

1.1 The Study of Life

KEY CONCEPT

Biology is the study of all forms of life.



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- Objectives:
 - Define and give examples of Earth's biodiversity.
 - Summarize the characteristics that all Living things share.

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Biology

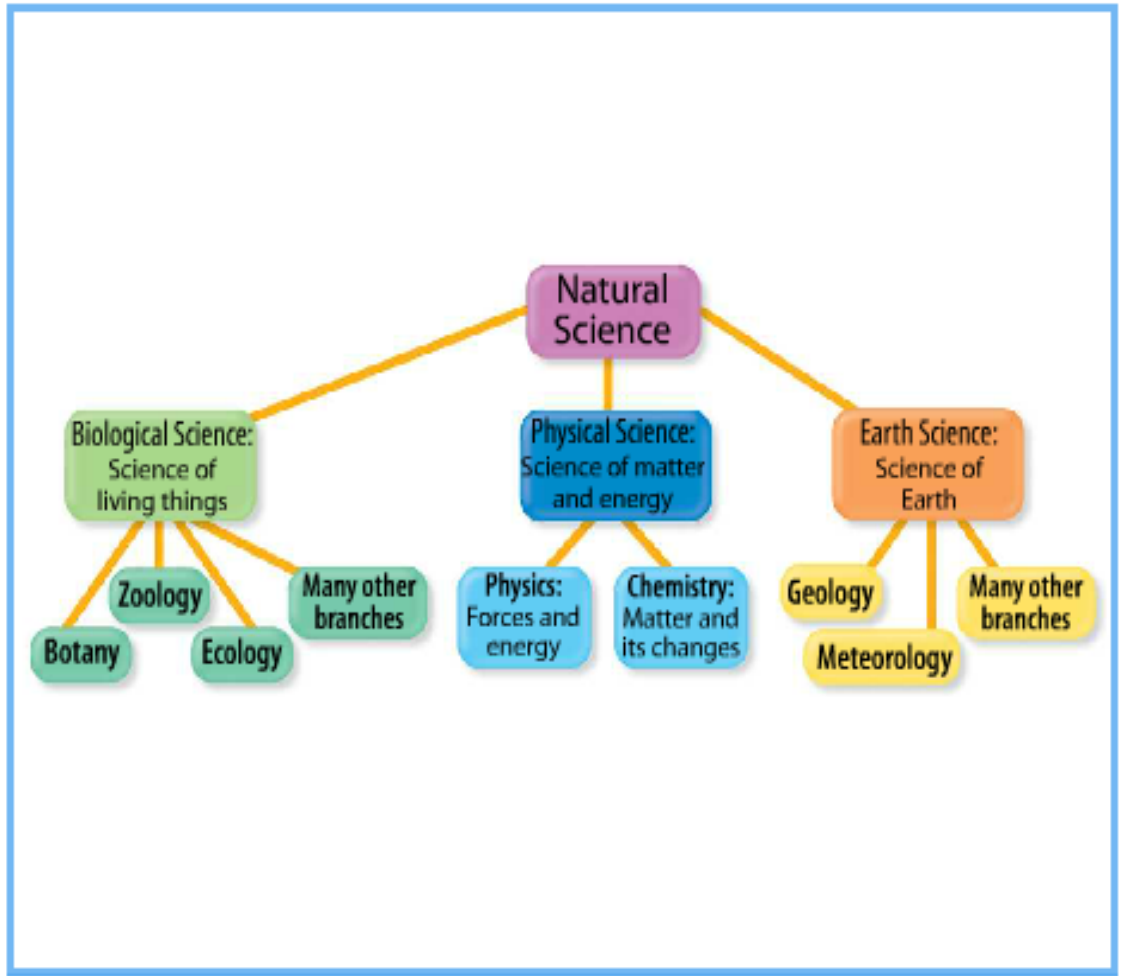
Biology is the study of all living things.

