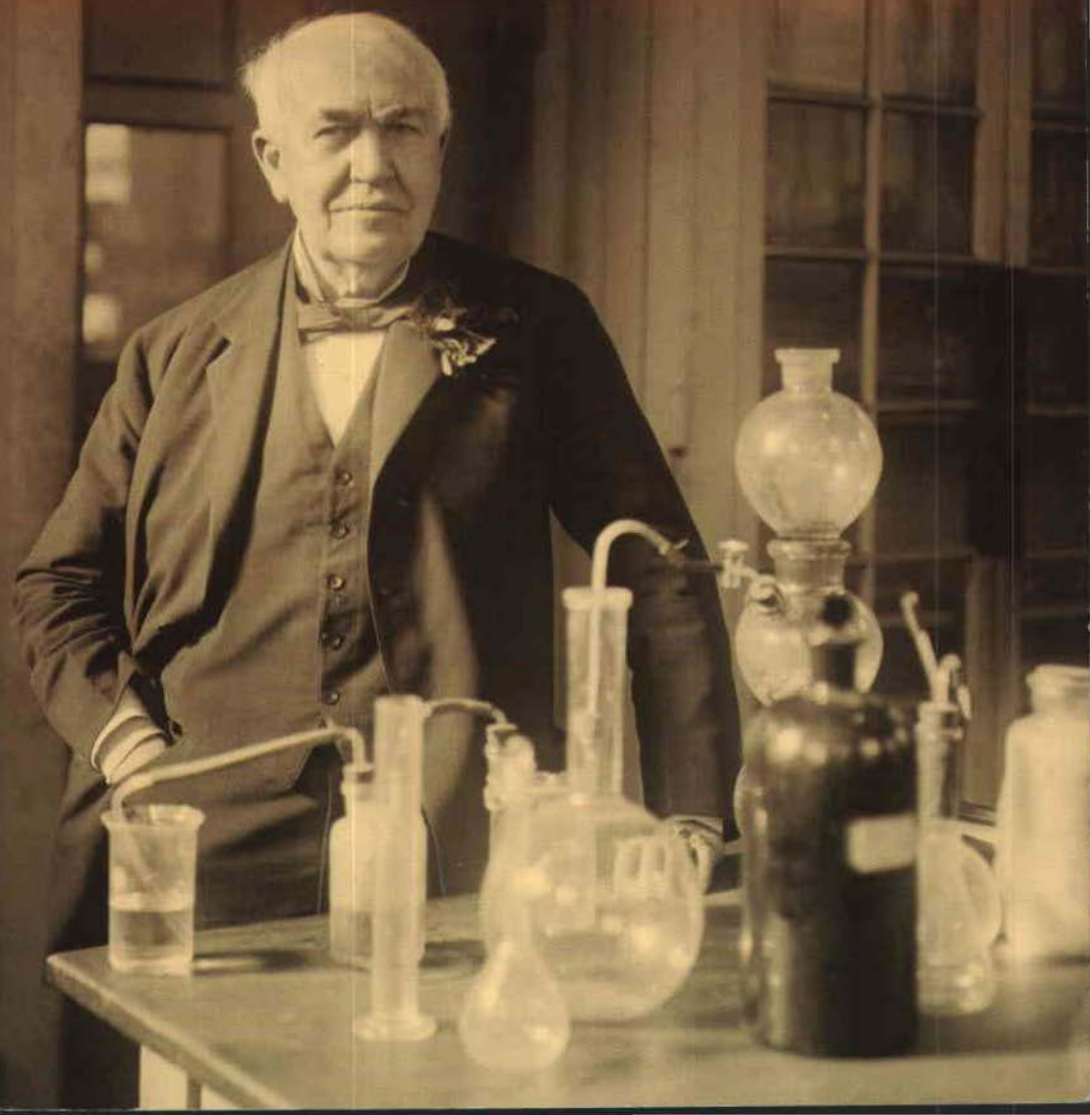


Biography

Thomas Alva Edison

by Laurie Rozakis



Read to Find Out

Read about the man who brought us more than 1,000 inventions—Thomas Alva Edison.

photo credits

Cover: Bettmann/CORBIS; 1: Schenectady Museum/Hall of Electrical History Foundation/CORBIS; 2: (l) Bettmann/CORBIS; (r) CORBIS; 3: FPG/Hulton Archive/Getty Images; 4: Bettmann/CORBIS; 5: Bettmann/CORBIS; 6: Ryan McVay/Getty Images; 7: Bettmann/CORBIS; B: Hulton-Deutsch Collection/CORBIS; 11: (l) Schenectady Museum/Hall of Electrical History Foundation/CORBIS; (r) Royalty-Free/CORBIS; 12: SuperStock, Inc.; 13: Ryan McVay/Getty Images; 14: Bettmann/CORBIS; 15: Schenectady Museum/Hall of Electrical History Foundation/CORBIS; 17: John Springer Collection/CORBIS; 18: Royalty-Free/CORBIS.

illustration: 9, 10: John Hovell.

