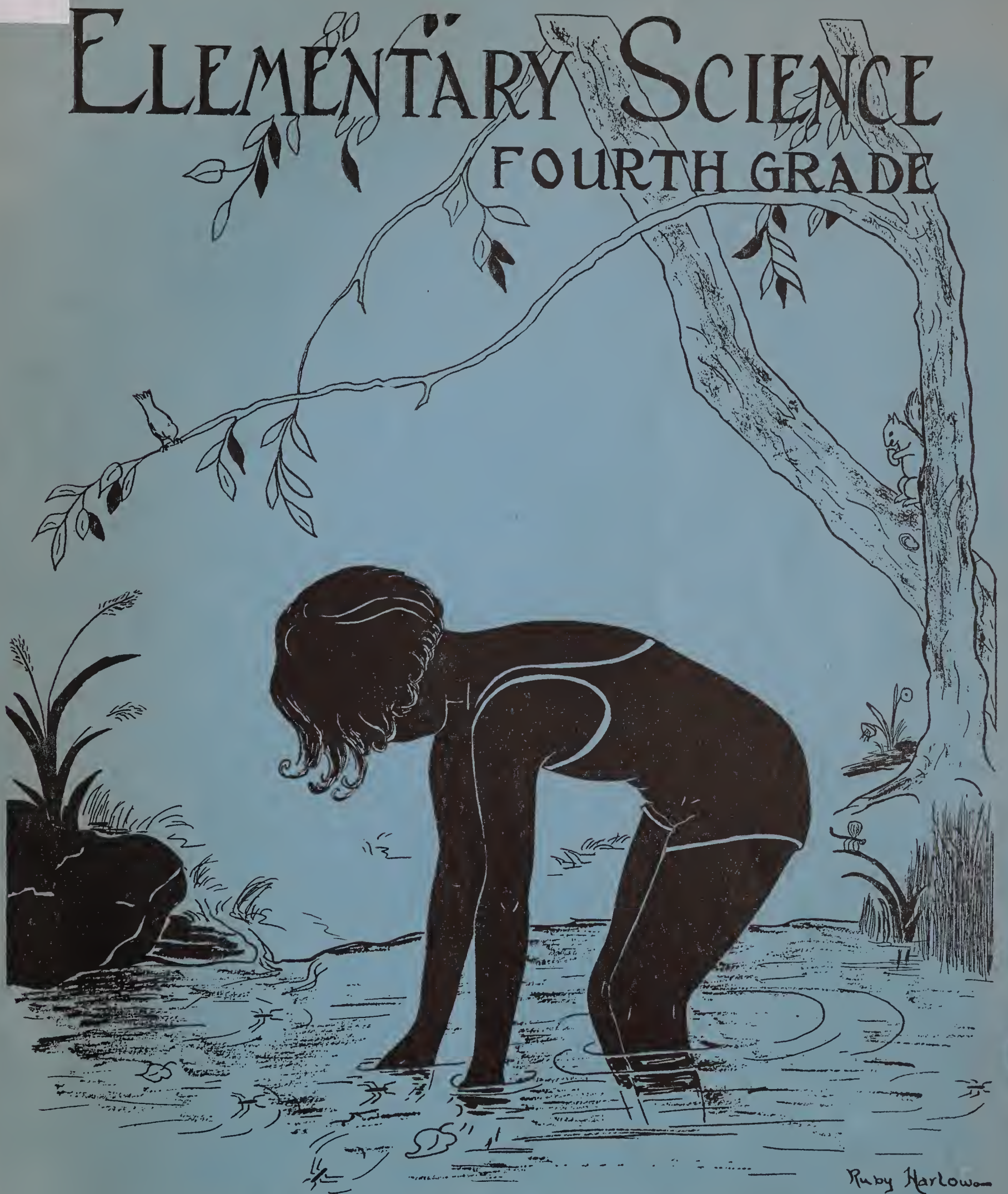


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# ELEMENTARY SCIENCE

## FOURTH GRADE



Ruby Harlow

BY CLARA MALLORY



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HARLOW PUBLISHING COMPANY

Oklahoma City, Oklahoma

**A Comprehensive Guidebook**

**for**

**Elementary Science**

**in the**

**Fourth Grade**

By

CLARA MALLORY

ELEMENTARY SUPERVISOR, BEAUMONT CITY SCHOOLS

with the co-operation of

MABEL BEAN, ZELMA SPENCER, AND CATHERINE TOUCHSTONE

This guidebook belongs to

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# CONTENTS

	Page		Page
Parts of a Flower .....	1	The Humming Bird .....	42
Types of Flowers .....	4	The Red-Winged Blackbird .....	43
The Cat-Tail .....	8	The Mocking Bird .....	44
The Goldenrod and Dandelion .....	10	The Red-Headed Woodpecker .....	47
The Aster .....	15	The Cardinal .....	48
Ferns .....	15	Bird Houses .....	49
Fungi .....	17	Bird Stories .....	51
Oaks .....	19	Soil .....	52
Pines .....	21	Minerals .....	53
Elms .....	22	Rocks .....	53
Care of Trees .....	23	Stars .....	56
Leaves .....	24	Stars and Planets .....	57
Seeds .....	26	Wind .....	59
Uses of Wood .....	27	Airplanes .....	62
Insects .....	29	Spring Flowers .....	63
The Grasshopper .....	31	The Violet .....	65
The Dragon Fly or Mosquito Hawk ..	33	The Wild Rose .....	66
Wasps .....	35	A Puzzle .....	67
Galls .....	36	Painted Turtle .....	68
Birds .....	38	The Bat .....	70
The Robin .....	39	Spiders .....	71
The Meadow Lark .....	40		

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## PARTS OF A FLOWER



The *petals* are the colored leaves of the flower. These attract the bees and other insects to the flower so it can get some *pollen*. The *sepals* hold the petals together. The *stamens* are the little factories where the pollen is made. We call the part of the stamen that holds the pollen, the *anther*. The little stem that holds up this anther is called the *filament*. The pistil has three parts: the *stigma*, the *style*, and the *ovary*. The stigma is the top of the pistil; it is sticky and the pollen easily sticks to it. The style is a tube that leads to the ovary which is the seed pod in which the seeds are made. The ovules and the pollen grains together form the seeds.

On the above picture write the following names in their correct places:

- |            |              |             |
|------------|--------------|-------------|
| 1. Petals  | 6. Sepal     | 11. Corolla |
| 2. Calyx   | 7. Ovary     | 12. Pollen  |
| 3. Pistil  | 8. Ovules    | 13. Style   |
| 4. Stamens | 9. Stigma    | 14. Stem    |
| 5. Anther  | 10. Filament | 15. Leaf    |

Fill in the blanks with the right words:

- The \_\_\_\_\_ attract insects to the flowers.
- The seeds are formed by the \_\_\_\_\_
- All the petals together form the \_\_\_\_\_

4. Bees get \_\_\_\_\_ and \_\_\_\_\_ from flowers.
5. Pollen is made by the \_\_\_\_\_
6. The petals are held together by the \_\_\_\_\_
7. The flower is held up in the air by the \_\_\_\_\_
8. The stigma is part of the \_\_\_\_\_
9. Each flower must have \_\_\_\_\_ to form seeds.
10. We call all the sepals together the \_\_\_\_\_

*Color your flower.*

#### HOW THE FLOWERS GROW

This is how the flowers grow:  
I have watched them and I know.

First, above the ground is seen,  
A tiny blade of purest green,  
Reaching up and peeping forth  
East and West, and South and North.

Then it shoots up day by day,  
Circling in a curious way  
Round a blossom, which it keeps  
Warm and cosy while it sleeps.

Then the sunbeams find their way  
To the sleeping bud and say,  
"We are children of the sun  
Sent to wake thee, little one."

And the leaflet opening wide  
Shows the tiny bud inside,  
Peeping with half-opened eye  
On the bright and sunny sky.

Breezes from the West and South  
Lay their kisses on its mouth;  
Till the petals all are grown,  
And the bud's a flower full-grown.

This is how the flowers grow;  
I have watched them and I know.—Gabriel Setoun



*Here is a simple flower. Draw the pistils and stamens for it.*

*In one space draw a pistil with all its parts. In the other, a stamen with all its parts. Label each part drawn. Color your flower.*

PISTIL	STAMEN

“Little flower; but if I could understand  
What you are, root and all, and all in all,  
I should know what God and man is.”—Tennyson

## THE FLOWERS

All the names I know from nurse:  
Gardener's garters, Shepherd's purse,  
Bachelor's buttons, Lady's smock,  
And the Lady Hollyhock.

Fairy places, fairy things,  
Fairy woods where the wild bee wings.  
Tiny trees for tiny dames—  
These must all be fairy names!

Tiny woods below whose boughs  
Shady fairies weave a house;  
Tiny treetops, rose or thyme,  
Where the braver fairies climb!

Fair are grown-up people's trees,  
But the fairest woods are these;  
Where, if I were not so tall,  
I should live for good and all.—Robert Louis Stevenson

## TYPES OF FLOWERS

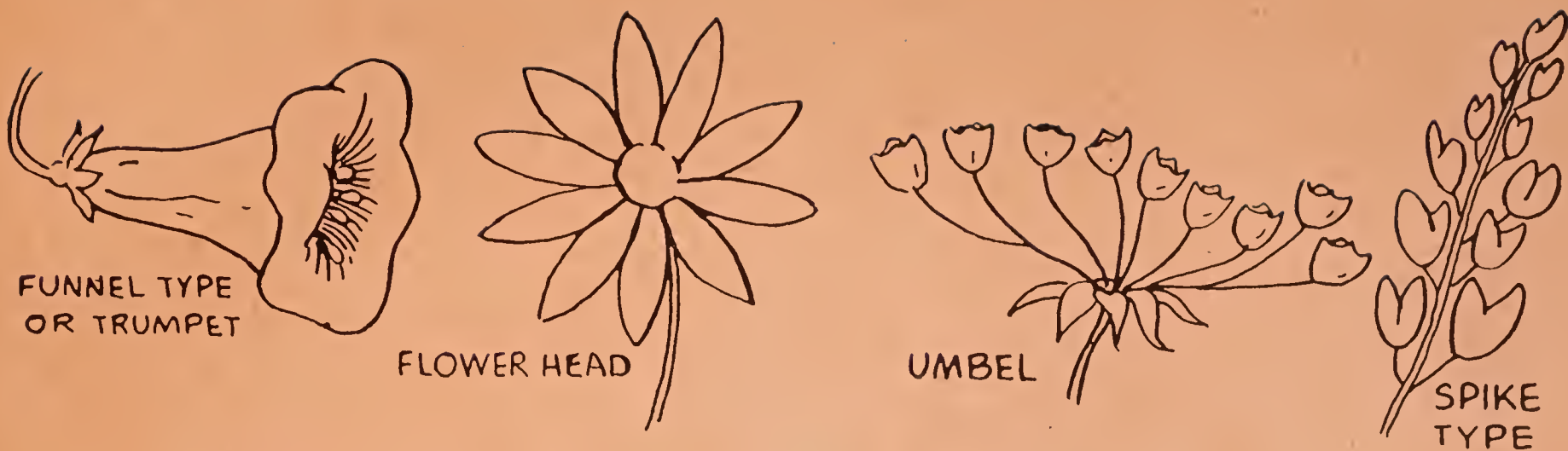
There are many shapes and forms of flowers. Many plants have large blossoms shaped like a funnel or trumpet. We find such flowers on the trumpet creeper, morning glory and jasmine vines. Some plants, such as the sunflower, the daisy and the aster, have a large flower made up of long petals which we call *ray flowers* around the outside of the flower and little *disk* flowers on the inside. We call this type of flower a *composite* flower head.

Another type of composite flower is made up of tiny tube-shaped blossoms with a little pistil and stamens in each. Some examples of this type are the thistle, the dandelion and the iron weed.

Other plants, such as the wild carrot, wild parsnip and wild onion, have flat clusters of little flowers but are not considered to be composite. These clusters are called *umbels*. Plants, such as larkspur, bluebonnets, snapdragons, and blazing star, have the flowers growing on a long, slender stem. We call this the *spike* type of flower.

Examine the pictures on the next page very carefully and you will see these types of flowers. See if you can find other flowers near your home that are like these pictures.





1. Underline the names of the composite flowers in this list:

sunflower  
asters  
dogwood

dandelion  
violet  
primrose

blue vervain  
vetch  
Indian blanket

2. Underline the trumpet-shaped flowers:

violet  
goldenrod

asters  
trumpet creeper

bindweed  
sunflower

sweet pea  
bluebonnet

3. Underline the umbel type flowers:

verbena

asters

goldenrod

primrose

4. Underline the flowers of the spike type:

bluebonnet  
thistles

asters  
snapdragon

fleabane daisy  
salvia

dandelion

5. Underline the flowers that are harmful:

morning glory  
vetch

dandelion  
thistles

Indian blanket  
goldenrod

6. How do bees and other insects help flowers? \_\_\_\_\_  
\_\_\_\_\_

7. Are morning glories and bindweed kin? \_\_\_\_\_

“In all places then and in all seasons  
Flowers expand their light and soul-like wings,  
Teaching us by most persuasive reasons,  
How akin they are to human things.”—Longfellow

TALKING IN THEIR SLEEP

“You think I am dead,” the apple tree said,  
“Because I have never a leaf to show—because I stoop,  
And my branches droop, and the dull gray mosses over me grow!  
But I’m all alive in trunk and shoot;  
The buds of next May, I fold away—  
But I pity the withered grass at my root.”

“You think I am dead,” the quick grass said,  
“Because I have parted with stem and blade;  
But under the ground I am safe and sound  
With the snow’s thick blanket over me laid.  
I’m all alive, and ready to shoot,  
Should the spring of the year come dancing here,—  
But I pity the flower without branch or root.”

“You think I am dead,” a soft voice said,  
“Because not a branch or root I own!  
I never have died, but close I hide  
In a plummy seed that the wind has sown.  
Patient I wait through the long winter hours;  
You will see me again—I shall laugh at you then,  
Out of the eyes of a hundred flowers.—Edith M. Thomas



*Label the parts of this flower. Be sure to spell the names correctly.*

*Some of the following statements are true and some are untrue. Write yes in the blank following the true statements and no following the untrue.*

1. The corolla is the petals of a flower. \_\_\_\_\_
2. Bees get pollen from the stem of a flower. \_\_\_\_\_
3. Ovules make seeds for the flower. \_\_\_\_\_
4. There are just a few stamens to each flower. \_\_\_\_\_
5. Some flowers have guide lines. \_\_\_\_\_
6. All flower stems are rough and hairy. \_\_\_\_\_
7. Each pistil has eight parts. \_\_\_\_\_
8. This flower is trumpet shaped. \_\_\_\_\_
9. These flowers are compound. \_\_\_\_\_
10. The sepals hold the petals together. \_\_\_\_\_



## THE CAT-TAIL



The Cat-tail is a very common plant found in marshy places. It does not like to grow with its roots under water but likes to be very near water. The cat-tail leaves are very long, narrow and flat. Out toward the end the leaf is very limp and easy to bend, but where the leaf joins the stem of the plant it curves to fit the stem, and is hard and brittle. The leaves are arranged alternately on the stem. The root of the plant is fleshy with many rootlets that can push out through the mud in which the plant grows.

