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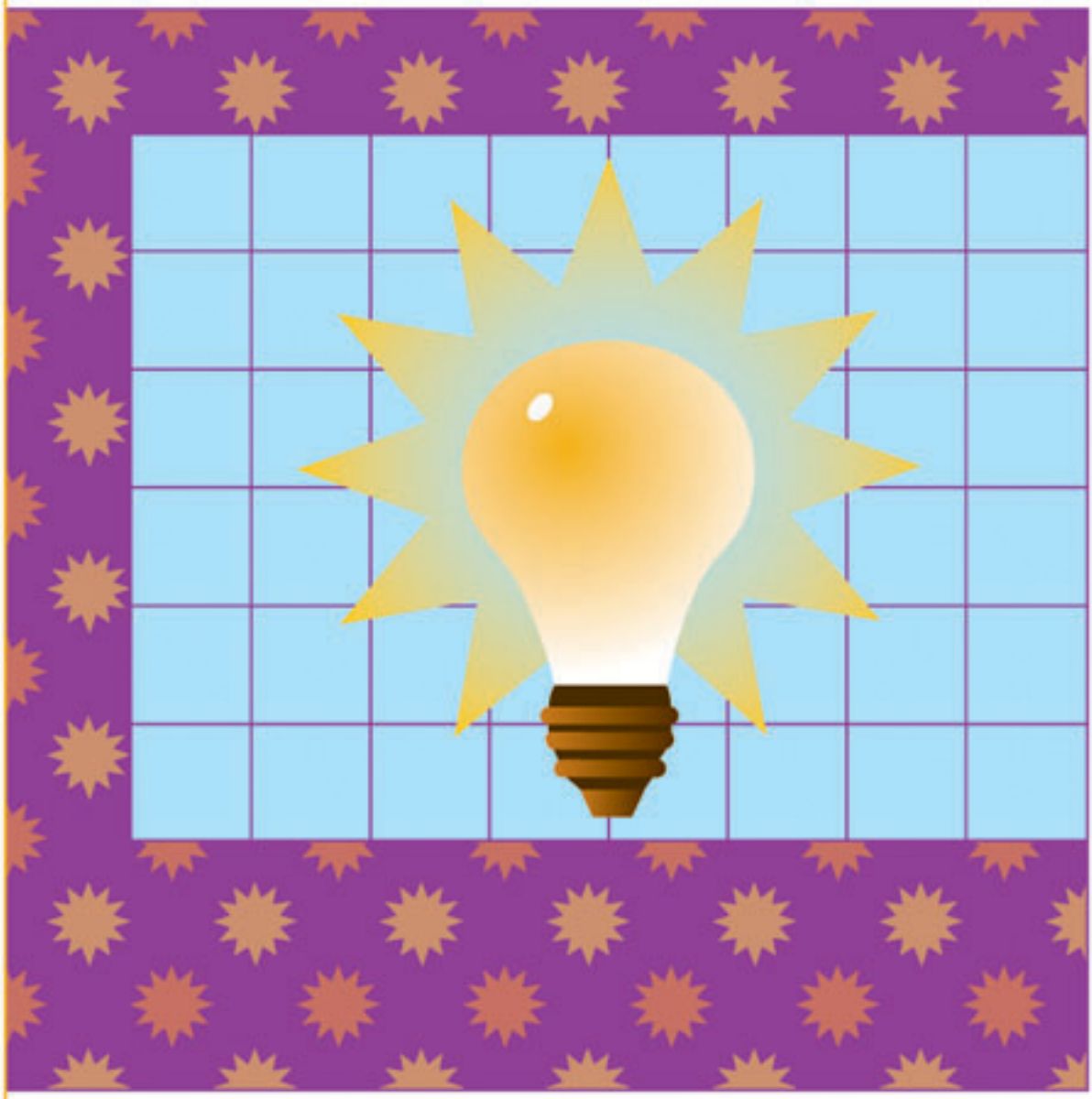
INVENT



A Simulation of Inventors and the Invention Process

Interact
Learn Through Experience

INVENT

A simulation of inventors and the invention process

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PURPOSE

INVENT is an exciting simulation that will turn your students into a classroom of inventors. They will gain insight into the creative process of inventing as they research inventors and see how their inventions have changed our lives. Students will then practice the creative process by brainstorming, tinkering, and actually creating their own inventions. They will patent their inventions, advertise and market the product, and defend it when faced with a Consumer Advocacy group composed of their classmates. Finally, each invention will be featured at a special Thomas Edison Day open house.

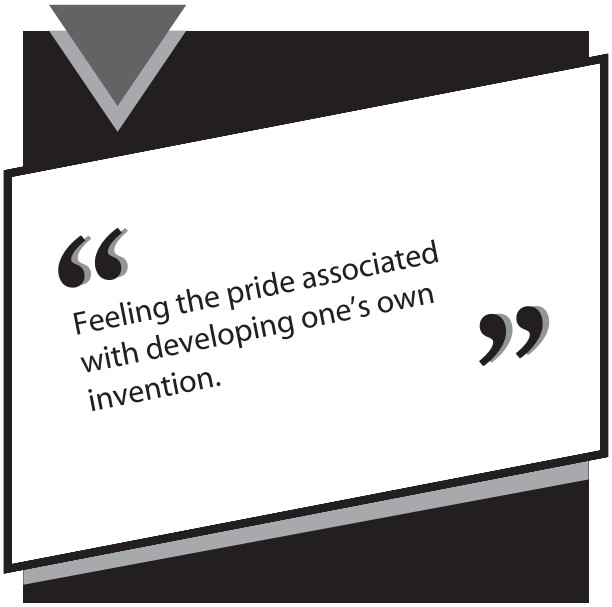
Specifically, students will participate in the following ways:

Knowledge

1. Why people invent (the need for inventions)
2. How important original thinking is to an inventor
3. How inventors have contributed to and changed history
4. What types of criticisms inventors face
5. How to get an invention patented
6. How to advertise and market an invention

Skills

1. Researching an inventor
2. Problem solving that is used to invent
3. Applying knowledge gained about inventors and inventions in a useful way for developing an original invention
4. Designing an invention that is practical and that fills a need

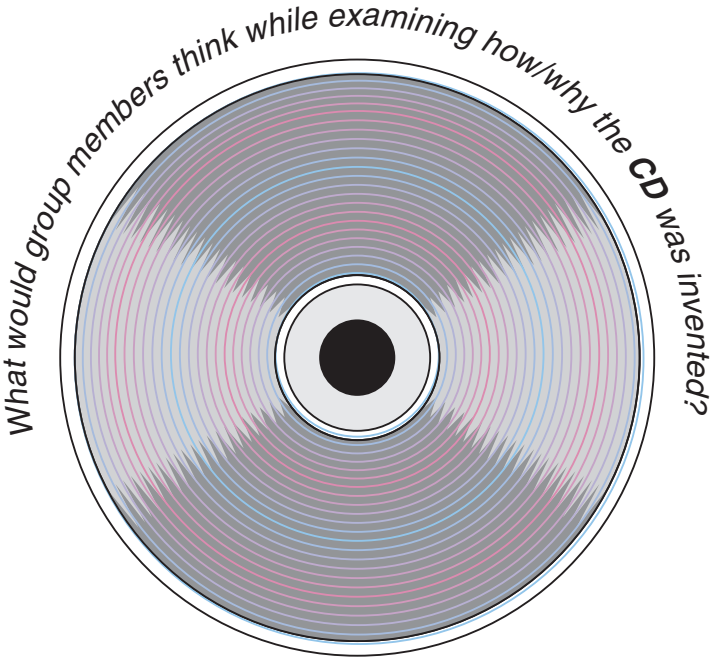


Feelings and attitudes

1. Understanding that inventions are needed for progress
2. Appreciating the criticism that inventors often face
3. A willingness to risk being different and seeing things in a novel way
4. Feeling the pride associated with developing one’s own invention

OVERVIEW

INVENT begins when a member of each cooperative team chooses one item from the "Invention Box." Each of the six items in the box is representative of a broad category of inventions. (For example, a telephone would represent communication and an ice cream cone would represent food.) Each group's members then study their item and brainstorm ideas of how this object might have been invented. When the group comes to an agreement about how they believe this item was invented, they will share this idea with the rest of the class. Then each group will learn how their item was actually invented.



Next, each member of the group will research—on his/her own—an invention that falls into their broad category. Each student will develop a page of a Classroom Invention Book as a result of this research. Once this activity is complete, cooperative groups will work together to develop a brand new invention for a fairy tale character that falls into its broad category.

Once this group invention has been developed, each member of the group will be asked to begin working on his/her own personal invention. This invention will be of the student's own choosing and can fit into any category. As students begin the process of making their own inventions, they will develop an invention log where they will record in writing and diagrams all the work they do on their invention. Students will patent, market, and create an advertisement for their invention. Finally, faced with a Consumer Advocacy group of classmates, students will share a model of their invention, explain how it is used, and answer questions about its benefits and hazards.

INVENT culminates with a Thomas Edison Day in which all inventions, advertisements, patents, drawings, and research are displayed for parents, others teachers, and students from their school to enjoy.

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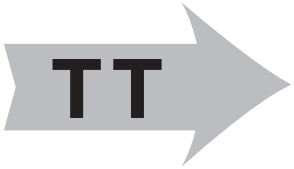
TEACHING **T**IP

Note: *If you sense you are going to have an outstanding Thomas Edison Day, you may wish to invite the local media to give your students the publicity they deserve.*

INITIAL PREPARATION - 1

Before you begin teaching this simulation, it is important to prepare in the following ways:

1. **Reading** Carefully read this entire simulation—the Teacher Guide and Student Guide—*before beginning*. Doing so will help you plan your time and adjust the simulation as needed to meet the individual needs of your students.



TEACHING **T**IP

#2: You might also look into the possibility of arranging a field trip in your community to visit an inventor or company that utilizes inventions.

2. **Speakers** Invite an inventor to come and speak to your class at some point during this simulation. A good time for the inventor to come would be around Day 10 when students have had enough experience in the inventive process to ask intelligent questions. To find an inventor, you might look for an inventive society in town or contact a patent attorney (who may also be interested in speaking to the class). Most large companies have a department (such as engineering) that focuses on improvements and inventions for a company.

#3: You may want to ask a few capable students to write letters to these sources for you.

3. **Source material** Write to the sources listed in the Teacher Information and Contests listed on page 10.

#4: The invention wheel is used to help each group keep track of accomplishments. As each activity is completed, the group will fill in one cog on the invention wheel.

4. **Invention wheel** Enlarge the Invention Wheel found on page 31 in the Teacher's Guide to display in your classroom as this simulation begins. To enlarge, use an overhead projector and trace the Invention Wheel onto a piece of butcher paper attached to your bulletin board. Color it as desired.

5. **Invention graph** Enlarge a copy of the Invention Graph found on page 32 in this Teacher Guide using the technique described in #4 above. (You may wish to draw this graph free hand on a large piece of butcher paper.)

6. **Judges** Contact three adults to serve as judges for this Thomas Edison Day at the end of the simulation. Arrange for the judges to show up early in the morning on Thomas Edison Day, about a half hour after school starts so that students have time to set up their invention materials.

7. **Duplication** Make copies of the following pages (the number to duplicate is indicated in parentheses.)
   - A HISTORY OF A FEW INVENTIONS (one copy per student)
   - INVENTOR CARDS (one copy given to the appropriate group)
   - OUR CLASSROOM INVENTION BOOK (one copy on colored paper)
   - MY INVENTION LOG (1/2 a class set ... Cut apart neatly and follow directions on bottom of page 6 of the Student Guide so that you are ready to help students set up their logs.)

- FAIRY TALE INVENTION (one copy cut apart and given to the appropriate group)
- PATENT (one copy per student)
- PATENT DRAWINGS (one copy per student)
- INVENTION EVALUATION FORM (one copy per student plus additional for judges)
- SAMPLE INVITATION
- SIGN-UP SHEET
- SAMPLE QUESTIONS FOR THE JUDGES
- ID BADGES (1/2 class set ... See #8 below.)

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TEACHING **T**IP

#8: *Encourage students to put their school photos on their ID badges. If you wish to have the ID badges laminated, you will want to make these badges early in the simulation.*

8. **ID badges** Duplicate and cut apart half a class set of page 51. *See marginal comment on page 29 about possibly wanting to have students create their own totally original ID badges.*

#9: *It would be beneficial to look into ordering films or videos that pertain to this unit if they are available.*

9. **Materials needed:**
   - A box—called the "Invention Box" (large enough to contain the next six bulleted items)
   - A band-aid
   - An ice cream cone
   - Some velcro
   - A telephone (play or real)
   - A single roller skate
   - A disposable diaper
   - 3" x5" notecards (enough for each student in the class)
   - Encyclopedias, books about inventors and inventions, or access to the school or public library
   - Six pieces of butchers paper (about 3'x3')
   - The items listed on Day 6 of Teacher Guide (page 21).
   - If bulletin board space is limited in the classroom where inventions will be exhibited, two or three refrigerator boxes will be needed to display student work.

#10: *Please note that on Days 7 and 8 there are two separate activities to accomplish.*

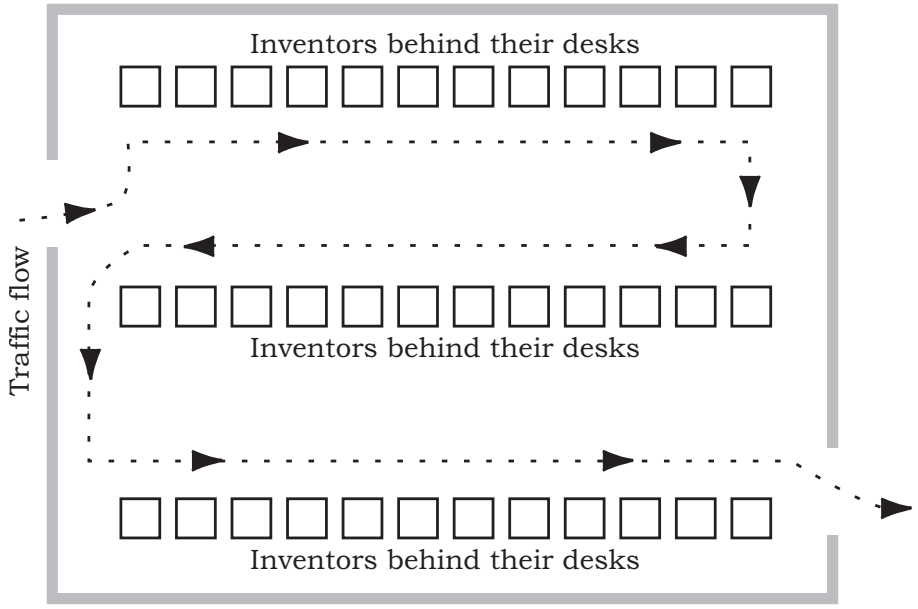
10. **Options** Adapt this simulation to meet the needs of the students you teach. If you teach younger students or those who might have difficulty doing all the tasks described in the simulation, eliminate some tasks (such as making the invention model) or make tasks easier (for example, have the students do a group invention rather than an individual invention.) If you teach students who are very capable and need more of a challenge, you may want to ask these students to do some additional tasks requiring more research. For example, students could be asked to determine how much their invention will cost to produce and sell, taking into consideration materials and advertising.

Before Day 15—Thomas Edison Day

1. **Room arrangement** You may want to arrange the room where you are holding Thomas Edison Day like the sample shown below to help with the flow of traffic through the room as different groups of people visit.

Students love having parents and other students from their school come to their classroom to view what they have produced.

THOMAS EDISON DAY "Open House"



2. **Appearance** Tell your students that they should dress in nice clothes for Thomas Edison Day so they will look their best for the visitors.