STRATEGIES & SKILLS AT A GLANCE Comprehension

- Strategy: Generate Questions
- Skill: Identify Problem and Solution

Vocabulary

- (come in) handy, convinced, dizzy, hilarious, independence, mischief, nowadays, whirlwind

Vocabulary Strategy

- Dictionary: Idioms

CONTENT-AREA VOCABULARY

Words related to inventions
(see *glossary*)

NATIONAL CONTENT STANDARDS

Science

- Science as Inquiry
- History and Nature of Science

Word count: 1,416**

The McGraw-Hill Companies

**Mc
Graw
Hill** **Macmillan
McGraw-Hill**

Published by Macmillan/McGraw-Hill, of McGraw-Hill Education, a division of The McGraw-Hill Companies, Inc., Two Penn Plaza, New York, New York 10121.

Copyright © by Macmillan/McGraw-Hill. All rights reserved. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written consent of The McGraw-Hill Companies, Inc., including, but not limited to, network storage or transmission, or broadcast for distance learning.

Printed in the United States of America

2 3 4 5 6 7 8 9 10 9 0 8 0 7 0 6

**The total word count is based on words in the running text and headings only. Numerals and words in captions, labels, diagrams, charts, and sidebars are not included.

Thomas Alva Edison

by Laurie Rozakis



Table of Contents

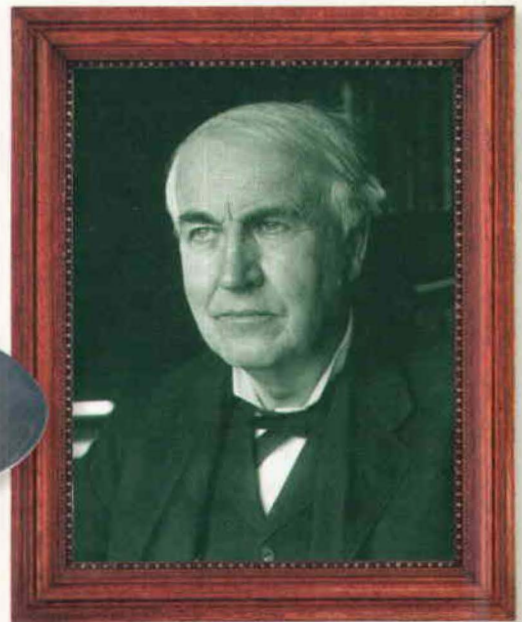
Introduction	2
Chapter 1 An Inventor from the Start	4
Chapter 2 A Bright Idea.....	8
Chapter 3 Let There Be Music!	12
Chapter 4 Motion Pictures.....	14
Conclusion	18
Glossary/Index	19
Comprehension Check	20

Introduction

What would the world be like without light bulbs? We have Thomas Edison to thank for that bright idea! He also invented the **phonograph** and **motion pictures**.

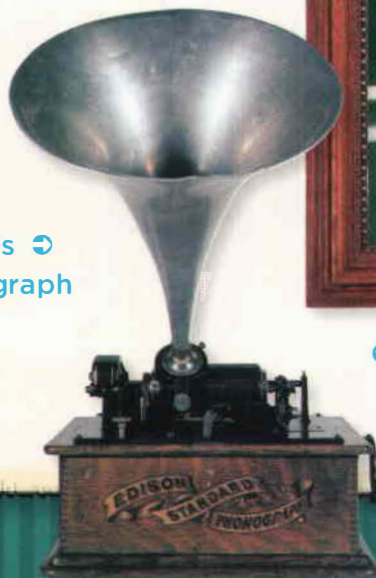
Thomas Edison is the most famous American inventor. He came up with more than 1,000 new devices. He worked with **electricity** and **technology** to make our daily lives better.

Find out how this one man changed history through his inventions.



