THE NATURE INTERESTS OF THE FIRST-GRADE CHILDREN
OF THE DEMONSTRATION SCHOOL
NORTH TEXAS STATE TEACHERS COLLEGE
DENTON, TEXAS

THESIS

Presented to the Graduate Council of the North Texas State Teachers College in Partial Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

Ina Louise Thurman, B.S.

Denton, Texas

August, 1936
# CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Purpose of Study</td>
<td>1</td>
</tr>
<tr>
<td>Description of Data</td>
<td>2</td>
</tr>
<tr>
<td>Definitions</td>
<td>3</td>
</tr>
<tr>
<td>Explanations of Equipments</td>
<td>5</td>
</tr>
<tr>
<td>II. Procedure and Interpretation of Data</td>
<td>9</td>
</tr>
<tr>
<td>September</td>
<td>10</td>
</tr>
<tr>
<td>October</td>
<td>20</td>
</tr>
<tr>
<td>November</td>
<td>25</td>
</tr>
<tr>
<td>December</td>
<td>38</td>
</tr>
<tr>
<td>January</td>
<td>52</td>
</tr>
<tr>
<td>February</td>
<td>55</td>
</tr>
<tr>
<td>March</td>
<td>60</td>
</tr>
<tr>
<td>April</td>
<td>72</td>
</tr>
<tr>
<td>May</td>
<td>78</td>
</tr>
<tr>
<td>III. An Example of How to Develop an Interest</td>
<td>81</td>
</tr>
<tr>
<td>IV. A Suggested Outline for the School Year</td>
<td>163</td>
</tr>
<tr>
<td>V. Conclusions</td>
<td>168</td>
</tr>
<tr>
<td>Bibliography</td>
<td></td>
</tr>
</tbody>
</table>
TABLES

Table I. Outstanding Interests of Each Month ...... 168
Table II. Objects and Specimens Brought in by the Children ......................... 170
Table III. The Number of Different Items Brought in-
The Number of Boys of the First Grade Bringing in Each Item .................. 173
Table IV. The Number of Different Items Brought in-
The Number of Girls of the First Grade Bringing in Each Item .................. 173
<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Perching Foot</td>
<td>107</td>
</tr>
<tr>
<td>2. The Scratching Foot</td>
<td>108</td>
</tr>
<tr>
<td>3. The Web Foot</td>
<td>108</td>
</tr>
<tr>
<td>4. The Web Foot</td>
<td>109</td>
</tr>
<tr>
<td>5. The Foot of Prey</td>
<td>109</td>
</tr>
<tr>
<td>6. The Fan Tail</td>
<td>110</td>
</tr>
<tr>
<td>7. The Square Tail</td>
<td>111</td>
</tr>
<tr>
<td>8. The Forked Tail</td>
<td>112</td>
</tr>
<tr>
<td>9. The Sapsucker Tail</td>
<td>112</td>
</tr>
<tr>
<td>10. The Long, Narrow Wing</td>
<td>113</td>
</tr>
<tr>
<td>11. The Short Wing</td>
<td>114</td>
</tr>
<tr>
<td>12. The Chisel Bill</td>
<td>115</td>
</tr>
<tr>
<td>13. The Digging Bill</td>
<td>116</td>
</tr>
<tr>
<td>14. The Hooked Bill</td>
<td>116</td>
</tr>
<tr>
<td>15. The Sharp-Pointed Bill</td>
<td>117</td>
</tr>
<tr>
<td>16. The Cross Bill</td>
<td>117</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

The following study was undertaken as an investigation to find out the nature interests of the First-Grade children of the Demonstration School, North Texas State Teachers College, Denton, Texas.

The techniques employed in making this investigation were those of direct observation and analysis. This study extended over a period of eight months in the First Grade of the Demonstration School.

Purpose of Study

1. To find out the different nature phenomena that seem most interesting to the First-Grade children of the Demonstration School.

2. To present a suggestive plan for developing nature interests for the First-Grade children of the Demonstration School.

3. To set forth a suggestive outline by which Nature Study may be taught in the First Grade of the Demonstration School and in similar situations.
Description of Data

Collection of data

The data for this study were collected by direct observation of the First-Grade children of the Demonstration School. This information was recorded verbatim. Classified files were kept for each child. In these files were recorded the children's interests as shown through conversation, spontaneous interests, and stimulated interests. There were other files which contained lists of objects and specimens brought in by each child, activities that were carried on, and units of outstanding interests.

Interpretation of data

The data for this study were interpreted from the viewpoint of what the children found most interesting in their study of nature. At the end of this study the data were compiled and grouped according to items for each month. Each month was fully described in terms of knowledges learned by the children and the questions left unanswered. A final interpretation of these data was made in calendar form for the entire school year.
Recommendation for the use of data

A suggestive plan for developing the nature interests of the First-Grade children of the Demonstration School has been evolved from the information collected and interpreted. It is hoped that this plan will be helpful in situations and environments similar to the one studied.

Definitions

The following definitions are the writer’s interpretations of the terms used in this study. Following each definition of the writer’s will be a definition given by an authority.

Nature Study in the First Grade of the Demonstration School means helping the children use their opportunities to investigate, explore, interpret, and enjoy their environment.

"Nature Study is, despite all discussions and perversions, a study of nature; it consists of simple, truthful observations that may, like beads on a string, finally be threaded upon the understanding and thus held together as a lobical and harmonious whole."¹

The term *interest* as used in this study means an awareness of and a reaction to natural phenomena in the daily environment.

"To become interested is to be absorbed in, wrapped up in, carried away by, some object. To take an interest in is to be on the alert, to care about, to be attentive."\(^1\)

Spontaneous interest means self-initiated response to those natural phenomena in the daily environment.

"Observation of natural tendencies is difficult under conditions of restraint. They show themselves most readily in a child's spontaneous sayings and doings, that is, in those he engages in when not put at set tasks and when not aware of being under observation."\(^2\)

Stimulated interest means a response encouraged by others, usually the teacher. Frequently this stimulation comes from the children during discussions.

"To arouse interest is a process of awakening or stimulating a desire to learn to do."\(^3\)

---

\(^1\) John Dewey, *Democracy and Education*, p. 148

\(^2\) Ibid., p. 136

\(^3\) S.R. Slavenson and R.K. Speer, *Science in the New Education as Applied to Elementary School*, p. 33
The Science Corner was located in a small, convenient place in the room. There was a crude cabinet made of orange crates. The cabinet was used to take care of the materials brought in by the children and the teacher. The live specimens were kept in aquariums, mayonnaise jars and fruit jars. There was a large bulletin board on which the children and the teacher could display various illustrations and pictures. Three small tables were used for the aquariums, science books, and magazines.

Books mean those Science Series published for classroom use. Such books are listed in the bibliography.

Pictures included those made by the children as well as ready made ones.

Charts included large pictures, mounted objects, diagrams, and stories.

The bulletin board was merely a large piece of beaver board measuring 46" x 46".

Glass containers consisted of old mayonnaise jars, pickle jars and fruit jars.

The thermometer was a small instrument used for measuring the temperature of the room.
The magnifying glass was a small, one lens reading glass costing about seventy-five cents.

Rubber tubes used were old tubes from gas heaters.

Aquariums were the usual glass box containers. Some were made from large pickle jars.

The specimen case was a wooden box measuring 20" x 20". It had a cork floor and a glass top which would open. This box was made by a carpenter.

Field glasses were furnished by the school. These glasses may be purchased from Sears, Roebuck and Company for as little as eighty-nine cents.

The insect house was a small screened house. It was twelve inches high, eighteen inches wide, twenty-four inches long, and the slanting roof was twelve inches high. This house was also used to keep horned toads in.

Activities

Collections made by the children:

Butterfly collection
Moth collection
Cocoon collection
Rock collection
Leaf collection
Wild flower collection
Excursions were walks taken with the children to see certain things. These walks were usually for thirty minute periods, sometimes lasting a little longer. Most of the walks were taken during the recess period. Following is a list of such excursions:

To enjoy the beauty of the out-of-doors.
To observe how plants look just before the fall of the year.
To observe how plants look during the fall of the year.
To observe the out-of-doors in the winter.
To examine snowflakes under the magnifying glass.
To observe the signs of spring.
To watch the birds.
To observe bees at work.
To see plants in a hot bed and to see a cold frame for plants.
To watch the garden grow.
To collect wild flowers.
To collect butterflies and moths.

Charts consisted of two kinds.

1. Charts made by the children
   a. Leaf chart
b. Bird charts
   (1) Migrating Birds
   (2) Resident Birds
   (3) Birds We Have Seen
   (4) Birds We Have Not Seen

c. Weather chart
   This chart was in the form of a calendar.

d. Things We Want To Know
   This chart was one on which the children kept a list of all the questions they wanted to find out.

2. Commercial Charts
   a. Bird charts
      These charts were pictures of birds.

Records and books kept by the children

The Garden Diary

Wild Flowers of Denton

What Am I? (Riddles about birds)
CHAPTER II

PROCEDURE AND INTERPRETATION OF DATA

This study was undertaken for the purpose of trying to find out what the First-Grade children of the Demonstration School found most interesting in nature. The investigator did not have opportunity nor time to carry all interests to their possible limits. In the chapter entitled "Conclusions" she has shown how several interests might be carried on simultaneously.

In order to make this study beneficial to teachers, the investigator took into consideration the length of the period and the time of day for nature discussions. Usually, the children were eager to discuss nature the first thing in the morning, just after recess, and immediately after the noon hour. They were most eager for this discussion the first thing in the morning. These discussions extended over a period of not more than twenty minutes.

Following is a description of the work of each month.
SEPTEMBER

Although this study did not definitely begin until the latter part of October, the writer observed the outstanding interests these children showed during the month of September.

The dominant interest of September was in pets. The children discussed their pets and brought them to school. Under the teacher's guidance, the children were helped to observe these animals and their habits more closely.

The big ideals, stated as the children would express them, for this study were:

- We can help others in our room enjoy our pets if we keep them in our room.
- We know that many animals are of some value to us.
- We know better how to choose animals that make good pets.
- We know better how to care for our pets.

Before a child brought his pet to school, he told the group the day he would bring it. In this way there was only one pet at a time in the school room.

The following pets were observed in the school room:

- Cat
- Rabbit
- Tadpole
- Duck
- Chicken
- Canary
- Dog
- Toy animal (of special interest to the owner)
The animals were discussed and examined. The following information was acquired about each animal:

The Cat

Most cats make good pets because

They are gentle and will not hurt us.

They can live in boxes, under houses, in special made houses, and on porches.

They are easily made happy.

Their food is not expensive.

They are clean.

Cats' eyes can be seen shining at night.

Cats wash themselves by licking their fur.

Cats do not make a noise when walking because they have cushions on their feet.

Cats find mice by the use of their noses and eyes.

They locate mice by their keen sense of hearing and seeing.

Cats eat bits of meat, mice and drink milk.

Cats have sharp claws to scratch with if made angry.

The Chicken

Chickens make good pets because

They are gentle and will not hurt us.

They can live most anywhere out-of-doors.
They can easily be made comfortable and happy.
They are clean.
Their food is not too expensive.

Chickens are used for meat to eat.
Chickens use their feet in scratching for their food.
Chickens have three toes in front and one little toe on the back of each foot.
Chickens have long, sharp beaks which helps them to peck their food from the ground.
Chickens sometimes live in houses called coops.
Chickens sleep sitting on a roost. These roosts are high enough that nothing can harm them. They sometimes tuck their heads under their wings while sleeping.
Chickens eat food that is specially prepared for them. They also eat bread crumbs, bits of scraps, insects, worms, and small gravel.

The Rabbit

Tame rabbits make good pets because
They are gentle and will not hurt us.
They can be caged.
They are easily made happy.
Their food is not expensive.
They are clean.

Rabbits have long, strong hind legs that they use to jump with and to sit on. Their front legs are very short.
While smelling rabbits have the habit of wiggling their noses.

Rabbits have long, slender, sharp teeth in the front of their mouths.

Rabbits eat vegetables, grasses, clover, and other herbs.

Rabbits should be lifted by the loose skin at the back of their necks.

The Canary

Canaries make good pets because

They will not hurt us.
They can be caged.
They are easily made happy.
Their food is not expensive.
They are clean.

Male canaries are the singers. Best singers are called rollers.

Canaries need different kinds of foods. They like fresh, green leaves of lettuce and chickweed; they like bread and milk. There should always be a piece of cuttle-fish bone or some sand in the cage as they need grit for digestion. They must have plenty of fresh water. Hardboiled egg is given at nesting time. Also bird seeds, hemp and rape seed
are favorite foods of the canary.

Canaries have wide and sharp beaks.

Canaries have toes with long, curved claws which they use for perching.

Canaries bathe by ducking their heads into water and splashing a great deal. Then they preen their feathers until dry.

Canaries sleep with their heads under their wings. They look like a fluffy ball of feathers.

The Tadpole

Tadpoles make good pets because

They will not hurt us.

They can be kept in aquariums.

They are easily made happy.

Their food is not expensive.

They can be kept clean.

Tadpoles should be turned loose as soon as they have become frogs or toads.

Tadpoles may be kept in water in an aquarium. It is well to have some alga from a pond in the aquarium for them to eat. The water should be changed often enough to be kept clean.

Tadpoles should be fed bits of hardboiled eggs every day or two. Alga and other tender water plants should
be kept in the aquarium.

Tadpoles have long tails which helps them to swim. As they get older the tail gets shorter and shorter. Tadpoles get their hind legs first. In about two weeks later they grow their front legs.

Tadpoles breathe by means of gills which are located on both sides of their bodies until lungs develop. Tadpoles become frogs or toads.

The aquarium should be kept where the sun will shine on it indirectly. If the sun shines directly on the water it will become too warm and the tadpoles will die.

The Dog

Some dogs make good pets because

They will not hurt us.
They can live out-of-doors.
They are easily made happy.
Their food is not expensive.
They are clean.

There are many different kinds of dogs.

Dogs protect themselves with their sharp teeth and their strong claws.
Dogs tell us they are happy by wagging their tails and by little, soft barks.
Dogs have long legs used for running.
Dogs like to eat meat best of all foods.
Dogs have a keen sense of smell.

The Duck

Ducks make good pets because
They will not hurt us.
They can live out-of-doors.
They are easily made happy.
Their food is not expensive.
They are clean.