The flowers of the cat-tail grow on the long slender stem around which the leaves are wrapped. There are two kinds of flowers on the stem. The upper part of the cat-tail holds the staminate flowers; flowers that have only stamens, that make pollen. The lower part of the flower, the part that looks like plush, holds the pistillate flowers. These have only pistils in them. They make the seeds of the flower. They have no petals, sepals or stamens. They get pollen from the staminate flowers above them or from those of another plant. The wind carries the pollen for this plant.

*Use the following questions in observing the plants that have been brought to class:*

1. What sort of a root has the cat-tail? Why is this root especially adapted to the soil where cat-tails grow?

2. The cat-tail plant.

Are the leaves arranged opposite or alternate? Tear off a few of the leaves and describe the difference between the lower and the upper end of a leaf as follows:

How do they differ in shape? \_\_\_\_\_

Texture? \_\_\_\_\_

Pliability? \_\_\_\_\_

Color? \_\_\_\_\_

Width? \_\_\_\_\_

Does each leaf completely encircle the stalk at its base? \_\_\_\_\_

Of what use is it to have the plant stiffen where the leaves clasp the stalk? \_\_\_\_\_

\_\_\_\_\_

3. Take a single leaf, cut it across near where it joins the main stalk and also near its tip. Look at the cross section to see how the leaf is veined. What do its long veins or ribs

do for the leaf? \_\_\_\_\_

Split the leaf lengthwise and see what other support it has. \_\_\_\_\_

Does the cat-tail leaf break or tear along its edges easily? \_\_\_\_\_

4. The pistillate flowers which are in the plush of the cat-tail have no sepals, petals, odor or nectar. Do you think their pollen is carried to them by the bees? \_\_\_\_\_

How is it carried? \_\_\_\_\_

*Color the cat-tails on page 8 with your crayolas.*

1. *Color the leaves green.*

2. *Color the ripe cat-tail on the right hand side of the picture brown with a yellow top.*

3. *The middle cat-tail is green with a yellow top.*

4. *The cat-tail on the left hand side of the picture is ripe and should be colored brown with a yellow top.*



## THE GOLDENROD AND DANDELION

We have just learned that some flowers are composite, that is, made up of a lot of tiny flowers (*florets*) put together. We are to study two of these types of blossoms, the goldenrod and the dandelion. I'm sure you have seen these common flowers often.

The goldenrod has two kinds of flowers, ray and disk flowers. If you will examine a flower head of the goldenrod, you will find it looks like a little yellow daisy. Pull it apart and you can see both the ray and disk flowers.

The dandelion does not have the separate ray and disk flowers, but it has little tube-shaped florets arranged in circles on its flower head. You can see the little pistil in each floret if you will carefully pull the big flower head apart. See if you can do this.

### THE GOLDENROD



This pretty flower grows wild. It can be found every fall. It grows in fence corners, along the road side, in fields and woods. The goldenrod is made up of many little flower heads which grow along a slender stem very close together. Each flower is made up of two kinds of flowers—ray flowers, and disk flowers.

Another name for ray flower is banner flower. In order to make the bees and other insects come to the plants with pollen from other goldenrods, the ray flowers are set close together to make the bright yellow color that we see when we look at a branch of this



flower. There are as many as fifty-six kinds of goldenrod, but all of them have two flowers in each flower head.

The pollen of this flower is yellow and such insects as bees, bumblebees, carpenter-bees and many others visit the plant to get nectar from the disk flowers. In this way, the pollen is taken from one flower to another and the seed is made. In the late fall the seeds ripen. Each seed has a number of silken threads fastened to it that help the wind to carry it along through the air to a new place where it falls to the ground and buries itself into the earth, to grow into a new plant next fall.

The goldenrod is an autumn flower. Its stem is slender and rod-like with rows of tiny yellow flowers. Each of the tiny little flowers grows close together so it can attract insects to come and gather their pollen and nectar. The tiny flowers along the stem are yellow. It gets its name from being such a stout flower that grows everywhere.

In the days of Queen Elizabeth, they used the goldenrod for healing wounds. Many people call the goldenrod "make-whole" because of its healing powers.

"I am alone with nature  
With the soft September day;  
The lifting hills above me,  
With goldenrod are gay."—Mary Clemmer Ames

*On Page 10 is a picture of the goldenrod for you to color. When you have finished, answer these questions orally in class.*

1. How are the flower heads set upon the stems? \_\_\_\_\_
2. What is the general shape of the flower branches? \_\_\_\_\_
3. Are the flower branches long or short? \_\_\_\_\_
4. Is the stem smooth, downy or covered with bloom? \_\_\_\_\_
5. What is the shape and form of the edges of the lower leaves? \_\_\_\_\_

*After you have returned from a field trip, answer these questions:*

1. Where do you find the goldenrod growing? \_\_\_\_\_
2. Do you find one kind growing alone, or several kinds growing together? \_\_\_\_\_  
\_\_\_\_\_
3. Do you find any growing in the woods? \_\_\_\_\_  
If so, how do they differ in shape from those growing in fields? \_\_\_\_\_
4. How many kinds of insects do you find visiting the goldenrod flowers? \_\_\_\_\_

5. How many kinds of galls do you find on the goldenrod stems and leaves? (See page 10.)

Where? \_\_\_\_\_

*Complete these sentences:*

1. The goldenrod is an \_\_\_\_\_ flower.
2. The tiny flowers along the stem are \_\_\_\_\_
3. It gets its name from being such a \_\_\_\_\_
4. In the days of Queen Elizabeth, they used it for \_\_\_\_\_  
because of its \_\_\_\_\_
5. Many people call it \_\_\_\_\_

## THE DANDELION



*Color the flower on this page yellow, and the stem and leaves green. Color the seed brown, but leave the silky part white.*

“There’s a dandy little fellow,  
Who dresses all in yellow,  
In yellow with an overcoat of green;  
With his hair all crisp and curly,  
In the springtime bright and early  
A-tripping o’er the meadow he is seen,  
Through all the bright June weather,  
Like a jolly little tramp,  
He wanders o’er the hillside down the road.  
Around his yellow feather,  
The gypsy fireflies camp;  
His companions are the wood lark and the toad.”—Gilbert M. Garabrant

The edges of the dandelion are notched in a peculiar way, so that the lobes were, by



some one, supposed to look like a lion's teeth; thus the plant was called in France *dents-de-lion* (teeth of a lion) and from this, the name dandelion has been made. The leaves are so bitter that grazing animals do not like to eat them, and thus the plants are safe, even in pastures.

Before a dandelion head opens, the stem, unless very short, is likely to bend down to protect the young flowers, but the night before it is to bloom, it straightens up; after the blossoms have come out it may again bend over, but straightens up when the seeds are to be cast off.

It oftens takes an hour for a dandelion head to open in the morning, and it seldom stays open longer than five or six hours; it may require another hour to close.

After all the florets of a dandelion family have blossomed, they retire again into their green house and start making seeds. The seeds with their balloons are set so as to make an exquisite filmy globe; and now they are ready to go sailing off. (Observe a seed through a lens). The balloon is attached to the top of the beak as an umbrella frame is attached to the handle, except the "ribs" are many and fluffy; while the dandelion youngster, hanging below, has an overcoat armed with grappling hooks, which enables it to cling fast when the balloon chances to settle to the ground.

The following are the ways by which the dandelion gets the better of us and takes its place in our lands:

It blossoms early in the spring and until snow falls, producing seed for a long season.

It is broadminded as to its location, and flourishes on all sorts of soils.

It thrusts its long tap roots down into the soil, and thus gets moisture and food not reached by other plants.

Its leaves spread out from the base, and crowd and shade many neighboring plants out of existence.

It is on good terms with many insects, and so has plenty of pollen carriers to make strong seeds; it can also develop seeds from its own pollen, and as a last resort it can develop seeds without any pollen.

It develops almost numberless seeds, and the wind scatters them far and wide and thus takes possession of new places.

It forms vigorous leaf rosettes in the fall, and thus is able to begin growth early in the spring.

1. How are dandelion seeds carried? \_\_\_\_\_
2. What part of the flower gives it the name of dandelion? \_\_\_\_\_
3. Why do animals leave this plant alone? \_\_\_\_\_
4. Why is it hard to pull up this plant? \_\_\_\_\_
5. What kind of flower is the dandelion—simple or compound? \_\_\_\_\_

## THE ASTER

The aster is another very common fall flower. It grows in fields, on the banks of streams and along the roadside. The stem has many branches with the small, daisy-like flower heads rather thick upon them. This little flower is also composite. It has yellow disk flowers and white, yellow, or purple ray flowers. See if you can find some asters in the field or vacant lot near your home or school. It is easy to tell the ray flowers from the disk flowers. If you have a microscope, you can see them better.

## FERNS

We all like ferns because they grow well inside our houses and look pretty. We call ferns flowerless plants because they never have any flowers. If you see a fern-like plant with flowers you may know that it is not a true fern; for the true fern never has any flowers at all.

Of course it cannot make any seed to grow new plants since it has no flowers; so it makes little *spores* that take the place of true seed. These spores are made in little fruit dots on the back of some of the fronds. Look at your ferns at home and find some fruit dots. When these are ripe they turn brown and pop open around the sides. The spores are in tiny spore cases. These little cases pop open also and the little spore, which is as fine as dust, puffs out. The spores, when they reach the ground, make a thick leaf-like plant which later sends up a real little fiddle head that becomes a new fern plant.

### FERN SONG

Dance to beat of the rain, little Fern,  
And spread out your palms again,

And say, "Tho' the sun  
Hath my vesture spun,  
He had labored, alas, in vain,  
But for the shade  
That the cloud hath made,  
And the gift of the Dew and the Rain."  
Then laugh and upturn  
All your fronds, little Fern,

And rejoice in the beat of the rain!—John Banister Tabb

Words to learn to spell: frond  
spores

stipe  
fiddlehead

pinules  
fruit dots  
blade



Color the Fern Leaf.

1. Label the parts of the fern.
2. Ferns grow by means of spores, seeds, roots, fronds. (*Underline the correct word.*)
3. The new or young fern frond is called a \_\_\_\_\_
4. Ferns grow best in: cold, wet, warm, damp, sunny, dry, shady places. (*Underline the correct word.*)
5. The green part of the fern is the \_\_\_\_\_
6. Spores grow in \_\_\_\_\_ on the frond.
7. Spores are carried by: animals, wind, water, birds. (*Underline the correct word.*)
8. The \_\_\_\_\_ holds up the blade of the fern.
9. Ferns cannot have seeds because \_\_\_\_\_
10. Does the fern grow like the one in the picture right from the spore?  
\_\_\_\_\_



## FUNGI

Fungi make up one-fourth of our known plants. They have no green coloring matter and therefore have to live on living things (*parasites*) on dead things (*saprophytes*). Some fungi cause dead organic matter to decay so that the elements can again be used in plant or animal growth. Without fungi there would be no decay, humus soil and fermentation and very few contagious diseases. Fungi require food, moisture, oxygen and warmth for growth.

We find mushrooms and other fungi fruiting bodies, without color, brown, olive, yellow or red in color, but with no signs of the living green of other plants. Some of them are parasites, as certain species of bracket fungi which are deadly enemies of living trees; but most of the fungi as a whole are a great boon to the world. Without them our forest would be choked out with dead wood. Decay is simply the process by which fungi and other organisms break down dead material so that most of it returns to the air in gaseous form, and the remainder, mostly humus, mingles with the soil.

*Underline the right words to make the following sentences true:*

1. Fungi make up (one-half, one-fourth, one-third) of our known plants.
2. Fungi have no (red, green, brown) coloring matter.
3. Plants living on living matter are called (parasites, saprophytes).
4. Plants living on dead plants are called (parasites, saprophytes).
5. Fungi require (food, moisture, oxygen, and warmth) for growth.
6. Certain species of bracket fungi are (friends, enemies) of living trees.

### THE MUSHROOM

What could be more wonderful than a plant that has no root, no stem, no leaves, and which springs up with such rapidity that you can fairly see it grow? Mushrooms, like other fungi, have no green coloring matter (*chlorophyll*) by means of which most plants manufacture their food, and so they live on food provided by animals and other plants. And how varied their shapes and colors—flat, umbrella-like, or branching like corals, and delicately tinted with reds and browns. Some are delicious food, while others contain a poison so powerful that to eat it is almost certain death.

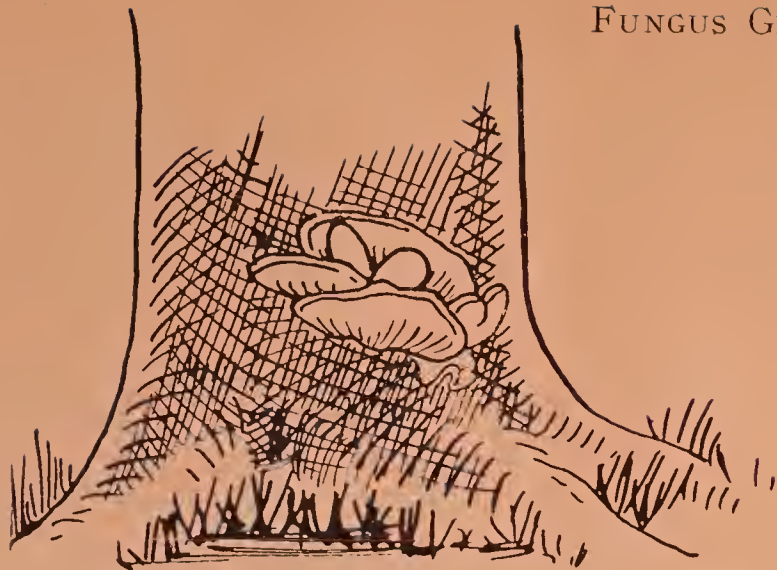
On most mushrooms you will find underneath the umbrella little radiating plate-like gills, set very closely together. It is on these gills that the tiny spores are developed, which drop out, and are carried far and wide by the wind. These develop new plants when they fall upon favorable surfaces.

