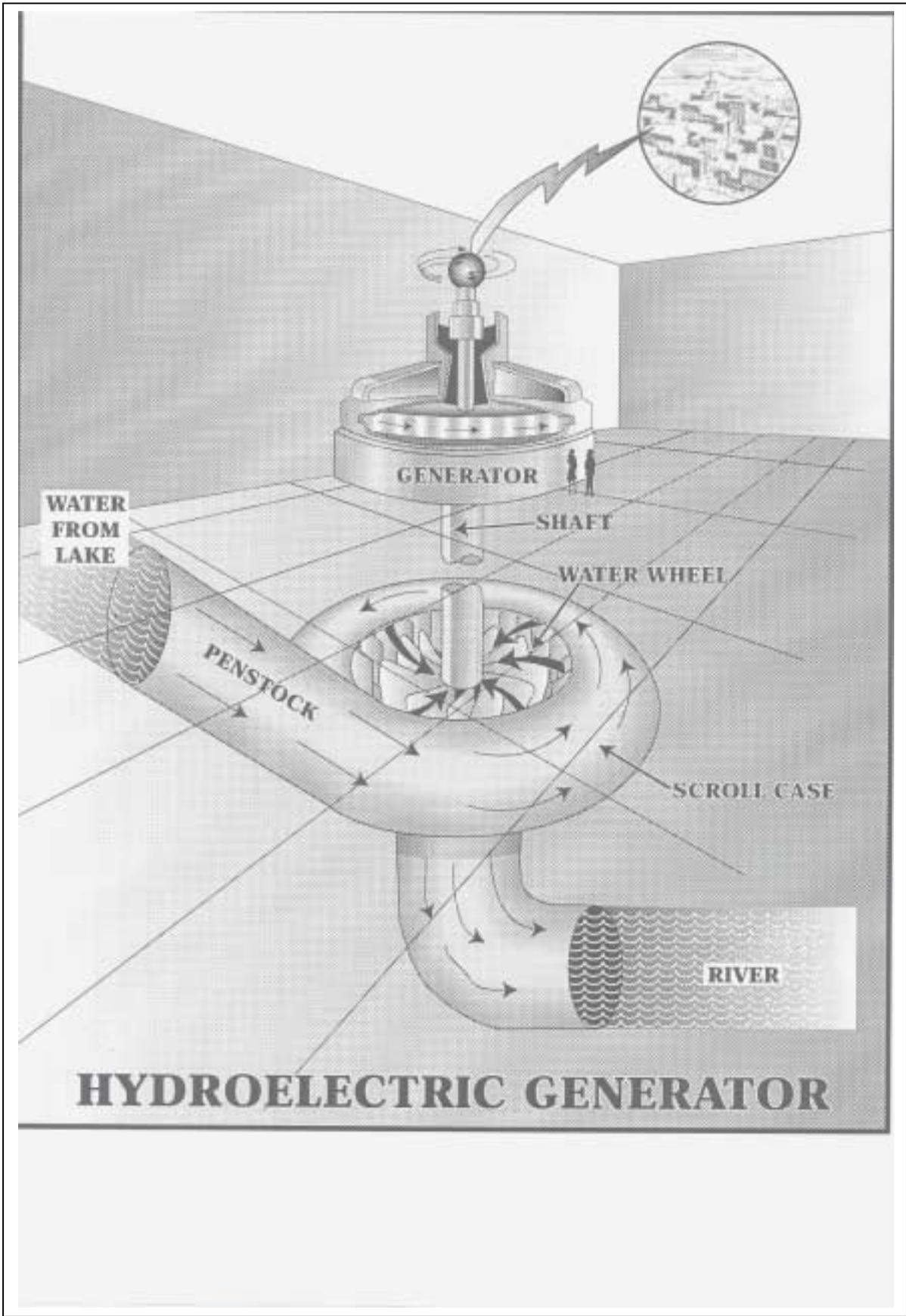
1. Dale Hollow Dam created Dale Hollow Lake
2. Water flowing from Dale Hollow Lake is used to make electricity
3. Turbines and generators are used to change water from mechanical energy into electrical energy.
4. Water in the Cumberland River is used over and over again

Generators can be powered by many sources. The most common sources are - the wind; atomic fuels like uranium; gasoline or diesel engines; steam from fuels like oil, coal, or natural gas; and last but not least, water. Energy from water is created by the force of water flowing from a higher elevation - usually from a reservoir or lake - to a lower elevation, through a large pipe (penstock). When the flowing water reaches the end of the penstock it funnels into the scroll case where it hits and spins a water wheel (turbine).