Branches of biology include

- **botany**, which is the study of plants
- **zoology**, which is the study of animals
- **ecology**, which is the study of the interactions between organisms



Read text



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- **What is Biology in the 21st century?**
 - Biology has always been the study of Life, but our knowledge of living things and our use of technology to study them is always changing.
 - For example, the enlarged image of a yellow fever mosquito was made with a scanning electron microscope.
 - Why bother with a mosquito?
 - Because even in the 21st century, mosquitoes can carry viruses for which we have no defense.



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▶ Yellow Stone National park

- Pools of hot, acidic water → full of life



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▶ Honeypot Ant

- Can store a lot of food for other ants

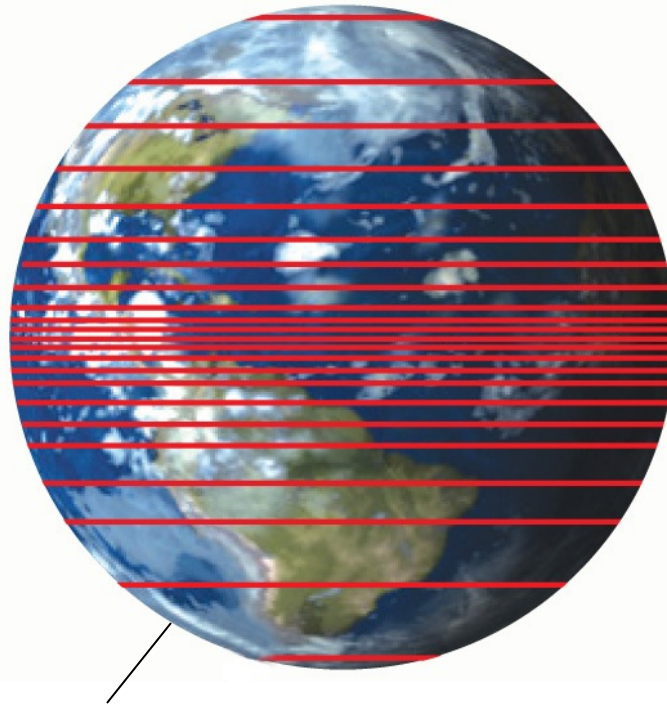


FIGURE 1.1 Honeypot ants live in deserts where food and water are scarce. Some of the ants in the colony act as storage tanks for other ants in the colony.