When the mushroom first pushes above the ground, it is in the "Button stage" and consists of a little rounded cap attached to the stem. Later the cap spreads wide like an umbrella and the stem becomes longer, and there is a collar around the stem. As the plant becomes old the top flattens and is not as smooth and silky as it was, and the collar disappears.

Most mushrooms delight to grow in moist shady woodlawns, or in bottoms of ravines where there is plenty of shade, warmth and dampness.

Many people make a business of raising mushrooms; especially in Europe where fungi are eaten much more commonly than in this country.

FUNGUS GROWTH



SHELF MUSHROOMS



III



I



II

1. Name the parts of these mushrooms. I-II

\_\_\_\_\_

\_\_\_\_\_

2. What type of mushroom is Number I? \_\_\_\_\_

3. Does the mushroom have flowers? \_\_\_\_\_

4. Why has the mushroom no true roots? \_\_\_\_\_

\_\_\_\_\_

5. What type of mushroom is Number III? \_\_\_\_\_

6. Are all mushrooms poisonous? \_\_\_\_\_

7. How do mushrooms spread? \_\_\_\_\_

\_\_\_\_\_

8. How many kinds of umbrella mushrooms have you learned? \_\_\_\_\_

9. Are mushrooms harmful to touch? \_\_\_\_\_

10. Mushrooms are green as well as white, brown or tan. *true-false.*

11. All mushrooms are parasites. *true-false.*

12. It is not safe to pick wild mushrooms to eat because \_\_\_\_\_

13. Mushrooms spread by means of: gills, pores, seeds, spores, buttons, roots, stems.  
(*Underline the correct word.*)

14. People often grow mushrooms to eat. *true-false.*

Words to learn to spell:

parasites  
spores

puffball  
(shelf) bracket mushroom

gills  
coral

spawn  
pores

umbrella



## OAKS

When we begin a study of trees we will find the oaks very interesting. These trees form a large family. There are white oaks, black oaks, red oaks, burr oaks, willow oaks, pin oaks, water oaks and live oaks. All of the oaks are very hardy trees. Their wood is very hard and is used in making furniture and floors. The seeds of oaks are called acorns. All oaks, except the live oak, are deciduous trees. Each kind of oak has a different type of leaf. Some have wavy margins while others have lobed margins; some are long and broad while some are narrow. What kind of oaks grow near your school?



RED OAK



BLACK JACK



WILLOW OAK



POST OAK

1. Make a sketch of an oak tree you have studied (winter tree).

2. Draw the acorns for the pictures at the top of the page.



## THE OAK TREE

Sing for the Oak Tree,  
The monarch of the wood;  
Sing for the Oak Tree,  
That groweth green and good;  
That groweth broad and branching  
Within the forest shade;  
That groweth now, and yet shall grow  
When we are lowly laid!

The Oak Tree was an acorn once,  
And fell upon the earth;  
The sun and showers nourished it,  
And gave the Oak Tree birth.  
The little sprouting Oak Tree!  
Two leaves it had at first.  
Till sun and showers had nourished it,  
Then out the branches burst.

The little sapling Oak Tree!  
Its root was like a thread  
Till the kindly earth had nourished it,  
Then out it freely spread;  
On this side and on that side  
It grappled with the ground,  
And in the ancient, rifted rock  
Its firmest footing found.

Four centuries grows the Oak Tree,  
Nor doth its verdure fail;  
Its heart is like the ironwood,  
Its bark like plated mail.  
Now, cut us down the Oak Tree,  
The monarch of the wood;  
And of its timbers stout and strong  
We'll build a vessel good.

Then sing for the Oak Tree,  
The monarch of the wood;  
Sing for the Oak Tree,  
That groweth green and good;  
That groweth broad and branching  
Within the forest shade;  
That groweth now, and yet shall grow  
When we are lowly laid!—Mary Howitt

## PINES

Pine trees are evergreen trees. Instead of having broad leaves that fall off in winter, these trees have long, narrow leaves shaped a little like the needles your mother knits with. For this reason the pine leaves are called needles.

There are several kinds of pines. The two pines that are most used for lumber are the white pine and yellow pine. The wood of white pine is not so hard as that of yellow pine. Each type of pine has a certain number of needles which are fastened together at the end with a thin, gray tissue like a bundle. The white pine has five needles in a bundle; while the yellow pine has three.

Pine *cones* are the seed pods of the pine trees. It takes two years for the cones to ripen. Inside each scale of the cone can be found two seeds. Each seed has a little wing attached to it to help the wind to carry it along to a new place where it can grow.

Pines have two kinds of flowers. One kind has the pistils to make the seeds and the other kind has the pollen in the stamens. Besides the sap, pines have a sticky juice called *resin*. Resin is not the sap of the tree but is used to close up wounds in bark.

*Make your answers to the questions below in the form of a short story.*

1. How does a pine tree look to you?
2. Why are pine leaves called needles?
3. Why is the pine tree useful?
4. How long do pine trees live?

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*Something to do:*

1. Draw a pine tree.
2. Draw a pine cone.
3. Draw a pine seed.
4. Draw a bundle of pine needles.

## ELMS

One of our most beautiful trees is the elm. In winter when all the leaves have fallen we can see that the branches form almost a fan shape as they stretch out from the trunk. This tree is deciduous. It has simple leaves with toothed margins and pinnate veins. The leaves grow alternately on the long twigs so at first glance they seem compound. The elm is used as a shade tree in the South. We see these tall trees with their graceful drooping branches growing on lawns, along drives and in parks. Its flowers bloom in the spring. They are a yellow-green and hang in clusters like tassels. The seeds also hang in clusters. Each seed has a little, stiff wing all the way around to help it to fly in the wind.

### SONG

For the tender beech and the sapling oak,  
That grow by the shadowy rill,  
You may cut down both at a single stroke,  
You may cut down which you will.

But this you must know, that as long as they grow,  
Whatever change may be,  
You can never teach either oak or beech  
To be aught but a greenwood tree.—Thomas Love Peacock

## MAPLES

Maple trees are deciduous, that is, they lose their leaves in winter. In the South, the red swamp maple is the most common. We also have the box elder or white maple.

These trees have simple leaves, with lobed margins and palmate veins. The seeds are formed on the red maple in the spring. The flowers are red and hang down like tassels in clusters. The seeds grow in pairs, and each little seed has a stiff wing so that it may be carried by the wind to a new place far from the tree where it grew. The box elder seeds form in the fall. They are much like the red maple seeds except that they are not red.

The leaves of this tree are compound. The wood of maple trees is used for lumber. See if you can find maple trees near your school.

### TREES

I think that I shall never see  
A poem lovely as a tree.  
A tree whose hungry mouth is prest  
Against the earth's sweet flowing breast;  
A tree that looks at God all day,  
And lifts her leafy arms to pray;  
A tree that may in summer wear  
A nest of robins in her hair;  
Upon whose bosom snow has lain;  
Who intimately lives with rain.  
Poems are made by fools like me,  
But only God can make a tree.—Joyce Kilmer



## CARE OF TREES



Trees sometimes need to be doctored just as people do. Branches are broken and torn by the wind, trunks decay and often disease destroys some of the roots of both shade trees and fruit trees. Fruit trees need to have their branches pruned (cut off) once a year in the early spring before the sap begins to run. This makes the trees look better and also makes them bear more fruit. Shade trees also should be trimmed or pruned, as it is called, to make them grow and to keep their shapes pretty. Often decayed parts of the tree trunks are cut out and concrete is poured into the hollowed out places. This makes the tree stronger and keeps the tree from falling when strong winds blow.

Iron rods are sometimes used to brace a divided trunk to keep it from splitting. When branches are cut, the stub that is left is painted to prevent decay.

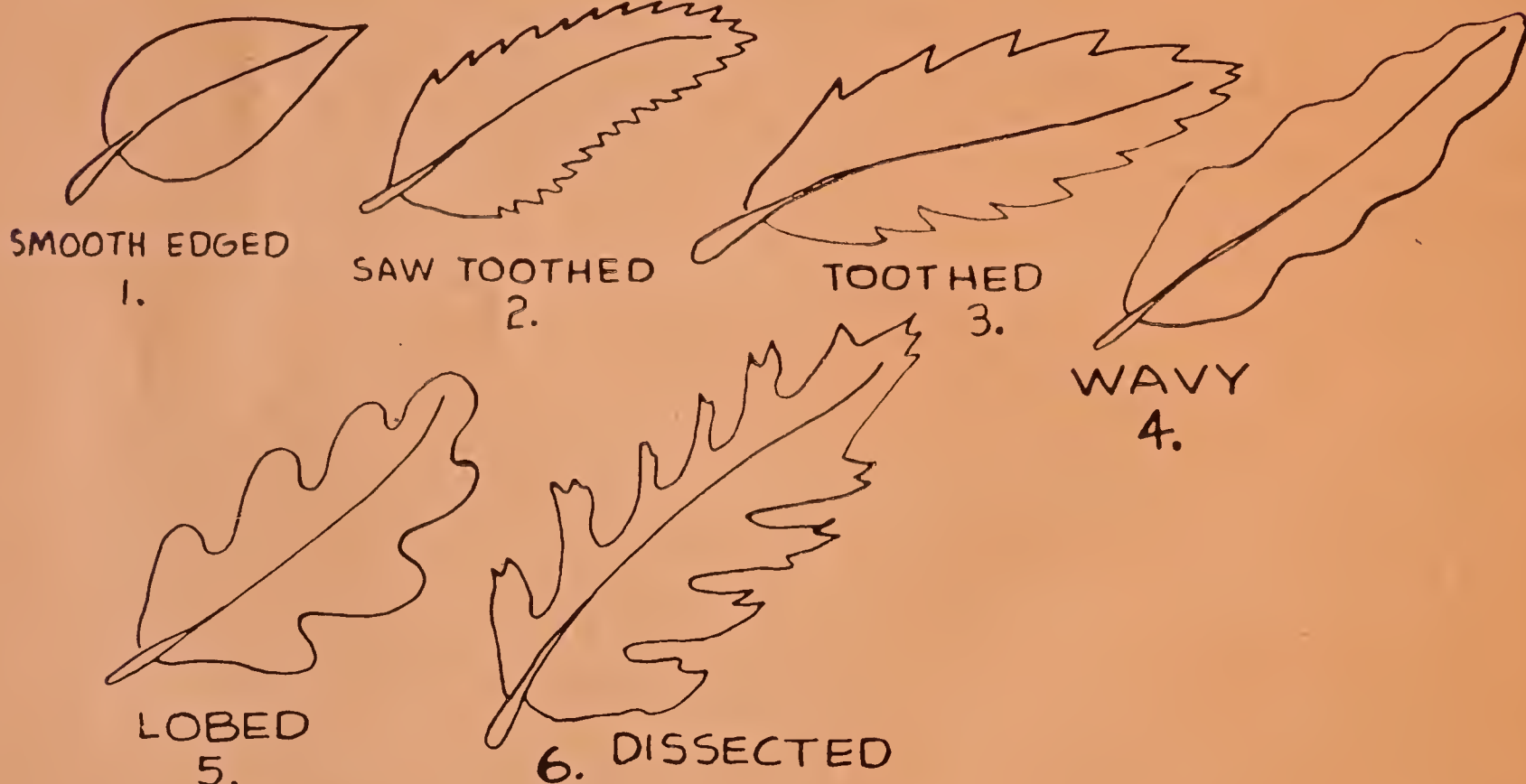
1. Mark an X on the tree which has been correctly pruned.
2. Mark the correct way to brace a forked or divided trunk.
3. Why should fruit trees be pruned? \_\_\_\_\_  
\_\_\_\_\_
4. How can a valuable tree be saved even if the trunk is decayed in some places?  
\_\_\_\_\_
5. Why should cut ends of branches be painted? \_\_\_\_\_
6. At what time of year should trees be pruned? \_\_\_\_\_

## LEAVES

We know that each kind of tree has leaves different from those of other trees. Some leaves are long and slender while others are broad and short. We can learn to know trees better by learning something about their leaves.

Below, we have listed the types of margins of leaves. By *margin* we mean the outside edge of the leaf. Each leaf has veins running through it, just as your body has veins and arteries. We find several types of veining in leaves. One type is called *pinnate* veins. Here, one large rib called the *mid rib* runs through the center of the leaf with many smaller veins branching from it somewhat like a feather. Another common type is called *palmate* veins. Here we find several large veins spread out like the spokes of a wheel or the fingers of one's hand. A less common type is *parallel* veins. Here the veins run the length of the leaf side by side almost horizontally.

Leaves are arranged either opposite each other on the stems or alternately.



MARGIN OF LEAVES

*Make a list of all the plants you know that have margins like those above.*

1. Smooth-Edged

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

2. Saw-Toothed

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

3. Toothed

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

4. Wavy

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

5. Lobed

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

6. Dissected

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

Leaves are of two types; *compound* or *simple*. By compound leaves we mean leaves made up of several little leaves or leaflets arranged on a long stem; such as rose leaves. A simple leaf has only one leaf on a stem. A good example of a simple leaf is the white oak. Each leaf has a brown leaf bud growing near the foot of its stem. When the leaf falls from the tree the buds may be seen. Compound leaves have only one large leaf bud at the end of the stem. There are no leaf buds at the stem of the leaflets.

Look at the trees in your yard and see what type of leaves they have.

*Complete the list:*

SIMPLE LEAVES	COMPOUND LEAVES
1. Sweet gum _____	1. Chinaberry _____
2. Oak _____	2. Sumac _____
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____
6. _____	6. _____
7. _____	7. _____







### THE TREE

The Tree's early leaf buds were bursting their brown;  
"Shall I take them away?" said the Frost, sweeping down.

"No, leave them alone  
Till the blossoms have grown,"

Prayed the Tree, while he trembled from rootlet to crown.

The Tree bore his blossoms, and all the birds sung:  
"Shall I take them away?" said the Wind as he swung,

"No, leave them alone  
Till the blossoms have grown,"

Said the Tree, while his leaflets quivering hung.

The Tree bore his fruit in the midsummer glow;  
Said the child, "May I gather thy berries now?"

"Yes, all thou canst see:  
Take them; all are for thee,"

Said the Tree, while he bent down his laden boughs low.

—Bjornstjerne Bjornson



## INSECTS

Insects are classed into two groups according to the way in which they grow up.

The butterfly belongs to a group that has four distinct stages; the *egg*, the *larva* (*caterpillar*), the *pupa*, and the *adult* (*butterfly*). Other insects that pass through these four stages are moths, bees, flies and beetles.

