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ABSTRACT

This learning guide on understanding the impact of new technology on life and work is part of a series of learning guides developed for competency-based adult consumer and homemaking education programs in community colleges, adult education centers, community centers, and the workplace. Focus is on the connections among personal, family, and job responsibilities so that these aspects of living will complement each other. Introductory material includes general guidelines/check list for users with key to symbols used to designate enhancement activities and an introduction. The guide covers four competencies: explain the evolution of technology as a means through which needs and wants are satisfied; identify current and expected developments in technology for agriculture, business management, communication, construction, consumer services, education, entertainment, financial management, health care, household operation, industrial production, law enforcement, recreation, and transportation; identify positive and negative effects of technological developments on people; and determine the skills needed to adapt to technological advancement at home and work. Twenty-six supplements include information and activity sheets on the following: impact of technology, what futurists say, food for Zero-G; positive and negative effects of technology, help for those terrified of technology, concerns about medical life support, skills workers will need, creativity, and fastest growing occupations. A bibliography contains 20 items. (YLB)

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Understanding the Impact of New Technology on Life and Work

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General Guidelines/Checklist for Users

The terms "facilitator" and "learner" are used throughout to describe the instructor and participants.

STRATEGIES (for facilitators) and ACTIVITIES (for learners) as stated in the guide, are not always parallel as to numbering system.

Facilitators need to find out where learners are with each of the competencies. For example, if working with a group of adults or youth who are preparing for future employment, it might be necessary to cover all competencies.

Key to Symbols - The following symbols are used throughout the guides to designate enhancement activities:

- related basic skills, giving particular attention to language arts and mathematics
- related decision-making and problem-solving skills, including the application and transferability of these skills to personal, family, and work responsibilities to be demonstrated
- enrichment activities according to learner abilities and experiences
- interrelationship of concepts to personal, family, and work
- influence of technology on the subject matter, application of knowledge, and related work.
- pre- and/or posttest assessment activities

Before addressing any of the competencies, the facilitator should check in advance to see what materials or preparations are needed for the competency as numbered.

Competency #1 - Explain the evolution of technology as a means through which needs and wants are satisfied.

_____The facilitator might gather the items listed in Method 1 and Method 5 and bring to class.

_____The facilitator might use a globe of the world or an atlas for Method 3.

_____The facilitator might collect pictures and articles from newspapers and magazines to make a bulletin board for Method 4.

_____Duplicate Supplement 1, "Impact of Technology on Your Life" for learners to complete for Activity 2.

_____Duplicate Supplement 2 to use for Activity 3.

_____Prepare Supplements 3 and 4, "2020 Vision," as transparencies to aid discussion of what technologists and futurists say about the future and the year 2020. (See Method 6.)

_____Duplicate Supplement 5 for learners' use for Activity 4.

_____Duplicate Supplement 6 (2 pages) as a handout for learners to compare technology of history to similar technology of today. (See Activity 5.)

Competency #2 - Identify current and expected developments in technology for areas of Agriculture, Business Management, Communication, Construction, Consumer Services, Education, Entertainment, Financial Management, Health Care, Household Operation, Industrial Production, Law Enforcement, Recreation, and Transportation.

_____Prepare Supplement 7, "Imagineering," as a bulletin board, poster idea, handout, or transparency to stimulate creative thinking of an Experimental City. (See Method 1.)

_____Prepare Supplement 8, "Food for Zero-G," as a transparency to share future agricultural technology. (See Method 2.)

_____If appropriate to learner group, the facilitator might duplicate Supplement 9 "Scanning the Future," as a handout. (See Method 3.)

_____Invite a resource person to show a personal computer that effects consumer services (e.g., banking, electronic mail, bookkeeping, budgeting, or tax preparation). (See Method 4.)

_____The facilitator may need to review key ideas in Supplement 10, "Impact of Technology on Education," in order to conduct discussion of new ideas about the future of education. (See Method 5.)

_____Invite a financial officer to the class to discuss new technology in banking. See Method 6 for discussion topics.

_____The facilitator can plan a field trip to a fitness, wellness, medical/hospital, or nursing center. Learners would have the opportunity to observe new technology used in health care. (See Method 7.)

_____For Method 9, invite a resource person such as a doctor or nurse to demonstrate new products available that makes health care easier for them and their patients. This may be a substitute if a field trip is not possible.

_____Duplicate Supplement 11, "A House Run by a Computer," as a transparency to stimulate thinking for Method 10.

_____The facilitator may need to furnish for the class advertisements from catalogs, pamphlets, newspapers, or magazines for new exercise equipment. (See Method 11.)

_____The facilitator may plan a trip or invite a resource person to explain new building sites and the latest technology.

_____Supply poster board or construction paper for learners to sketch their version of "My Experimental City." (See Activity 11.)

Competency #3 - Identify the positive and negative effects of technological developments on people.

_____Duplicate Supplement 13 as a handout. This supplement may be used as a pre- and/or posttest. (See Method 1.)

_____The facilitator may use Supplement 14 as a guide to key ideas for discussion purposes of the positive and negative effects of technology in individual health. (See Method 2.)

_____If appropriate, invite a resource person to share concerns of health hazards at different workplaces. See Method 4 for questions to ask.

_____Prepare articles from newspapers or magazines which represent scientific or technological items affecting the family or environment (e.g., oil spills). (See Method 5.)

_____The facilitator will need supplies such as large beaker, cold water, blue food coloring, and a white sheet of paper to perform the demonstration in Method 6.

_____Duplicate Supplement 15 as a handout for Method 8.

_____Duplicate Supplement 16 as a transparency to identify suggestions for learners with fears of technology.

_____Invite a human resource person to share the positive work and family benefits their company is providing for employees. (See Method 11.)

_____Duplicate Supplement 17 to use as a handout and discussion topic for Activity 1.

_____Duplicate Supplements 18 and 19 as handouts for Activities 3 and 4.

Competency #4 - Determine the skills needed to adapt to technological advancement at home and work.

_____Duplicate Supplement 20 as a handout or transparency for learners to know skills workers will need for future jobs. (See Method 5.)

_____Duplicate Supplements 21 and 22 as handouts to be used as a creativity profile and as suggestions for improving creativity. (See Method 7.)

_____The facilitator may need to be prepared in advance to share an example of a recent news event from newspapers or magazines that might have an impact on job trends (e.g., an election of a democratic President). (See Activity 1.)

_____Duplicate Supplement 23 as a handout so learners may determine what technology is appropriate in the given situation. (See Activity 3.)

_____Duplicate Supplement 24, "Help Wanted 21st Century Careers," for Activities 6 and 7.

_____Duplicate Supplement 25, "Fastest Growing Occupations . . .," as a handout for Activity 8.

_____Duplicate Supplement 26, "Fastest Growing Occupations . . .," as needed for Activity 9.

Introduction

Most segments of human life are touched by technological growth.

These systems of technology impact directly and indirectly on the nature of society and the quality of life and living.

In earlier times, humankind had to know about and understand the natural environment in order to survive. Now, we must understand the technological developments and what effects they have on human, social, and natural environments as well.

How well the present is managed will depend on how well *all* citizens understand the behavior of technological systems and their relation to human existence and purpose.

Explain the Evolution of Technology As a Means Through Which Needs and Wants Are Satisfied.

Learner Outcomes

- Recognize the development of technology and its effects on people.
- Analyze the impact of technology on current and future life.
- Identify solutions to technological problems.
- Recognize that inventions satisfy needs and wants.

Definitions

technology	- the application of knowledge; the use of resources to meet human needs, to solve problems, and to extend human capabilities
family	- one or more individuals joined by blood, marriage, adoption, or other bonds who share same support systems
invention	- using knowledge to select the best possible solution
change	- cause to become different, alter

Key Ideas

From the earliest times to present, humans have sought to satisfy three basic needs: food, shelter, and clothing. The difference in satisfying basic needs from early times to the present is in the level of technology that is applied to satisfy those needs.

To fully appreciate the extent of today's knowledge, one must examine its evolution since the beginning of recorded history. Early man's development was based on previously known knowledge which in turn has led to how present man satisfies the needs and wants of today.

Each significant step in the development of technology had an effect on the evolution of yet another. Inventions and products are examples of technology and are the means through which needs and wants are satisfied.

Strategies/Methods

1. The facilitator might introduce the competency by bringing in antique home devices such as rug beaters, noodle cutters, and farm tools. Have students guess what each devise is; then discuss the need for the tool at the time. What has replaced the tool or why don't we need it any more?

2. It is important for the facilitator to discuss the concept of change. Some questions to ask:

   - Why do things change?
   - Why should things change? or why not?
   - Are we challenged afraid of changes caused by technology?
   - What if time stood still and nothing new ever developed?

3. Discuss how the different cultures and people in the global environment have affected technology. Using a globe of the world, the facilitator might point out origins of consumer products such as coffee from Brazil. Technology has effected the manufacturing, assembly, and transportation of our consumer products. Ask learners to list other products that can be identified with other cultures.

4. To develop interest, the facilitator could use a bulletin board titled FYI (for your information). Post pictures and articles found in newspapers and magazines depicting technology. Include future predictions and illustrations.

5. The facilitator may wish to bring a past and present invention to class (e.g., old-fashioned telephone compared to a push button phone). Discuss the impact of these on life and work then and now. Discuss what needs and wants were satisfied by this invention.

6. Using Supplements 3 and 4, "2020 Vision," as transparencies, discuss with the learners what technologists and futurists project. Ask if any evidence of these are seen as of 1994. Which are more believable? What could be added to the list for 2020?

Suggested Activities

1. Have learners give examples of two ways technology today is like the technology of early humans. Give two ways in which it is different. For example, likeness was early humans were hunters and gatherers of food; difference today is the growth of plants and animals is controlled to ensure a food supply and variety.

2. Have learners complete the checklist in Supplement 1, "Impact of Technology on Your Life." Analyze what impact the devices or technology has on their life now. Discuss how the future may be impacted. Discuss questions raised on the supplement.

3. Have learners list three situations of which a computer affects their life (e.g., class registration, bank accounts, grocery shopping). (See Supplement 2.)

4. Using Supplement 5, "What Earth People are Saying," ask learners to role play an outer space person. Have them brainstorm a list of comments earth people may be making about the future (e.g., we are afraid to eat food because of the additives and cancer causing agents; we just love getting our housework done in five minutes; we have a lot of leisure time).

5. Using Supplement 6, "Comparison Chart of Technology," have learners match the pictures of the oldest technology to the newest technology. (6A is the oldest technology and 6B is the newest technology.) Have learners compare the technological advancement of today to earlier times and how technology has affected their lives (e.g., picture of bicycle could compare to the picture of the car).

6. Using brainstorming, interviewing, and observation techniques, have learners identify technology problems people have at home, work, school, or in the community that need solutions. Ask learners to identify ten problems. An example could be the proper disposal of disposable diapers which may be a community or environmental problem.

7 Working in groups, have learners suggest some possible solutions to the problems listed in Activity 6. Discuss what would be needed to solve problems. Discuss what impact this solution (or invention) would have on satisfying people's needs and wants.

8. Have learners sketch or identify an invention that would satisfy a need or a want and make their life easier today. The learner could discuss the problem first (don't like to clean the sink in the bathroom) and invent or identify a solution for that need (a self-cleaning sink).

COMPETENCY TWO

Identify Current and Expected Developments in Technology For Areas of Agriculture, Business Management, Communication, Construction, Consumer Services, Education, Entertainment, Financial Management, Health Care, Household Operation, Industrial Production, Law Enforcement, Recreation, and Transportation.

Learner Outcomes

- Recognize the need and value of technological information and developments.
- Develop an awareness of how technology is currently impacting work, family, and the community.

Definitions

imagineering - to make believe and create

Key Ideas

For one to compete in the future, an understanding of new developments in technology is important. For example, technology places new demands on many employers in the workplace.

Current and expected developments in technology areas will impact all aspects of life—work, play, family, and government. People will need to be able to work and perform with the new technology developments.

Introductory Note: The facilitator may need to determine appropriateness of the general method suggested for implementing this competency; that being the learner "imagineering" an Experimental City of the Future. The facilitator may need to familiarize her/himself with learners' backgrounds and experiences to determine if the competency activities are appropriate. It is suggested that the facilitator try to test the idea to see how learners respond. Learners need to recognize the current and expected developments in various areas of technology.

If imagineering an Experimental City does not seem appropriate for learners, activities could center on technologies suggested with more emphasis on resource people, field trips, and brainstorming and research activities.

Strategies/Methods

1. The facilitator should introduce the competency by explaining to the learners that they are going to take an imagineering trip. Imagine yourself in your car on a highway heading toward the Most Experimental City in the world, a city that has all the latest possibilities for urban living. As you come to a rise, you suddenly see it for the first time. Pull off to the side of the road, stop your car, and get out for a good look. The following activities will be related to what the learner will see in this Experimental City that relates to the topics mentioned in the competency. The facilitator might use Supplement 7, "Imagineering," as a bulletin board idea, poster idea, transparency, or handout to stimulate creative inventing.

2. Using Supplement 8, "Food for Zero-G," direct learners to make a list of the agricultural developments mentioned in the interview with the space farmer (e.g., no imports from earth, feed 10,000 citizens on one farm, and so on). Suggest that the learners decide which development the Experimental City will use to feed the population in the city. Ask the learner if this technology would eliminate our farms.

3. The facilitator might use Supplement 9, "Scanning the Future," as a transparency. Discuss with the learners how people will react when they realize that new purchases trigger more direct-mail promotions. Does this invade privacy?

4. The facilitator might share with the learners new technology that affects consumer services. The facilitator might include new ideas for grocery shopping carts. A resource person might be invited to demonstrate how a personal computer can access a variety of goods and services (e.g., banking, electronic mail, bookkeeping, budgeting, and tax preparation). **A point to make:** Consumers have a wider use of technology to satisfy needs and wants.

