

NAME: _____ BLOCK: _____



Elements & Macromolecules in Organisms

Most common elements in living things are **carbon, hydrogen, nitrogen, and oxygen**. These four elements constitute about **95% of your body weight**. All compounds can be classified in two broad categories --- **organic and inorganic compounds**. Organic compounds are made primarily of **carbon**. Carbon has **four outer electrons** and can form four bonds. Carbon can form **single bonds** with another atom and also bond to other carbon molecules forming **double, triple, or quadruple bonds**. Organic compounds also contain **hydrogen**. Since hydrogen has only one electron, it can form only **single bonds**.

Each small organic molecule can be a unit of a large organic molecule called a **macromolecule**. There are **four classes of macromolecules** (polysaccharides or **carbohydrates**, triglycerides or **lipids**, polypeptides or **proteins**, and nucleic acids such as DNA & RNA). **Carbohydrates and lipids** are made of only carbon, hydrogen, and oxygen (**CHO**). **Proteins** are made of carbon, hydrogen, oxygen, and nitrogen (**CHON**). **Nucleic acids** such as DNA and RNA contain carbon, hydrogen, oxygen, nitrogen, and phosphorus (**CHON P**).

Use the drawing of the **amino acid on this worksheet** (look ahead to another page for this sketch and remember that the **NUMBER OF LINES** from a single atom is their **NUMBER OF BONDS**) to determine the number of bonds formed by:

_____ Oxygen _____ Hydrogen _____ Nitrogen

The body also needs trace amounts of other elements such as calcium, potassium, and sulfur for proper functioning of muscles, nerves, etc.

Questions:

1. Name the 4 main elements that make up 95% of an organism.
2. Name the 4 types of bonds carbon can form.
3. What are macromolecules?
4. Name the 4 classes of macromolecules.
5. Give 2 examples of nucleic acids. _____
6. What elements make up carbohydrates & lipids (symbols)? _____
7. Name 3 elements your body needs trace amounts of for proper functioning.

Answer Key Elements And Macromolecules In Organisms

Sonia E. Sultan



Answer Key Elements And Macromolecules In Organisms:

Cell and Molecular Biology Essentials Bolakale Aremu, 2025-03-02 Are you ready to unlock the secrets of life itself Whether you re a high school student college learner or a curious mind seeking to understand the fundamental building blocks of life this comprehensive book is your ultimate guide to mastering cell and molecular biology without the overwhelm What s Inside This book takes you on an engaging journey through 38 well structured chapters covering everything from the basic principles of biology to the complex processes that sustain life at the cellular and molecular levels Key Topics Include The origins and evolution of life Understand how life evolved and adapted Cell structure and function Dive deep into prokaryotic and eukaryotic cells Genetics and DNA Discover how our genetic blueprints shape who we are Atoms molecules and chemical bonds Explore the microscopic forces that hold life together Thermodynamics in living systems Learn how energy flows through cells Enzymes metabolism and cellular respiration Uncover how cells power themselves The plasma membrane and transport systems See how cells communicate and manage resources Photosynthesis and energy production Follow the incredible story of plants capturing sunlight Cell signaling and communication Discover how cells talk to each other Oxidation reduction and redox reactions Essential processes for life itself And so much more Every concept is explained in simple clear language with bolded keywords to help you retain the most critical terms and ideas Real world examples tables and helpful summaries guide you along the way making this book perfect for independent learners and students preparing for exams Why This Book Stands Out Comprehensive Coverage Covers everything from evolution to gene therapy Easy to Understand Complex topics simplified without sacrificing accuracy Student Friendly Format Clear headings structured sections and key terms highlighted Practical Focus Connects biology concepts to everyday life medical breakthroughs and cutting edge technology Perfect for All Levels Whether you re just starting or need a refresher this book meets you where you are Who Should Read This Book High school students preparing for exams College and university students taking introductory biology Self learners interested in understanding how life works Professionals in health biotech and environmental sciences seeking a solid biology refresher Parents and teachers looking for a reliable teaching resource Unlock the Mysteries of Life One Cell at a Time Whether you need a complete study guide a reliable reference book or an engaging resource for your biology journey this book delivers the knowledge you need in a clear accessible way Start your biological adventure today and see how the science of life fits into everything around you Essential Microbiology Stuart Hogg, 2013-04-25 Essential Microbiology is a comprehensive introductory text aimed at students taking a first course in the subject Covering all aspects of microbiology it describes the structure and function of microbes before considering their place in the the living world The second half of the book focuses on applied aspects such as genetic engineering industrial microbiology and the control of microorganisms Adopting a modern approach and with extensive use of clear comprehensive diagrams Essential Microbiology explains key topics through the use of definition boxes and end of chapter questions This

book is invaluable for undergraduate students in the biological food and health sciences taking a first course in Microbiology comprehensive introduction covering all aspects of this exciting subject includes numerous examples and applications from a wide range of fields definition boxes key points and self test questions enhance student understanding

