REVIEW & ACTIVITIES

CHAPTER SUMMARY

The summary states the key concepts covered in each section. This is an important tool for reviewing what you've read.

REVIEW QUESTIONS

These are questions you should be able to answer from the chapter. They will help make sure you've understood what you read.

CRITICAL THINKING

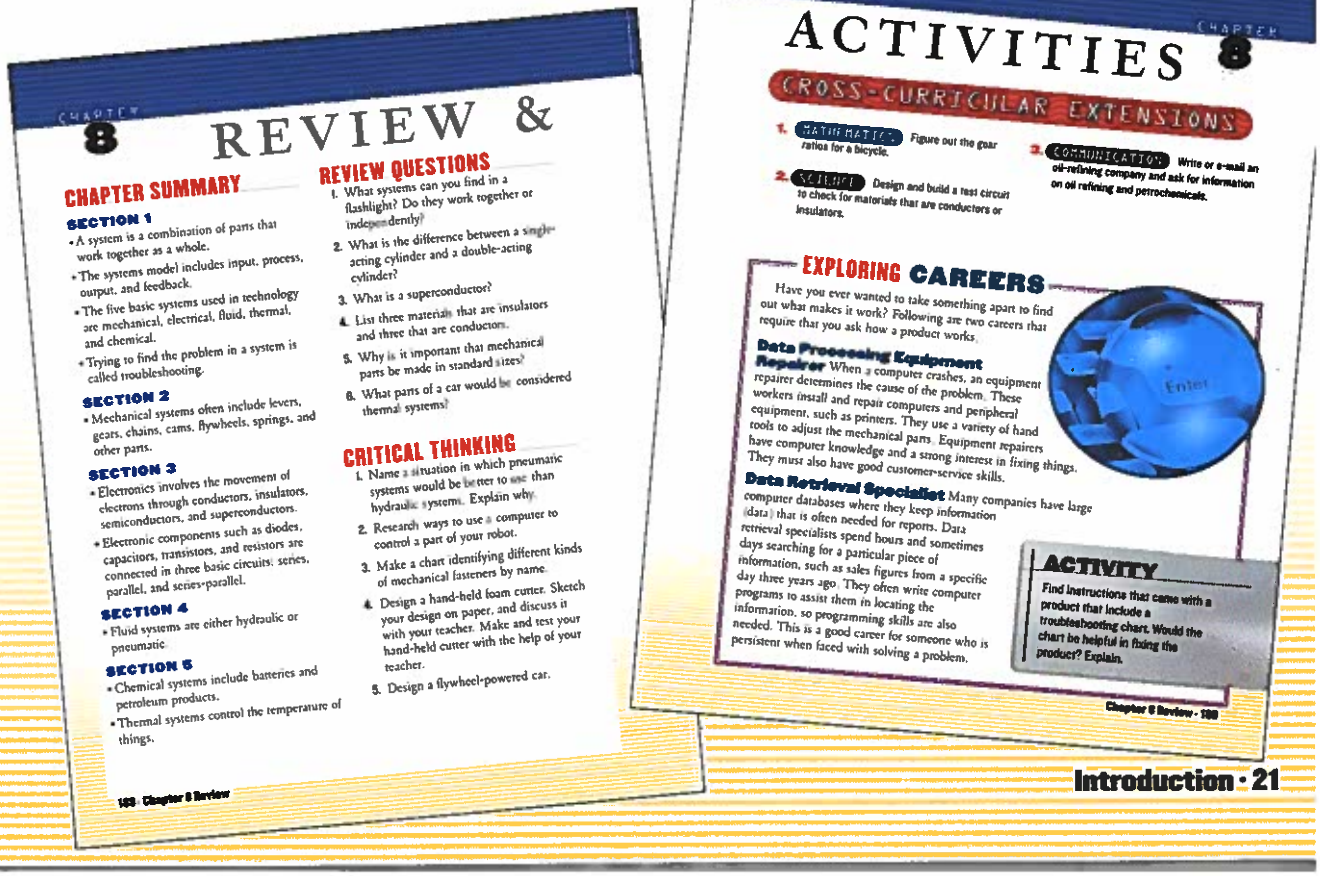
Knowing how to think critically is an important skill. These questions require you to think at a higher level. For example, you might be asked to apply what you've learned to a related situation or to something in your life.

CROSS-CURRICULAR EXTENSIONS

In these activities, you apply what you've learned to other subject areas. You will see how technology relates to mathematics, science, social studies, health education, and communication.

EXPLORING CAREERS

This part of the chapter review pages describes two careers that relate to the topics in the chapter, plus there's an activity for further exploration. You will explore how you might use technology in a future career.


CHAPTER 8

REVIEW &

CHAPTER SUMMARY

SECTION 1
- A system is a combination of parts that work together as a whole.
- The systems model includes input, process, output, and feedback.
- The five basic systems used in technology are mechanical, electrical, fluid, thermal, and chemical.
- Trying to find the problem in a system is called troubleshooting.

SECTION 2
- Mechanical systems often include levers, gears, chains, cams, flywheels, springs, and other parts.

SECTION 3
- Electronics involves the movement of electrons through conductors, insulators, semiconductors, and superconductors.
- Electronic components such as diodes, capacitors, transistors, and resistors are connected in three basic circuits: series, parallel, and series-parallel.

SECTION 4
- Fluid systems are either hydraulic or pneumatic.

SECTION 5
- Chemical systems include batteries and petroleum products.
- Thermal systems control the temperature of things.

REVIEW QUESTIONS

1. What systems can you find in a flashlight? Do they work together or independently?
2. What is the difference between a single-acting cylinder and a double-acting cylinder?
3. What is a superconductor?
4. List three materials that are insulators and three that are conductors.
5. Why is it important that mechanical parts be made in standard sizes?
6. What parts of a car would be considered thermal systems?

CRITICAL THINKING

1. Name a situation in which pneumatic systems would be better to use than hydraulic systems. Explain why.
2. Research ways to use a computer to control a part of your robot.
3. Make a chart identifying different kinds of mechanical fasteners by name.
4. Design a hand-held foam cutter. Sketch your design on paper, and discuss it with your teacher. Make and test your hand-held cutter with the help of your teacher.
5. Design a flywheel-powered car.

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CHAPTER 8

ACTIVITIES

CROSS-CURRICULAR EXTENSIONS

1. MATHEMATICS Figure out the gear ratios for a bicycle.
2. SCIENCE Design and build a test circuit to check for materials that are conductors or insulators.
3. COMMUNICATION Write or e-mail an oil-refining company and ask for information on oil refining and petrochemicals.

EXPLORING CAREERS

Have you ever wanted to take something apart to find out what makes it work? Following are two careers that require that you ask how a product works.

Data Processing Equipment Repairer When a computer crashes, an equipment repairer determines the cause of the problem. These workers install and repair computers and peripheral equipment, such as printers. They use a variety of hand tools to adjust the mechanical parts. Equipment repairers have computer knowledge and a strong interest in fixing things. They must also have good customer-service skills.

Data Retrieval Specialist Many companies have large computer databases where they keep information (data) that is often needed for reports. Data retrieval specialists spend hours and sometimes days searching for a particular piece of information, such as sales figures from a specific day three years ago. They often write computer programs to assist them in locating the information, so programming skills are also needed. This is a good career for someone who is persistent when faced with solving a problem.

ACTIVITY

Find instructions that came with a product that include a troubleshooting chart. Would the chart be helpful in fixing the product? Explain.

Chapter 8 Review • 169

CHAPTER 1

Getting Started in Technology

SECTION

What Is Technology?

