AROUND AND ABOUT NEW JERSEY

TEACHERS GUIDE

PROGRAM FIVE

THOMAS A. EDISON

NATIONAL HISTORIC SITE

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I. SYNOPSIS

Thomas Alva Edison's laboratory in West Orange was called an invention factory for good reason. Edison assembled a team of workers who helped him produce inventions on a regular schedule and for the purpose of making a profit.

Today Edison's West Orange laboratory is a national park. Ranger Ben Bolger takes a class on a tour of the site. He explains the steps in the invention process as the class visits Edison's library, storeroom and machine shop.

We learn about three of Edison's most important inventions -- the electric light, the phonograph and the motion picture camera. Charley Hummel demonstrates the workings of the early tinfoil phonograph. Ben Bolger shows how Edison improved the phonograph to make it more profitable. In order to profit from his motion-picture camera, Edison made movies and built the kinetoscope arcades in which to show them.

Finally, we learn how Edison's inventions changed the way we live, work and play, as students give their own answers to the question which of Thomas Edison's inventions was the most important?

II. KEY WORDS

Invention - a device produced for the first time

Factory - a building in which products are manufactured in great number

Patent - a grant from the United States government of the exclusive right to make, use and sell an invention for seventeen years

Profit - the amount of money made from sales of a product minus the expenses of making and selling it

Filament - a wire within an electric light bulb that glows and thus produces light

III. NEW JERSEY CORE CURRICULUM CONTENT STANDARDS

6.1: ALL STUDENTS WILL UTILIZE HISTORICAL THINKING, PROBLEM SOLVING, AND RESEARCH SKILLS TO MAXIMIZE THEIR UNDERSTANDING OF CIVICS, HISTORY, GEOGRAPHY, AND ECONOMICS.

Building upon the knowledge and skills gained in the previous grades, by the end of Grade 4 students will:

A. Social Studies Skills
1. Explain how present events are connected to the past.

STANDARD 6.4 (UNITED STATES AND NEW JERSEY HISTORY) ALL STUDENTS WILL DEMONSTRATE KNOWLEDGE OF UNITED STATES AND NEW JERSEY HISTORY IN ORDER TO UNDERSTAND LIFE AND EVENTS IN THE PAST AND HOW THEY RELATE TO THE PRESENT AND FUTURE.

Building upon knowledge and skills gained in preceding grades, by the end of Grade 4, students will:

B. State and Nation
5. Identify and discuss major scientific discoveries and inventions, the scientists and inventors who developed them (e.g., Thomas Edison), and their impact on life today.

STANDARD 6.5 (ECONOMICS) ALL STUDENTS WILL ACQUIRE AN UNDERSTANDING OF KEY ECONOMIC PRINCIPLES.

Building upon the knowledge and skills gained in the preceding grades, by the end of Grade 4, students will:

A. Economic Literacy
1. Distinguish between goods (e.g., objects) and services (e.g., activities).
2. Distinguish between a want and a need and explain how to choose needed goods and services.
6. Define consumers as buyers and producers as workers and sellers.

IV. THEMES

A. The Invention Process -- Edison did not work alone; he was the leader of a team of researchers.

B. Making a Profit -- Edison wanted each of his inventions to make a profit.

C. Changing Our Lives -- Edison's inventions changed the way we live, work, and play.

V. CORE ACTIVITIES

A. THE INVENTION PROCESS

1. Objective

Students will recall the steps of the invention process.

2. Before Viewing the Program

Explain to the students that one of the themes of the following program is the steps Thomas Edison used in inventing. Ask the students to pay attention to these steps and to look for examples of them in particular inventions mentioned in the program.

3. After Viewing the Program

Ask each student to choose one of Edison's major inventions, such as the electric light, the phonograph or the motion-picture camera. Ask her or him to draw a picture of the chosen invention and to write an imaginary letter to the United States Patent Office, describing what the invention does. You may replay the segments of the program that provide the information your students need.

B. MAKING A PROFIT

1. Objective

Students will explain how Edison's inventions were made profitable.