3. **Greeters** Arrange for two students to serve as the host and hostess of Thomas Edison Day. These students will welcome guests and can give visitors information about what they will see at Thomas Edison Day.

4. **Visitors** While arranging for visitors to Thomas Edison Day, be sure to include parents, other classes, a local newspaper, and a local TV station if your community has one. Only one class should visit Thomas Edison Day at a time. Each group will probably spend about 20 minutes visiting.

5. **Recording** Students will love to see how they looked answering judges questions, and parents who are unable to attend would love to see the video at Back to School Night. Future classes who work on INVENT will enjoy looking at the video.

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TEACHING **T**IP

To help prepare greeters for this job, have them write a short synopsis of this unit of study on a notecard. The greeters should also give visitors some instructions on what they are to do in the room—to look at the inventions and feel free to question the inventors.

Howard Gardner "Multiple Intelligences"

THEORY OF MULTIPLE INTELLIGENCES - 1

In Howard Gardner's book entitled *Frames of Mind,* he describes seven different forms of intelligence. These learning styles are best accommodated in the classroom when students are given the opportunity to use their preferred style of learning when doing an activity. There are also times when you need to encourage students to experience a different area of intelligence to broaden their horizons.

In this simulation, students will have experiences in both their preferred area of intelligence as well as experiencing other intelligences.

Gardner's learning styles are:

1. **Linguistic** The linguistic student loves to talk and probably learned to read at a young age. To best serve this child, provide plenty of books and time for them to explain what they think about a topic.

2. **Logical-Mathematical** The student who is logical-mathematical loves patterns and abstractions. This student works well on problem solving, logic and math problems, and categorizing.

3. **Musical** The musical student loves listening to and creating music. This student expresses him/herself well musically.

4. **Spatial** The spatial student loves visuals and aesthetics. S/he enjoys using different media to express him/herself. To best serve this student, provide opportunities to use art, models, or diagrams.

5. **Bodily-Kinesthetic** The student who is bodily-kinesthetic will stand out in physical activities and will have excellent coordination. This child expresses him/herself through movement or model building.

6. **Interpersonal** The student who has interpersonal strength is very in tune to their own feelings and the feelings of those around them. They work well when given leadership roles and enjoy role-playing and dramatic activities.

7. **Intrapersonal** The intrapersonal student is very organized and easily meets deadlines. This student thrives on self-evaluation and staying organized.

THEORY OF MULTIPLE INTELLIGENCES - 2

Howard Gardner
"Multiple Intelligences"

Specifically, Gardner's theory is used in this simulation in the following ways:

1. **Linguistic** Each student will share information about his/her own invention orally both in large groups and with individuals.

2. **Logical-Mathematical** In developing a personal invention, every student will use logic abilities. Students will also determine the cost to make a model of their invention.

3. **Musical** Students will be asked to develop advertisements for their inventions and are free to use music whenever they share. Some students may also develop an invention which involves music.

4. **Spatial** There are many opportunities for art in this simulation including model making, diagrams, and pictures.

5. **Bodily-Kinesthetic** Since students are asked to make a model of their invention, each student will experience this aspect of intelligence.

6. **Interpersonal** Students will have the opportunity to give dramatic presentations both in group and individual situations.

7. **Intrapersonal** There will be information about deadlines given throughout this simulation. The opportunity to evaluate themselves and others will take place at the end of the simulation.

AUTHENTIC ASSESSMENT

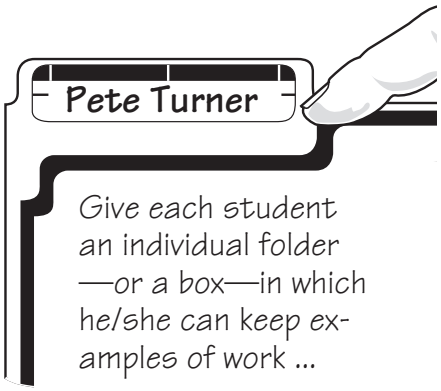
TEACHING **T**IP

Besides written words, your students' evidence of authentic assessments can include objects and other items such as photographs and a video tape.

There are many methods to achieve authentic assessment, some of which have been incorporated in this simulation. Authentic assessment involves looking at more than a single test to judge a student's ability in an area of study. It is much more meaningful to look at a student's progress over a period of time before making a judgment about the student's work. At the end of a unit of study, a student should be able to show thoughtful understanding of a complex idea. Simulations are idea tools to use for authentic assessment.

In this unit, the students will begin their studies by writing a brief essay describing what they know about inventions. As students work through this simulation, they actually become inventors. By keeping a log, conducting research to see if their idea has been invented, making a model, advertising their product, and presenting their invention to others, students experience all facets of inventing. During the course of playing INVENT, the teacher may wish to have the students keep the activities they complete in a portfolio.

By the end of the simulation, students will have accomplished a great deal as inventors. Completing activities to the teacher's satisfaction is really a type of authentic assessment. For the inventor in the work place, a job must be completed to his/her boss' satisfaction.



Finally, it would be advantageous for the teacher to have the class write a second essay as the simulation comes to an end. This essay will demonstrate to the students and others the learning that has taken place. As a result, the students will feel a sense of closure and accomplishment.

SOURCE MATERIAL

About a month before beginning this unit, you may be interested to write to the following addresses for information concerning inventions:

1. Information about **copyrights**:
   The Copyright Office
   Library of Congress
   Washington, DC 20559

2. Information about **patents**:
   U.S. Department of Commerce
   Patent and Trademark Office
   Washington, DC 20231

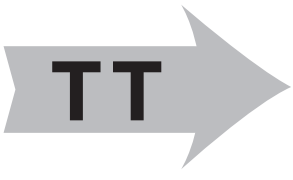
3. Information about an **invention contest**:
   Invent America! (spring deadline)
   The United States Patent Model Foundation
   510 King Street, Suite 420
   Alexandria, VA 22314
   (703) 684-1836

4. Information about an **invention contest**:
   Weekly Reader National Invention Contest
   (fall deadline)
   245 Long Hill Road
   Middletown, CT 06457
   (203) 638-2638

5. Information about an **invention contest**:
   Silver Burdett/Ginn–Invention Convention
   250 James Street
   Morristown, NJ 07960-1918
   (201) 285-7894

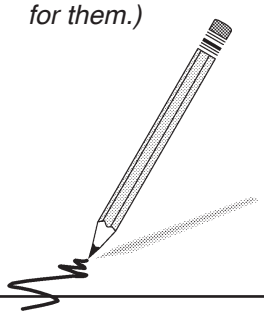
6. Information about an **invention contest**:
   Foundation for a Creative America
   Virginia Office
   1755 Jefferson Davis Highway, #400
   Arlington, VA 22202
   (703) 413-4491

7. Information about the **Odyssey of the Mind competitions and publications**:
   O.M. Association
   P.O. Box 27
   Glassboro, NJ 08028



TEACHING **T**IP

Consider having an aide, a parent, or some of your most capable students do this writing for your class. (Having students write such letters—which, of course, you carefully proof—is a real growth experience for them.)



U.S. Dept. of Commerce

Dear gentlepersons:

Betty Anders and I have invented something really special—a new growth stick for gardeners. My grandfather is using it all the time. He says we should try to sell it. Could you tell me how we go about getting a patent?

Unit Time Chart

Note: This Unit Time Chart is intended as as example. Alter it as desired.

Monday	Tuesday	Wednesday	Thursday	Friday
Organize teams GROUP THINKER ACTIVITY Introduce the simulation Give HOME-WORK assign-ment in the Student Guide **1**	Greatest Invention Graph Research inventors → **2**	**3**	Begin Group Fairy Tale Invention Discuss Individual Invention Project **4**	Share Group Fairy Tale Invention **5**
Tinkerer Activity **6**	Log Mini-lecture Make logs Inventive Ideas Activity #1 **7**	Patent Mini-lecture Inventive Ideas Activity #2 **8**	Advertising Mini-lecture Develop Advertisements → **9**	**10**
Share Invention Models and Ads → Evaluate Peer Inventions **11**	**12**	Set up Thomas Edison Day → **13**	**14**	Thomas Edison Day **15**

Day 1

Materials

1. A band-aid
2. An ice cream cone
3. Some velcro
4. A telephone (play or real)
5. A single roller skate
6. A disposable diaper
7. An "Invention Box" large enough to hold items #1-6 listed above
8. An enlarged copy of the Invention Wheel
9. A HISTORY OF A FEW INVENTIONS handout
10. Student Guides

Procedure

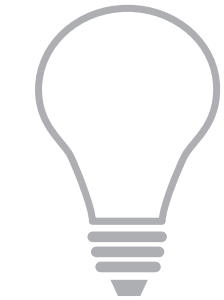
1. Divide students into six cooperative learning groups.

2. Tell your students that they are about to begin a simulation about inventions. The following activity will introduce and excite your students about the world of inventions:
   a. Tell the students that they will send one member from their group up to the front of the room to pick an item from the "Invention Box." These students may not look inside the box before choosing the item.
   b. Once the group member has chosen an item, this person will return to the rest of the group.
   c. The entire group will develop their own idea about how this item was invented without using any resource materials. If the class is not familiar with brainstorming techniques, the teacher may want to model the appropriate way to brainstorm before students begin this activity. Remind the class that during a brainstorming activity everyone in the group much give ideas and there should be no criticism of the ideas when they are first given. Once the group has many ideas to chose from, they should narrow down their choices by getting group consensus.
   d. The group will devise a way to present their idea to the rest of the class of how this item was invented. The teacher may want to offer suggestions for presentation ideas to help groups. For example, the groups may present a:
      1. skit
      2. newscast
      3. commercial
      4. documentary featuring the inventor
      5. poem or rap
      6. diagram (or illustration)
      7. song
   e. After giving the groups 10-15 minutes to prepare, have each group come forward to show the rest of the class its presentation.

TEACHING **T**IP

If groups have difficulty selecting a person, help by telling them to send to the front of the room the person whose birthday falls earliest (or latest) in the year.

f. Before the groups speak, you may want them to try to find out how their item was actually invented. They could then bring this information to class along with the source of this information. You could also tell students at this moment how each item was invented. However, information on all six is contained in the HISTORY OF A FEW INVENTIONS handout. *See #6 on the next page. Students will be assigned to read this handout today.*



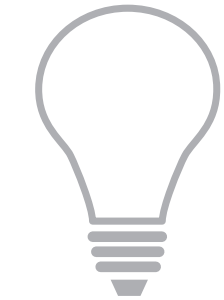
Read aloud ...

Of course, **Read aloud** *means you can read this or put it into your own words.*

3. Once each group has shared, the teacher can give an overview of the simulation to the class. Say:

"We are going to begin studying inventions in class. I would like to begin this study by asking you to define what you think an invention is in writing. Please write what you know about inventions. When I collect this exercise, we will discuss some ideas you came up with in class."

Once the class has completed the writing assignment, solicit ideas about inventions from the class being sure that they understand an invention involves creating something new. There may be some discussion about discoveries (something that was always there but not known about until someone revealed it—example: penicillin). Since inventions and discoveries are so closely related, both may be acceptable for the purposes of this simulation. This, of course, is up to the discretion of the individual teacher.



Read aloud ...

4. Then continue by giving a simulation overview. Say:

"In this simulation, you will do a variety of activities involving inventions. You will have things that you will do in cooperative groups and things that you will work on individually. The item that each group pulled out of the "Invention Box" represents a broad category that will be the focus when you work in a group. For instance:

- The ice cream cone represents **Food**
- The band-aid represents **Health and Safety**
- The velcro represents **Tools**
- The telephone represents **Communication**
- The diaper represents **Convenience**
- The roller skate represents **Travel**

Later, when you work on your individual invention, you will not have to invent something that fits into this broad category unless this is something that interests you. We will discuss your personal invention in more depth at a later date. Now I would like you to look at our class Invention Wheel."

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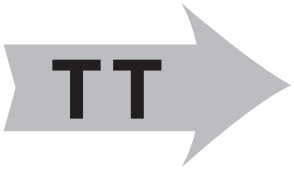
TEACHING **T**IP

The RESEARCH CARDS found on pages 36-41 will be used by the separate groups.

5. Show the class the Invention Wheel and tell them as they do each activity that is represented on the wheel, they will begin to fill in the dots on the spokes. Each group will chose a color that will represent that group on the wheel. As each activity is completed, the group will color in a dot with their group's color. Since the class has already completed the group activity that asked them to come up with an idea about how an object was invented, each group can fill in the dot along the wheel spoke that is entitled: **Thinker**. *Hint:* If the you think you will be doing this simulation more than once, you may want to laminate the Invention Wheel and have each group select a color of sticky dot that will represent them. Then, once this simulation is over, you can remove the sticky dots easily and reuse the wheel at a later date.



TEACHING **T**IP

If you put a thumb-tack in the center of the Invention Wheel when you are put-ting it up on the bulletin board, you can move the wheel around as the class completes each activity.

6. Give each student a Student Guide and a A HISTORY OF A FEW INVENTIONS handout. Ask everyone to read the Student Guide's first two pages and to do the page 3 HOMEWORK ASSIGNMENT before tomorrow. *(Note that #2 on this assignment asks students to read the A HISTORY OF ... handout.)*

Days 2-3

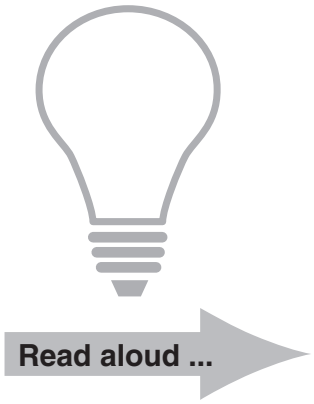
Materials

1. One notecard (at least 3"x5") for each student in the class
2. INVENTION GRAPH
3. Student Guide
4. INVENTOR CARDS (one copy for each group)
5. RESEARCH ASSIGNMENT: Day 2 (one copy for each student)
6. Encyclopedias, books about inventions, and/or access to the school library.
7. INVENTION BOOK COVER

Procedure

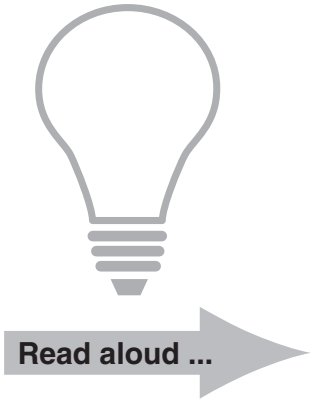
1. Give each student a notecard and say the following:

"Last night you were given an assignment to come up with the most important invention in history. You were also to find the year this invention was developed and the name of the inventor. On the notecard I have given you, I would like you to write the invention, inventor and date the same way it is written on page 3 of your Student Guide. If you were not able to find the date your invention was developed or the name of the inventor, leave that part blank and we will look for that information at a later time."



2. After giving the students some time to fill out their notecards say:

"Now I would like each of you to share what you consider to be the most important invention in history with the rest of the class. You have probably noticed the graph on the bulletin board which lists the broad categories you were assigned to yesterday along with a category called 'Other.' I would like each of you to come to the front of the room when I call on you and tape your notecard in the column to which it belongs. Then I would like you to tell the class what your invention is and why you chose it. Please be brief when presenting but if there was something interesting about your invention that you discovered, feel free to share it."



3. Once every student has the opportunity to share his/her invention, draw their attention to the graph they developed and discuss which category they had the most and least inventions. Have students draw some conclusions or give their thoughts on what this graph might show to people who look at it. Then have one student from each group fill in the Investigator cog (#2) on the Invention Wheel.