5. Use Supplement 10, "Impact of Technology on Education," as a transparency. Discuss how technology allows education to operate efficiently. How has education changed since the learner graduated from or left high school?

6. Invite a financial officer to speak to the class about new technology in banking. The discussion might include how long it takes to clear a check, and other aspects of banking affected by technology.

7. The facilitator could suggest the "imagineer" visit a doctor's office in the Experimental City. Ask what processes were used in the care of the patient. Did a computer analyze, diagnose, and suggest proper care? Did a physician conduct the examination? Was a new product or machine used in the examination? Give examples of developments in the health care area such as computerized diagnosis (house calls) where symptoms are reported over the phone and diagnosed by a doctor or nurse.

8. Take a field trip to a fitness, wellness, medical center/ hospital, or nursing center so learners can observe new technology being used in health care.

9. Invite a local doctor or nurse to discuss new technology in health care and to demonstrate new products available that make health care easier for them and their patients (e.g., tamper-proof bottles for prescriptions, disposable gloves and syringes, digital thermometers, and other items they could easily bring to the classroom).

10. Using Supplement 11 "A House Run by a Computer," the facilitator might suggest that learners write a letter to a friend about the new computer that runs their house. Suggest the learners tell their friend about the positive (it gets me to work on time) and the negative (the clock got messed up and woke us up at 3:00 a.m.) aspects of their computer.

    Supplement 12 can be used as a sample of a letter for the above or can be read and examined for analysis of effects of computers.

11. The facilitator might bring in catalogs, pamphlets, and newspapers or magazine advertisements for new exercise equipment. Have learners select the ones they think would be right for their needs now and later in life (e.g., bicycles, trampolines, rowing machines, weightlifting equipment). The purpose is to make learners more aware of improved technology.

    Follow this up with a discussion of how technology is affecting activities such as sports and outdoor activities.

12. The facilitator could invite resource people in or take a field trip to sites where new technologies such as the following are being used:

    - a local architect to explain a computer-aided design system used to plan a house
    - a new house under construction to observe energy-efficient windows and doors
    - Local houses using alternative energies for heating and electrical needs
    - Local houses adapted to accommodate the special needs of residents
    - SMART House that uses automated concepts

Suggested Activities

1. Have learners look at the Experimental City in Supplement 7 and discuss what they *see* and *feel*. Is the city beautiful, ugly, dirty, clean, cold, warm? Is it all paved or does it have grass and trees?

2. Have learners close their eyes and imagine what the *people* in the Experimental City are like. Are they young or old? Are there any children? Are people relaxing or working? What expressions do they have on their faces? Are there any people at all? Do they look like you do now?

3. Have learners draw a picture of a future *house* that they would like to live in. (The Experimental City may have communities of houses developed underground, underwater, or in space.) If appropriate, have learners construct a basic drawing of their new home and describe how they think living in the new house would be.

4. Have learners determine how to *communicate* with the occupants of the Experimental City. Does everyone have mobile phones on them or in transportation vehicles? Learners could role play how one would communicate with a family member across the city.

5. Have learners close their eyes and imagine what kind of *educational system* the Experimental City would have. Are there traditional schools, modified schools, year-round schools, or no schools at all . . . learning centers . . . community centers . . . stimulus studios . . . learning banks . . . interaction studios? (See Supplement 10, "Impact of Technology on Education.")

6. Have learners discuss what people do for *entertainment* in the Experimental City. Are they listening to a universal sound system for the whole city? Are they individually involved in video games and robotic play? What types of music, movies, or literature are available to the citizens?

7. Ask learners to envision a *financial establishment* in the Experimental City. Have them role play someone wanting to transfer or to pay bills. Ask them if they used an automatic teller machine (ATM) or if they used an Electronic Fund Transfer (EFT) that allows a customer to pay bills or transfer money between accounts. Did they use a credit card or their home computer to pay bills or transfer money?

8. Have learners brainstorm what kind of *law enforcement* is present in the Experimental City. Does the city need law enforcement? Is there a "Robo Cop" that patrols the streets? What kind of correctional facilities exist?

9. Have learners determine what people do for *recreation*. Describe the forms of recreation, or how people are involved in leisure activity. Explain what kinds of sports or activities are being done. Do people go on vacation from the city or do they vacation within the city? Devise a vacation plan for a single mother and two children ages 7 and 12.

10. As learners look down on the Experimental City, discuss *transportation* vehicles that are being used by the citizens. Are there trains running on air? Are there boats and ships running through the city? Are airplanes landing inside the city? Is there space travel to and from the city? Are there cars and gas available?

11. Have learners develop a poster of her/his Experimental City by taking one new development from each of the listed areas and displaying a picture or sketching on a poster entitled "My Experimental City." Ask each learner to share with the class what the city of the future will be like.

Identify the Positive and Negative Effects of Technological Developments on People.

Learner Outcomes

- Develop an awareness of responsibility associated with the use of technology.
- List positive and negative effects that technology can have on health, the environment, and family life.

Key Ideas

Advancing technology will affect people, in the short and long term, both positively and negatively, regardless of cultural level of technology or rate of change.

All people now, however, are affected by technology even when they have no choice as to their own involvement. Decisions made today about the development and use of technology in one country will very likely have an effect on other countries of the world. Although there are many short- and long-term benefits, there are also short- and long-term negative effects.

Technology has affected where jobs are located and how they are done. Some automation takes the place of semiskilled workers, and controls quality and quantity of inventory.

Most workplaces have some health hazards created by technology. Although technology devices or materials were used to make work easier or faster, they can also result in many new problems.

Definitions

biodegradable	- can be decomposed in the environment as a result of biological action. **Note:** products vary in the amount of time required to degrade, from a few weeks to thousands of years
cocooning	- a social occurrence where families stay close to the home and interact very little with their outside surroundings
life-support	- an artificial or natural system that provides items necessary for maintaining life or health system
organ	- the surgical replacement of a diseased or destroyed organ with a healthy one (such as transplant kidney or liver)

Examples of potential health hazards in the workplace created by technology:

- Mental Hazards—the need for increased productivity with technological equipment can result in worker stress, anxiety, depression, and stress-induced physical illnesses such as headaches.
- Equipment Hazards—misuse or failure to use protective guards or gear can result in loss of sight, hearing, limb, or life.
- Material-Handling Hazards—improper lifting and moving of material can result in back or muscle injuries.
- Computer Hazards—prolonged sitting, keyboarding, and viewing a computer screen can result in eye problems, carpal-tunnel syndrome (nerve damage in wrist), or low-level radiation exposure.
- "Sick" Building Hazards—poor air quality because of inadequate circulation and toxic fumes from building materials can result in many respiratory problems for workers in that building.
- Electromagnetic Field (EMF) Hazards—exposure to repeated or high levels of radio waves, X-rays, or infrared or ultraviolet light is possibly linked to a higher incidence of cancer.

Beneficial Effects of Technology

The benefits of technology can most easily be appreciated by comparing the standard of living today with that of the past. (In 1900, the average life expectancy of people living in the United States was 47.3 years. By the year 2000, it is expected to approach 80.) Advances in medical science have allowed a longer productive life.

Advances in agriculture have increased food production by providing larger equipment, new varieties of crops which resist disease, and new methods of processing the raw materials. Because of technology, there is time to enjoy many leisure activities and to engage in community and social work.

Communication systems have brought people of the world closer than they have ever been.

Detrimental Effects of Technology

The impact of technology has affected social organization, values, and lifestyles. High unemployment, high living costs, and overcrowding of people in substandard housing are some urban problems. One of the far-reaching effects of technological change has been population mobility. When transportation technology developed to a point where nearly anyone could move anyplace at any time, the strong community and family tie structure started to break down. The two most pressing long-term problems as a result of technology are the applications and disposal of toxic substances and radioactive material and the depletion of natural resources. Because many dangerous chemicals take years to break down to a harmless state, the chances of ingesting them through plants, meat, and other foods is great if proper disposal procedures are not used.

Strategies/Methods

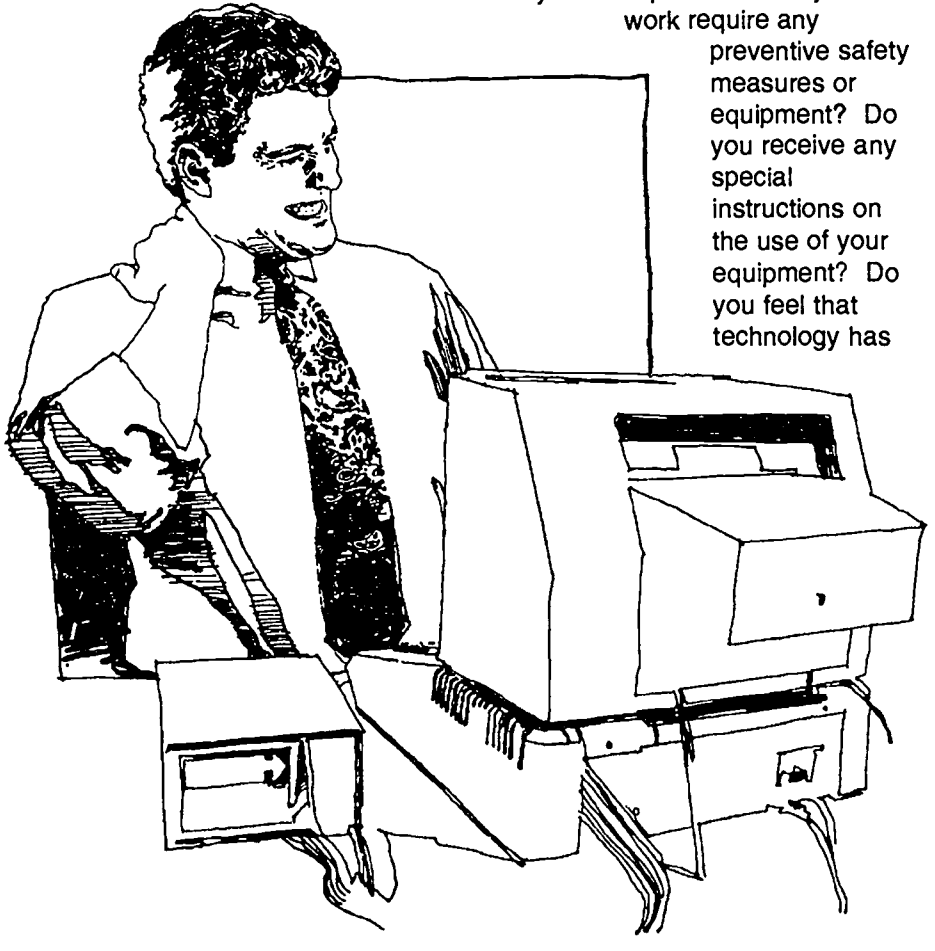
1. Using Supplement 13, "Positive and Negative Effects of Technology," have learners complete the quiz. Have learners discuss why they feel positively or negatively to the statements. The facilitator may use this as a pre- and/or posttest.

2. The facilitator might use Supplement 14, "Positive and Negative Effects of Technology on Individual Health," as a guide for discussion. Points to make: Technology and health care prevent and control diseases; cure illnesses and save lives; and enhance or replace ailing body parts Technology, on the other hand, creates ethical and legal problems in health care.

3. After discussing Supplement 14, the facilitator might ask learners to discuss whether they think technology has had a positive or negative impact on health care. Topics that can be included are life support, organ transplants, test-tube babies, and surrogate mothering.

4. Invite individuals involved in different occupations (e.g., print shop employees, office workers, construction workers, medical center employees) to determine what, if any, health hazards are involved in their jobs, which were caused by technology.

   Resource persons might address questions such as Are there any physical hazards at your workplace? Does your work require any preventive safety measures or equipment? Do you receive any special instructions on the use of your equipment? Do you feel that technology has been harmful to your health? See "Key Ideas" for a list of health hazards at work.



5. The facilitator should be prepared to provide articles from newspapers or magazines that represent scientific or technological items affecting family or environment. Discuss with learners whether these were positive or negative effects.

6. To help learners become aware of how technology carries responsibility, the facilitator might conduct the following demonstration. Fill a large beaker with cold water and tell the learners it represents clean water or air. Ask students what happens when a pollutant such as oil is added? Add several drops of blue food coloring to the water, hold a sheet of white paper behind the jar for ease of view, and observe food coloring spread out. Note how much time it takes for the coloring to spread through the water. Point out that pollutants in water and air may, first, be in only one place, but they spread rapidly. Ask learners to respond to the question, "What is our responsibility regarding pollution of our resources?"

7. Ask if learners would consider an environmental clean-up day or a class project to help needed areas in the community or school district. If a project is done, ask learners to take pictures of their involvement and report to the class.

8. Distribute Supplement 15, "What's My Responsibility?" Generate classroom discussion by asking learners to read and respond to the situations. The

Suggested Activities

facilitator might ask if the situation would affect them and what their responsibility would be in dealing with science and technology.

9. The facilitator might share Supplement 16, "Help for Those Terrified of Technology," with the learners. Discuss the definition of technophobia and suggestions for overcoming the fear of technology. Ask learners to brainstorm other ideas to add to the list.

10. Ask learners to list some ways the present use of resources and decisions about technology may affect the quality of life for their children. For discussion purposes, the facilitator might use examples of current controversies such as forest cutting, car pollutants, or depletion of the ozone layer.

11. Invite a human resource manager from an area company to talk to the class about work and family benefits that affect the workplace and employees' home life. The resource person might also share benefits and programs the company offers such as a child study center close to the site, an exercise program, and so on.