SECTION 1

THINGS TO EXPLORE

- Define technology.
- Explain what a technologically literate person can do.

TechnoTerms
technologically literate
technology

You live in a "high-tech" world. Fig. 1-1. Tech (pronounced tek) is short for *technology*. What exactly is technology? Is it robots, satellites, lasers, and computers? Does it include tools, such as saws and hammers? All of these are products of technology, but technology is a lot more!

Most definitions agree that **technology** is the use of knowledge, tools, and resources to help people solve problems. It depends on a combination of people like you, your ideas, and the tools you use. It involves both thinking and doing.

Technology is fast-paced, exciting, challenging, and fun! As you learn about technology you will be

- Using knowledge from science, mathematics, and other subjects to solve problems
- Designing, inventing, and making things based on your creative ideas
- Discovering how products of technology have helped make your life better

Fig. 1-1. Technology has enabled us to do so many things! Can you name some of the technologies shown here?

The Effects of Technology

The effects of technology are not always good for society or for the environment. Fig. 1-2. Some advancements in technology have caused problems such as acid rain. Other technologies are being developed to help solve those problems.

OPPOSITE Technology has had many impacts on our world. One of those impacts has been on the environment.

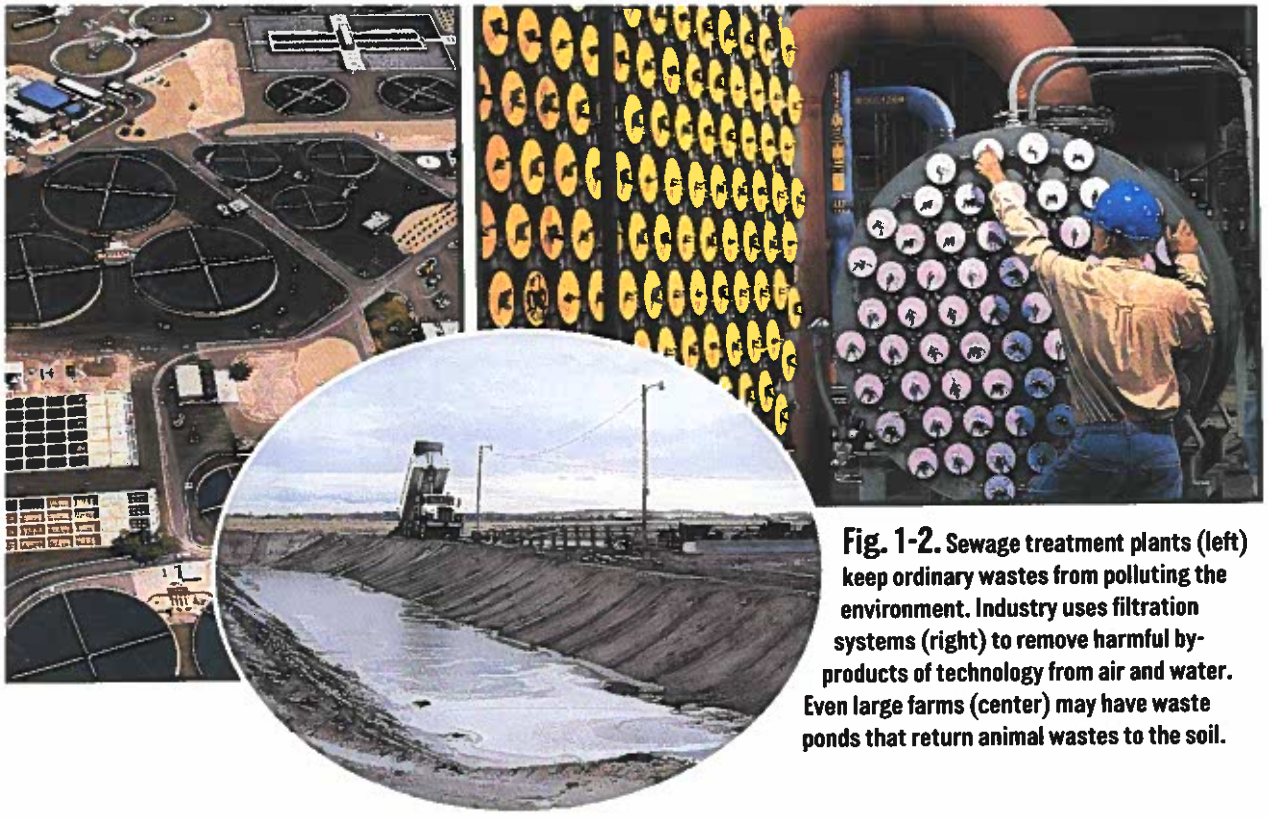


Fig. 1-2. Sewage treatment plants (left) keep ordinary wastes from polluting the environment. Industry uses filtration systems (right) to remove harmful by-products of technology from air and water. Even large farms (center) may have waste ponds that return animal wastes to the soil.

Because technology has an impact on people and the environment, you need to know how technology affects you. A person who understands the effects of technology is **technologically literate**. If you are technologically literate, you will be able to make decisions about your future and the future of technology based on facts. You will be able to

- See how technology has changed through time
- Understand the newest uses of technology
- Think through a problem and use the tools of technology to solve it
- Decide whether a specific technology is good or bad for people or for the environment

SECTION 1 TechCheck

1. What is technology?
2. What is the definition of a technologically literate person?
3. List four things a technologically literate person is able to do.
4. **Apply Your Knowledge.** Write your own definition of technology.

Technology Is Changing Fast!

SECTION 2

THINGS TO EXPLORE

- Tell why technology is growing so fast.
- Explain how the history of technology can be organized.
- Explain the exponential rate of change.

TechnoTerms

exponential rate of change
knowledge base
scientific method

Over 90 percent of all technologies we have today were invented in the last 25 or 30 years. Fig. 1-3. But do you know when technology really began?

How Technology Got Started

Many people think that technology began in the 1700s with the first factories. However, technology really began over one million years ago. Prehistoric people used simple tools, such as clubs and axes, to work on different materials.

One way to organize history is to divide the past into periods based on the materials people used. This method shows how people developed new technologies to meet their changing needs.

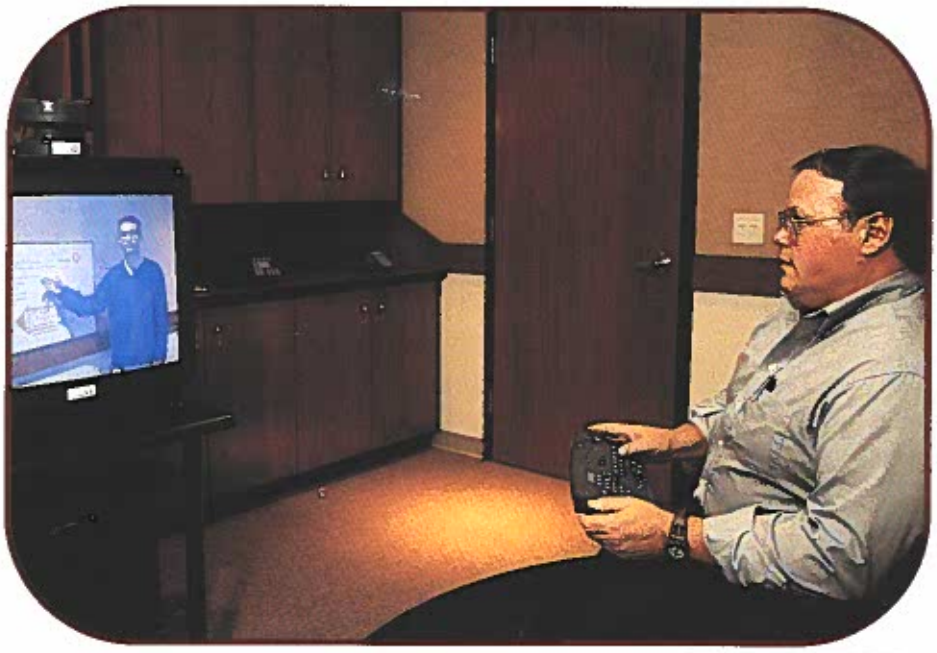


Fig. 1-3. Closed-circuit television enables this student to attend a class that is actually far away. What new uses for TV have you heard about recently?