4. Read this mini-lecture to the class:

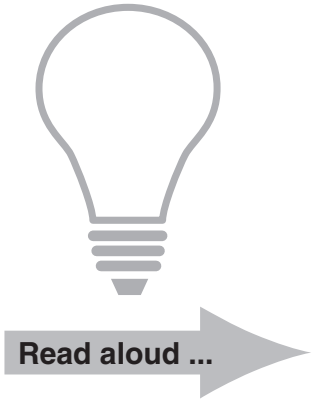
"If you look at a person you will not be able to tell if he/she is an inventor. Inventors are young and old, male and female, trained and untrained. Anyone who is creative, persistent, a problem solver, and able to take criticism has the qualities needed to be an inventor. Virtually every group of people in the world, men and women alike, have come up with inventions that fit their own particular needs.

"In ancient Egypt, there was no cement so builders carefully shaped each stone when building a pyramid. In ancient Rome, cement was invented and used to make some aqueducts that still stand today. The ancient Chinese invented gunpowder powered rockets but this invention was not used for purposes of war until the 1300s in Europe. The first tools were made by early humans on earth millions of years ago. Wherever there is a need, there will be inventors with ideas.

"Our world is constantly changing and inventors find ways to help us keep up with these changes. Anyone who has the desire can become an inventor and make

a tremendous difference in our world. That person could very well be sitting in this room right now!"

5. Tell the students:



"To fulfill the part of the Invention Wheel that asks you to be a Researcher, you are going to do some research on an inventor. You have the choice of researching any inventor who fits your group's broad category, even one who is not named on the list that I will give each group. If you do chose a person who isn't on the list, please just tell me the name of the inventor you chose. It would be wonderful if there is at least one person in each group who researches a female or minority inventor. If you look in your Student Guide on page 4, you will see a sample of how I would like you to submit your research. You must hold your paper the same way it is shown in the Student Guide because we are going to make a class book of inventions with this research. Later, we will expand this book and you will each add a page that you will write about your own personal invention. In addition to writing and drawing information you learn in your research, you will also share this information briefly with the class. You can chose any number of ways to share the information you learn—you can create a song or rap, write an interview, act out a part of the inventor's life, draw a diagram or create a model. How you share the information is up to you. This will allow us as a class to learn about a number of inventors from one another and to share knowledge without each having to do so much research. As soon an each person in your group has completed this assignment, the group can fill in the Researcher cog on the Invention Wheel."

TEACHING **T**IP

Depending on your students experience conducting research, you may want to give some specific directions about notetaking before students write their final page for the Invention Book.

*By allowing each student to share the information their research uncovered in the manner they choose, they use their strengths as determined by Howard Gardner in his *Theory of Multiple Intelligences.*

6. Pass out invention cards to each group

7. Once each student has selected an inventor to research, take the class to the library or allow them to use the encyclopedias and invention books to begin their research.

8. For the last 20 minutes of Hour 3, you may want to have students share the results of their research with the rest of the class. As each group completes this assignment, have one student from each group fill in the researcher cog (#3) on the Invention Wheel.

9. Collect the invention research and put it in Section 1 of the invention book. Section 2 of the book will consist of write ups students complete on their own inventions.

Day 4

Materials

1. FAIRY TALE INVENTION (one copy cut apart and given to the appropriate group)
2. Large pieces of newsprint or butcher paper (approximately 36"x36")
3. Markers, crayons, or other drawing instruments
4. Student Guide

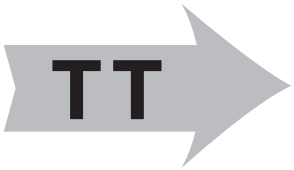
Procedure

1. Tell the students that they will be fulfilling the Brainstormer cog on the Invention Wheel today.

2. Say:

"The activity you will work on today is a group activity. Each group will be given a paper that describes a device to invent that fits the group's broad category and that will provide a service to a fairy tale character. This activity will fulfill the Brainstormer cog on the Invention Wheel and will give you the experience of inventing in a group before you begin working on your individual invention.

"Once your group has agreed upon an invention, you will make a diagram of this invention on the large paper that I will give to you. It may be a good idea to draw rough drafts on scratch paper so that the final diagram will be neat and presentable. When drawing the final copy, be sure to draw it large enough so that people viewing the invention from a distance will not have any trouble seeing it. Every person in your group must contribute to this invention. If one person is better at drawing than another, that person can draw and the other person can color.



TEACHING **T**IP

Although some older students may balk at first at the idea of creating an invention for a fairy tale character, you will be amazed at the sophisticated inventions groups develop.

"At the top of the paper, write the name of your group's invention. Every member of the group should have their full names written somewhere on the front of the diagram. You will want to be proud of the group's effort because people will be looking at these group inventions when they visit our room during Thomas Edison Day. Please begin working on your group invention."

3. During the last five minutes of the class period, direct the students to look at YOUR INDIVIDUAL INVENTION on page 5 in their Student Guide. Tell them to go home and discuss possible invention ideas with their family. Students can get ideas for inventions by thinking about chores they (or their parents) have to do that could be made easier. Stress that inventions should be simple but helpful. Students have a tendency to want to make complicated inventions that can be costly and difficult to make. It is more effective to have a simple device that will make someone's life easier.

Day 5

Materials

1. The fairy tale inventions that groups developed on Day 4

Procedure

TEACHING **T**IP

Remind the students that although many of the group inventions that were shared could have been highly complex, these inventions were only developed in diagram form. Their own personal inventions are much more practical if they are simple.

1. Have each group come forward to share its fairy tale inventions with the rest of the class. As each group comes up to share, allow one person in the group to indicate on the Invention Wheel that the group has completed the Brainstormer (#4) requirement.

2. If possible, display these diagrams in the classroom. If there is no room to present the diagrams at this time, keep these inventions in a safe place so that they can be displayed during Thomas Edison Day.

3. Discuss the individual invention assignment further. It would be a good idea to share some inventions that have won past Weekly Reader Invention Contest or Invent America. These inventions are described in some books listed in the bibliography. The contests will send information when you write to the addresses listed in this simulation.

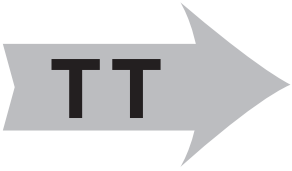
4. If some students have not yet come up with an individual invention, there are a number of things you can do to help them:

a. Provide students with books about inventions or inventors. (See the bibliography for some ideas.)
b. Have students list chores they have to do at home. Using a webbing technique, they could come up with inventions that could help with a chore they have to do.
c. Group together students who haven't thought of inventions yet. These students could brainstorm different invention ideas as a group and then select an individual idea from the brainstorming session.
d. Tell students to think of people they know who are elderly or who have a disability. Coming up with an invention that would make life easier for these people would be advantageous.

Day 6

Materials

1. A box filled with about 30 of each of the following items so that there will be a wide selection of things for each student in your class:
   - rubber bands
   - thin wire or string
   - straws
   - paper clips
   - pipe cleaners
   - aluminum foil
   - cardboard (or paper) tubes
   - brads
   - magnets
   - toothpicks
   - balloons
   - buttons
   - film canisters
   - tongue depressors
   - scraps of fabric
   - clay (cut in small cubes)
   - paper cups
   - marbles
2. glue or paste
3. 3"x5" cards (one for each student in the class)

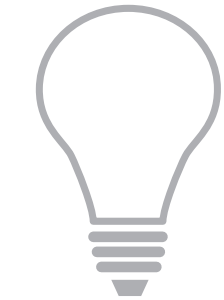


TEACHING **T**IP

Feel free to add or substitute any item you wish to this list.

Procedure

1. Tell the students:



Read aloud ...

"Today we will work on fulfilling the Tinkerer cog on our Invention Wheel. To fill in this cog, each member of your group will develop his/her own invention using just four items from this box. This invention does not need to fit your group's broad category, but it may match this category if you would like it to. In addition to the four items selected from this box, you will need one 3"x5" card folded in half on which you will name and describe your invention. You also will need to include your name on the card. The point of this assignment is to demonstrate that many inventions that are developed are not totally new. Often, inventors use items that have already

been invented and combine them in an unusual way. Our goal will be to have as many different types of inventions developed from this exercise as we can. Your finished product may be a miniature version of what the invention would actually be."

2. To help with management, you may wish to set the items across a table, keeping items that are the same in a pile. Then each group of students can be called up to select their four items. Groups that remain at their seats can get the glue for their group and the 3"x5" cards that will need to be labeled. You may wish to put a time limit on each group for the amount of time they may remain at the table. If their time is up before they have selected four items, they must take what they have, sit down, and wait until all the other groups have had a chance to select their items.

3. For the last 15 minutes of this hour, students will display their inventions along with the description card on their desks. The rest of the class will rotate around the room, looking at their classmates inventions.

4. Once students have looked at each others inventions, it would be a good idea to ask the students what they learned doing this activity.

5. After the class completes this activity, remind a student from each group to come up and fill in the Tinkerers cog (#5) on the Invention Wheel.

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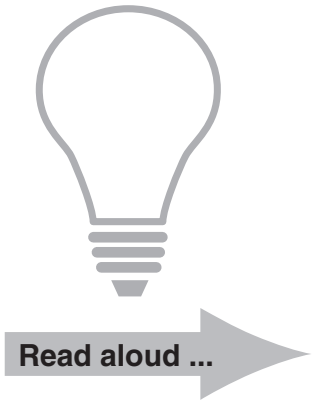
TEACHING **T**IP

You may want students to write out what they learned and add it to their INVENT portfolio.

Day 7

Materials

1. Student Guide
2. One sheet of 8.5"x11" construction paper for each student
3. 10 sheets of 8.5"x5.5" blank ditto paper or newsprint for each student.
4. Staplers
5. Ink pens
6. MY INVENTION LOG cover (page 51) plus large sheets of white construction paper or newsprint so that students can create their individual logs

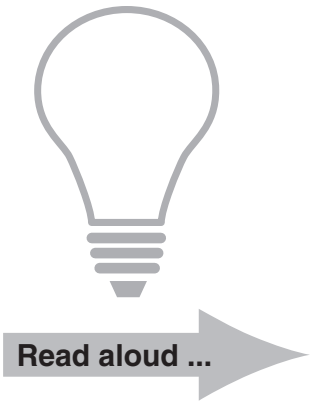


Procedure

1. Tell the students:

   "Today we will begin working on our individual invention assignments. Remember that your individual invention does not need to fit the broad category that your group has been working on. You can invent anything at all that you are interested in. The very first thing you must do when developing an invention is to start your invention log book."

2. Read this mini-lecture to the class:



   "The log is really the inventor's most important tool. The log is a written document that should be started as soon as the inventor comes up with an idea and be up-dated every time the inventor works on her/his invention. This log should be written in ink and every entry should be dated and signed by a witness.

   "An accurate log is crucial because it is the only proof that a person really came up with the idea for an invention first independent of others. Remember the story about Daniel Drawbaugh, the man who claimed to have come up with the invention of the telephone first and had actual witnesses who saw him using his telephone before Alexander Graham Bell received a patent? The only reason the Supreme Court awarded the patent to Alexander Graham Bell was because he had a log that was dated and witnessed. Daniel Drawbaugh did not keep his log book up-to-date and therefore lost the patent. An inventor is often excited about a new invention idea and may talk about it in front of another person who may want to claim the idea was his/hers. If a log has been started and is witnessed and dated, no one else can claim the idea is theirs first.

   "If you look at page 6 in your Student Guide, you will see some things that should be included in your log. Of course, you are free to add to these things, but all of the items on this list should be included in your log. If you keep your log up-to-date, you will not have to worry about anyone else profiting from your idea."

Read aloud ...

3. Ask students to look at page 6 in their Student Guides.

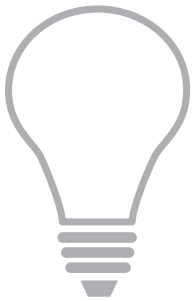
4. The first half of this class period will be spent on making invention log books. Give each student a MY INVENTION LOG cover. an 8 and 1/2 x 11 inch piece of construction paper and ten sheets of plain paper.) Say:

   "One of the activities you will work on today in class is your invention log book. To make the log book, I have given you a piece of construction paper, ten sheets of plain paper, and a cover to place on the construction paper. Fold and staple together the construction paper (the cover) and the white paper. While you are waiting for the stapler to "bind" your log, you can design a cover for your log book. Sometime soon color the cover I gave you and paste it on the construction paper. Of course, if you prefer, you may create your own cover totally by yourself. Once your cover is made and the pages are stapled inside, you will want to start the actual log. Use pens rather than pencils while writing in your logs.

   "At home tonight, you may want to call a place of business to complete the research part of your log.

   "You may now get started on your logs."

5. Some students might feel more comfortable talking to a business person about their invention idea if they write out beforehand what they are going to say. Give students an idea of what is proper to say by writing the following script on the board or overhead projector: "Hello. My name is _____. In my class in school we are studying inventions and I am calling to ask if you have ever heard of my idea. (State and describe the invention idea and then ***wait for an answer.***) Do you think customers who come to your store would buy the idea that I just described? Do you have any idea how much money people might be willing to spend on this idea? Thank you very much for your time. Could I have your name to record in my invention log? Thanks again."



Read aloud ...

6. Give students some information about the invention model they will need to develop. Say:

   "To fulfill the Inventor cog on the Invention Wheel, each member of your group will need to make a model of their individual invention. As you read on your assignment sheet, this does not have to be a working model and you should not spend much money making your model. Look around your house for spare materials such as wood, cardboard, clay, fabric, etc. If you are having a difficult time deciding

which material to use to make your model, see me as soon as possible. The model of your invention will be due soon." This model is due during Day 11 of this simulation. The actual due date for the model will depend on whether you do the simulation every day or a few times a week.

TT

TEACHING **T**IP

A large piece of white construction paper 11"x14" or larger) was used to complete this assignment in the author's class.

7. During the second half of the class, tell the students to turn to the Inventive Idea Activity #1 on page 7 in their Student Guides. Tell them that they can work on this activity as an individual or they can chose one or two people to work with. It is important to stress that the students document where they found their information for this activity on the back of the paper.

Day 8

Materials

1. PATENT (one for each student)
2 PATENT DRAWINGS (one for each student)
3. Optional: A box of round gold seals (typically put on awards) to put on the patent when it is filled out
4. Student Guide
5. Large sheets of white construction paper or newsprint

Read aloud ...

Procedure

1. Tell the students that they are going to work on another invention activity today: the patent.

2. Read this mini-lecture to the class.

"A patent is a special piece of paper awarded to an inventor from the United States government. This piece of paper says that no one but the inventor named on the patent may use the invention unless that person has the inventor's permission. The patent lasts for a number of years (depending on how often the inventor renews the patent). For example, the original patent lasts for four years, and can be renewed at four years, eight years and twelve years. The maximum length of time for a patent is 17 years.

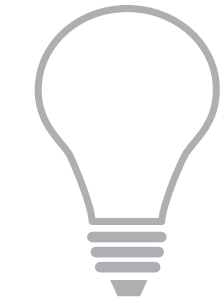
"An inventor doesn't have to apply for a patent, but if s/he doesn't, other people may use the idea and make money from it without giving any of the money to the inventor. The real purpose of the patent is to protect the inventor so that others do not take the idea.

"To apply for a patent, an inventor sends a written description and a diagram of the invention to the U.S. Patent Office. The patent office then checks to be sure that no one else has come up with this idea. Only about 20% of the ideas that are sent to the patent office haven't been thought of before. When the patent office determines that no one else has had the idea, the inventor needs to send money to the patent office to actually receive the patent. Most inventors do not even make as much money on their invention as it costs for the patent. It can take up to a year after applying to actually receive a patent. That is why you sometimes see "patent pending" on some items.

"Even though something it patented in the United States, there are countries in the world who do not honor patents from the United States. Luckily, most countries do honor U.S. patents.

"The patent is a very important document for an inventor. It will protect the inventor's idea for a number of years so that the inventor has the first opportunity to make money from his/her idea.