Chemical Evolution Bernd Markert, Stefan Fränzle, Simone Wünschmann, 2015-02-19 This book is written for researchers and students interested in the function and role of chemical elements in biological or environmental systems Experts have long known that the Periodic System of Elements PSE provides only an inadequate chemical description of elements of biological environmental or medicinal importance This book explores the notion of a Biological System of the Elements BSE established on accurate and precise multi element data including evolutionary aspects representative sampling procedures inter element relationships the physiological function of elements and uptake mechanisms The book further explores the concept Stoichiometric Network Analysis SNA to analyze the biological roles of chemical species Also discussed is the idea of ecotoxicological identity cards which give a first hand description of properties relevant for biological and toxicological features of a certain chemical element and its geo biochemically plausible speciation form The focus of this book goes beyond both classical bioinorganic chemistry and toxicology

Trace Elements in Man and Animals 6 Lucille S. Hurley, Carl L. Keen, 2012-12-06 This book is the published proceedings of the Sixth International Symposium on Trace Element Metabolism in Man and Animals The Symposium was held at the Asilomar Conference Center in Pacific Grove California U S A from May 31 through June 5 1987 The decision to hold TEMA 6 at Asilomar was made at TEMA 5 in 1985 The International Guidance Committee decided to hold the meeting in California in part to recognize the significant contributions made to the field of trace element metabolism by Professor Lucille S Hurley As such she was the obvious choice as chair of the local organizing committee One of the principal goals of Professor Hurley was that TEMA 6 serve as a forum for discussing the use and application of newer methodologies such as molecular biology computer modelling and stable isotopes in studies of trace element metabolism Based on the comments which the local organizing committee has received this goal was achieved The Symposium was attended by 275 scientists from 32 countries covering 6 continents Twenty five speakers were chosen for our plenary sessions

Cambridge International AS and A Level Biology Coursebook with CD-ROM Mary Jones, Richard Fosbery, Jennifer Gregory, Dennis Taylor, 2012-11 A series of titles which provides full support for the Cambridge International AS and A Level Biology syllabus Cambridge International AS and A Level Coursebook provides students with a full introduction to the AS and A Level syllabus and comprehensive support for their examination The experienced author team have reviewed the core text expanded the Applications of Biology chapters and added two new chapters on practical skills Each chapter now has a set of exam style practice questions as well as questions to help review the material Also included are advice on how to revise and prepare for the examinations multiple choice questions revision summaries and answers to all book questions

Climate Change and the Energy Transition Anirudh Singh, 2026-12-08 The climate crisis is on the brink

of its threshold of no return and there is great urgency for finding a viable solution to this existential threat. But many have still not woken up to the seriousness of the situation. This book attempts to remove some of the key knowledge barriers and proposes a radically new strategy to treat the crisis. The book takes the reader on a learning journey through the cause of global warming, the impacts of climate change and the science behind changes in the Earth's climate system. A detailed introduction to how the Earth's climate system is monitored by NASA, the European Space Agency (ESA) and the US National Oceanic and Atmospheric Administration (NOAA) using projects such as the Clouds and the Earth's Radiant Energy System (CERES) project follows, and how the Intergovernmental Panel on Climate Change (IPCC) teams together with climate modelling centres to predict future climate change using climate models is explained. The reader is treated with a history lesson on the UN Framework Convention on Climate Change (UNFCCC) and its Conference of the Parties (COPs) as well as the Paris Agreement, the latter of which signals the beginning of an organised effort to tackle the climate issue. The role of renewable energy in the energy transition is elaborated. Attention next dwells on the state of the global climate near 1.5°C. The final chapter proposes a new climate action framework and action strategy, dubbed the rationalised net zero strategy, that employs an innovative process to include external influences on climate action into a new unified strategy. The book is primarily intended for climate policymakers, NGOs, climate action practitioners and advocates, as well as academics, government and private sector decision makers and the climate-conscious public at large. **Key Features:** Written in plain English. A comprehensive, coherent and timely treatment of the climate crisis from the science background to the policies and the required energy transition and strategies needed to implement them. Provides a contiguous historical record of the progress of climate action from the Paris Agreement to the present.