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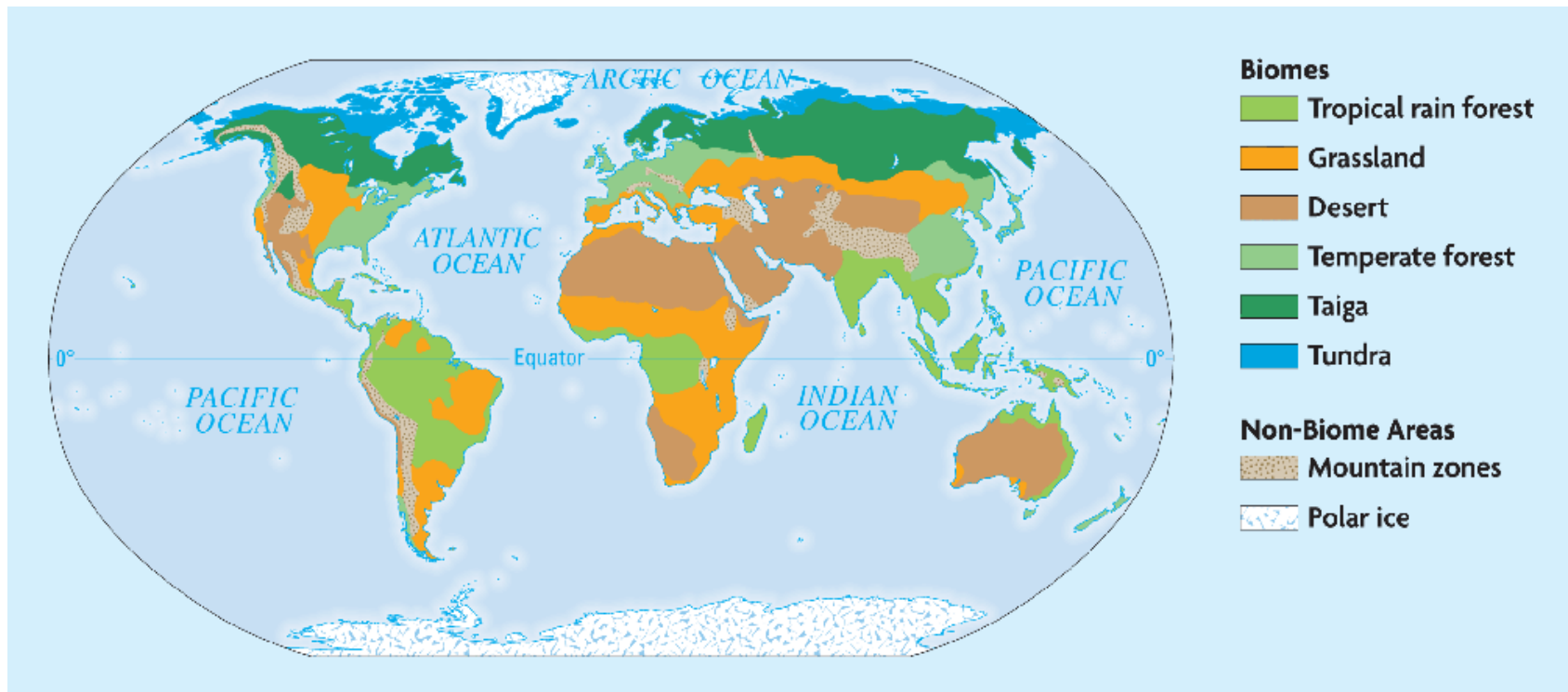
- ▶ **Earth is home to an incredible diversity of life.**
 - The biosphere includes all living things and all the places they are found.



biosphere = everywhere life exists

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- ▶ **Earth is home to an incredible diversity of life.**
 - Every part of the **biosphere** is connected with every other part.
 - The biosphere includes many environments.
 - land environments



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- The **biosphere** includes many environments.
 - saltwater and freshwater environments