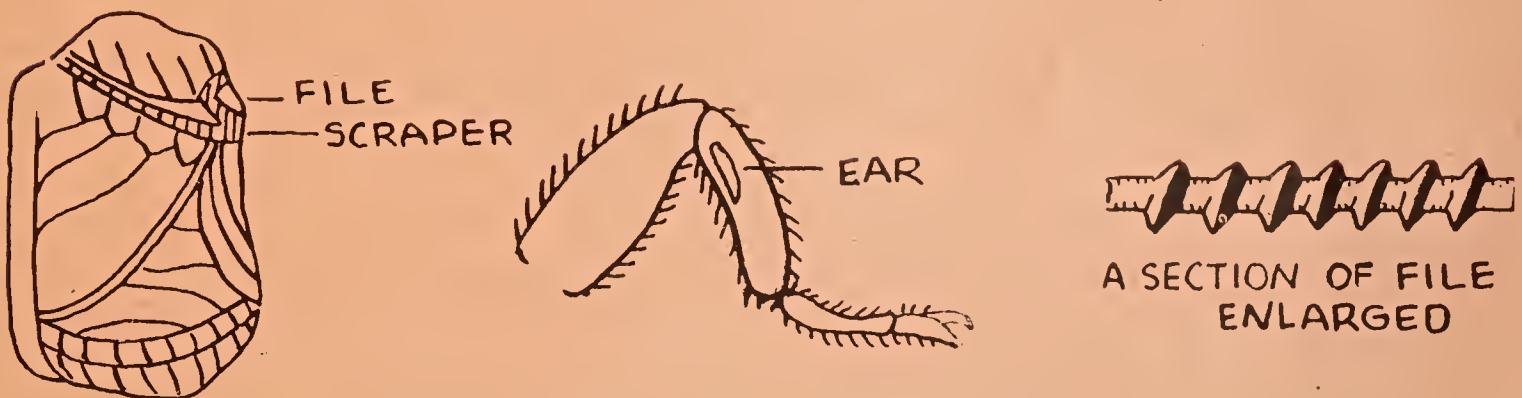
The grasshopper belongs to a group that has three stages: the *egg*, the *nymph* and the *adult*. The egg hatches into a nymph, which grows and moults its skin very much like the caterpillar.

The mouth parts of insects are divided into two classes: (1) those for biting; (2) those for sucking.

Insects can move about in many different ways; such as flying, jumping, running, crawling and swimming.

The insects breathe through openings in their abdomen.

### THE BLACK CRICKET



The crickets are among the most famous of the insect musicians. As with the song birds, the male only makes music.

The patent leather finish to the cricket's clothes is of great use in escaping his enemies. If you try to catch one you will see how slippery it is.

The haunts of the cricket are usually sunny; it digs a little cave beneath a stone or clod in some field, where it can have the benefit of all the sunshine when it comes out of its door.

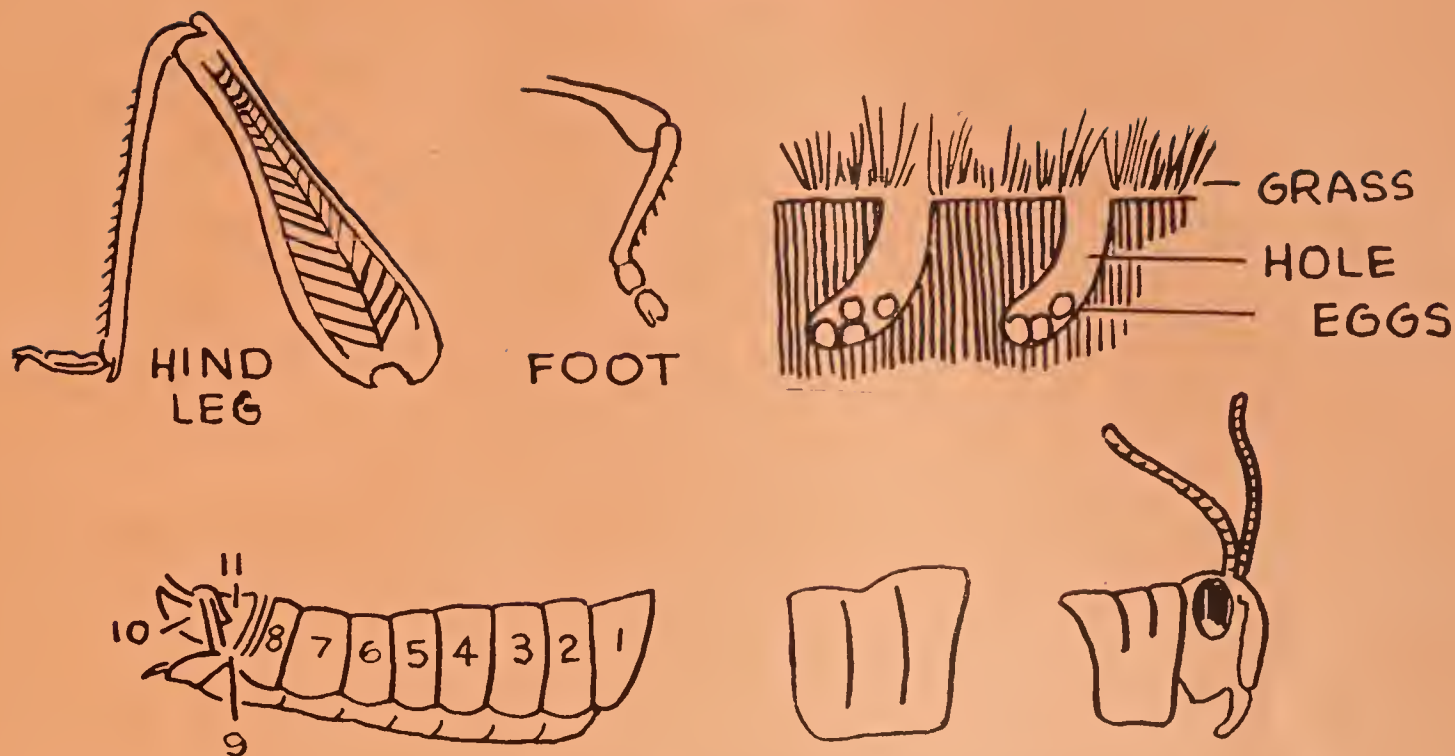
*Make some cricket cages, as follows:*

Plant in a small flower pot a root of fresh grass or clover. Place over this and press well into the soil a lantern or lamp chimney. Cover the top with mosquito netting. Place the pot in its saucer, so that it may be watered by keeping the saucer filled. Col-

lect some crickets for each cage. Place the cages in a sunny window and answer the following questions by watching the crickets in the cages:

1. Is the covering of the cricket shining like black patent leather, or is it dull? \_\_\_\_\_  
\_\_\_\_\_ Of what use do you think this kind of covering is to the cricket? \_\_\_\_\_
2. Where did you find the crickets? \_\_\_\_\_  
When you tried to catch them, how did they act? \_\_\_\_\_  
\_\_\_\_\_
3. Look carefully at the cricket's legs. Which is the largest of the three pairs? \_\_\_\_\_  
Has the cricket a pad between its claws like the grass-hopper? \_\_\_\_\_
4. Study the cricket's head. Can you see the eyes? \_\_\_\_\_  
Describe the antennae—their color, length, and the way they are used. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Study the wings. Are the wings of the mother cricket the same size and shape as those of her mate? \_\_\_\_\_ How do they differ? \_\_\_\_\_  
How does the male make the noise? \_\_\_\_\_  
Can you see the wings vibrate? \_\_\_\_\_
6. Look in the tibia, or elbow, of the front leg for a little white spot. What do you suppose this is? \_\_\_\_\_
7. Why does the mother cricket need such a long ovipositor? \_\_\_\_\_  
\_\_\_\_\_  
Where does she put her eggs in the fall to keep them safe until spring? \_\_\_\_\_  
\_\_\_\_\_
8. Study the grasshopper on opposite page. Make a collection of insects you have studied. Put them on pins in cigar boxes.

## THE GRASSHOPPER



## BODY OF GRASSHOPPER

Grasshoppers are funny little fellows and we like them—when there are not too many of them. There are a great many species of them, and we have placed them in two divisions: the *shorthorned* grasshopper and the *longhorned* grasshopper.

### THE SHORTHORNED GRASSHOPPERS

Grasshoppers have no horns, of course, but have short *antennae* that stick out like little horns. Their eyes are compound. See it move its mouth parts. It bites out of the leaves and chews them up very fast. It has six legs and all are used in walking. Its hind legs are long and large, and are used in jumping. The grasshopper can turn its legs in almost any direction because of these small upper parts.

The little pad on its foot between the claw is fringed with hair; out of the tip of each hair comes a little drop of sticky liquid. This fastens the foot to any smooth surface. The foot pad is called a *pukvillus*. Mr. Grasshopper sings his songs with his hind legs; he rubs the inside of his femurs against the outside of his wings.

When full grown the females lay their eggs in a hole in the ground. The end of the abdomen is very strong and sharp, and the grasshopper can make a hole with it quite easily. When the hole is made and the eggs are laid in it, the grasshopper covers the opening to the hole with a sticky substance to keep out the wet. The eggs usually lie in the ground all winter. Early in the summer the eggs hatch.

1. Name the two divisions of grasshoppers. \_\_\_\_\_
2. Do they have simple or compound eyes? \_\_\_\_\_
3. How many legs do they have? \_\_\_\_\_



4. How is the music made? \_\_\_\_\_
5. Does the female sing? \_\_\_\_\_
6. When are the eggs laid? \_\_\_\_\_
7. Where are they laid? \_\_\_\_\_
8. When do they hatch? \_\_\_\_\_

### THE LONGHORNED GRASSHOPPER

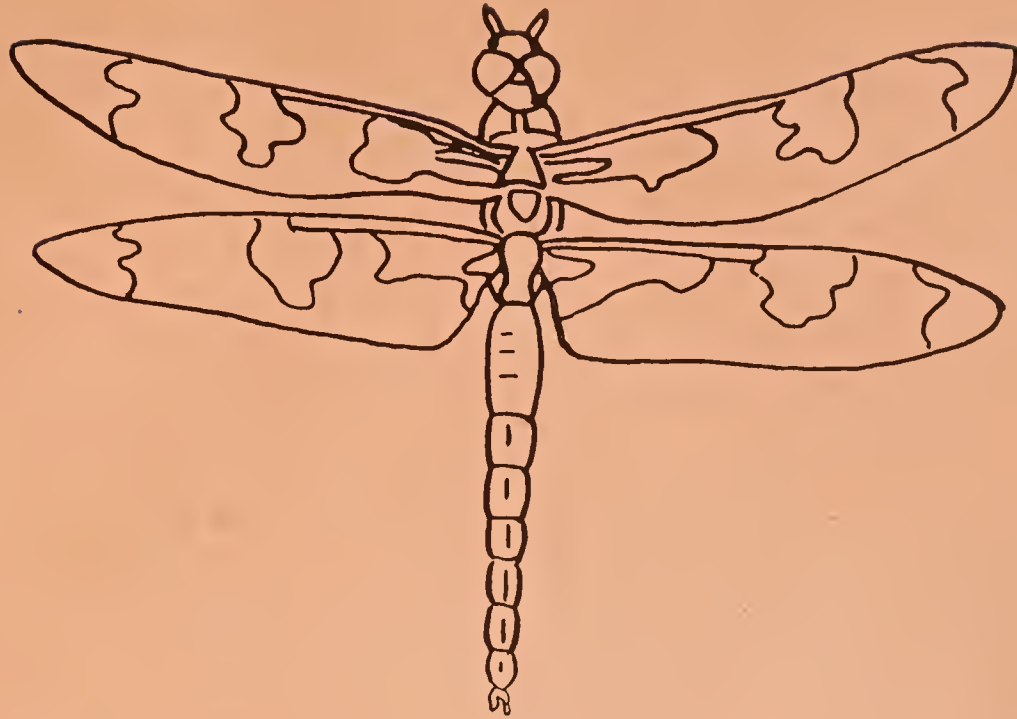
The antennae of the longhorned grasshopper are like threads, and they are longer than the body. Ears are on front legs of the insect. In many species of the longhorned grasshopper, the male has a curious musical instrument on his wing covers, close to where they grow from the body. The sword-like organ at the end of its body is its *ovipositor*. Ovipositor means "egg placer." With this long sharp ovipositor, the grasshopper can roughen the bark of twigs or make holes in the stems of plants or in the earth. Only the female grasshoppers have the sword-shaped ovipositor.

On page 31 there is a picture of a grasshopper. The legs and wings are not drawn and the abdomen is drawn by itself so you may see it easily. There are ten rings. The rings are covered with a hard, horny substance called *chitin*. Insects have no bones. They are kept stiff by the chitin. The rings are made in pieces so the insect can move. The rings are called segments. The segments are fastened together by skin. This picture shows the head and thorax of the grasshopper.

The grasshopper has muscles. The muscles are very, very, strong. Almost any insect can pull a load that is five times the weight of its body.

1. Are the grasshopper's antennae longer than its body? \_\_\_\_\_
2. Where are the ears? \_\_\_\_\_
3. Where is the musical instrument? \_\_\_\_\_
4. What does ovipositor mean? \_\_\_\_\_
5. Does the male have an ovipositor? \_\_\_\_\_
6. How many rings are in the abdomen? \_\_\_\_\_
7. What is chitin? \_\_\_\_\_
8. Where is chitin used on the grasshopper? \_\_\_\_\_
9. Do insects have bones? \_\_\_\_\_
10. Are the muscles strong or weak? \_\_\_\_\_

## THE DRAGON FLY OR MOSQUITO HAWK



The dragon fly is sometimes called a mosquito hawk because it catches mosquitoes. It also catches gnats, flies, and other insects while flying. It is our friend and we should never kill a dragon fly.

It has compound eyes. Forty thousand eyes are on the little dragon fly's head. Eyes like these are made of many small eyes called *facets*.

The dragon fly has a big mouth. Its jaws do not show unless it opens its lower lip, which fits over its mouth like a mask. It has two short antennae. Its eyes, its mouth and its antennae belong to its head. The dragon fly can fly as well as it can see. Of course, this is necessary to catch the insects. When it rests, it folds its wings together. Sometimes birds eat the smaller dragon flies. No bird could swallow a large one because they are too stiff. But a frog can, and it watches for the dragon flies as they come to the water to lay their eggs. Every dragon fly has six legs. They are short and small, because they do not need large strong legs. They hardly ever walk.

The female dragon fly drops her eggs in the water or lays them on twigs in the water where they hatch into larvae. The dragon flies have to be very careful when they go close to the water to lay their eggs. You know why, because the frogs are on the watch to catch them. The mother dragon fly knows the larvae have to live in the water, so she is careful to put the eggs there.

When the larvae first hatch, it is very small, and its legs are rather long and spidery, but it eats and eats and eats. It sheds or changes several times, and at last little short wings appear. They have a sort of syringe in the end of the body and there are breathing pores or gills in the syringe.