TechnoFact

BETTER THAN DIRT? How would you like to wash your face using ashes, water, and a little animal grease? This sounds messy, but soap used to be made from those ingredients. The soap we use today is very similar chemically. But technologists and scientists continue to improve the process of making soap.

History of Technology

- **The Stone Age** (2,000,000 B.C. to 3000 B.C.) During the Stone Age, prehistoric people used tools made mostly of stone, animal bones, and wood. The tools were important as weapons or for gathering food.

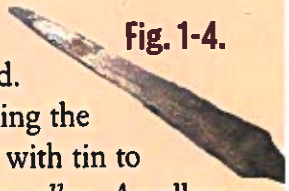


Fig. 1-4.

- **The Bronze Age** (3000 B.C. to 1200 B.C.) During the Bronze Age, people learned how to mix copper with tin to make a stronger metal called *bronze*. Bronze is an *alloy*. An alloy is a mixture of two or more pure metals. Bronze was used to make better tools and weapons. Fig. 1-4 shows the bronze head of a lance, a type of throwing weapon.
- **The Iron Age** (1200 B.C. to A.D. 500) Iron is harder and holds a cutting edge better than bronze. Iron ore was also easier for early people to find, and refining it was less costly. Iron inspired the design of more kinds of tools and is still used in industry today.
- **The Pre-Industrial Age** (A.D. 500 to 1750) Few changes in science and technology occurred during the first part of this period. People in some parts of the world moved ahead technologically, while others stayed the same. Fig. 1-5 shows a compass invented by the Chinese. During

Fig. 1-5.

SCIENCE CONNECTION

The Scientific Method

The process of scientific problem solving is called the *scientific method*. The scientific method was developed by the Italian scientist Galileo Galilei (1564-1642) and the English philosopher Francis Bacon (1561-1626).

The scientific method is applied generally to problems rather than followed strictly. The five steps of the scientific method are:

1. Recognize the problem.
2. Form a *hypothesis* (an educated guess) about the correct solution to the problem.
3. Make a prediction as to how your solution will work.
4. Experiment to test your solution.
5. Organize the hypothesis, prediction, and results of your experiment into a general rule.

this period, they also invented movable type for printing. These technologies were introduced in Europe at a later time.

During the second part of the Pre-Industrial Age, technology and science began to bring change. Several important scientific instruments, such as the microscope, were invented. Scientists started using the **scientific method** to find answers to their questions.

- **The Industrial Revolution** (1750 to 1900) During this period, many inventions brought changes that affected all of society. Using new inventions and machines, people set up factories that could produce goods cheaper and faster.
- **Recent Times** (1900-Today) Since the early 1900s, technology has grown rapidly. Fig. 1-6 shows an airplane built by the Wright Brothers. They achieved the world's first controlled flights.

Recent history can be divided into periods, or ages, based on developments in technology. Some of the recent periods include the Atomic Age, the Jet Age, the Space Age, and the Information Age. These ages overlap, and later discoveries are often based on earlier ones. Today, in the Information Age, skills such as finding and using information are important.

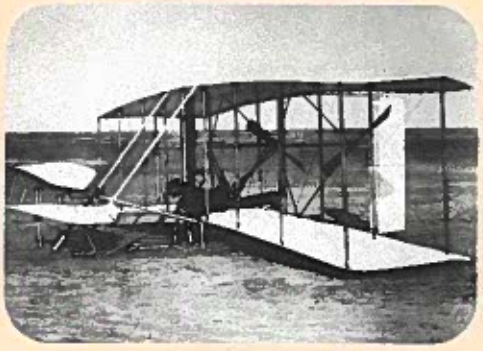


Fig. 1-6.

Scientists and technologists face the same traps in trying to solve problems. Everyone has a set of ideas about how the world works. These ideas often block new ideas or restrict our thinking to one path. Scientists must keep an open mind about their investigations because their results have to be based on scientific facts. Scientists can't let their results be changed by what they think the results *should* be. Another important reason for keeping an open mind is that many scientific discoveries happen by accident!

ACTIVITY

You know a boat is made to float. Form a hypothesis about why, and design an experiment to test your hypothesis.

