

3



Formerly published by J. B. LIPPINCOTT COMPANY
under the title
Science Across the Land

Science and Living in God's World

VICTOR C. SMITH

BARBARA HENDERSON

In Consultation With

W. R. TEETERS

Revised edition published by: Lepanto Press
421 S. Lochsa Street
Post Falls, ID 83854



CONTENTS

1. LOOKING FOR A HOUSE 5

AN OLD HOUSE, 10; A NEWER HOUSE, 11; A COAL FURNACE, 11
THE BASEMENT, 17; MORE HOUSES, 18; THE BEST HOUSE, 20
THE WATER PIPES, 21; A SAFETY LESSON, 24; THE NEW HOME
26; A DOLLHOUSE, 27

2. MAKING AN AQUARIUM 35

CLEANING THE JAR, 36; FINDING THE SAND, 38; CHOOSING THE
PLANTS, 40; BUYING THE FISH, 44; CLEANING THE AQUARIUM
49; THE BABY SNAILS, 53; ENJOYING THE AQUARIUM, 55

3. EXPERIMENTING WITH ELECTRICITY 61

THE DIVING DOLL, 64; THE POLES OF A MAGNET, 68; ELECTRIC
CHARGES, 70; STATIC ELECTRICITY, 71

4. LOOKING AT THE MOON 83

THE OBSERVATORY, 84; THE STORY OF THE MOON, 86; THE
APOLLO MISSIONS, 90; THE TELESCOPE, 95

5. ENJOYING LIFE IN THE SPRING 103

HOW TO RECOGNIZE SOME TREES, 106; SOME THINGS TO SEE IN
THE WOODS, 108; THE BIRDHOUSE, 110; THE SPRING FLOWERS,
114; THE TURTLE, 119

6. HELPING WITH THE GARDEN 125

PLANTING THE GARDEN, 128; CUTTING THE WEEDS, 132;
STARTING A COMPOST PILE, 133; WATCHING THE PLANTS
GROW, 134; PROTECTING THE PLANTS, 136; EATING THE
VEGETABLES, 142

7. HOW THINGS WORK: SCIENCE AROUND US . . . 149

THE FIRE BOW, 151; THE TOY FLUTE, 154; THE KITCHEN TOOLS,
156; THE HAMMER AND NAIL, 160; THE TOY XYLOPHONE, 161;
THE HAND DRILL, 163; THE TOY PAIR, 165; THE TOY PIANO, 167;
THE MECHANICAL TOY SET, 169; WHAT THE PUPILS LEARNED,
171

8. VISITING A STATE PARK 179

THE WATERFALLS, 180; THE LOOKOUT TOWER, 184; THE WILD
DEER, 187; THE CARE OF FORESTS, 190

Things To Remember 29, 56, 77, 98, 120, 145, 174, 193

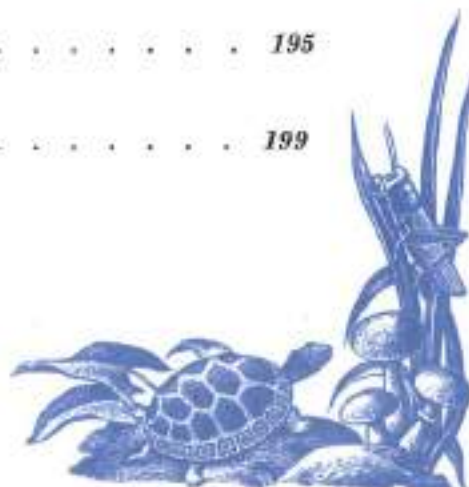
Experiments To Do 29, 56, 78, 98, 145, 174

Things To Do 31, 58, 79, 100, 121, 145, 175, 193

Things to Think About 32, 58, 80, 100, 122, 146, 176, 194

GLOSSARY 195

INDEX 199





ABOUT THE TEXT

The bulk of this text was originally published in 1951 under the title *Science Across the Land* by J. B. Lippincott Company, with revision in 1956.

Original Library of Congress Catalog Card Number: 56-5001.

ORIGINAL AUTHORS

Victor C. Smith, formerly of the Department of General Science, Ramsey Junior High School, Minneapolis, MN

Barbara Henderson, former Director of Intermediate Education, Kansas City Public Schools, Kansas City, MO

W. R. Teeters, former Director of Education, St. Louis Public Schools, St. Louis, MO

ORIGINAL ILLUSTRATORS

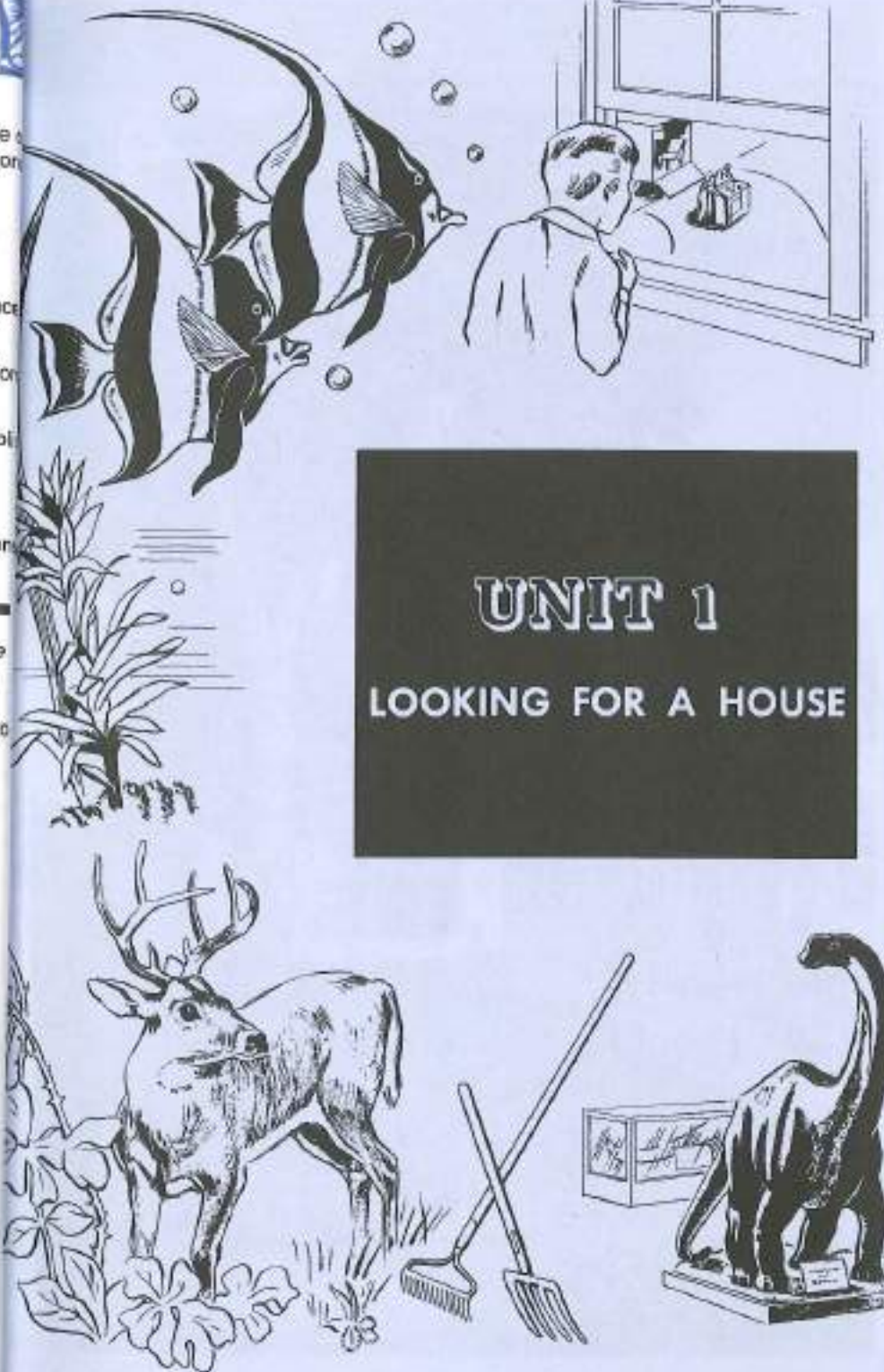
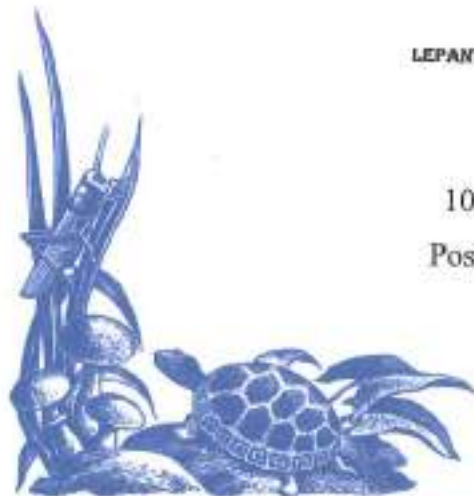
Title pages were prepared by Paul Hazelrigg. The text illustrations were drawn by Gregory Orloff.