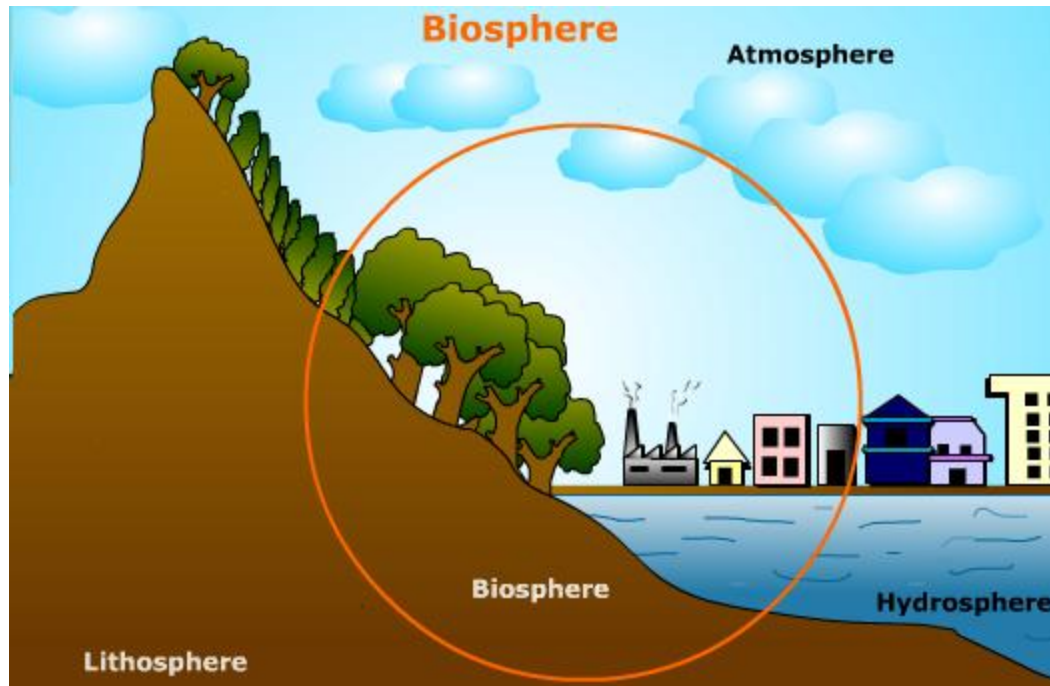


- portions of the atmosphere

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▶ Biosphere

- All living things and all the places they are found



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- **Biodiversity** is the variety of life.
 - Biodiversity generally increases from the poles to the equator.
 - Biodiversity is greater in areas with consistently warm temperatures.



Biodiversity is **greater** closer to the equator.

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- A **species** is one particular type of living thing.
 - Members of a species can interbreed to reproduce.
 - There are about 2 million different living species have been identified.



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- ▶ All organisms share certain characteristics.
 - **Biology** is the scientific study of all forms of life.



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- An **organism** is any individual living thing.
 - All organisms are made of one or more **cells**.



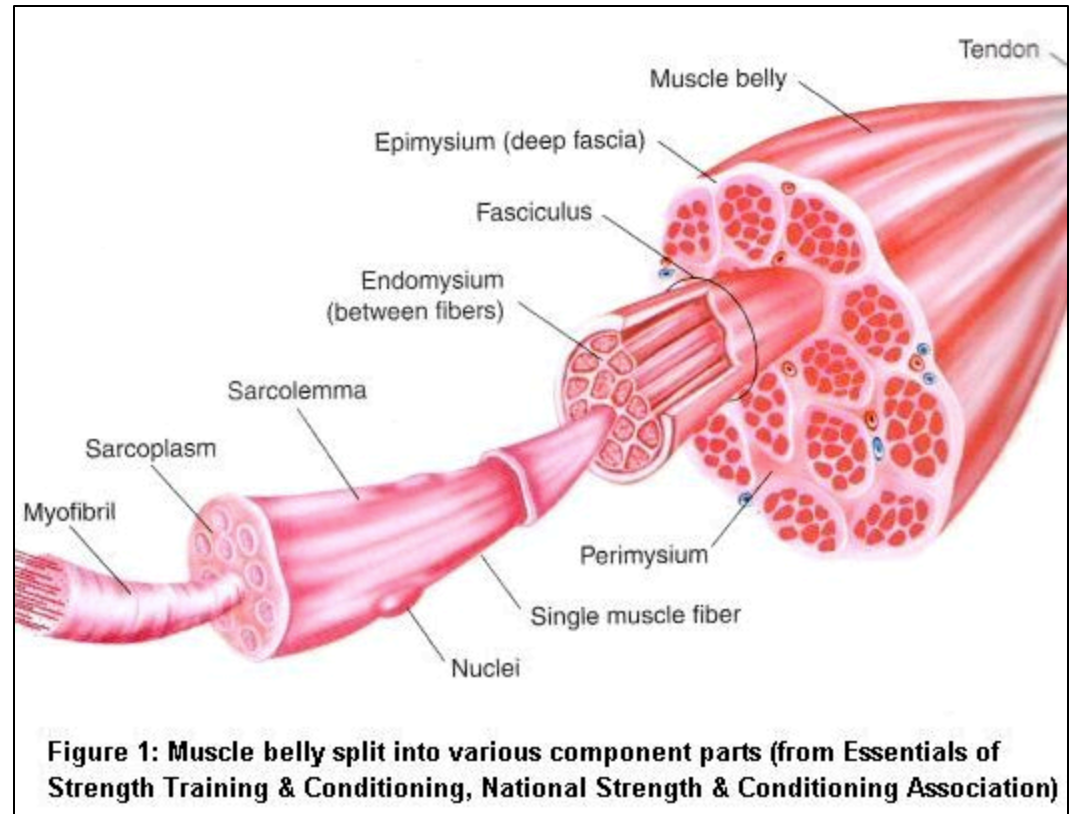
Leaf hairs that protect a leaf from insects