The larvae stay down in the pond eating, growing and moulting for nine or ten months or even longer; then something wonderful happens—it climbs up a weed or a stick until it is clear out of the water. Then its skin splits down the back for the last time, and out comes the dragon fly.

Some of the following statements are true and some are untrue. Write yes in the blank following the true statement, and no following the untrue.

1. The dragon fly is called a mosquito hawk. \_\_\_\_\_
2. The dragon fly's eyes are simple. \_\_\_\_\_
3. The dragon fly is our enemy. \_\_\_\_\_
4. The dragon fly does not need long antennae. \_\_\_\_\_
5. When the dragon fly rests, its wings are folded. \_\_\_\_\_
6. The frog catches the dragon flies when they come to lay their eggs on the water.  
\_\_\_\_\_
7. The dragon fly has six legs. \_\_\_\_\_
8. The larvae live in the pond nine or ten months. \_\_\_\_\_

*Answer these questions concerning insects:*

1. All insects have 3, 5, 6, 8, 7 legs. (*Draw a line through all but the correct number.*)
2. How many life stages has the mosquito hawk? \_\_\_\_\_
3. Do bees and grasshoppers pass through the same life stages? \_\_\_\_\_
4. Grasshoppers lay their eggs in the water, dead leaves, ground, dirty places. (*Draw a line through all but the correct word.*)
5. Where does the baby locust or cicada live until fully grown? \_\_\_\_\_  
\_\_\_\_\_
6. How many wings has the mosquito hawk? \_\_\_\_\_
7. What is the difference between a dragon fly and a mosquito hawk? \_\_\_\_\_  
\_\_\_\_\_
8. Why should we kill grasshoppers but protect mosquito hawks? \_\_\_\_\_  
\_\_\_\_\_
9. Which of these insects has a sucking mouth: cricket, grasshopper, butterfly, mosquito hawk, locust? \_\_\_\_\_
10. Which of these insects lays its eggs in water: ant, bee, locust, wasp, mosquito hawk? \_\_\_\_\_



## WASPS

1. Of what is the hornet's nest made? \_\_\_\_\_
2. What does the dirt dauber feed its young? \_\_\_\_\_
3. Where do polistes (wasps) get the material for their nests? \_\_\_\_\_
4. How does the dirt dauber differ from the polistes? \_\_\_\_\_
5. What type of mouth have wasps? \_\_\_\_\_
6. Why is the dirt dauber not a true social insect? \_\_\_\_\_
7. How can wasps smell and hear? \_\_\_\_\_
8. Do wasps die when they sting? \_\_\_\_\_
9. How are paper wasps' cells like those of the bees? \_\_\_\_\_
10. What happens to wasps in winter? \_\_\_\_\_
11. Where does the dirt dauber get her material for her nest? \_\_\_\_\_
12. What idea did wasps give man? \_\_\_\_\_

## GALLS

Although Alladin is out of fashion, we still have houses of magic that are even more wonderful than that made by his wonderful lamp. Those houses are built through the partnership between insects and plant tissues, and no one understands just how they are made. These houses are called *galls*. They grow because of a soreness to the plant caused by the insect.

There are many forms of these gall-dwellings, and they may grow upon the root, branch, leaf, blossoms or fruit. The strange thing about them is that each kind of insect builds its house upon a certain part of a certain species of tree or plant; and the house is always of a certain form on the outside and inside.

Many galls are compound; that is, they are made up of a community of larvae, each in its own cell. The mossy rose-gall is an example of this. See if you can find one and bring it to class.

1. Bring as many different kinds of galls to class as you can find. Place each one in a jar covered with cheese cloth and place where they will be under observation for perhaps several months. Note what sort of winged insects comes from each.
2. Make a list of all the words in the paragraph that tell where gall dwellers may be found.

a. \_\_\_\_\_ d. \_\_\_\_\_  
b. \_\_\_\_\_ e. \_\_\_\_\_  
c. \_\_\_\_\_ f. \_\_\_\_\_

3. Write in your own words what you think a gall is:

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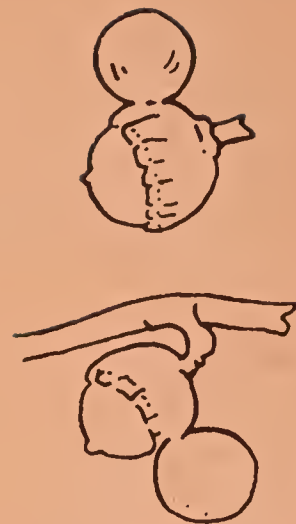
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The spring oak-gall



The pointed bullet-gall  
on oak twigs



The acorn  
plum-gall



Stem of goldenrod, showing the round gall above made by larva of a fly; and the spindle shaped gall below, made by the caterpillar of a moth.

A green little world  
With me at its heart;  
A house grown by magic,  
Of a green stem, a part.

My walls give me food  
And protect me from foes,  
I eat at my leisure,  
In safety repose.

My house hath no window  
'Tis dark as the night,  
But I make me a door  
And button it tight.

And when my wings grow,  
I throw wide my door;  
And to my green castle  
I return never more.—Comstock.

*Draw another gall beside these shown in the picture:*



## BIRDS

What boy or girl doesn't like to study birds with their pretty bright colors, beautiful song or call, and their nest-making?

In the spring after the nest is made the mother bird lays from four to seven eggs. The eggs of different birds vary in color; some are blue, some white and some brown. The mother bird sits upon her nest from ten to fourteen days. When the eggs hatch the father and mother bird must feed their little ones because they are very hungry. Baby birds eat many, many insects a day. Some say that the parents feed their young as often as two hundred times a day. Because young birds eat so much food, they are soon full-grown. Then the parents teach them to fly. After they have learned to fly they are ready to make a nest of their own.

Did you ever hear a bird sing? Birds begin to sing early in the morning, and are in full chorus by sunrise. Then they sing again late in the afternoon. The father bird is the only one that sings.

Birds travel like people, only we say birds *migrate*. Migration means going from one place to another.

Birds travel in the winter and summer. There are some that go to South America, some go to the northern and southern part of the continent, some travel only a few miles, and others from state to state.

The birds that travel so far never lose their way. They follow the coast line and mountain regions, though these are not the only guides. The bird, itself, has a sense of direction which leads it even when it is going on a journey for the first time in a new country.

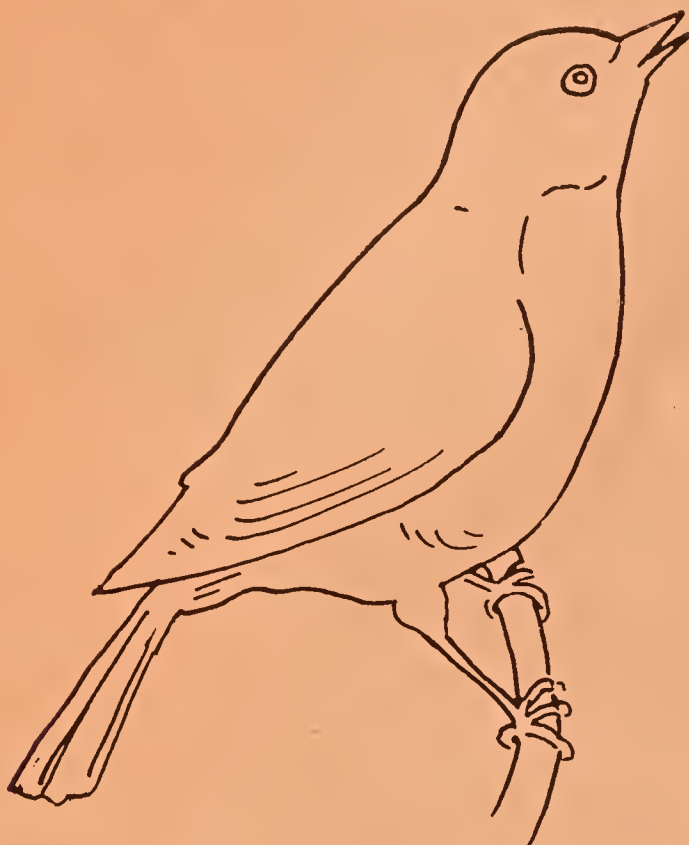
Birds are divided into four groups according to the length of time they stay in one place. Permanent residents remain one place all the year; summer residents stay only the summer; winter residents stay during the winter; and transient visitants stay only a short time during the spring and fall.

*Underline the correct answer.*

1. Migration means (1) sleeping all winter, (2) traveling, (3) something to eat.
2. Do all birds migrate the same distance? Yes—No.
3. Do birds migrate without stopping or do they stop for food and rest? Yes—No.
4. Birds are divided into groups according to (1) the way they sing, (2) their color, (3) the length of time they stay in one place.
5. Permanent residents live in one place (1) during summer, (2) all the time, (3) during winter, (4) for six months.
6. The English sparrow is a (1) summer resident, (2) winter resident, (3) permanent resident, (4) transient visitor.
7. To which of these classes does the robin belong in your city? \_\_\_\_\_
8. Give the name of your state bird. \_\_\_\_\_

9. Birds migrate in \_\_\_\_\_ and \_\_\_\_\_
10. Give two reasons why we should protect the birds. \_\_\_\_\_
11. To which group does the cardinal belong? \_\_\_\_\_
12. What do the birds use as guides when going to Mexico and South America? \_\_\_\_\_  
\_\_\_\_\_
13. Does the mocking bird migrate? \_\_\_\_\_
14. To which country do the humming birds go? \_\_\_\_\_
15. Do sea gulls go south for the winter? \_\_\_\_\_

### THE ROBIN



*Color the breast a red brown; color the head, wings and back dark brown.*

The robin is about eight inches long and eats insects almost entirely. The male sings a very pretty song. The nest is made of coarse straw or grass, lined with a cup-shaped form of mud with a soft inner lining of fine grass. They raise several broods each season. Robins eat some fruit, but do good by eating many insect pests.

*Underline the sentences that are true.*

1. The robin is a cheerful bird.
2. The song of the robin is light and soft.
3. The robin builds his nest of mud, sticks and grasses.
4. The robin is one of the first birds of spring.

## THE MEADOW LARK



The meadow lark, as its name tells us, is a bird of the meadows.

The colors of the meadow lark are shades of brown and yellow, well set off by the black locket on its breast. Its wings are light brown, each feather being streaked with black and brown; the line above the eye is yellow, bordered with black above and below; a buff line extends from the beak backward over the crown. The wings are light brown and have mere suggestions of white bars; portions of the outer feathers on each side of the throat are greenish, the middle part and breast are lemon yellow with the large black crescent just below the throat. The beak is long and black. The meadow lark is a little larger than the robin.

*Color this bird as he has been described.*

The meadow lark has a liking for meadows which border streams. It sings when on the ground, on the bush or fence, and while on the wing; and it sings during the entire period of its northern stay, from April to November, except while it is moulting in late summer.

Its nest is built in a shallow hole in the ground near a tuft of grass, and it is made of coarse grass and sticks and lined with finer grass. There is a dome or roof of grass blades woven above the nest, and a long covered passage-way leading to the nest is made in the same way. This is for protection from the keen eyes of the hawks and crows. The eggs are laid about the last of May, are usually from five to seven in number, and are white speckled with brown and purple.



The food of the meadow lark during the whole year is made up almost entirely of insects which eat the grass of our meadows. It eats great numbers of grasshoppers, cut worms, and some weed seeds. The killing of the meadow lark in New York state is a punishable offense, as it should be in every state of the Union. It has been estimated that the meadow larks save for every township where hay is produced, twenty-five dollars each year on this crop alone.

1. How does this bird get its name? \_\_\_\_\_
2. What good does this bird do the farmer? \_\_\_\_\_
3. Why does it cover its nest? \_\_\_\_\_
4. What is its food? \_\_\_\_\_

## THE HUMMING BIRD



Formerly it was believed that this daintiest of birds ate only nectar of flowers. But the later methods of discovering what birds eat by examining their stomachs show that the humming bird is an insect eater.

It is interesting to note that the young humming birds have a beak much shorter than when grown. Its beak is exactly fitted to probe those flowers where the humming bird finds its food. The tongue has the outer edges curved over, making a tube on each side. These tubes have tiny brushes at the tips and thus are fitted both for sucking nectar and for sweeping up the insects.

The natural home of the humming bird seems to have been in the eastern part of the Rocky Mountains. He comes to us after a very long journey each year. One species on the Pacific Coast is known to travel three thousand miles to the north for the summer, and back again in winter.

Humming birds are not supposed to sing, but to use their voices for squeaking when angry or frightened. The nest of the humming bird is a most exquisite structure; it is about three-fourths of an inch in diameter on the inside, and about one-half an inch deep. It is, in shape, a symmetrical cup, and the outside is covered with lichens to make it exactly resemble the branch on which it rests. The nest is lined with the down of plant seeds and plant fibers. The lichens are afterwards fastened together with the silk web of spiders or caterpillars. The nest is usually saddled on a branch of a tree from ten to fifty feet above the ground. The eggs are two in number, white, and they look like tiny beans. The young humming birds are black, and look, at first glance, more like insects than like birds.

*Color the picture with crayolas. The bird's body is a greenish brown; his beak is black; his throat is red.*

## THE RED-WINGED BLACKBIRD



*Color the wings red and yellow. Color (1) yellow. (2) red. Color the rest of the bird black.*

The red-winged blackbird dwells in marshy places. Its kong-queruee is as sure sign of the presence of water as is the croaking of frogs in spring. The male, in spring and early summer is unmistakable with its brilliant red shoulders. In winter its feathers are tipped with brown, and the colors are less marked in the young. The feathers of the streaked female are grayish brown with bits of red on the shoulders.

The most beautiful of birds in North America is the so-called "red-wing." It is sometimes called the officer bird because of the brilliant red shoulders which correspond to epaulets.

The nest is built in alders or button bushes, and sometimes on the ground. Although the birds arrive at their nesting marshes in March, their pale blue eggs, spotted, blotched and scrawled, are not laid until May. Eastern North America from Florida to Canada is the home of red wings during the nesting season. In winter they are found southward from Maryland.

The blackbird does not have many friends among the farmers, because there is a feeling among them that he does a great deal of damage to the crops. At times this is true, for they eat the heads of growing grains. Careful study shows that the good this bird does far outweighs the injury. Seeds of ragweed, barnyard grass, and smart weed, as well as numerous insects, are food favorites of the red wing.