Ducks breathe through nostrils which are close to the end of their bills.
Ducks make a hissing noise through their mouths when they are made angry.
Ducks have long, flat, hard bills.
Ducks enjoy having a place to swim.
Ducks have webbed feet which they use for swimming.

The Turtle

Some turtles make good pets because
They will not hurt us.
They are easily made happy.
Their food is not expensive.
Their homes are made easily.
They are clean.
Some turtles must be kept in water about one inch deep. They must have a rock to climb up on. Here they rest and sleep.

Turtles eat small insects, small fish, earthworms, lettuce leaves, and berries.

Turtles have sharp, hard mouths with a cutting edge instead of teeth.

Turtles breathe by means of small nostrils.

Turtles have hard shells to protect them from enemies.

Certain turtles have little trap-doors to pull their heads, feet, and tails into for protection and for resting.

Turtles have five sharp claws on their front feet and four on their back feet. Some turtles have webbed feet to help them in swimming.

Two turtles should never be kept in one aquarium because they will eat each other's tails and feet.

A "Pet Show" given by the children served as the culminating activity for this study. All pets were brought to the school for the show. The kindergarten and second-grade children were invited to see the show. Each child stood by his pet and told something interesting about it.
The "Pet Show" was given out-of-doors. It was arranged as seen below:

- Kitten
- Duck
- Chick
- Puppy
- Tadpole
- Dog
- Bird
- Turtle

**Do Not Feed Animals**

Enter

Toy Animals

Exit

Frieze of Pet Animals

Ticket Table
The children showed an interest in butterflies. They collected a few and learned their common names. They talked about the life cycle of the butterfly and moth which lead to the collecting of cocoons. This interest was fully developed in the early spring.

Another interest was in flowers both wild and cultivated. This interest was shown by their not only bringing flowers to school but by such expressions as the following:

"I brought these flowers so the boys and girls could enjoy them."

"Aren't these pretty colors?"

"Just look at all the colors."

"These will make our room look pretty."

"Roses have so many pretty colors."
OCTOBER

By the month of October the children had become more curious about their surroundings. Their outstanding interests for this month were as follows:

- Bees
- Leaves
- Turtles
- Caterpillars
- Tortoises
- Flowers
- Terrapins
- Rocks
- Wasps
- Berries

Of course all of these items could not be extensively studied in one month, but each one was discussed as it was brought up.

It was interesting to note that on one day butterflies, caterpillars, bees, rocks, berries, and a turtle were brought in.

This situation was handled in a very simple manner. Each child was permitted to come before the group and show what he had. He was to tell all he wanted to about his object and to ask the group any questions he wished to. Then the group was to ask him questions if it desired. Naturally the children did not have many questions at first. Gradually the teacher asked what she thought were stimulating questions for all to discuss and try to answer then or in the near future.

For instance, the following outline has been worked out
on the basis of what the children actually learned and the questions that were left unsettled for the time being concerning each item of interest.

**Bees**

**Knowledges**

Bees carry pollen.
Bees carry pollen in baskets on their legs.
Pollen is the yellow powder inside of flowers.
Bees visit the flowers and gather the pollen.
The queen bee has most of the bees that do not work killed when there are too many in the hive.

**Questions**

How do bees make honey?\(^1\)

How do bees make their homes?\(^2\)

What do bees make out of pollen?\(^1\)

What is the name of the bee that does not work?\(^1\)

\(^1\) Stimulated question

\(^2\) Spontaneous question
Seeds (Dandelion)

Knowledges

How a false dandelion seed looks.
Each seed is fastened to a soft feather like part which is sometimes called a parachute.
Each seed fits into a little hole.
The wind scatters these little seeds.

Berries

Knowledges

Hackberries are not poison.
Birds eat hackberries.
Hackberries grow on trees.

Wasps

Knowledges

How a real wasp nest looks.
How the young wasps come out of their rooms.
The young wasps come out head first.
Questions

How do wasps make their houses?¹
What are the rooms called?²

Caterpillars

Knowledges

How real caterpillars look.
Watched them and fed them.
Watched them turn into cocoons.
Tried to identify them.

Turtle--Tortoise--Terrapin

Knowledges

How a young turtle looks.
A turtle’s back rounds off.
A terrapin’s back is higher than a turtle’s back.
A tortoise’s back is still higher and does not have a curving edge.
Some turtles can be found in gardens.

¹ Stimulated question
² Spontaneous question
Questions

What do turtles eat? ¹
Do terrapins and turtles always stay in the water? ¹
How are turtles helpful to people? ¹

Leaves

Knowledges

The leaves are beginning to turn different colors.
Sumac leaves are turning red.

Rocks

Knowledges

Some rocks are petrified.
Petrified rock means something that has died and turned to a rock.
Trees petrify.

Questions

What makes stripes in rocks? ²
What makes holes in rocks? ²

¹ Stimulated question
² Spontaneous question
NOVEMBER

The interests during the month of November were more or less a continuation of those in October. The children brought in the following things:

- Wasp nest
- Caterpillars
- Cocoons
- Rocks
- Seeds
- Butterflies
- Leaves
- Grasshoppers
- Tortoises
- Pictures of Carlsbad Caverns

The dominating interests were in rocks and leaves.

The rock interest was carried on in a discussion manner largely among the children. They were interested mostly in the shapes and colors of the rocks. Gradually questions of "why" began to creep in, but nothing definite was done.

The interest in leaves was guided into a careful study of how plants and animals get ready for winter. This constituted the second big unit.

The interests that were continued from October were in

- Bees
- Turtles
- Wasps
- Butterflies
- Caterpillars
- Rocks
- Leaves
- Seeds
A few other interests had their beginnings during this month of November. These were in

Birds
Weather
Snakes
Cocoons
Grasshoppers
Winter

Following is an outline for each item of the month:

**Birds**

**Knowledges**

Some birds go to a warmer climate when winter comes.
Some birds stay in the same community the year round.
Geese are among the first birds to leave for a warmer climate in the fall.
Geese fly in a V-formation.
Geese make a "Honk-Honk" sound while flying.

**Questions**

Where is the South where the birds go?  
Are people in the South where the birds go?  

1 Spontaneous question
Rocks

Knowledgeable

Some rocks are made up of several different colors.
Some rocks will mark different colors. We sometimes call these chalk rocks.
Some rocks are striped looking.
Some rocks are made up of several small rocks which have stuck together.
Some rocks have gravel in them.
Gyp rock is a glassy-white. Some can be found in West Texas.
Some rocks are petrified.
Petrified means something that was once living (plant or animal) and has turned into stone.
Some rocks have holes in them.
Sometimes water falling on rocks will make holes in them.
Some rocks look like different things. For example,

- Cocoons
- Turtles
- Eggs
- Caterpillars

Shoes
Books
Leaves
Animal backs

Some rocks are called crystals.
Some rocks are called sandrocks because they are made of sand.

Some rocks are called slate. Slate is a gray color. It is in very thin layers.

Flint rocks are those the Indians used for making arrow heads. They are grayish in color. They are very slick.

Some rocks are smooth and slick while others are very rough.

Some shells are hard coverings of animals.

Questions

Are rocks and stones the same?¹
What makes rocks so shiney?²
Why do rocks look like different things?¹
Why do dead things turn into rocks?²
What makes holes in rocks?²
What makes stripes in rocks?²

¹ Stimulated question
² Spontaneous question
Questions (continued)

How do rocks get stuck together? 
How do rocks get so many different colors? 
What makes the ground so many different colors? 
Will bones and things not dead turn to rock?

Weather

Knowledges

Jack Frost came this month. 
Jack Frost is very pretty. It sparkles and shines. 
This morning it was cloudy real close to the ground. 
This is called foggy weather.

Turtle--Tortoise--Terrapin

Knowledges

Turtles have backs that round off. 
Terrapins have higher backs than turtles. 
Tortoises have still higher backs.

1 Stimulated question 
2 Spontaneous question
Turtles, terrapins, and tortoises eat bugs, leaves, and fruit.

Our tortoise hibernated.

Our turtle did not hibernate.

**Snakes**

**Knowledges**

Snakes have fangs that poison comes through.

Snakes shed their skins.

There are different kinds of snakes.

**Questions**

Why do snakes shed their skins?

**Opossum**

**Knowledges**

Opossums eat chickens.

Opossums hang by their tails when caught and pretend they are dead.

---

1 Stimulated question
Questions

What is an Opossum?\textsuperscript{1}
Are there different kinds of opossums?\textsuperscript{1}

Cocoons

Knowledges

Some caterpillars make their cocoons in the dirt where it is dark and warm. Some caterpillars spin their cocoons. Some caterpillars make cocoons that look like dark-brown shells. Butterflies and moths come out of cocoons.

Caterpillars

Knowledges

Some caterpillars are called tobacco worms. They are large, green worms. Caterpillars can be caught without touching them; however, they will not hurt us. This can be done by putting a jar in front of a caterpillar and letting it walk into the jar. Caterpillars eat leaves.
Questions

What are the names of our caterpillars?

Leaves

Knowledges

Leaves are different colors in the fall.

Sumac leaves are red.
Sycamore leaves are yellow and brown.
Maple leaves are red.
Vitex leaves are evergreen.
Pine leaves are green.
Oak leaves are red.
Honey Locust leaves are yellow.
Elm leaves are a yellowish-brown.

Leaves turn yellow, brown, and red in the fall.
Some leaves stay green the year round. These are called evergreens.

When the weather begins to get cold and it is about time for "Jack Frost" the leaves begin to turn different colors.

1 Spontaneous question
The veins in the leaves carry the sap.

Sap is the juice in plants. It is made of water and air.

Sap starts from the roots of trees and other plants. Then it goes up the trunk, out the branches, into the stems, and into the leaves. (Explained by diagram on the board)

Trees that are not evergreens should shed their leaves each fall because it helps them get rid of dirt and waste. They also are resting during the time they shed their leaves. When the spring comes the trees will be healthy and have pretty leaves.

The leaves that fall off the trees sometimes keep small plants snug and warm during the winter months.

Most leaves really have green, red, yellow, and brown colors in them all the time, but we can see only one color. Sometimes we call these colors "workmen". In some leaves the green workmen can be seen only while the weather is warm. The yellow, red, and brown workmen show up when the weather begins to get cool. Watch and see which workmen are the strongest in the leaves where you live.

Leaves have different shapes. The edges of leaves are different, too.

Sometimes we can find leaves that insects have eaten.
This is very interesting because we can see the many, many tiny veins. They look like lace.

There are two kinds of trees. Those that stay green the year round called evergreens, and those that do not stay green the year round.

Trees do not die in the winter. They are merely asleep.

The sap goes down to the roots and stays there until the weather begins to get warm in the spring of the year.

To prove that a tree is alive, scrape a limb and if it is green on the inside it is alive, but if it is a brownish-white color it is dead.

Questions

Is the bark of a tree any good?¹

Grasshopper

Knowledges

How a real grasshopper looks.

Questions

Why does this grasshopper have stripes on it?¹

¹ Spontaneous question
Winter (Plants)

Knowledges

Plants store up food for the winter. They have different ways of doing this. Here are those we learned about.

<table>
<thead>
<tr>
<th>Bulb</th>
<th>Stem</th>
<th>Root</th>
<th>Seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>onion</td>
<td>potato</td>
<td>carrot</td>
<td>bean</td>
</tr>
</tbody>
</table>

Seeds

Knowledges

The milkweed seed has an oblong shell like an okra pod. The second layer is very soft. Inside is soft, fuzzy material which when dry will float in the air. The milkweed pod pops open and the particles inside are scattered by the wind.

Cactus seed usually has little stickers on it. The color of some is purple. The seed hold a great deal of water which helps the plant to live in dry ground.

Wasps

Knowledges
How a wasp nest looks.
The queen wasp is larger than the other wasps.
She has bright colors on her body.
Wasps make their nests out of bark from trees.

Questions

How do wasps make their nests out of bark?

Butterflies

Knowledges

There are many different kinds of butterflies.
The Monarch is one that lives here. It is orange and black.
The Goatweed butterfly is a pinkish-orange color with some brown markings.
The cabbage butterfly is solid yellow in color.

Butterflies have eyes and tongues.
The tongue looks like a black, coiled thread.
The eyes look like black beads.
In making a collection we need only one butterfly of each kind.

1 Spontaneous question
2 Done by a little boy spontaneously.
Bees

Knowledge

Bumblebees are yellow and black. They have thick, soft hair on their bodies.

Bees make honey.

Questions

How do bees make honey?

How do bees make their nests?

How are bees made?

Spontaneous question
During the month of December the children were attracted by plant life and by rocks. The study of plant life was most interesting. Some experiments on how plants store up food, how plants rest, and how plants are made up were carried on by the children. They also began to learn the names of leaves. A little boy came in one morning with a sack full of leaves. He dumped them all on the table and picked them up one by one and named them all except one. The teacher asked him how he had learned all their names. His answer was, "My Daddy and me just walk around and name them." I might add that this child came from a family living in the rural district.

The interest in rocks continued along the same lines of thought. Some of the children had started making individual collections which they brought to show and to tell why they had kept those particular rocks. Our science corner looked more like a "rock" corner than anything else, but all rocks were kept.

The children also kept a chart on the weather during the month of December. A calendar was made from a large piece of tag board. It was divided into squares. Each square represented a day. Each day some child drew a picture of the weather for that particular day and pasted it in the correct square. This activity did not stimulate any questions on
causes of the weather, it was merely observational.

Of course, some interests were carried into December from the preceding months. These interests were in

- Bees
- Leaves
- Birds
- Wasps
- Caterpillars
- Cocoons
- Rocks
- Snakes.

There were only two new interests. These were in the weather and in the sun and moon.

Following is the outline for this month:

**Bees**

**Knowledges**

Bees lay eggs and grow as this picture shows.

(On the bulletin board were pictures of the stages a bee goes through to become a bee)

- The egg
- The tiny grub
- The cocoon
- The bee taking shape
- The bee

The bee really goes through about eleven stages to become a full grown bee.

There are three kinds of bees in each hive.
The queen

The drones

The workers

Bees live in houses called hives.

Bee policemen guard the entrance of the hive.

All the bees in one hive are of one family.

There is one mother bee who is called the queen.

The queen lays thousands and thousands of eggs.

The drones are the bees that do not work.

The worker bees do all the work in the hives.