Thomas Alva Edison

Edison's
phonograph



The Television

Television was the result of many inventions by different people. In 1895 Guglielmo Marconi invented the first radio. In 1901 he found a way to make electrical signals stronger. In 1923 Vladimir Zworykin invented the first TV camera. Then, in 1929, Zworykin invented the TV picture tube.



Look at this picture. Then look at a modern television set. Would you ever guess that the two machines are related?

The 1800s have been called “The Age of Invention.” That is because many things were invented at that time. It seemed like a whirlwind of inventions!

The first steamboat, steam-engine train, and airplane were invented during this time. The telephone was invented too. These inventions changed the way people lived and worked.

Chapter 1

An Inventor from the Start

Thomas Alva Edison was born in 1847 in Milan, Ohio. His friends called him “Al.” His mother probably called him “Trouble.” That’s because he made mischief. Here is an example.

Al asked why geese sat on eggs. His mother said, “The goose wants to keep her eggs warm. Then they will hatch.”

Al went out. His family looked all over for him. A few hours later, they found him sitting on some goose eggs! The eggs had all broken, though. Al learned that geese can hatch eggs but people can’t.

Al didn’t give up on his experiments. When he was seven years old, his family moved to Port Huron, Michigan. Al had a hard time in school. He was smart, but he could not hear well.



👉 The young inventor

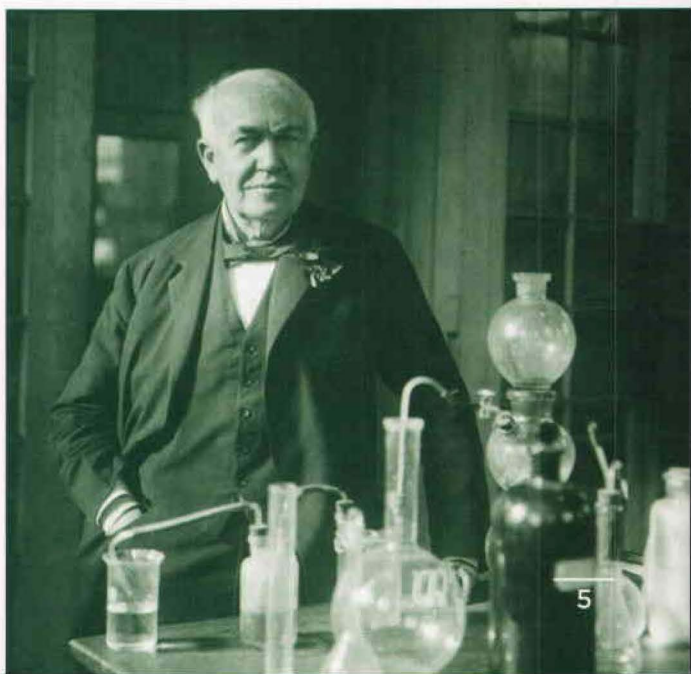
After three months, his mother took him out of school. She had been a schoolteacher. She taught him at home. “My mother taught me how to read good books quickly and correctly,” Al later said. “I have always been very thankful for this early training.”

Al built a **laboratory** in his bedroom. His mother made him move it to the basement. The chemical smells made her dizzy.

“If we did all the things we are really capable of doing, we would literally astound ourselves.”

—Thomas Alva Edison

The laboratory ↻ Edison worked in as an adult was probably very different than the one he set up in his family’s basement.



Back then, kids had a lot more independence than they do nowadays. Many kids got jobs early. Edison worked on the railroad when he was just 12 years old. He sold newspapers and snacks. But he had a problem.

How could he keep doing experiments if he was working? He solved the problem by setting up a new lab in an empty railroad car.

Edison learned how to work a telegraph machine. People used the telegraph to send messages over long distances. Edison was so interested in the telegraph that he quit his railroad job to learn how to use it. He was only 16 years old.

Edison worked at night. He invented a way to send telegraph signals automatically. It was his first invention.



🔗 Telegraph machines use electricity to send messages from place to place.

"I never quit until I get what I'm after."

—Thomas Alva Edison

In 1868 Edison moved to Boston. He got a job with the Western Union Telegraph Company. At night Edison did his experiments in an electrical shop.

Edison moved to New York City. One day one of the Western Union machines broke. Edison was asked to help. He fixed the machine with a new part he invented. Western Union wanted to buy the part Edison had invented. Edison wanted \$5,000 for his invention. But he was too shy to ask for that much money, so he did not say anything. Western Union gave him \$40,000! That was a lot of money then. It is still a lot of money today. Edison knew the money would come in handy.



🕒 In 1869 Edison invented a machine to show stock prices.