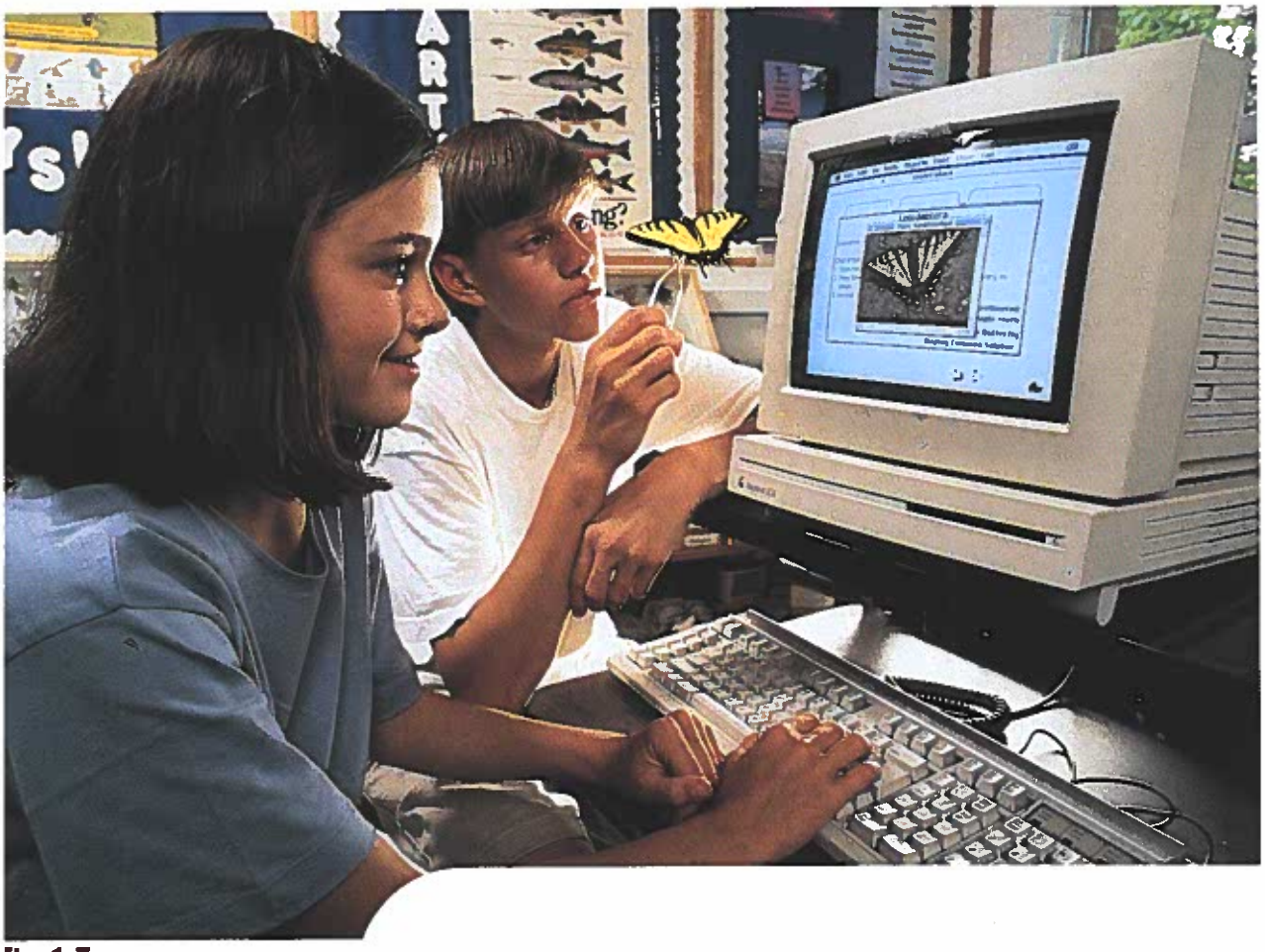


Fig. 1-7. A few short years ago, putting an entire encyclopedia on computer disks wasn't practical. Floppy disks couldn't hold enough information. Today, all the information, plus colorful pictures, can be put on one CD. Find out how much information a CD can hold compared to a floppy diskette.

Technology's Rate of Change

Technology touches every part of our lives. It changes the way we do things, the way machines work, and the way we think. These changes are coming faster and faster. More people are adding new ideas and inventing more new tools to meet our changing needs. Fig. 1-7. But they don't throw away the old technologies; they build on them. When people combine ideas, we have even more new machines and tools. Some people say our **knowledge base** (all the facts known to people today) doubles every two to three years. This is what is called an **exponential rate of change.**

Because our knowledge base is so large and is growing so fast, it is important for you to learn where and how to find information.

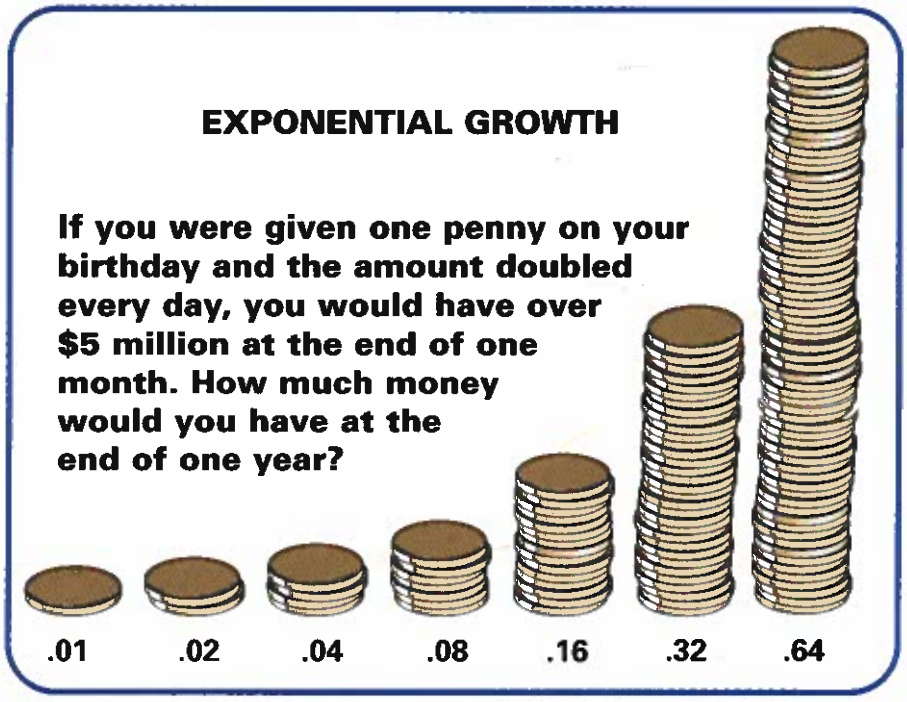


Fig. 1-8. Technology is growing at an exponential rate. It is doubling every few years. Also, the time it takes to double is getting even shorter.

Exponential Growth If someone gave you one penny on your birthday and told you that the amount would double every day for a month, you might be disappointed at first. On the first day you would have only one cent. On the second day you would have double that amount—two cents. On the third day the two cents would be doubled to four cents. That still doesn't sound like much. By the end of 30 days, however, you would have over $5 million—$5,368,709.12 to be exact! Fig. 1-8.

TechnoFact

GOING UP! About a century ago, skyscraper construction was made possible through the use of steel framing. Then the invention of the elevator made very tall buildings practical. The world's tallest self-supporting structure of any kind, anywhere, is the Petronas Twin Towers in Malaysia. The towers are 88 stories tall. That's 1483 feet (452 meters). What's the tallest structure in your area?

SECTION 2 TechCheck

1. List the technological ages of the recent time period.
2. Why is technology changing so fast?
3. What is meant by an exponential rate of change?
4. **Apply Your Knowledge.** Make a bulletin board display showing technologies you commonly use.

ACTION ACTIVITY

Making a 3D Model of Exponential Growth

Be sure to fill out your TechNotes and place them in your portfolio.

Real World Connection

Exponential growth is easy to understand if you make a model of it. Graphs are often used to model mathematical information (numbers). Fig. A. But in this activity, you will build a three-dimensional (3D) model showing the exponential growth of the world's knowledge base.

Design Brief

Working in groups of three or four students, design and make a 3D model that shows the exponential growth of the world's knowledge base. Use only recycled materials such as empty milk cartons, soda cans, or scrap paper. Fig. B.

Materials/Equipment

- recycled packaging or other materials
- scissors
- tape
- glue
- markers

SAFETY FIRST

If you use soda cans, watch out for sharp edges. Be sure to read and follow all the safety rules on pages 42-43, at the end of this chapter.

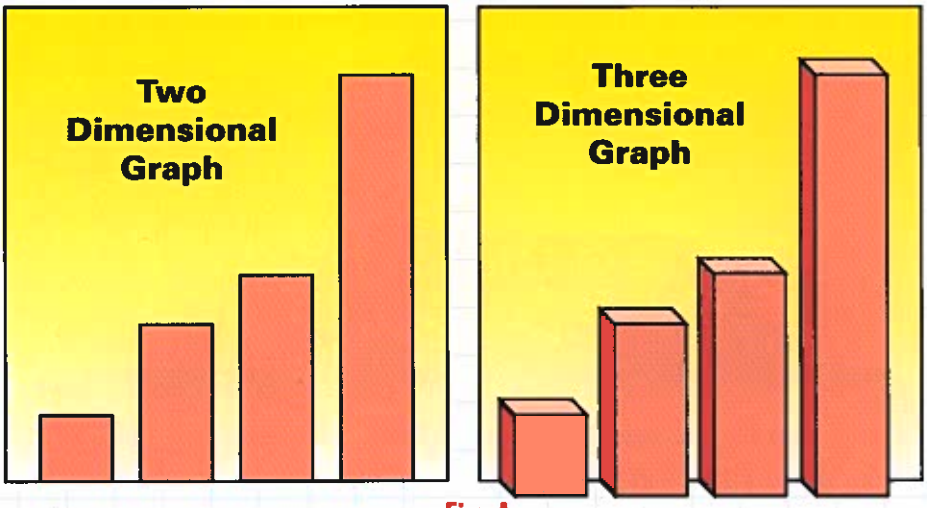


Fig. A

SECTION 2
ACTION ACTIVITY

Procedure

1. List possible materials you can use for the 3D graph.
2. Make a sketch of how your graph will look.
3. Gather materials.
4. Build your model.
5. Show your model to other groups.