"The patent you will fill out in this class will be two pages long. On the first page, you will write a detailed description of your invention idea. On the second page you will draw your invention from at least two viewpoints. Of course, this is not an official patent, but by filling out our class patent, you will get an idea of what it's like to be an inventor working on a patent."



Read aloud ...

3. Say:

   "The patent you will fill out today is not nearly as complex as a real patent, but it is similar. Once you have completed your patent, bring it up to me so that I can sign it. I will only sign the patent if it is completely finished. If you finish your patent before the end of this class period, you may work on anything you have not yet finished concerning inventions. You will certainly want to work on a page in your invention log book to keep it up-to-date."

4. If gold seals are available, you will wish to give each student a gold seal when their patent is complete. These seals help make the patent look more authentic.

5. As soon as an entire group has filled out their individual patents, have one student from that group indicate the group has completed the patent requirement (#6) on the Invention Wheel.

6. During the second half of the class, have the students turn to the Inventive Idea Activity #2 on page 8 in their Student Guides. After students have read the directions, tell them that they are to develop a Rube Goldberg invention on their own using the large paper you have provided.

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TEACHING **T**IP

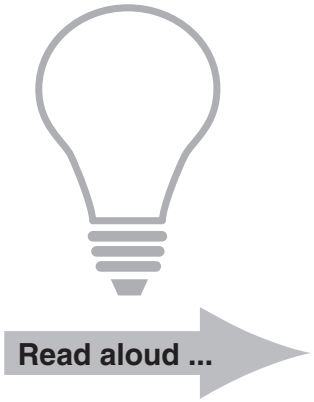
To help students come up with their own Rube Goldberg ideas, list things on the board they do every day (e.g., brush their teeth, comb their hair, write their name, etc.)

Days 9-10

Materials

1. Large sheets of white construction paper or newsprint

Procedure



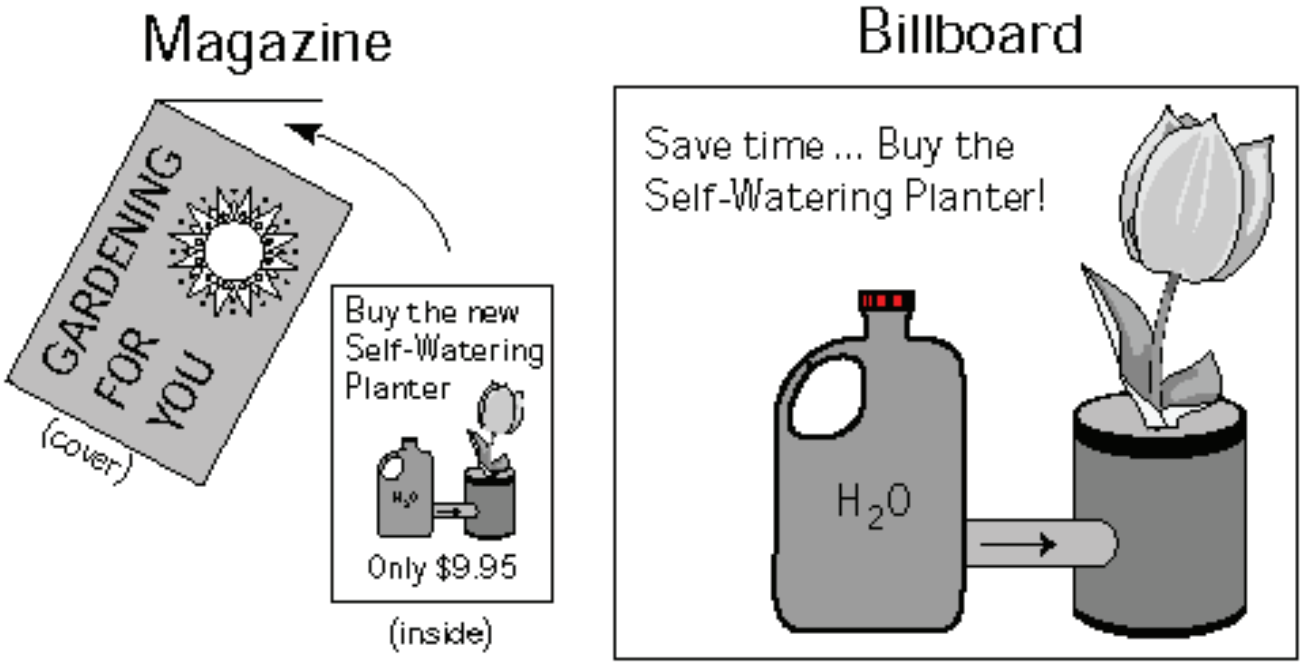
1. Read this mini-lecture to the class:

"An inventor does more than just come up with an idea. To make money, the inventor must either sell the invention him/herself or find a company that would be interested in selling the idea. If a company is interested in selling an invention, they will pay the inventor either a flat fee or royalties for the idea. Flat fee means the inventor will receive a one time payment from the company no matter how well or how poorly the invention sells. If an inventor receives royalties, s/he will be paid a small percentage of the selling price every time an invention is sold. In either case, the company takes care of making and selling the invention.

"If an inventor tries to sell an invention without the help of a company, there are many things that must be done after coming up with the idea. The inventor must find a way to make a model of the invention and then come up with a way to make many copies of this model. Then, the inventor must find a store that will sell the invention. It is also beneficial to develop an advertisement that will inform people that the invention is available to buy. The best advertisements take into consideration the type of person who might be interested in buying the particular invention. To determine who might be the type of person who would be interested in buying the invention, a survey

could be developed and given to people of many different ages, both boys and girls. If the advertisement is successful, orders for the invention will begin to come in. Then the inventor will need to keep up with these orders so that people will stay interested in the product."

2. Tell the class that during this class period they will be developing advertisements for their own personal inventions. The white construction paper can be used for a magazine advertisement or for a billboard. See the examples below:



3. If your school has blank tapes and a tape recorder, you may want to give the students the option to develop a radio commercial. If videotapes and a VCR are available, you may give them the option to develop a television commercial.

4. If students complete their commercials during Day 9, you may want to give them an extra hour to complete any assignments that they need to work on. You may want to check student's logs to be sure they are completely caught up.

5. As each group completes their advertisements, ask one group member to fill in that cog (#7) on the Invention Wheel.

6. At the end of the class period on Day 10 tell the students:

Read aloud ...

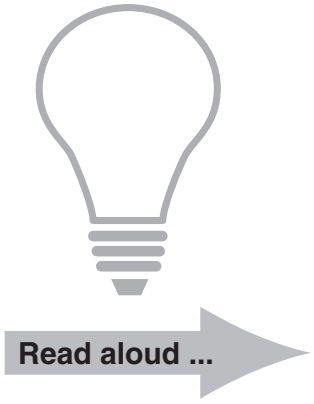
"Tomorrow you will be sharing your invention models, advertisements, patents and logs with the rest of the class. You must be prepared to describe your invention and to

answer any questions your classmates might have. When you are not sharing, you are part of a consumer advocacy group, trying to make sure that the invention is safe. You will be filling out an evaluation form on the inventions you see. Come prepared to share and evaluate tomorrow."

Days 11-12

Materials

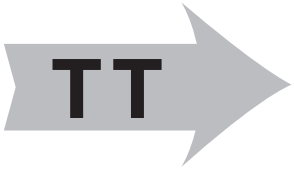
1. Students will need to bring the following materials:
   a. Model of the invention
   b. Patent
   c. Log book
   d. Advertisement
2. INVENTION EVALUATION FORM (one copy for each student)



Procedure

1. Tell the students that today they are going to have the opportunity to share their invention with the class. The class will serve as a Consumer Advocacy group, and will try to find out if the invention is safe and useful. Say:

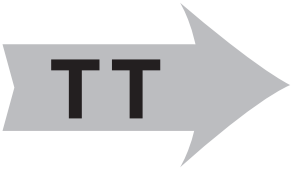
   "When it is your turn to share your invention, take your materials to the front of the room. Describe your invention briefly and then share your advertisement. Then the class will have the opportunity to ask you questions about your invention. When asking questions, we do not want to make the inventor feel as though s/he is under attack. Remember, you will all have a turn to share in class so you will want to treat your classmates the way you would like to be treated. In the interest of time, we will allow each inventor approximately four minutes to describe the invention and answer any questions. If the inventor finishes before the four minutes are up, that is fine. Once the inventor has finished answering questions, fill out your evaluation sheet for that invention. We will now have our first inventor come forward."



TEACHING **T**IP
It is useful to remind students that the purpose of asking each other questions is to practice for Thomas Edison Day. Some students may wish to give the inventor suggestions (which is fine) but the majority of time should be spent answering questions.

2. It may save some time to have the next inventor come to the front of the class and set up while the rest of the class is filling out their evaluations.

3. Once each member of the class has had the opportunity to share and defend their invention, have one student from each group fill in both the Inventor (#8) and the Defender cog (#9) on the Invention Wheel.



TEACHING **T**IP

To fill in cog #8 (Inventor) each member of the group must have a model of their invention. To fill in cog #9 (Defender) each student in the group must describe and answer questions about his/her invention.

Days 13-14

Materials

1. SAMPLE INVITATION
2. SAMPLE SIGN-UP SHEET for classes to visit Thomas Edison Day
3. Paper for the students to fill out regarding their personal invention to add to the Class Invention Book they began when they were researching other inventors
4. Materials needed to make the invitations such as crayons, markers, or paint

Procedure

1. Tell the students that it is now time to set up for Thomas Edison Day. Judges, parents, classes and the news media will be invited to attend.

2. Each student needs to make an invitation for their parents to attend Thomas Edison Day. Using the sample invitation as a guideline, students will be made aware of the information that is important to include in this invitation.

TEACHING **T**IP

If you are planning to send some of the student's inventions to a contest, it is best to have judges who are impartial. If you are not planning to compete in an invention contest, you may wish to have a number of categories for judges to consider (e.g. originality, practicality, helpfulness to disabled people, helpfulness to the environment, etc.)

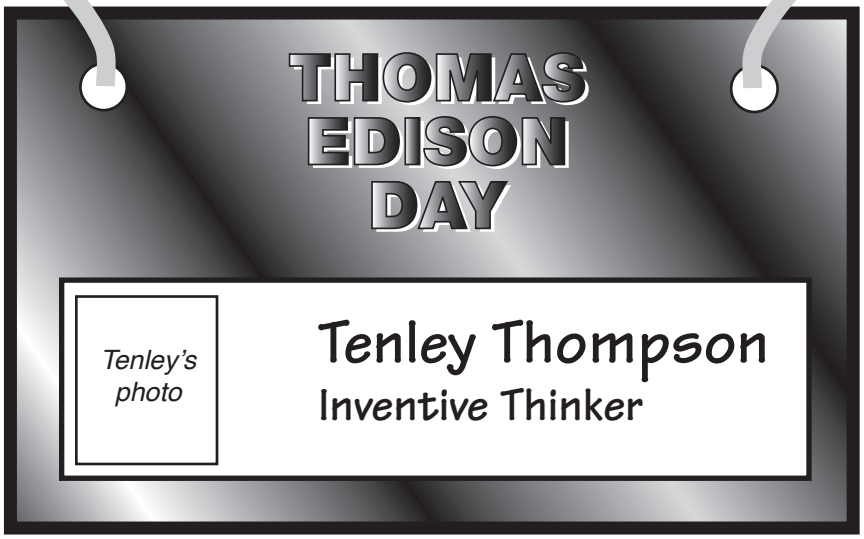
3. Once the students have completed their invitations, they will make a page for the Class Invention Book which describes their own invention. It is important that they hold the paper in the same direction as the inventor research page they completed earlier in the simulation.

4. As students finish their invitation and page for the Invention Book, they should check to make sure all assignments for this simulation have been completed. If they are finished, a number of other jobs need to be completed before Thomas Edison Day. The following things should be on display, either on a bulletin board or on a refrigerator box:
   a. Fairy tale group inventions
   b. Past/Present/Future activity
   c. Rube Goldberg Inventions
   d. The class graph of the most important invention in history
   e. The Class Book of Inventions
   f. The Invention Wheel

5. Some students could ask classes to sign up for a time to visit Thomas Edison Day while others contact the local newspaper or television stations to cover this event.

6. Once each of these jobs has been completed, students should gather their invention materials and get them ready for display for Thomas Edison Day. One student from each group can fill in the Exhibitor cog (#10) on the Invention Wheel.

7. Have students create ID badges. See #8 on page 4 of this Teacher Guide.



TEACHING TIP

#5: Often, the newspaper and television stations respond well to a student's invitation to visit as long as the student is knowledgeable and articulate.

#7: Of course, if you wish to have your students use their own creativity, don't use the ID badge given on page 51. Instead, have students create their own—totally.

Day 15

Materials

1. All of the invention products students have developed during this simulation.
2. SAMPLE QUESTIONS FOR THE JUDGES (one copy for each judge)
3. INVENTION EVALUATION FORM (one for each judge)
4. Student badges with pictures (laminated if possible)
5. Pins

Procedure

1. Allow at least a half hour at the beginning of the day for students to set up their invention materials on their desks, put on ID badges, and be comfortably seated when the judges arrive.

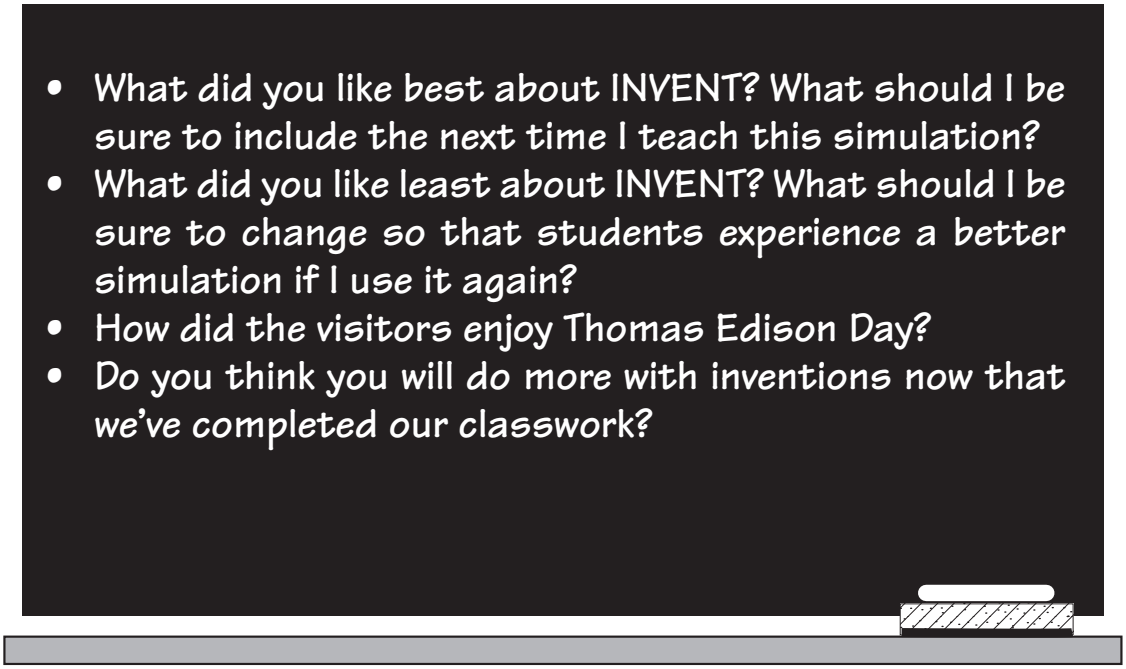
2. When the judges arrive, hand them each a copy of the Sample Questions and the Invention Evaluation Form. Then take each judge to a different area of the room to begin asking students questions.

Allow about a half hour for the judges to complete their tour of the room.