Chapter 2

A Bright Idea

Edison used the money to set up his own laboratory in Newark, New Jersey. He was most interested in electricity. Edison also got married. He had met his wife at his lab, of course!

In 1876 Edison set up a new lab in Menlo Park, New Jersey. He hired other inventors to help him.

In the 1800s, people used gas, oil, and candles to light their homes. Some of these light and heat sources were not safe. As a result, there were many fires. Edison was convinced that there was a safer, better way to make heat and light.



Gaslights were dangerous.

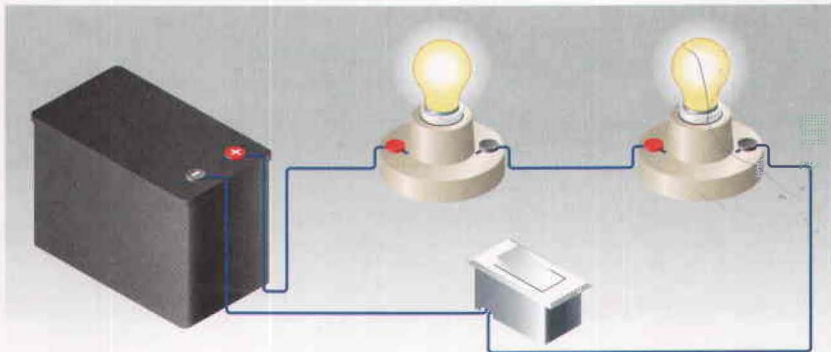
“I find out what the world needs, then I proceed to invent.”

—Thomas Alva Edison

Other scientists had worked with electricity. They had proved that electricity could flow from object to object. They learned that some materials work better with electricity than other materials. Edison learned from their work.

In the 1870s some outdoor areas had a form of electric lighting. They were all linked together. The electrical current flowed in only one way. That meant that if one light bulb went out, they all went out.

First, Edison had to find a way to keep the lights on if one bulb went out. Second, he had to find a good material for the thin wire inside the light bulb. Third, he had to make the light bulbs.



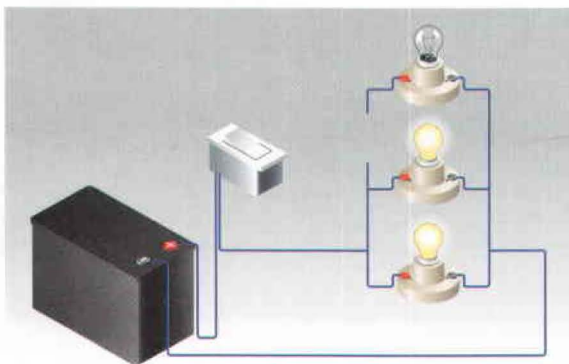
⚡ Wiring light bulbs with the current flowing in only one direction means that if one light bulb blows out, they all blow out.

Edison's first problem was keeping the lights on if one light bulb went out. He solved this problem by using parallel circuits.

Edison's second problem was finding a good material for the wire. Edison tried metal, wood, and cotton. He even tried hair from a coconut shell! Lewis Latimer, a scientist working with Edison, solved this problem by using carbon.

Edison's third problem was making the light bulbs. Edison solved this problem by setting up a glass-blowing factory to make the bulbs.

In 1879 Edison made the first light bulb that lasted a long time. Edison's bulb burned for about 13 hours. By December 1878, Edison had lit up his lab and home with light bulbs.



Edison used parallel circuits to keep electricity flowing if one bulb went out.



Edison's light bulb and a modern light bulb. How are they the same? How are they different?

How could Edison bring this electric power to many people? He started by building a big electric **generator**.

Then Edison built an electric power station in New York City. He called it the Edison Electric Illuminating Company. On September 4, 1882, a worker pulled a switch. Suddenly 85 people had electric power in their homes! Soon everyone wanted electric power. Edison made electric lighting possible for homes, offices, and streets. "I have accomplished all that I promised," Edison told reporters.

