## Preschool - 5th Grade



## PHONICS

Trace the letters with a colored pencil, crayon, or marker. Can you see the Mm at the beginning of the words moose and mouse?


Letter M
Trace the letters $\mathbf{M m}$ with your finger. Color the mittens.


From Calvert
Preschool for Threes


Lesson 99b
Find the path through the maze that connects the letters of the alphabet in order.


From Calvert
Preschool
$\qquad$
Say the name of the letter. Say the sound of the letter. Trace the letters with your pencil.


Use your finger to trace the large number 4. Count the animals and trace the number. Count the fish in each fishbowl and use a pencil to trace the number on the line next to the fishbowl.

5
67
89
10
II 12

$\qquad$

Cut out the number strip at the bottom of the page. Count the items in each group. Paste the correct number in each box.

-3<


| $\begin{gathered} 0 \\ \vdots \\ \vdots \\ Z \end{gathered}$ |
| :---: |

Circle the things that you can hear．


From Calvert
Preschool Electives

| $\begin{aligned} & 0 \\ & \text { © } \\ & \text { © } \\ & \text { Z } \end{aligned}$ |  |  |
| :---: | :---: | :---: |

Students: You have been learning about all of the creatures that live in the seas and the oceans. This is an aquarium. See how many creatures you can add to the water.

Parents: The students have been learning about the many creatures that live in the water. Allow your child freedom in filling their aquarium with any creatures they can remember. Return to class tomorrow.


## How about you?

## Do you want to read?



From Calvert Kindergarten Language Arts

## Red things.



## Blue things.


blue यंक्ष
From Calvert Kindergarten Language Arts

## Draw a line to match one-to-one.

徐

Write the number for the facts.


## Circle the answer.

People can communicate with sounds.
yes
no

You can only communicate by talking.
yes
no
Babies communicate when they $\qquad$ .
( sleep / cry )

Put an $X$ on each picture of the things that help us communicate.


Write 1, 2, and 3 to show what happens first, next, and last.


From Calvert
1st Grade

Write bl, cl, or fl.


### 1.11 Read the words in the boxes.

Color the word red if it is a noun.
Color the word blue if it is a verb.
Color the word green if is an adjective.

| baby | eye | garden | dig | picture | shirt | sister |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| cow | pizza | talk | good | see | bell | apple |
| paper | add | silly | grumpy | scary | jumped | hill |
| blow | feed | look | give | learn | read | took |



Teacher Check
Initial Date

Use a noun, verb, and adjective from the box above to write a sentence.
1.12

Count by 10: say $10,20,30,40,50,60,70,80,90$ in that order.


How many?

Count the stars by 10's.


Write the time on each clock.


- $\qquad$ a.m.

: $\qquad$ a.m. $\qquad$ : $\qquad$ a.m.

$\qquad$ . $\qquad$ a.m.

$\qquad$ : $\qquad$ P.m

$\qquad$ $\stackrel{-}{-}$ $\qquad$ p.m.

$\qquad$ : $\qquad$ p.m.
$\qquad$ : $\qquad$ p.m.

Write the times for before and after noon.

$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Circle the things you might smell from your room.


From Calvert
1st Grade
Science
"Sometimes, I go down the mountaindown, down to the valley.
I go down to eat.
Sweet grass grows in the valley.
I eat and eat."

## 

Circle the right word.

goat / goats

animal / animals

rock / rocks
mountain / mountains


Circle True if the statement is correct (right) and False if the statement is incorrect (wrong).
2.13 In the early 1700s, the colonies were a part of the United States of America.

True False
2.14 The colonists could make all their own laws.

True False

## - ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

## Problems with Great Britain

In time, the colonists became unhappy with laws of Great
Britain. Some laws helped Great Britain but hurt the colonies. For example, colonists had to pay certain taxes on British goods. Yet, the colonists did not have any say in the laws the British government passed. Colonists felt they should be able to make their own laws. Some colonists
 began to talk about getting their freedom from England. They wanted to becomennindonande country.