1. Using Supplement 17, "Evaluate Given Situations About Concerns with Medical Life Support," have learners read the situations and decide who will remain on life-support systems. (This activity can help learners see how difficult the decisions about life support can be and how technology can affect lives.)

2. Have learners trace family trees to their great-grandparents' time. Noting the dates of birth and death, have learners determine if there is a difference in life expectancy between that generation and the present generation. Discuss whether or not there are differences in lifestyles from one generation to the next. Does the learner think that technology has improved lifestyles which, in turn, affects living a longer life?

3. Using Supplement 18, "Positive and Negative Impacts of Technology" on family and child development, have learners choose one positive and one negative impact and discuss with the class what impact it has had on her/his family (e.g., employers have become more aware and responsive to employees' needs in attracting and retaining workers. This has affected my family by allowing me to have a flexible schedule so I can take my daughter to school and pick her up).

4. Using Supplement 19, "Impact of Technology on the Workplace," ask the learners to list work and family benefits that their employers are engaging in.

5. If appropriate, have learners interview an employer or a company representative about company policies concerning the environment. Ask questions about recycling, proper waste disposal, and pollutants. Ask employer(s) what the company is doing to promote a positive outlook for future generations.

Determine the Skills Needed to Adapt to Technological Advancement At Home and Work.

Learner Outcomes

- Develop an awareness of job trends and skills needed to adapt to technological advancement.
- Identify employability skills needed to become marketable in the technological jobs of the future.
- Develop a list of jobs and the skills needed for the jobs.

Definitions

high-technology	- state-of-the art technologies being used to increase productivity in manufacturing, communication, transportation, agriculture, mining, energy, and commercial purposes, and to improve the provision of health care
transferable skills	- abilities that can be used in many different jobs
career clusters	- groups of jobs that require similar abilities and skills
learning to learn	- the ability to move into training and learn
problem solving	- ability to identify, define, and analyze problems
technological literacy	- knowledge of scientific and mathematical concepts

Key Ideas

Technology has had an effect on many occupations. Some jobs are lost through technology change and other jobs are created.

Changes in life create stress. Some kinds of stress can help one perform better on the job.

Human requirements needed to adapt to technological advancement at home and work include adaptability, analyzing, calculating, communication, coping capability, flexibility, learning to learn, observing, problem solving, and reading and writing.

A broader range of skills are needed to provide for greater job security and increase mobility within the labor market.

Transferable skills include the abilities to organize one's time, to work with people, and to express oneself well. People with transferable skills have a great advantage when changing jobs.

A workplace dominated by technology places new demands on many employees. Employers want workers who are good at solving problems, who can invent ways to do work better or faster, who are good with math, who can communicate well with others, who have a good background in science, and who have good work habits.

According to the Bureau of Labor Statistics, only one new job in 25 will actually involve high technology. However, the work done in this area will affect the jobs of millions. The robots designed and created now perform the hazardous tasks people once did. High technology has transformed the jobs of workers in many fields.

Some automation is aimed not at taking the place of workers' labor but at controlling quality and keeping track of inventory. Automation has replaced human labor mainly in jobs that involved semi-skilled tasks.

Population increases might mean that there will be more jobs for teachers, people who provide police protection and electric power, and for companies that make and sell toys, children's clothes, and appliances. As more people live longer, more jobs working with the elderly will become available.

Strategies/Methods

1. The facilitator might start this competency by asking learners if they have seen science fiction movies, television shows, or read any books or comic books that are set in the future. (STAR TREK might be an example.) If so, what was the vision of the future that was presented? What type of jobs would they enjoy? Explain that decisions being made now are shaping the future for learners. Emphasize that learners can ensure better futures by finding out more about job trends and social changes.

2. Suggest that learners start a media watch to keep track of new developments on job trends, *high* technology, and business responses to social changes such as changing roles of women and the growth of the single-parent families. Learners could be encouraged to collect newspaper and magazine articles and pictures and to take notes on radio and TV news broadcasts. Encourage learners to read and watch business news to prepare themselves for a rapidly changing job market.

3. The facilitator might write on chalkboard or a poster chart, "The Changing Nature of Work." Give learners ten minutes to work in small groups listing ways they think jobs will change during their lifetime. Ask each group to share one way that would be the most likely to come true and one way that would be the most imaginative.

4. The facilitator might encourage volunteers to discuss someone they know who has changed jobs in the middle of a career. Discuss why she/he made the change and how satisfied the person felt. An alternate activity might be to interview someone.

5. Share Supplement 20, "Skills Workers Will Need," as a transparency with the learners. Suggest learners discuss what characteristics employers might think important.

6. Survey the learners and ask how many have used computers. If so, determine where they used them (school, home, other). What did they use them for? How long have they been using them? How has life been affected by computers? List how computers affect their lives daily (grocery shopping labels, computerized banking, some cars). Ask learners to brainstorm situations where computer skills could help them in their job or home. It is important for the facilitator to stress that learners must have some basic computer skills for future jobs and daily living. It is estimated 50% of future jobs will require computer technology of some type.

7. Supplement 22, "Increasing Your Creativity," can be shared with the learners after they have completed Supplement 21, "A Creativity Profile," and Activity 2. Ask learners how they can better prepare for the technological changes of the future.

   Facilitator Note: It is important to help learners see that they do have practical problem-solving skills, which they use to make common sense decisions. Be sure to compliment learners whose work habits in class have been commendable. Emphasize learners' strengths. Give them a chance to discuss the skills in which they feel they excel. Discuss with the class what people can do to improve themselves. For example, learners could try to concentrate on finding solutions to everyday problems rather than giving up immediately. Also, deciding to speak up more often in class and doing writing activities could help them improve their communication skills. Suggest also that learners consider furthering their education with coursework to improve their knowledge of scientific principles. Remind them that schoolwork, volunteer work, and experimenting with work around their homes can give chances to improve work habits.

Suggested Activities

1. Given the question, "What recent news events do you think might have an impact on job trends?," ask learners to write several sentences to answer the question (e.g., environmental crisis, natural disasters such as floods or earthquakes).

2. Creativity is the power to bring something new or useful into existence. Have learners complete Supplement 21, "A Creativity Profile," and decide whether she or he has a mixture of both creative and uncreative qualities. (See instructions on Supplement.)

3. Problem solving is an important human skill that will be important in solving technological problems. Ask learners to read the case studies in Supplement 23, "Determine Technology Needed To . . .," and solve given problems. Determine what technology is appropriate in each situation. Discuss how technology can be used to solve problems.

4. Have learners brainstorm and compare skills performed in previous jobs to the jobs they now hold. Have learners relate skills performed previously that were transferred to their present jobs. (Transferable skills are skills that can be used in many different types of jobs.)

5. Have learners imagine that it is the year 2010. Have them write imaginary diary entries describing a day at work in their jobs of the future. Include topics such as the new inventions they use on the job, the role of women in the workforce, the way workdays are scheduled, the amount of stress created by changes in working conditions, and the kinds of education and training people need for the jobs of the future. Ask volunteers to read their diary entries to the group during one of the sessions.

6. In the future, some kinds of work will no longer be available. However, new opportunities will open up for teachers, law enforcement, child and elderly care, and home health care. Direct learners to write a help wanted ad for a job they think they will be working in 2010. After sharing job ideas, suggest the learners complete Activity 7 using Supplement 24, "Help Wanted 21st Century Careers."

7. Using Supplement 24, "Help Wanted," have learners study the cartoon characters and try to identify which applicant is trying to get the job listed in the classified ad. Discuss what skills each applicant must have to qualify for that particular job. Have learners be creative and imaginative by listing new 21st century careers.

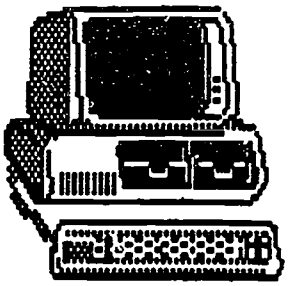
8. Using Supplement 25, "Fastest Growing Occupations Requiring a High School Diploma or Less Education," have learners review the list of occupations and ask them to identify three job titles they could apply for in the next year. Discuss what skills they have now and what other skills will be needed to get and keep the job.

9. Using Supplement 26, have learners review the list of occupations requiring training beyond high school. Research or discuss which occupations learners have skills for and determine other skills needed.

SUPPLEMENT 1

Impact of Technology on Your Life

DIRECTIONS: Part A. Using the checklist below, check (✓) the technological devices you have for personal or family use. After completing Part A, continue with Part B.



_____ air conditioner
_____ automobile
_____ cigarette lighter
_____ calculator
_____ car phone
_____ compact disc (CD) player
_____ digital clock or watch
_____ dishwasher
_____ electric can opener
_____ electric coffee maker
_____ electric hair curlers, curling iron
_____ electric hair dryer
_____ electric hand mixer
_____ electric razor
_____ electronic garage door opener
_____ facsimile (fax) machine
_____ microwave oven
_____ personal computer
_____ remote control devices
_____ shower massage
_____ smoke detector
_____ stationary bicycle
_____ stereo with tape recorder/player
_____ television
_____ telephone
_____ telephone answering machine
_____ trash compactor
_____ treadmill exerciser
_____ video camera (camcorder)
_____ video cassette recorder (VCR)
_____ video games
_____ washer and dryer
_____ water conservation devices (low flow toilet, faucet, shower)

Include additional examples on the line below.

_____

Part B: Now that you have considered some of the modern devices that technology has produced, imagine that they all have disappeared or you never had the convenience of owning any of the devices.

How would your daily routine and activities change?

Would your life be affected at all?

Which device would you miss the most?

Why?

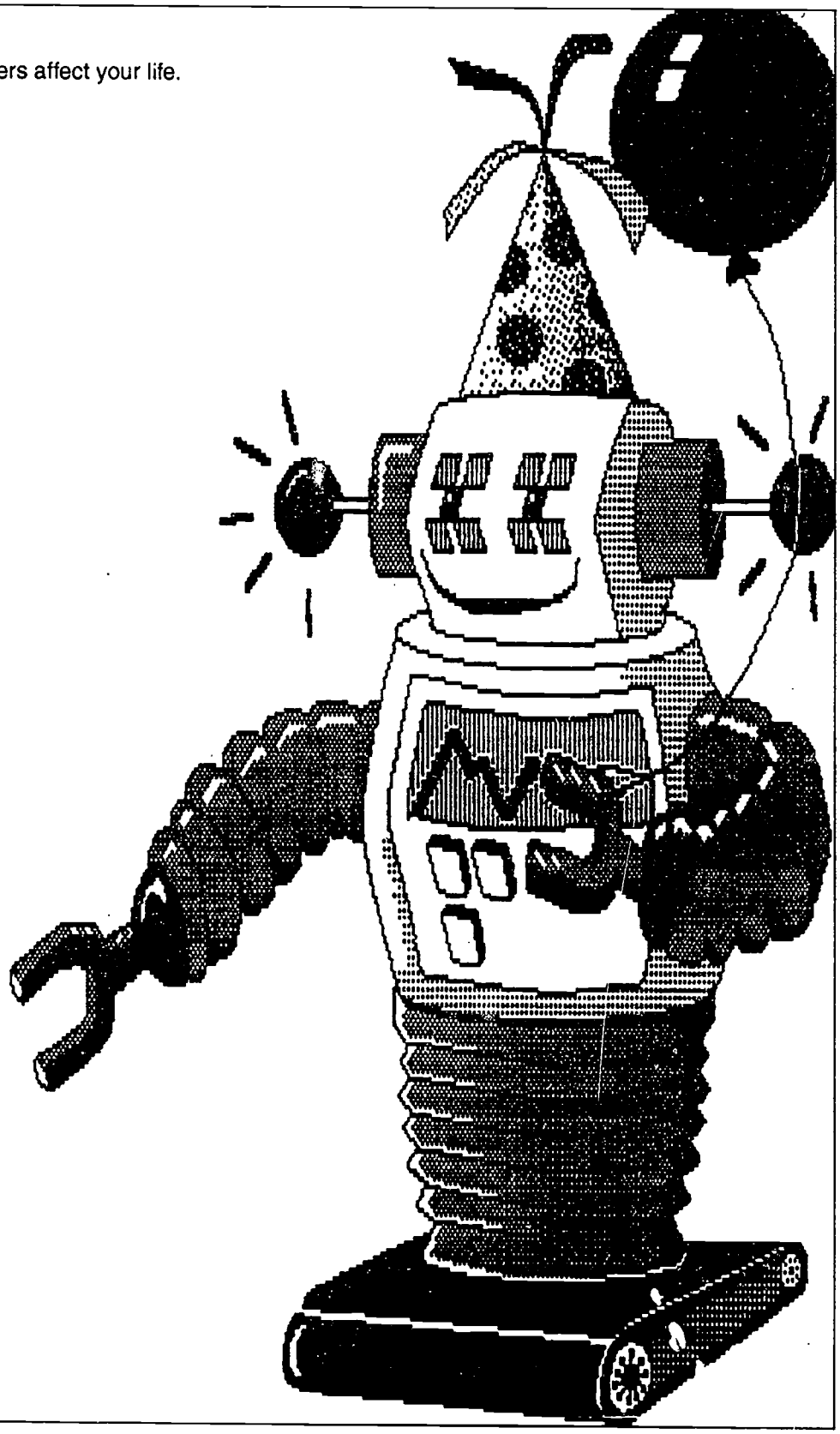
If you could wish for any of the devices on the list in Part A, which would you like to have?

Source: *Impact of technology on the family* (p. T:F-9, 10). (1992). Stillwater, OK: Mid-America Vocational Curriculum Consortium.

Computers and Their Affect on Your Life

List three situations when computers affect your life.