Sometimes they lose patience with the drones and kill them.

The only point in favor of the drones is that as soon as the queen is old enough to be married she has to choose one of them for a husband.

The marriage flight is very interesting. One day the queen will fly straight up into the sky with all the drones racing after her. The one that is the strongest catches her and marries her. A few minutes after the marriage the drone dies, and the queen returns to the hive and begins laying eggs.

The worker bees have many different duties. Some of them fan the honey. They do this to keep the inside of the hive cool and fresh and to keep the honey from having too much water in it.
Bees never stop working. They never sleep.
Some bees, called the nurses, guard the baby cells.
The nurses keep the cells very clean.
The queen bee is much larger than the other bees
and has many beautiful colors on her body. Some of
the workers brush and polish her till she shines like
silver. Some others feed her a special kind of food
called Royal Jelly which they never eat themselves.
Bees never allow anything dead to stay in the hive.
Even when another bee dies they carry it out immediately.
The rooms of a hive are called cells.
Bees gather nectar and pollen.
Nectar is a kind of sweet juice that is in flowers.
Pollen is the yellow dust in flowers.
Bees carry pollen in little baskets on their legs.
They bring the pollen to the hive and some other
bees store it in cells.
The nectar is stored in cells, too.
As the nectar is stored another bee comes along and
dips her stinger into it before the cell is sealed.
This bee is called the chemist-bee, because from her
stinger is dropped a formic acid which keeps the pollen
and nectar always fresh.
There are royal cells where the baby queens are born.
These cells are much larger than the other ones. Bees swarm when the hive becomes too crowded. When the bees swarm the queen goes with them. Some scout bees go to look for a new home while the others stay with the queen on a limb of a tree. As soon as these bees have found a nice place to make a home they return to the queen and the other bees and show them the way to the new home.

On arriving at the new home the bees begin work at once. One group of bees will fly to the ceiling and as soon as they have fastened themselves to the ceiling another lot fastens themselves to the first and so on until there are dozens of long chains hanging from the ceiling to the floor.

In this position the bees are making wax for construction of the cells.

The wax is made in little pockets that are on each side of their bodies. Each bee mixes saliva with the wax and sticks it to the ceiling. Then another bee comes along and shapes the wax into cells.

Following is how the baby bee grows into a grown bee:

First, the egg is laid by the queen.
Second, the egg turns into a larva.
Third, the larva turns into a nymph
Fourth, the nymph grows legs and arms.

Fifth, the baby bee is grown.

Sixth, the baby bee eats its way out of the cell. The nurse bee helps the baby bee out, brushes it, cleans it, and gives it its first taste of food which is little drops of honey.

If the queen bee forgets to lay an egg in the queen cell the bees just take an ordinary egg from a cell, put it in the queen cell, and turn it into a queen egg by feeding the larva the special food called Royal Jelly.

The Royal Jelly comes from a gland in the worker bee's head.

The queen bee will live three or four years.

If a queen bee should be born in a hive before the old queen had left they would have a fight. The one that was the strongest would win. Sometimes two queens are born at the same time; this also calls for a fight as there is room for only one queen bee in each hive.

As soon as the queen bee is born she goes to all the other queen bee cells and stings the baby queens to death.

Bees do not always die when they sting a person.

If part of the digestive organs and the fifth
gangliar are pulled loose the bee will die.

Bees are our friends and will not hurt us as long as we leave them alone and do not bother them.

Bees swallow the nectar from the flowers. It goes into a stomach and stays there until the bee is ready to deposit it in the cell.

Bees have two stomachs. One stomach is used for carrying honey and one for eating purposes.

Bees make bee bread out of pollen. They store this in cells for food.

If the queen bee should die before another queen is born the other bees would go on with the work and also try to hurry up the birth of the new queen. Bees cannot live for long without a queen.

---

Rocks

Knowledges

Rocks from Colorado

Fleur Spar

Fool's Gold

Rocks are shaped so that they look like different things. For example,

Man's face

Horse Shoe

1 Dorothy Wall, Bridget and the Bees, pp. 9-45
Salt is made from rock. It is a clear, crystal rock.

There is a salt mine at Grand Saline, Texas.

Some rocks are called coral.

If a rock is soft when an animal walks across it and the rock later becomes hardened, the print of the animal's foot may still be seen on the rock.

Questions

How is coral made?  
What is a fossil?

Carlsbad Caverns

Knowledges

Carlsbad Caverns are located in New Mexico. New Mexico joins West Texas.

Jim White is given credit for having explored the caverns first.
There are many beautiful rooms made by Nature. Some of the rooms are called "The Big Room", "King's Palace", "Queen's Chamber", and others.

The rocks that form this cave are called stalagmites and stalactites. These are made by slow dripping and trickling of water which have minerals in them.

Some of the stalactites look like icicles. Some of the stalagmites look like great totem poles. In the "Queen's Chamber" is said to be a formation that looks like an elephant's ear.

The trip in the caverns is seven miles long. The weather is always pleasant. A light wrap is comfortable at all times.

These caverns used to be called the "Bat Cave" because each evening during the summer at a certain time bats would leave the caverns in large numbers. They would return each morning.

There is a place for people to eat in the caverns. It takes about five hours to make the trip through the caverns.

Birds

The Junco is sometimes called a snowbird.
Birds like to eat seeds.

Birds help "Mother Nature" from having too many plants on the earth by eating some of the seeds.

Cocoons and Caterpillars

Knowledges

When the caterpillar is in its cocoon it is resting.

Spiders and Ants

Knowledges

Black Widow spiders have a red spot on them.

Questions

Why do ants and other insects like to live under the ground?  

What is an insect?  

Is the red spot on the back or stomach of the Black Widow spider?

1 Spontaneous question

2 Stimulated question
Weather

Knowledges

What the weather was in Denton during the month of December.

Animals do not get cold in the winter because their coats of fur get thicker.

The out-of-doors looks so pretty early in the morning when "Jack Frost" is sparkling and shining.

Animals

Knowledges

Squirrels store up nuts to eat during the winter months.

Squirrels do not hibernate like snakes, bears, and ants.

Dog's skin gets thicker in the winter.

Squirrel's skin gets thicker in the winter.

When spring comes the animal's skin gets thinner and people take off their heavy clothing.

Cat's skin gets thicker in the winter.

Other animals' skins get thicker during the winter months. For example, the sheep, bear, horse, and cow.
Leaves and Trees

Knowledges

Holly is an evergreen. Holly has sharp points on the edges of the leaves and has a very slick finish. To see just how the sap goes through the veins of the leaves try this:

1. Put some red cake coloring in a glass of water.
2. Pull up a small plant, root and all. Take all of the dirt off the roots.
3. Put the plant in the red water and leave for the day.
4. The red water will go up the stem and out into the veins just as sap does in plants.

Sweetgum trees have balls on them that are full of little black seeds. When the seed ball is dry and ready the seeds fall out and are buried in the soil. The sap stays stored up in the roots while the tree rests in the winter.

The roots hold or anchor the tree to the ground and keep it standing upright.

The stem of a plant is used for carrying the sap to the leaves.
The veins take the sap out into all parts of the leaves.
New plants cannot make their food.
Food is stored in the roots.
An onion will sprout if put away because it has plenty of food stored in the bulb.
The carrot has food stored in its root. To prove this try the following experiment:
1. Break the leafy part of the carrot off.
2. Cut the carrot off about one inch from the top.
4. It will grow leaves again.

Potatoes store their food in tubers. Potatoes are stems.
An experiment with a bean to see its parts can be carried on as follows:
1. Soak some beans over night.
2. Give each child a bean.
3. Start examining the bean with the children bringing out these parts:
   Seed Scar--caused by its growing inside the pod where it was fastened on.
   Seed Coat--all of the outside skin.
The young plants inside--
   Feather part--makes leaf.
   Pointed part--makes bean.
The other part of the bean is food stored up to help the young plant inside grow into a bean plant.

The word experiment means trying to discover something that has already been found or something that has not been found.

Questions

What makes the water go up the stem? How does the leaf suck the water up?¹

How do trees grow on top of mountains where there are rocks?¹

¹ Spontaneous question
JANUARY

The month of January seemed to be one of few interests compared with the preceding months. The children discussed and examined the following things:

Rocks       Heavens
Wasp nests  Cocoons

The rock interest seemed to continue as before. The children brought in the following rocks:

Flint rock   Shell
Salt rock    Slate rock
Fleur Spar rock Crystal rock

Through a discussion on rocks the children were led into making a large exhibit of the most interesting rocks they had found. These were to be properly labeled as soon as the children could find the correct names.

A large piece of heavy cardboard was brought into the room and with the teacher's help the children wired the rocks on the board. Labels were stuck under each rock for later identification.

During this month the children and the teacher began to read the questions that had accumulated on the chart called "Things We Want To Know". All the questions that could be answered correctly by the children were checked off the chart.
The following questions were answered:

How do wasps make their homes?
What are wasps' rooms called?
Are wasps our friends?
How do bees make honey?
Why do bees have feelers?
What is pollen?
What do bees make out of pollen?
What is the name of the bee that does not work?
What bees make honey?
Who is Mother Nature?
How do leaves change colors?
What makes leaves change colors?

Heavens
Knowledges

The children were very interested in talking about the late King George of England and his burial. During this discussion these questions came up:

Questions

When it is name o'clock here what time is it in England?
What makes day and night?
Do the sun and moon move?

Does the earth move?

Most of these questions were stimulated through the discussion. None were answered to the satisfaction of the children the first day.

Cocoons

Dr. Sharp, the Director of the Demonstration School, purchased four large cocoons for each of the elementary grades. The children cleaned the large aquarium, put sand about one and one half inches deep in it, placed the cocoons in the aquarium, and covered it with cheese cloth. The aquarium was placed on a table so the children could watch it during the day.
FEBRUARY

The interests during the month of February were more or less a completion of the outstanding interests of the preceding months. These interests were in

Bees
Rocks
Heavens

The children brought up two new interests which were in

Wild Flowers
Birds

The interest in birds had shown up before, but not as definitely as it did this month. The reason for this was probably because the birds were returning and the children were seeing more of them.

An outline for this month follows:

Bees

Knowledges

How a real honey comb looks.
How honey looks.
Review of these points---

Swarm Drones
Workers  Queen Bee

It takes three days for an egg to hatch.
It takes two weeks for the bee to come out of the cell.

Rocks

Knowledge

Furnace rock is very light in weight. It is found in the sea.
Shells are different sizes. Animals with soft bodies live in them.
Inside of some shells is a pink color. Sometimes this is used for making buttons.
Some rocks are made of clay. Put a clay rock in some water and it will go back to clay soil.
Many rocks were brought and put on the rock chart.
Mr. Swenson, a geology teacher, came and talked to the children about rocks. The following things were discussed:

1. The three classes of rock.
   A. Those formed in water:
      (Dirt settling in layers)
   B. Lime in rocks:
      Usually white rocks are lime rocks.
Marble is limestone that has been roasted.

C. Some rocks have been melted inside the earth by volcanos.

Probably the most common rocks belong to those classified as quartz. These have a glass-like appearance.

Some rocks are called conglomerate because sands, gravels, and small rocks have collected and stuck together.

Shale is another kind of rock which is made from the settling of the soil.

Flint is formed in water and is made from quartz.

No one really knows why holes form in rocks.

But perhaps the impure sand and soil would not stick and so left a hole. Sometimes water falling on a rock will cause a hole to form in it.

Wild Flowers

Knowledges

Henbits are the first wild flowers to appear in the very early spring. They are small purple flowers.
Heavens

Knowledges

The earth moves. The sun and moon just look as if they were moving.

When the sun goes down here it is just coming up somewhere else.

This was illustrated by using a round vase and marking a place for the sun rise and the sun set. A ball was used for the sun so as to cast a shadow on the vase as it turned.

Birds

See Chapter III for full details.

Chart Questions

Where is a duck's nose?
How is a terrapin different from a turtle?
What do terrapins eat?
Why are holes in rocks?
Is the bark on a tree useful to the tree?
Where is the South where the birds go?
How are bees made?
Why does the grasshopper have stripes on it?
What is sap made of?

Why do some rocks have different colors in them?

How can trees grow through rocks on mountains?

Most of these questions had already been answered in discussions, but the children had not checked them. This served as a means for checking on some of the seemingly less interested children.
MARCH

The month of March brought a large variety of interests. The children talked about their mothers and fathers making gardens. They became eager to make one of their own. The school furnished a small plot of land and the children planned and made a garden.

The new interests for this month were as follows:

- Goldfish
- Garden
- Locust
- Grayfish
- Snails
- Worms
- Ants
- Horned Toad

The interests that were continued from the preceding months were in

- Rocks
- Snakes
- Moths
- Grasshoppers
- Birds
- Butterflies
- Flowers
- Wasps

The making of the garden did not take away the nature study period entirely. It was carried on at different intervals during the day. A brief description taken from the children's diary follows:

March 3

- We went to the garden.
- We found some bluebonnets.
- The soil was already loose.

March 4

- We brought seeds for our garden.
<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Flowers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrots</td>
<td>Nasturtiums</td>
</tr>
<tr>
<td>Raddishes</td>
<td>Zinnias</td>
</tr>
<tr>
<td>Lettuce</td>
<td>Marigolds</td>
</tr>
<tr>
<td>Green Beans</td>
<td>Larkspurs</td>
</tr>
<tr>
<td>Onions</td>
<td>Snapdragons</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>Cosmos</td>
</tr>
</tbody>
</table>

March 5

We planted some seeds in our hot box.

We planted three rows of carrots, two rows of radishes, three rows of nasturtiums, and three rows of zinnias.

Then we watered the seeds and put them in the sunshine.

March 6

Today we screened some soil.

We went to see Mr. Collier. He showed us his hot boxes. In the boxes were many tomato plants. He showed us how to transplant.

March 9

The radishes came up.

We went to get more soil.

We put the soil in another hot box.

We planted lettuce and tomato seeds.
March 10

We talked about the foods our plants need. They need water, sunshine, and fresh air.
We started an experiment. We planted two jars of beans. We watered them and put them in the sunshine.

March 11

Some zinnias came up.
Paul and Gene made a hot box out of an old tomato box.
We screened some more soil.

March 12

The carrots came up.
We planted some marigold and larkspur seeds.

March 13

Some lettuce is up today.
The radishes are ready to transplant.

