Annotated Reading List

Architecture	
Animal Architecture. Jennifer Owings Dewey. 1991.	Examines how creatures like arthropods, vertebrates, birds, and rodents build their homes, with some hints and suggestions on how humans might apply these strategies theoretically. All of these books have many creatures in common, but they also have their own unique examples as well.
Animal Architecture. Karl von Frisch. 1974.	
Wonders of Animal Architecture. Sigmund A. Lavine. 1964.	
Biography	
Buckminster Fuller's Universe. Lloyd Steven Sieden. 1989.	Explores Fuller's examination of significant underlying principles in nature.
Biology	
Color in Nature. Penelope Farrant. 1999.	Explores the role of color in nature, including astronomy, botany, geology, physics and zoology. Technical, but written for the lay-reader. Lots of images.
Exploring the Way Life Works: The Science of Biology. Mahlon B. Hoagland., et. Al. 2001.	Comprehensive overview of the natural world from patterns in life to energy and evolution. Devoted to the wonder and unity of the natural world.
Life Itself: Exploring the Realm of the Living Cell. Boyce Rensberger. 1998.	A digest of everything currently known about the mechanisms by which living cells perform their myriad of tasks.
Natural Earth, Living Earth. Miranda Smith and Steve Parker. 1996.	Full-color photography shows how living things interact with the functions and conditions of the earth.
The Hidden Powers of Animals. Carl P.N. Shuker. 2001.	A fascinating look at the astonishing behavior and super-human abilities of animals, from kings of the jungle to household pets. This book reveals incredible truths about animals and their remarkable sensitivities, skills and strengths.
The Way Nature Works. Ed. Jill Bailey. 1992.	Drawing on a series of questions that children might ask, a team of scientists proposes answers in this manual for adult readers. They address large issues such as atmospheric phenomena, ecosystem relationships, and animal communication with brief essays, each well illustrated with charts, diagrams, and photographs.
The Work of Nature: How the Diversity of Life Sustains Us. Yvonne Baskin, et al. 1997.	Baskin examines the threats posed to humans by the loss of biodiversity. Biodiversity is much more than number of species -- it includes the complexity, richness, and abundance of nature at all levels.
Weird Nature. John Downer. Firefly Books. 2002.	Some of the most fantastic behaviors of real animals are explored in this beautifully illustrated companion volume to a BBC/Discovery Channel series.
Chemistry	
Green Chemistry: Theory and Practice. Paul T. Anastas, John Charles Warner. 2000.	Overview of the design, development, and evaluation process central to green chemistry. Explores alternative solvents and catalysts, benign syntheses and biomimetic principles, among many other topics.
Design	
Biologic: Environmental Protection by Design. David Wann. 1990.	Guide to designing our way out of the environmental conundrum we are in by taking a system's view of technology – asking, "how does it fit in?"
Biomimicry: Innovation Inspired by Nature. Janine Benyus. 1997.	Demonstrates how nature's solutions to survival needs have been the creative jumping-off points for individuals seeking solutions to human challenges, developing, or simply revitalizing processes or products.
Cat's Paws and Catapults: Mechanical Worlds of Nature and People. Steven Vogel. 1998.	Investigates whether nature or human design is superior and why the two technologies have diverged so much.
Deep Design: Pathways to a livable Future. David Wann. 1996.	A new way of thinking about design by asking: "What is our ultimate goal?" The idea is to produce designs that are sensitive to living systems.
Design and Nature II. Ed M. W. Collins et. Al. 2004.	Contains proceedings of 2nd international conference on design and nature. Brings together researcher around the world on a variety of studies involving nature's significance for modern scientific thought and design.
Design for the Real World, Human Ecology and Social Change. Victor Papanek. 1984.	One of the worlds most widely read books on design. Author provides a blueprint for sensible, responsible design.
Design in Nature: Learning from Trees. Claus Mattheck. 2004.	Describes and verifies external shape laws in nature. Also explores self healing. Many optimization examples.
Design Lessons from Nature. Benjamin De Brie Taylor. 1974.	Early text with many classic examples of how humans can learn from nature.