3. After the judges leave, other groups will visit Thomas Edison Day. Be sure to leave some time at the end of the day to clean up the classroom.

4. The work that your students produced for this simulation can certainly be used elsewhere. Your school and district office will want to display this work. Since you put so much work into this project, you will want others to have the opportunity to enjoy it for as long as possible.

5. Once you have finished cleaning up Thomas Edison Day, ask your students how they think things went. Ask the following questions, which you may wish to put on your chalkboard:



6. ***Option 1:*** You may want to videotape some students' impression during this debriefing session.

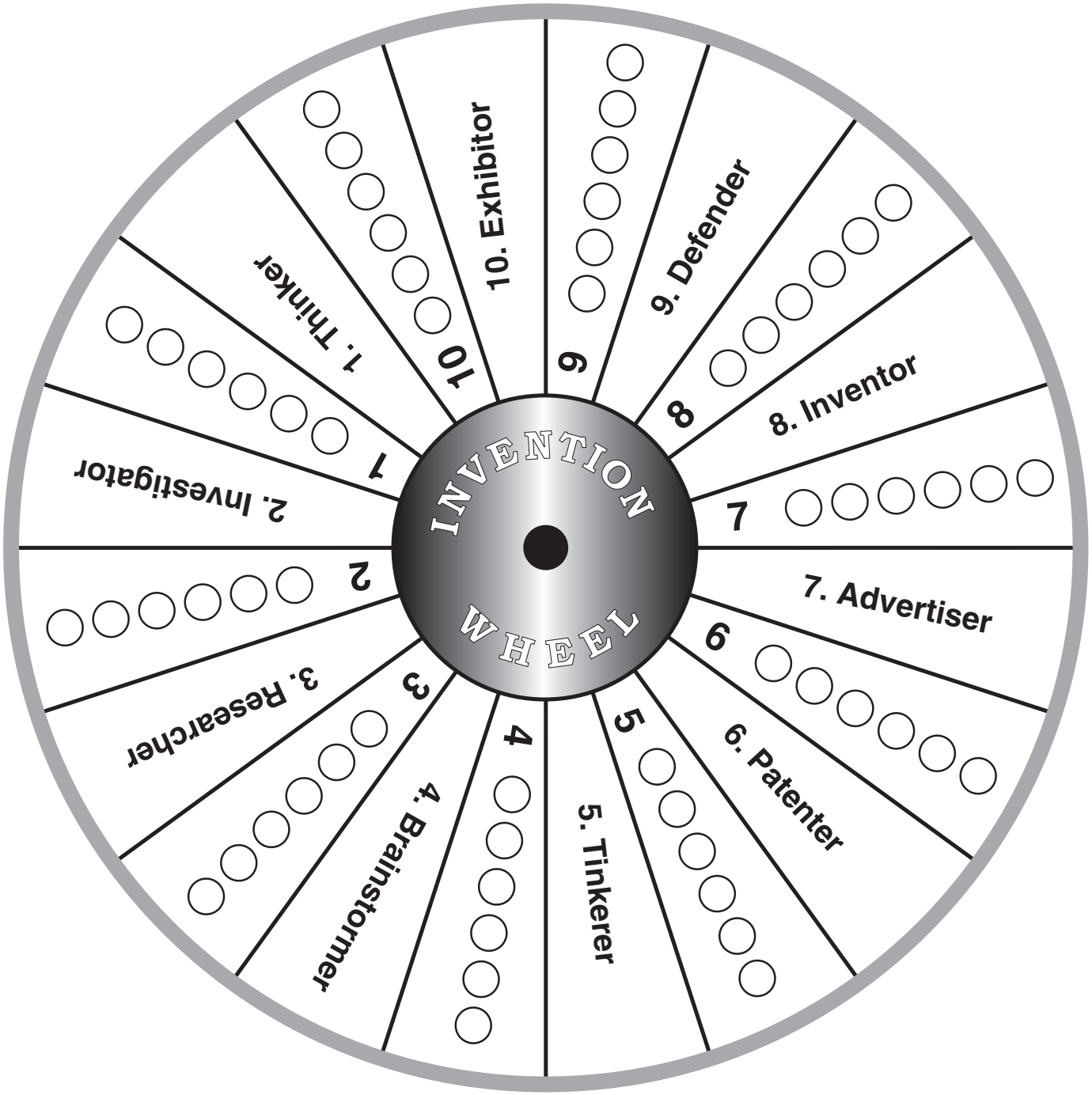
7. ***Option 2:*** Have students write an essay about inventions. This could serve as an assessment tool and culmination for this simulation.

8. Consider sending **Option 2** above to me at Interact:

Beth Arner (INVENT)
Interact
10200 Jefferson Blvd.
P.O. Box 802
Culver City, CA 90232-0802

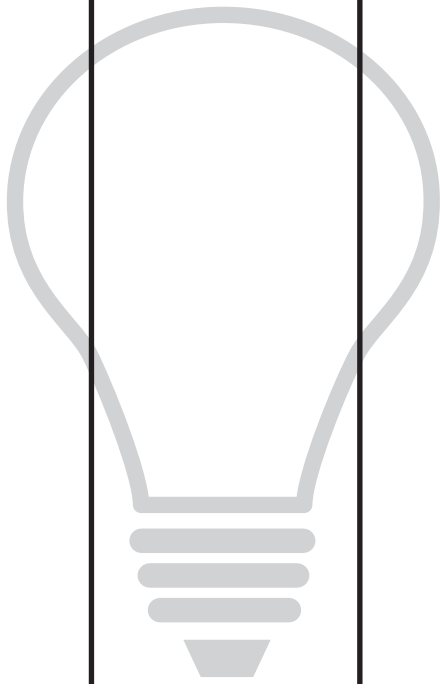
We love to know what works and what needs improvement.

INVENTION WHEEL



INVENTION GRAPH: Graph of the Most Important Inventions in History

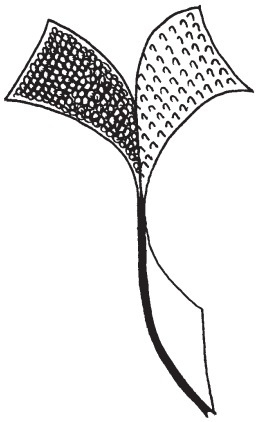
Food	Health/Safety	Tools	Convenience	Travel	Communication	Other



A HISTORY OF A FEW INVENTIONS - 1

ICE CREAM CONE The most commonly believed story about how the ice cream cone was invented is as follows: Charles Menches was an ice cream salesman, and like everyone else in 1904, he served ice cream to his customers in a bowl. On a very hot August day, all of the bowls for serving ice cream were used up by noon. Charles had a store full of hot and hungry people and no way to serve his ice cream. Charles certainly did not want to lose customers but to keep them, he had to think fast. Fortunately, his ice cream shop was right next to a store that sold a Middle Eastern dessert called Zalabia. Zalabia was a thin, sweet, crisp pastry that was normally served with syrup. Charles Menches decided to use Zalabia to solve the problem of how to serve his customers ice cream. He rolled up the Zalabia and scooped some ice cream on top of it. Most people think that the ice cream cone that is so well known today was born on that hot August day in 1904 in St. Louis, Missouri.

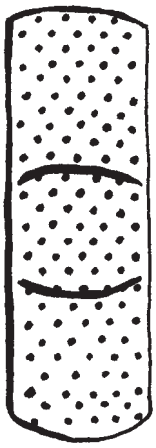
However, unknown to Charles Menches, a man named Italo Marchiony actually invented the ice cream cone and had received a patent for his invention in September of 1903. This was almost a full year before Charles Menches served his ice cream in a cone. Marchiony invented the cone because he sold lemon ice to customers in New York City. His first cone was a paper cone, but he also invented a pastry cone to make it easier to sell his lemon ice.



VELCRO Have you ever looked at Velcro and noticed how it resembles something in nature? Because George de Mestral was an observant and curious man, he invented the fastening tool Velcro that is so common today. George lived in Switzerland near the mountains. One day he took his dog for a walk in the woods. When they returned home, George noticed that there were many burrs stuck in the dog's fur. George discovered that it was extremely difficult to remove the burrs and wondered why this was so. He closely examined the burr and noticed that the burr contained many hooks which would cling to the dog's fur on contact. When George thought about how well the burrs stuck on his dog's fur, he realized that a material similar to a burr that was connected to a softer material like dog's fur would make an excellent fastener.

It took George a few years to actually invent this new fastener. He had to conduct many experiments to find a material that would work as well as a burr and dog's fur. Finally, in 1957, he found materials that would work and received a patent for his invention. Today, Velcro is used in a variety of ways because it works well in hot, cold, and wet environments. Astronauts are thankful for Velcro because things would float around their spaceship if Velcro didn't hold things down.

A HISTORY OF A FEW INVENTIONS - 2

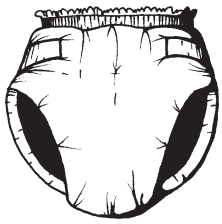


BAND-AID When Earl Dickson married his wife Josephine, he did not know that she was accident prone. Josephine often cut herself with the kitchen knife and burned herself while cooking. Josephine was fortunate that Earl worked for Johnson & Johnson. Earl combined two items that Johnson & Johnson sold (gauze and tape) to develop a ready-made bandage for those times when his wife hurt herself. He did this by placing a small piece of gauze in the middle of a strip of tape. Since the tape would dry up if the bandages weren't used right away, Earl put crinoline over the tape. This crinoline material could easily be removed from the sticky tape. Now when his wife hurt herself, she would be able to put on a bandage in a matter of seconds. Johnson & Johnson heard about these bandages and began to sell them on a small scale. The bandages sold so well that Johnson & Johnson began mass producing Band-Aids only four years after Earl invented them. If Earl Dickson hadn't married a clumsy woman, he may never have invented the Band-Aid.

TELEPHONE Throughout his life, Alexander Graham Bell had a great interest in science. When Bell began his career as a teacher of the deaf, he studied phonetics (the sounds in speech) and he experimented with how sounds vibrated through the air. He then became fascinated with how sound was able to travel over a wire (as it does in a telegraph). Alexander worked for more than five years trying to send more than one voice over a single wire at the same time. After a lot of hard work and experimentation, Bell was successful and the telephone was invented in 1876. Many people did not see the value of this new invention. Since Alexander Graham Bell spent so much money developing his invention, he really couldn't start a company of his own to sell the telephone. He decided to charge people to hear him give talks about his new invention. These talks earned him enough money to start making and selling his telephone to the public.

Once the telephone became popular, some people decided to sue Alexander Graham Bell, claiming that they were the true inventor of the telephone. Over 600 law suites were filed against Bell. For a number of years he had little time for anything other than testifying and defending himself in court. One inventor named Daniel Drawbaugh said that he had the idea for the telephone long before Bell received a patent. Eventually, the Supreme Court of the United States voted four to three that Alexander Graham Bell was the inventor of the telephone. The main reason that the court ruled in Bell's favor was because of his superior record keeping that was witnessed and dated. After this ruling, Bell was able to get back to the business of inventing. He did invent other things, but to this day he is still best known for inventing the telephone.

A HISTORY OF A FEW INVENTIONS - 3



DISPOSABLE DIAPERS Before disposable diapers became popular, mothers had a great deal of laundry to do. There were other problems with cloth diapers—babies were often wet and cold unless they were changed often.

Marion Donovan decided that she would do something about this problem. She decided to use plastic rather than the rubber pants that were commonly used over cloth diapers. Marion took plastic shower curtains and cut them into a diaper shaped envelop. Then she put some material that would absorb wetness inside this envelope of plastic and put a snap on each side to take the place of diaper pins. These diapers could be thrown away after they were used. Marion called this invention a “Boater” and patented it in 1951.

She tried to sell her idea to many companies but could not find one company that was interested in her invention. Marion did not give up. She decided to make her own “Boaters” and sold them to stores herself. They became very popular and sold very well. Marion Donovan eventually did sell her disposable diaper company and made a great deal of money.

ROLLER SKATES In 1760, an instrument maker and mechanic named Josef Merlin was invited to a masquerade party in London. He wanted to wear something that would be not only unique but that people who came to the party wouldn’t forget. Ice skating was popular in those days, but could only be enjoyed when the weather was cold. Merlin invented the first roller skate for this masquerade party using a design similar to a bicycle—one wheel in front of the skate and one wheel in the back of the skate. Josef Merlin made a grand entrance to the party by rolling across the ballroom on his new roller skates while he played the violin. The only problem with this invention was that he forgot to devise a way to turn or stop. Merlin skated across the room and crashed into a large mirror. The mirror smashed, broke his violin and injured Josef. He did get his wish for the people at the party would not soon forget such a grand entrance and uncontrollable crash stop.

In later years, other inventors tried their hand at inventing roller skates and several improvements and variations were made. The roller skate did not become popular until 1863 when a wealthy American named J.L. Plimpton designed a skate that could turn and stop. He came up with the invention because he enjoyed ice skating and wanted to be able to skate all year. Plimpton decided to share his idea with others by building a skating rink in Rhode Island. J.L. Plimpton’s invention made roller skating much more popular. Today, the improvements and variations in roller skate and rollerblades have provided a fun way for children and adults to travel (and have fun).

INVENTORS RESEARCH CARD

Ruth Wakefield
chocolate chip cookie

FOOD

INVENTORS RESEARCH CARD

Gail Borden
condensed milk

FOOD

INVENTORS RESEARCH CARD

Dr. John/William Kellogg
cereal

FOOD

INVENTORS RESEARCH CARD

H.J. Heinz
pickles

FOOD

INVENTORS RESEARCH CARD

Clarence Birdseye
frozen/freeze dried food

FOOD

INVENTORS RESEARCH CARD

Frank Epperson
popsicles

FOOD

INVENTORS RESEARCH CARD

George Crum
potato chips

FOOD

INVENTORS RESEARCH CARD

Clarence Crane
Lifesaver candy

FOOD

INVENTORS RESEARCH CARD

John Pemberton
Coca Cola

FOOD

INVENTORS RESEARCH CARD

George Washington Carver
peanut/sweetpotato
products

FOOD

INVENTORS RESEARCH CARD

Galileo
telescope, thermometer

TOOLS

INVENTORS RESEARCH CARD

Alexandro Volta
electric battery

TOOLS

INVENTORS RESEARCH CARD

Michael Faraday
electric motor

TOOLS

INVENTORS RESEARCH CARD

Robert Watson-Watt
radar

TOOLS

INVENTORS RESEARCH CARD

Eli Whitney
cotton gin

TOOLS

INVENTORS RESEARCH CARD

Linus Yale
cylinder lock

TOOLS

INVENTORS RESEARCH CARD

Isaac Singer
sewing machine

TOOLS

INVENTORS RESEARCH CARD

Jacques-Yves Cousteau
aqualung

TOOLS

INVENTORS RESEARCH CARD

Jack St. Claire Kirby
microchip

TOOLS

INVENTORS RESEARCH CARD

Elijah McCoy
automated lubricator

TOOLS

INVENTORS RESEARCH CARD

Philo Farnsworth/
Vladimir Zgorykin
television

COMMUNICATION

INVENTORS RESEARCH CARD

Joseph Niepce
photograph

COMMUNICATION

INVENTORS RESEARCH CARD

Johannes Gutenburg
printing press

COMMUNICATION

INVENTORS RESEARCH CARD

Louis/Auguste Lumiere
movies

COMMUNICATION

INVENTORS RESEARCH CARD

Samuel Morse
telegraph

COMMUNICATION

INVENTORS RESEARCH CARD

Charles Michael
sign language

COMMUNICATION

INVENTORS RESEARCH CARD

Guglielmo Marconi
radio

COMMUNICATION

INVENTORS RESEARCH CARD

Chester Carlson
photocopier

COMMUNICATION

INVENTORS RESEARCH CARD

Thomas Edison
light bulb, phonograph

COMMUNICATION

INVENTORS RESEARCH CARD

Jack St. Clair Kirby/
Robert Norton Noyce
computer microchip

COMMUNICATION

INVENTORS RESEARCH CARD

Carl Benz
first automobile powered by internal combustion engine

TRAVEL

INVENTORS RESEARCH CARD

David Bushnell
submarine

TRAVEL

INVENTORS RESEARCH CARD

Orville/Wilbur Wright
airplane

TRAVEL

INVENTORS RESEARCH CARD

George Stephenson
principal inventor of railroad locomotive

TRAVEL

INVENTORS RESEARCH CARD

Igor Sikorski
helicopter

TRAVEL

INVENTORS RESEARCH CARD

Montgolfier Brothers
hot-air balloon

TRAVEL

INVENTORS RESEARCH CARD

Robert Fulton
first commercially successful steamboat in U.S.