A water turbine is a wheel with fins on it, somewhat like a windmill, except it uses water instead of air. Water hits and rotates the turbine; the turbine rotates the connecting shaft, which then turns the generator. Magnets spinning inside wire coils in the generator make the electricity. In this way the generator and turbine change mechanical energy into electrical energy. The electricity then flows by wires (transmission lines) to cities and homes where it is used.

After having done its job of turning the water turbines to generate electricity, the water flows downstream. There it can be stored behind dams and used again. Dale Hollow Dam was built to make Dale Hollow Lake, to keep water from flowing down the Obey River and flooding the Cumberland River. There are ten other major storage dams either on the Cumberland River or small rivers that empty into the Cumberland River.

All these dams use much of the same water and work together to control floods, irrigate crops, supply drinking water, make places for recreation, create habitat for wildlife, and of course - generate electricity.



HYDROELECTRICITY

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

BLADES
 COIL
 CREST
 DAM
 DRUM GATE
 ELECTRICITY

ENERGY
 GENERATOR
 INTAKE
 MAGNET
 MEGAWATT
 NEEDLE VALVE
 OUTLET

PENSTOCK
 POWER PLANT
 ROTATE
 SCROLL CASE
 SHAFT
 SPILLWAY
 STEEL

STONEY GATE
 TRANSFORMER
 TRANSMISSION LINE
 TURBINE
 WATER
 WATER WHEEL

ELEMENTARY SCHOOL LEARNING GOALS

Curriculum Focus

MATH:

Develop and use strategies to solve problems, build models, conduct experiments, make lists, tables, and graphs to reason logically.

Create and solve math problems from real life, relevant situations.

Observe, compare, and order by measurable attributes, including temperature, linear, capacity, weight/mass, and volume.

Estimate measurables to describe and compare real life situations.

SCIENCE:

Explore the interactions of magnets.

Explore rocks and minerals and their properties.

Investigate the effects of natural forces on the earth's surface.

LANGUAGE ARTS:

Summarize information from printed materials.

Identify important details from presented materials.

Organize ideas to show relationships.

Ask questions to clarify and develop unclear ideas.

SOCIAL SCIENCES:

Describe the functions of the federal government.

Describe the factors of production.

Explain how government provides public goods and services.

Define earth as being made up of land and water.

Relate important historic events in Tennessee to the development of American History.

Recognize famous explorers in Tennessee history.

THE ARTS:

View memorials and monuments which artists have created to remember important people and events in the past.

Examine architectural structures and their functions.

Construct an architectural form applying the appropriate principles.

Create models with clay.

Explore the music of other cultures.

COMPUTERS:

Use a computer to collect data.

Demonstrate the use of computer-based technologies as a tool.

MIDDLE SCHOOL LEARNING GOALS

Curriculum Focus

MATH:

Read appropriate standard measuring devices, such as century, decade, km., mi., L., kg., ton....

Estimate measurements to describe and compare nonstandard appropriate units to real life situations.

Design a strategy for collecting data to solve a problem.

Analyze data from a chart.

SCIENCE:

Apply the steps of the scientific method.

Exhibit skills in observation through use of the senses and laboratory techniques.

Use various library and professional resources to develop information on a given topic.

LANGUAGE ARTS:

Interact verbally in informal situations.

Identify important details from presented materials.

Relate prior knowledge to new information.

Classify information (people, places, things, ideas).

Expand vocabulary.

Demonstrate note-taking skills

Maintain a journal or log.

SOCIAL SCIENCE:

Analyze the effects of climate on human populations and regions.

Analyze the impact of the relocation of people within the Dale Hollow Watershed.

Research the importance of federally developed projects in Tennessee.

THE ARTS:

Relate networks to proper historic and cultural context.

Construct three-dimensional forms with paper, tag board, and other assorted materials.

Explore the music of many cultures including style, instruments, and traditions through listening.

COMPUTERS:

React with multiple methods of communication, such as videos and computers.

Employ computer skills acquired previously.

BOOK RESOURCES:

50 Simple Things Kid Can Do To Save The Earth; The EarthWorks Group; Andrews and McMeel, Kansas City; 1990.

Life Science Library; Luna B. Leopold, Kenneth S. Davis; Time, Inc, NY; 1969.

The Magic School Bus at the Water Works; Joanna Cole; Scholastic, Inc, NY, NY; 1986.

What Makes It Rain? The Story of A Raindrop; Keith Brandt; Troll Associates, Mahwah, NJ; 1982.

Where Does Water Come From?; C. Vance Cast; Barrons Educational Series, Inc., Hauppauge, NY; 1992.

History of Clay County, Tennessee; Clay County Homecoming '86 Historical Book Committee; Celina, TN; Turner Publishing Co., Paducah, KY; 1986.