March 16

How our plants are growing!
The tomato plants are up.
The nasturtiums are up.
We are going to the garden tomorrow.

March 17

We went to the garden.
We loosened the soil.
We weeded the garden.
We planted one row of onions.
We transplanted two rows of radishes.

March 18

Today we planted two more rows of onions and one more row of radishes. We planted two rows of beans and three rows of lettuce.

We also planted some flowers. They were cosmos, larkspurs, phlox, and zinnias.

March 19

We almost finished our garden today.
We finished one flower bed. The nasturtiums were transplanted. Some of the zinnias and phlox were planted.

Another bed of lettuce was planted.

March 20

We finished our garden.
We planted six rows of carrots. We left a place for some tomato plants.

We planted another flower bed. In it we planted snapdragons, marigolds, nasturtiums, and bluebonnets.

We also planted some popcorn, four o'clocks, and hollyhock. We transplanted some yellow flags.

March 21

The bluebonnets were the first flowers to bloom.
The flags were the second flowers to bloom.

Following is an outline of the other interests of this month:

Goldfish

Four fish were brought into the room. A goldfish, a spotted goggle-eyed fish, a white fish, and a black fish. The children seemed to have no other interest than to enjoy their beauty and unusualness. They made up the following story about these four fish:

Goldie and Big Eyes
Live in a fish bowl
And look very wise.
While Whity and Blackie
Circle the bowl,
And look at us
In great surprise.

Worms

Knowledges

Some worms are divided into parts. In each part
is a small spot.

These spots are called spirals. They are for breathing.

A little boy came before the class in a very excited manner and said, "Those spots are the worm's nostrils."

**Snails**

**Knowledge**

How a real snail looks.

The snail has his eyes on the ends of stems.
The snail can move his eyes in all directions.
He can see around a corner before he turns it.
This helps him to protect himself from his enemies.
The snail has just one foot.
The snail carries his house with him. His house is a shell. Sometimes he sees an enemy and pulls himself into his shell. He also pulls himself into his house when he rests. His shells looks as if it were a rock.

**Butterflies and Moths**

**Knowledge**

The Yellow Swallow Tail is a large yellow butterfly
that is seen frequently on our campus. The edges of its wings are black with a bluish color on the lower parts.

The Black Swallow Tail is a large black butterfly spotted with yellow along the edges of its wings. On the lower parts of the wings a light blue color is dominant. Two red eye-spots are shown on the inside edges of the lower wings.

The Cecropia Moth came out of its cocoon on March 12. We observed these things:

It is a very large moth.
Its coloring is beautiful.
It has large hairy feet and legs.
Its body is hairy. It is red.
It has large feather like antenna.
It has four eye-spots.
It looked like a beautiful wet piece of silk just after it emerged from its cocoon.
It pumped its body and wings about thirty-five minutes before it was completely dry.
It spread its wings about four inches.

Rocks

Knowledges
The following rocks were brought in:

Petrified
Sandrock
Fossil
Shell
Marble
Lime or chalk

A little boy brought in an unusual sandrock which had some loose sand in the middle of it. This statement was made by him, "I found this rock and it has some loose sand in the middle; I guess it'll have a hole in it or maybe it isn't finished making yet."

**Snakes**

**Knowledges**

A ship snake is a long, black snake. It is non-poisonous.

A poisonous snake has a diamond shaped head and a blunt tail.

A non-poisonous snake has a rounded head and a pointed tail.

**Questions**
Why do snakes shed their skins?
What makes snakes different colors?
How many bones do snakes have?
What are the names of the snakes in Texas?
Are the snakes in Texas poisonous?
How do snakes crawl?

Ants

Knowledges

Flying ants have wings.
Flying ants come out in the early spring.
Flying ants live in wood; usually, in trees.
Sometimes they get into the wood of houses and ruin them.

It would be very interesting to have some ants in our room to watch.

A house for the ants could be made out of an old, large glass jar. The ants and soil they were in should be put into the jar. The jar must be placed in a pan of water in order to keep the ants in the jar.

To keep ants in the school room the children must

Spontaneous question
give them food. Sugar and bread crumbs are two good foods for ants.

Grasshoppers

Knowledges

A female grasshopper has a large opening at the end of her body. She stick this part of her body into the soil to lay her eggs.

A male grasshopper has a sharp pointed tail.

Mother Nature makes grasshoppers about the same color of the ground or grass in order to help protect them from enemies.

A grasshopper belongs to that group of insects that have three pairs of legs and two pairs of wings.

The hind legs of a grasshopper are called its jumping legs.

Questions

What do grasshoppers eat?

1

Spontaneous question
A locust is an insect.
A locust has big eyes.
A locust makes a queer sound with its wings.
The locust comes out of a shell that looks just like its body.
This shell can be found stuck on fence posts, trees, or on the ground.

The children learned the names of two wild flowers. These were Henbits and Bluebonnets.
Wild flowers will soon be in bloom.

How a dirt dobber's house is made on the inside.
Dirt dobbers belong to the wasp family.
They will not hurt us if we do not bother them.
**Crayfish**

**Knowledges**

How a real crayfish looks.

Crayfish have fan-like tails that helps them in swimming. They have eight pairs of legs. There are three pairs of legs that have small claws on them. Another pair of legs has large pinchers. Four pairs of legs are used for walking.

The crayfish also has two large antennae and four small ones.

The crayfish's body is divided into three parts: the head, back, and tail. The back has a hard shell on it.

**Questions**

1. What do crayfish eat?

**Birds**

See Chapter III for full details.

---

1 Spontaneous question
APRIL

The month of April brought forth a few new interests. These new interests were discussed briefly and the children seemed satisfied with the results. These interests were in:

- Horned Toads
- Frogs
- Baby Chicks
- Rabbits
- Cut Worms
- Potato Bugs

The interests that were continued from the preceding months were in:

- Tadpoles
- Butterflies
- Moths
- Wild Flowers
- Birds
- Rocks

The outline for this month is as follows:

**Frogs**

**Knowledges**

Frog skeletons are often mounted and studied. The frog has almost all the parts that people have.

<table>
<thead>
<tr>
<th>Frog</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>Head</td>
</tr>
<tr>
<td>Nostrils</td>
<td>Nostrils</td>
</tr>
</tbody>
</table>
People study frogs because they help them to know and understand more about their bodies.

The frog's tongue is fastened in the front part of its mouth. There is a sticky liquid on the tongue that helps the frog in catching insects to eat.

One of the little girls gave this description of the frog's tongue, "Its tongue is just like one of those whistles you blow and it goes out and then curls back up."

The frog has webbed feet and hands which helps him in swimming.

The eggs are laid in a mass of jelly like substance.

Tadpoles

Knowledges

How to care for tadpoles in the room.

The tadpoles grow their hind legs first.
As the tadpole grows into a frog or a toad his gills disappear, his mouth gets larger, and his lungs develop. When the tadpole begins to come up to the top of the water more often than usual his lungs are beginning to develop, and soon the hind legs will appear.

**Potato Bugs**

**Knowledges**

Potato bugs have hard shells; therefore, they belong to the beetle family.

Potato bugs are striped.

Potato bugs injure potato plants.

**Wild Flowers**

**Knowledges**

The following flowers were identified according to
their common names:

Evening Primrose  Verbena
Yellow Pucoon     Wild Honeysuckle
Henbits          Yarrow
False Dandelion  Milkweed
Wild Hollyhock   Slender Vervain
Small Fox Glove  Large Fox Glove

Rabbit

Knowledges

The rabbit eats carrots, lettuce, wild flowers, clover, and grasses.
The rabbit washes by licking and pawing his fur.
The rabbit can stand up on his hind legs.
The hind legs are much stronger than the short front legs. The hind legs are also used for jumping.
The rabbit wiggles his nose because it is a habit he has while smelling.

Cut Worm

Knowledges

Cut worms are small, green worms.
Cut worms eat leaves, flowers, vegetables, and other plants.
Cut worms are caterpillars.
Cut worms make small, brown cocoons.
Cut worms have some little sharp saw like teeth which they cut with.
The worm walks or crawls by means of several pairs of tiny legs. It pushes up the back legs first and then move along in a wave like manner.

Baby Chicks

Knowledges

Baby chicks are fed oatmeal, water and cornbread.
Chickens have most all the parts that people have.

Butterflies and Moths

Knowledges

The difference between moths and butterflies.

Moths
Feelers have knobs on the end.
When at rest the wings are not held straight up.

Butterflies
Feelers are straight.
When at rest the wings are held straight up.
Fly at night. Fly in daytime.

Cocoons will hatch much sooner if kept in a warm place.

Questions

Why do some butterflies and moths hatch from the sharp end of the cocoon and others from the other end?¹

Which comes out first the head or the tail?¹

What are the names of the butterflies and moths we have in our case?²

Rocks

The children kept bringing in interesting rocks and talked intelligently about them. There were no new ones.

Birds

See Chapter III for full details.

¹ Spontaneous question
² Stimulated question
The month of May was used in trying to finish all the children had started, and to answer as many of the questions on the chart "Things We Want To Know" as possible.

The main things to be finished were:

Mounting wild flowers.
Making a book cover for wild flowers.
Making a book cover for the bird riddles.
Learning the names of all the butterflies and moths in the cases.
Answering the questions on the chart.

There was one thing brought in that interested the children very much for a short time. This was the lightning bug. They observed its long, striped body and the yellow part of the tail which helps make the light. The question, "What makes the lightning bug light?", was asked first. Several attempts were made to answer it, but the children were not satisfied with any of these attempts. The children, with the teacher's help, found that this had not been answered definitely in the field of science, but it was thought that the yellow under part of the tail had many air tubes in it and as the air passed through these tubes the light was made.
The children finished mounting the flowers on paper covered with cellophane. The name of each flower was written below it. The book was named "Wild Flowers of Denton".

The book cover for the wild flower collection was made of heavy pasteboard. The children made designs and one was selected. This one consisted of three simple flowers of orange coloring. These flowers were drawn on the board. A border of orange was made around the covers. This was all washed with a green coloring. The book was bound together and tied with a heavy orange cord.

The book contained the following wild flowers:

Bluebonnets
Yellow Sweet Clover
Wild Honeysuckle
Queen Ann's Lace
Blue Eyed Grass
Texas Toad Flax
Wild Verbana
Henbit
Sheep Sorrel
Venus Looking Glass
Dock
Texas Star
False Dandelion
Mountain Daisy
Large Fox Glove
Wild Hollyhock
Evening Primrose
Indian Plaintain
Yarrow
Wild Petunia
Indian Blanket
Pepper Grass
Slender Vervain
Sensitive Brair
Small Fox Glove    Butterfly Weed

After the book was completed the children were asked
to a wild flower show. After the show many other wild flowers
were given to them, but it was impossible to mount them.

The riddle book cover was made. It was made in the
shape of a robin. The robin form was covered with colored
construction paper. The back, tail, head, and feet were
black, the bill was yellow, the eyes were white, and the
breast was orange. The book was named "What Am I?"

The butterflies and moths collected were:

<table>
<thead>
<tr>
<th>Butterflies</th>
<th>Moths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monarch</td>
<td>Luna</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Io</td>
</tr>
<tr>
<td>Black Swallow Tail</td>
<td>Polyphemus</td>
</tr>
<tr>
<td>Yellow Swallow Tail</td>
<td>Cecropia</td>
</tr>
<tr>
<td></td>
<td>Sphinx</td>
</tr>
</tbody>
</table>
CHAPTER III

AN EXAMPLE OF HOW TO DEVELOP AN INTEREST

The unit of work that follows is a very detailed one. It is to be understood that the writer has purposely developed this interest in a most resourceful manner so as to try to show the many possibilities of this type of work. It is also to be understood that the writer does not advocate that all interests can be developed as extensively as this one, but some interests may be culminated in about two or three weeks; however, others will require even less time.

The title of the unit that follows is "Learning About the Birds in Our Community."
THE WOODPECKER

This morning as I was coming to school I heard the queerest noise. It went "R-r-r-r-". I stopped and listened. Again I heard "R-r-r-r-". I began to look around to see if I could find what was making this queer noise. I looked up in the trees, but nothing was there. I looked in the shrubs, but nothing was there. I looked all around, but I could see nothing. Just then I heard the "R-r-r-r-" again; and, this time I saw what was making the noise. On a telephone pole was a bird. He was very busy pecking out a round hole with his strong bill. On his head he wore a hood and a collar of red. He used his tail to prop himself steadily on the telephone pole while he was pecking.

Do you know the name of this bird? Could you find a picture of him on our bulletin board? I'm sure this poem will help us to find what the bird's name is.

The woodpecker pecked out a little round hole.
And made him a house in a telephone pole.
One day when I watched he poked out his head,
And he had a hood and a collar of red.
When the streams of rain poured out of the sky,

* This is an original interest story by the writer based on the poem "The Woodpecker" by Elizabeth Madox.
And the sparks of lightening go flashing by,
And the big, big wheels of thunder roll,
He can snuggle back in the telephone pole.

Now do you know his name?
Yes, he is a woodpecker. But there are several different families of Woodpeckers. Each family has a different name. Can you guess the family name of this woodpecker? Suppose we try to find out for tomorrow.

I wonder how much of the woodpecker poem you could say with me? May I read it again before you say it with me?

The woodpecker pecked out a ______ ______ ____. *
And made him a house in a ______ ______.
One day when I watched he poked out his ______.
And he had a hood and a collar of ______.
When the streams of ______ poured out of the ______,
And the big, big wheels of ______ roll,
And the sparks of lightening go ______ ______.
He can snuggle back in the ______ ______.

* The blanks indicate pauses made by the teacher for the children to supplement the correct words.
BIG IDEALS

"The fundamental purpose as developed here is to guide the child in interpreting the phenomena of environment in the broader sense. Obviously, the emphasis in the primary grades is not to train the children to become scientists and naturalists—rather the concern should be for the great multitude of individuals who will never use science as a vocation. This group needs those great scientific conceptions that are such a vital influence in human thought today; it needs the interpretation of the simple phenomena as found on the street, on the farm, and in the woods, and which are appearing to a greater and greater extent in popular treatments of science in laymen's periodicals."¹

¹ The Classroom Teacher, Vol. V, p. 180
BIG IDEALS

We see more birds since we have been studying about them.

Most birds are our friends and helpers. They eat insects and worms. They protect the leaves on our trees, flowers, and vegetables.