3. **Going Beyond.** Use a computer to create a three-dimensional chart showing exponential growth.

Evaluation

1. How many doublings could you create before the model became too big?
2. Did everyone in class have the problem of the model becoming too large at some point?

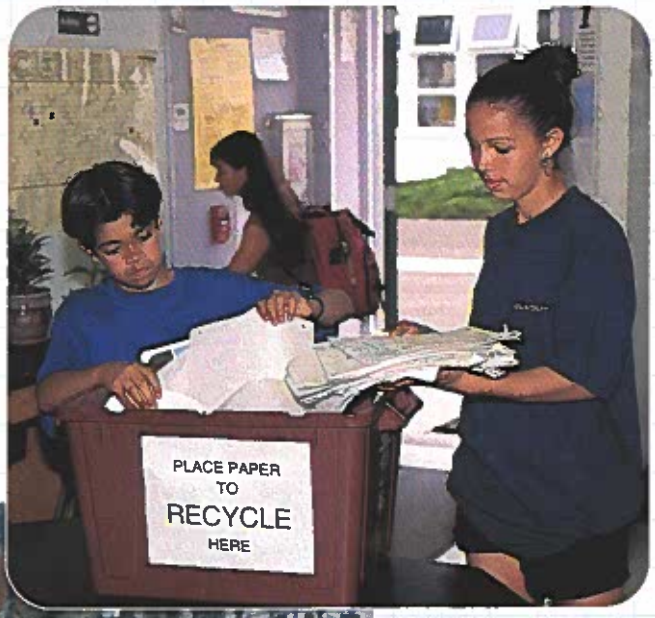


Fig. B

SECTION 3

Solving Problems Step by Step

TechnoTerms
design brief
parameters
problem-solving strategy
problem statement

THINGS TO EXPLORE

- Explain the basic steps in problem solving.
- Tell how a design brief is different from a problem statement.
- Apply research skills in locating information.

Have you ever had a problem that you wanted to solve but you didn't know where to start? Problems aren't always bad or complicated. A problem can be as simple as deciding whether to eat a chocolate chip cookie or an oatmeal cookie. But most of the time, the problems you will be solving in technology class are more complex than that. If you have steps to follow in trying to solve a problem, getting an answer is easier.

Problem-Solving Strategy

A step-by-step plan for solving problems is called a **problem-solving strategy**. Once you learn a basic problem-solving strategy, you can use it to solve all kinds of problems throughout your life. Fig. 1-9. Any problem in school, at home, or with your friends can be tackled.

Fig. 1-9. Problem-solving methods helped these students analyze the pollution in a pond (upper left), just as they helped people develop wind "farms" in California (lower left) that capture wind energy. How do you think problem solving resulted in the use of robots to weld cars (right)?

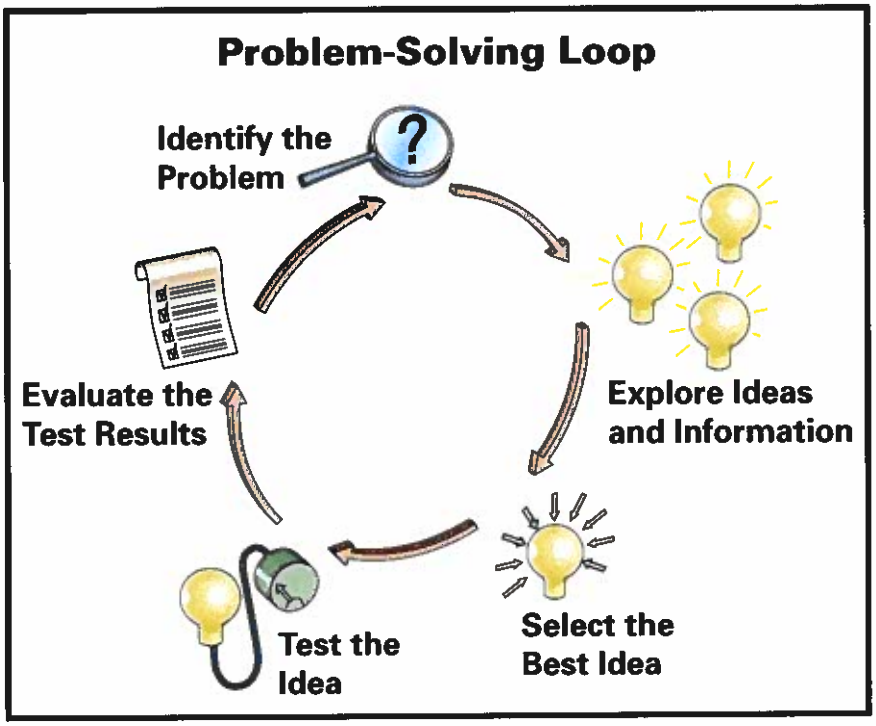


Fig. 1-10. The problem-solving process is shown as a loop, or circle, because you may need to repeat the steps to arrive at the best solution. Think of a problem you solved recently. How many of the problem-solving steps did you use?

Identifying the Problem

Most problem-solving strategies have some things in common. Fig. 1-10. Usually, the first step in solving a problem is being able to state exactly what the problem is in your own words. This definition of the problem is sometimes called the **problem statement**. Here are some examples of problem statements.

- Design a solar-powered vehicle.
- Build a bridge to span a river.
- Produce a television show.
- Program a robot to move objects.

A more detailed problem statement is called a **design brief**. A design brief gives the **parameters** (specific details) of the problem. Parameters include such things as the amount of money you can spend and the time available. Fig. 1-11.

Design Brief: Solar-Powered Vehicle

Design a solar-powered vehicle that will carry a minimum of two passengers at least 100 miles without needing recharging. The design budget is $10,000. The vehicle must meet the federal safety standards for use on public highways.

Fig. 1-11. This design brief shows the parameters for a solar-powered vehicle.

TechnoFact

TSA The Technology Student Association (TSA) is for students who are enrolled in or who have completed a technology education course. Over 100,000 elementary, middle school, and high school students are members. Through its conferences, contests, and other activities, the TSA promotes technological literacy, leadership, and problem solving.

INFOLINK

Many companies have special research and development (R&D) departments that seek new product ideas or improve existing products. See Chapter 11 for more information.

Exploring Ideas and Information

Once the problem is identified, you need to explore ideas and gather information related to your problem. You need to use as many different resources as possible. Fig. 1-12. You also need to be sure your information is current.

You will need to evaluate the information and decide whether or not it is useful in solving your problem. Is the particular information "need to know" or just "nice to know"?

Experimentation is another way to do research. By finding out how things work you can then change or improve technology that already exists. Fig. 1-13.

INFOLINK

See "Where Do Ideas Come From?" in Chapter 6.