## Activity

Number of senators elected every 2 years

## $\star \star \star$ * * <br> * <br> *

Number of votes needed to pass a vetoed bill


You learned how the legislative branch uses some fractions. Every two years, one-third $\left(\frac{1}{3}\right)$ of the senators are elected. On the first flag, color one-third of the stars, or one column of three stars.

You also learned that a vetoed bill needs to win twothirds $\left(\frac{2}{3}\right)$ of the votes in Congress to become a law. On the second flag, color two-thirds of the stars, or two columns of three stars.

Use this activity to help you study for the Self Test.

Teacher Check

## Phonics - Beginning Consonant Blends br, cr, dr, fr, gr, pr, tr

Sometimes a word begins with two consonants.
These two consonants can blend together to make a new sound.


Look at the pictures.
Write the correct beginning consonant blend from the list below in the blank to spell the word.

| br | cr | dr | fr | gr | pr |
| :--- | :--- | :--- | :--- | :--- | :--- |

1.13
a.

___ophy

$\underline{ }$
occoli
b.
$\qquad$
$\qquad$

$\qquad$ ib

___ incess


From Calvert
2nd Grade
Language Arts

## Spelling Activity. Write a spelling word on the line to complete each sentence.

| skate | scold | spoon | swim | scrape | spray |
| :--- | :--- | :--- | :--- | :--- | :--- |
| snap | small | step | twin | split | stray |

a. Mother will $\qquad$ you if you come in the house with muddy shoes.
b. It would be good to $\qquad$ the mud off your shoes.
c. Amanda likes to ice $\qquad$ on the frozen pond.
d. Bob caught a $\qquad$ fish.
e. Becky likes to $\qquad$ her fingers.
f. Randy $\qquad$ the log in two.
g. The baby learned to eat cereal with a $\qquad$ .
h. Christopher uses a hose to $\qquad$ water on the garden.
i. The baby took his first $\qquad$ in the kitchen.
j. Mike found a $\qquad$ cat in the park.
k. It is fun to $\qquad$ in the lake when it is hot.
I. Erik had a $\qquad$ brother named Alan.

3.9 Write addition facts.


Read the operation symbols.
greater than > less than <


Four cats
are greater than two cats.


Three ducks are less than

## Write six numbers using 7, 3, and 5.

3.9

Write the numbers in number order.
3.10 Write the number words. Remember the hyphen (-).

$$
11
$$

$\qquad$
26 $\qquad$
345 $\qquad$
209 $\qquad$


## Addition with Carry



Add ones. Carry. Add tens. Add hundreds.
3.11

$$
\begin{array}{r}
56 \\
+\quad 27 \\
\hline
\end{array}
$$



## Seeds

A new plant begins inside the flower of a plant. A seed is inside the flower. A new plant is inside the seed. It is hard to see the plant inside the seed.

When the seed is ripe, it is time to plant the seed in the ground. If the seed has some water, the plant inside will start to grow.


## -1000000000000000000



Bring some seeds to school. Look at them. Put the seeds somewhere so everyone can see. Do the seeds look alike or different?

Print the right word under the picture or pictures.
muscles organs bones skin

1.010


## Ask your teacher to say these vocabulary words with you.



## Natural Resources

The natural resources of the MidAtlantic states have influenced how people settled the area. They have also affected the types of employment in the region. With the exception of Pennsylvania, all of the states in the region touch the Atlantic coast. The shipping industry is important to the area. The Chesapeake Bay and the Delaware River enable Philadelphia,

| Cranes lift cargo boxes and place them on the ship.

Pennsylvania to have a shipping industry. The New York City and New Jersey ports are among the busiest in the United States. The natural resources of the Atlantic Ocean, the Chesapeake Bay, and large rivers allow the Mid-Atlantic states to export and import large quantities of goods through shipping.