This book has been renamed *Science and Living in God's World, Grade 3*. The text of this book has been revised from the Lippincott edition to reflect Roman Catholic perspectives on science and to include current scientific information. Revised portions are Copyright © 1998 by Lepanto Press and Our Lady of Victory School. Revised text may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, scanning, recording, or by any information and retrieval system.

LEPANTO  PRESS

103 E. 10th Avenue
Post Falls, ID 83854

6



UNIT 1

LOOKING FOR A HOUSE



How lovely are Thy dwellings, O Lord of hosts! My soul longs and faints for the courts of the Lord . . . For the sparrow has found herself a house, and the turtle a nest for herself where she may lay her young ones. . . Blessed are they that dwell in Thy house, O Lord; they shall praise Thee for ever and ever. . .

For better is one day in Thy courts above thousands in others. I have chosen to be the lowliest in the house of my God, rather than to dwell in the tabernacles of sinners. Psalms, 83:1 - 5, 11

When King David wrote the Psalms, many people lived in tents. There were cities, but many people still traveled with their herds in search of grassy areas. Some of their dwellings (tabernacles) were quite ornate, but their purpose was to provide shelter for people.

Holy Mother Church teaches us that our most important goal in life is to know, love, and serve Almighty God. In her wisdom, the Church does not wish for us to be overly worried about temporal matters. So she recognizes that food, shelter, and clothing are important necessities. But a comfortable home should only be a tool toward helping us perfect our spiritual lives.

1

LOOKING FOR A HOUSE

For a long time Father and Mother had been planning to buy a new house in a parish with a good Catholic school. Bob and Betty were happy when Father said, "Today we shall look for a new house."

As Mother put the breakfast dishes away she said, "I want a house that is easy to keep clean and pleasant to work in."

Bob wanted a house with a workshop and space to play. Betty wanted a pretty house in a block where other children lived. Father wanted a house that had been carefully planned.

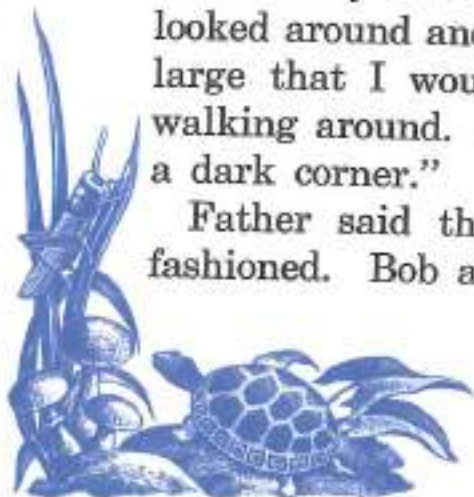
"The new house must have a good heating plant," he said. "It must be well lighted, too."



AN OLD HOUSE

Mr. Brown, the man who sold houses, took them first to a large, attractive old house. When they entered the kitchen, Mother looked around and said, "This kitchen is so large that I would waste too much time walking around. And, look, the sink is in a dark corner."

Father said that the lighting was old fashioned. Bob and Betty noticed that an



electric light bulb hung by a cord from the middle of the ceiling.

As they walked through the rooms Father said, "This is an old house. It uses radiator heat. Radiator heat is good, but the radiators are not under the windows as they should be. In winter the cold air from the windows will fall to the floor and make our feet cold."

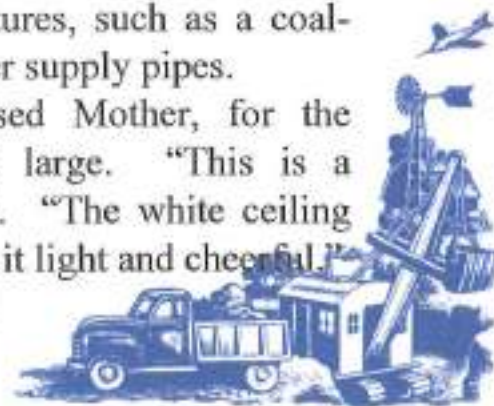
They found the basement dark because the windows were too small. There was an open coalbin near the furnace. Old papers and boxes were stacked nearby. "These papers near a furnace are dangerous," said Mr. Brown. "A spark from the furnace might start a fire."

Nobody liked the old house very much.

A NEWER HOUSE

The next house they visited was newer. As Mother, Bob, and Betty looked around, Father discussed the house with Mr. Brown. There were still some older features, such as a coal-fired furnace and lead water supply pipes.

The living room pleased Mother, for the windows were high and large. "This is a pleasant room," she said. "The white ceiling and pretty wallpaper make it light and cheerful."

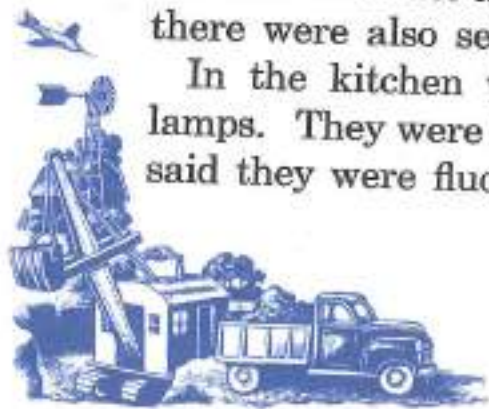




"I see there are plenty of base outlets for lamps," Father added. "We could have enough light at night, too."