Ex: Grocery Shopping



2020 Vision: What Technologists Say

- Computers will be a powerful force and an integral part of everyday life, even in household tasks.
- People will have more time for creative pursuits.
- Relationships will become more and more vital for meeting emotional and social needs.
- People will have ready access to more knowledge than ever before imagined.
- Entertainment options will expand, using audio, video, and computer components.
- Telephone communications will be greatly improved.
- Robots will be used for manufacturing, construction, and exploration purposes.
- Supplies of usable natural resources will continue to grow more scarce and costly.
- New technologies will be developed for waste management and conservation of resources.

2020 Vision: What Futurists Say

- Personal and home management may become almost completely computerized. You may be able to program your refrigerator to serve a glass of chilled fruit juice for breakfast and your closet to clean your clothes automatically.

- Home decor may be programmed by computer and changed for special occasions or holidays.

- Work options will move toward entrepreneurial and intrapreneurial activity. Entrepreneurs will create their own businesses to respond to the needs of consumers. Intrapreneurs will develop their own ventures within the structure of a larger company or corporation.

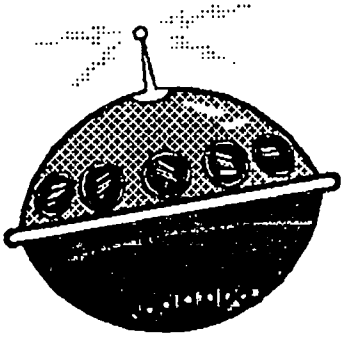
- Microcomputers will revolutionize many forms of travel, including the automobile. This will lead to great reductions in highway accidents.

- Fashion consulting will be in demand with video cameras and computerized analysis.

- Global communication will be achieved through computer networking.

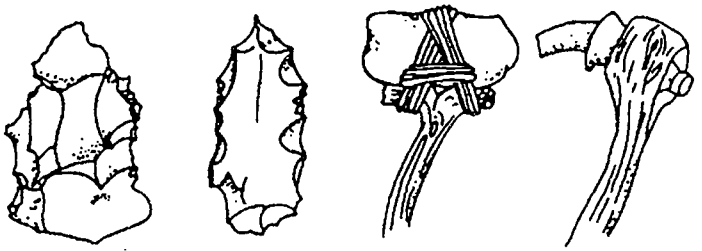
- Computers will be used for conducting interviews and making objective judgments.

What Earth People are Saying!



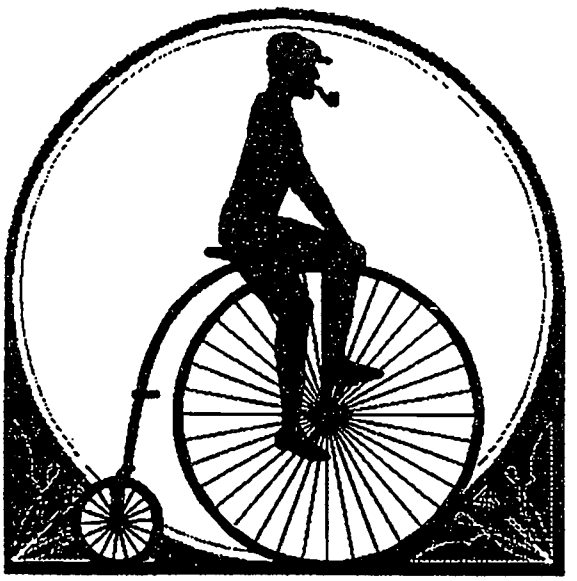
SUPPLEMENT 6A

Comparison Chart of Technology: "Oldest"

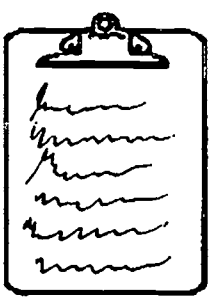


1. _____

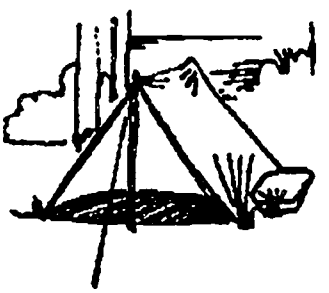
2. _____



3. _____



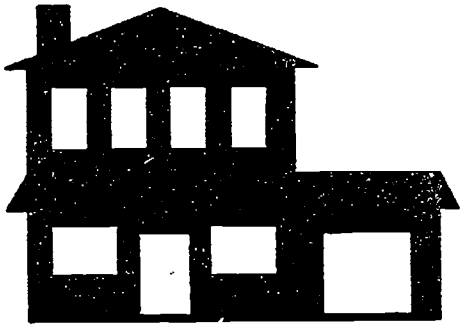
4. _____



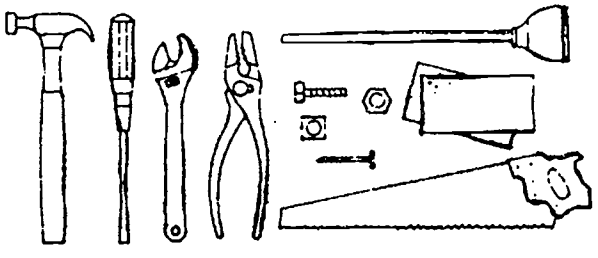
5. _____

Comparison Chart of Technology: "Newest"

A.



B.

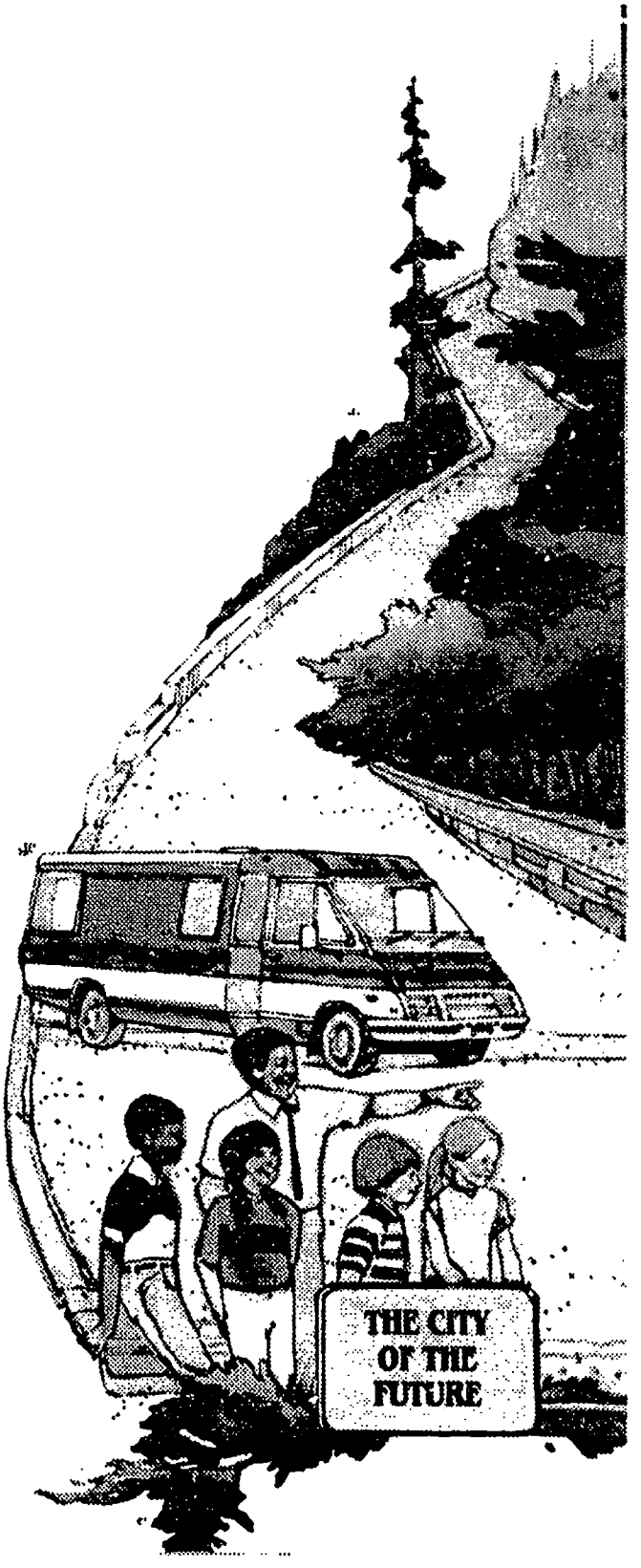


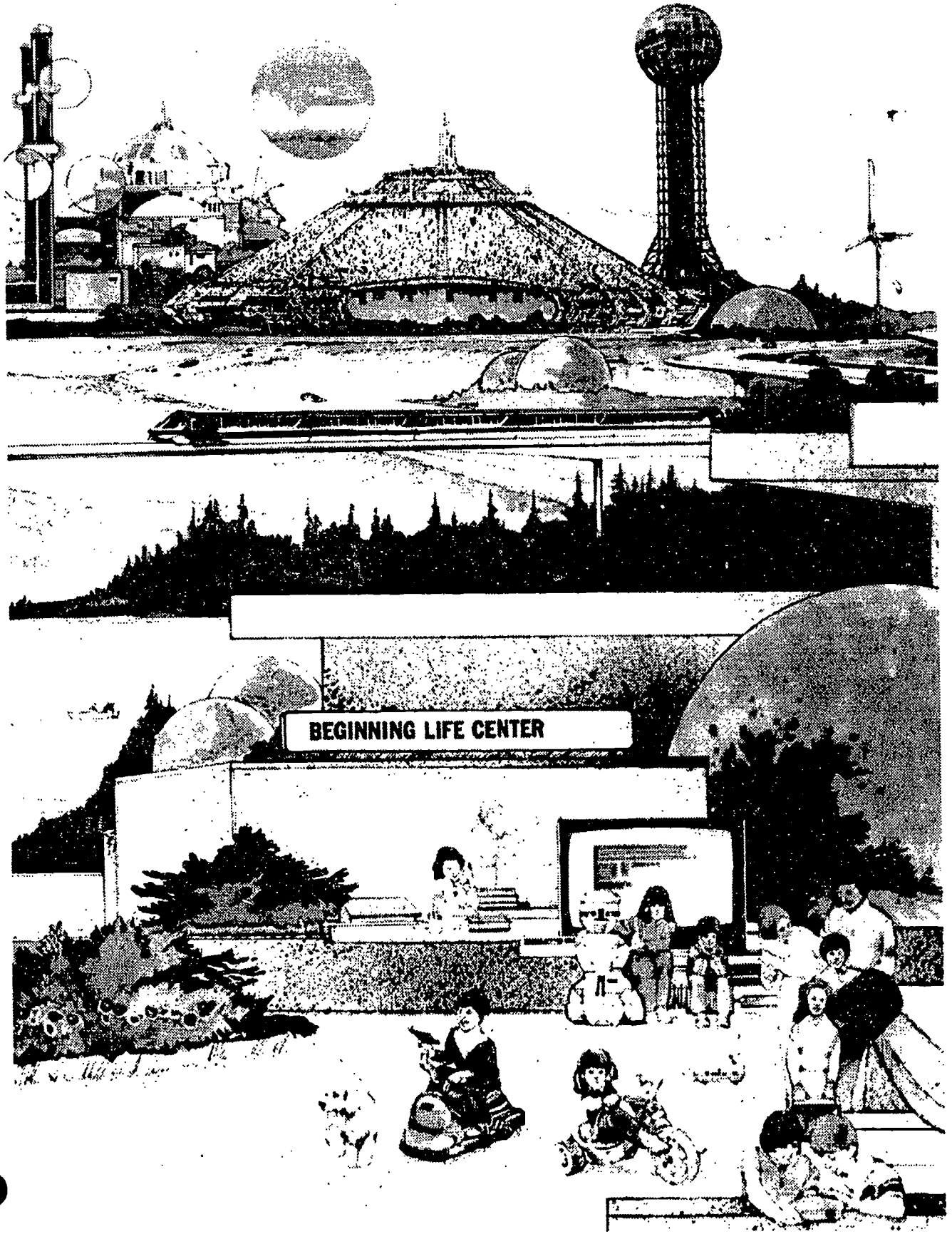
C.