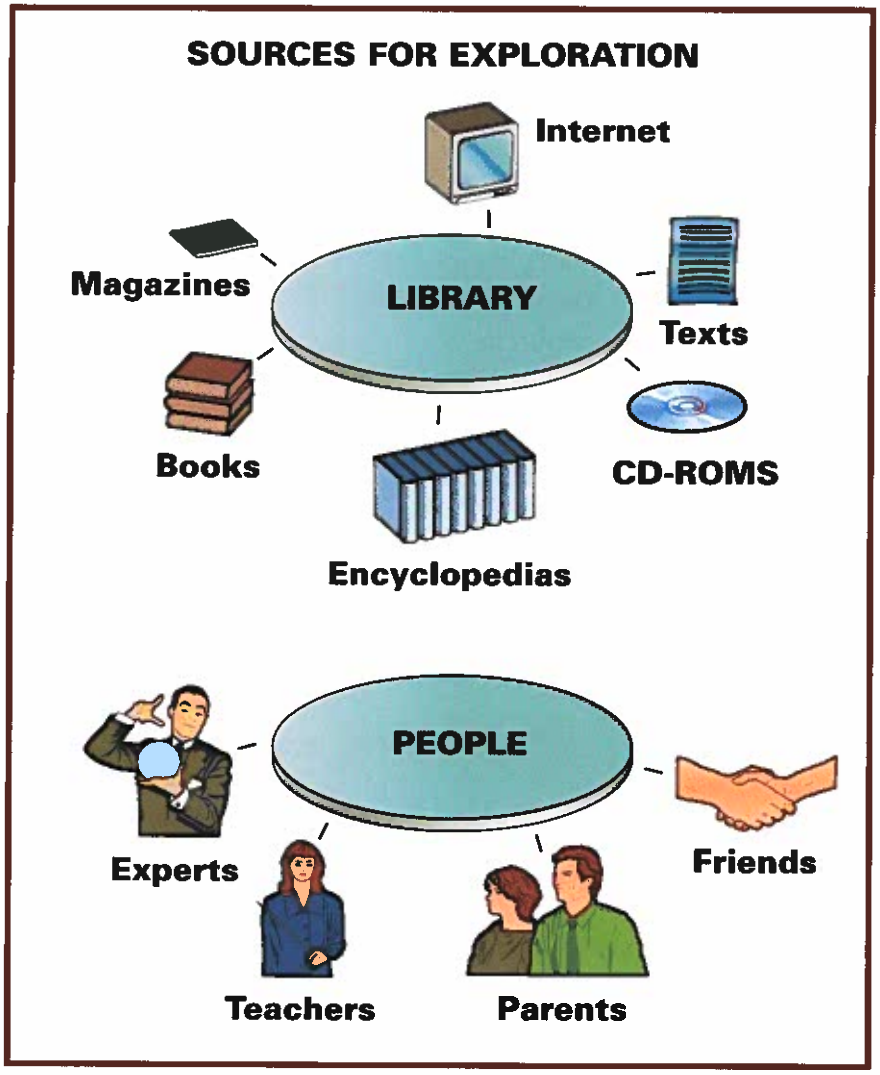


Fig. 1-12. These are common resources. Which do you use regularly?

Selecting the Best Idea

Next you select what you think is the best idea to try first. Many times your first idea will not work, and you must choose a different idea that might work better.

Testing the Idea

The fun part is testing your idea or solution. Testing usually requires taking measurements or accurate notes about what's happening.

Evaluating the Results

The most important part of the entire problem-solving strategy is evaluating what happened during testing. Sometimes you want so much for your idea to work that you do not look at the results carefully. However, the chances of your first idea being totally successful are slim.

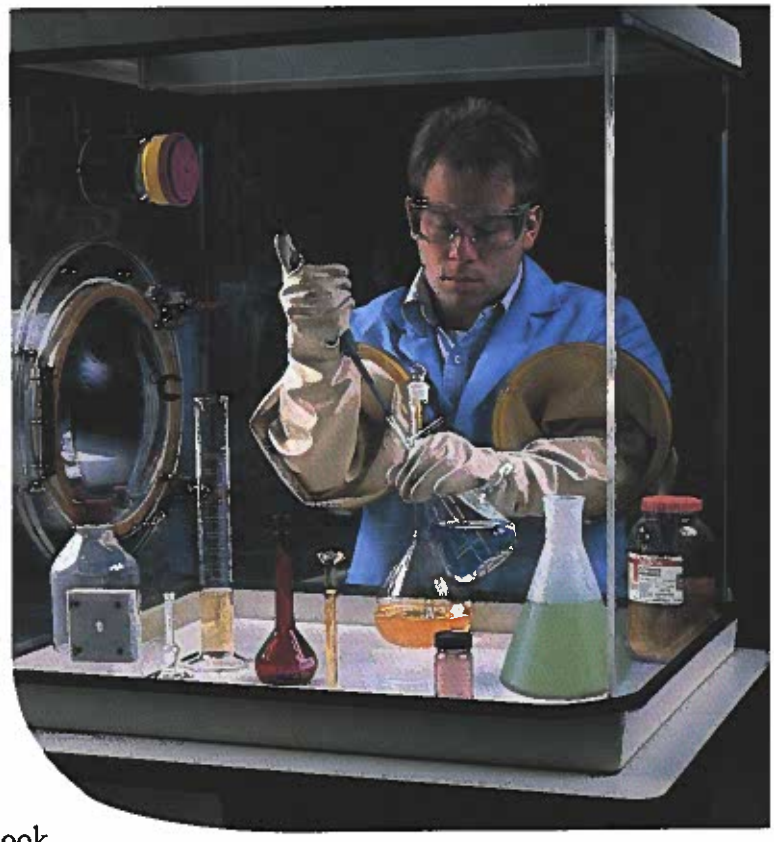


Fig. 1-13. This research scientist wears special gloves that are built into a sealed chamber. The chamber can be kept very clean, or a vacuum can be created in it, and work can still go on.

Remember that there may be many possible solutions to a problem. You may have to try many of them before you reach your final solution. If your first idea did not work, it doesn't mean you failed. It just means you learned what doesn't work. That is a big step toward solving the problem!

SECTION 3

TechCheck

1. List the five basic steps in problem solving.
2. What is the difference between a problem statement and a design brief?
3. What different resources might you use to research a topic?
4. **Apply Your Knowledge.** Write a design brief for building a bridge across a river. Remember to add the specific parameters.

SECTION 3

ACTION ACTIVITY

Doing Technology Research

Be sure to fill out your TechNotes and place them in your portfolio.

Real World Connection

Many of today's jobs require you to research information. In this activity you will research information on three topics from companies all over the country. To find the company names and phone numbers, you will use resources in the library or from your teacher. Fig. A.

Design Brief

Research three technology topics of your choice from the list provided. Find information on companies that make products or do research related to your topics. Request information either by phoning or writing to the companies.

Materials/Equipment

- telephone
- books
- videos
- magazines
- the Internet
- newspapers
- computer word processor or paper and pencil