Bob was exploring. He found a place for the television set and the electric clock, and there were also several other base outlets.

In the kitchen were the newest ceiling lamps. They were long glass tubes. Father said they were fluorescent lamps. Fluores-



cent lamps do not have hot wires in them. The gas inside the glass tubes is charged with electrical current, causing it to give off light. There was a lamp above the stove, too.

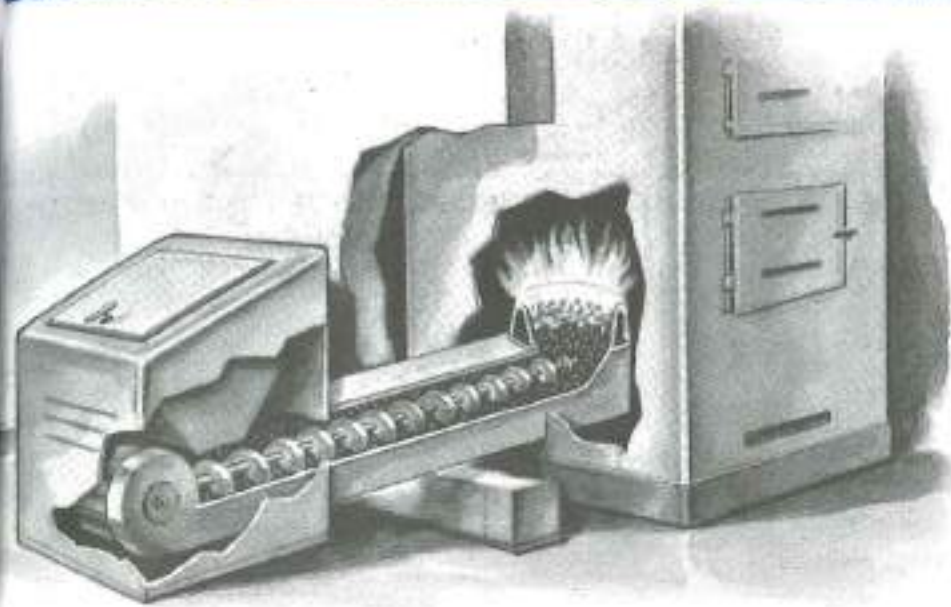
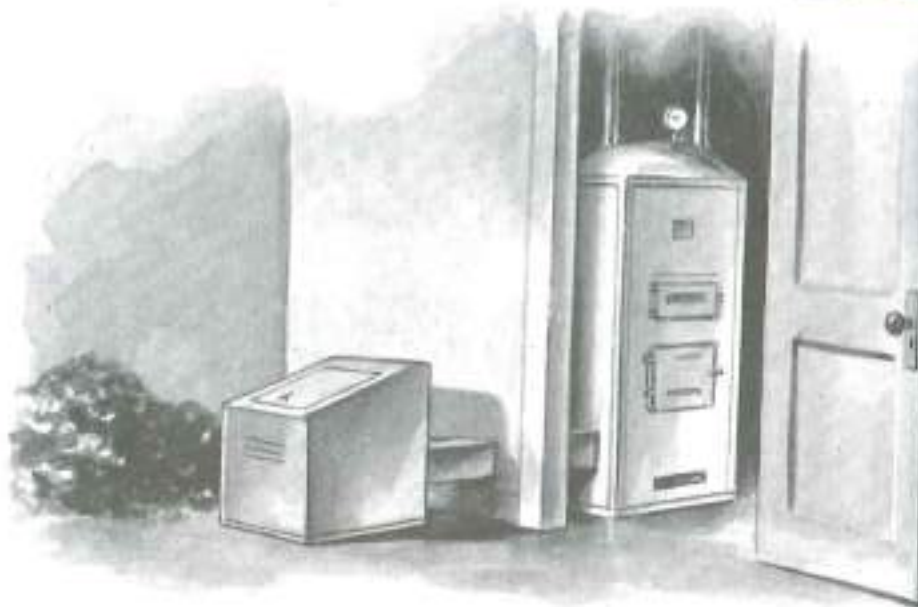
Mother found places to plug in her food processor and coffeemaker above the counter near the sink. Above and below the counters were plenty of cupboards and cabinet spaces. There were drawers for flatware and places for pots and pans. Above the sink was a window through which they could see an attractive yard full of autumn flowers.

There was a large, white refrigerator and a white stove. The stove had a cover that came down over the electric burners when they were not in use.

Father noticed that the radiators were placed under the windows. He was becoming interested in this house, but he was concerned about the furnace burning coal instead of gas. He asked Mr. Brown to take them to the basement.

A COAL FURNACE

Mr. Brown showed them the furnace. Father liked the hot water heat system. The heating plant was neat and clean. The coalbin was in a



separate room with a concrete wall around it. From the coal room to the furnace was a pipe. Mr. Brown explained that the stoker did the work of putting the coal into the fire.

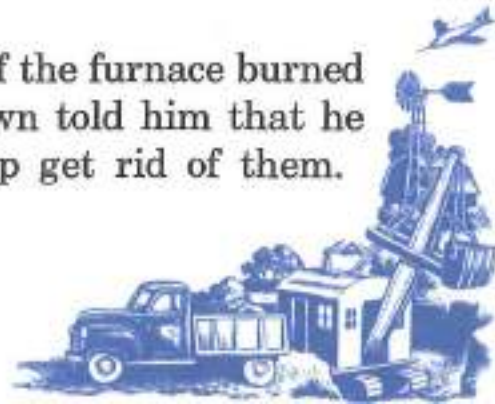
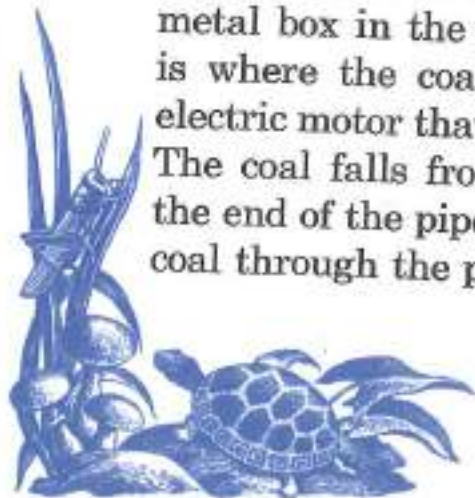
"How does it do that?" Betty asked.

