

Pathfinder for 10th Grade Biological Science: Structural and Functional Similarities and Differences Among Living Things

About this Pathfinder

This pathfinder was created to assist 10th Grade students in meeting Pennsylvania Academic Standard 3.3.10 A, in which students are expected to "explain the structural and functional similarities and differences found among living things." This includes the ability to:

- Identify and characterize major life forms according to their placement in existing classification groups.
- Explain the relationship between structure and function at the molecular and cellular levels.
- Describe organizing schemes of classification keys.
- Identify and characterize major life forms by kingdom, phyla, class and order.



What is Biology?

Biology is the science of living systems. It is inherently interdisciplinary, requiring knowledge of the physical sciences and mathematics, although specialties may be oriented toward a group of organisms or a level of organization. Botany is concerned with plant life, zoology with animal life, algology with algae, mycology with fungi, microbiology with microorganisms such as protozoans and bacteria, cytology with cells, and so on. All biological specialties, however, are concerned with life and its characteristics. These characteristics include cellular organization, metabolism, response to stimuli, development and growth, and reproduction. Furthermore, the information needed to control the expression of such characteristics is contained within each organism.

Resource cited: Giesmann, Larry A. "biology." *Grolier Multimedia Encyclopedia*. 2010. Grolier Online. 13 Feb. 2010
<<http://proxy.montgomerylibrary.org:2081/article?assetid=0033710-0>>.)

Where to look for information on Biology



- 1) Look on the shelves in the areas with the **Dewey Decimal Call Numbers** listed below
- 2) Use **keywords** or **subjects** listed below to search the library catalog and/or databases

Dewey Call Numbers and Subject Headings for Biology

570	Biology: general resources	580	Plants: general resources	590	Animals: general resources
570	Biology: education	580.7	Botanical gardens and museums	591	Specific topics in natural history of animals
570	Biology: journals	580.9	Plants of specific areas	592	Worms
570	Biology: societies	581	Fruits and nontaxonomic kinds of plants	593	Marine and seashore invertebrates
571	Physiology and related subjects	582.1	Trees and shrubs	594	Mollusks and other shellfish
571.92	Plant pathology and physiology	583	Magnoliopsida	595	Arthropoda
572	Biochemistry and molecular biology	584	Liliopsida	595.3	Crustaceans
572.8	Genome mapping	585	Pinophyta, Coniferales	595.7	Insects
573	Specific systems in animals	588	Bryophyta	596	Chordata
576.5	Genetics			597	Fish
576.8	Evolution			597	Amphibians and reptiles
577	Ecology			597.3	Sharks
578	Natural history of organisms and related subjects			598	Birds
579	Microorganisms, fungi, algae			599	Mammals
				599.2	Marsupials
				599.4	Bats
				599.5	Whales
				599.6	Horses
				599.7	Land Carnivores
				599.8	Primates
				599.93	Human genetic



Alternative keywords to use when searching

anatomy	cellular biology	order	zoology
biological science	class	phyla	
biology	kingdom	species	
botany	molecular biology	taxonomy	

Selected Resources

The resources listed below are just a small sample of what materials can be accessed about biology through the Montgomery County (Maryland) Public Library. Similar items can be found by searching by keyword in the catalog and databases. Use of databases and electronic resources may be restricted to library card holders. To apply for a library card, visit: http://www.montgomerycountymd.gov/Apps/Libraries/librarycatalog/online_registration.cfm

Reference Books

Bobick, James E. *The Handy Biology Answer Book*. 1st ed. Detroit: Visible Ink Press, 2004. Print.
Grzimek, Bernhard, et al. *Grzimek's Animal Life Encyclopedia*. 2nd ed. 17 vols. Detroit: Gale, 2003. Print.

Nonfiction Books

Simon, Eric J., et al. *Campbell Essential Biology*. 4th ed. San Francisco: Benjamin Cummings, 2010. Print.
Mauseth, James D. *Botany: an introduction to plant biology*. 4th Ed. Sudbury, Mass.: Jones and Bartlett Publishers, 2009. Print.

Periodical/Journal Articles

Cannell, Michael. "New Species--Keep On Counting!(scientists sighting 13,000 new species a year)." *Science World* 55.9 (Feb 8, 1999): 8. Print.
Feldman, Ruth Tenzer. "Life form X. (Animal Angles).(five major kingdoms of living things)." *Odyssey*. 11.4 (April 2002): 49. Print.
Petersen, David. "The name game: a few words about understanding the language of the natural world." *Backpacker*. 21.3 (April 1993): 32-33 Print.



Electronic Databases

McGraw-Hill's *AccessScience: Encyclopedia of Science and Technology Online*.
<http://proxy.montgomerylibrary.org:2051/>

Science Resource Center. Detroit: Gale, 2004. <http://proxy.montgomerylibrary.org:2071>

- "Comparison of the Five-Kingdom and Six-Kingdom Classification of Organisms." *Science Resource Center*. Detroit: Gale, 2004.
- "Geologic History of Animal Life." *Science Resource Center*. Detroit: Gale, 2004.
- "Plant and Animal Cell Illustration." *Science Resource Center*. Detroit: Gale, 2004.

Multi-media Resources

Biology. Perf. Bill Nye. Science Channel, 2005, DVD.

Biology, the Science of Life. Perf. Stephen Nowicki. Teaching Co., 2004, DVD.

Organizations and other Internet Resources

BiologyBrowser (<http://www.biologybrowser.org/>) includes:

- Current science news stories
- Images and video
- Information resources produced to compliment Thomson Reuters products such as BIOSIS Previews & Zoological Record (Nomenclatural Glossary for Zoology, Student Guide to the Animal Kingdom)
- Links to other relevant scientific digital resources (scientific data sets, images, videos, Web pages)

ITIS, the Integrated Taxonomic Information System (<http://www.itis.gov/>) lets you search authoritative taxonomic information on plants, animals, fungi, and microbes of North America and the world.

National Wildlife Association (<http://www.nwf.org/>) includes a Wildlife Library where you can read about the biology and life history of many kinds of wildlife and learn how to identify different species.