TRAVEL

INVENTORS RESEARCH CARD

Baron von Drais
bicycle

TRAVEL

INVENTORS RESEARCH CARD

Robert H. Goddard
liquid-fuel rocket

TRAVEL

INVENTORS RESEARCH CARD

Henry Ford
Model T automobile

TRAVEL

INVENTORS RESEARCH CARD

Stephanie Kwolek
Kevlar—material used
in bullet-proof vests

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Alexander Fleming
penicillin

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Benjamin Franklin
bifocal lens

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Charles R. Drew
method for preserving blood

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Edward Jenner
smallpox vaccination

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Jonas Salk
polio vaccine

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Mary Horn
Apnea Detection Device, alarm
when infant stops breathing

HEALTH/SAFETY

INVENTORS RESEARCH CARD

William Potts
traffic light

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Wilhelm Roentgen
x-rays

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Rene Laennec
single-tube stethoscope

HEALTH/SAFETY

INVENTORS RESEARCH CARD

Blaise Pascal
(or William Burroughs)
adding machine

CONVENIENCE

INVENTORS RESEARCH CARD

George Eastman
low-cost camera

CONVENIENCE

INVENTORS RESEARCH CARD

Sir John Harrington
flush toilet

CONVENIENCE

INVENTORS RESEARCH CARD

Ladislo Biro
ballpoint pen

CONVENIENCE

INVENTORS RESEARCH CARD

Jacob Perkins
mechanical refrigerator

CONVENIENCE

INVENTORS RESEARCH CARD

Mary Anderson
windshield wipers

CONVENIENCE

INVENTORS RESEARCH CARD

Barthelemy Thimonnier
sewing machine

CONVENIENCE

INVENTORS RESEARCH CARD

Josephine Cochrane
dishwasher

CONVENIENCE

INVENTORS RESEARCH CARD

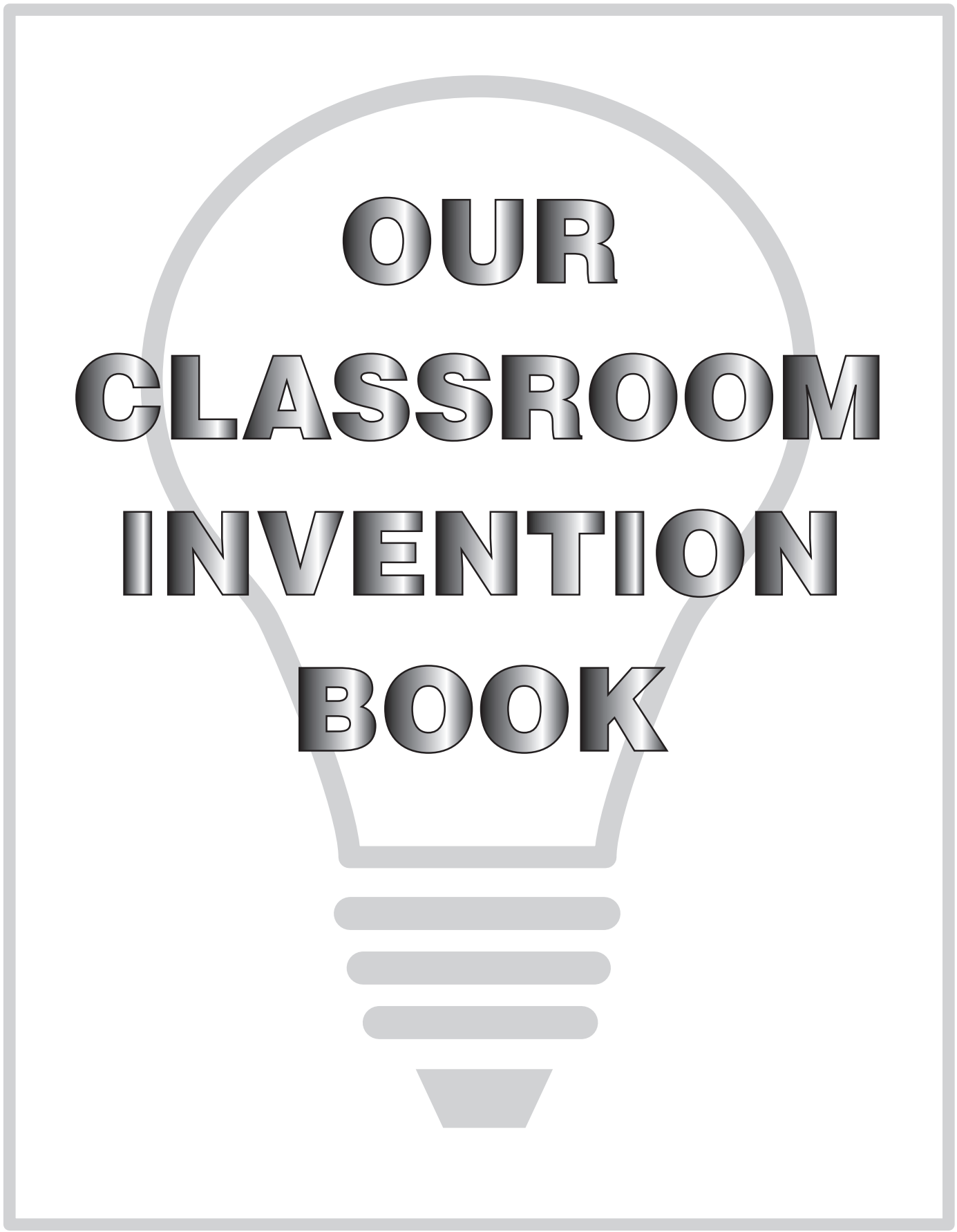
Elisha Otis
safety elevator

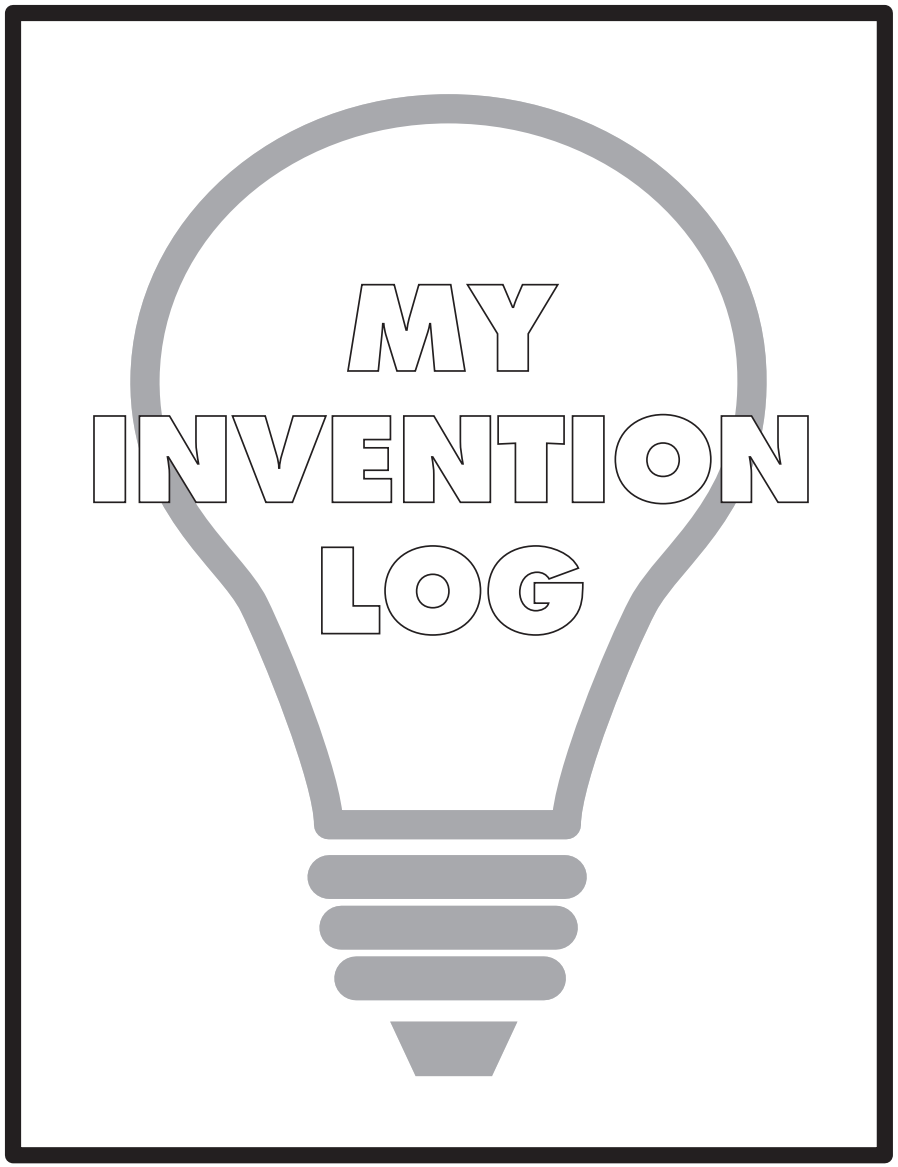
CONVENIENCE

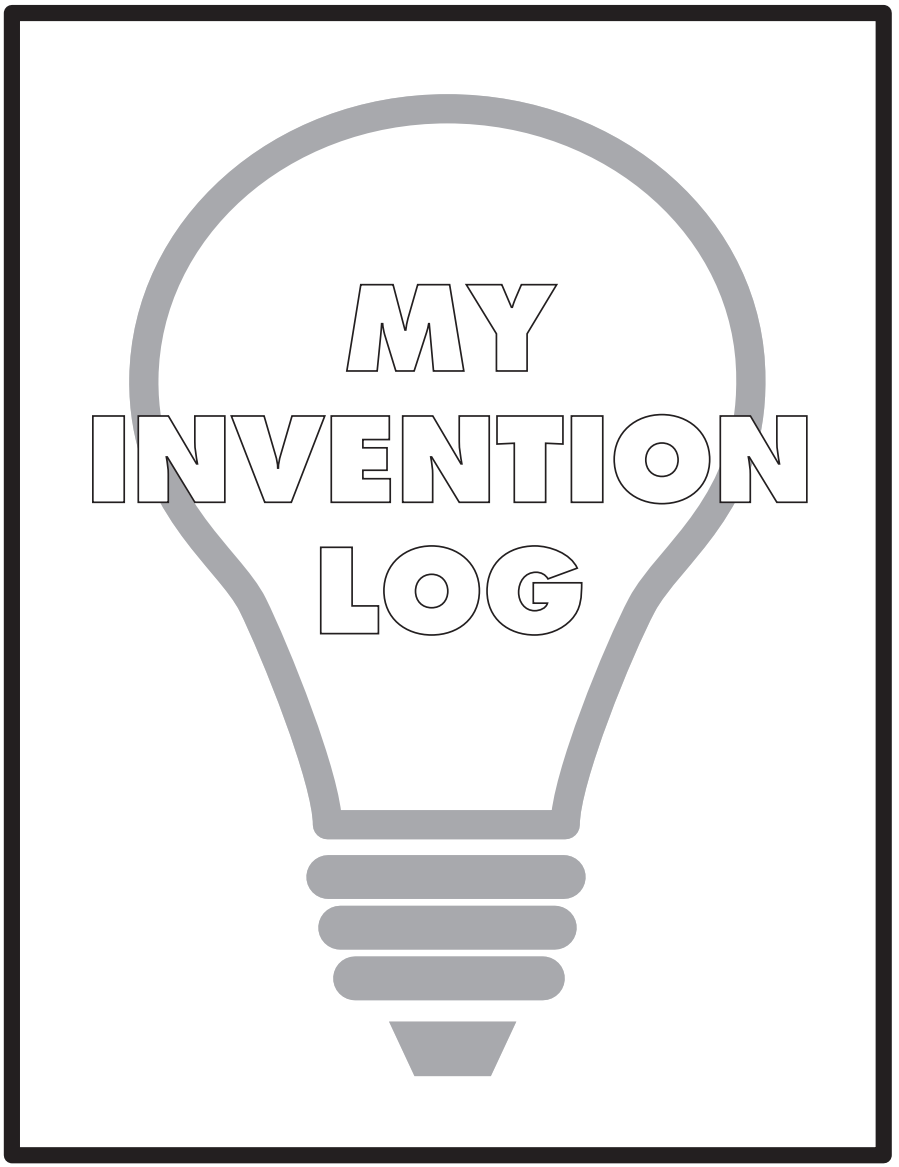
INVENTORS RESEARCH CARD

Melville Bissell
carpet sweeper

CONVENIENCE


OUR
CLASSROOM
INVENTION
BOOK





(Cut apart and follow the directions on the bottom of page 6 in the Student Guide.)

FAIRY TALE INVENTION

TOOL GROUP

Invent a specialized device to put
Humpty Dumpty back together again

CONVENIENCE GROUP

Invent a radar device to assist
Little Bo Peep in finding her sheep

HEALTH/SAFETY GROUP

Invent a poison detection device for
Snow White to use on unfamiliar apples

(Cut apart)

TRAVEL GROUP

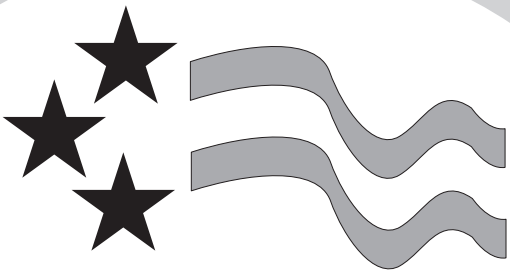
Invent an alternate way for the Gingerbread Man
to cross the stream

COMMUNICATION GROUP

Invent a way for the Three Bears
to communicate with Goldilocks

FOOD GROUP

Invent alternate food sources for the
Big Bad Wolf (other than the Three Pigs
and Little Red Riding Hood's grandmother)



Patent

Name: _____

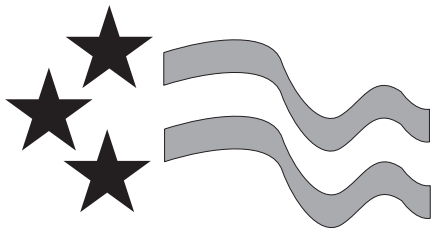
Title of invention: _____

Describe your invention—including its purpose and how it will be used.