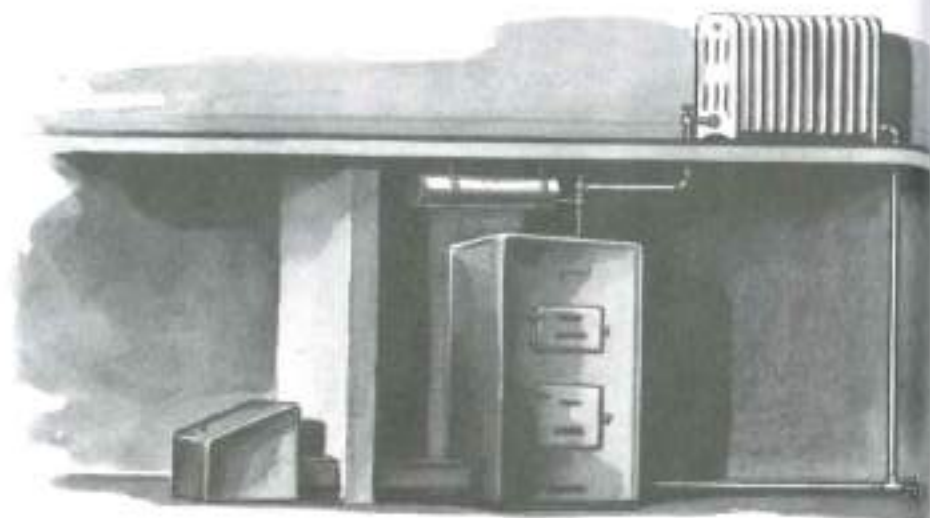
Mr. Brown smiled. He pointed to a large metal box in the coal room and said, "This is where the coal is put in. There is an electric motor that turns a screw in the pipe. The coal falls from the box or hopper into the end of the pipe, and the screw forces the coal through the pipe into the bottom of the

furnace. It works just like the screw does in the food grinder when it forces the food through the grinder."

Betty said she did not quite understand what started the fire. Mr. Brown explained this: "You start a coal fire just as you would in a stove. Then the stoker adds fresh coal to the fire. And a fan which blows air in gives the fire draft."

Bob wanted to know if the furnace burned the ashes, but Mr. Brown told him that he would still have to help get rid of them.





Then Bob wanted to know how the heat went up into the house from the furnace.

Mr. Brown showed him some pipes. "This is a hot-water heating plant," he said. "The furnace heats water in the boiler, and these pipes carry the hot water upstairs to the radiators. The heat goes out into the rooms from the hot water in the radiators."

Father had been looking at the thermostat in the dining room before they came into the basement. The thermostat turned the heat on when the rooms were cool and turned the heat off when the rooms were warm

enough. Wires led down from the thermostat to the motor that ran the stoker.

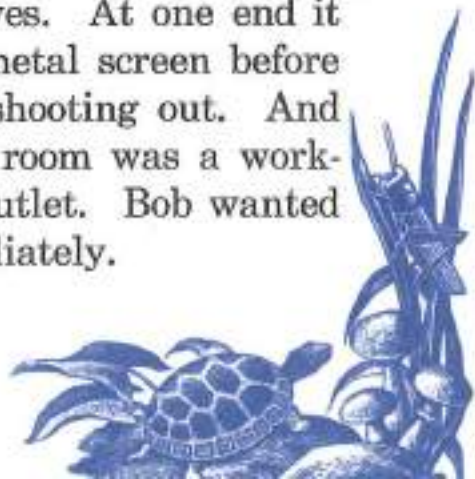
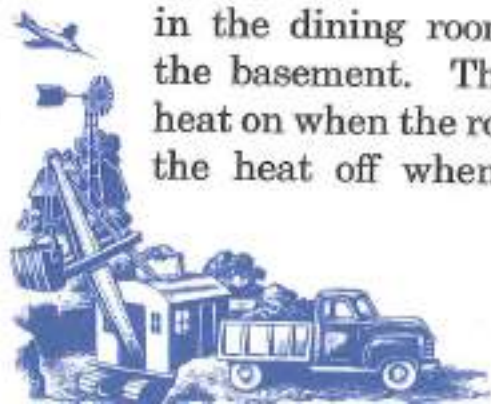
"Electricity is important in this house," Bob said. "It does the work of running the furnace. It turns the stoker on and off. It will heat the iron. It gives us light."

THE BASEMENT

The basement was large and contained two other rooms. One of the rooms was the laundry. The other was a playroom.

In the laundry were tubs and ironing boards, as well as a place for the washing machine. Along the walls were bright-colored pictures of people doing the washing.

The playroom was wonderful. Along the walls were rows of shelves. At one end it had a fireplace with a metal screen before it to keep sparks from shooting out. And in the other end of the room was a workbench with an electric outlet. Bob wanted to buy the house immediately.





But Mother asked, "Where do I keep my canned fruit and vegetables?"

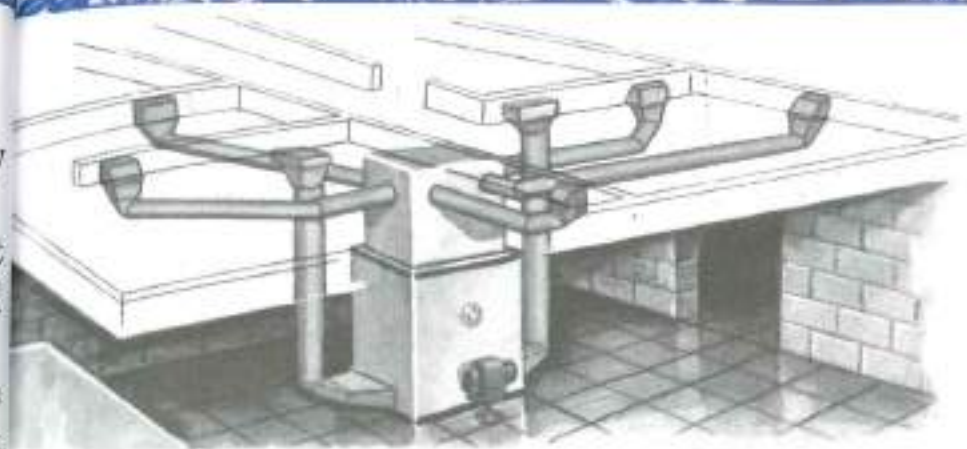
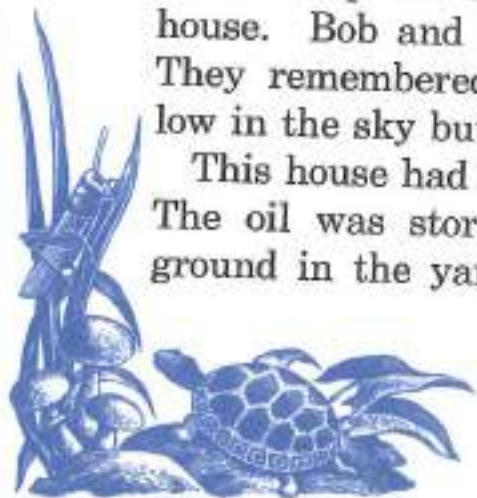
Mr. Brown opened a door they had not noticed. "This," he replied, "is the cool room for food storage."

Then they looked at the upstairs rooms and liked them, too. But Father said, "Let us look at other houses."