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Organism and Environment Sonia E. Sultan, 2015. Over the past decade, advances in both molecular developmental biology and evolutionary ecology have made possible a new understanding of organisms as dynamic systems interacting with their environments. This innovative book synthesizes a wealth of recent research findings to examine how environments influence phenotypic expression in individual organisms, ecological development or eco-devo, and how organisms in turn alter their environments, niche construction. A key argument explored throughout the book is that

ecological interactions as well as natural selection are shaped by these dual organism environment effects This synthesis is particularly timely as biologists seek a unified contemporary framework in which to investigate the developmental outcomes ecological success and evolutionary prospects of organisms in rapidly changing environments Organism and Environment is an advanced text suitable for graduate level students taking seminar courses in ecology evolution and developmental biology as well as academics and researchers in these fields

Global Ecology Sven Erik Jørgensen, 2010-04-16 *Global Ecology* focuses on the perception of the biosphere or the ecosphere as a unified cooperative system with numerous synergistic effects which describe the distinctive properties of this sphere This book is subdivided into five parts dealing with diverse aspects in global ecology The first part of the book provides comprehensive description of the biosphere including its unique characteristics and evolution This part also describes various spheres in the biosphere such as the hydrosphere noosphere and pedosphere as well as their composition The next part focuses on the global cycles including calcium carbon iron microbial nitrogen oxygen phosphorus sulfur and water cycles In addition global balances and flows are explained Presented in the third part are the results of the global cycles and flows as well as the patterns of the climatic factors and marine currents There is also a part discussing the climate interactions climatic changes and its effect on the living organisms The book concludes by covering the application of stoichiometry in the biosphere and in ecosystems The book offers a comprehensive view of global ecology and ecological stoichiometry which will aid in the processes of global ecology Provides an overview of the theory and application of global ecology International focus and range of ecosystems makes *Global Ecology* an indispensable resource to scientists Based on the bestselling *Encyclopedia of Ecology* Full color figures and tables support the text and aid in understanding

Inorganic Trace Analytics Henryk Matusiewicz, Ewa Bulska, 2017-12-18 Highly accurate chemical speciation is of great importance in environmental clinical and food sciences as well as in archaeometry Trace analysis via atomic spectrometry mass spectroscopy gas chromatography electron microprobing or X ray absorption spectroscopy provides detailed information on surface and sub surface domain of samples The book comprehensively presents modern techniques timely application and data modeling

Veterinary Immunology - E-Book Ian R Tizard, 2017-09-21 Selected for Doody's Core Titles 2024 in Veterinary Medicine Exploring the immunologic concerns of both large and small animals *Veterinary Immunology An Introduction* 10th Edition is the only complete resource on immunology for veterinary practitioners This new edition has been meticulously updated to continue its trend of incorporating the latest advances and topics in the field It features a straightforward presentation of basic immunologic principles along with thorough and timely information on the most significant immunologic diseases and responses seen in domestic animals Comprehensive coverage clearly explains the general principles of immunology and provides information on the most significant immunologic diseases and immunologic responses seen in domestic animals and marine mammals A wealth of clinical examples show how principles will be experienced and addressed in the clinical setting Educator and

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Functional Metabolism Kenneth B. Storey, 2005-02-25 Functional Metabolism of Cells is the first comprehensive survey of metabolism offering an in depth examination of metabolism and regulation of carbohydrates lipids and amino acids It provides a basic background on metabolic regulation and adaptation as well as the chemical logic of metabolism and covers the interrelationship of metabolism to life processes of the whole organism The book lays out a structured approach to the metabolic basis of disease including discussion of the normal pathways of metabolism altered pathways leading to disease and use of molecular genetics in diagnosis and treatment of disease It also takes a unique comparative approach in which human metabolism is a reference for metabolism in microorganisms and plant design and presents novel coverage of development and aging and human health and animal adaptation The final chapter reviews the past and future promise of new genetic approaches to treatment and bioinformatics This the most exhaustive treatment of metabolism currently available is a useful text for advanced undergraduates and graduates in biochemistry cell molecular biology and biomedicine as well as biochemistry instructors and investigators in related fields *Fundamentals of Geobiology* Andrew H. Knoll, Don E. Canfield, Kurt O. Konhauser, 2012-03-30 2012 PROSE Award Earth Science Honorable Mention For more than fifty years scientists have been concerned with the interrelationships of Earth and life Over the past decade however geobiology the name given to this interdisciplinary endeavour has emerged as an exciting and rapidly expanding field fuelled by advances in molecular phylogeny a new microbial ecology made possible by the molecular revolution increasingly sophisticated new techniques for imaging and determining chemical compositions of solids on nanometer scales the development of non traditional stable isotope analyses Earth systems science and Earth system history and accelerating exploration of other planets within and beyond our solar system Geobiology has many faces there is the microbial weathering of minerals bacterial and skeletal biomineralization the roles of autotrophic and heterotrophic metabolisms in elemental cycling the redox history in the oceans and its relationship to evolution and the origin of life itself This book is the first to set out a

coherent set of principles that underpin geobiology and will act as a foundational text that will speed the dissemination of those principles The chapters have been carefully chosen to provide intellectually rich but concise summaries of key topics and each has been written by one or more of the leading scientists in that field Fundamentals of Geobiology is aimed at advanced undergraduates and graduates in the Earth and biological sciences and to the growing number of scientists worldwide who have an interest in this burgeoning new discipline Additional resources for this book can be found at <http://www.wiley.com/go/knoll/geobiology> **Alcamo's Fundamentals of Microbiology: Body Systems** Jeffrey C. Pommerville, 2009-03-03