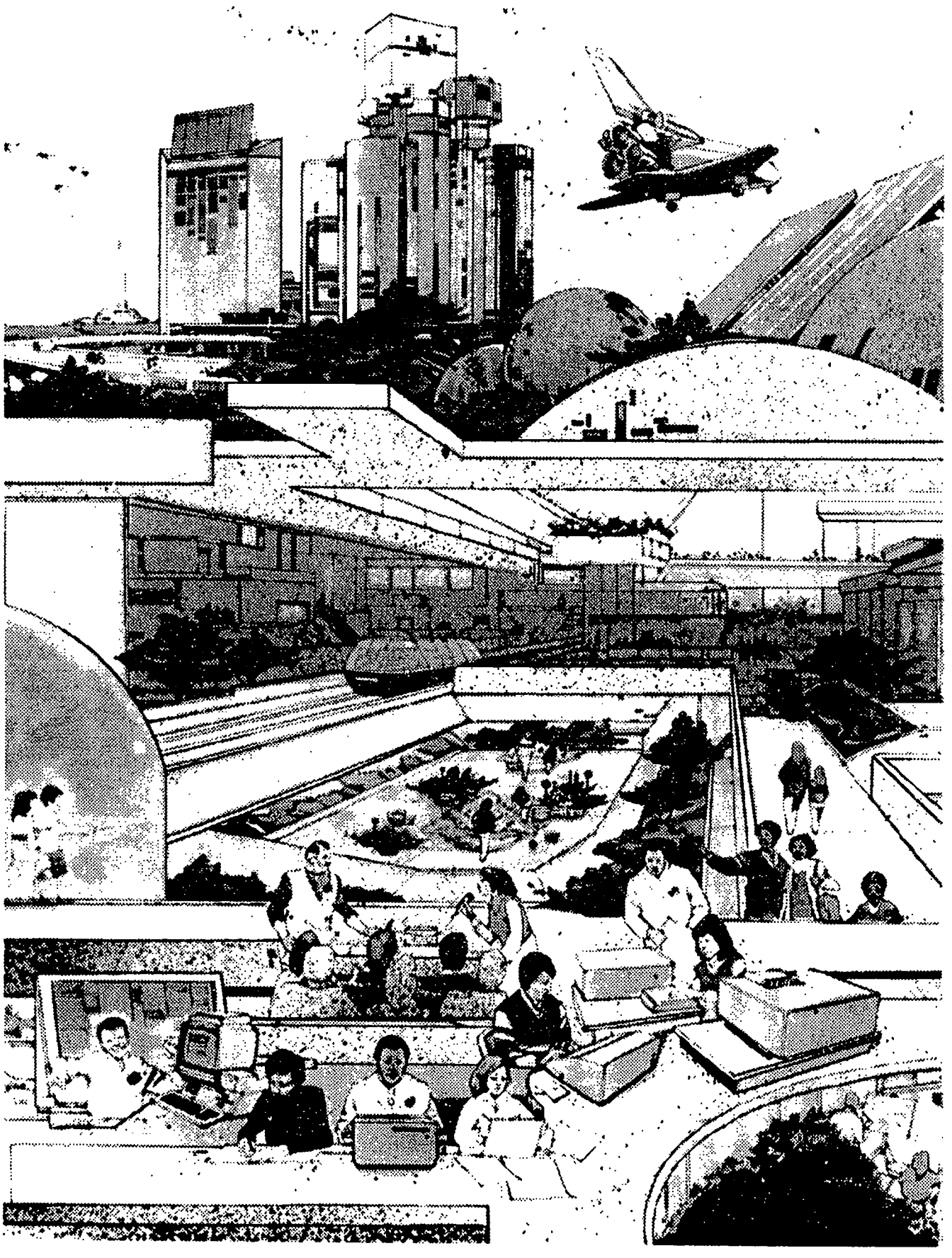
D.

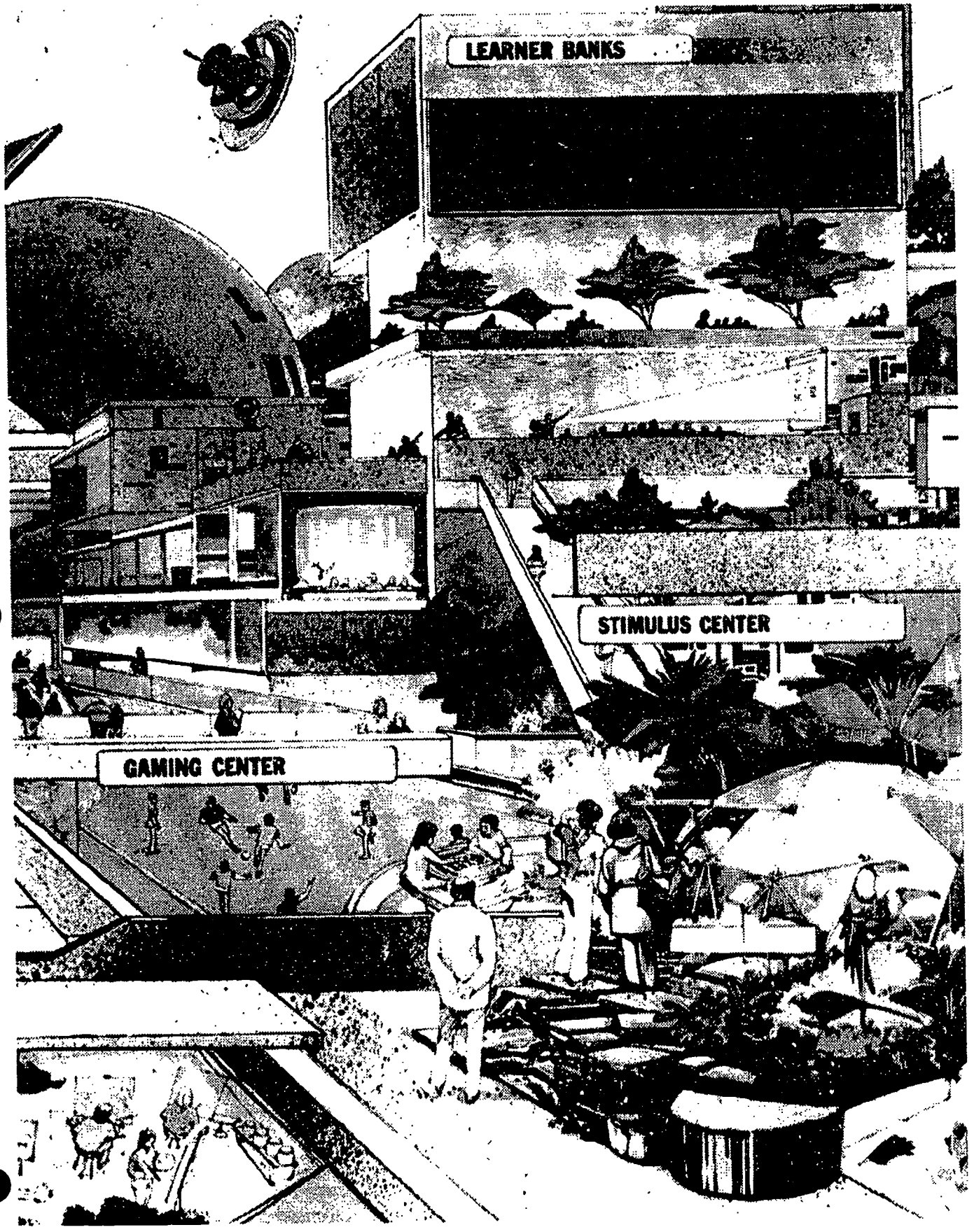
E.

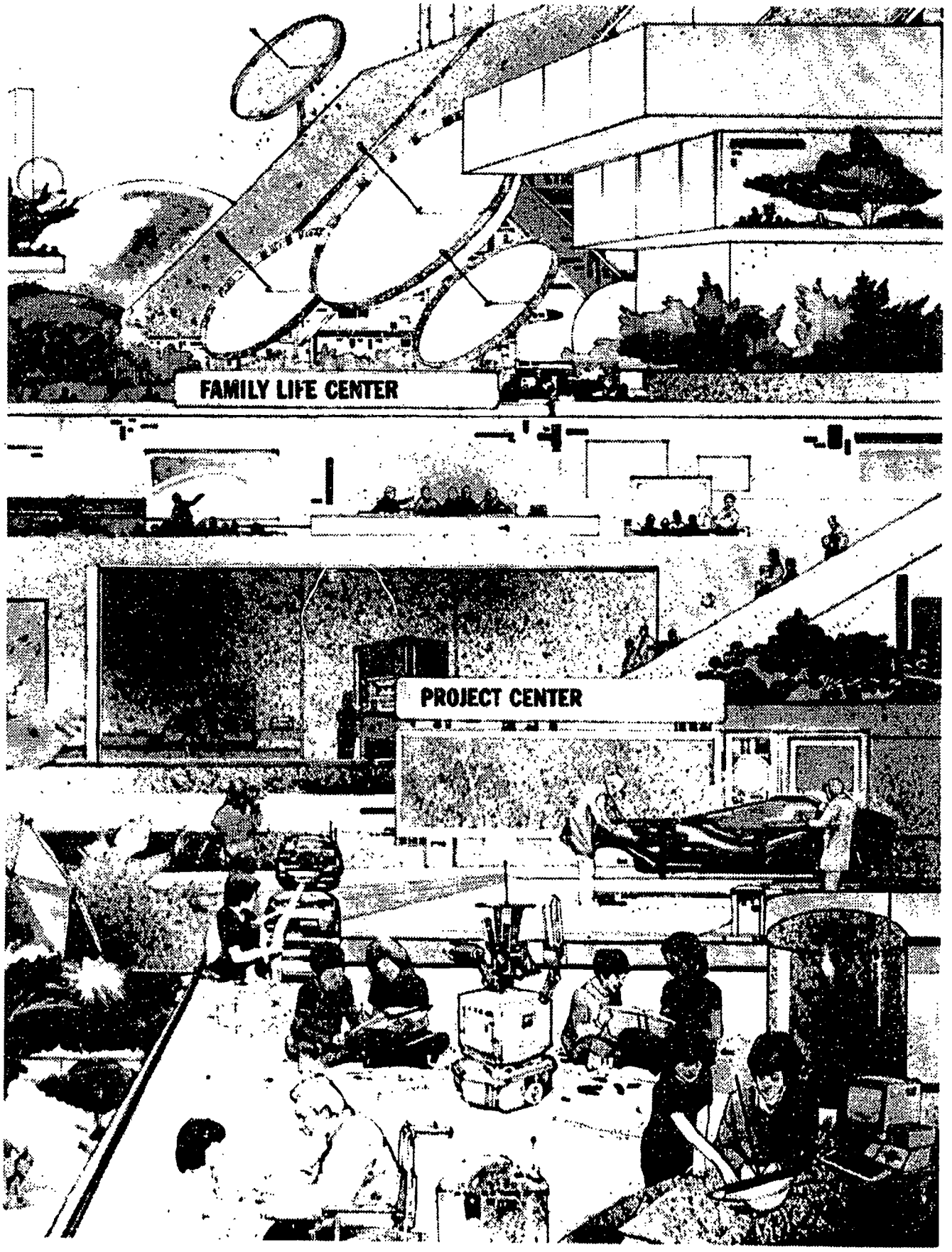
Imagineering . . .



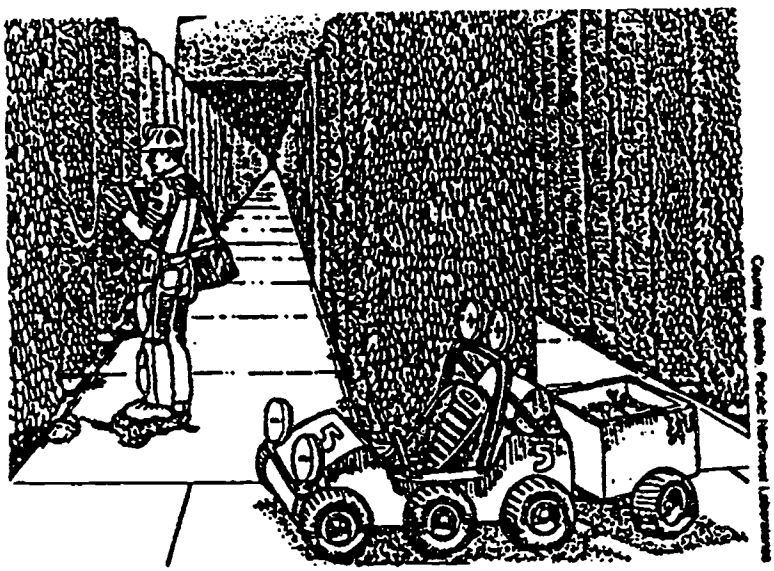

BEGINNING LIFE CENTER




LEARNER BANKS
STIMULUS CENTER
GAMING CENTER


FAMILY LIFE CENTER
PROJECT CENTER

Food for Zero-G



Before long, some farmers will be growing food that is really out of this world! The drawing shows a worker checking one of the hydroponic growth systems inside a domed space farm.

Interview with a Space Farmer

Island One, January 16, 2012

On a recent tour through the Colonies of the United Universe, we stopped at Island One and talked with a farmer there:

Q: *At lunch today, the waiter told us that all the food on the menu was produced here on Island One. Do you import any food from Earth?*
A: No, it's too expensive. We raise every bit of food for all 10,000 of our citizens right here on this farm.

Q: *You must have a very large area under cultivation?*
A: Not really. We can grow all the food necessary to support one person in an area just 6½ ft. long and 6½ ft. wide. The entire farm takes up just 100 acres.

Q: *How can you raise so much food in such a small space?*
A: Well, for one thing, we raise most of our crops hydroponically—in water instead of soil. That saves a lot of space because we can grow plants on tall vertical frames. Also, our farm produces food continuously—one crop after another, all year-round. It's always summer here, and we don't have any cloudy days or storms to contend with.

Q: *Do you raise any animals?*
A: Yes, they help us recycle leftovers. We raise our cows and goats almost entirely on corn stalks, cucumber vines, and other crop wastes.. Our chickens eat table scraps. Rabbits are our main source of meat. They take up less space than hogs or cows and they need only half as much feed to produce a pound of meat. We also raise fish in those ponds over there.

Q: *Where do you get the water for the fish ponds?*
A: All the water in the colony is used over and over again. Water for drinking and cooking comes from the farm's dehumidifiers, which pull moisture out of the air. Waste water is purified in a solar furnace and then piped back to the farm.

Q: *Have you had any crop failures?*
A: Not so far. When we started the farm, we inspected the shipments of plants and seeds from Earth very carefully to make sure they didn't contain any weeds or insects. Now our farm is pretty much pest-free.

Q: *Do you miss your farm back on Earth?*
A: Not a bit! I've even learned to like rabbitburgers!

Source: Taylor, P. (1982). *The kid's whole future catalog* (p. 76). New York, NY: Random House.

Scanning the Future

Welcome to the brave new world of the supermarket scanner, where the laser devices that tote up what's in your grocery cart will soon do a lot more than help control the store's inventory and generate detailed receipts for you. By drawing on computerized data from the scanners, and the plastic you use at the checkout counter, marketers, manufacturers, and even nonprofit groups that want to get a message to you, will soon be able to know your family's buying habits and brand preferences.

HOW WILL PEOPLE REACT
WHEN THEY REALIZE
THAT WHAT THEY BUY
TRIGGERS A NEW FLOOD
OF DIRECT-MAIL PROMOTIONS?