MORE HOUSES

The next house was large and attractive. It had a very large window in the living room. Mr. Brown said that this window would let in sunlight in the winter to keep the room warm and light. But in summer the sun would be so high that the wide roof would keep the sun from shining into the house. Bob and Betty had to think hard. They remembered that the winter sun is low in the sky but the summer sun is high.

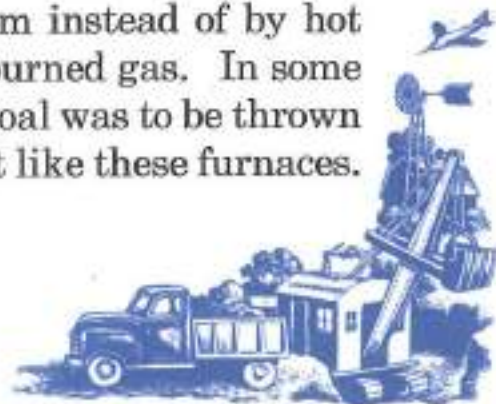
This house had a furnace that burned oil. The oil was stored in a tank under the ground in the yard. A pipe ran from the

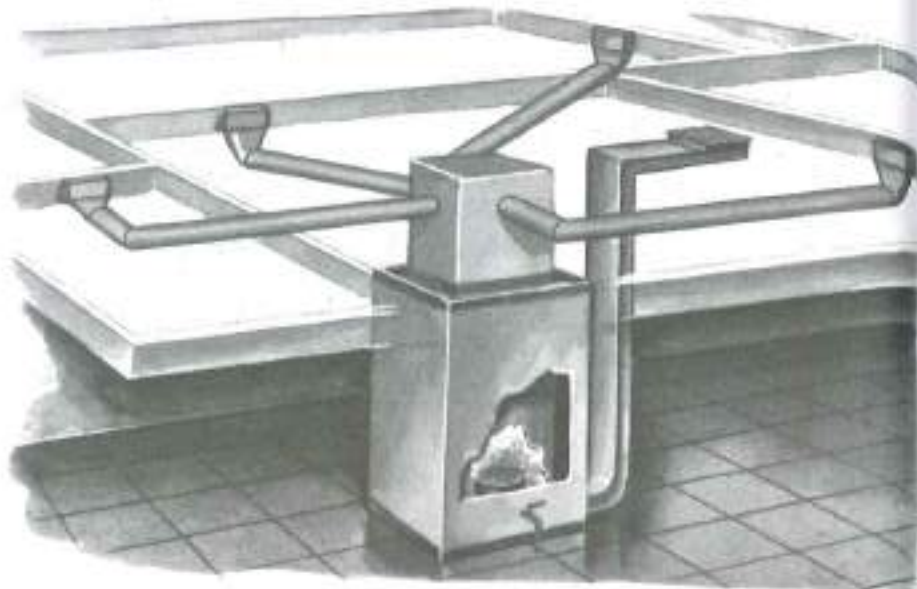


tank to the furnace to carry the oil. A pump worked by an electric motor forced the oil to the furnace.

The heat was carried to the living room by large metal pipes. The lighter hot air went from the furnace up through the pipes, and the heavier cold air ran down other pipes from the rooms to the furnace.

After lunch they looked at other houses. These houses were all much alike. In one house the heat was carried from the furnace to the radiators by steam instead of by hot water. Some furnaces burned gas. In some of the coal furnaces the coal was to be thrown in by hand. They did not like these furnaces.

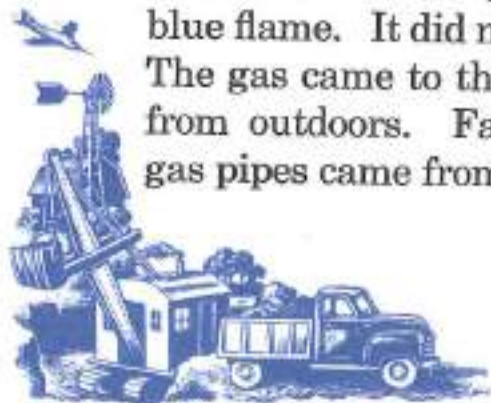




THE BEST HOUSE

Finally Father and Mother decided to look again at still another house they had visited. Mr. Brown gave Father the plans used by the man who built the house.

This new house had a furnace which burned gas. The gas burned with a clear, blue flame. It did not need a stoker or pump. The gas came to the furnace through a pipe from outdoors. Father explained that the gas pipes came from a large tank downtown.



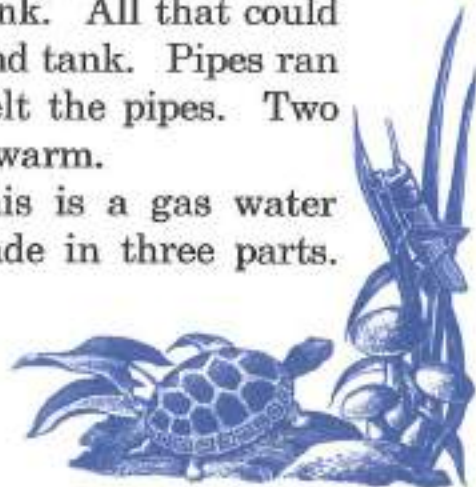
The furnace had hot and cold air pipes to carry air to and from the rooms. These pipes were much smaller than those of the oil-burning furnace. They all ran near the basement ceiling. Father showed the children a large fan inside the cover of the furnace. This fan helped to blow hot air into the rooms upstairs.

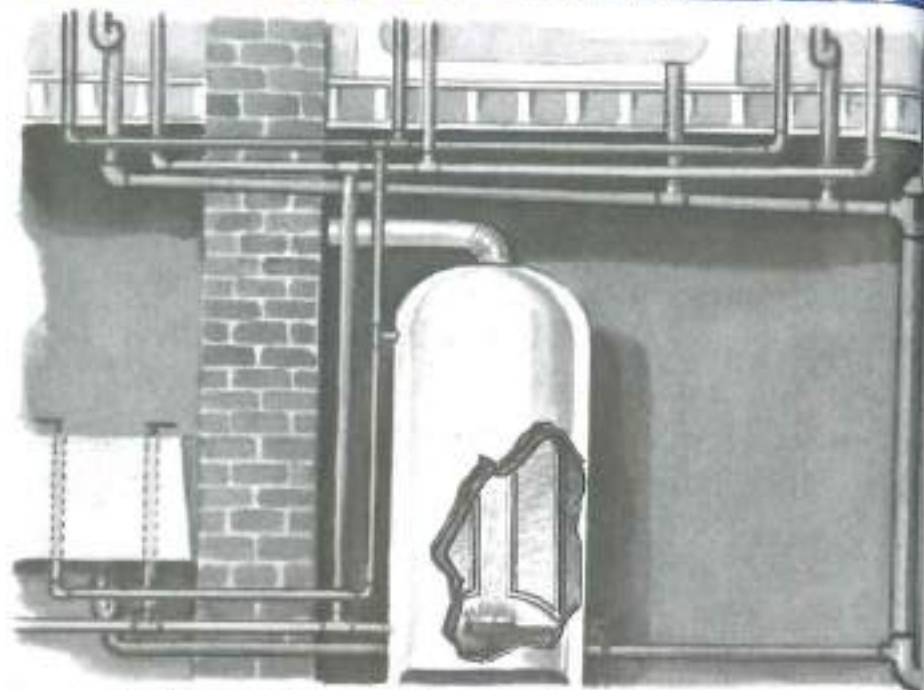
THE WATER PIPES

From the plans they could see how the pipes were put into the house. Bob saw where there was a pipe that brought water from the street main into the house. From this large pipe, cold water went to the kitchen, the bathroom, the laundry, and the faucets outdoors.