We can make birds happy by being kind to them, by building bird baths, by building bird houses, and by putting out food for them.

Birds tell us that spring is here with their cheerful songs.

We enjoy watching the many pretty colors that the birds wear. Sometimes it is hard to see a bird if he is in a tree.
OBJECTIVES

Interests

Interest in observing bird habits:
  During the spring
  During the summer
  During the autumn
  During the winter
Interest in making reports about birds.
Interest in listening to reports about birds.
Interest in reading about birds.
Interest in affording protection for birds.
Interest in collecting old bird nests.
Interest in relating experiences and observations pertaining to birds.
Interest in helping enforce the laws that protect our birds.
Interest in gathering material to make a scrapbook.
Interest in constructing bird baths, bird houses, and bird feeding tables.
Interest in learning to sing songs about birds.
Interest in learning to recognize birds by color and song.
Interest in making field trips to observe birds.
Interest in hearing and learning poems about birds.
Attitudes

Kindly attitude toward our bird friends.

Inquiring attitude about our bird friends.

Protective attitude toward
- Protecting game birds
- Protecting song birds
- Protecting the young birds
- Protecting the bird nests

Cooperative attitude in working together and in protecting birds.

Courteous attitude toward
- The person making a report
- Others when making field trips
- Others of the group in using materials, books, pictures, and charts.

Experimental attitude in gathering data concerning
- Time for hatching of bird eggs
- Time required for birds to learn to fly
- Time required in building the nest
- Time and difficulty in finding food

Friendly attitude toward
- Our bird friends
- Other members of the class
- Those who protect our birds
Appreciations

Appreciation of the birds that serve us.
Appreciation of the beauty of coloring in certain birds.
Appreciation of the laws that protect our birds.
Appreciation of birds as friends instead of mere flying creatures that heretofore had meant nothing to the children.
Appreciation of the songs of birds.
Appreciation of protection that children can give birds.
Appreciation of the efforts birds make to get food and to get materials to build their homes.
Appreciation of stories, poems, and songs about birds.
Appreciation of the interdependence of birds and man.

Habits

Habit of listening courteously to the report that is being given.
Habit of giving a report so that everyone in the class will hear it.
Habit of looking in books for factual material about birds.
Habit of protecting our birds.
Habit of listening to the songs of our birds.
Habit of recognizing birds by their songs, colors, and nests.
Habit of cooperation in protecting birds.
Habit of courteously informing our friends that birds are valuable and we must protect them.
Habit of constructiveness in building bird houses, bird baths, and bird feeding tables.
Habit of neatness in making a bird book.
Habit of clear thinking.

Skills

Skill in recognizing the different birds by their songs, colors, and nests.
Skill in reading developed through reading about birds.
Skill in measuring while measuring for the bird house, bird bath, or bird feeding table.
Skill in giving reports about birds.
Skill in creative drawing or painting of pictures.
Skill in constructing bird houses, bird baths, and bird feeding tables.
Skill in making an attractive scrapbook.
Cutting pictures
Pasting pictures
Keeping book neat
Formulating material
Skill in composing stories, songs, poems, and riddles.
Knowledge of the different birds found in our community.

Woodpecker  Sparrow
Cardinal     Hummingbird
Blue Jay     Crow
Bluebird     Meadowlark
Robin        Pigeon
Mockingbird  Black Bird

Scissortail

Knowledge of the birds that have spent the winter with us.

Knowledge of the birds that have returned to us in the spring.

Knowledge of the fact that some birds build new nests.
Knowledge of the fact that some birds use old nests.
Knowledge of the fact that some birds just come through our community on their way to a warmer climate.

Knowledge of the influence of spring on birds.

They come back north in the spring.
They sing cheerful songs in the spring.
They build nests in the spring.
They rear young birds in the spring.

Knowledge of the ways birds have of protecting themselves.

They are the same color as their surroundings.
The Mother bird's plumage is not as bright as the plumage of the father bird.

Knowledge of our song birds and their songs and calls.

Knowledge of how birds fly.
Difference in wing feathers.
Difference in tail feathers.

Knowledge of how different birds get their food and what they eat.

Knowledge of how birds care for their young.
Knowledge of the difference in bird bills.
Knowledge of size and color of eggs of the different birds.

Knowledge of the birds that are our friends.
Knowledge of the different bird nests.
Knowledge of the birds that are our enemies.
Knowledge of how we can protect our birds.
LIST OF ACTIVITIES

1. Watching for the first bird to return in the spring.
2. Going on field trips to observe birds.
3. Going on an excursion to a museum to see birds that have been stuffed.
   - Observing birds according to colors.
   - Observing birds according to their heads.
   - Observing birds according to their feet.
   - Observing birds according to their tail feathers.
   - Observing birds according to their wing feathers.
   - Observing birds according to their bills.
   - Observing birds according to their eggs.
4. Discussing the trip to the museum.
5. Comparing birds according to size, food, and habits.
   - Birds We Have Seen
   - Birds We Have Not Seen
   - Migrating Birds
   - Resident Birds
   - Birds Seen in Denton
7. Going on sight-seeing trips to see bird baths, bird houses, and bird feeding tables.
8. Making bird houses.
10. Making bird baths.
11. Reading stories about birds.
12. Reading poems about birds.
13. Singing songs about birds.
14. Learning poems about birds.
15. Writing stories about birds.
16. Writing riddles about birds.
17. Collecting pictures about birds.
18. Making a riddle book about birds or a scrapbook.
19. Playing games about birds.

Recognizing birds by pictures.

Two Little Black Birds.

20. Drawing pictures of birds.
21. Making a bird corner in our room.
22. Dramatizing stories about birds.
23. Joining the Audubon Junior Society.
24. Carrying on discussions about birds.
25. Going on sight-seeing trip to see a mother bird feeding her young.
26. Writing for free material on birds.
27. Entertaining the parents.
PROCEDURE FOR ACTIVITIES

1. Watching for the first bird to return in the spring.

   In late April or very early May the children could discuss the signs of spring. The following things could be brought out:
   - The days begin to get longer.
   - The flowers begin to bloom.
   - The butterflies and moths begin to come out of their cocoons.
   - The trees begin to put out new leaves.
   - The birds begin to return.

   When birds were mentioned the question concerning the name of the bird that usually returns first might be asked. If no one knew the name of this bird, it might be suggested that we watch to find out its name, color, etc. Some of the birds that are the first to return might be mentioned.

2. Going on field trips to observe birds.

   The first of these trips would have to be for the purpose of learning how to observe birds and to find out how many birds the children could recognize by sight. Later, after having studied some of the common birds in our community, the children would become more capable of observing
birds intelligently and would look for the characteristics we had studied.

3. Going on an excursion to a museum to see birds that have been stuffed.

Before going on this excursion to the museum it would be necessary to first discuss with the children these things:

a. How to act when going to a museum or to any display.

   Be as quiet as possible when entering the building.
   Follow the leader and do as he tells you.
   Take your place and wait for the leader to begin the display.
   Do not touch any of the things being displayed unless told.

b. The kinds of birds likely to be seen.

   This would be a means of finding out how many bird names the children already knew.

c. What to look for when observing birds.

   Color of male and female.
   Size of the different birds.
   Wing feathers
   Tail feathers
Feet

Heads

Bills
c. The display should be ready before the children arrive. The things to be observed should be on a level with the children's eyes in order that they might observe with ease. If possible, each child should be so seated that no one would be seated directly in front of him.
d. Birds that were seen and observed by the outline under "b" section. This outline might be written on the board as a review for the children.

Following is the outline given in detail:

Observing birds according to color.

Cardinal

Male
Bright red color. Black around the bill and on the neck; often called a black necktie.

Female
Soft rose color. She does not have the black on her neck.
Blue Jay
Male
Wings, tail and back are blue, with some white scattered through out. The breast is white and he wears a black collar.

Female
The same color except slightly lighter.

Robin
Male
Black head and back. Orange-brown breast.

Female
Head is gray and breast is lighter red.

Bluebird
Male
Blue head, back, and tail. Red breast. White under the tail.

Female
Same as the male.

Bobolink
Male
Black and white and buff. In July he changes his suit to one of buff just like the female. Then they start on their long trip southward.

Female
Entire suit of buff.
**House Wren**

Male
- Coat of light brown.
- Barred wings and tail.
- Dull gray underparts, barred with brown on the flanks.

Female
- Same as male.

**Ruby-throated Hummingbird**

Male
- Throat band of red. A green coat tinged with brown.

Female
- Coat of green. Breast feathers are gray. Does not have the red throat.

**Belted Kingfisher**

Male
- Color is a bluish gray.
- White band about his throat.
- White mark on his breast.
- White spot just under his eye.
- A brownish band on his sides and breast.

Female
- Practically the same as the male.

**Yellow Warbler**

Male
- Bright lemon-yellow, streaked below with dull red.

Female
- Duller in color and is not streaked.
**Barn Swallow**

*Male*

Steel-blue back, chestnut throat and buffy underparts, white showing on the inner web of each feather of the forked tail.

*Female*

Practically the same as the male.

**Baltimore Oriole**

*Male*

Head, neck and shoulders are black. The rump, upper tail-coverts, lesser and middle coverts of the wings and the underparts of the body are orange. The underpart of the tail is orange, crossed near the base by a broad band of black.

*Female*

Less brightly colored.

**Red-headed Woodpecker**

*Male*


*Female*

Same as male.
**Downy Woodpecker**

Male

Color is black and white with white stripes on the side of the head and a white band down the back. The wings and wing coverts are spotted with white, the crown of the head is plain black. The underparts are a dull white. The outer tail feathers are white, slightly spotted with black. He has a red spot on his head.

Female

Same except she does not have the red spot on her head.

**Flicker**

Male

The upper parts are brown, barred with black. The rump white and the crown of the head is ashy gray. Under the wings and shaft are bright yellow colors, and under the tail and shafts of tail feathers are yellow except the tip which is black. There is a spot of

Female

Only a slight difference.
red on its head. The underparts are grayish white, nearly uniformly spotted with black. He has a black crescent on his breast.

**Cedar Waxwing**

**Male**
Coat of soft brown. It has a black "bridle". The tail is tipped with yellow. Breast is yellow, and has red spots on wings.

**Female**
Slightly lighter in color, and does not have the red on the wings.

**Orchard Oriole**

**Male**

**Female**
Coat is of yellowish color. She does not have the black face and throat.

**Red-Winged Blackbird**

**Male**
Body and wings are black. On the shoulder is a patch of brilliant red which has

**Female**
Upper part of the body is brownish black, and almost ashy in color.
Mockingbird

Male

Colors are gray coat and white breast. There are white spots on the wings which can be seen only when the bird is in flight. Under the tail are white feathers.

Female

Same as the male.

Meadowlark

Male

Yellow underparts and black breast crescent. White outer tail feathers are seen when in flight.

Female

Practically the same as the male except for the slightly lighter in coloring.

Brown Thrasher

Male

Reddish brown in color in the upper parts. The wings are tipped with buffy white

Female

Same except slightly lighter.
which is heavily streaked with black except on the throat and center of the abdomen.

**Goldfinch**

**Male**

Coat of golden color with brown and white wings. On its head is a cap of brown. In the winter it takes on a coat of yellow-olive color like its mate.

**Female**

Coat of yellow-olive color with brown accessories.

**Chipping Sparrow**

**Male**

Chestnut crown and a black forehead with a black line through the eye.

**Female**

Same as male.

**English Sparrow**

**Male**

Upperparts of reddish-brown, streaked with black, and its underparts

**Female**

Same as male.
are grayish-white.

Field Sparrow  

Male          Female
Reddish bill and a plain Same as male.

breast. A white stripe

over the eye, and a crown

and ear coverts of brown

with no black markings.

The back is reddish-brown

with a ting of brown on the

breast.

Junco  

Male          Female
Gray and white plumage and Same as the male.
a flesh colored bill. In
flight, white outer tail

feathers are visible. The

breast is white.

Cowbird  

Male          Female
Colored a glossy greenish-

black with a brown head.

Dull gray in color.
Crow
Male
Jet black.

Female
Jet black.

Raven
Male
Intensive black

Female
Same.

Great Blue Heron
Male
Slate blue with black flowing feather.

Female
Same.

Bob-White
Male
Throat is white, margined with a blackish tint. Under parts are grayish white, the sides are streaked with brownish red. There is a white line from the forehead over the eye and down the sides of the neck.

Female
Duller in color.

Throat is brownish-yellow; the bill is blackish, and the feet are brown.

Catbird
Male
Drab plumage, black cap and tail a rusty color. Under

Female
Alike all but one season.
tail coverts are a rusty color.

**Brown Thrush**

*Male*
Reddish brown upperparts with brighter head feathers.

*Female*
Practically the same.

Breast is white with black spots.
Observing birds according to their heads.

Some birds have crests or topknots on their heads.

- Blue Jay
- Cardinal
- Kingfisher
- Cedar Waxwing
- Great Blue Heron

Observing birds according to their feet.

Most birds have four toes. Three of these toes are usually on the front of the foot and one on the back of the foot. There are different kinds of feet according to their make-up as well as their use. Some examples and illustrations follow:

![Perching Foot](image)

*Fig. 1 Perching Foot*

Figure 1 shows the foot used like a hand to slasp a perch. This foot is called a "perching foot."

---

Figure 2 shows the foot used for scratching.

Figure 3 shows the foot used for swimming. This foot is called a "web foot."

---

2 Ibid., p. 185.

Figure 4 shows the foot used for wading. This foot is called the "web foot."

Figure 5 shows the foot used for killing. This foot is called the "foot of prey."

---

4 Ibid., p. 21.
5 Ibid., p. 29.
Observing birds according to their tail feathers.

The tail of a bird is formed of an even number of feathers in pairs, most often twelve. When spread they are shaped like a fan, and when closed they lie over each other with the middle pair on top. There are different kinds of tails according to the way they are made-up. Some examples and illustrations follow:

Fig. 6

The fan shaped tail.

---

Modified illustration taken from O.T. Miller, The First Book of Birds, p. 111
The tail feathers are not always of the same length, and that makes a difference in the shape of the end. Sometimes they are even, and the tail is said to be "square."
Sometimes the middle feathers are a little longer than the outside ones, and the tail is said to be "rounded" or "pointed." If the outside feathers are the longest, the tail is said to be "forked."

