



essential biology

The colorful and oddly shaped insect adorning the cover of **Campbell Essential Biology** is a thorn bug (*Umbonia crassicornis*). This species, a relative of cicadas, can be found from Florida to South America. To feed, the bugs pierce plant stems with their beak-like mouths and suck out sap. The most striking feature of this species is without doubt the prominent and ornate pronotum ("helmet") that extends upward from the back. Although these helmets vary in size, shape, pointiness, and coloration, the helmet of every thorn bug provides camouflage that discourages attacks by predators. However, thorn bugs are more than just tie-dyed beauties with prominent headgear. This one species can be used to illustrate a wide range of biological perspectives. For example, from an evolutionary view, evidence suggests that the "thorn" of this species arose through a gradual series of adaptations of the wings. From a genetic perspective, research has shown that the genes that control development of the wings also control development of the helmet. From an ecological viewpoint, although each thorn bug is only a half inch long, swarms can damage plant populations and affect entire food webs. But you might be wondering "Why does this bug matter to me?" Within Florida's agricultural regions, thorn bugs infest fruit trees such as avocados and date palms and can therefore have a significant effect on agriculture—meaning that this little bug *does* have an impact on human society. Examining the thorn bug from multiple biological perspectives illustrates the primary goal of **Campbell Essential Biology**: to highlight the interconnectedness between our society and the greater biological world. Throughout this book, we hope to deepen your understanding of life on Earth, to illustrate how science can be used to investigate life, and to emphasize why biology matters—that is, how this fascinating topic affects your life and the lives of those you care about.

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