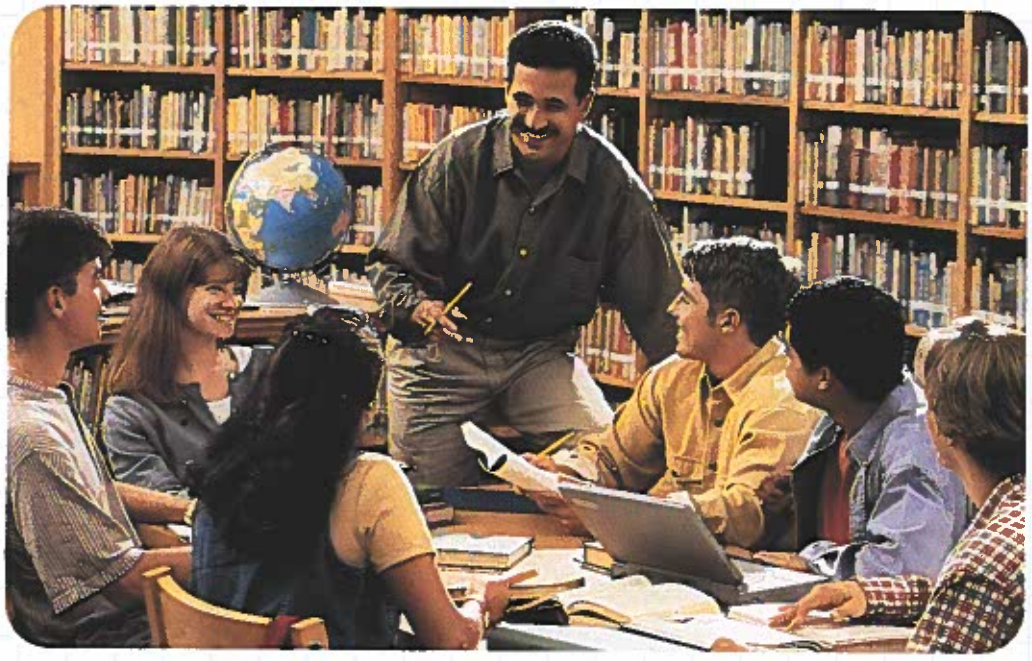


Fig. A

Procedure

1. Choose any three of the following technology topics:
   - composite materials
   - computer controls
   - conveyor systems
   - fasteners
   - fiber optics
   - hydraulics
   - lubricants
   - plastics
   - pneumatics
   - robotics
   - soldering
   - superconductors
   - welding
   - any other technology-related topic your teacher approves
2. Research your topics using the resources in your library or those available from your teacher. Record information about the resources you used in a chart like the one shown in Fig. B.
3. Get your teacher's permission to call each company (use toll-free phone numbers if possible), or write a letter to request information. Ask them to send their catalog or product information to you at the school address. Don't forget to say "please" and "thank you." Good manners are appreciated everywhere.

Evaluation

1. Which of your three topics were easy to research?
2. How many companies sent you information on their products? Share the information you received with the members of your class.
3. If you owned a business, what would you be willing to do to help students learn more about technology?
4. **Going Beyond.** Talk to your media specialist at school or the local librarian to see what new research tools are available for you to use. Make a list to share with your classmates.
5. **Going Beyond.** With your teacher's permission, research a topic in three different resources on the Internet. Compare your information and evaluate whether the sources are current and accurate.

SAFETY FIRST

Check with your teacher before looking up information on the Internet.

TOPIC 1:	TOPIC 2:	TOPIC 3:
COMPANY NAME: PHONE: (800)	COMPANY NAME: PHONE: (800)	COMPANY NAME: PHONE: (800)
RESOURCE: PAGE:	RESOURCE: PAGE:	RESOURCE: PAGE:

Fig. B

SECTION 4

Putting Your Abilities to Work

THINGS TO EXPLORE

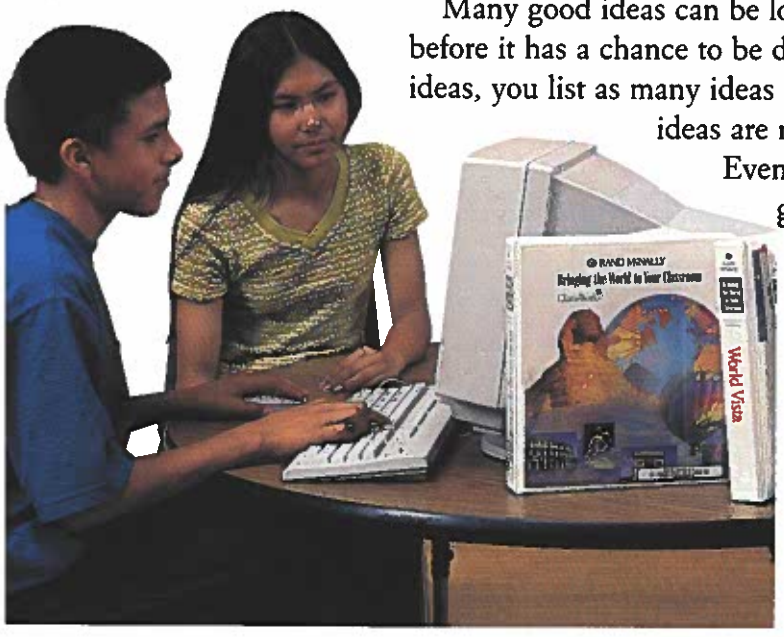
- Explain why working in groups makes solving problems easier.
- Tell why brainstorming is important in problem solving.
- Tell why being creative is important to problem solving.
- Work as part of a group to solve a problem.

TechnoTerms

brainstorm
idea bank

The ability to work as part of a group is important to you in solving problems both in school and later in a job. Fig. 1-14. The old saying "two heads are better than one" is really true. Problems are often easier to solve with the help of other people. Those with different experiences and backgrounds can bring more information and a new way of looking at the problem. Each person's talents can be put to good use. Some of us are better at tossing out new ideas. Others are better at putting ideas into action. You will have a chance to do both as a member of a group.

Fig. 1-14. When people work together, more skills and ideas are contributed to solving a problem. Think of the last problem you and your family solved together. What did each person contribute to the solution?



Brainstorming

Many good ideas can be lost if someone puts an idea down before it has a chance to be discussed. When you **brainstorm** ideas, you list as many ideas as possible. During brainstorming the ideas are not judged as either good or bad. Even those that might sound silly are given a fair hearing.

During brainstorming, everyone in the group has a chance to contribute to the **idea bank** (all the ideas presented). From that idea bank your group selects the best idea.

Fig. 1-15. A film animation director inserts a computer-generated hummingbird into a piece of film with real people. Describe some recent cartoons you've seen that you think are very creative.

Being Creative

A person who is creative has the ability to come up with a new idea or way of doing things. Everyone can be part of the creative process.

To be a creative thinker, you need to use facts, feelings, experiences, and knowledge. You might have to break your usual rules for thinking or create some new ones. Fig. 1-15.

It is helpful to ask yourself "what-if" questions. For example, what if there were a pill that would make anyone smarter? Who should take it?

Remember that the more creative ideas you have to choose from, the better your chances of finding a good solution to the problem.

TechnoFact

IT'S AN ART! Many good solutions to problems have been found when someone looked in an unusual place, found an idea, and then applied the idea to his or her own field. For example, did you know that the camouflage patterns used for guns and tanks were borrowed from the style of a famous artist, Pablo Picasso?

SECTION 4

TechCheck

1. Name one advantage to working in groups to solve problems.
2. What is brainstorming? Why is it important in problem solving?
3. What can you do to be more creative?
4. **Apply Your Knowledge.** Brainstorm ideas for designing a classroom of the future. Write your ideas down to share with others.

SECTION 4

ACTION ACTIVITY

Working in a Group to Solve a Problem

Be sure to fill out your TechNotes and place them in your portfolio.

Real World Connection

An important skill in the business world is being able to work as part of a team. You might be part of a design team or a construction team.

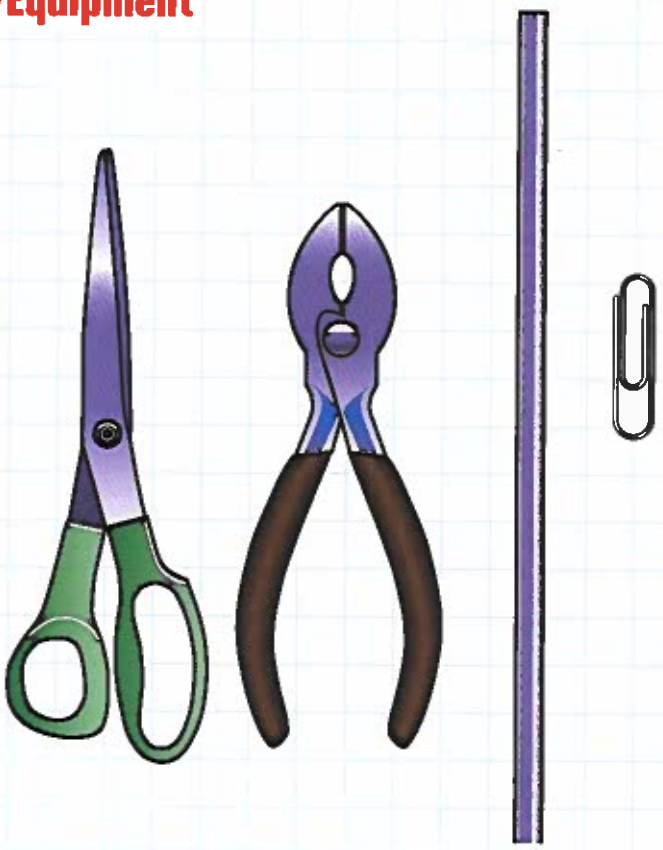
In this activity, you will work in groups using a step-by-step procedure to solve a problem.