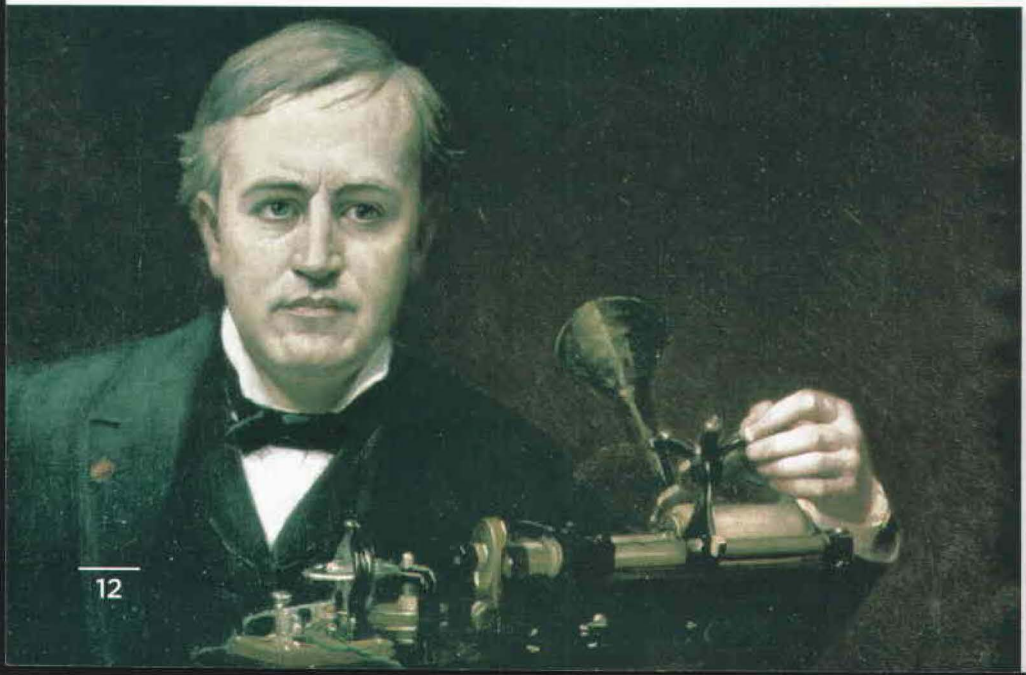
Chapter 3

Let There Be Music!

In 1877 Edison invented a talking doll for his daughter. She thought this toy was hilarious. It gave Edison an idea. Why not make a machine that could record and play voices and music?

Edison had already invented a way of recording telegraph clicks. To record people's voices, he covered a metal cylinder with tinfoil. He used a needle to make marks on the tinfoil. To work the machine, he turned the cylinder. The needle "played" back the sounds made on the tinfoil.

🔗 Edison and his phonograph.



The *Titanic* sinks on its first trip across the Atlantic

In 1877 Edison tested his machine. He spoke into the microphone. Edison played it back. The machine said his words exactly. Edison had invented the phonograph!

The phonograph was a big hit. Edison hired people to show how the phonograph worked. All over the country, people paid 25 cents to hear it. Some people paid \$30 to buy a phonograph. That was a lot of money back then.

From Phonographs to MP3 Players

After Edison's phonograph, Leon Berliner invented a machine called the gramophone. It worked like Edison's machine but used a round disc instead of a cylinder. In the United States, gramophones were also called record players. Record players play vinyl discs. Around 1980 people invented CD players. CD players play compact discs, or CDs. Then MP3 players were invented. An MP3 player doesn't play a disc at all. Instead music is stored on a computer file.



Chapter 4

Motion Pictures

After Edison invented the phonograph, people gave him a new name. They called him “The Wizard of Menlo Park.” Edison was about to invent another great thing—motion pictures! This invention would change the world just as electric light and the phonograph had.

“I am experimenting upon an instrument which does for the eye what the phonograph does for the ear, which is the recording and reproduction of things in motion.”

—Thomas Alva Edison

Sunnyside, an early motion picture, was released in 1919.





➤ This painting shows Edison (center) and some of his workers testing a new lamp in his Menlo Park laboratory.

Edison wanted to photograph people and things in motion. George Eastman had invented a new type of camera film. In 1889 Edison got some of this film. He cut it into long, thin strips. One of Edison's helpers, William Dickson, ran the film through the camera. The camera took pictures of things and people as they moved.

Edison had done it again. This time he had invented a motion picture camera that recorded action on film. He called his machine a kinetograph.

Now Edison had another idea. How could he play the moving pictures back? He invented a motion picture player. He called it a kinetoscope. He watched his recordings on his new invention. These two inventions led to the invention of the movie camera and movie projector.

Patents

Inventions are protected by patents. A patent is an official document issued by a government. A patent gives a person or company the right to be the only one to make or sell an invention for a certain number of years. Edison had more than 1,000 patents. Here are the main steps in writing a patent application in the United States.

Step #1
Name the invention.



Step #2
Tell what problem the invention solves.