Fig. 8
Forked Tail.\(^8\)

Fig. 9
Sapsucker Tail.\(^9\)

---

\(^8\) Ibid., p. 112.
\(^9\) Ibid., p. 113.
Figure 9 shows the tail of a sapsucker. The sapsucker belongs to the woodpecker family. In woodpeckers and swifts the tail feathers are not so soft at the end as they are in other birds, but the stems or shafts project beyond the feathery part, and are stiff. These birds use their tail feathers as a prop to hold themselves on tree trunks or chimney walls, and also, to help them in climbing.

**Observing birds according to their wing feathers.**

A bird's wing is divided into parts similar to the human arm. These parts are the shoulder, elbow, wrist, and fingers. There are several different kinds of wings according to their make-up and their use. Some examples and illustrations follow:

![Illustration of a bird's wing](image.png)

**Fig. 10**
The Long, Narrow Wing

---

10 Ibid., p. 110.
Figure 10 shows the long, narrow, pointed wing that is used in flying long distances and in spending long hours at a time in the air.

Figure 11 shows the short, round wing that is used in flying short distances.

The shape of a bird's wing tells how that bird flies.

Birds use their wings to help protect themselves.

Sometimes wings serve as musical instruments for birds.

Ibid., p. 110.
Observing birds according to their bills.

Birds use their bills for preparing their food, keeping their feathers in order, building their nests, feeding and carrying for their young, and for fighting. Some examples and illustrations of the different types of bills follow:

**Fig. 12**

The chisel bill.

Ibid., p. 95.
Fig. 13
The digging bill.

Fig. 14
The hooked bill.

13 Ibid., p. 96
14 Ibid., p. 96
Fig. 15

The sharp-pointed bill.

Fig. 16

The cross bill.

---

Ibid., p. 97.
Ibid., p. 97
Observing birds according to their eggs.

Cardinal --------------- Three or four bluish-white eggs.

Blue Jay --------------- Four to six pale olive-green eggs speckled with brown.

Robin ------------------ Three to five greenish-blue eggs.

Bluebird ---------------- Four to six bluish white eggs.
                                Frequently they are plain white.

Bobolink ---------------- Four to six white eggs spotted with reddish or olive-brown spots.

House Wren ------------- Six to eight whitish eggs thickly speckled with pinkish-brown.

Hummingbird ------------ Two tiny white eggs.

Kingfisher ------------- Five to eight white eggs.

Yellow Warbler --------- Four to six bluish-white eggs thickly marked with brown.

Barn Swallow ----------- Four to six white eggs speckled with brown.

Baltimore Oriole ------ Four to six white eggs with fine black and brown markings.

Red-headed Woodpecker --- Four to six white eggs.

Downy Woodpecker ------ Four to six white eggs.

Flicker ---------------- Five to nine white eggs.

Cedar Waxwing ---------- Four or five bluish-white eggs speckled with black.
Orchard Oriole ------------ Four to six white eggs speckled with brown and black.

Red-winged Blackbird -------- Three to five pale blue eggs streaked and scrawled with purple or black.

Mockingbird --------------- Four to six light greenish-blue eggs with heavy brown spots at the larger end.

Meadowlark --------------- Four to six white eggs speckled with reddish-brown.

Brown Thrasher ------------ Three to six grayish eggs speckled with cinnamon brown.

Goldfinch -------------- Four or five unmarked, pale bluish eggs.

English Sparrow ---------- Four or seven white marked eggs with olive color.

Chipping Sparrow -------- Four or five greenish-blue eggs.

Field Sparrow ----------- Three or four whitish-eggs speckled with reddish-brown.

Crow ----------------- Four to six bluish eggs thickly marked with varied shades of brown.

Bob-White ---------------- Ten to eighteen white eggs.
4. Discussing the trip to the museum.

The children should be given an opportunity to discuss their trip as soon as they have returned to the room. After a short, free discussion they might be asked to look over the list of birds they had made before going to the museum and see how many bird names they could add to this list.

5. Comparing birds according to size, habit, and food.

**Birds according to size.**

<table>
<thead>
<tr>
<th>Bird</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardinal</td>
<td>8 3/4</td>
</tr>
<tr>
<td>Blue Jay</td>
<td>11 3/8</td>
</tr>
<tr>
<td>Robin</td>
<td>10</td>
</tr>
<tr>
<td>Bluebird</td>
<td>7</td>
</tr>
<tr>
<td>Bobolink</td>
<td>7</td>
</tr>
<tr>
<td>House Wren</td>
<td>4 3/8</td>
</tr>
<tr>
<td>Hummingbird</td>
<td>3 3/8</td>
</tr>
<tr>
<td>Belted Kingfisher</td>
<td>12</td>
</tr>
<tr>
<td>Yellow Warbler</td>
<td>4 3/4</td>
</tr>
<tr>
<td>Barn Swallow</td>
<td>7</td>
</tr>
<tr>
<td>Baltimore Oriole</td>
<td>8</td>
</tr>
<tr>
<td>Red-headed Woodpecker</td>
<td>9</td>
</tr>
<tr>
<td>Downy Woodpecker</td>
<td>6 1/2</td>
</tr>
<tr>
<td>Flicker</td>
<td>13</td>
</tr>
<tr>
<td>Cedar Waxwing</td>
<td>7 3/8</td>
</tr>
<tr>
<td>Orchard Oriole</td>
<td>7</td>
</tr>
<tr>
<td>Bird</td>
<td>Length</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Red-winged Blackbird</td>
<td>8 3/8 inches</td>
</tr>
<tr>
<td>Mockingbird</td>
<td>10 inches</td>
</tr>
<tr>
<td>Meadowlark</td>
<td>10 3/4 inches</td>
</tr>
<tr>
<td>Brown Thrasher</td>
<td>11 inches</td>
</tr>
<tr>
<td>Goldfinch</td>
<td>5 inches</td>
</tr>
<tr>
<td>English Sparrow</td>
<td>5 3/4 inches</td>
</tr>
<tr>
<td>Chipping Sparrow</td>
<td>5 1/2 inches</td>
</tr>
<tr>
<td>Field Sparrow</td>
<td>5 3/4 inches</td>
</tr>
<tr>
<td>Junco</td>
<td>6 inches</td>
</tr>
<tr>
<td>Cowbird</td>
<td>8 inches</td>
</tr>
<tr>
<td>Crow</td>
<td>13 3/4 inches</td>
</tr>
<tr>
<td>Raven</td>
<td>26 1/2 inches</td>
</tr>
<tr>
<td>Great Blue Heron</td>
<td>42-50 inches</td>
</tr>
<tr>
<td>Bob-White</td>
<td>10 inches</td>
</tr>
<tr>
<td>Catbird</td>
<td>8 3/4 inches</td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>7 3/4 inches</td>
</tr>
</tbody>
</table>

It should be understood that the children would not be expected to remember these figures, but it would be a splendid way of having an incidental lesson in learning to use a ruler; also in learning the differences between $\frac{1}{2}$, $\frac{3}{8}$, and $\frac{5}{4}$ inches.
Birds according to food.

Cardinal ----------- Seeds, berries, fruits, insects.
Blue Jay ------------ Eggs of other birds and insects.
Robin ------------- Fruits, vegetables, insects.
Bluebird ---------- Berries, small fruits, insects.
Bobolink ----------- Seeds of grass, rice.
House Wren --------- Caterpillars, insects, spiders.
Hummingbird ------- Nectar from flowers, tiny spiders, insects.
Kingfisher -------- Minnows, chubs, insects, frogs, crayfish.
Yellow Warbler ------ Insects.
Barn Swallow ------- Animal food, insects, berries.
Baltimore Oriole ---- Caterpillars, ants, grasshoppers, wasps, bettles, few vegetables.
Red-headed Woodpecker -- Worms, ants, grasshoppers, bettles, flies, beech nuts, fruit.
Downy Woodpecker ---- Grub worms, ants.
Flicker ------------- Ants, insects, worms.
Cedar Waxwing ------- Berries.
Orchard Oriole ------ Worms, caterpillars, bettles, seeds, insects.
Red-winged Blackbird --- Grain, seeds of weeds.
Mockingbird -------- Wild fruit, vegetables, weed seeds, insects.
Meadowlark ------------ Insects, grasshoppers, crickets
Brown Thrasher -------- Insects, wild fruits.
Goldfinch ------------ Seeds of flowers and weeds.
English Sparrow ------- Grain, fruit, peas, beans, insects, wasps, waste from streets.
Chipping Sparrow ------ Insects, worms, seeds.
Field Sparrow --------- Seeds of weeds, vegetables.
Junco ----------------- Seeds of weeds, insects, caterpillars.
Cowbird --------------- Flies mostly.
Crow ------------------ Corn mostly.
Raven ----------------- Gets most of its food from garbage piles.
Great Blue Heron ------ Fish.
Bob-White ------------- Berries, seeds, grains.
Catbird --------------- Fruit, berries, insects.
Wood Thrush ............. Bottles, bugs, snails, wild fruits, berries.

_Birds according to habit._

This information should be attained by the children as much as possible. They can find a great deal in stories, poems and songs. The teacher might help by reading stories to the children and discussing the story from the stand-point
of habits. This procedure would be carrying out the following objectives:

Looking for factual material in books.
Giving a good report.
Being a good listener.
Developing an attitude of inquiry.

6. Making charts about birds.

The following charts are merely examples of bird charts. To make the charts more attractive the children might make illustrations to paste opposite each bird name or they might have some pictures they had received from a company they would like to use.

BIRDS WE HAVE SEEN

Cardinal
Bluebird
Robin
Blue Jay
Mockingbird
Woodpecker
Scissor Tail
Pigeon

BIRDS WE HAVE NOT SEEN

Red-winged Blackbird
House Wren
Hummingbird
Baltimore Oriole
Junco
Cowbird
Catbird
Flicker
7. Going on sight-seeing trips to see bird baths, bird houses, and bird feeding tables.

On this trip the children would want to observe bird baths according to location, size, and height. They would want to visit people who had bird house in order to see the construction and location. Visits to observe feeding tables according to their location, height, construction, and the kinds of food kept on them would be of most importance to the children.

8. Making bird houses.

To make bird houses that will really be used by birds, one must know the kinds of houses that attract birds in his community.

The wren must have a certain kind of house. Following is a simple way to make one:

Get a flower pot measuring six inches across.

Use a piece of galvanized iron, bent into conical shape for the roof. This can be obtained from a hardware store.

Fasten the roof to the flower pot with a \( \frac{3}{4} \) inch by 3 inches eyebolt, an iron washer, and a nut.

Cut the floor out of a board \( \frac{3}{4} \) inches thick. Fasten it to the rim of the flower pot with three screw hooks.
Attach a spool in the middle of the floor with a screw.

Cut a round hole the size of a twenty-five cent piece for the door. This is done by using a nail and a hammer to chisel out the hole.

Run an eyebolt through the roof peak to hang the house up by.

Paint the house white and the roof green.

Information for building bird houses may be found in the following two books:


White and Hanthorn, *Our Friends at Home and School*, Chicago, American Book Co.; 1929

A bird feeding table may be made with very little difficulty. The children can make it and put it up with very little supervision.

First, measure the window sill that it is to be attached to. Get a board slightly shorter than the window sill, about 12 inches wide and three-eights inch thick.

Second, nail a piece of wood on the back of this board.

Last, attach the tray to the window sill.

The children should bring little jar lids from home for the cups to put feed in. They should go out in the yard and get sand or fine gravel to cover the table. Some evergreen shrubs might be put on the table to make it look as much like the natural surroundings as possible.

The children should then devise what food is to be kept on the table and who is to bring it each day. Such foods as bread crumbs, berries, pieces of fat meat, wild fruits, seeds, and water should be on the feeding table.

A committee should be appointed to be responsible for this table each week.

10. Making a bird bath.

A bird bath may be made by sinking an old tub or pan filled partly with heavy rocks into a hole, and then filling the pan with water. Plants of many different
kinds might be planted around the bath.

A committee should be appointed each week to be responsible for keeping the pan filled with water.

11. Reading stories about birds.

The following books are on the first grade level and can be read by average first grade children:

<table>
<thead>
<tr>
<th>Story</th>
<th>Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds</td>
<td>Sally and Billy in Spring</td>
</tr>
<tr>
<td></td>
<td>Majorie Hardy</td>
</tr>
<tr>
<td></td>
<td>Wheeler Publishing Co.</td>
</tr>
<tr>
<td></td>
<td>Chicago</td>
</tr>
<tr>
<td>Making a Bird House</td>
<td>Toots in School</td>
</tr>
<tr>
<td></td>
<td>Baker and Baker</td>
</tr>
<tr>
<td></td>
<td>The Bobbs-Merrill Co.</td>
</tr>
<tr>
<td></td>
<td>Indianapolis</td>
</tr>
<tr>
<td>Birds</td>
<td>The Little Book</td>
</tr>
<tr>
<td></td>
<td>Majorie Hardy</td>
</tr>
<tr>
<td></td>
<td>Wheeler Publishing Co.</td>
</tr>
<tr>
<td></td>
<td>Chicago</td>
</tr>
<tr>
<td>What Was in the Nest?</td>
<td>Elson-Runkel Primer</td>
</tr>
<tr>
<td>The White Dove</td>
<td>Scott, Foresman &amp; Co.</td>
</tr>
<tr>
<td>The Jay and the Dove</td>
<td>Chicago</td>
</tr>
<tr>
<td>The Little Owl</td>
<td></td>
</tr>
<tr>
<td>Story</td>
<td>Page</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Six Robins</td>
<td>32</td>
</tr>
<tr>
<td>Goodbye to Billy and Sally</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>The Brown Thrasher's Nest</td>
<td>65</td>
</tr>
<tr>
<td>The Brown Thrasher's Family</td>
<td>73</td>
</tr>
<tr>
<td>The Wren</td>
<td>71</td>
</tr>
<tr>
<td>The Wren's House</td>
<td>82</td>
</tr>
<tr>
<td>Mr. and Mrs. Wren</td>
<td>88</td>
</tr>
<tr>
<td>The Baby Wren</td>
<td>93</td>
</tr>
<tr>
<td>The Little Brown Bird</td>
<td>28</td>
</tr>
<tr>
<td>A White Pigeon</td>
<td>23</td>
</tr>
<tr>
<td>Strange Lands</td>
<td>27</td>
</tr>
<tr>
<td>The Turtle and the Duck</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>The Bluebird</td>
<td>50</td>
</tr>
<tr>
<td>Three Little Birds</td>
<td>51</td>
</tr>
<tr>
<td>The Secret</td>
<td>54</td>
</tr>
<tr>
<td>Guess Who I Am?</td>
<td>55</td>
</tr>
<tr>
<td>The Nest in the Tree</td>
<td></td>
</tr>
<tr>
<td>Fly Away Jack</td>
<td>63</td>
</tr>
<tr>
<td>Story</td>
<td>page</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>A Home in the Tree</td>
<td>76</td>
</tr>
<tr>
<td>The Little Christmas Tree</td>
<td>100</td>
</tr>
<tr>
<td>The Snow Picnic</td>
<td>82</td>
</tr>
<tr>
<td>Bobby and the Apple</td>
<td>87</td>
</tr>
<tr>
<td>Two Little Blackbirds</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>The Bird in the Snow</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>The Picnic</td>
<td>51</td>
</tr>
<tr>
<td>&quot;A Knight&quot;</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;The Cowbird and the Sparrow&quot;</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12. Singing songs about birds.

