

# 1 Evolution, the Themes of Biology, and Scientific Inquiry

## KEY CONCEPTS

- 1.1 The study of life reveals unifying themes p. 3
- 1.2 The Core Theme: Evolution accounts for the unity and diversity of life p. 11
- 1.3 In studying nature, scientists form and test hypotheses p. 16
- 1.4 Science benefits from a cooperative approach and diverse viewpoints p. 22

## Study Tip

**Make a table:** List the five unifying themes of biology across the top. Enter at least three examples of each theme as you read this chapter. One example is filled in for you. To help you focus on these big ideas, continue adding examples throughout your study of biology.

Evolution	Organisation		
The species <i>Banksia serrata</i> has evolved to survive more frequent fires.			

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**Figure 1.1 Over millions of years, Australia's climate became hotter and drier.** Plants like this banksia (*Banksia serrata*) evolved to survive more frequent fires. New branches and leaves grow from undamaged cells and tissues beneath the protective and burned bark. Stored resources allow the banksias to reestablish their canopy, which shades potential competitors. Maintaining a place in the landscape, in spite of frequent fires, maximises the potential for the species to survive and flourish.

## How does this banksia illustrate the unifying themes of biology?

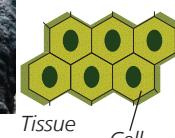


*Banksia serrata*

As a result of **evolution** through natural selection over long periods of time, banksias developed traits that allowed them to survive frequent fires.



Organ  
(leaf)

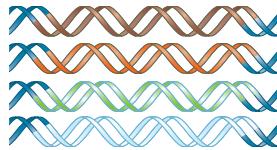


Tissue

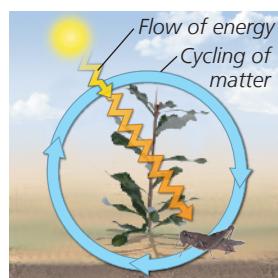
Cell

Structure fits function at all levels of a banksia's **organisation**.

Genetic **information** encoded in DNA determines how the banksia grows.



**Energy** flows one way from the sun to plants to a grasshopper; **matter** cycles between a grasshopper and its environment.



A plant being eaten by a grasshopper and a mouse being preyed upon by a swamp harrier are **interactions** within a system.

