

I'm not a robot































To provide the best experiences, we use technologies like cookies to store and/or access device information. Consenting to these technologies will allow us to process data such as browsing behavior or unique IDs on this site. Not consenting or withdrawing consent, may adversely affect certain features and functions. Functional Functional Always active The technical storage or access is strictly necessary for the legitimate purpose of enabling the use of a specific service explicitly requested by the subscriber or user, or for the sole purpose of carrying out the transmission of a communication over an electronic communications network. Preferences Preferences The technical storage or access is necessary for the legitimate purpose of storing preferences that are not requested by the subscriber or user. Statistics Statistics The technical storage or access that is used exclusively for statistical purposes. The technical storage or access that is used exclusively for anonymous statistical purposes. Without a subpoena, voluntary compliance on the part of your Internet Service Provider, or additional records from a third party, information stored or retrieved for this purpose alone cannot usually be used to identify you. Marketing Marketing The technical storage or access is required to create user profiles to send advertising, or to track the user on a website or across several websites for similar marketing purposes. 100%(12)100% found this document useful (12 votes)44K viewsThis document is the Cambridge International AS & A Level Biology Coursebook. It provides exam-style questions and answers to help students prepare. The summary discusses key differences bet...AI-enhanced title and descriptionSaveSave Biology Coursebook Answers AS A Level For Later100%100% found this document useful, undefined Live Science is part of Future US Inc, an international media group and leading digital publisher. Visit our corporate site. © Future US, Inc. Full 7th Floor, 130 West 42nd Street, New York, NY 10036. Biology is the study of life. The word "biology" is derived from the Greek words "bios" (meaning life) and "logos" (meaning "study"). In general, biologists study the structure, function, growth, origin, evolution and distribution of living organisms.Biology is important because it helps us understand how living things work and how they function and interact on multiple levels, according to the Encyclopedia Britannica. Advances in biology have helped scientists do things such as develop better medicines and treatments for diseases, understand how a changing environment might affect plants and animals, produce enough food for a growing human population and predict how eating new food or sticking to an exercise regimen might affect our bodies.Four principles unify modern biology, according to the book "Managing Science" (Springer New York, 2010): You may like Cell theory is the principle that all living things are made of fundamental units called cells, and all cells come from preexisting cells.Gene theory is the principle that all living things have DNA, molecules that code the structures and functions of cells and get passed to offspring.Homeostasis is the principle that all living things maintain a state of balance that enables organisms to survive in their environment.Evolution is the principle that describes how all living things can change to have traits that enable them to survive better in their environments. These traits result from random mutations in the organism's genes that are "selected" via a process called natural selection. During natural selection, organisms that have traits better-suited for their environment have higher rates of survival, and then pass those traits to their offspring.Although there are only four unifying principles, biology covers a broad range of topics that are broken into many disciplines and subdisciplines.On a high level, the different fields of biology can each be thought of as the study of one type of organism, according to "Blackie's Dictionary of Biology" (S Chand, 2014). For example, zoology is the study of animals, botany is the study of plants and microbiology is the study of microorganisms.A botanist is a biologist who studies plants. (Image credit: Shutterstock)Within those broader fields, many biologists specialize in researching a specific topic or problem. For example, a scientist may study behavior of a certain fish species, while another scientist may research the neurological and chemical mechanisms behind the behavior.There are numerous branches and subdisciplines of biology, but here is a short list of some of the more broad fields that fall under the umbrella of biology: Biochemistry: The study of the chemical processes that take place in or are related to living things, according to the Biochemical Society. For example, pharmacology is a type of biochemistry research that focuses on studying how drugs interact with chemicals in the body, as described in a 2010 review in the journal Biochemistry. Ecology: The study of how organisms interact with their environment. For example, an ecologist may study how honeybee behavior is affected by humans living nearby. Genetics: The study of heredity. Geneticists study how genes are passed down by parents to their offspring, and how they vary from person to person. For example, scientists have identified several genes and genetic mutations that influence human lifespan, as reported in a 2019 