Moving in from the coast, the land becomes marshy. A coastal marsh is a low, soft area. It serves as a transition between water and land. The term coastal wetlands is also used to describe these areas. These marshy areas were passed over by the early settlers. The land could not be farmed.
The mosquitoes living in them spread disease. Today, these marshes are seen as a wonderful natural resource for the area.

Many of the marshes have been preserved to help prevent flooding.
When there is a heavy rain, the marshes provide a place for the water to

## Weather

A winter blizzard is a type of strong Midwestern storm. Blizzards have strong winds and often heavy amounts of falling snow. The strength of the wind turns a snowstorm into a blizzard. Because the winds are so strong, travel becomes dangerous. Drivers are unable to see the road because of the way the snow is whipped around by the wind.


Blizzards make driving dangerous.

The incredibly cold temperatures also make being outside dangerous.
Blizzards can shut down roads, businesses, and schools. The winds cause the snow to drift, making huge banks on the sides of buildings and roads. Some blizzards cause power outages. Because the temperature is so cold, people need to put on many layers of clothes and blankets when the power is not working. All the northern states in the United States can experience blizzards.

The winters are cold throughout the region. In January, temperatures are often below freezing. Of course in the southern states of the region, the average temperature is warmer. While there are significant snowfalls, they are not as great as those in the Great Lakes region. The Midwestern region is largely sunny. Even during the cold winters, the sun shines brightly.

Midwestern summer months are generally hot. In July, most of the states in this region have average temperatures around 85 degrees.

| Tornadoes are also known as twisters or
1.12 Match pictures from the first column to pictures in the second column to make compound words from Spelling Words-1.

a. $\qquad$
b. $\qquad$

c. $\qquad$

d. $\qquad$

e. $\qquad$


## Using Reference Books

Reference books are special books we use to get special kinds of information. The reference books people use most are an encyclopedia and a dictionary.

An encyclopedia is a book or a set of books giving information about many subjects. The subjects are in alphabetical order in an encyclopedia.

A dictionary is a book that tells the meaning of words. A dictionary also tells how to say each word. The words in a dictionary are in alphabetical order.

Another reference book that is used often is an atlas. An atlas is a book of maps. The maps are in alphabetical order in an atlas, too.


## Money

You will need pennies, nickels, dimes, quarters, and dollars.
We go to the store to buy things.
We give the store clerk money to pay for the things we are buying.
We may pay in coins, or we may pay in dollars.


## Complete this activity.

4.4 Find the total amounts in cents of each set of coins.

$\qquad$
$\qquad$


## You will need

grocery store items that show liters or grams
4.12 List each one of the grocery store items.

Write the measurement in liters or grams that is shown on the label. Write the measurer that we would use for the English Standard of Measurements.
grocery store item
liters or grams
English Standard
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Different fractions may tell us about the same part of a whole.
4.13 Circle or shade the part that shows the fraction. Do the fractions tell about the same part? Circle $Y$ for yes or $N$ for no.


## Unit 3 | CHANGES IN ANIMALS AND ENVIRONMENTS

## Amphibians

Frogs and toads are amphibians. They go through metamorphosis, too. If you live near a lake or a stream, you may have seen some tadpoles. A tadpole and its mother do not look alike. If the environment is right, the tadpole will go through several changes before it looks like the mother.

There are three parts to the life story of an amphibian. First comes the egg. Next comes the baby frog that is called a tadpole. The tadpole will then undergo metamorphosis to become the adult frog.

If you catch some tadpoles and try to keep them, you must be very careful of their environment. The environment you keep them in must be exactly like the environment where you find them. The kind of water and the temperature of the water must not change. Keep in mind that when the tadpole gets its

| Life cycle of a frog legs and starts breathing with its lungs, it must be able to get its head out of the water. If it cannot breathe, it will drown. Put something in the jar, like a rock, that will let the frog get out of the water to breathe. Watching the metamorphosis of a frog over time can be an amazing experience!

