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Why It Matters

Life abounds in almost every nook and cranny of our planet. Earth. A lion creeps across an East African plain, its body silhouetted against the sky. The leaves of a sunflower in the American Midwest turn slowly through the day, keeping their surfaces fully exposed to rays of sunlight. Fungi and bacteria in the soil of a suburban forest obtain nutrients by decomposing dead organisms. In one room of a European hospital, a mother hears the first cry of her newborn baby; in another room, an elderly man sighs as his last breath. All over the world, countless organisms are born, live, and die every moment of every day. How did life originate? How does it persist, and how is it changing? Biology, the science of life, provides scientific answers to these questions.

What is life? Ostensibly, you might say that you know it when you see it. The answer has no simple answer, because life is a complex state that has been unfolding for billions of years, ever since nonliving materials assembled into the first organism, living cells. Clearly, any list of criteria for the living state only hints at the richness of life. Deeper scientific inquiry requires a wide-ranging examination of the characteristics of life, which is what this book is all about.

Over the next semester or two, you will encounter examples of how organisms are studied, how they function, where they live, and what they do. The examples provide evidence in support of concepts that will greatly enhance your appreciation and understanding of the living world, including its fundamental unity and its great diversity. The chapter introductions and summaries of these basic concepts. It also describes some of the ways in which biologists conduct research, the process by which they observe nature, formulate explanations of their observations, and test their ideas.