review published in the journal Nature Reviews Genetics. Physiology: The study of how living things work. Physiology, which is applicable to any living organism, "deals with the life-supporting functions and processes of living organisms or their parts," according to Nature. Physiologists seek to understand biological processes, such as how a particular organ works, what its function is and how it's affected by outside stimuli. For example, physiologists have studied how listening to music can cause physical changes in the human body, such as a slower or faster heart rate, according to the journal Psychological Health Effects of Musical Experiences. Biology is often researched in conjunction with other fields of study, including mathematics, engineering and the social sciences. Here are a few examples:Astrobiology is the study of the evolution of life in the universe, including the search for extraterrestrial life, according to NASA. This field incorporates principles of biology with astronomy. Bioarchaeologists are biologists who incorporate archaeological techniques to study skeletal remains and derive insights about how people lived in the past, according to George Mason University.Bioengineering is the application of engineering principles to biology and vice versa, according to the University of California Berkeley. For example, a bioengineer might develop a new medical technology that better images the inside of the body, like an improved Magnetic Resonance Imaging (MRI) that scans the human body at a faster rate and higher resolution, or apply biological knowledge to create artificial organs, according to the journal Cell Transplant.Biotechnology involves using biological systems to develop products, according to the Norwegian University of Science and Technology. For example, biotechnologists in Russia genetically engineered a better-tasting and more disease-resistant strawberry, which the researchers described in their 2007 study published in the journal Biotechnology and Sustainable Agriculture 2006 and Beyond. Biophysics employs the principles of physics to understand how biological systems work, according to the Biophysical Society. For example, biophysicists may study how genetic mutations leading to changes in protein structure impacts protein evolution, according to the Journal of the Royal SocietyA 3d illustration of the chain of amino acids that make up protein. (Image credit: Getty Images)Biologists can work in many different fields, including research, healthcare, environmental conservation and art, according to the American Institute of Biological Sciences. Here are a few examples:Research: Biologists can perform research in many types of settings. Microbiologists, for instance, may study bacterial cultures in a laboratory setting. Other biologists may perform field research, where they observe animals or plants in their native habitat. Many biologists may work in the lab and in the field — for example, scientists may collect soil or water samples from the field and analyze them further in the lab, like at North Carolina University's Soil and Water Lab.Conservation: Biologists can help with efforts in environmental conservation by studying and determining how to protect and conserve the natural world for the future. For example, biologists may help educate the public on the importance of preserving an animal's natural habitat and participate in endangered species recovery programs to stop the decline of an endangered species, according to the U.S. Fish & Wildlife Service.An ecologist taking a water samples from a creek. (Image credit: Getty Images)Healthcare: People who study biology can go on to work in healthcare, whether they work as doctors or nurses, join a pharmaceutical company to develop new drugs and vaccines, research the efficacy of medical treatments or become veterinarians to help treat sick animals, according to the American Institute of Biological Sciences.Art: Biologists who also have a background in art have both the technical knowledge and artistic skill to create visuals that will communicate complex biological information to a wide variety of audiences. One example of this is in medical illustration, in which an illustrator may perform background research, collaborate with experts, and observe a medical procedure to create an accurate visual of a body part, according to the Association of Medical Illustrators.Additional resourcesIf you're curious about just how wide-reaching biology is, The University of North Carolina at Pembroke has listed a number of biology subdisciplines on their website. Interested in a career in biology? Check out some options at the American Institute of Biological Sciences website.Bibliography Lormande Loss Woodruff, "History of Biology", The Scientific Monthly, Volume 12, March 1921. . P.N. Campbell, "Biology in Profile: A Guide to the Many Branches of Biology", Elsevier, October 2013. The University of North Carolina at Pembroke, "Biology Sub-disciplines", October 2010. University of Minnesota Duluth, "What is Biology?", January 2022. Eric J. Simon et al, "Campbell Essential Biology", Pearson Education, January 2018. Simply reading textbooks often isn't enough to solidify knowledge. Instead of just taking notes, transform your textbooks into interactive quizzes. Engage with your material, test your understanding, and retain information in a smarter, more effective way. Welcome to the Biology Library. This Living Library is a principal hub of the LibreTexts