## The Earth Rotates

The earth is round like a ball. From space, the earth looks mostly like a big blue ball. If you were in a spaceship looking at the earth from the direction of the sun, you would notice that the earth is slowly turning. This is one of the ways the earth moves. It rotates. If you flew your spaceship over the top of the earth, you would be over the North Pole. Looking down at the earth from the North Pole, the earth would rotate in a counterclockwise direction. The North Pole would stay in the same place. All of the other places that you could see would rotate around the North Pole.

| From space in the direction of the sun, the earth rotates from left to right.

| From above the North Pole, the earth rotates counterclockwise.

| A lioness on a savanna in Africa

Grasslands often have rich, fertile soil. Less rain falls on grasslands than in the forests which can wash out the minerals that helps plants grow. Also, the grasses die and pile up quickly, then decompose to fertilize the soil. The grasslands often have a thick layer of very, very good black soil from the dead grass.

The dead grass and roots from the living grass make a thick mat on top of the ground called "sod." Sod is difficult to cut through and sticks together so well that people can build with it. Many of the early settlers on the Great Plains lived in sod houses. The thick sod blocks kept the house warm in the winter and cool in the summer.

There are usually very few trees on the grasslands, because they need more water than grass does. Savannas do have special trees scattered here and there. In other grasslands, trees are found along rivers or lakes or where people have planted them.

Grass grows well even in dry places because it grows so fast. It can quickly sprout up when there is rain and die when there isn't, leaving seeds for the next time. Trees need to grow for many years to produce seeds.

The savanna is unusual because it gets a great deal of rain during the wet season. Trees that can store up water or send down deep roots can live on the savanna. Savannas usually have trees spread out among the grass, looking as if somebody dropped tham in ..... the wrong place.

From Calvert 4th Grade

The American space program was led by NASA (National Aeronautic and Space Administration). It has gone through five stages. Mercury, the first stage, carried one man into space at a time. Under Mercury, in 1961, Alan Shepard was the first American in space, and John Glenn was the first American to orbit the Earth in 1962.

The Gemini program began in 1965 and put two men at a time into space. Apollo, which carried three men into space, was launched in 1968. Under the Apollo program, Neil Armstrong became the first man to walk on the Moon. Several other Apollo ships went to the moon after that. The last Apollo mission, in 1975, was a link-up between an American and a Soviet space ship. It showed that the two countries could work together in space.

Skylab was a small space station in orbit around Earth. Beginning in 1973, it was used by three crews to do experiments in space and learn about how people can live in space. It fell out of Earth's orbit in 1979.

The Space Shuttle, the fifth stage of the American space program, was first launched in 1981. It could carry five to seven people and was the first reusable spaceship. It landed on a runway like an airplane, instead of splashing down into the ocean like earlier ships. Space shuttles made over one hundred thirty trips to launch satellites, repair satellites, and do experiments in space. The satellites which the Shuttle launched are used to watch the weather on Earth, allow people to communicate, and explore the rest of the universe. So, modern man continues to explore just as Columbus and Magellan did.

| The Space Shuttle was reusable and could land like an air

## Complete this coloring puzzle.

4.48 Color the spaces using the following key.
a. Color homonym word pairs yellow.
b. Color synonym word pairs blue.
c. Color antonym word pairs green.
d. Color prefixes purple.
e. Color suffixes black.


## Complete these activities.

1.11 Divide the following information into paragraphs. Write the first word of each paragraph on the line following the information.


The United States has many popular sports. Three of the most popular sports are basketball, football, and baseball. Millions of people watch or take part in these sports each year. Basketball is probably the most popular. More people attend basketball games than any other sport. Almost every school has a basketball team. Football is also very popular. Many people will watch no other sport. Large crowds fill stadiums across the United States to watch teams play. Another very popular sport is baseball. It is called our "national pastime." Baseball, too, has very loyal fans. The greatest interest in this sport is probably shown at World Series time.
a. Paragraph One $\qquad$
b. Paragraph Two
c. Paragraph Three
d. Paragraph Four
1.12 Now write your own paragraphs. Write a paragraph on each of three different sports or games that you can describe or explain. Use a separate piece of paper for this activity.


