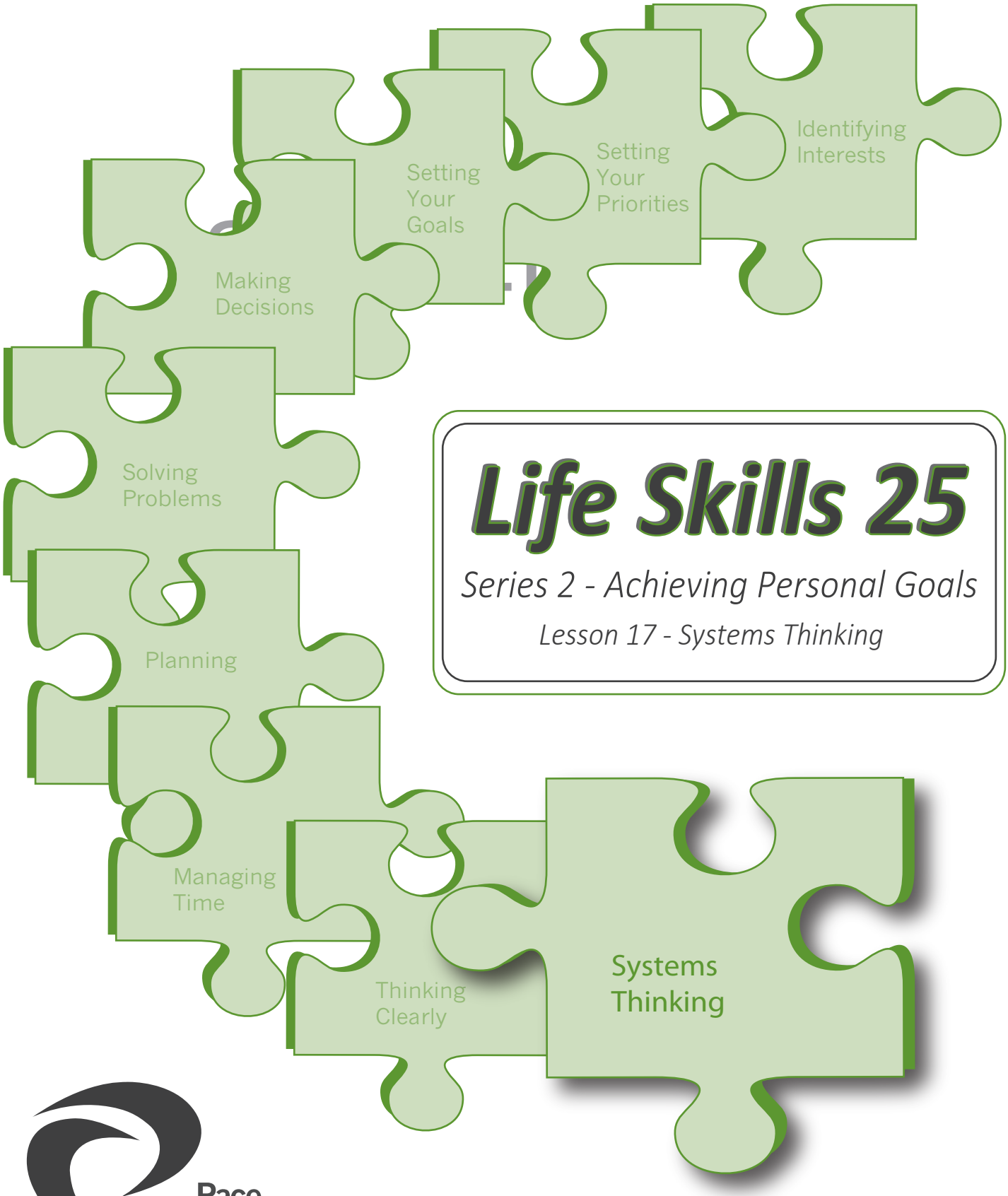

Life Skills 25

Series 2 - Achieving Personal Goals

Lesson 17 - Systems Thinking

Pace Learning Systems

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Name:

SAMPLE

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Systems Thinking

Systems Thinking

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We recognize a **system** as having many different parts – parts that work together to produce or accomplish something. For example, our justice system includes police, courts, jails, and the people who work in many different roles. A system's parts form a complex whole. The independent **subsystems** or **components** of a system perform independent functions. All of these independent functions collectively contribute to the system's objective or purpose.

For example, we might think of our national defense system. The main purpose of the whole system is to protect the country. This system includes all the different branches of our armed forces, along with all personnel, facilities, weapons, and computer networks, working together in a common mission: to defend and protect the people and property of the United States. Within this large system are numerous smaller subsystems, like training systems, weapons systems, information systems, and many other kinds of systems. Each of these has a mission of its own to perform so our national defense system as a whole can serve its purpose.