project, which is a multi-institutional collaborative venture to develop the next generation of open-access texts to improve postsecondary education at all levels of higher learning. The LibreTexts approach is highly collaborative where an Open Access textbook environment is under constant revision by students, faculty, and outside experts to supplant conventional paper-based books. Campus BookshelvesBookshelvesLearning Objects Home is shared under a not declared license and was authored, remixed, and/or curated by LibreTexts. Movement into & out of CellsDiffusion, Osmosis, Active Transport, Endocytosis & Exocytosis, Investigating Transport Processes in Plants, Investigating Diffusion, Surface Area to Volume Ratios, Investigating Surface Area, Estimating Water Potential in Plants, Osmosis in Plant Cells, Osmosis in Animals, Comparing Osmosis in Plants & AnimalsStructure & Function of Mitochondria, The Four Stages in Aerobic Respiration, Aerobic Respiration: Glycolysis, Aerobic Respiration: The Link Reaction, Aerobic Respiration: The Krebs Cycle, Aerobic Respiration: Role of NAD & FAD, Aerobic Respiration: Oxidative Phosphorylation, Anaerobic Respiration, Energy Yield: Aerobic & Anaerobic Respiration, Anaerobic Adaptation of Rice, Aerobic Respiration: Effect of Temperature & Substrate ConcentrationControl & Coordination in MammalsThe Endocrine System, The Nervous System, Neurons, Sensory Receptor Cells, Sequence of Events Resulting in an Action Potential, Transmission of Nerve Impulses, Speed of Conduction of Impulses, The Refractory Period, Cholinergic Synapses, Stimulating Contraction in Striated Muscle, Ultrastructure of Striated Muscle, Sliding Filament Model of Muscular ContractionTheory of Evolution, Allopatric & Sympatric SpeciationPrinciples of Genetic TechnologyRecombinant DNA, Genetic Engineering, Isolating the Desired Gene, Genetic Engineering: Enzymes, Genetic Engineering: Vectors, Genetic Engineering: Promoters & Marker Genes, Gene Editing, Polymerase Chain Reaction, Gel Electrophoresis, Microarrays, Bioinformatics Share — copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt — remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution — You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation. No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Providing Ofqual Approved Qualifications © 2025 MME When you visit or interact with our sites, services or tools, we or our authorised service providers may use cookies for storing information to help provide you with a better, faster and safer experience and for marketing purposes. Interested in online learning? Edukatico will keep you updated from time to time. (You can stop this at any time.) Directory of 8,051 video courses from 50+ providers Transparency note: Some course providers support the operation of our search portal with referral commissions. Interested in online learning? Edukatico will keep you updated from time to time. (You can stop this at any time.) More filters Less filters ...go to top Extend Your Knowledge with Online Courses in BiologyAre you studying Biology and wish to supplement your specialist knowledge from lectures, seminars, or scientific exercises? Or are you generally interested in this scientific field? You will find a broad spectrum of online courses in specialized subjects of Biology, Biochemistry, and Biotechnology. These courses and other related fields are available in our directory.Biology as a Multi-Faceted DisciplineBiology is the area of natural sciences described as the study of living things. In particular, it investigates the construction, organisation, and development of life. It can be subdivided into many subject areas.These subject areas can be defined by the living things being studied. Botany is the study of plants. This subject area originated from the study of medicinal plants. Similarly, Zoology is dedicated to the analysis of animals. Human Biology, which is a crossover with the study of Human Medicine, focusses on humans. It only became a scientific discipline in its own right in the second half of the 20th century. The smallest living things - bacteria, fungi, viruses - are studied in Microbiology.Other specialist areas of biology include Molecular Biology, Cell Biology, Development Biology, Behavioural Biology, Genetics, and Ecology. These disciplines encompass all species.You can find interesting online courses in many of these categories on our site. These e-learning offerings are continually expanded. Independent further study in the field of Biology is thus possible via the digital route.What Online Offers Are Available in the Area of Biology?Online courses provide an outstanding opportunity to study Biology. With online learning, you can review a topic at any time or pause at particular points. In contrast, some explanations might get lost in a typical two-hour university lecture. You can also prepare for practical activities and tests with the help of online courses or deepen certain areas of interest with additional information.You will find a great selection of online courses in the subject of Biology in our directory. The courses come from large platforms like edX or Coursera. Biology courses and Biology MOOCs (massive open online courses) by top international universities are made available through these platforms. And, as with all of the courses in our directory, these courses are purely online offers with no attendance requirements. Browse all the available courses now! ...go to top