Other pipes led to a tank. All that could be seen was the tall, round tank. Pipes ran to and from it. Betty felt the pipes. Two were cold and one was warm.

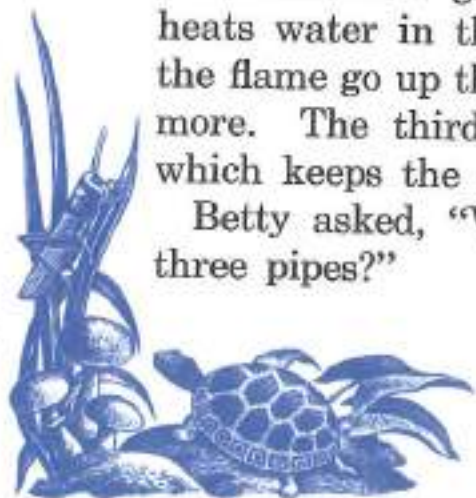
Father explained, "This is a gas water heater. The tank is made in three parts.





First is the tank which holds water. It is like a large, tin can. Passing up through the middle of the tank is a flue. The flue leads to the chimney. At the bottom of the tank there is a gas burner. The hot flame heats water in the tank. Hot gases from the flame go up the flue and heat the water more. The third part is the thick cover which keeps the water hot."

Betty asked, "Why does the tank have three pipes?"



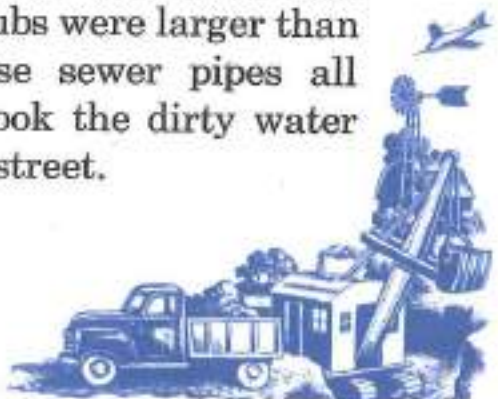
Father answered, "The smallest pipe carries gas to the burner. One pipe carries cold water to the tank. Another pipe carries hot water from the top of the tank. When water gets hot, it rises to the top of the tank."

Father then opened a small door at the bottom of the tank. Betty could see a small flame burning. Then Father turned on the hot water at a faucet. Soon a large, blue flame spread around the burner.

Father said, "When enough cold water runs into the tank, it gets cool. Then the large flame is turned on. Then the water gets hot, and the flame is turned off. The water tank has a thermostat in it."

Father showed them where pipes led to the kitchen, bathroom, and laundry from the hot-water tank.

The pipes that led from the sinks and bathroom and laundry tubs were larger than the water pipes. These sewer pipes all sloped downward and took the dirty water to a large pipe in the street.





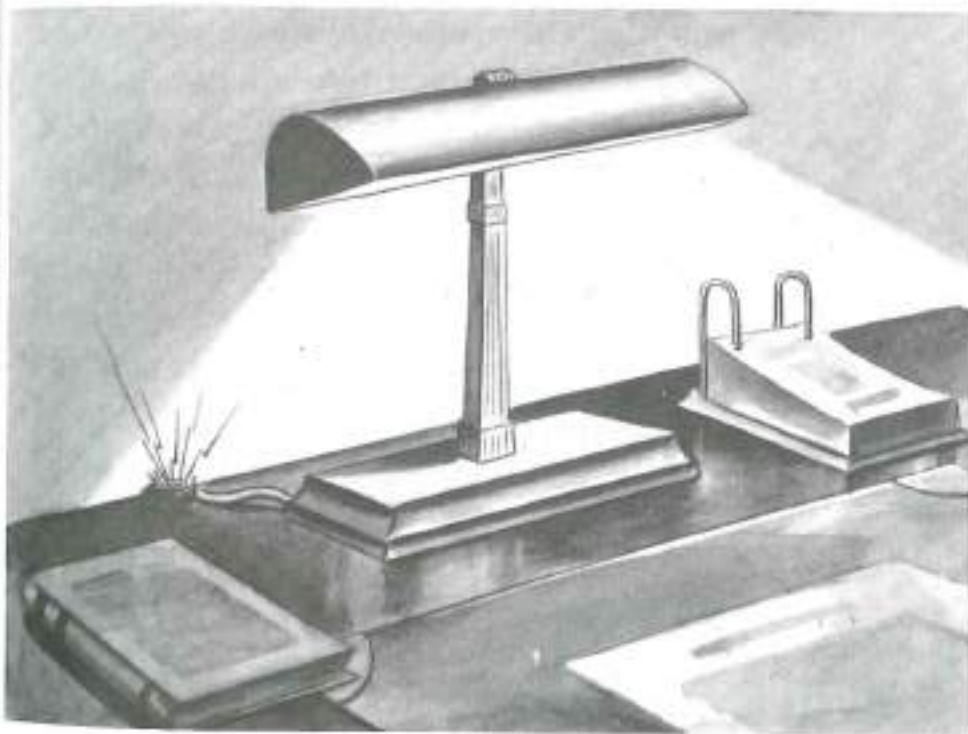
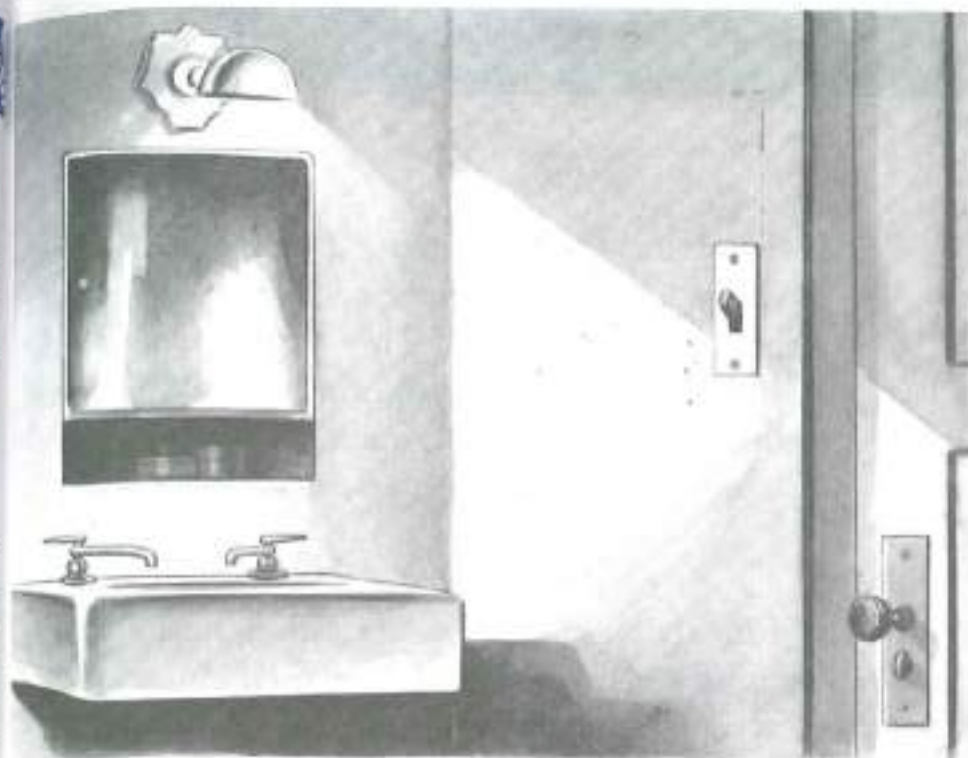
The pipe in the street led the dirty water to a place outside of town. There it ran into large tanks, where dirt settled out. The cleaner water ran into the river.