Invented on this __ day of _____, 20 _____

Official signature: _____

Patent DRAWINGS

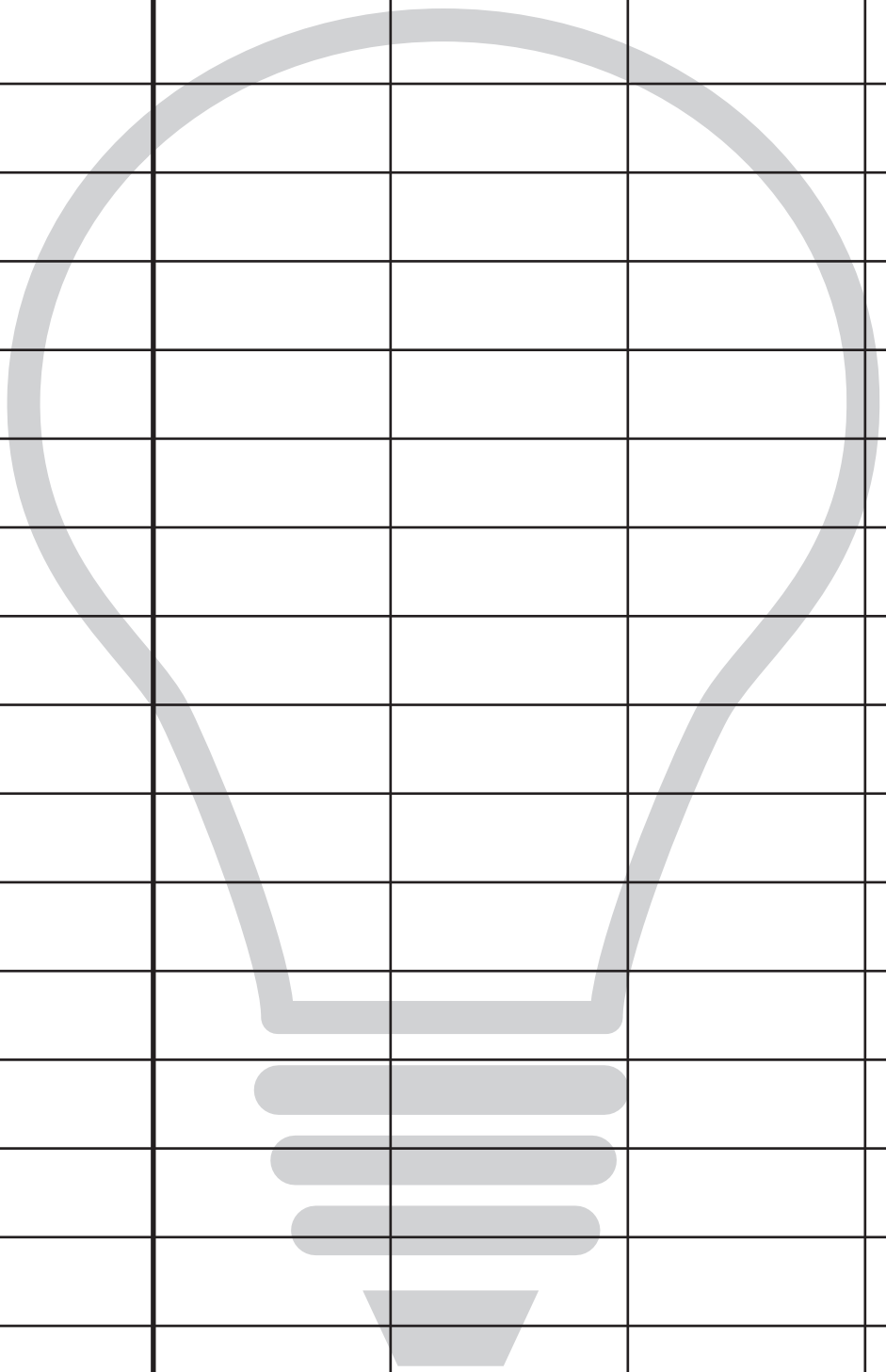


Illustrate at least two different viewpoints (bird's eye, side view, sectional view, etc.) of your invention. Use this sheet and other sheets of paper. ***Good luck!***

INVENTION EVALUATION FORM

Evaluator: _____ Sheet # ___

Rate from 0 to 5 → Name/Invention	Is it unique?	Is it useful?	Is it safe?	Overall Score



SAMPLE INVITATION

(Fold)

8 and 1/2 inches

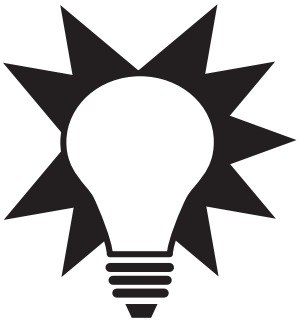
Discovery Elementary School

"Open books ... Open minds ..."

- *Visit our school again when you are in the neighborhood.*

THOMAS EDISON DAY

"An exhibition of inventive minds"



May 5, 2010

11 inches

(Side 1–outside)

(Fold)

8 and 1/2 inches

Who: The 25 students in Mary Frances Miller's class are proud to present their inventions.

When: Friday May 5, 2010

Where: Room 15 in Discovery Elementary School

Time: 10:00 a.m. – 12 p.m.
1:00 p.m. – 2:30 p.m.

- *Come to our school and experience how we all became inventors!*

Welcome to
Thomas Edison Day
at Discovery
Elementary School

Our sixth grade class has created these for you:

- invention models
- patents
- advertisements
- invention logs
- class invention book
- group fairy tale inventions
- Rube Goldberg inventions

- *We hope you enjoy the exhibition and learn from it!*

11 inches

(Side 2–inside)

Sign-Up Sheet

"An exhibition of inventive minds"

THOMAS EDISON DAY

1

Our class of _____ in room _____, welcome you to sign up for one of the blocks of time below.

2

During the time for which you sign up, you will visit our INVENTION EXHIBIT honoring Thomas Edison.

3 **Time**	**Your class, room #, and teacher**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

SAMPLE QUESTIONS FOR THE JUDGES

First of all, the students in our class want you to know that we appreciate your agreeing to judge our inventions.

Here are five sample questions to ask the students. Don't feel that you have to ask every one of these questions.

We would also like you to make up and ask some questions of your own.

1. Where did you get the idea for your invention?

2. Who will use this invention? Did you do a survey to determine who might be interested in using this?

3. How do you know this idea hasn't already been invented?

4. Do you consider this invention to be safe?

5. If you had the chance to add anything to this project in the future, what would you add?

Judges, once again we want to say—no, we want to ***shout*** ...

THOMAS EDISON DAY

THOMAS EDISON DAY

(Duplicate and cut apart this sheet so that each student will have one ID tag. See item #8 on page 4.)

Teacher Feedback Form

At Interact, we constantly strive to make our units the best they can be. We always appreciate feedback from you—our customer—to facilitate this process. With your input, we can continue to provide high-quality, interactive, and meaningful instructional materials to enhance your curriculum and engage your students. Please take a few moments to complete this feedback form and drop it in the mail. Address it to:

Interact • Attn: Editorial
10200 Jefferson Blvd. • P.O. Box 802
Culver City, CA 90232-0802

or fax it to us at **(800) 944-5432**

or e-mail it to us at **access@teachinteract.com**

We enjoy receiving photos or videos of our units in action!
Please use the release form on the following page.

Your Name: _____

Address: _____

_____

E-mail: _____

Interact Unit: _____

Comments: _____

_____

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Release Form for Photographic Images

To Teachers:

To help illustrate to others the experiential activities involved and to promote the use of simulations, we like to get photographs and videos of classes participating in the simulation. Please send photos of students actively engaged so we can publish them in our promotional material. Be aware that we can only use images of students for whom a release form has been submitted.

To Parents:

I give permission for photographs or videos of my child to appear in catalogs of educational materials published by Interact.

Name of Student: _____ (print)

Age of Student: _____ (print)

Parent or Guardian: _____ (print)

Signature: _____ Date: _____

Address:

_____

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_____

Phone: _____

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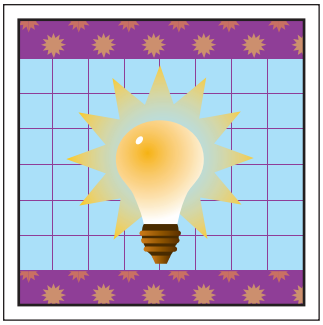
10200 Jefferson Blvd.
Culver City, CA 90232-0802
310-839-2436



Interact
Learn Through Experience

INVENT

A simulation of inventors and the invention process

Student Guide

Introduction

Excitement is ahead The simulation you are about to begin offers you the unique and exciting opportunity to become an inventor. You may think that only adults can be inventors, but that simply is not true! Children as young as 9 and 10 years old have received patents for their ideas. Children actually have an advantage over adults in producing inventions because young minds tend to be more creative than adult minds. There are ways you can improve your ability to invent. Examine the next five paragraphs for ideas on how inventors work.

Creativity Inventors are very creative. You, too, can become more creative. For example, look at your shoe. Don't just think of it as something to wear on your foot. Think of other things you can do with that shoe. You could put dirt and seeds in it and use it for a planter. You could enlarge it and make it into a house for a mouse. You could make it very small and use it for a button on a shirt. Or you could or turn it upside down and add a pole and it could be an umbrella for a gerbil. You can probably think of other things to do with a shoe — and you should. Creative thinkers look at common objects and think of uncommon ways to use them.

Curiosity An inventor is a curious person. This curiosity helps the inventor look at the world with wonder, trying to find out about things that are new or unknown. A young person with an inventive and curious mind may get in trouble at home because things around the house are taken apart to find out how they work (and sometimes things are easier to take apart then they are to put back together again).

Problem solving Inventors are also problem solvers. They may use their creative thinking abilities to think of new and unusual ways to solve a problem. For example, a problem solver may come up with a way to take out the trash on a rainy day without getting wet. A problem solver looks at existing ideas and thinks of ways to improve them. For example, a problem solver looked at a manual pencil sharpener and invented an electric sharpener to make life a bit easier. At times, a person is working on solving one problem and invents something else accidentally. Spenser Silver, the

Beth Arner, the author of INVENT, teaches gifted students and is a mentor teacher in Bakersfield, California. For Interact she has also written MUSEUM, a simulation in which students create a community art museum within their classroom.

978-1-56004-458-1

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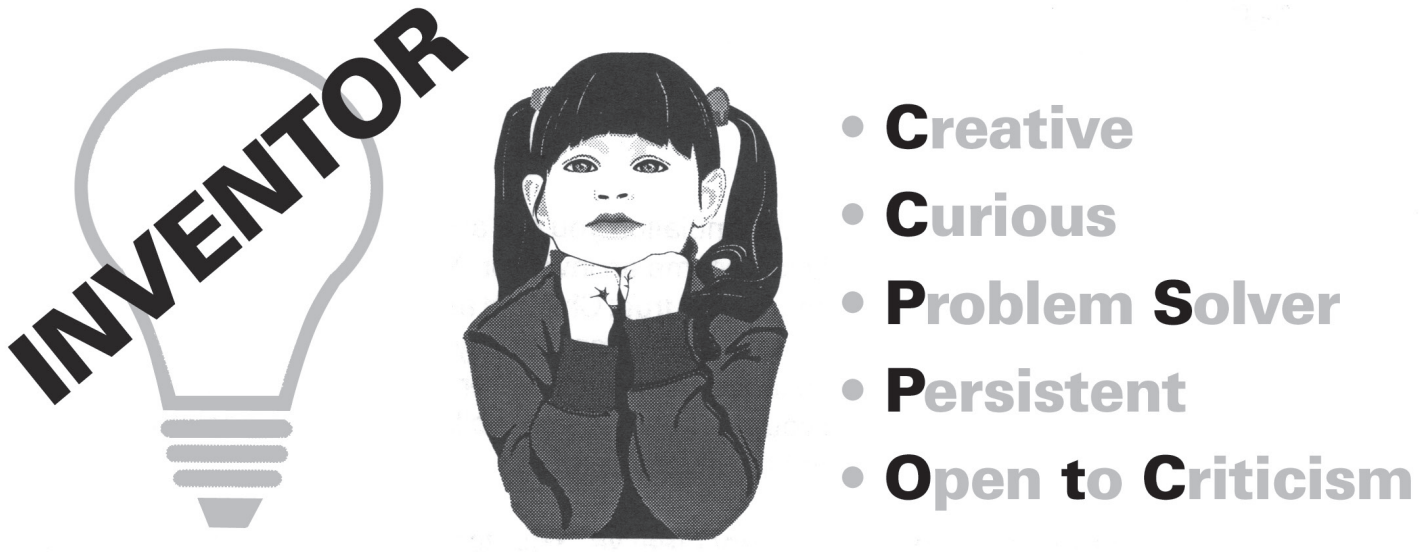
INT948SG v1.12

man who invented post-it notes, worked for 3M and was trying to invent a very strong adhesive. Instead, he invented an adhesive that was extremely weak. Even though this adhesive stuck to things, it could easily be removed. He didn't realize the value of his invention until a friend used this adhesive on paper to mark songs in a hymnal for the church choir. These markers were better than plain pieces of paper because they wouldn't fall out but they could also be easily removed from the hymnal without harming the pages.



Persistence An inventor must be persistent. There is always more than one way to solve a problem. There are also many ways to make a model of an invention. Thomas Edison, one of the most productive inventors who ever lived, conducted more than 1200 experiments over 15 months before he invented the light bulb to his satisfaction. If Thomas Edison wasn't so persistent, he would have given up and another inventor would have invented the light bulb.

Open to criticism A successful inventor will often hear criticism and negative comments about an invention. Even inventions that are considered crucial today were once criticized by people. For example, Alexander Graham Bell could not find a company interested in selling his invention of the telephone and many people thought it was a totally useless invention. He believed in his invention and didn't take the criticism to heart. Luckily, Alexander Graham Bell found a way to start his own company to sell the telephone despite the fact that other people told him the idea would never sell. Many inventors throughout history faced the same kind of criticism Alexander Graham Bell experienced.

Now you know some of the qualities that are important to an inventor. You will have many opportunities to practice using these qualities as you work through this simulation.

Happy inventing!

HOMEWORK ASSIGNMENT:
"The Most Important Invention in History"

Your homework assignment is to chose what you consider "the most important invention in history." Follow these steps:

Before class tomorrow

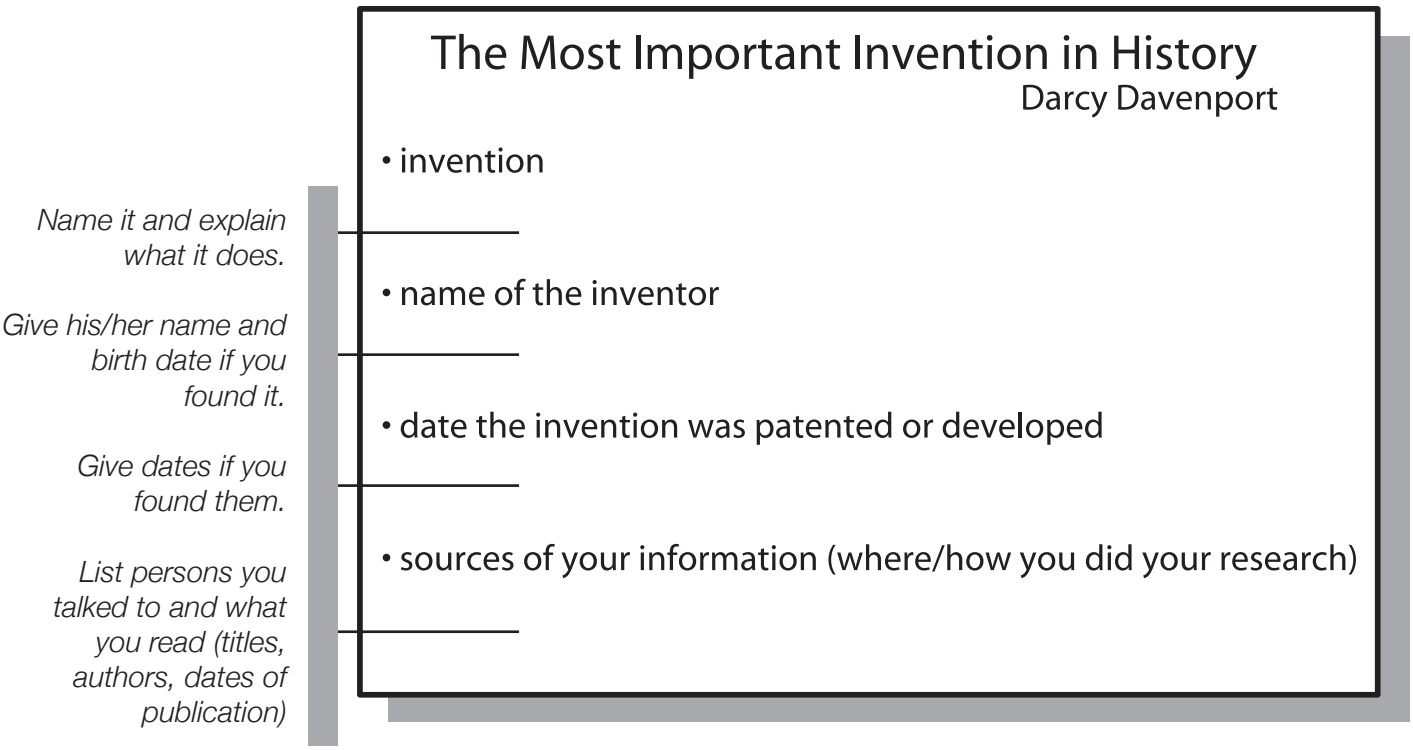
1. Talk to other people to get ideas, but *you* must make the final decision as to what you believe has been the world's most important invention.