Design Brief

Design and build a model of a skyscraper structure. Your goal is to build the tallest structure possible using only the materials listed below. The finished structure must support the weight of this textbook without falling down.

Materials/Equipment

- straws
- paper clips
- pliers
- scissors
- paper



SAFETY FIRST

Follow the safety rules listed on pages 42-43 and the specific rules provided by your teacher for tools and machines.

SECTION 4
ACTION ACTIVITY

Procedure

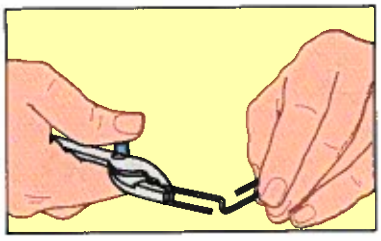
1. Brainstorm at least four or five designs with your group. Fig. A.
2. Sketch all the designs for the structure. Evaluate the designs, and as a group select one to construct.
3. Use scissors to cut the straws to the lengths needed for your structure.
4. Bend the paper clips as needed to attach them according to your design.
5. Measure the height of your structure from its base to the very top. Write its height on your sketch.
6. Test your structure by balancing this textbook on top.
7. Problem-solving strategy reminder: Did your group try different ideas if the first one didn't work?

Evaluation

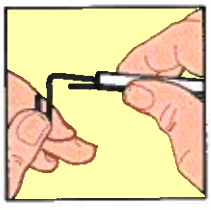
1. What were the things that held you back when solving this problem?
2. How could you change your structure to make it stronger?
3. Did your group members work well together to complete the project? Explain.
4. **Going Beyond.** Working in a group or team, design and make a model of a school locker that would be useful to a wheelchair-bound student. Your design should provide storage for coat, books, pencils, notebooks, and so on.
5. **Going Beyond.** Working in small groups, come up with a list of ten products you think will be useful in the future.

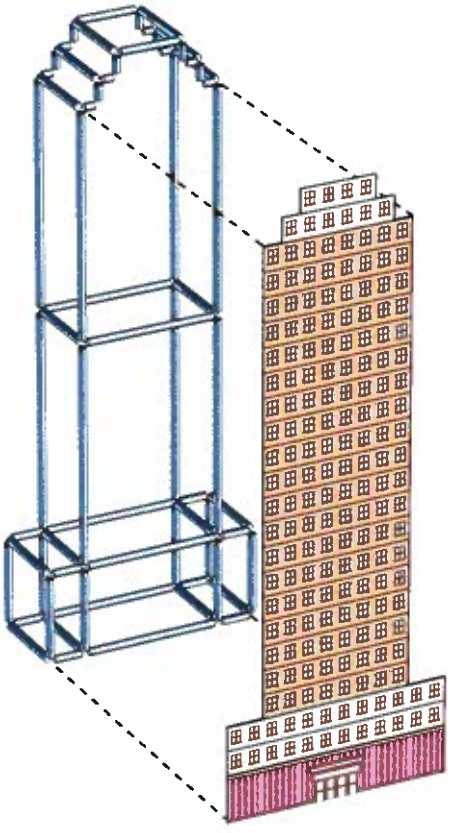
Fig. A

Sheets of paper can be attached to the frame with paper clips to form the "skin" of your building.



Bend paper clips at right angles to form fasteners that can be inserted into the ends of drinking straws.





SAFETY

Here are ten general safety rules to follow as you do the activities in this book. Following these rules will keep you safe and will help keep tools and equipment in good condition. Well-maintained tools and equipment are safer to use, work better, and last longer.

1 Follow the safety manuals, instructions, and requirements given to you by your teacher. Do not fool around in the technology lab.

2 Pay close attention to what you are doing at all times. Do not let others distract you while you are using a machine.

3 Always wear eye protection. Special eye protection may be needed for some activities such as using a laser, welding, or using chemicals. Ask your teacher for help.

4 Never use any tool or machine without a demonstration by your teacher. Know the safety rules related to a specific machine before you turn it on.

5 Be careful not to wear loose clothing, jewelry, or other items that could get caught in a machine.

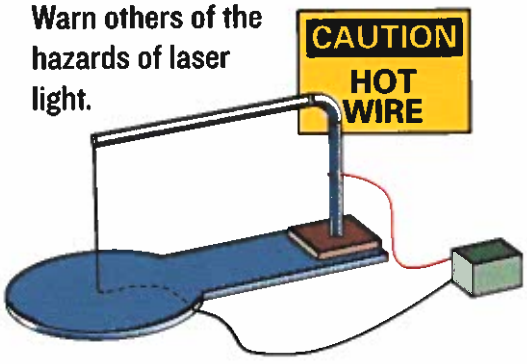
6 Always use the guards on each machine. Keep hands and fingers away from all moving parts.

RULES

7 Keep the work area clean. Store tools and materials properly.

8 Report all injuries to your teacher at once.

9 Put warning signs on things that are hot and could cause burns. Warn others of the hazards of laser light.



10 Do not use electric tools near flammable liquids or gases. Store oily rags in a proper container. Know where the nearest fire extinguisher is and how to use it.

COLORS FOR SAFETY

COLOR	MEANING	COLOR	MEANING
RED	Danger or emergency	WHITE	Storage
ORANGE	Be on guard	GREEN	First aid
YELLOW	Watch out	BLUE	Information or caution

CHAPTER 1

REVIEW &

CHAPTER SUMMARY

SECTION 1

- Technology is the use of knowledge, tools, and resources to help people solve problems.
- A person who understands the effects of technology is technologically literate.

SECTION 2

- Technology is rapidly changing the way our world works.
- The history of technology can be divided into ages according to the materials people used.
- Technology is growing at an exponential rate—doubling every few years.

SECTION 3

- It is easier to solve problems if you use a problem-solving strategy.
- The basic steps in most problem-solving strategies include: identify the problem, explore ideas and information, select the best idea, test the idea, and evaluate the test results.
- A design brief provides more specific information than a problem statement.
- Research and experimentation are important ways to find information.

SECTION 4

- It is often easier to solve problems when you work in groups.
- Creative thinking is important to develop new technologies.

REVIEW QUESTIONS

1. What does it mean if a person is technologically literate?
2. How are the time periods in technology's history organized?
3. Why is a problem-solving strategy important to use?
4. If you need to find information on a topic, what should you do?
5. What are the advantages of working in a group?

CRITICAL THINKING

1. During what part of technology history do you think the most important technological developments happened? Explain.
2. Create your own problem-solving strategy.
3. Write a design brief for a classroom of the future.
4. List as many other uses as you can for popsicle sticks besides making popsicles.
5. Write a design brief for a package that will protect a fragile (easily breakable) object.