Chlorophyll Eduardo Jacob-Lopes, Leila Queiroz Zepka, Maria Isabel Queiroz, 2017-05-10 Chlorophyll presents an authoritative and comprehensive overview of the biology, biochemistry and chemistry of chlorophylls in photosynthetic organisms Divided into seven discreet parts the book covers topics on basic science and applied technology of chlorophyll molecules Chlorophyll provides an insight into future developments in each field and extensive bibliography It will be an essential resource for researchers and academic and industry professionals in the natural pigment field The Handy Biology Answer Book Patricia Barnes-Svarney, Thomas E. Svarney, 2014-07-21 Easy to use and friendly guide explains the inner workings of cells bacteria viruses fungi plants animals as well as evolution the environment DNA and chromosomes genetics and genetic engineering laboratory techniques and much much more Gene therapy Forensic DNA profiling Biochemistry Biotechnology Cloning Stem Cells Super Bugs Genetically modified food Botany Zoology Sex The study of life and living organisms is ancient broad and ongoing Biology combines the Greek word for life bios with the suffix ology or science study knowledge of The new completely revised and updated The Handy Biology Answer Book examines explains and traces mankind's understanding of this important topic From the newsworthy to the practical and from the medical to the historical this entertaining and informative book brings the complexity of life into focus through the well researched answers to more than 1 250 common biology questions such as What is life Why do you need protein in your diet Do animals suffer from allergies just like humans What is the Human Genome Project Why do birds fly in formation Can the environment affect genes Do bacteria get addicted to caffeine What was the historical significance of hemp How are seedless grapes grown What is social Darwinism Can animals suffer from psychological disorders The Handy Biology Answer Book has clear concise answers to questions on everything from genetics to the anatomy of cells to the emotional life of elephants and from the environment and ecology to human biology and evolution It's a must have for any student of life With many photos illustrations and other graphics this tome is richly illustrated Its helpful bibliography and extensive index add to its usefulness **Biology for the Informed Citizen** Donna M. Bozzone, Douglas S. Green, 2014 Biology for the Informed Citizen helps student connect the concepts of biology to the consequences of biology This text aims to teach the concepts of biology evolution and the process of science so students can apply this knowledge in their everyday lives as informed consumers and users of scientific information This version of the text does not feature Physiology For more information about

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Jeffrey C. Pommerville, 2021-03-15 Fundamentals of Microbiology Twelfth Edition is designed for the introductory microbiology course with an emphasis in the health sciences **Nanostructured Materials Preparation via**

Condensation Ways Anatolii D. Pomogailo, Gulzhian I. Dzhardimalieva, 2014-08-26 The book is devoted to novel nanostructured materials and nanotechnology A comprehensive analysis of the condensing methods of preparation of novel nanostructured materials is given The methodology of power consuming preparation of nanostructured materials is discussed including thermolysis photo and radiolytic electrochemical and mechanochemical methods The peculiarities of chemical transformations in organic and inorganic matrices are compared Special attention is given to kinetics and mechanism of the formation of nanocomposites The structure and properties of such nanostructured materials are analysed

Environmental Physiology of Animals Pat Willmer, Graham Stone, Ian Johnston, 2009-03-12 The new and updated edition of this accessible text provides a comprehensive overview of the comparative physiology of animals within an environmental context Includes two brand new chapters on Nerves and Muscles and the Endocrine System Discusses both comparative systems physiology and environmental physiology Analyses and integrates problems and adaptations for each kind of environment marine seashore and estuary freshwater terrestrial and parasitic Examines mechanisms and responses beyond physiology Applies an evolutionary perspective to the analysis of environmental adaptation Provides modern molecular biology insights into the mechanistic basis of adaptation and takes the level of analysis beyond the cell to the membrane enzyme and gene Incorporates more varied material from a wide range of animal types with less of a focus purely on terrestrial reptiles birds and mammals and rather more about the spectacularly successful strategies of invertebrates A companion site for this book with artwork for downloading is available at www.blackwellpublishing.com/willmer

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