## Teacher check:

Initials $\qquad$ Date
3.4 Write the correct symbol. > , <
a. 72,458 is $\qquad$ than 76,458 .

42,960 is $\qquad$ than 42,961.
b. 56,765 is $\qquad$ than 46,765. 88,571 is $\qquad$ than 87,571 .
c. 22,960 is $\qquad$ than 22,760 .

15,000 is $\qquad$ than 13,000.
d. 61,200 is $\qquad$ than 71,200.

33,852 is $\qquad$ than 33,752.
e. 95,500 is $\qquad$ than 95,700. 47,900 is $\qquad$ than 43,900.

## Adding and Subtracting Fractions

## Complete these activities.

3.5 Complete the problem in addition of fractions for each illustration.
a.



$$
+\overline{4}
$$

a. $\qquad$

6

$+\frac{}{6}$
b.
3.6 Complete the problem in subtraction of fractions for each illustration.
a.



$$
-\overline{4}
$$

b.

8
$\qquad$
a. $\qquad$



## Complete this activity.

1.9 Write the shaded portion of each of the following as:

1) an improper fraction; and
2) as a whole number or mixed number.
a.

3) $\qquad$ 2) $\qquad$
c.

4) $\qquad$ 2) $\qquad$
b.

5) $\qquad$ 2) $\qquad$
d.

6) $\qquad$ 2) $\qquad$

To change an improper fraction to a whole number or mixed number, divide the denominator into the numerator. If there is a remainder, it is expressed as a fraction.

$$
\begin{aligned}
& \frac { 1 0 } { 5 } = 5 \longdiv { 2 } = 2 \\
& \frac{11}{6}=\frac{6 \sqrt[11]{10}}{\frac{6}{5}}=1 \frac{5}{6}
\end{aligned}
$$

## Look at the picture.

1.25 On the lines write the name of each resource that living things need.


## Think and draw.

1.26 What is your environment like? Does it include natural things and peoplemade things? Does it include people and animals? Does it include pleasant and unpleasant things? On a sheet of drawing paper, make a picture of your environment. When you have finished it, put it in your unit at this page. You will want to look at it again when you study about human communities.


## Teacher check:

Initials $\qquad$ Date $\qquad$
1.44 $\qquad$ When air becomes colder, it expands and spreads out.
1.45 $\qquad$ Cold air rises.

## Moisture

Radiation from the sun, changes in temperature, and moving air all play an important part in causing the weather. The amount of moisture in the air also causes different weather conditions. If you have walked in fog, you have been walking in a low cloud. Tiny water droplets are all around you. You cannot see very far ahead.

At home, you have probably watched water boiling and steam rising from a teakettle. The water in the teakettle gets very hot. Soon some of the water turns to steam. The steam settles against the cold window and turns to drops of water again.

In the sky, billions of water droplets also get close together. When they hit the cold upper air, they form a cloud.

| Water Cycle

## Problems in Power

Immigration. In the past, the United States of America was called a "melting pot" because immigrants from all over the world have come here. They brought their ways, ideas, music, and food with them. The term "melting pot" is used less often today because it describes a process of all the different cultures melting into the American culture. While many people who immigrate to the U.S. do begin to speak English, enjoy American foods, and pick up some American habits, they usually also retain their own cultures, enjoying foods, religions, traditions, and more that come from their original country. Americans born in the U.S. also enjoy learning new languages, eating new foods, listening to new music, and learning about new traditions that come from other cultures, brought by immigrants from all over the world.