2. Read the A HISTORY OF A FEW INVENTIONS handout which your teacher has given you.

3. Look in some other books or encyclopedias if you have time to do so. You will find it interesting to find information about inventors and their inventions. Such information will help you tomorrow with #4 below.

In class tomorrow

4. Neatly print your conclusions on a notecard under the bulleted items. (See the model below.)



RESEARCH ASSIGNMENT: Inventors and their Inventions

Your assignment is to research an inventor.

Include the following things in your one-page report. It will be part of your class INVENTION BOOK.

1. Name of the inventor.
2. Diagram of an invention developed by this inventor.
3. Background information on the inventor.
4. How and why the invention you illustrated in #2 came about.
5. Did any earlier inventions influence the inventor and this invention?
6. What difference did this invention make in the world?
7. What is the source(s) you used to find your information?

- Show your research in a one-page report such as the one on the right.
- Be sure your final report is free of errors.

TELEPHONE

Alexander Graham Bell: 1876

by Colin Dorner

Alexander Graham Bell was a teacher of the deaf. He became very interested in the source of sound. Soon he xxxxx xxxxxxx xxxxxxx xxxx xxxxx xxxxx xxxxxxxx xxxx xxxxx xxx. xxxxxxxx xxxxx xxxxx xxxxx. xxx xxxxx xxxxx xxxxxxx xx. xxxxxxxxxxxxx xxxxx xxxxx xxxxx. xxxxxxx xxxxxxxxxxxx xxxxxxxx xxxx. xxxxx xxx xxxxxxx xxxxxxxx. xxxxxxxxxxxxxxx xxx. xxxxxxxx

My two main sources on Bell were the *World Book* Encyclopedia on the library shelves and the Grolier Encyclopedia on a computer CD.

YOUR INDIVIDUAL INVENTION

Assignment Your assignment is to develop your own invention for the **Thomas Edison Day**, which will be held at your school. This invention can be anything in which you are interested. *It does **not** need to fit into the broad category that your group has been working on in class.*

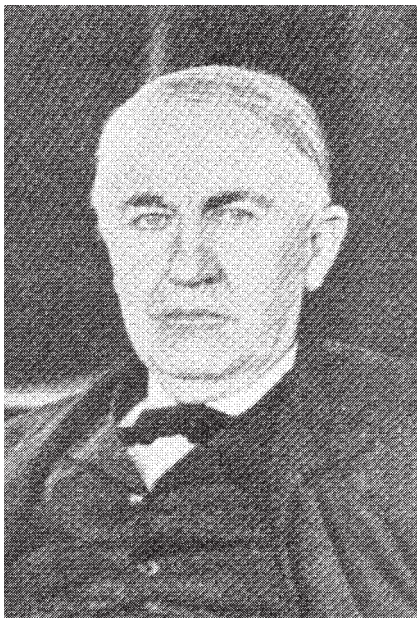
How complex? As you begin to think of an invention, remember that the simpler the invention, the better. If your invention is highly complicated, it will be difficult to complete this assignment on time.

Ideas? To come up with invention ideas, think of things such as the following:

- chores you have to do that could be made easier or an invention that might help someone you know ... and
- problems that all kinds of people face each day that a new invention would help them overcome ... and
- things that people would enjoy doing more than they do now if you could ...
- and ?

Making a model Eventually you will need to make a model of your invention. This does not need to be a working model, and it should not cost much money to make. Try to use things you have around the house to make your model. You should jot down how much the materials cost to make your invention. If you use items around the house to make the model, estimate what their value would be.

Survey The information about cost will also help when you survey people asking whether they would be interested in your invention. Most people will want to know how much your product will cost before telling you if they would be interested in buying it.



Thomas Edison
1847-1931

Sharing your model At the end of this simulation, you will be sharing your model with the class. At that time you will need to be able to answer questions posed by your classmates and your teacher. You will all be sharing inventions during your classroom Thomas Edison Day. You will invite other classes, your parents and the media to see your inventions.

KEEPING A LOG

In your teacher's "mini-lecture" you will hear why it is so important for an inventor to keep a log. Don't forget to date each entry and have a witness sign after you have finished writing the entry. It is probably a good idea to have a different witness sign each entry if possible. The following pages should be included in the invention log:

1. **Description** A written description of your invention idea should be the first page of your log. This page should be signed by a number of witnesses.

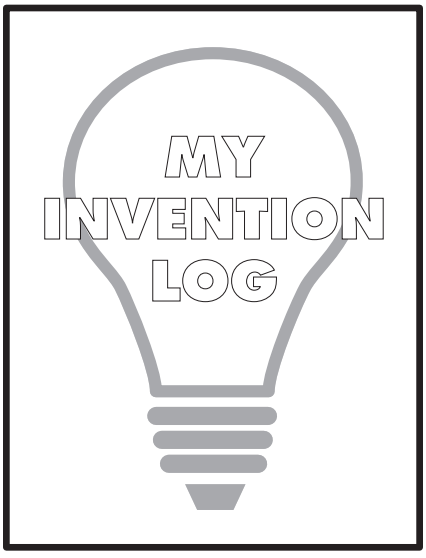
2. **Research** You will need to conduct research to find out if your idea is original. This is not research you can do by looking in a book or encyclopedia. Why? Because it takes time to write a book, and new inventions will not be found in books. To do this type of research, make a phone call or — even better — visit a local place of business that would sell the invention. Do the following during your phone call or personal visit:
   a. When talking to one or more business persons there, describe your invention and ask if they have ever seen anything like it.
   b. If they haven't, ask whether they think your invention would sell and how much they think people would be willing to pay for your product.
   c. Be sure you thank them for their time.
   d. If you are visiting a business, ask someone to witness your log entry.
   e. If you called the business, ask a person who witnessed your phone call to sign your log book.

3. **Diagram** Draw a labeled diagram of your invention on one page of your log book.

4. **Materials** On the page in #3 above, list the materials you will need to make a model of the invention. Remember: this does not need to be a working model and you should not go to great expense to make it. (You may wish to make a miniature model if your invention is something large.)

5. **Model** As you are building the model of your invention, write about your experiences on a page in your log book. Even though your model does not need to work, you may still make adjustments and changes in your original plan for your model. Keep track of how much the materials cost to help you on the marketing page.

6. **Marketing** You should survey people in the age group that you feel would be interested in purchasing your invention if it were for sale. Ask a number of people if they would be interested in buying the invention when it becomes available to the public. Give them an idea about how much your product would cost. Make this calculation by adding up the cost of materials plus an amount to pay you for the time it took to build the model. Show the results of your survey in your log book.



Setting up your INVENTION LOG

Your teacher will give you a sheet of construction paper, a copy of the cover sheet on the right and some plain sheets of paper. Color the cover sheet, place your name on it and glue it on the construction paper. Fold the construction paper and the sheets of paper to make a log which is about 8 and 1/2 inches tall by 5 and 1/2 inches wide.

INVENTIVE IDEA #1

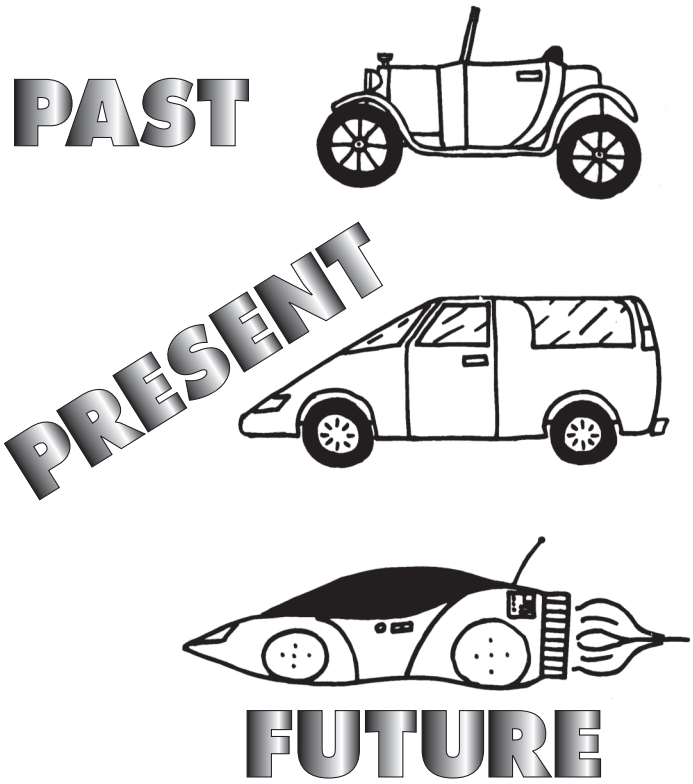
Past/Present/Future

In this activity, you will be asked to make a diagram of an invention showing what it looked like in the past, what it looks like today and what you believe it will look like in the future. The purpose of this activity is to demonstrate that even great ideas are constantly being improved and changed. To complete this assignment, be sure you write a short description to accompany your drawings in all three categories (past, present and future). You will have to do some research to be sure that you depict the past and present accurately. On your paper, note the source where you found your information.

Some suggestions are listed below, but feel free to come up with your own ideas.

Past	Present	Future
Cars	Airplanes	
Boats	Helicopters	
Clothes	Shoes	
Backpacks	School Desks	
Computers	Telephones	
Televisions	Books	
Cooking Devices	Bicycles	

Here is how one student completed this activity in the author's class. Of course, you are free to present your information any way you wish.



Early in this century the first cars had small doors and no glass in the windows. These cars were not as reliable as today's cars. They often broke down.

Today's cars have safety glass windows. They also come in many more styles than in the past. Cars have become quite reliable because of many technical improvements.

The cars of tomorrow will be amazing. I believe some of them will even have the ability to fly. My imaginary car is completely computerized so that it can operate safely on city streets and freeways.

INVENTIVE IDEA #2

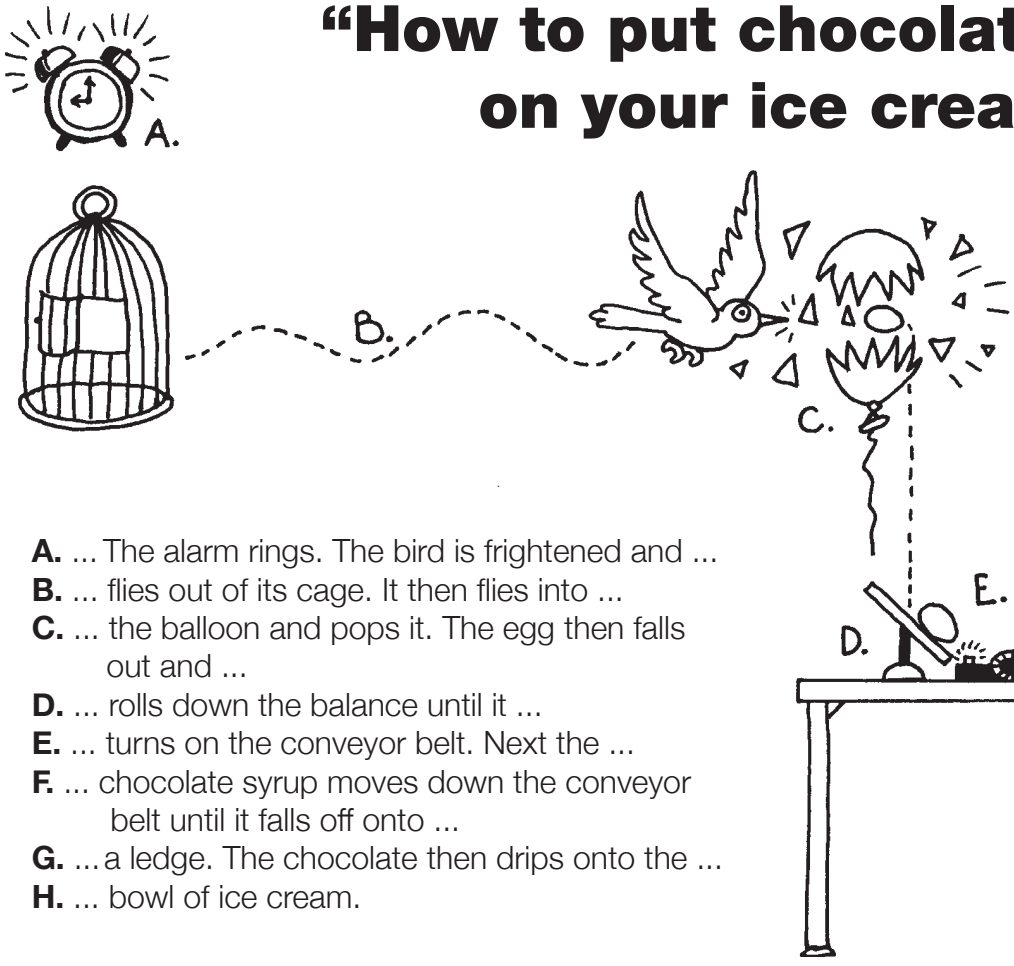
Rube Goldberg Invention

Reuben Lucifer Goldberg (1883-1979) drew a famous cartoon strip for which he was awarded a Pulitzer Prize in 1948. The main character in his cartoon was Professor Lucifer Gorgonzola Butts. Professor Butts was a wacky inventor who made the most simple task (such as cracking an egg or brushing your teeth) overly complicated with his inventions. In these cartoons, Rube Goldberg was pointing out that new ideas aren't always better. These cartoons are humorous, but they also make clear that the best inventions serve a purpose. Webster's dictionary defines a Rube Goldberg as "a device or method to accomplish by extremely complex and roundabout means a job that actually could be done simply."

Look at the example of a Rube Goldberg type invention below. Then design your own Rube Goldberg invention. Be sure to label and describe each part of your invention similar to the way that the example is labeled. Use a large sheet of paper to draw your cartoon so that it will be easily seen when it is on display at the Thomas Edison Day celebration your class will hold at your school.

RUBE GOLDBERG CARTOON

"How to put chocolate syrup on your ice cream"



A. ... The alarm rings. The bird is frightened and ...
B. ... flies out of its cage. It then flies into ...
C. ... the balloon and pops it. The egg then falls out and ...
D. ... rolls down the balance until it ...
E. ... turns on the conveyor belt. Next the ...
F. ... chocolate syrup moves down the conveyor belt until it falls off onto ...
G. ... a ledge. The chocolate then drips onto the ...
H. ... bowl of ice cream.