1. Are blackbirds harmful? \_\_\_\_\_

2. What color are the eggs? \_\_\_\_\_

3. Where does the blackbird like to live? \_\_\_\_\_

4. What is its food? \_\_\_\_\_



## THE MOCKING BIRD

The mocking birds go as far north as southern New England, but they are found at their best in the southern states and in California. On the Gulf Coast the mockers begin singing in February; in warmer climates they sing almost the year through. During the nesting season the father mocker is so busy with his cares and duties during the day that he does not have time to sing, and so devotes the nights to serenading; he may sing almost all night long if there is moonlight, but even on dark nights he gives now and then a happy sleepy song. One authority noted a mocker which imitated the songs of twenty species of birds during ten minutes of singing.

Although the mocking birds live in wild places, they like best to live near men, taking up their homesites in gardens and cultivated grounds. For nesting sites they choose thickets or the lower branches of trees, being especially fond of orange trees. The nest is usually from four to twenty feet from the ground. The foundation of the nest is made of sticks, grasses and weed stalks interlaced and criss-crossed; on these is built the nest of softer materials, such as rootlets, horsehair, cotton or in fact anything suitable which is at hand. The nest is often in plain sight, since the mocker trusts to his strength as a fighter to protect it. He will attack cats and chase them; he will kill snakes; he will also drive away birds much larger than himself. The mocker, in making his attack, hovers above his enemy and strikes it at the back of the head or neck.

The female lays from four to six pale greenish or bluish eggs, blotched with brown, which hatch in about two weeks; then comes a period of hard work for the parents, catching insects to feed the young. The mockers often raise three broods a season.

The mocking birds have the same color in both sexes. The head is black; the back is ashy gray; and the tail and wings are so dark brown that they look black. The tail is very long and the outer tail feathers are entirely white, while the two next inner ones are white for more than half their length. The wings have a strikingly broad, white bar, which is very noticeable when the bird is flying. The underparts and breast are grayish white, and the beak and legs are blackish. The food of the mocking bird is about half insects and half fruit.

The mocker is full of tricks and is distinctly a bird of humor. He will frighten other birds by screaming like a hawk and then seem to laugh over the joke.

Sidney Lanier describes him well:

“Whate’er birds did or dreamed, this bird could say,  
Then down he shot, bounced airily along  
The sward, twitched in a grasshopper, made song  
Midflight, perched, prinked and to his art again.”



*Color the bird gray. Leave 1, 2 and 3 white.*

Something to do: Draw a mocking bird's nest or try to find one.

*Answer these questions:*

1. At what months of the year and for how many months does the mocking bird sing in this locality? \_\_\_\_\_
2. Does he sing only on moonlight nights? \_\_\_\_\_ Does he sing all night? \_\_\_\_\_
3. Do these birds like best to live in wild places, or about houses and gardens? \_\_\_\_\_
4. Where do they choose sites for their nests? \_\_\_\_\_  
Do they make an effort to hide the nest? \_\_\_\_\_ If not, why? \_\_\_\_\_  
\_\_\_\_\_
5. Of what material is the nest made? \_\_\_\_\_  
How is it lined? \_\_\_\_\_  
How far from the ground is it placed? \_\_\_\_\_





## THE RED-HEADED WOODPECKER

The red-headed woodpecker likes to eat acorns, beechnuts and grasshoppers. It hides its food away just as the squirrel does. It will put its food in holes of trees, in old barns between shingles of the roof, in the ends of railroad ties and in all sorts of places. He eats this food in winter when there is none to be found.

Red-headed woodpeckers eat beetles which are useful to man; they also eat canker-worms which do much damage to orchards. These woodpeckers sometimes eat the eggs and young of other birds.

All woodpeckers seem to like music. Tin roofs, gutters, dry dead limbs of trees and telephone poles are some of the things they like to drum upon. They do not sing; likely because of this drumming they do.

*Color the head red; color the wings and tail black; leave Fig. 1 white; Fig. 2 white; color the tree trunk brown.*



*Answer the following questions:*

1. Where does the red-headed woodpecker build its nest? \_\_\_\_\_  
\_\_\_\_\_
2. What does the woodpecker eat? \_\_\_\_\_  
\_\_\_\_\_
3. Does the woodpecker sing like other birds? \_\_\_\_\_
4. Why is he called a red-headed woodpecker? \_\_\_\_\_

## THE CARDINAL



*Color the beak orange red. Color the feet brown. Color the throat and around the eye black. Color the body red.*

The cardinal gets its name from its bright coat and peaked red cap of feathers. It is also called the redbird, Georgia corncracker and cardinal-grosbeak. It eats weed seeds of all kinds almost entirely except when nesting. The baby birds are fed worms and insects.

The cardinal does not migrate during the winter but lives among evergreen trees so it may find berries and seeds to eat. It likes cedar and holly berries; also hackberries. Two families of little birds are raised during one nesting season and both broods stay with the parents during the winter.

Above is a picture of the male bird. The female is an olive gray with only a little red on her beak, wings and tail. The nest is hidden in vines or bushes and is well made of grass, horsehair or strings. The male sings a pretty song in the spring.

1. Do the male and female cardinals look alike? \_\_\_\_\_
2. How do these birds help the farmers? \_\_\_\_\_
3. Where does the redbird spent the winter? \_\_\_\_\_
4. What are the little ones fed? \_\_\_\_\_

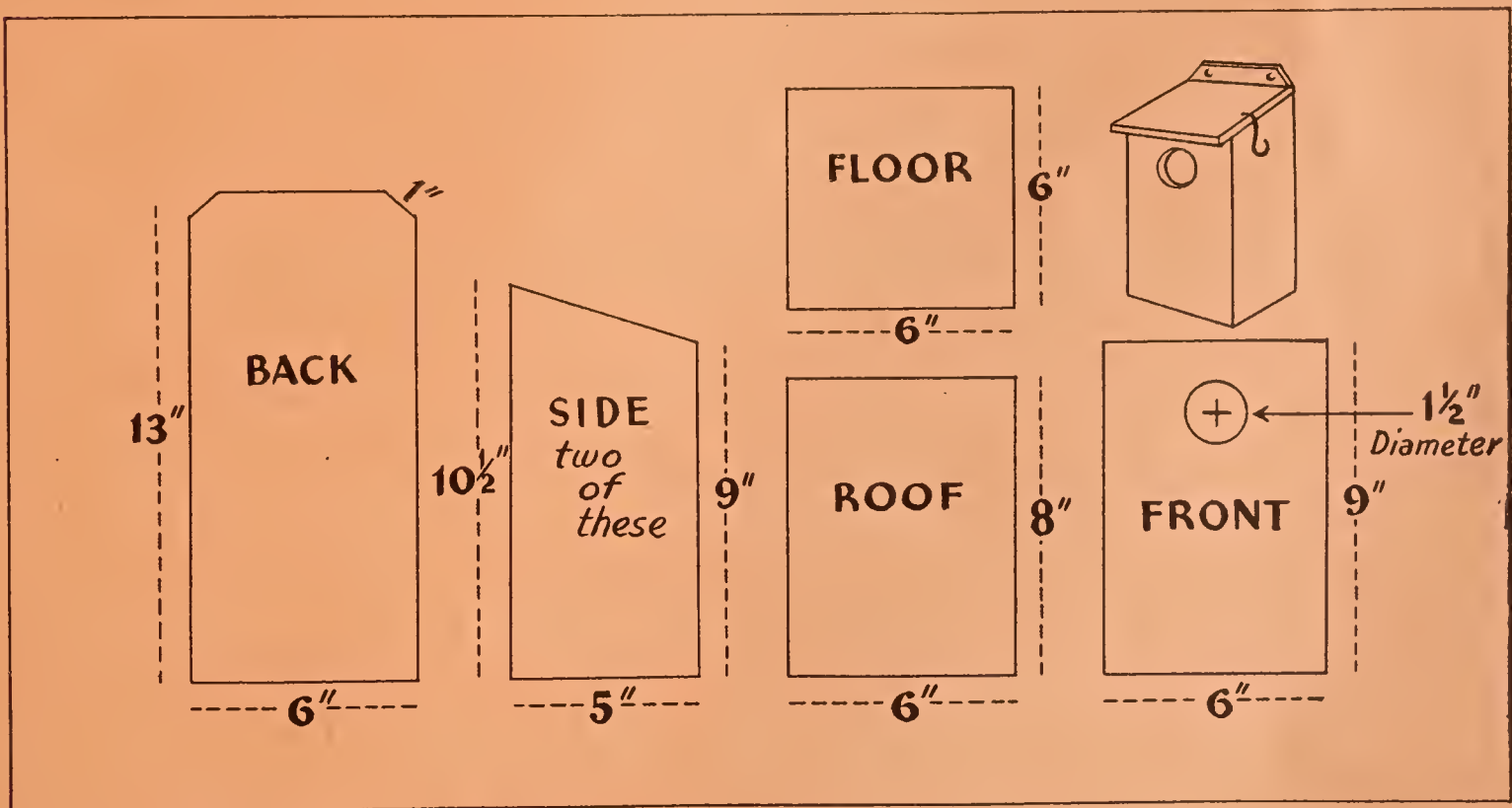
## BIRD HOUSES

The Indians were one of the first people to build bird houses. They built these houses for the martins. These houses were made of gourds. They hung the gourds on a long line near their fields. They knew that the martins helped them by eating many insects. Now our martin bird houses are made like our own. These like to live together.

When we make bird houses, we are helping the birds. Many years ago the birds did not need our help but now so many of our trees have been cut down that the little birds have no place to build a nest.

Many birds will not accept our built houses. Only those that build their nest in cavities such as, the wren, bluebird, and martin.

If you are going to build a bird house, you must decide first on the kind of bird that you wish it built for. After you have decided on the bird you must then plan on the kind of house that you want to make, the materials to be used, the size and shape of the house. Here are some plans to make bird houses. Try and make one for your yard or school.





Something to do: *Draw your house in this space. You may make a square for your house. Around your house draw the trees that grow in your yard. Name each tree. If you do not have any trees around your house, use your neighbor's yard.*

*In the space below, draw a bird house, a bird bath and a bird food tray.*

## BIRD STORIES

*Name the birds that come in the winter. Choose the bird you like best and tell why you like it best.*

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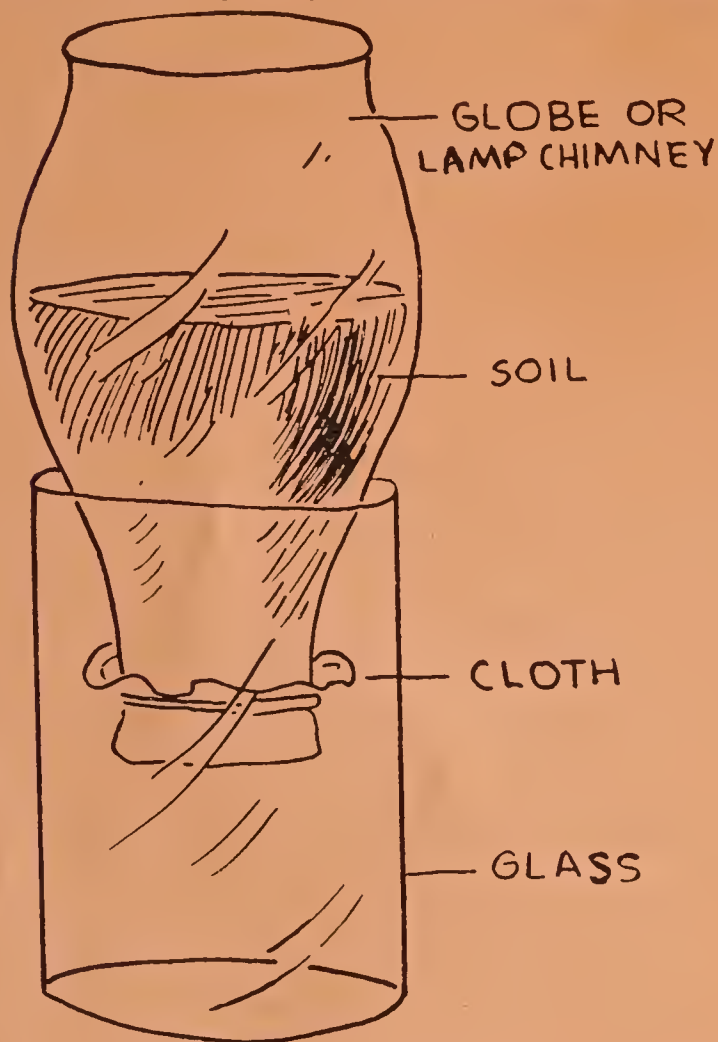
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*Draw a picture of your bird.*

## SOIL

There are five kinds of soil: *sand*, *clay*, *humus*, *loam* and *gravel*. Loam is the best soil for growing plants. We need sand and humus to make loam. Humus is made of dead plants and animals. Gravel is very coarse rocks. In sand there are tiny bits of mica. The richest soil is humus. Water-formed rocks have much lime in them. Sand lets the water drain quickly, and clay holds water longer than other soils.



### AN EXPERIMENT WITH SOILS

Get an equal amount of clay, gravel, loam and humus. Put each into a small glass globe or lamp chimney. Tie a piece of cloth over one end of each globe and place it over a straight sided glass. Pour into each globe an equal amount of water. Then watch closely to see how much water each kind of soil will hold. This shows us the water-holding power of the soil in each globe.

Words to learn to spell:

loam	sand	mica
clay	humus	lime
gravel	soil	

Fill in the blanks with the correct words:

1. The soil that is best for growing plants is \_\_\_\_\_
2. \_\_\_\_\_ holds water longer than other soils.
3. We need sand and humus to make \_\_\_\_\_
4. We get \_\_\_\_\_ where there are lots of dead leaves and plants on the ground.
5. Sand has bits of \_\_\_\_\_ in it.
6. \_\_\_\_\_ is very coarse rocks.
7. The richest soil is \_\_\_\_\_
8. \_\_\_\_\_ is very poor in plant food.
9. Water-formed rocks have much \_\_\_\_\_ in them.
10. \_\_\_\_\_ lets the water drain quickly.



## MINERALS

Minerals are the prettiest things we have. There are many kinds of minerals; such as, *quartz, feldspar, mica, calcite, ores, gems, and precious stones.*

There are ten grades of minerals. They are graded according to their hardness. The diamond is the hardest of all the minerals.

Most of these minerals are in the form of beautiful crystals. Quartz is the most common of all the minerals. Quartz occur in many forms. When in the form of crystals, like glass, it is called rock crystals. Rock crystals are used in jewelry. Another form is in crystals, glassy but transparent. If white it is called milky quartz. If pink, called rose quartz. The other is of different colors called amethyst. The petrified trees found in the western United States are forms of quartz. Flint is another form of quartz.

Feldspar is seen mostly as the pinkish color in granite. Feldspar is ground to powder as fine as flour and made into pottery.