The following songs are on the first grade level and can be sung by average first grade children:

<table>
<thead>
<tr>
<th>Song</th>
<th>Book</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Woodpecker</td>
<td><em>Songs of Child World, Vol. II</em></td>
</tr>
<tr>
<td>The Bobolink</td>
<td>Riley and Gaynor</td>
</tr>
<tr>
<td></td>
<td>The John Church Co.</td>
</tr>
<tr>
<td></td>
<td>New York</td>
</tr>
<tr>
<td>The Little Bluebird</td>
<td><em>Songs of Childhood</em></td>
</tr>
<tr>
<td>Chickadee</td>
<td>Music Educational Series</td>
</tr>
<tr>
<td>My Canary</td>
<td>Ginn and Co.</td>
</tr>
<tr>
<td></td>
<td>Dallas</td>
</tr>
<tr>
<td>The Robin</td>
<td><em>Music Hour for Kindergarten and First Grade</em></td>
</tr>
<tr>
<td></td>
<td>McConathy, Miessner, Birge, &amp; Bray</td>
</tr>
<tr>
<td></td>
<td>Silver, Burdett and Co.</td>
</tr>
<tr>
<td></td>
<td>Chicago</td>
</tr>
<tr>
<td>Pigeons</td>
<td><em>A Child's Book of Songs</em></td>
</tr>
<tr>
<td></td>
<td>Robert Foresman</td>
</tr>
<tr>
<td></td>
<td>American Book Co.</td>
</tr>
<tr>
<td></td>
<td>Chicago</td>
</tr>
</tbody>
</table>
Learning poems about birds.

The children should be allowed to select the poems they like best and learn them in ensemble style.

Some of the poems found most desirable for this work are as follows:

The Bluebird

I know the song that the bluebird is singing,
Out in the apple-tree where he is swinging.
Brave little fellow! the skies may be deary,---
Nothing cares he while his heart is so cheery.
Hark! how the music leaps out from his throat!
Hark! was there ever so merry a note?
Listen a while, and you'll hear what he's saying,
Up in the apple-tree swinging and swaying.
"Dear little blossoms down under the snow,
You must be weary of winter, I know;
Hark while I sing you a message of cheer!
Summer is coming! and spring-time is here!"
"Little white snow-drop! I pray arise;
Bright yellow crocus! come open your eyes;
Sweet little violets, hid from the cold,
Put on your mantles of purple and fold;
Daffodils! daffodils! say, do you hear?--
Summer is coming! and spring-time is here."

Emily Huntington Miller
The Robin's Nest

How do the robins build their nests?
Robin Redbreast told me.
First a wisp of yellow hay
In a pretty round they lay
Then some threads of flax or floss,
Feathers, too, and bits of moss,
Woven with a sweet, sweet, sweet song,
This way, that way, and across:
That's what Robin told me.

Where do robins hide their nests?
Robin Redbreast told me.
Up among the leaves so deep,
Where the sunbeams rarely creep.
Long before the winds are cold,
Long before the leaves are gold,
Bright-eyed stars will peep and see
Baby robins --- one, two, three:
That's what Robin told me.

George Cooper
Two Little Birds

Two little birds sat on a tree
On a warm bright sunshiney day.

Said the first little bird,
"My greatest joy is flying far away, away."
And away, away he flew.

Said the second little bird,
"My greatest joy is the people and things
around me
And the good that I can do."

And he flew to the door
Of a little lame boy,
And sang till the air
Was filled with joy
The prettiest song he knew.

Unknown
Once I Saw A Little Bird

Once I saw a little bird
Come hop, hop, hop;
So I cried, "Little bird,
Will you stop, stop, stop?"
And was going to the window
To say, "How do you do?"
But he shook his little tail,
And far away he flew.

Unknown

What Does Little Birdie Say?

What does little birdie say,
In her nest at peep of day?
"Let me fly," says little birdie,
"Mother, let me fly away."

"Birdie, rest a little longer,
Till the little wings are stronger."
So she rests a little longer,
Then she flies away.

Alfred Tennyson
The Little Birds

Once on a time, two little birds
Sat singing in a willow tree,
And every song those birdies sang
Was just as sweet as it could be.

They sang: "O, we have got a nest,
'Tis swinging in this willow tree,
And in the nest our baby birds
Are safely cuddled, one, two, three.

"But by and by they'll sing and fly
As loud and far as all the rest,
Chick, chick-a-dee, dear willow tree,
Swing for birdies in their nest."

Now, all the time, a cruel cat
Was listening to the song, and she
Said to herself: "I'd like a bird
To eat this evening for my tea."

So then she crept, and crept, and crept,
So very softly no one heard.
"And now," said she, "I'll climb the tree,
And catch the biggest little bird."
Just then a little boy named Claude
Came running down the road and he
Called out: "You naught, wicked cat,
Come down, you mustn't climb that tree!"

And when the pussy heard him shout,
She trembled very much with fright,
And jumped right down and ran away,
And ran and ran till it was night.

The little birds looked down at Claude,
They sang a happy song of joy:
"Chick, chick-a-dee, we're safe and we
Will always love that little boy."

Mary C. Fletcher

Little Robin Redbreast

Little Robin Redbreast
Sat upon a rail;
Middle naddle went his head,
Wiggle waggle went his tail.

Mother Goose
The Woodpecker

The woodpecker pecked out a little round hole
And made him a house in the telephone pole.

One day when I watched he poked out his head,
And he had on a hood and a collar of red.

When the streams of rain pour out of the sky,
And the sparkles of lightening go flashing by,

And the big, big wheels of thunder roll,
He can smuggle back in the telephone pole.

Elizabeth Madox Roberts

The Screech Owl

The screech owl lives in a hole in a tree.
Only at night is he able to see;
On noiseless wings he flies about
To catch any mice that may be out.
Then he flies back, and sleeps all day
While you and I are out to play.

Unknown
The Brown Thrush

There's a merry brown thrush sitting up in the tree,
He's singing to me! He's singing to me!
And what does he say, little boy, little girl?
"Oh, the world's running over with joy!
Don't you hear? Don't you see?
Hush! Look! In my tree,
I'm as happy as happy can be!"

And the brown thrush keeps singing, "A nest do you see,
And five eggs hid by me in the juniper tree?
Don't meddle! Don't touch, little girl, little boy,
Or the world will lose some of its joy!
Now I'm glad! Now I'm free!
And I always shall be,
If you never bring sorrow to me."

So the merry brown thrush sings away in the tree,
To you and to me, to you and to me.
And he sings all the day, little girl, little boy,
"Oh the world's running over with joy!}
But long it won't be,
Don't you know? Don't you see?
Unless we're as good as can be?"

Lucy Larcom

The Robin

When father takes his spade to dig
Then Robin come along;
He sits upon a little twig
And sings a little song.

Or, if the trees are rather far
He does not stay alone,
But comes up close to where we are
And bobs upon a stone.

Lawrence Alma-Tadema

A Bird

A bird came down the walk;
He didn't know I say
He bit an angle-worm in halves
And ate the fellow raw.
And then he drank a dew
From a convenient grass,
And then hopped sidewise to the wall
To let a bettle pass.

Unknown

Mrs. Peck-Pigeon

Mrs. Peck-Pigeon
Is pecking for bread,
Bob-bob-bob
Goes her little round head,
Tame as a pussy cat
In the street,
Step-step-step
Goes her little red feet.
With her little red feet
And her little red head,
Mrs. Peck-Pigeon
Goes pecking for bread.

Unknown
14. Writing stories about birds.

The following are samples of what the children might compose in writing stories. The first story is a factual story while the second story is what we sometimes call fantastical.

The Cardinals

The cardinals are bright red.
The male cardinal wears a black necktie.
On his head he wears a crest.
The female cardinal lays three white eggs with light brown spots on them.
The cardinals eat worms and seeds of weeds.
They do not make a very good nest.
They have very sweet songs.

Mr. Woodpecker’s Dinner

Tap, tap, tap goes Mr. Red-headed Woodpecker.
"Oh! What is that?", said little Wiggle Worm.
"Be still; let’s see what it is."
Mr. Woodpecker tapped again.
Then he listened.
Little Wiggle Worm peeped out the window.
He saw Mr. Woodpecker.
He snuggled back in the telephone pole.
Tap, tap, tap down goes Wiggle Worm's door.
Gobble, gobble down goes little Wiggle Worm.
And that was the end of Wiggle Worm.

15. Writing riddles about birds.

The following are samples of the types of riddles the first grade children might make:

I am red.
I have a black necktie.
I have a topknot.
I sing a pretty song.
What am I?

I am gray and white.
I mock other birds.
I am the Texas State bird.
What am I?
16. Collecting pictures of birds.

The children should be encouraged to bring bird pictures to school. These pictures should be shown and explained to the class by the owner. The bulletin board could be made an attractive place by these pictures.


Either a bird book or a book of bird riddles might be made by the children to be put in their library for future use and for the pleasure of reading later on.

The bird book might contain the stories that the children had composed, pictures that they had drawn, and the riddles that they had made.

The covers for these books should be planned and made by the children.

18. Drawing pictures about birds.

This activity of drawing pictures of birds should take place at many different intervals. Most of these pictures should be the children's own drawings, however, a few hectographed sheets might be used.

19. Playing about birds.

Bird games interest the children very much. Perhaps
the children might make up some games. Following are two examples:

**Bird Picture Recognition**

In playing this game the teachers holds up a picture of a bird. The children raise their hands if they know the name of the bird.

This is a means of checking to see just how many birds the children can recognize by picture.

**Two Little Blackbirds**

This game is quite old, but the children alway enjoy it. First, teach the poem.

Two little blackbirds
Sitting on a fence.
One's name is Jack
One's name is Jill.
Fly away Jack.
Fly away Jill.

Come back Jack.
Come back Jill.

In playing this game the players use their two fore fingers. On these two fingers stick small pieces
of paper. With the children decide which finger is Jack and which is Jill. Then, sitting with elbows on the desk and fingers in the air, say the first four lines.

As you say "Fly away Jack", sling that hand back over the shoulder and tuck "Jack" in the fist, and bring back the finger next to the one named "Jack". This makes it look as if the paper had flown away.

"Jill" is treated in the same manner.

As you say "Come back Jack", again sling that hand over the shoulder and bring out "Jack", and put the other finger back in the fist.

"Jill" is treated in the same manner.

20. Making a bird corner in our room.

The children should be permitted to select a place in the room to keep all collections they might care to bring concerning birds. This corner might be connected with the science corner. The children would probably bring pictures, bird nests, bird eggs, books, and drawings. All these things would make an interesting and attractive place in the room.


Children always enjoy playing stories. In playing stories
about birds the children would certainly have an opportunity to do some creative work. Most of the stories listed in activity eleven are suitable for dramatization.

22. Joining the Audubon Junior Society.

The following is a description of the steps taken by the first grade children of the Demonstration School in joining the Audubon Junior Society.

The teacher explained what the Audubon Junior Society was and what it stood for. She also told the children that they could join this Society if they wished to help protect birds.

The small cost of ten cents per pupil was brought and sent immediately to the Society.

In a few days a large package was delivered to the room. On opening it they found it was from the Audubon Society. After having examined all the material sent, the children were eager for their pins.

Each child came before the room and took this oath which they had made themselves, "I will help protect birds." If a child did not say it so that everyone could hear him or did not say it as if he really meant it, the group insisted that he say it again.

They have enjoyed being a member of this Society, and wearing the pin has meant much to them because of its meaning.
23. Going on sight-seeing trip to see a mother bird feeding her young.

If possible the teacher should locate a mother bird with her young ones and take the children to see these while feeding. This is an excellent opportunity to note the length of time it takes birds to come into maturity, that is, just how long it takes them to become strong enough to leave their nest.

24. Carrying on discussions about birds.

These discussions are to be carried on largely by the children. They might tell each other about the birds they have seen from day to day and what these birds were doing that interested them. Questions should be asked by the teacher, thus making inquiries necessary. The teacher should help out when she is needed; usually, by asking some question that she hopes will stimulate further investigation.

25. Writing to the Singer Sewing Machine Company for free bird pictures.

The teacher may write to the company and ask for these pictures or the children may buy penny postal cards and write a very short note to the company themselves. The
note may be this brief--

Dear Sir:

Please send me the free bird pictures.

Betty Jones
1111 Mulberry St.
Denton, Texas

The address:

The Singer Sewing Machine Co.
149 Broadway
New York

26. Entertaining the parents.

If the teacher feels the need for a culminating activity, she could invite the parents to the room for a short display of the children's work.

The children should be divided into committees to make plans for the entertainment. They would decide on their menu and how to arrange the room so that it would be comfortable. They should decide on the program and the materials they wished to display.

