

The Human Organism

Human Identity

SAP

The similarity of human DNA sequences and the resulting similarity in cell chemistry and anatomy identify human beings as a single species.	2d
Written records and photographic and electronic devices enable human beings to share, compile, use, and misuse great amounts of information and misinformation. No other species uses such technologies.	

Human Development

SAP

As successive generations of an embryo's cells form by division, small differences in their immediate environments cause them to develop slightly differently, by activating or inactivating different parts of the DNA information.	5c
Using artificial means to prevent or facilitate pregnancy raises questions of social norms, ethics, religious beliefs, and even politics.	
The very long period of human development (compared to that of other species) is associated with the prominent role of the brain in human evolution. The ability to learn persists throughout life and may improve as people build a base of ideas and come to understand how to learn well. Human mental abilities that apparently evolved for survival are used for newly invented cultural purposes such as art, literature, ritual, and games.	5c
	5d
The development and use of technologies to maintain, prolong, sustain, or terminate life raise social, moral, ethical, and legal issues.	5e

Basic Functions

SAP

The immune system is designed to protect against microscopic organisms and foreign substances that enter from outside the body and against some cancer cells that arise within.	4e
The nervous system works by electrochemical signals in the nerves and from one nerve to the next. The hormonal system exerts its influences by chemicals that circulate in the blood. These two systems also affect each other in coordinating body systems.	3a
	3b
Communication between cells is required to coordinate their diverse activities. Some cells secrete substances that spread only to nearby cells. Others secrete hormones, molecules that are carried in the bloodstream to widely distributed cells that have special receptor sites to which they attach. Along nerve cells, electrical impulses carry information much more rapidly than is possible by diffusion or blood flow. Some drugs mimic or block the molecules involved in transmitting nerve or hormone signals and therefore disturb normal operations of the brain and body.	3a
	3b
	3c
Reproduction is necessary for the survival of any species. Sexual behavior depends strongly on cultural, personal, and biological factors.	5a
	5b

Physical Health

SAP

Some allergic reactions are caused by the body's immune responses to usually harmless environmental substances. Sometimes the immune system may attack some of the body's own cells.	4e
Faulty genes can cause body parts or systems to work poorly. Some genetic diseases appear only when an individual has inherited a certain faulty gene from both parents.	5c
New medical techniques, efficient health care delivery systems, improved sanitation, and a fuller understanding of the nature of disease give today's human beings a better chance of staying healthy than their forebears had. Conditions now are very different from the conditions in which the species evolved. But some of the differences may not be good for human health.	5e
Some viral diseases, such as AIDS, destroy critical cells of the immune system, leaving the body unable to deal with multiple infection agents and cancerous cells.	1c
	4e

The Living Environment

Cells

SAP

Within every cell are specialized parts for the transport of materials, energy transfer, protein building, waste disposal, information feedback, and even movement. In addition, most cells in multicellular organisms perform some special functions that others do not.	1e
	2a
	2b
	4a
	4b
	4c
	4d
Complex interactions among the different kind of molecules in the cell cause distinct cycles of activities, such as growth and division. Cell behavior can also be affected by molecules from other parts of the organism or even other organisms.	1e
	2a
	2b
	4a
	4b
	4c
	4d
Most cells function best within a narrow range of temperature and acidity. At very low temperatures, the reaction rates are too slow. High temperatures and/or extremes of acidity can irreversibly change the structure of most protein molecules. Even small changes in acidity can alter molecules and how they interact. Both single cells and multicellular organisms have molecules that help to keep the cell's acidity within a narrow range.	4a
	4d