Mica is another common mineral often called isinglass. It is transparent and not affected by the heat. You can find mica in your electric irons and electric toasters.

Would you like to make some crystal forms? Ask your teacher if you may bring a saucer, cup, teaspoon and some salt to school. Fill the cup about a third full of water. Then add salt and stir until the salt is all dissolved. Then pour off the clear liquid into the saucer. In the liquid put a piece of colored paper and string. Put the saucer on the window sill and leave it there until the water evaporates. What do you have? What is their shape? Look at them under a lens or magnifying glass.

## ROCKS

Rocks are very useful to man. At one time all soil was made of rocks. Soil is necessary for plant life. Rocks are used for plant life. Rocks are used for building stones, for putting ornamentation on fine buildings, such as marble for floors or pillars.

There are three groups of rocks. One group is called the *sedimentary* rocks. These are the limestone and sandstone. Limestone and sandstone are water-formed rocks. Among the water-formed rocks are found many fossils of both plants and animals that lived many years ago. Fossils are things such as animals, plants and fernlike plants that have become petrified in rocks.

A second group of rocks is called *igneous* rocks. Igneous means fire. The igneous rocks were first in the form of hot liquid. As they cooled off they formed into a solid rock. Granite is an igneous rock. Many beautiful monuments are made of granite.

The third group of rocks is called *metamorphic*. Metamorphic means changing from one form to another. Metamorphic rocks are made from rocks of the other two classes. For example limestone may be changed into marble, shale changed to slate. These changes are brought about by heat, water, and pressure. Marble is a metamorphic rock. It is used for building stones, monuments, and ornamentation.

### REVIEW OF ROCKS AND MINERALS

1. How many grades of minerals have we? \_\_\_\_\_
2. Minerals are graded according to color, size, brightness, hardness. (Underline the correct word.)
3. Name the hardest mineral. \_\_\_\_\_

4. Name two of the second grade minerals.

1. \_\_\_\_\_

2. \_\_\_\_\_

5. Name four valuable ores.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

6. Are silver and rubies both minerals? \_\_\_\_\_

7. Name four gems or precious stones.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

8. How did the Indians use flint? \_\_\_\_\_

9. Give one use for silver. \_\_\_\_\_

10. What use had the Pilgrims for flint? \_\_\_\_\_

11. Name three uses for rocks.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

12. Rocks may be grouped into how many classes or kinds? \_\_\_\_\_

13. Name two water-formed rocks. \_\_\_\_\_

1. \_\_\_\_\_

2. \_\_\_\_\_

14. To which group does granite belong? \_\_\_\_\_
15. What does the word metamorphic mean? \_\_\_\_\_
16. What stone does limestone make? \_\_\_\_\_
17. Igneous is a Latin word meaning \_\_\_\_\_
18. Do stratified rocks belong to the igneous group? \_\_\_\_\_
19. Give two uses for marble.
1. \_\_\_\_\_
2. \_\_\_\_\_
20. The hardest rock of all is \_\_\_\_\_



## STARS

We often look at the stars but we very seldom think of them as being as large or even larger than our sun and moon. They are really bright, hot suns but are so very far away from us that they look like little points of light. We can only see about 2,000 stars with our unaided eye but there are many millions of them in the sky. People who study stars tell us that because they have been able to see them with a big strong telescope, or have taken a picture which shows more stars than we can see with just our eyes. These same stars have been in their places for hundreds of years. Little boys and girls, who first lived in America, saw the same stars you can see tonight.

A group of stars is called a *constellation*. We have five of these groups of stars or constellations that we can see any clear night of the year. They swing in a circle around the north or pole star so we call them *circumpolar* constellations. The following stories tell how these constellations were named. Most of the large groups of stars were named by the Greeks or Romans. We call such stories as these *myths*.

### BIG AND LITTLE BEARS OR DIPPERS

There once lived in Greece a very beautiful woman named Callisto. She was much admired by Jupiter, the most powerful of all the gods. Juno was jealous of Callisto and changed her into a bear. Poor Callisto was so afraid in the big forest. Each time she heard hunters with their dogs she ran away to hide until they were gone.

Callisto had a son who was a great hunter. He and the other boys often took their bows and arrows and hunted in the forest for deer and bear.

One day these boys, while on a hunt, found a large bear and chased it. This was really Callisto. When she saw her son she ran toward him. He thought the bear was about to kill him for of course he did not know it was his mother. He put an arrow in place to shoot her but Jupiter, who was watching, changed them into the constellations, Big Bear and Little Bear and placed them in the heavens. He placed them in such a way that they never sink beneath the ocean.

### CASSIOPEIA, CEPHEUS, AND THE DRAGON

Long years ago there lived, in a kingdom by the sea, a king whose name was Cepheus. His queen was named Cassiopeia. She was very vain and thought she was more beautiful than anyone else. She even boasted that she was more beautiful than the nymphs.

The sea nymphs were very angry and sent a big dragon to eat the people along the shore. King Cepheus asked the nymphs to take away the dragon but they would not unless he chained his daughter Andromeda to a rock out in the water so she could be eaten. This was done.

In another kingdom, far away there lived a young man whose name was Perseus. He was trying to rescue his mother from a wicked king. This king told Perseus that he must cut off the head of Medusa. Medusa was a terrible woman who had snakes instead hair on her head and she turned to stone anyone who looked at her. Mercury, the messenger of the gods, helped Perseus to cut off her head by lending him some sandals with wings, a cloak that made him invisible, and a sharp sword. While on his way home after getting the head of Medusa, Perseus saw Andromeda chained to the rock. He killed the dragon and rescued her. Cepheus gave her to Perseus to be his wife. When all these people died, the gods changed them to stars. In order to punish Cassiopeia, she was placed so that half of the time, she hangs head downward.

## STARS AND PLANETS



We call the place on which we live the earth, or world. There are seven other worlds besides ours that move in a circle around the sun. They are called *planets*.

Their names are: Venus, Mercury, Uranus, Mars, Neptune, Saturn and Jupiter. Mercury is closer to the sun than any of the other planets, then comes Venus, then our earth, then Mars. We do not know whether anyone lives on these other worlds but it is thought that there may be people living on Mars. Jupiter is the largest planet. Its diameter is eleven times bigger than that of the earth.

1. Name each of the constellations in the drawing above. \_\_\_\_\_
2. What race of people gave us many of the names and myths of the stars? \_\_\_\_\_
3. Give the name of the constellation that has in it the North Star. \_\_\_\_\_
4. What is a constellation? \_\_\_\_\_
5. How many planets are there? \_\_\_\_\_
6. What are the circumpolar constellations? \_\_\_\_\_
7. What is meant by stars of the first magnitude? \_\_\_\_\_
8. Can we see the constellation Orion in the summer? \_\_\_\_\_

9. Which of these planets is the largest? Mars, Venus, Jupiter, Earth. (*Underline the correct planet.*)
10. Is the Earth the only planet with a moon? \_\_\_\_\_
11. What heavenly body has its own light and heat? \_\_\_\_\_
12. Give three differences between the moon and the sun. \_\_\_\_\_
1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
13. Which planet is nearest the sun? Mercury, Mars, Earth, Venus, Saturn. (*Underline the correct planet.*)
14. Upon what do we depend for our heat and light? \_\_\_\_\_



## WIND

Wind can be very harmful and very useful. When it is useful it helps to scatter the seed, helps the trees to get rid of their leaves, helps a boy to fly his kite, drives the dark clouds away and turns the windmills to pump water.

The wind can be very harmful. When winds are hot and dry they cause crops to die, they destroy homes and trees, cause great ships to sink at sea. But the wind does more good than harm. Air is always moving. Wind is air in motion.

### THE WIND

I saw you toss the kites on high  
And blow the birds about the sky;  
And all around I heard you pass,  
Like ladies' skirts across the grass—  
O wind, a-blowing all day long,  
O wind, that sings so loud a song!

I saw the different things you did,  
But always you yourself you hid.  
I felt you push, I heard you call,  
I could not see yourself at all—  
O wind, a-blowing all day long,  
O wind, that sings so loud a song!

O you that are so strong and cold,  
O blower, are you young or old?  
Are you a beast of field and tree,  
O wind, a-blowing all day long,  
Or just a stronger child than one?  
O wind, that sings so loud a song!—Robert Louis Stevenson

### THE WIND

Has anybody seen the wind?  
It makes the wash wave on the line;  
Bends trees and scatters leaves about,  
And whistles through the dry brown vines.  
It roars, it whistles, then it moans,  
It makes the old gate hinges screech;  
Then with a shriek and sudden blast,  
Takes small boys' kites far out of reach.  
It's here, and there, and everywhere,  
It sweeps from lowland meadows green,  
Up to the rugged mountain top—  
And yet this wind is never seen.

—Dorothy M. Herr, in *Story Time*

*In each square draw a picture representing the east, west, south and north winds.*


1. Name five ways in which the wind is useful to us:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

2. Write opposite the winds the season of the year in which they come.

WINDS

SEASONS

- |          |          |
|----------|----------|
| 1. East  | 1. _____ |
| 2. North | 2. _____ |
| 3. South | 3. _____ |
| 4. West  | 4. _____ |



## AIRPLANES

There are many uses for the airplane; such as, to carry mail, to deliver express packages, to transport passengers, to spray infected fields, to patrol forests, to watch for forest fires, to take photographs, and to make maps of land. Both airships and airplanes have crossed the Atlantic Ocean.

Man first got the idea of flying from birds. The Wright brothers made the first successful airplane. When on the ground the airplane is resting on wheels.

1. Give three uses for airplanes besides their use in war.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
2. Are airships and airplanes the same things? \_\_\_\_\_
3. Who made the first successful airplane? \_\_\_\_\_
4. How did men first get the idea of flying? \_\_\_\_\_
5. Of what use is the propeller? \_\_\_\_\_
6. Tell the difference between a biplane and monoplane. \_\_\_\_\_
7. On what does the airplane rest when on the ground? \_\_\_\_\_
8. Of what value is the airplane as a mail carrier? \_\_\_\_\_
9. Draw an airplane.
10. Draw an airship.

## SPRING FLOWERS

The pretty wild flowers of spring are found during the months of March, April and May. Did you ever play games with the wild flowers? What fun it is to make clover chains! Did you ever ask the dandelion what time it is, or, if your mother wants you?

The buttercups tell us if we like butter by placing the buttercup under our chin and if it reflects yellow we like butter.



By pulling petals from daisies and saying, "love me, love me not," we can tell whether our sweetheart loves us or not.

Many of our wild flowers have been destroyed because someone was careless and pulled them up by the roots. We must learn to protect them if we are going to have any left.

### BLUE FLAG OR IRIS

The blue flag, or iris, lives in wet, rich marshes and meadows. It blooms from May to July. It must have help from the bees to carry its pollen from one flower to another.

The iris is a plant that stores up its own food in its roots. These roots are called *rootstocks*. The rootstocks are tiny *bulbs*.

1. *Color the flower blue.*
2. *Color the part marked yellow.*
3. *Color the bud blue.*
4. *Color the leaves and stem green.*

1. Where have you seen these flowers growing? \_\_\_\_\_

2. How many petals has the Iris? \_\_\_\_\_
3. What kind of root has this flower? \_\_\_\_\_
4. Is the stem round or flattened? \_\_\_\_\_
5. Do these flowers keep well after you pick them? \_\_\_\_\_
6. Are the leaves growing as opposites or alternates? \_\_\_\_\_



## VIOLET



1. Color the flower light blue.
2. Color the leaves and stem green.

There are many different kinds of violets. Some may be found in the woods, others in meadows, and others in damp, marshy places.

The violet has five petals, one pair above, a pair at each side, and one broad lower petal. This broad petal goes backward and makes a cup. This cup holds the nectar.

The leaves and flowers are on separate stems.

Did you know the violet has a secret? She has a way of making seeds that few people know.

The little fall violet makes her seeds. They do not look at all like violets. They stay very close to the root of the violet just above the ground. They are tiny pointed green buds that never open. When the seeds are ripe, the pod splits open and throws them out.

*Underline the words that make each sentence correct:*

1. Violets may be found in the woods, ocean, rocks.
2. A violet has five leaves, stems, petals.
3. A violet has a secret of making her own flowers, seeds, roots.
4. Some colors of violets are blue, white, green.

*Underline the right answers:*

1. Violet seeds are planted by wind, by water, by plant itself.
2. The flower has six, eight, five petals.
3. The flowers and leaves are separate, are together.

## WILD ROSE



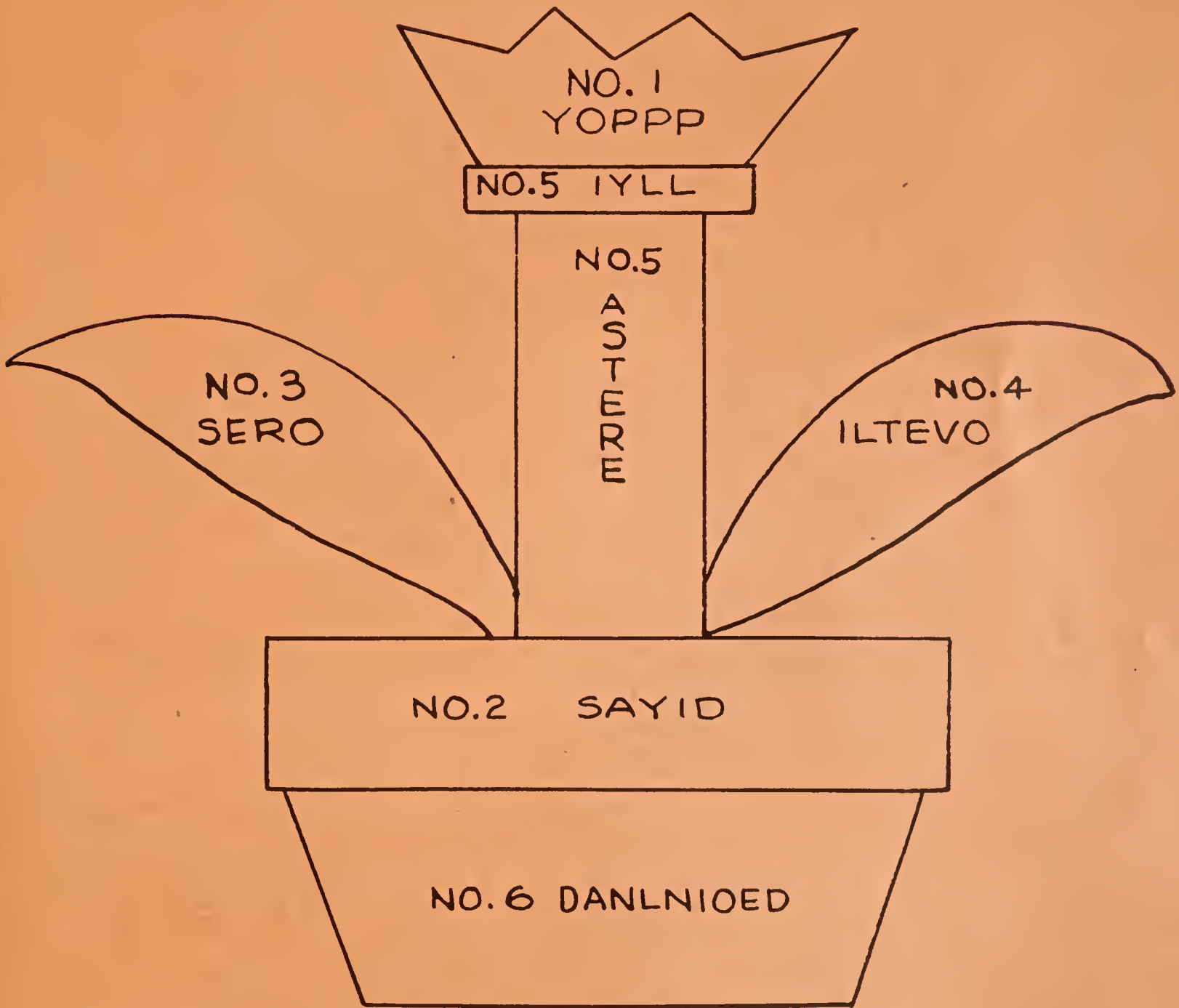
1. Color the center of rose yellow.
2. Color the buds green.
3. Color the leaves and stem green.

