# SUMMARY

Introducing Systems

BIG Ideas

- ☑ Systems are designed to accomplish tasks.
- ☑ All systems include an input and an output.
- ☐ Systems are designed to optimize human and natural resources.

Looking Back

Systems are composed of parts that work together to perform a function.

- Systems are often composed of smaller subsystems and mechanisms that perform part of the overall function.
- Components of systems have specific tasks that they must perform for the system to work well.
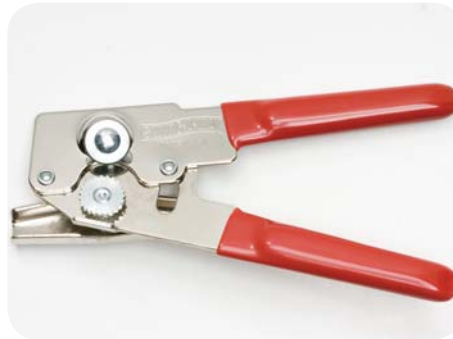

Systems may be physical (for example, telephones, electronic games, or organ systems) or social (for example, health care, transportation, education, police force, or an ant colony).

- Physical systems are often named according to the type of energy they use (for example, mechanical systems/mechanical energy, optical systems/light energy).
- Social systems are named for the type of service they provide (legal system, education system, transportation system, for example).

pentaprism — viewfinder
light path —
digital sensor
shutter
mirror
lens
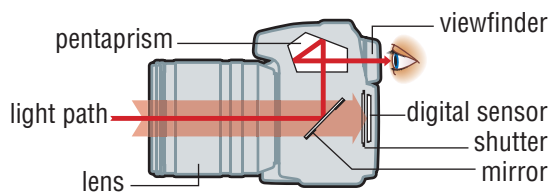
Systems have inputs, outputs, and side effects.

- Systems require inputs (force, energy, resources) and produce outputs (desired force, work, service).
- Many systems produce side effects, or undesired outputs.
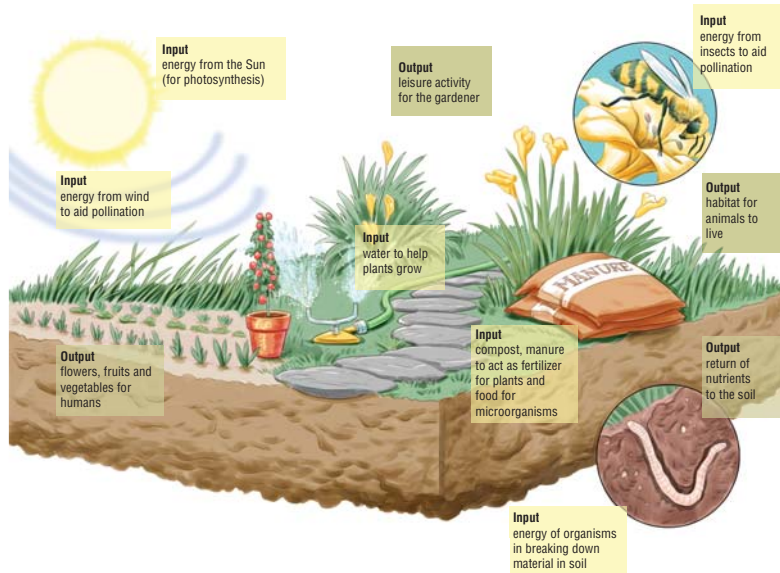
The skills of analysis can be used to study the inputs, outputs, and side effects of everyday systems.

- Devices may be investigated by identifying their subsystems and mechanisms.
- A system's usefulness may be evaluated by analyzing its effects on society and the environment.

The way we use systems affects society and the environment.

- Some side effects to using systems negatively affect society and the environment.
- People often replace systems, even when they still work.
- There are costs and benefits to consumerism.
- When we change how we make and use systems, we often impact society and the environment.
- Systems thinking is an ability to understand how parts of a system relate to all other parts, as well as how the system as a whole relates to its users, society, and the environment.