2. Before Viewing the Program

Ask the students if they know what the term profit means? If not, explain the term. Tell them that the following program will show how Thomas Edison tried to make each of his inventions profitable. Ask them to pay special attention to this theme.

3. After Viewing the Program

Divide the class into three groups and assign to each group one of Edison's major inventions (the electric light, the phonograph or the motion picture camera). Ask each group to list the ways that Edison tried to make this invention profitable. The students may review portions of the program if required. Have one student from each group report to the class about his/her group's list. The teacher should help the class draw general conclusions about what is necessary to sell an invention.

C. CHANGING OUR LIVES

1. Objective

Students will analyze the ways that Edison's inventions changed our lives and judge which inventions were the most important.

2. Before Viewing the Program

Ask the students to name some of Thomas Edison's inventions. Explain that the following program shows three of his most important inventions and how they changed our lives. Ask them to pay attention to this theme and try to answer for themselves which of these inventions was the most important.

3. After Viewing the Program

Divide the students into three groups and assign each group one of Edison's major inventions (the electric light, the phonograph, or the motion picture camera). Ask each group to list all the things in their lives that would be missing if it weren't for that particular invention (e.g. electric light -- traffic lights, street lights, lights in the home, etc.). A student from each group should report to the class what was on his/her group's list. The class as a whole should try to determine from these lists which was Edison's most important invention.

VI. ADDITIONAL ACTIVITIES

A. EDISON'S PHILOSOPHY

1. Objective

Students will infer attitudes from sayings and construct their own sayings to express their attitudes.

2. After Viewing the Program

Reproduce and distribute the list of Thomas Edison's sayings provided in the "Supplementary Materials" section of this guide. Ask the students to discuss the meaning of each. Then ask them to compose sayings that expess their own attitudes towards work, play, obedience, etc.

VII. BIBLIOGRAPHY

A. FOR STUDENTS

Cosner, Shaaron. *The Light Bulb* (Inventions That Changed Our Lives). New York: Walker and Company, 1984.

This book deals with lighting sources that preceded the light bulb (candles, oil, gas, electric arc lights), Edison's life, the search for the right filament, and how electricity has changed our lives.

Cousins, Margaret. *The Story of Thomas Alva Edison*. New York: Random House, Landmark Books, 1965.

Written at a ten to fourteen year-old level, this book treats Edison's family life, his work, and his inventions. Contains non-technical explanations and photographs.

The Young Scientist Book of Electricity: Understanding the Secrets of Electric Power and How We Use It. Tulsa, Okla.: EDC Publishing Company, n.d.

Contains color illustrations and simple explanations of workings of a light bulb, batteries, electric motors, alternating current, a power station, power lines, the telephone and telegraph, and the wiring inside a house.

B. FOR TEACHERS

Pretzer, William S. *Working At Inventing: Thomas A. Edison and the Menlo Park Experience*. Dearborn, Michigan: Henry Ford Museum and Greenfield Villages, 1989.

Contains essays on Edison's life, working at Menlo Park, machine shop culture, telegraphy and Edison's invention factory, and drawing as a means of inventing.

Friedel, Robert and Paul Israel. *Edison's Electric Light: Biography of an Invention*. New Brunswick: Rutgers University Press, 1986.

A detailed exploration of the invention of the electric light, emphasizing how Edison thought in pictures and used a team approach to invention.

Millard, Andre. *Edison and the Business of Innovation*. Baltimore and London: The Johns Hopkins University Press, 1990.

This book concentrates on Edison's business career. Its author argues that Edison invented the idea of industrial research and that he was a better businessman than was suggested by his reputation.

SUPPLEMENTARY MATERIALS

SAYINGS OF THOMAS ALVA EDISON

"Genius is one percent inspiration; ninety-nine percent perspiration."

"I have tried a million schemes that will not work. I know everything that is no good. I work by elimination."

"I was always afraid of things that worked the first time."

"I do not regard myself as a pure scientist. . . . I am only a professional inventor. My studies and experiments have been conducted entirely with the object of inventing that which will have commercial utility."

"I always invent to obtain money to go on inventing."