The teacher might help by suggesting these things if the children failed to mention them:

Songs about birds.
Reading stories about birds that they composed.
Reading poems and riddles.
Having a dramatization.
Displaying charts, booklets, and illustrations.
Everyone a host to show the display to his guest.
WAYS THE UNIT MAY BE LAUNCHED

By reading a poem about a bird.
By putting pictures of birds on the bulletin board.
By putting bird books on the reading table.
By taking a walk in the park.
By taking a trip to the zoo.
By having a news and reports period and some child reports having seen a bird.
By reading a bird story.
By singing songs about birds.
By taking a walk to see a nest of young birds.
By discussing the signs of spring.
By children observing birds on the way to school.
By a display of birds that have been stuffed.
POSSIBLE LEADS TO OTHER UNITS

Making a garden.
Observing butterflies.
Watching a tadpole grow into a frog or a toad.
Making friends with animals.
Learning about the honeybee.
Helping to make our campus more beautiful.
Riding in the air.
Collecting wild flowers.
Watching spring come.
Watching the trees change.
TESTS FOR CHILDREN

Directions:

Underline the word that completes the sentence.

1. The red-headed woodpecker has a head of
   green red brown
2. The flicker is the woodpecker's cousin brother sister
3. The redbird is called a crow cowbird cardinal
4. The blue jay is blue red green
5. The robin has a bill of black yellow orange
6. The cedar waxwing eats berries worms grass
7. The mockingbird is a good jumper player singer
8. The canary is a good chick pet dog
9. The hummingbird is big little black
10. The crow is white red black
Directions:

If the sentence is **true** underline **Yes**.

If the sentence is **not true** underline **No**.

1. The English sparrow is our friend.  **Yes**  **No**
2. The canary is a pet.  **Yes**  **No**
3. Hummingbirds are little carpenters.  **Yes**  **No**
4. A baby blue jay is blue and white.  **Yes**  **No**
5. The yellow warbler has a pretty song.  **Yes**  **No**
6. The cardinal cannot sing.  **Yes**  **No**
7. The junco is called a snow bird.  **Yes**  **No**
8. The oriole is orange and black.  **Yes**  **No**
9. The redbird lives here in the spring.  **Yes**  **No**
10. The redheaded woodpecker is green.  **Yes**  **No**
11. The chick-a-dee eats sitting up-side-down.  **Yes**  **No**
**Directions:**

Make a ring around each word the teacher tells you to.

<table>
<thead>
<tr>
<th>bird</th>
<th>bird</th>
<th>bird</th>
</tr>
</thead>
<tbody>
<tr>
<td>woodpecker</td>
<td>flicker</td>
<td>bluebird</td>
</tr>
<tr>
<td>oriole</td>
<td>blue jay</td>
<td>wren</td>
</tr>
<tr>
<td>mockingbird</td>
<td>sparrow</td>
<td>dove</td>
</tr>
<tr>
<td></td>
<td>brown thrush</td>
<td>hummingbird</td>
</tr>
<tr>
<td>crow</td>
<td>eagle</td>
<td>crow</td>
</tr>
<tr>
<td>pigeon</td>
<td>cardinal</td>
<td>junco</td>
</tr>
<tr>
<td>robin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>meadowlark</td>
<td>bobolink</td>
<td>mockingbird</td>
</tr>
<tr>
<td>goldfinch</td>
<td>cedar waxwing</td>
<td>sparrow</td>
</tr>
<tr>
<td>wood thrush</td>
<td>penguin</td>
<td>dove</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>flicker</td>
<td>eagle</td>
<td>woodpecker</td>
</tr>
<tr>
<td>bluebird</td>
<td>blue jay</td>
<td>bobolink</td>
</tr>
<tr>
<td>oriole</td>
<td>wren</td>
<td>robin</td>
</tr>
</tbody>
</table>
Directions:

The riddles are to be read aloud by the children. After the riddle has been read, each child is to underline the name of the bird he thinks that riddle tells about.

I work with my bill.
I eat worms, insects, and seeds of weeds.
I live in a telephone pole.
I have a red head.
Who am I?

robin red-headed woodpecker cardinal

I have a black necktie.
I eat worms and insects.
I am red.
I sing sweet songs.
Who am I?

cardinal sparrow flicker

I have an orange brown breast.
I sing sweet songs.
I help the farmer.
Who am I?

robin cardinal woodpecker
Keys for Tests

Test I
1. red
2. cousin
3. cardinal
4. blue
5. yellow
6. berries
7. singer
8. pet
9. little
10. black
11. red
12. tree

Test III
woodpecker eagle
blue jay bobolink
wren
robin
cardinal
hummingbird
meadowlark
cedar waxwing
sparrow
bluebire

Test II
1. No
2. Yes
3. No
4. No
5. Yes
6. No
7. Yes
8. Yes
9. Yes
10. Yes
11. No
12. Yes

Test IV
red-headed woodpecker
cardinal
robin
TEST FOR TEACHER

Do the children have a knowledge of the different birds found in our community?

Yes   No

Do the children have a knowledge of

The birds that have spent the winter away from us?

Yes   No

The birds that returned to us in the spring?

Yes   No

The birds that spent the winter with us?

Yes   No

Do the children have a knowledge of the influence of the spring on birds?

Yes   No

Do the children have a knowledge of the ways birds have of protecting themselves?

Yes   No

Do the children have a knowledge of our song birds and their songs?

Yes   No

Do the children have a knowledge of the fact that some birds just come through our community on their way farther north?

Yes   No

Have the children shown progress in creativeness?

Yes   No
Do the children have a skill in recognizing the different birds by their colors?  
Yes  No

Have the children developed a skill in giving reports?  
Yes  No

Have the children developed habits of listening courteously to the reports being given?  
Yes  No

Do the children refer to books to prove their statements?  
Yes  No

Have the children developed a habit of listening to songs of birds?  
Yes  No

Have the children developed kindly attitudes toward birds?  
Yes  No

Have the children developed an inquiring attitude toward birds?  
Yes  No

Have the children developed a cooperative attitude in working together?  
Yes  No

Have the children developed a courteous attitude toward the person reporting?  
Yes  No

Have the children developed a courteous attitude toward Others while making a field trip?  
Yes  No
Others while using materials?

Yes  No
Do the children have an appreciation of the beauty of coloring of certain birds?

Yes  No
Do the children appreciate and enjoy the songs of the different birds?

Yes  No
Do the children understand and appreciate how birds serve us?

Yes  No
Have the children developed a skill in reading?

Yes  No
Have the children shown an interest in collecting materials about birds?

Yes  No
Have the children shown an interest in field trips?

Yes  No
Have the children shown an increased skill in singing?

Yes  No
BIBLIOGRAPHY


Allen, Glover, *Birds and Their Attributes*, Boston, Marchall Hones Company; 1925

Ashbrook, F. G., *The Blue Book of Birds of America*, Racine Wis., Whitman Publishing Company; 1931


King, Julius, *More Birds in Rhyme*, New York, Thomas Nelson and Sons; 1927

Mathews, S.F., *Field Book of Wild Birds and Their Music*, New York, Putman's Son; 1921


Terrel, Mary Field, *Bird House to Let*, New York, Frederick A. Stokes Company

Walker, Margaret C., *Our Birds and Their Nestlings*, New York, American Book Company; 1904
CHAPTER IV

A SUGGESTED OUTLINE FOR THE SCHOOL YEAR

September

I. Animals:
   Studying Our Pets

II. Insects:
   Butterflies and Moths
      (1) Common names
      (2) Collections

October

I. Plants
   A. How plants get ready for winter
   B. Leaves
   C. Trees
   D. Seeds

II. Insects
   A. Butterflies
   B. Wasps
   C. Grasshoppers
   D. Bees
III. Rocks
   A. Beauty
   B. Shape
   C. Color
   D. Names of very common rocks.

IV. Animals
   A. Tortoise
   B. Terrapin

November

I. Plants (continued):
   . Collection

II. Rocks (continued)
   A. Fossil
   B. Collection
   C. Carlsbad Carvans

III. Insects
   A. Bees
   B. Wasps
   6. Butterflies

IV. Animals
   A. Tortoise
   B. Terrapin
   C. Turtle
I. Plants (continued)
   A. How plants store up food
   B. How plants rest
   C. How plants are made up

II. Weather

III. Insects (continued)
   A. Bees
   B. Wasps
   C. Ants

IV. Rocks:
   Names of rocks collected

V. Animals:
   How animals get ready for winter

January

I. Rocks (continued)

II. Heavens
   A. What makes day and night?
   B. Do the sun and moon move?
   C. Does the earth move?
February

I. Rocks (completed)

II. Wild Flowers:

Observation of the first wild flowers

III. Heavens (completed)

IV. Birds

March

I. Plants:

Making a garden

II. Wild Flowers (continued)

III. Fish

A. Goldfish

B. Crayfish

IV. Insects

A. Butterflies

B. Moths

C. Grasshoppers

V. Animals

A. Snakes

B. Birds
April

I. Wild Flowers:
   Collection

II. Birds (continued)

III. Insects
   A. Moths
   B. Butterflies

IV. Animals
   A. Frogs
   B. Tadpoles
   C. Horned Toads

May

I. Wild Flowers

II. Birds

III. Insects
   A. Butterflies
   B. Moths
   C. Lightning bugs
CHAPTER V

CONCLUSIONS

From the results of the choices of thirty-four children, the following conclusions were drawn:

TABLE I

OUTSTANDING INTERESTS OF EACH MONTH

<table>
<thead>
<tr>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pets</td>
<td>Plants</td>
<td>Rocks</td>
<td>Bees</td>
<td>Rocks</td>
<td>Rocks</td>
<td>Garden</td>
<td>Wild</td>
<td>Birds</td>
</tr>
<tr>
<td>Butterflies</td>
<td>Butterfly</td>
<td>Plants</td>
<td>Plants</td>
<td>Heavens</td>
<td>Birds</td>
<td>Wild</td>
<td>Flowers</td>
<td>Wild</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bees</td>
<td>Rocks</td>
<td>Bees</td>
<td>Wild</td>
<td>Butterflies</td>
<td>Flowers</td>
<td>Butterflies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weather</td>
<td></td>
<td></td>
<td>Flowers</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table I shows the variety of interests which indicates the effect of seasonal changes on the children. There are twelve different outstanding interests for the entire year.

According to the ranking of each item, Table I shows the interest in pets was ended in September. The interest
in butterflies began in September. After a period of four months this interest revived and continued throughout the remaining school months.

A further study of the original data which is not presented in this document indicates:

1. In October plants held first place in the children's interests; took second place in November, and maintained second place in December.

2. The dominant interest of November was in rocks. This interest continued during the months of December, January, and February. A definite interest in bees appeared in November. This interest took first place in December and ended in January.

3. An interest in weather was shown in December. It did not appear again.

4. In January a short, yet strong, interest was shown in the heavens; however, this interest did not have the recurrence that it might have had.

5. February brought two very outstanding interests, in birds and in wild flowers. These interests continued throughout March, April, and May, holding first and second place except during the month of March when the interest in making a garden held first place.

6. In April an interest in frogs and their growth was shown. This interest lasted only the one month.
TABLE II

OBJECTS AND SPECIMENS BROUGHT IN BY CHILDREN

<table>
<thead>
<tr>
<th>Child</th>
<th>Plants</th>
<th>Animals</th>
<th>Rocks</th>
<th>Pictures</th>
<th>Books</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>3</td>
<td>20</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>2</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>12</td>
<td>2</td>
<td>4</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>7</td>
<td>13</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>8</td>
<td>3</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>7</td>
<td>2</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table II indicates the organization of teaching materials around large topics according to objects and specimens brought in by the children which served as a means of selecting the content for the first grade.

It will be observed from the above table that plants were brought in the greatest number of times. This indicates the great interest these children had in growing things.

Rocks came next to plants in number and interest. This showed the interest the children had in their immediate surroundings.
Animals, according to the number brought in, held third place in the children's interest. This number is high considering the fact that seventy-two different animals were brought into the school room and given close observation.

This study showed clearly that books and pictures play a minor part in the children's study of nature. Seemingly the children had much rather have the real object or specimen before them to observe and to study.
### Table III

The number of different items brought in - the number of boys of the first grade bringing in each item

<table>
<thead>
<tr>
<th>Number of Boys</th>
<th>Item</th>
<th>Number Brought In</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Plants</td>
<td>809</td>
</tr>
<tr>
<td>14</td>
<td>Animals</td>
<td>46</td>
</tr>
<tr>
<td>13</td>
<td>Rocks</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>Books</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Pictures</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>233</td>
</tr>
</tbody>
</table>

### Table IV

The number of different items brought in - the number of girls of the first grade bringing in each item

<table>
<thead>
<tr>
<th>Number of Girls</th>
<th>Item</th>
<th>Number Brought In</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Plants</td>
<td>65</td>
</tr>
<tr>
<td>8</td>
<td>Animals</td>
<td>26</td>
</tr>
<tr>
<td>11</td>
<td>Rocks</td>
<td>74</td>
</tr>
<tr>
<td>5</td>
<td>Books</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Pictures</td>
<td>5</td>
</tr>
<tr>
<td>37</td>
<td></td>
<td>475</td>
</tr>
</tbody>
</table>
Table III and IV indicate that the boys were slightly more active than the girls in bringing in objects and specimens for study.

A total of 408 objects and specimens were brought in. The boys brought in 57.1% of the objects and specimens and the girls brought in 42.9%.

Outstanding teaching units for the first grade in this community and in similar ones might be taken from Table I as follows:

**September**
- Bringing Our Pets to School

**October**
- How Plants and Animals Get Ready for Winter

**November-December-January-February**
- Learning About the Rocks in Our Community

**February-March-April-May**
- Helping the Birds in Our Community
- Learning About Bees

**March**
- Making and Using a Garden
April-May

Watching Tommy Tadpole Grow
Having a Wild Flower Show
Collecting Butterflies and Moths

A guide for teaching nature study may be successfully made from spontaneous and stimulated questions by the children and the teacher. The questions should come out of a free discussion period.

My experience with this problem leads me to believe that the teacher of nature study should have some training in this field. He must have a true interest in this field as well as an actual knowledge. This does not mean that he must know all the facts about nature, but he should know enough to guide the children intelligently in finding out the things they will want to know.

From this problem I was led to agree with authorities that Nature Study does not need to be taught as fantastical or mythical to be made interesting. It is more interesting to the children in its true form.
BIBLIOGRAPHY

Chapman, Frank M., **Color Key to North America Birds**, New York, D. Appleton and Company; 1912

Comstock, Anna B., **Handbook of Nature Study**, Ithaca, New York, Comstock Publishing Company; 1931

Dewey, John, **Democracy and Education**, New York, The Macmillan Company; 1933

Miller, O.T., **The First Book of Birds**, New York, Houghton, Mifflin and Company; 1902