Design with Nature. Ian L. McHarg. 1969.	A blend of philosophy and science, author shows how humans can copy nature's examples to design and build better structures.
Economics/Business	
Nature of Economies. Jane Jacobs. 2000.	Dissects relationships between economics and ecology through a multilayered discourse around the fundamental premise that "human beings exist wholly within nature as part of a natural order."
The Living Company. Arie de Geus. 1997.	The author writes that "companies die because their managers focus on the economic activity of producing goods and services, and they forget that their organizations' true nature is that of a community of humans." He summarizes the components of the long-lived company as sensitivity to the environment, cohesion and identity, tolerance and decentralization, and conservative financing.
Engineering	
Biomimetics: Biologically Inspired Technologies. Ed. Yoseph Bar-Cohen. 2005.	Explores biological models useful to engineering and the challenges awaiting future research.
Design Homology. David Offner. 1995.	Examples of nature applied to specific mechanical engineering case studies. Textbook.
Mechanical Design in Organisms. Stephen A. Wainwright. 1982.	Surveys the mechanics of living systems and components of living systems. Interface between mechanical engineering and biology.
Nature and Design. Ed M. W. Collins, et. Al. 2004.	Comprehensive introduction to common scientific laws of both the natural world and engineered worlds. Features mathematics, physics, chemistry, thermodynamics, biomimicry, mechanical engineering and history of science.
Evolution	
On Growth and Form: The Complete Revised Edition. D'Arcy Wentworth Thompson. 1992.	Classic of biology and modern science sets forth seminal "theory of transformation"—that one species evolves into another not by successive minor changes in individual body parts but by large-scale transformations involving the body as a whole.
Survival Strategies: Cooperation and Conflict in Animal Societies. Raghavendra Gadagkar. 1997.	Why creatures great and small behave in such fascinating and seemingly perplexing ways is explained in this delightful account of the evolutionary foundations of animal social behavior.
General Science	
Basic Nature. Andrew Scott. 2002.	Fundamental concepts of modern science.
A Short History of Nearly Everything. Bill Bryson. 2004.	Covers everything from "primordial nothingness" to "ascendancy of Homo sapiens."
Innovation	
Biomimicry: Innovation Inspired by Nature. Janine Benyus. 1997.	Demonstrates how nature's solutions to survival needs have been the creative jumping-off points for individuals seeking solutions to human challenges, developing, or simply revitalizing processes or products.
Invention by Design. Henry Petroski. 1996.	Philosophical and cultural study of the process of invention. Full of case studies in easy to read writing.
Nature: Mother of Invention. Felix Paturi. 1976.	The book provides an overview of bio-inspiration, noting that scientists can learn from natural structures of all sizes and put their knowledge to use in a number of way, often by studying nature at the nanolevel, where the distinction between nature and human technology is often blurred.
The Gecko's Foot: Bio-inspiration, Engineering New Materials and Devices from Nature. Peter Forbes. 2005.	Presents technologists' pure research into nano-anatomy, followed by their applied and, as many entrepreneurs hope, commercial mimicry of nature's ingenuity.
Material Science	
Biomimetic Materials Chemistry. Stephen Mann (Editor). 1995.	Provides a unified, up-to date approach to the applications of biological concepts, products and processes in material research.
Biomineralization. Stephen Mann. 2002.	Describes a new type of chemistry that brings together soft and hard material for the design of functionalized inorganic-organic materials.
Biomolecular Materials. Ed. Christopher Viney et. Al. Materials Research Society. Volume 292. 1992.	Design of material synthesis, assembly, processing and physical optimization strategies based on examples from nature.
Structural Biomaterials: (Revised Edition). Julian F.V. Vincent. 1990.	The book presents a biologist's analysis of the structural materials of organisms, using molecular biology as a starting point. It is an excellent introduction to the field which attempts to stimulate interest in biomaterials.
Mathematics	
Life's Other Secret: The New Mathematics of the Living World. Ian Stewart. 1999.	Shows how mathematics can be used to describe the symmetry of the living world. Author argues that "life is a partnership between genes and mathematics."

The Sizesaurus: From Hectares to Decibels to calories, a Witty Compendium of Measurements. Stephen Strauss. 1995.	Delightfully illustrated book that looks at champion adapters and extreme measures.
Mechanics	
Exploring Biomechanics: Animals in Motion. R. McNeill Alexander. 1992.	Explores a multitude of animals' movement and how they've evolved mechanisms for efficiency.
Life's Devices: The Physical World of Animals and Plants. Steven Vogel, Rosemary Calvert. 1988.	This is an entertaining and informative book that describes how living things bump up against non-biological reality.
Life in Moving Fluids. Steven Vogel. 1996.	This book is for biologists who want to come to the beginning of a quantitative understanding of a wide variety of adaptations, and for general readers who want to see how fluid mechanics work in a varied and often surprising context.
Structure, Form, Movement. Heinrich Hertel. 1963.	An early book that explores how nature's structures and principles of movement could apply to human systems.
The Biomechanics of Insect Flight. Robert Dudley. 2002.	Explores insect physiology, functional morphology, paleontology, aerodynamics, behavior and ecology. The book excels as a synthesis of all these fields, and as a unique source of information on the subject of insect flight as a whole.
Patterns	
The Curves of Life. Theodore A. Cook. 1979	A well-thought-out examination of the function of the spiral, or helix, in both nature and art. Demonstrates how the spiral is fundamental to the structure of shells, leaves, horns, human body, drawings of Leonardo, Leaning Tower of Pisa, and more.
The Power of Limits: Proportional Harmonies in Nature, Art and Architecture. Gyorgy Doczi. 1981.	*The Power of Limits* was inspired by the continuity of natural patterns. The book explores how certain proportions occur over and over and are also repeated in how things grow and are made.
The Self-Made tapestry: Pattern Formation in Nature. Philip Ball. 2001.	This deep, beautiful exploration of the recurring patterns that we find both in the living and inanimate worlds will change how one thinks about everything from evolution to earthquakes.
The Shape of Life. Nancy Burnett. 2002.	Based on the National Geographic - Sea Studios Foundation series seen on PBS. Every animal that ever lived fits into one of only eight basic body plans. Those basic forms have given rise to billions of species of animals and continue to define the shape of life on Earth.
Systems Science	
Buckminster Fuller's Universe. Lloyd Steven Sieden. 1989.	Explores Fuller's examination of significant underlying principles in nature.
Emergence: The Connected Lives of Ants Brains, Cities, and Software. Steven Johnson. 2001.	Details the development of increasingly complex and familiar behavior among simple components.