A SAFETY LESSON

Father wanted to be sure that all the electric wires were safe. He knew that electricity can sometimes escape and cause fire or shock.

Mr. Brown showed them samples of the kinds of wire used in the house. There were two copper wires in the center to furnish a path for the electricity. Each wire was first wrapped with rubber and cloth. Then each was wrapped with paper, and all were inside a metal cable. Mice could not gnaw through the cable to let the electricity out through the bare wires.

The bathroom lights were safe. They could be turned on by a switch near the door, but not by anyone who was touching a pipe or had his hands in water. Father said that





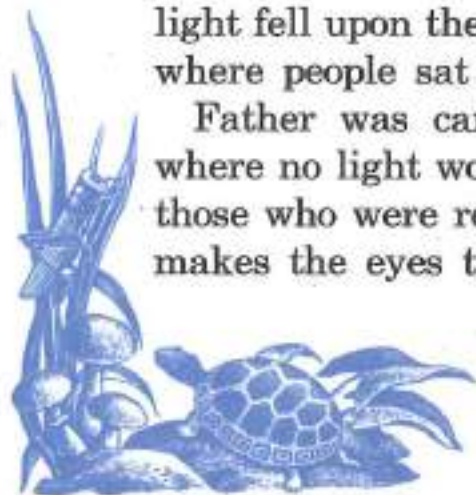
if electricity should run from the switch through a person's body to the pipes, a bad shock might occur. The shock would be painful or even dangerous. Sometimes people are killed by shock.

THE NEW HOME

Finally everyone was satisfied, and Father bought the house. A few days later they moved into it. What fun to ride on the truck with the moving van! All the furniture was put into the rooms, and everybody had to eat dinner downtown that day.

At last everything was in place. The dishes were in the cupboards. The beds were made. The lamps were placed so that light fell upon the desk and upon the chairs where people sat to read.

Father was careful to place the lamps where no light would shine into the eyes of those who were reading, for a glaring light makes the eyes tired.



Bob and Betty had their toys in the play-room, and Bob had his tools on the work-bench.

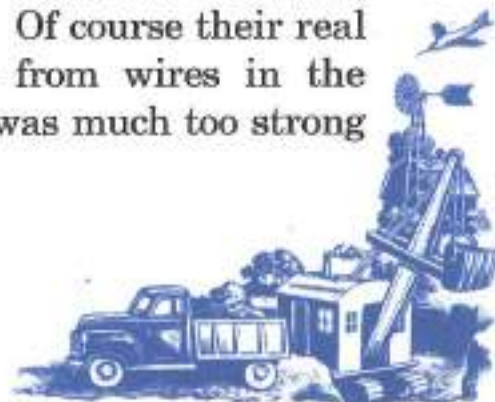
Before long they were ready to start to a beautiful new school. The new school had lights which came on when it was dark.

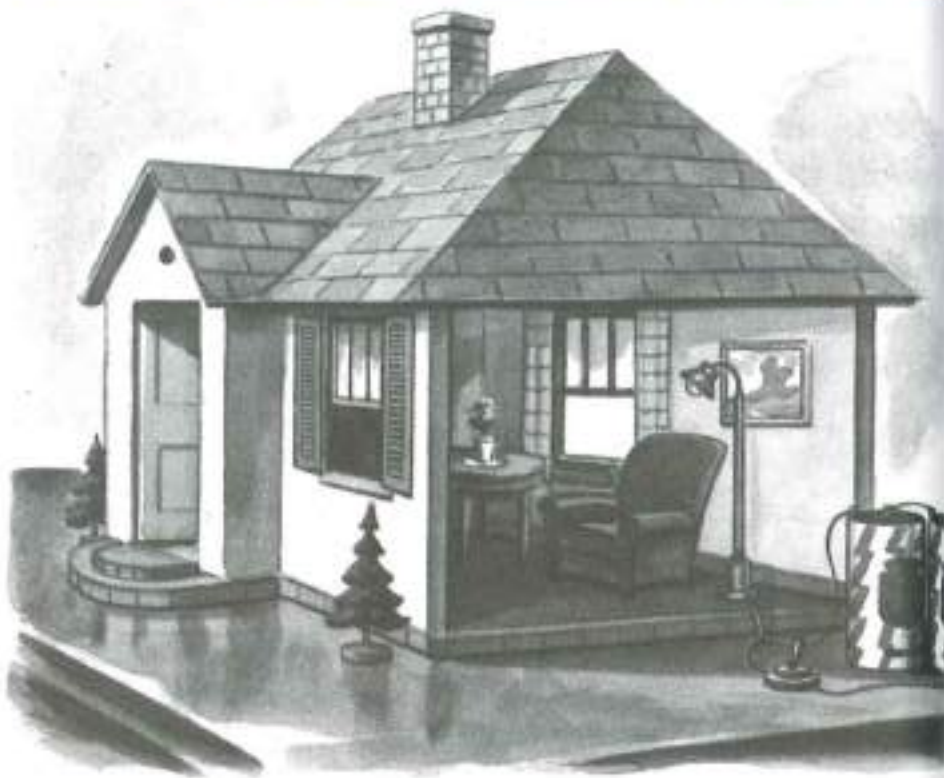
A DOLLHOUSE

Bob and Betty belonged to the science club in their class at school. Bob decided to use what he had learned about houses to make a big dollhouse modern. They borrowed the house from the first grade room.

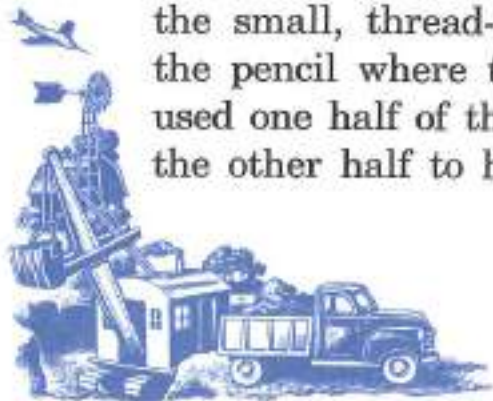
With the help of Mr. Johnson, the janitor, Bob put little lamp sockets on the ceiling and put flashlight bulbs in them for lamps.