Adapted from Mayer, M. (1990, October 15). Scanning the future. *FORBES*, pp. 114-117

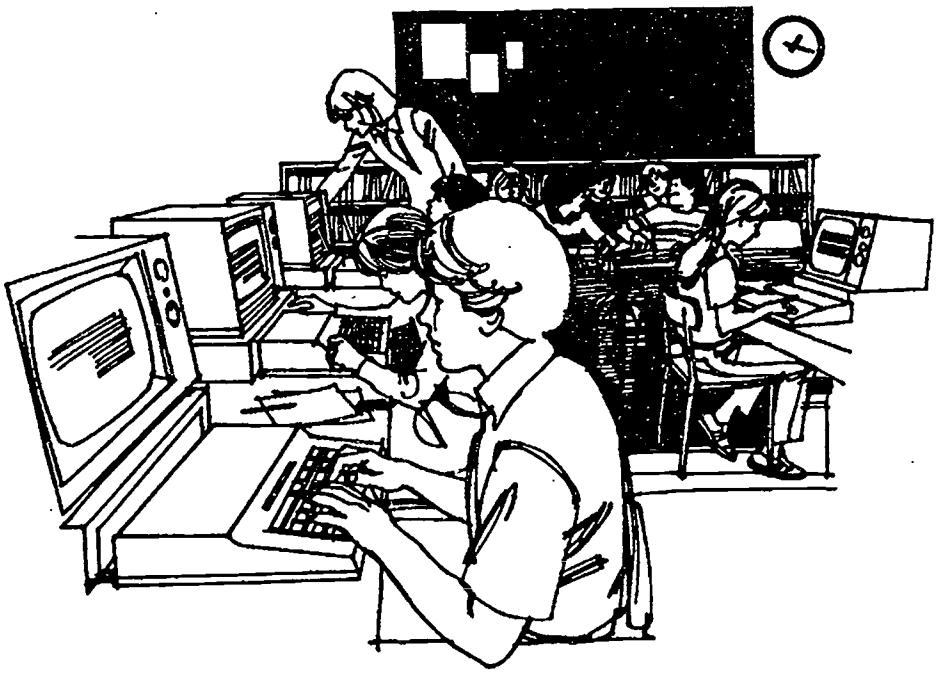
Impact of Technology on Education

Technology allows many aspects of education to be accomplished more efficiently.

- New technologically advanced equipment is used to make the physical conditions at schools more pleasant, to demonstrate occupational skills, and to help students with special needs.

Computers In Schools

- Computers are used throughout education
  - By students for math and reading drills, to take tests, and to design projects
  - By teachers to write curriculum, to grade and record tests, and to design posters
  - By administrators to keep financial records for the school, to maintain academic records for students, and to design newsletters or reports

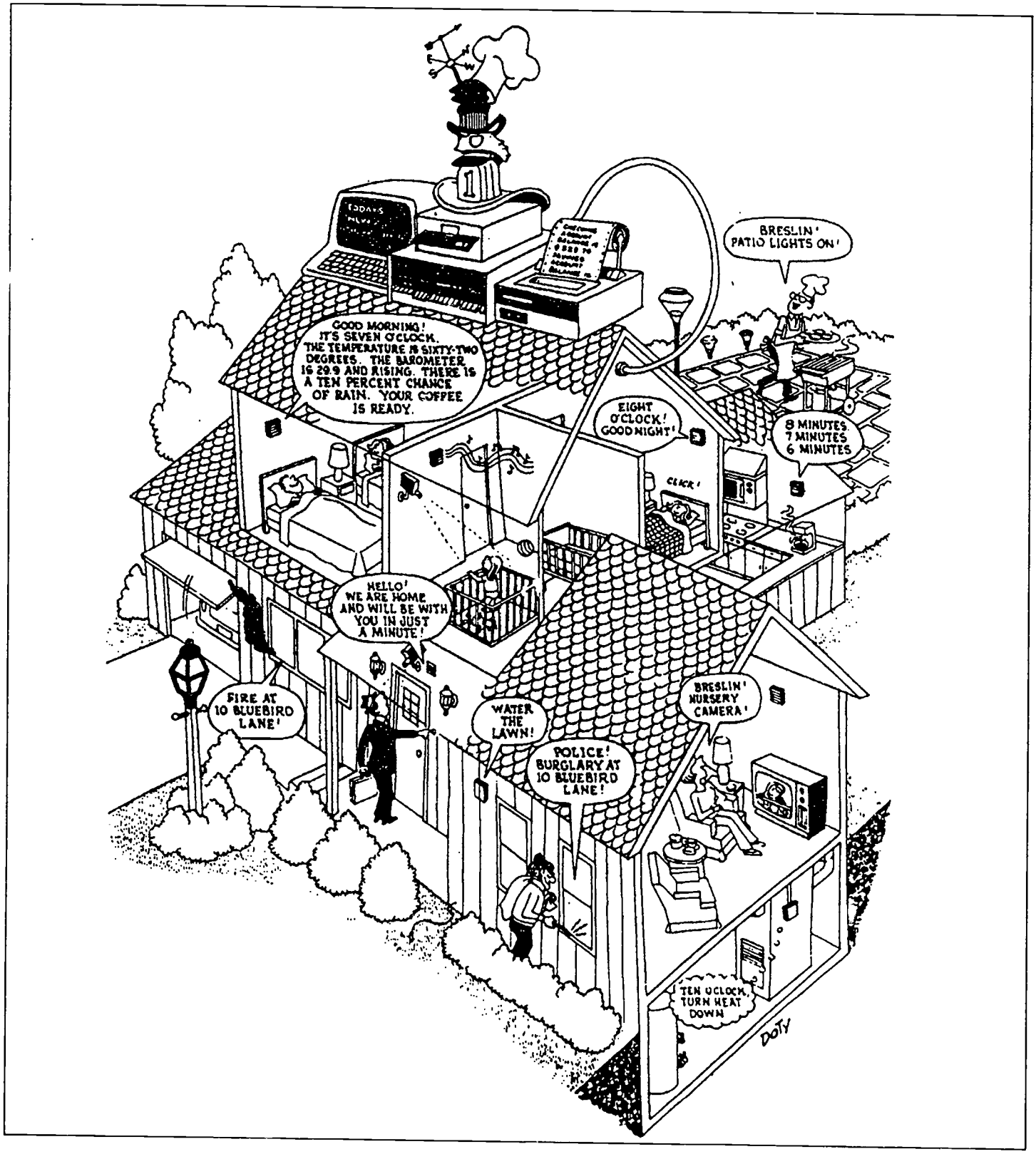


Technology helps to bring the world to the student.

- Satellites pick up signals from around the world and transmit them to education sites.
- Satellites allow talk-back television and teleconferencing to make special courses available to all schools (long-distance learning).
- Many extension classes can also be viewed on home television for homebound students or individuals interested in continuing their education at home.

Source: *Impact of technology on the family* (p. T:F-24, 25). (1992). Stillwater, OK: Mid-America Vocational Curriculum Consortium.

A House Run by a Computer



Source: Taylor, P. (1982). *The kid's whole future catalog* (p. 32). New York, NY: Random House.

Sample Letter

Dear Shana,

We've had a lot of changes around here since you last heard from me. A couple of months ago, we got a new home computer. It's a lot different from the one we had before. Our old computer could play Ping-Pong and figure out my dad's bank balance and stuff like that, but this one actually TALKS to us. It's kind of spooky—almost like there's a person inside that little box. In fact, this computer seems so human we've even given him a name. We call him "Breslin."

Breslin keeps track of all kinds of things around the house. He tells my parents when the coffee is ready and reminds me to take the garbage out. He lets us know if the grass needs watering or if the baby's crying. Breslin can operate the dishwasher, the TV, and all of our other appliances through a remote-control system. If we want him to open the garage door or turn the lights off, we just give him an order through the intercom.

Breslin is on duty day and night. He constantly checks various sensors around the house to make sure everything's all right. If a fire started or if someone tried to break into the house, he would sound an alarm.

All night long, Breslin works on the jobs we've given him during the day—like paying bills or addressing invitations to our Halloween party. Sometimes he "talks" to other computers to find out the answers to questions we ask him. Once my brother Joey wanted to know the won-lost record of all the left-handed Yankee pitchers. Breslin called the computer at the New York Public Library and got the information for him in no time.

Every morning, about the time the sun comes up, Breslin turns off night lights around the house. In the winter, he also turns up the heat. Then he checks his orders for the day. The schedule he follows depends on the day of the week. On school days, he gets me up about 6:30. "Good morning," he says cheerily. "This is Breslin." Then he tells me the time, the temperature, and what the weather's like outside. He reminds me of any appointments that day, like a babysitting job or my piano lesson. Finally, he turns on my radio to my favorite station for music and the news.

Usually everything goes smoothly, but once in a while my family wishes we'd never heard of Breslin. One time his clock got mixed up and he woke us up at 3:00 in the morning. Another time we were all out in the backyard and my dad was cooking hamburgers on the grill. Dad asked Breslin to turn the patio lights on—but instead he locked us out of the house and set off the burglar alarm. You should have seen us trying to explain that one to the police!

Write soon,

Love, Ann

Source: Taylor, P. (1982). *The kid's whole future catalog* (p. 33). New York, NY: Random House.

Positive and Negative Effects of Technology

DIRECTIONS: Distinguish between the positive and negative aspects of technology by writing P or N on the blank before each statement.

____ A. New products are produced more efficiently.

____ B. Many people feel a loss of privacy and less secure.

____ C. Many new products have increased costs.

____ D. Information can be accessed much faster.

____ E. Families are cocooning which leads to less interaction.

____ F. More information and training will be needed to use each new device.

____ G. Environmental problems from excess wastes that are not biodegradable are increasing.

____ H. Communication is easier and more mobile.

____ I. Transportation continues to improve and be more energy-efficient.

____ J. Newer products will need to be replaced rather than repaired.

Source: *Impact of technology on the family* (Unit 1, p 12). (1992). Stillwater, OK: Mid-America Vocational Curriculum.

SUPPLEMENT 14

Positive and Negative Effects of Technology on Individual Health

Positive

1. Being healthy
2. Helps individuals cope with change/stress
3. Increases life expectancy
4. Provides more career opportunities in development, testing, research, and evaluation of technology
5. Improves medical procedures (laser surgery, x-ray, and so on)
6. Develops new pharmaceutical products (drugs)
7. Allows individuals to live at home instead of in medical institutions

Negative

1. Results in higher costs because of more drug options, more treatments, higher insurance rates, and newer facilities and equipment
2. May create more complications or side effects arising from new drugs and treatments
3. Creates environmental problems with contaminated medical wastes and throw-away packaging
4. Creates legal and ethical dilemmas (life-support systems, organ transplants)
5. May result in increased stress related to newer advancements requiring greater productivity, more decisions about options available, and more education needed to stay informed

Source: *Impact of technology on the family* (p. T:F-60, 61) (1992). Stillwater, OK: Mid-America Vocational Curriculum Consortium.

SUPPLEMENT 15

What's My Responsibility?

Burger King, McDonald's, and Wendy's have all announced that they are cooking their French fries in 100% vegetable oil. No more 90+% artery-clogging beef fat. No more fries with more saturated fat than hamburger. How does this decision affect their image? Will it affect you?

The noise level has risen steadily in the twentieth century, increasing both stress and hearing loss in individuals. Experts report that loud music already is causing permanent damage to the hearing of many young people. What jobs might expose you to high levels of noise?

Adapted from Illinois State Board of Education. (1992). *Illinois plan for home ecor : .ics education exploration/orientation curriculum guide* (p. SA-15). Macomb, IL: Curriculum Publications Clearinghouse.

Help for Those Terrified of Technology

TECHNOPHOBIA: Anxiety experienced by a person when confronted with an object or situation involving technology.

- Educate yourself. Take classes, call the manufacturer's helpline, ask questions of your technologically endowed friends. The more you know the less you have to fear.
- Learn only what you need to. If a product has features you don't need, don't bother learning about them.
- Rely on other people.
- Join a support group.
- Realize you have the option of doing it the old way.
- Don't insist on control. Let your spouse, children, or coworkers be responsible for operating the machine and fixing it if it breaks.
- Ask for help. Experts say your confusion is most likely the result of overly complex product design, not inadequacy on your part.
- Turn it OFF. Try later when the frustration is gone.

SUPPLEMENT 17

Evaluate Given Situations About Concerns with Medical Life Support

The medical community deals with life and death situations every day. When dealing with whether or not to use life-support systems, there is often a conflict between the medical staff, the legal system, the family, and the patient. This supplement will help you see how difficult the decisions about life support can be.

DIRECTIONS: After reading the situations below, decide who will remain on life-support systems. Indicate your decisions by circling yes or no. State your rationale of how you made that decision. Be prepared to discuss your decisions with the group.

Yes No 1. A 5-year-old girl has taken an overdose of drugs obtained from a tamper-proof container. The child has been in a coma for eight weeks and is being fed intravenously (by IV bottle). Doctors are not sure if or when the child will regain consciousness.

Rationale for decision:

Yes No 2. A 58-year-old woman has suffered from emphysema for many years. She is back in the hospital and is unconscious because of the lack of oxygen to her brain. Her lungs can no longer do their job, so she is on an artificial respirator.

Rationale for decision:

Yes No 3. A 16-year-old boy was involved in an automobile accident two days ago. He has multiple injuries with the most serious being the head injury. He is unconscious and is being fed intravenously. The latest tests show very little brain activity.

Rationale for decision:

DIRECTIONS: Answer the following questions in the blank provided.