Step #3
Describe the invention.



Step #4
Draw pictures and take photos of the invention.



Step #5
Explain why the invention needs a patent.

The Sneeze

The Sneeze is one of the first movies ever made. The star was John Ott. He was a scientist who worked with Edison. Edison recorded the movie's sound on the phonograph.



📷 Photo sequence from *The Sneeze*.

Edison built a movie studio in New Jersey. He made films of boxers, dancers, and the circus. *The Great Train Robbery* was his first movie that told a story.

Edison made more than 2,000 movies. He even made color movies. An artist painted each piece of film.

Conclusion

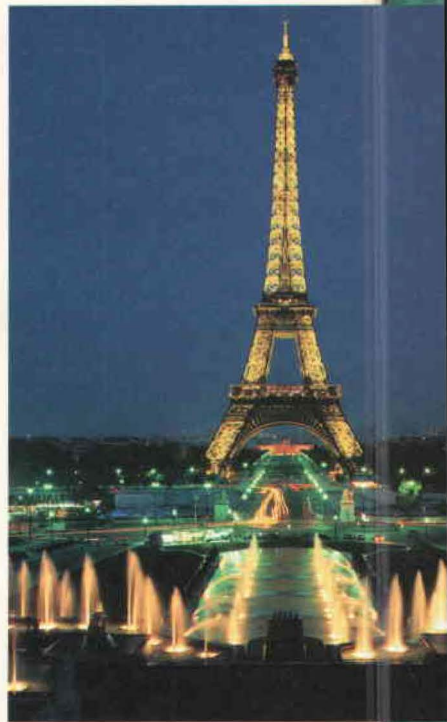
Thomas Edison brought electric light to the world. He invented the phonograph and motion pictures. But Edison never stopped inventing. “He invents all the time, even in his dreams,” his wife said.

Thomas Alva Edison died on October 21, 1931. When they heard the news, people all over the United States turned off their lights for one minute. They did this to honor the great inventor.

*“The thing I lose
patience with the most
is the clock. Its hands
move too fast.”*

—Thomas Alva Edison

Electric lights are beautiful ↻
as well as useful. Some
people think the Eiffel Tower
looks best at night—when it
is all lit up.



Glossary

electricity (*i-lek-TRI-suh-tee*) energy that is in the form of a current. Electricity is the power that lights lamps, heats some houses, and makes appliances work. **(page 2)**

generator (*JE-nuh-ray-tuhr*) a machine that makes electric power **(page 11)**

laboratory (*LA-bruh-tawr-ee*) a room or building where scientists carry out their work **(page 5)**

motion picture (*MOH-shuhn PIK-chuhr*) a movie; a series of pictures projected so quickly that it seems like the objects in the pictures are moving **(page 2)**

phonograph (*FOH-nuh-graf*) a machine for playing records **(page 2)**

technology (*tek-NOL-uhj-ee*) scientific knowledge that is applied for practical purposes **(page 2)**

Index

“The Age of Invention,” 3

light bulb, 9-11, 18

motion pictures, 2, 14-17, 18

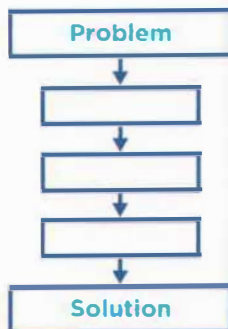
phonograph, 2, 12-14, 18

telegraph, 6-7, 12

Comprehension Check

Summarize

Use a Problem and Solution Chart to tell what problems Thomas Edison identified and how he solved them. Then use the information on the chart to summarize the book.



Think and Compare

1. Look back at page 6. What problem did Edison see? How did he solve it? (**Identify Problem and Solution**)
2. Edison was convinced he could accomplish anything he set out to do. Do you agree with this opinion? Why or why not? (**Evaluate**)
3. You know that the phonograph is used to play music. What other uses does this technology have today? (**Apply**)

Literacy Activities



Solve a Problem

Edison often invented things to solve problems that he saw. Think about a problem that you solved. Write a paragraph telling about the problem. Be sure your topic sentence identifies the problem. The other sentences should tell how you solved it.



Describe Your Invention

Think of an invention of your own. Describe it. Use a flowchart to show how your invention works.



Thomas Alva Edison

The light bulb. Motion pictures. The phonograph. A talking doll! These are just a few of Thomas Alva Edison's inventions.



4.2 Week 4

The McGraw-Hill Companies

ISBN 0-02-193064-3