Likewise, in the private sector there are numerous examples of systems. There are manufacturing systems that produce goods; service systems that perform services; transportation systems that carry passengers and goods; and communication systems that transmit, receive, and distribute messages and information. There are also examples of systems all throughout nature, such as ecosystems, weather systems, and even plants and animal systems.

Recent technological advances have helped to form the way people think about systems. The systems concept has also affected the way a person must think in the workplace. Although you may have a very specific job to do or task to perform, it usually fits somewhere within a bigger system. That is, your job, if you do it successfully, helps the larger system reach its goals. **Systems thinking** is a problem-solving approach or way of thinking that helps us understand complex events, problems, or processes. Instead of focusing on just one aspect, we can examine how different elements work as part of a whole system.

This lesson will introduce you to systems thinking. The lesson includes the following:

- Common examples of systems
- The design of a system
- How the systems concept has affected workplace thinking and behavior
- Terms and definitions

Systems Thinking

Below are some examples of different types of systems. Notice that each system includes several component parts that combine to serve the function or purpose of the overall system.

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System	Mission/Function	Subsystems/ Component Parts
Manufacturing System (Home Appliances Factory)	Produce large quantities of home appliances like toasters, lamps, blenders, or coffee pots	Assembly plant, parts and scrap collection system, product servicing system, personnel, service technicians, equipment upkeep system
Information Processing System	Receive, process and distribute information required in operating an insurance agency	Computers, printers, computer networking system, personnel, accounting, filing system
Food Service System (Restaurant)	Serve "fast foods" to the general public	Facility, cooking hardware, personnel, cash register, order processing system, marketing team, food heating and cooling systems, food distribution system, air conditioning system
Computer Personnel Training System	Qualify personnel to troubleshoot and repair computers	Instructors, trainees, facilities, training aids and equipment, filing system, evaluation system
A Living System (Cow)	Keep a cow alive and healthy, and provide for healthy reproduction	Digestive system, reproductive system, circulatory system, heart, lungs, eyes, blood cells

Systems Thinking

Design of a System

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To understand the concept of systems, consider how you might put together a simple system to accomplish a specific purpose. Let's say you need to develop a system to produce and reproduce papers effectively and efficiently for your English class. The following steps outline the design of such a system.

Step 1: Recognize the need. The English class requires you to write several papers. Your system will need to allow you to type, edit and save, print documents, and send documents electronically. You may also need to staple or bind your documents. You decide to start at the office supply store since you know they carry the materials you will need.

Step 2: Define the mission or purpose. Based on the need to produce papers for class, you state that the purpose for the new system you plan to create is to "Efficiently type, edit, print, and electronically submit documents." You will call it your "Paper Writing System."

Step 3: Specify objectives of the major components or subsystems. Although there is one main purpose, several elements are needed to serve that purpose. There are independent parts or subsystems, each of which helps you produce your papers. In this example, your "Paper Writing System" has at least three subsystems:

- Enter, edit, and save your writing: Personal Computer Subsystem
- Print papers: Printer Subsystem
- Send documents electronically: Computer Networking Subsystem

Step 4: Obtain components for the system. In this example, you should include a personal computer and all of its component parts, which you'll need to produce, edit, and save your assignments. Your Personal Computer Subsystem would consist of things like internal computer hardware, monitor, keyboard and mouse, and software for word processing. In order to print your papers to turn them in, you will need a Printer Subsystem, which would include the printer, cables, ink cartridges, etc.

Systems Thinking

In order to send your papers electronically when your professor requests, you'll need a Computer Networking Subsystem. A **computer network** is a system in which computers in different locations are connected electronically in order to share information over distances. First, you would need a modem, or some other way to connect to the Internet. You might also need an e-mail account. Alternatively, you may need to connect to a class website to submit your paper. Other components of your "Paper Writing System" would be the necessary supplies – it may be helpful to have things like scratch paper, pens and pencils, and possibly a stapler.

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Step 5: Select qualified personnel to operate the system. This step will be important in the design of all systems. Systems that are more complicated will likely require specialists to operate the different subsystems. In this example, the personnel subsystem will be you.

Step 6: Operate and adjust the system. The final step is an ongoing process in most systems. Systems do not generally operate forever without adjustment or attention from an operator. In this case, you will be constantly working to operate your "Paper Writing System." You may need to adjust your system, by changing printer cartridges and adding more paper, or restarting or updating your computer occasionally.

Note: these steps do not guarantee that you will write "good" papers for your English class or earn an "A" on your paper. The system described above is just designed to help you produce and transmit the paper.

How the Systems Concept Has Changed Our Thinking

The systems concept has influenced business and industry by affecting business management and decision making. Management personnel analyze and make decisions about a business as a system, which has helped to shape the ways that workers are required to think and adapt in order to be successful. Therefore, understanding and using systems thinking can help you in your work career. The following are some examples of the ways workers are required to think that are related to the concept of systems.

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End of Lesson Sample

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