1. Who should make these decisions regarding life support?

2. Has technology improved the quality of life or simply prolonged it? Why?

Source: *Impact of technology on the family* (p. T:F-67-69). (1992). Stillwater, OK: Mid-America Vocational Curriculum Consortium.

Positive and Negative Impacts of Technology

Impact on Families

Positive

1. There is a greater variety of services available for home use (e.g., food delivery, electronic entertainment, shopping networks, electronic mail).
2. New products are produced more efficiently (e.g., computer-aided design, computer integrated manufacturing, robotics).
3. Information can be accessed much faster (e.g., facsimile machines, pagers, educational satellite programs, personal computers with subscription utilities).
4. Communication is easier and more mobile (e.g., portable phones, cellular car phones, pagers, personal computers, facsimile machines).
5. Transportation continues to improve and be more energy-efficient (e.g., vehicles are designed with improved aerodynamics; aluminum and plastics are replacing heavier steel parts; artificial intelligence programs produce "brainy cars" that almost drive themselves; more vehicles use alternative energies).
6. Individuals with physical disabilities have increased mobility and improved performance of tasks (e.g., electric wheelchairs, communication through electronic devices, computers especially designed to assist with various disabilities).
7. Home health care made available through medical advancements is less expensive than hospitalization or nursing care facilities and allows for an improved quality of life for the elderly or disabled person.
8. Telecommuting allows work-at-home opportunities.
9. Employers have become more aware and responsive to employees' needs in order to attract and retain workers.
10. Using technology at home makes adjustments to the workplace easier.
11. Technology responds to the needs of more personal choices, freedom, and security.
12. Persons with disabilities can achieve greater independence.

Negative

1. "Cocooning" leads to decreased physical activity and less interaction with friends, neighbors, and extended family members.

2. More training and information will be needed to use or service the many new devices.

3. Newer products will need to be replaced rather than repaired resulting in increased costs and more discarded items.

4. Environmental problems from excess wastes that are not biodegradable are increasing.

5. New technology that was designed to assist the consumer also allows others to track your purchases and know about your personal life. Many people feel a loss of privacy and less secure knowing that others can also access information about them (e.g., computerized bank accounts, computerized medical records, home shopping using credit card numbers).

6. Many products and procedures used by technology can cause health problems for family members (e.g., respiratory problems from smog, joint injuries from repetitive motion while operating machinery, cancer from water contaminated by toxic waste).

7. As technology increases in leisure life, communication tends to decrease.

8. Medical advances now available so individuals can remain at home may burden the time and expenses of family members who care for an ill, disabled, or elderly person in the home. Also, daily invasion of privacy occurs by care providers.

9. Retraining for employment changes may leave the family head-of-household unemployed.

10. Job mobility may lessen family support.

Impact on Child Development

Positive

1. Increased competence of children using computers and machines.
2. More innovative child development products, toys, and equipment.
3. Increased awareness of the world by children because of more exposure through the media.
4. More opportunities for problem-solving games and tutoring through the use of the computer.
5. Later ages for marrying. Couples are marrying and having children later when they are more financially and emotionally prepared for parenting. This is an indirect effect of technology.

Negative

1. Less human interaction. Studies show less one-to-one contact between people, including coworkers, partners, and parents and children.
2. Stress occurs when technology systems that we depend on break down.
3. Stress also occurs when one feels she/he does not have enough time to accomplish work or leisure activities.
4. There is also increased stress from trying to stay up-to-date on new technological inventions and breakthroughs.
5. Less physical activity because technology encourages spectators over participants. "Couch potatoes" watch television for hours at a time.
6. Many technology products are designed to make work easier and less physically demanding (e.g., instead of pulling open the garage door, we now push a button to open it).
7. Less uniqueness; more products are mass produced, resulting in more look-alikes.

Source: *Impact of technology on the family* (p. T:F-7, 8, 41-43). (1992). Stillwater, OK: Mid-America Vocational Curriculum Consortium.

SUPPLEMENT 19

Impact of Technology on the Workplace

Note: Increasing numbers of companies, including small companies, are adopting work and family benefits to attract and keep highly qualified workers, especially a growing number of women.

Job Shift

1. The types of jobs available change with new technology.
2. There has been a decrease in the number of manufacturing jobs.
3. There has been an increase in information processing and service jobs in areas such as finance, insurance, real estate, child and elder care, medical care, public utilities, and transportation.

Adult Retraining

1. The need for manual labor has declined with the technological automation of industry and robots.
2. This shift in the workforce emphasizes the need for advanced and continuing education, training, and retraining.
3. Adults can expect to change jobs several times in their working life.

Work Schedules

1. Part-time positions allow for more free time, more time at home with children, and seasonal workloads for industry.
2. Flextime gives employees the freedom to set their own working hours within a given framework. Examples: 8-4; 7-3; a 4-day week (10 hours each day); or a 5-day week (8 hours each day)
3. Shared jobs allow two people to share the hours and duties of one full-time job.

Company-Provided Child Care

On site or nearby child care allows working parents to be closer to their children. Child care expense may be partially or totally covered by the company as an employee benefit.

Source. *Impact of technology on the family* (p. T:F-23. 24). (1992). Stillwater, OK: Mid-America Vocational Curriculum Consortium.

Skills Workers Will Need

Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.

A. *Reading*—Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.

B. *Writing*—Communicates thoughts, ideas, information, and messages in writing; creates documents such as letters, directions, manuals, reports, graphs, and flow charts.

C. *Arithmetic/Mathematics*—Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.

D. *Listening*—Receives, attends to, interprets, and responds to verbal messages and other cues.

E. *Speaking*—Organizes ideas and communicates orally.

Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons.

A. *Creative Thinking*—Generates new ideas.

B. *Decision Making*—Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

C. *Problem Solving*—Recognizes problems and devises and implements plan of action.

D. *Seeing Things in the Mind's Eye*—Organizes and processes symbols, pictures, graphs, objects, and other information.

E. *Knowing How To Learn*—Uses efficient learning techniques to acquire and apply new knowledge and skills.

F. *Reasoning*—Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.

A. *Responsibility*—Exerts a high level of effort and perseveres toward goal attainment.

B. *Self-Esteem*—Believes in own self-worth and maintains a positive view of self.

C. *Sociability*—Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.

D. *Self-Management*—Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.

E. *Integrity/Honesty*—Chooses ethical courses of action.

Resource Management: Identifies, organizes, plans, and allocates resources.

A. *Time*—Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.

B. *Money*—Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.

C. *Material and Facilities*—Acquires, stores, allocates, and uses materials or space efficiently.

D. *Human Resources*—Assesses skills and distributes work accordingly, evaluates performance, and provides feedback.

Interpersonal: Works with others.

A. *Participates as Member of a Team*—Contributes to group effort.

B. *Teaches Others New Skills*—Negotiates with others to solve problems or reach decisions.

C. *Exercises Leadership*—Communicates ideas to justify position; persuades and convinces others.

E. *Negotiates*—Works toward agreements.

F. *Works with Diversity*—Works well with women and men from diverse backgrounds.

Information: Acquires and uses information.

A. *Acquires and Evaluates Information*—Identify, assimilate, and integrate information from diverse sources.

B. *Organizes and Maintains Information*—Prepare, maintain, and interpret quantitative and qualitative records.

C. *Interprets and Communicates Information*—Convert information from one form to another and are comfortable conveying information orally and in writing.

D. *Uses Computers to Process Information*—Understands operations of equipment.

Technology: Works with a variety of technologies.

A. *Selects Technology*—Chooses procedures, tools, or equipment including computers and related technologies.

B. *Applies Technology to Task*—Understands overall intent and proper procedures for setup and operation of equipment.

C. *Maintains and Troubleshoots Equipment*—Prevents, identifies, or solves problems with equipment, including computers and other technologies.

Adapted from *The Occupational Outlook Quarterly.* (1993, Fall). Office of Employment Projections, Bureau of Labor Statistics, U.S. Department of Labor, 2 Massachusetts Avenue, NE, Washington, DC 20212-0001.

A Creativity Profile

Most people have a mixture of both creative and uncreative qualities. For each item below, decide if you are closer to the creative or uncreative factor. Then circle the number that best describes you.

	UNCREATIVE ←						→ CREATIVE
Desire to give and serve	1	2	3	4	5	6	7
Enthusiastic	1	2	3	4	5	6	7
Confidence in self and others	1	2	3	4	5	6	7
Calm, relaxed, alert	1	2	3	4	5	6	7
Sensitive, aware	1	2	3	4	5	6	7
Open-minded	1	2	3	4	5	6	7
Curious, looks for better ways	1	2	3	4	5	6	7
Often thinks imaginatively	1	2	3	4	5	6	7
Willing to experiment	1	2	3	4	5	6	7
Enjoys life, smiles, and laughs	1	2	3	4	5	6	7
Uses good judgment	1	2	3	4	5	6	7
Uses time well	1	2	3	4	5	6	7
Takes care of health	1	2	3	4	5	6	7

Increasing Your Creativity

Try one of these suggestions to increase your creativity.

- Take something you value and give it to someone who will appreciate it.
- Exercise in the fresh air.
- Visit a friend who has lots of positive energy.
- List 7 things you can do well and review your list at least 3 times during the next 24 hours.
- Think about what it would be like to live without war or crime.
- Picture a very difficult situation and see yourself handling it calmly.
- Think about the positive aspects of your life.
- Spend time becoming friends with a person from a different background.
- Without spending extra money, give yourself 3 new experiences.
- Read a book about a very creative person.
- Look at an item near you (a stapler, a zipper) and try to figure out exactly how it works.
- Do one of your regular activities in a different way (e.g., go to work a new way).
- Experiment with some of the items you normally throw away and see what you can make.
- Find something that you really like in the next 3 people you meet.
- Think about a problem situation and find something good in it.
- Think of how each moment of life goes by so quickly and therefore is special.
- Go out of your way to help others experience a little joy.
- Practice saying what is on your mind, but do so with kindness.
- Consider how you use your time and then pick out 2 things you would like to stop doing.
- Design a personal exercise plan and guidelines for healthier eating.
- Think of something that you want to do but have been putting off, and do it before the day is over.
- Look at a single object (flower, leaf, pencil) and concentrate on it for 3 minutes.
- Make excellence a habit by always doing your best.
- Practice staying happy.
- Do something that will better organize the area in which you work.
- Change something in your environment to make it more positive.

Determine Technology Needed To Solve Given Problems

One of the goals of technology is to solve problems. However, humans must make decisions about what technology is appropriate in each situation.

DIRECTIONS: Determine how technology is needed to solve the following problems based on your own awareness of technology. Read each of the following case studies and in writing determine how technology can be used to help solve the individual or family problem.

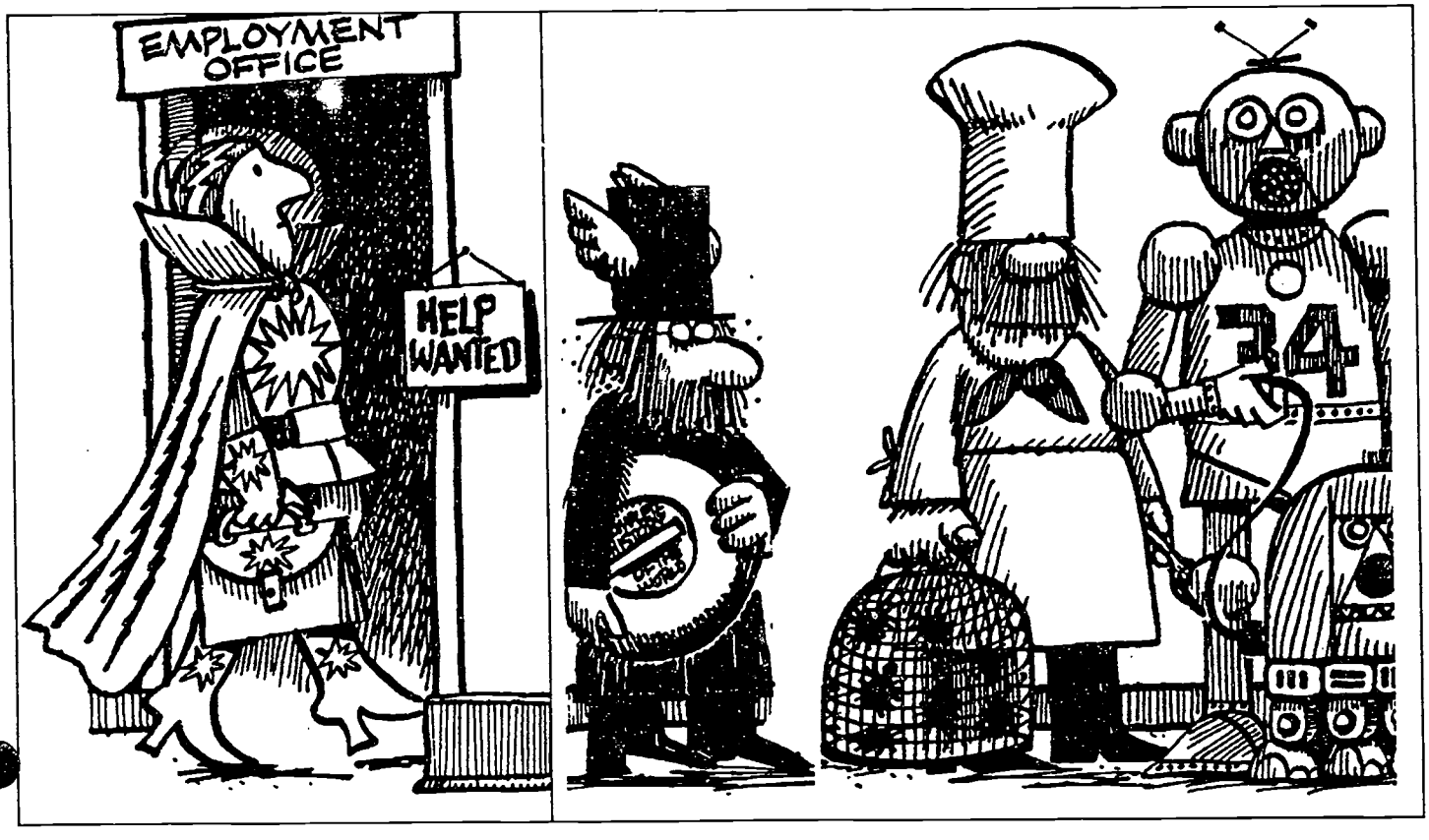
Case A: Mr. & Mrs. Gregory, an elderly couple, return home to a dark house after an evening of playing bingo at the senior citizen center. The potential for burglary exists within their neighborhood. How can technology help this couple?

