Necessary Life Functions

Maintain boundaries
Creates a space separate from the environment where activities can take place.

Movement
Locomotion
Movement of substances

Responsiveness
Ability to sense changes and react

Digestion
Break-down and absorption of nutrients

Necessary Life Functions
Metabolism—chemical reactions within the body
Produces energy
Makes body structures

Excretion
Eliminates waste from metabolic reactions

Reproduction
Produces future generation

Growth
Increases cell size and number of cells

Survival Needs

Nutrients
Chemicals for energy and cell building
Includes carbohydrates, proteins, lipids, vitamins, and minerals

Oxygen (for humans)
Required for chemical reactions

Water
60–80% of body weight
Provides an environment for metabolic reaction

Stable body temperature
Our body is optimized to function in a narrow range.

Atmospheric pressure
Must be appropriate

Survival Needs

Interrelationships Among Body Systems

Homeostasis
Homeostasis—maintenance of a stable internal environment
A dynamic state of equilibrium
Homeostasis is necessary for normal body functioning and to sustain life

Homeostatic imbalance
A disturbance in homeostasis resulting in disease

Maintaining Homeostasis
The body communicates through neural and hormonal control systems

Receptor
Responds to changes in the environment (stimuli)
Sends information to control center

Control center
Determines set point
Analyzes information
Determines appropriate response

Effector
Provides a means for response to the stimulus

Feedback Mechanisms

Negative feedback
Includes most homeostatic control mechanisms
Shuts off the original stimulus, or reduces its intensity
Returns the measured variable back to its acceptable working range.
Works like a household thermostat
Thermostat set at 75
Air turns on at 77
Heat turns on at 73
Overall effect is to maintain temp around 75.

Positive feedback
Increases the original stimulus to push the variable farther
In the body this occurs in blood clotting and during childbirth.
Stretch results in increased number and intensity of contractions.
Each contraction pushes baby further down the birth canal leading to more stretch of tissues.
Continues until baby has been delivered.