The wild rose is kin to the dewberries and blackberries. It is a simple flower with five large petals. There are many stamens growing in a cluster around the pistil. This rose climbs over fences and trees. Long ago people planted wild roses called Cherokee roses out on the plains in long, high, thick rows to keep the wind from the cattle in winter. The vine is covered with thorns to keep the animals from eating them. Even the leaves have thorns on the under side.

1. How many petals has this rose? \_\_\_\_\_
2. How many leaflets in each leaf? \_\_\_\_\_
3. Is this a composite flower? \_\_\_\_\_
4. What do we call this kind of leaf? \_\_\_\_\_
5. Of what use were Cherokee roses? \_\_\_\_\_

# A PUZZLE

Here is a flower puzzle. Each space has a flower with its letters all mixed up. Can you spell the flower? If you can, put the right name by the right number.



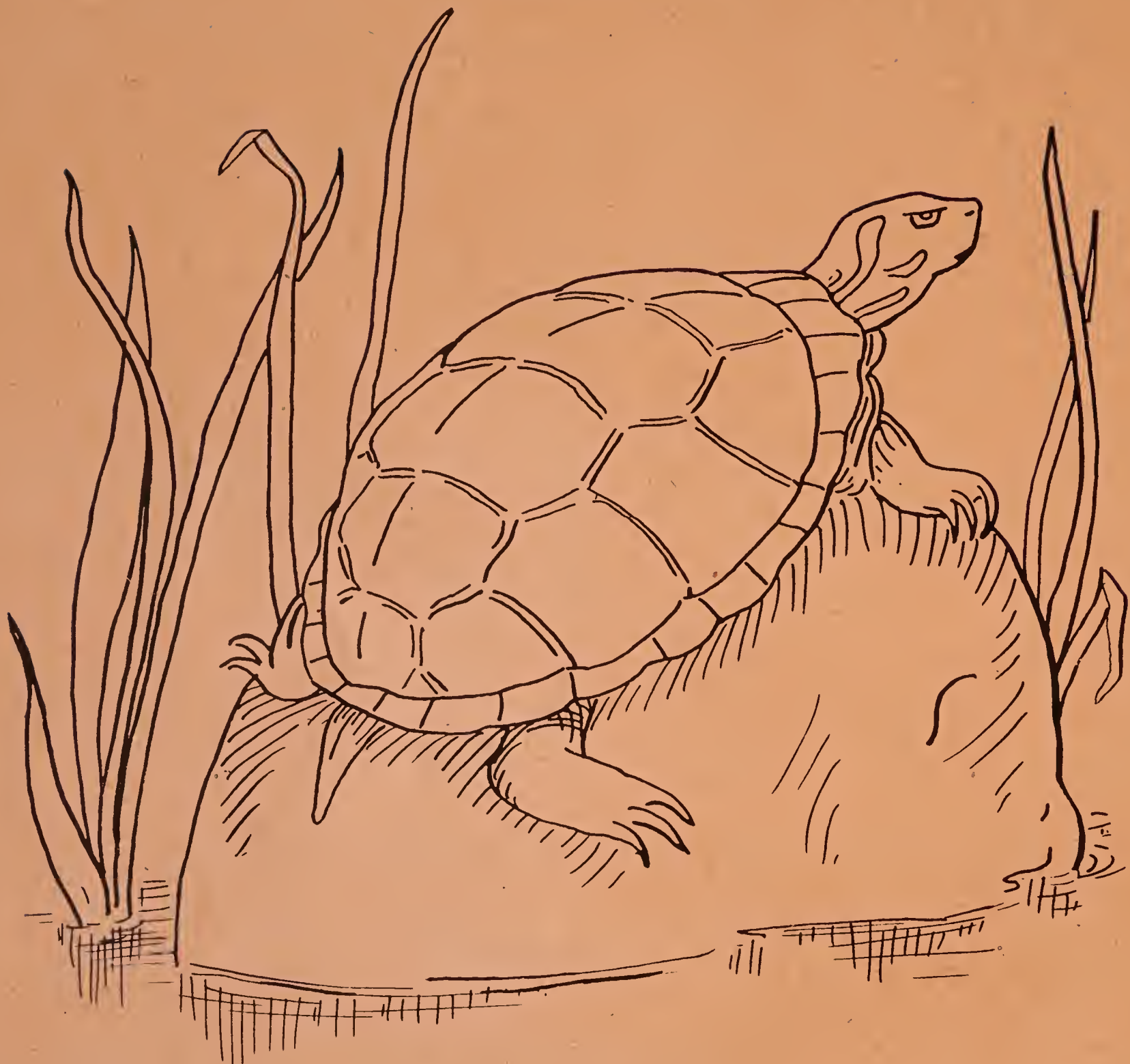
No. 1: \_\_\_\_\_ No. 4: \_\_\_\_\_

No. 2: \_\_\_\_\_ No. 5: \_\_\_\_\_

No. 3: \_\_\_\_\_ No. 6: \_\_\_\_\_



## PAINTED TURTLE



*Paint the turtle with crayolas.*

Shell: Greenish black with red marking on edge.

Head: Black with yellow marking.

Legs: Black.

Tail: Black, yellow marking.

Rock: Brown.

Water: Blue.

Reeds: Green.

The turtle's head, foot and tail may be seen at all times.

His foot and legs have no bones.

When frightened he draws within his shell.

The upper shell has grown to his back bone.

The lower shell has grown to his chest bone.

There is no different species of turtle.

The turtle's eyelids are like ours.

The sense of smell is well developed.

The nostrils are small.

The constant swallowing is caused by swallowing food.

The claws are long and strong.

There are five claws on the front foot and four on the back.

Some species have web toes.

Two turtles should always be kept in the same aquarium.

The enemies of turtles are large fishes and other turtles.

The turtle lays her eggs in the water or in the sand.

1. Underline the name of the turtle that can close its shell: mud turtle, snapping turtle, wood terrapin, soft shell turtle, pond turtle, box turtle, spotted turtle.
2. Tell where painted turtles lay their eggs. \_\_\_\_\_
3. Do turtles have teeth? \_\_\_\_\_
4. How do turtles spend the winter? \_\_\_\_\_
5. What do land turtles eat that water turtles do not? \_\_\_\_\_
6. How many toes has the front feet of a turtle? \_\_\_\_\_  
How many on the back feet? \_\_\_\_\_
7. How old do turtles often grow to be? \_\_\_\_\_
8. Tell how the turtle protects himself. \_\_\_\_\_
9. Why should we protect turtles? \_\_\_\_\_

## THE BAT



Bats are not birds as many people think. They are animals which are called mammals because they feed their babies on milk. Bats haven't wings like a bird but have a very thin skin which surrounds their whole body and can be stretched out by the arms and legs and used as wings to fly about on.

The bat is not harmful but does a great deal of good by eating mosquitoes and other insect pests. They catch their food by flying with their mouths wide open. They hunt at dusk and early morning but fly some at night.

They sleep during the daytime in a tree or some quiet corner of a house or barn and always hang by their hind feet, head downward. They cannot walk but can crawl in an awkward way.

Some bats eat fruit, but the common brown bat, eats nothing but insects. The old saying, that "bats will get in your hair" is not true. They are very timid and will not trouble anyone if left alone.

The bat's fur is very soft. The body looks very much like that of a mouse. The eyes are small, but bats can see fairly well. The ears are rather big and have a sort of cover that can close over the opening at will. The front legs correspond to our arms. A claw or hook represents the thumb and the four fingers are long and slender, and help to hold out the skin of the wings. The hind feet are small but have five toes, each with a tiny claw. Bats generally sleep through the winter when it is cold and there are few insects to eat. The baby bats hang on the underside of the mother's body when she flies.

1. How do bats spend the winter? \_\_\_\_\_
2. How do they sleep usually? \_\_\_\_\_
3. At what time of day does the bat catch its food? \_\_\_\_\_



4. Why are bats said to be mammals? \_\_\_\_\_
5. Are bats birds or animals? \_\_\_\_\_
6. Why should we not kill every one we see? \_\_\_\_\_
7. Of what animal does the bat remind us? \_\_\_\_\_
8. Does the bat bark, groan or make any loud noise? \_\_\_\_\_
9. Why do many people think bats are birds? \_\_\_\_\_
10. Tell how bats carry their babies? \_\_\_\_\_
11. Are bull bats and bats the same? \_\_\_\_\_
12. How does the bat catch its food? \_\_\_\_\_

## SPIDERS

We have all seen spiders in our houses or gardens. Spiders have eight legs and are not insects. They belong to a family called *Ariamidre*. There are hundreds of spiders but the ones we usually see are the house spider, the grass spider, the wolf spider, the crab spider and the garden spider.

Spiders have four pairs of eyes. They have a fat, round abdomen but they do not have a separate thorax as insects do, for the head and thorax of the spider are all in one piece called a *cephelorax*. At the tip of the abdomen, we can see some little finger-like pairs of spinnerets. With these, the spider can spin several kinds of threads. There are usually at least two pairs of these spinnerets.

House spiders do not make a pretty web. They build a platform on which to chase and catch their prey. The threads are rather dry and are not made into a pattern, but are jumbled over each other, this way and that.

The grass spider builds its web in much the same way except that it is funnel shaped with a wide mouth that is spread out in the grass, in old woodpiles or in shrubs.

The wolf spider lives in a hole in the ground. It lines the hole with silk webbing to keep the dirt from falling into the hole. The tarantula and trapdoor spider do the same thing. The wolf spider has a tower about an inch and a half or two inches high around its hole. Here it watches for insects and catches them by running after them or pouncing upon them suddenly. The tarantula catches its food the same way. Both these spiders feed mostly at night.

The trapdoor spider gets its name from its round door made up of dirt and silk webs that fits very tightly over the opening of its hole. This spider seldom goes away from its nest.

These spiders all lay their eggs in a large silk sack. When the little spiders hatch, they ride on the back of their mother until they are large enough to take care of themselves.



1. Draw a web as a spider would spin it. Color the picture with crayolas.
2. Underline the type of spider that spins this type of web: house spider, orb weaver, grass spider, wolf spider, trapdoor spider.
3. What do we call the straight threads of the web? \_\_\_\_\_
4. At what time of day does the spider mend its web or spin a new one? \_\_\_\_\_
5. How many kinds of thread does the spider spin? \_\_\_\_\_
6. Does the house spider spin this type of web? \_\_\_\_\_
7. How do we know a spider is not an insect? \_\_\_\_\_
8. Give three differences between spiders and wasps.
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
9. Where are the spinnerets on the spider's body? \_\_\_\_\_

## THE SPIDER AND THE FLY

“Will you walk in to my parlor?” said the Spider to the Fly;

“ ’Tis the prettiest little parlor that ever you did spy.

The way into my parlor is up a winding stair,

And I have many curious things to show when you are there.”

“Oh, no, no,” said the little Fly; “to ask me is in vain,

For who goes up your winding stair can ne’er come down again.”

“I’m sure you must be weary, dear, with soaring up so high;

Will you rest upon my little bed?” said the Spider to the Fly.

“There are pretty curtains drawn around; the sheets are fine and thin.

And if you like to rest awhile, I’ll snugly tuck you in!”

“Oh, no, no,” said the little Spider; “for I’ve often heard it said,

They never, never wake again who sleep upon your bed!”

Said the cunning Spider to the Fly; “Dear friend, what can I do

To prove the warm affection I’ve always felt for you?

I have within my pantry good store of all that’s nice;

I’m sure you’re very welcome—will you please to take a slice?”

“Oh, no, no,” said the little Fly; “kind sir, that cannot be;

I’ve heard what’s in your pantry, and I do not wish to see!”

“Sweet creature!” said the Spider, “you’re witty and you’re wise;

How handsome are your gauzy wings! How brilliant are your eyes!

I have a little looking-glass upon my parlor shelf;

If you’ll step in one moment, dear, you shall behold yourself.”

“I thank you, gentle sir,” she said, “for what you’re pleased to say

And bidding you good morning now, I’ll call another day.”

The Spider turned him round about and went into his den,

For well he knew the silly Fly would come soon back again;

So he wove a subtle web in a little corner sty,

And set his table ready to dine upon the Fly;

Then came out to his door again, and merrily did sing:

“Come hither, hither, pretty Fly, with the pearl and silver wing;

Your robes are green and purple; there’s a crest upon your head;

Your eyes are like the diamond bright, but mine are dull as lead!”

Alas, alas! How very soon this silly little Fly,

Hearing his wily, flattering words, came slowly flitting by;

With buzzing wings she hung aloft, then near and nearer drew,

Thinking only of her brilliant eyes and green and purple hue,

Thinking only of her crested head. Poor, foolish thing! At last

Up jumped the cunning Spider, and fiercely held her fast;

He dragged her up his winding stair, into his dismal den,

Within his little parlor—but she ne’er came out again!

—Mary Howitt





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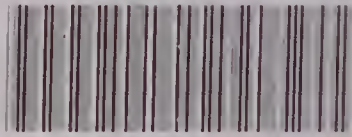
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