The huge growth of industry after the Civil War created a need for workers, and that would attract many newcomers. America became the "land of opportunity" for the desperately poor of Europe. America was a land where jobs and education could mean a better life. It was a land where poor immigrants, like Carnegie, could become millionaires. From the 1870s until the 1920 s, millions of immigrants came from Europe to America. Every year during the last 30 years of the 19th century about 400,000 new arrivals came into the country.

Most of the immigrants before 1880 came from northern Europe: Germany, England, and Ireland. However, after that time more and more came from southern and eastern Europe: Hungary, Italy, Poland, and Russia. These people had a harder time fitting into American life. Their languages were much different. They usually could not read or write. They were

| Many immigrants lived in communities of people from the same

## A Growing Nation

Jackson. Andrew Jackson was elected president in 1828. He was the first U.S. president who was not born into a wealthy family. He was born poor, earned his own fortune, and lived in the west (Tennessee). He was wildly popular and had strong ideas about being president. He vetoed more laws than all six of the presidents before him. The ordinary man began to be important in American politics after Andrew Jackson.

Jackson encouraged the "spoils system" which gave government jobs to his supporters. He vetoed a charter for the National Bank, which he did not trust, and took federal money out of it. The money was put in state banks ("pet banks"), and the National Bank was closed. Jackson also threatened to use force when South Carolina nullified the tariff in 1832 by refusing to allow it to be collected in their state. Henry Clay ("the Great Compromiser") arranged for the tariff to be lowered, and Carolina backed down. Jackson also moved thousands of Native Americans from their land east of the Mississippi to Oklahoma so that American pioneers could have their land. Many died on the journey, later known as the "Trail of Tears."

After Jackson. Andrew Jackson chose his vice president, Martin Van Buren, to run for the presidency when he retired. With Jackson's support, Van Buren won the election in 1836. However, a depression in 1837 (also called a "panic") made him very unpopular.


## Word and Sentence Study

In this lesson, you will learn how to pronounce words by the way they are used in a sentence. This practice is called looking for context clues. You will also read about sentences, both written and spoken. As you read through the examples below, identify the subject and the predicate. Ask yourself if the sentence expresses a complete thought.

Certain words need to be identified by the way they are used in sentences. For example, you do not know how to pronounce the word lead until you see it used in a sentence. In the sentence, "I will lead the way," the ea has the long /e/ sound. In the sentence, "The pencil was made of lead," the ea has the short /e/ sound. Words that are spelled the same but have different meanings and are pronounced differently are called homonyms or heteronyms.

Homonyms are actually three classes of

| Heteronyms words: 1) words that sound the same but have different spellings and meaning; 2) words with exactly the same sound and spelling but can mean different things; and 3) words that are spelled the same but sound different and mean different things. A heteronym is one of two words that are spelled the same, but sound different and mean different things. For example, bass (having a deep voice) and bass (a type of fish). Bass, as in a deep voice, sounds like base, as in baseball. But bass, like the fish, makes the same -a sound as grass.

You may have noticed the pronunciation key that usually follows vocabulary. Below is a picture of a key that will help you pronounce words correctly.


## The Village Blacksmith

by Henry Wadsworth Longfellow (1840)
1 Under a spreading chestnut-tree
The village smithy stands;
The smith, a mighty man is he, With large and sinewy hands;
5 And the muscles of his brawny arms Are strong as iron bands.

His hair is crisp, and black, and long, His face is like the tan;
His brow is wet with honest sweat,
10 He earns whate'er he can,
And looks the whole world in the face, For he owes not any man.

Week in, week out, from morn till night,
You can hear his bellows ${ }^{1}$ blow;
You can hear him swing his heavy sledge, ${ }^{2}$
15 With measured beat and slow,
Like a sexton ${ }^{3}$ ringing the village bell,
air pump
When the evening sun is low.