Case B: Andrea, a sixteen-year-old high school student, is having difficulty finding enough time for study and frequently "forgets" to complete her homework. How can technology help her with this problem?

Case C: David and Maria are the young parents of baby Lee. Lee has breathing problems including asthma and an allergy to mold spores. David and Maria are fearful their baby will stop breathing. How can technology help solve their problem?

Source: *Impact of technology on the family* (p. T:F-11, 12). (1992). Stillwater, OK: Mid-America Vocational Curriculum Consortium.

Help Wanted 21st Century Careers



ROBOT RELATIONS. Interviewer needed to design or match personal robots to the needs and desires of human customers. Four years experience with robots, psychology degree, and high-level communication skills necessary. Your own personal robot included. Inquire MECHAN PALS, INC., 5K2-1B8-NV2

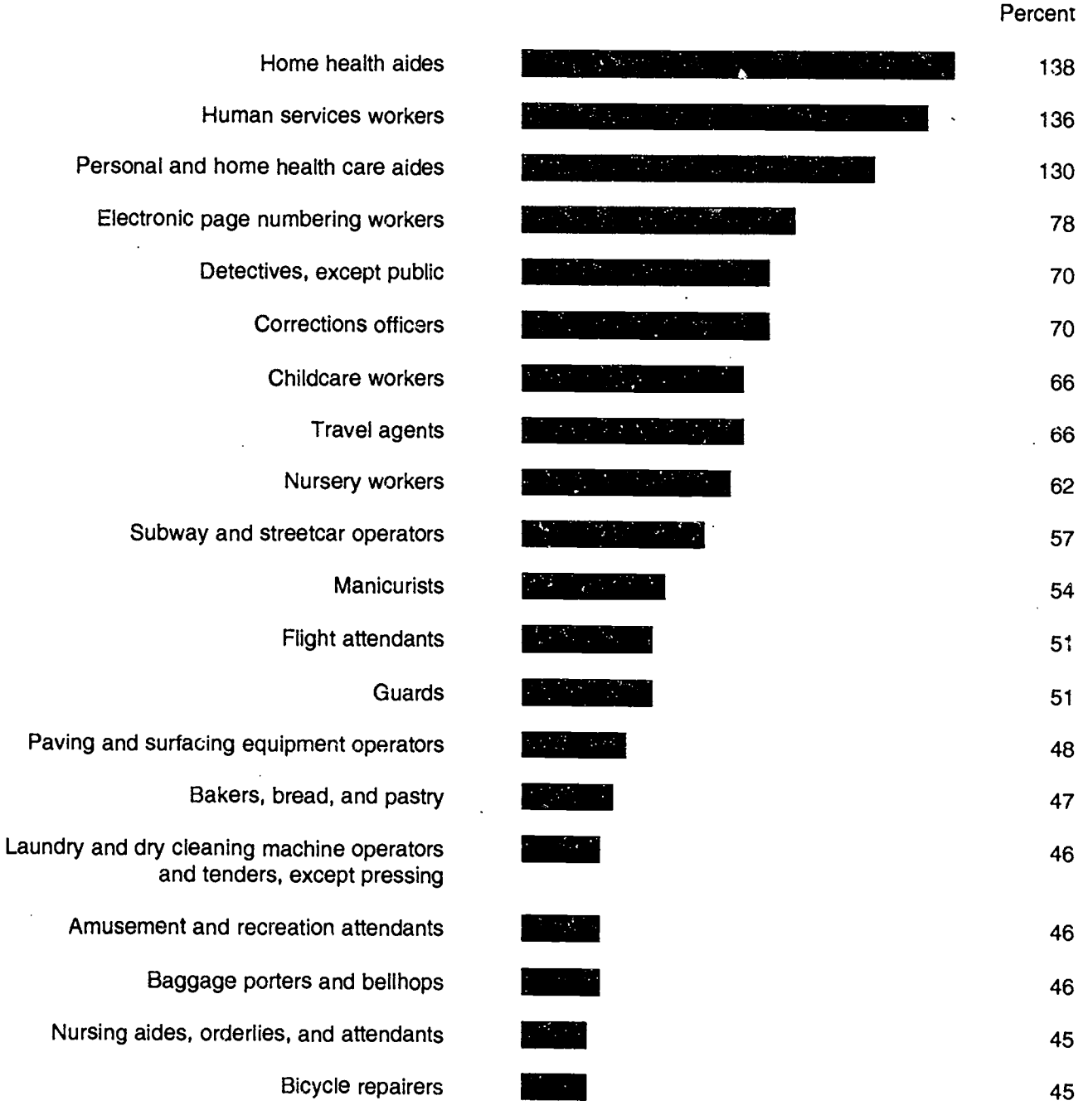
CHEFS needed for space hotel. To specialize in insect cookery. Top salary plus time-in-space bonus pay. Free transportation to and from Earth. Zip your résumé to Earth Headquarters. SPACE-OUT INNS, J207-1P26V

ACTORS/ACTRESSES. Be a star among the stars! Sing and dance on stages throughout the galaxy! The UP AND AWAY THEATER has bookings at Moon Base II and all the major space colonies. Zip your videotape to Minerva White, Director, 46X8N06

HISTORY RESEARCH POSITION AVAILABLE. Are you interested in what written communication was like back in the 20th century? Extensive computer work involved. Weekly reassignment, flex hours, and personally tailored workload. Zip your résumé to WHATWAS CORP., 4V19-D458S

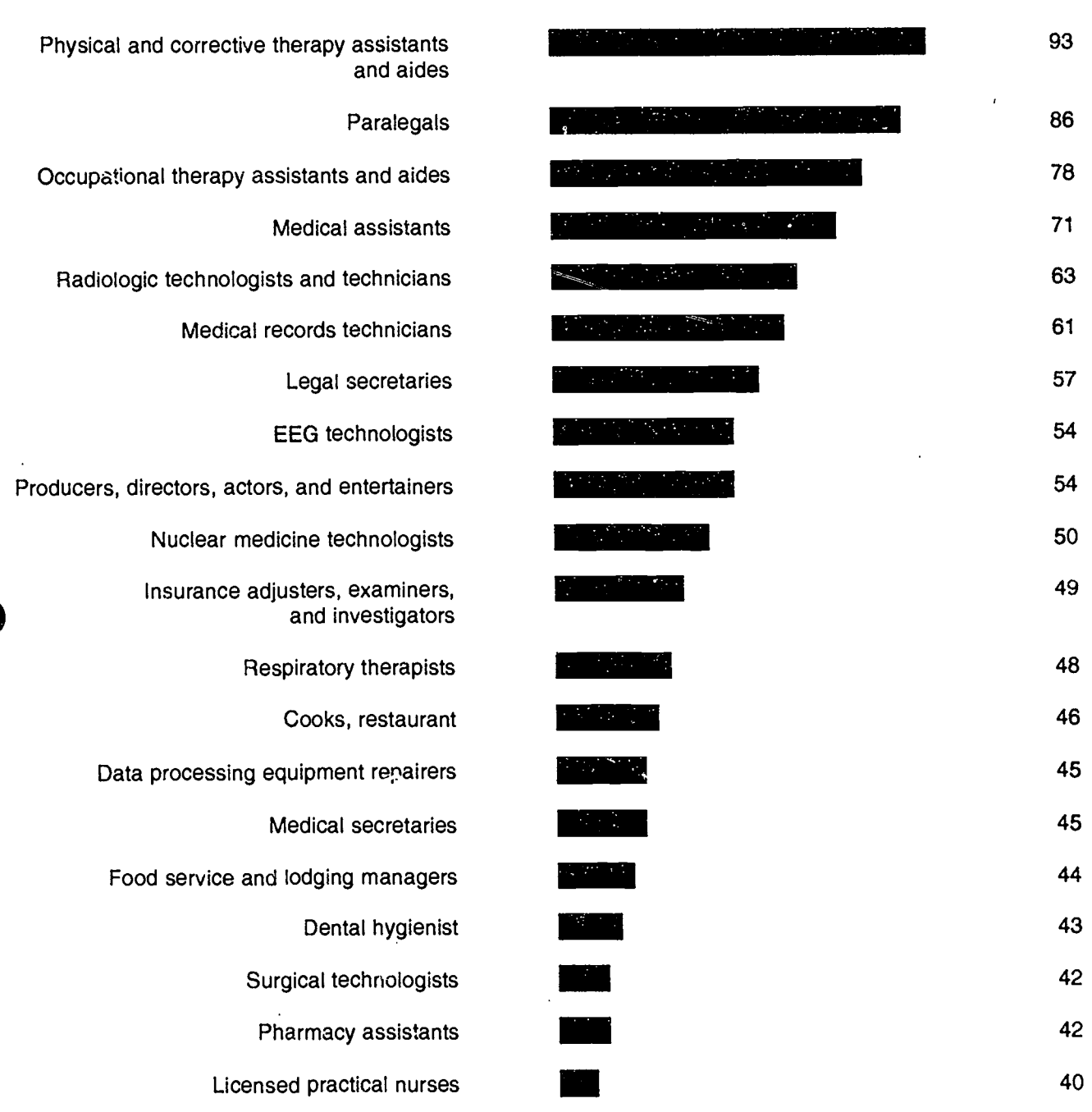
Adapted from Taylor, P. (1982). *The kid's whole future catalog* (pp. 198, 199). New York, NY: Random House.

Fastest Growing Occupations Requiring a High School Diploma or Less Education



Source: *The Occupational Outlook Quarterly*. (1993, Fall). Office of Employment Projections, Bureau of Labor Statistics, U.S. Department of Labor, 2 Massachusetts Avenue, NE, Washington, DC 20212-0001.

Fastest Growing Occupations Requiring Some Postsecondary or Extensive Employer Training



Source: *The Occupational Outlook Quarterly.* (1993, Fall). Office of Employment Projections, Bureau of Labor Statistics, U.S. Department of Labor, 2 Massachusetts Avenue, NE, Washington, DC 20212-0001.

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Understanding the Impact of New Technology on Life and Work – Notes

WORLD-CLASS EDUCATION FOR THE 21ST CENTURY: THE CHALLENGE AND THE VISION

VISION STATEMENT

As we approach the 21st century, there is broad-based agreement that the education we provide for our children will determine America's future role in the community of nations, the character of our society, and the quality of our individual lives. Thus, education has become the most important responsibility of our nation and our state, with an imperative for bold new directions and renewed commitments.

To meet the global challenges this responsibility presents, the State of Illinois will provide the leadership necessary to guarantee access to a system of high-quality public education. This system will develop in all students the knowledge, understanding, skills and attitudes that will enable all residents to lead productive and fulfilling lives in a complex and changing society. All students will be provided appropriate and adequate opportunities to learn to:

- communicate with words, numbers, visual images, symbols and sounds;
- think analytically and creatively, and be able to solve problems to meet personal, social and academic needs;
- develop physical and emotional well-being;
- contribute as citizens in local, state, national and global communities;
- work independently and cooperatively in groups;
- understand and appreciate the diversity of our world and the interdependence of its peoples;
- contribute to the economic well-being of society; and
- continue to learn throughout their lives.

MISSION STATEMENT

The State Board of Education believes that the current educational system is not meeting the needs of the people of Illinois. Substantial change is needed to fulfill this responsibility. The State Board of Education will provide the leadership necessary to begin this process of change by committing to the following goals.

ILLINOIS GOALS

1. Each Illinois public school student will exhibit mastery of the learner outcomes defined in the State Goals for Learning, demonstrate the ability to solve problems and perform tasks requiring higher-order thinking skills, and be prepared to succeed in our diverse society and the global work force.

2. All people of Illinois will be literate, lifelong learners who are knowledgeable about the rights and responsibilities of citizenship and able to contribute to the social and economic well-being of our diverse, global society.

3. All Illinois public school students will be served by an education delivery system which focuses on student outcomes; promotes maximum flexibility for shared decision making at the local level; and has an accountability process which includes rewards, interventions and assistance for schools.

4. All Illinois public school students will have access to schools and classrooms with highly qualified and effective professionals who ensure that students achieve high levels of learning.

5. All Illinois public school students will attend schools which effectively use technology as a resource to support student learning and improve operational efficiency.

6. All Illinois public school students will attend schools which actively develop the support, involvement and commitment of their community by the establishment of partnerships and/or linkages to ensure the success of all students.

7. Every Illinois public school student will attend a school that is supported by an adequate, equitable, stable and predictable system of finance.

8. Each child in Illinois will receive the support services necessary to enter the public school system ready to learn and progress successfully through school. The public school system will serve as a leader in collaborative efforts among private and public agencies so that comprehensive and coordinated health, human and social services reach children and their families.

Developed by citizens of Illinois through a process supported by the Governor, the Illinois State Board of Education and the Illinois Business Roundtable. Adopted as a centerpiece for school improvement efforts.

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ILLINOIS STATE BOARD OF EDUCATION
100 North First Street, Springfield, Illinois 62777-0001

Michael W. Skarr, *Chairperson, Illinois State Board of Education*
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