He did not have switches to put on the walls, but he did find one switch which he put outside the house. For electric current Bob used two dry cells. Of course their real house had its current from wires in the alley, but that current was much too strong for flashlight lamps.





Betty made a reading lamp from a spool, a pencil, some wires, and a flashlight socket and bulb. She made a paper shade. She soaked the pencil apart in water and put the small, thread-covered copper wires in the pencil where the lead had been. She used one half of the spool for the base and the other half to hold up the lamp socket.



The children agreed that they liked the house very much when the switch was closed and the lights were on.

Things to Remember

Electricity flows through wires.

Electricity may produce heat.

Electricity may do work.

Good light comes from large, clear windows.

Good light from electricity is bright and does not shine in the eyes.

Electricity may cause fire or shocks.

Electric wires must be covered to keep in the electricity.

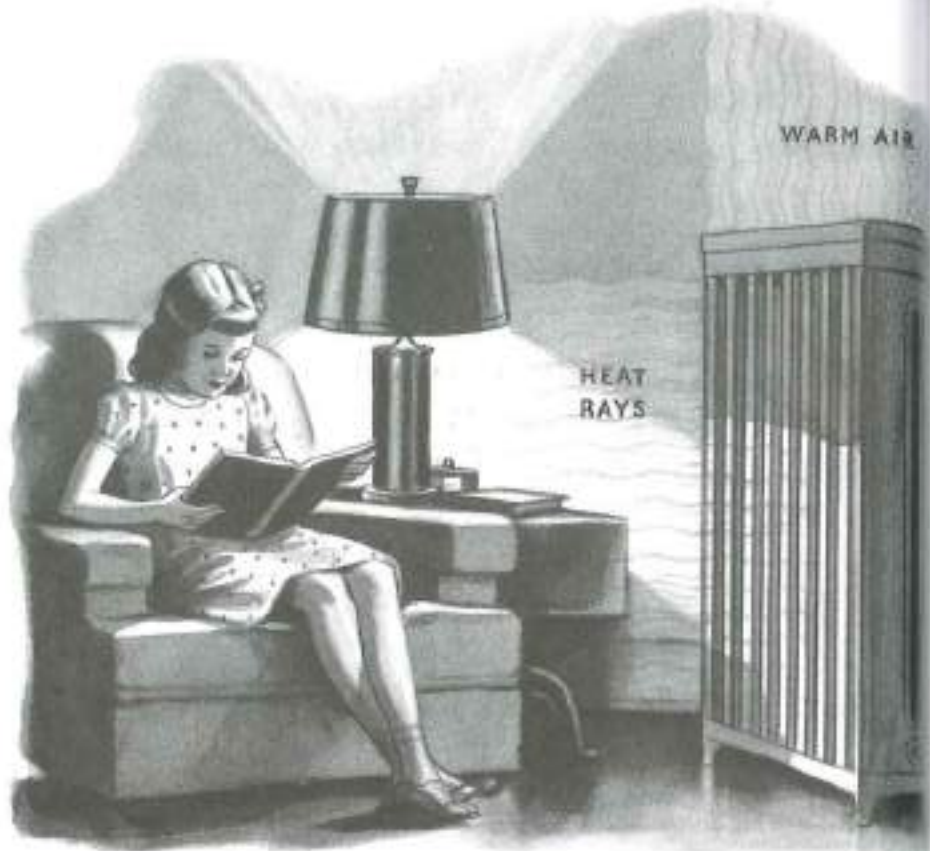
Heat may be carried by water, air, or steam.

A good radiator is dull in color.

Experiments to Do

You should test your ideas and answer your questions by doing experiments whenever you can. Here are some experiments to do.

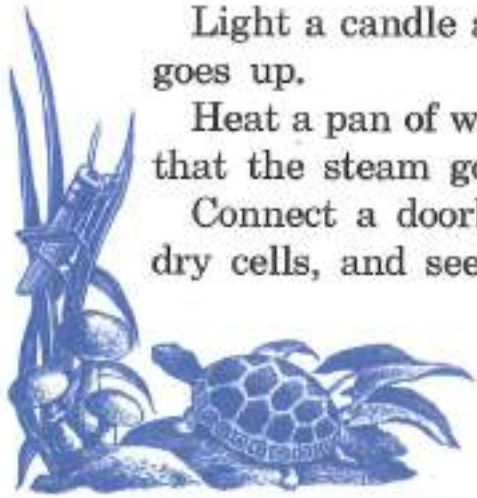




Light a candle and notice that the smoke goes up.

Heat a pan of water until it boils. Notice that the steam goes up.

Connect a doorbell with copper wires to dry cells, and see how it works.



With a reading glass make sunlight shine on a black letter of a newspaper. Then make it shine on white paper. Can you make the light burn a hole in the paper? **Be careful that you do not set something afire.**

Take a flashlight apart and look at the battery, the lamp, and the lens. Is the lens a magnifying glass?

Things to Do

Find pictures of houses that you like.

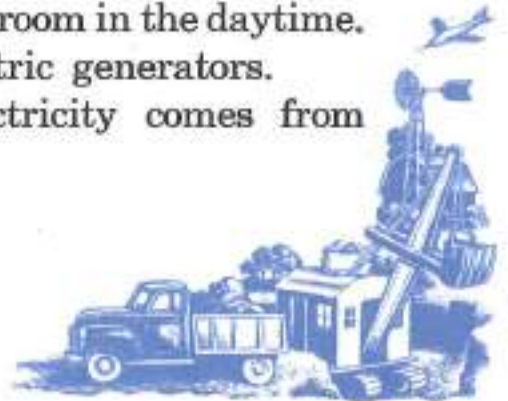
Tell the class what kind of heating system you have in your house.

Learn to read with light falling on your book and not shining in your eyes.

Tell why you should keep the shades all the way up in the living room in the daytime.

Find pictures of electric generators.

Find out where electricity comes from to your house.





Things to Think About

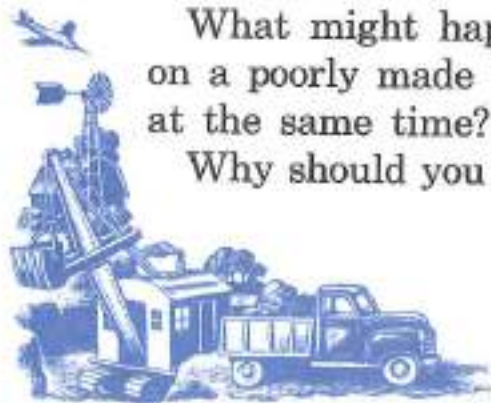
Why do we need big windows in our houses?

Why do we need good electric wires in our houses?

Why are electric wires wrapped with cloth and rubber?

What might happen if you should turn on a poorly made light and touch a faucet at the same time?

Why should you read only by good light?



UNIT 2

MAKING AN AQUARIUM