## Dividing Decimals by Whole Numbers

Let's use an example to review what it means to divide with whole numbers. If we have 20 apples that need to be divided between 5 people, we want to see how many apples each person will get. So, the dividend, or 20 , is the amount that is being divided. The divisor, or 5, is the number of groups that we are evenly splitting the dividend into. And, the quotient is the amount that will be in each group after dividing. For this example, the quotient is 4 , because each person will get 4 apples. We can use a picture, or model, to show this division:

## 20 apples $\div 5$ people $=4$ apples for each person



We can apply this same idea to dividing decimal numbers. In this lesson, we'll explore how to divide a decimal number into groups. We'll use models and long division to help us find quotients.

## Dividing Decimal Numbers Using a Grid

Remember that a decimal number can be represented using a grid.
For example, the decimal number 0.4 can be represented on a tenths grid by shading in four tenths. Or, it can be represented on a hundredths grid by shading in forty hundredths.
0.4
0.40


## Finding the Area of Plane Figures

Our next measurement was area, which is measured in square units. We learned that area is the number of square units inside of a figure. For many plane figures, we could just count the number of squares inside the figure.

This figure has an area of 14 square units because there are 14 squares inside of the figure.

We learned that for some figures, there is a shorter way to find the area. We developed formulas for rectangles (using the length and width), and for parallelograms, and triangles (using the base and height).


$$
\begin{array}{ll}
\text { Rectangles: } & A=l W \\
\text { Parallelograms: } & A=b h \\
\text { Triangles: } & A=\frac{b h}{2}
\end{array}
$$

We found that each of these formulas are related. Rectangles are made up of rows of squares, so we can multiply the length (the number of squares in one row) by the width (the number of rows) to find the area.

Parallelograms can be converted to rectangles using the same length (base for parallelograms) and width (height for parallelograms).


If a triangle's area is doubled, it will form a parallelogram. So, to find its area we take half of the area of a parallelogram with the same base and height.


We used these formulas to find the area of figures that could be broken up into rectangles, parallelograms, and/or triangles.

## Viewing Cells

The only way to view most cells is to use a microscope. There are different types of microscopes. An optical microscope is the one you will normally see and use. It can magnify a cell up to about 2,000 times so that we can easily see the basic parts of the cell. However, some cells are too small to be seen by an optical microscope. For these, an electron microscope is needed. An electron microscope can magnify a cell by one million times! These electron microscopes not only allow us to see the smallest of cells, they also allow us to view the tiny subparts of cells. (We will cover some of these subparts of cells in Section 2.)

It is also helpful to use dyes to view cells. The dyes stain certain parts of the cell-such as the cell membrane and the nucleus-so that they stand out more clearly when we view the cells under a microscope. (You will use iodine as a dye in some of the experiments.)

| Muscle cells


Red blood cell

| Nerve cell

| Paramecium

| Diatom


Worms. Worms are animals that have soft, slender bodies and no backbone or legs. There are thousands of different kinds of worms. The largest worms are several feet long, and the smallest ones cannot be seen without a microscope.

Worms have no outside covers or bones to give them protection. Since worms have no protective structures, they live in places that are safer for them. Most of their lives are spent under the ground, in water, or inside other animals.

The larvae of some insects sometimes look like worms, but they are not really worms. There are big differences in the life cycles of real worms and the larvae of insects. Larvae will change into adult insects sometime during the life cycle. The adult insects no longer look like worms. Worms will stay worms all their lives. The adult worms can reproduce. Insect larvae cannot reproduce.

The most commonly known worm is the earthworm. Flukes, flatworms, roundworms, tapeworms, and leeches are other types of worms. Most of these worms have similar types of life cycles. However, some life cycles of worms cannot be completed unless the worms are located in the right place. The need for the right place to live is especially important to worms who live in other animals. These worms that live in other animals are known as parasites. The animal where the parasite lives is called the host.

The flea and tapeworm grow into adulthood
Flea larvae eat tapeworm eggs


Cat accidently ingests the flea and is infested with the tapeworm