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► Characteristics Shared by Living Organisms:

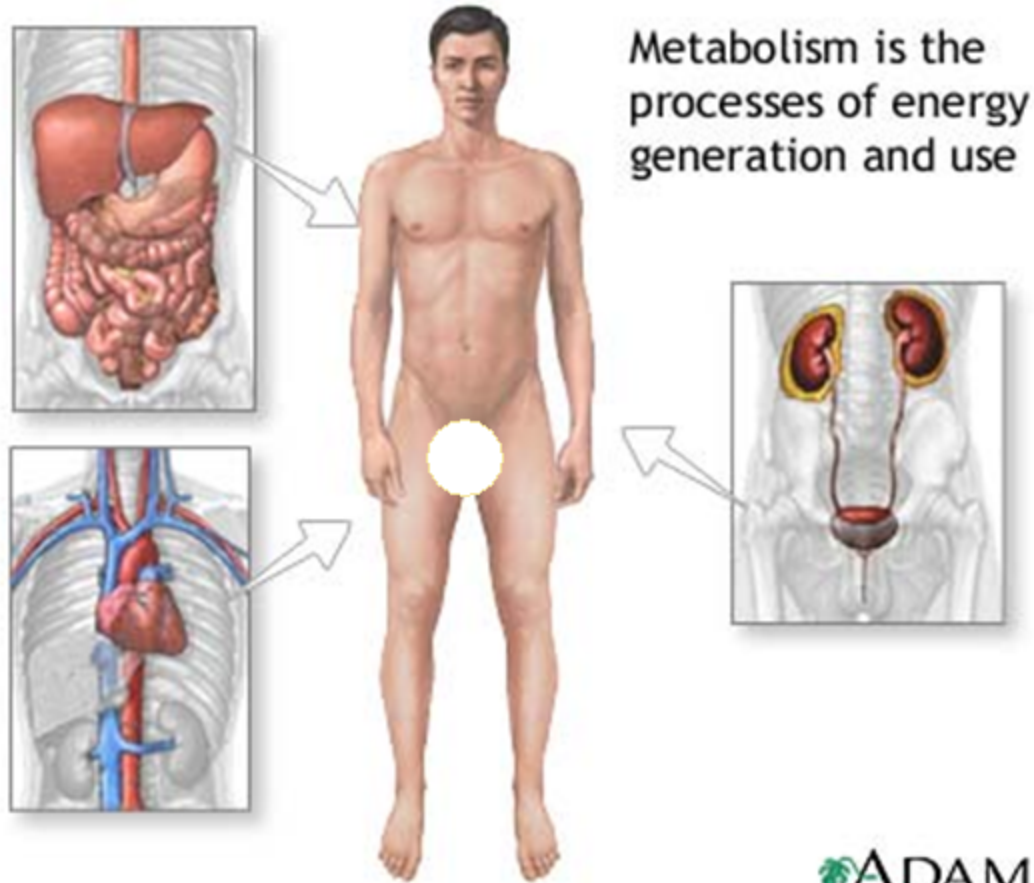
1. A **cell** is the basic unit of life.

- Unicellular vs Multicellular Organisms



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- ▶ **Characteristics Shared by Living Organisms:**
 2. All organisms need **energy** for metabolism



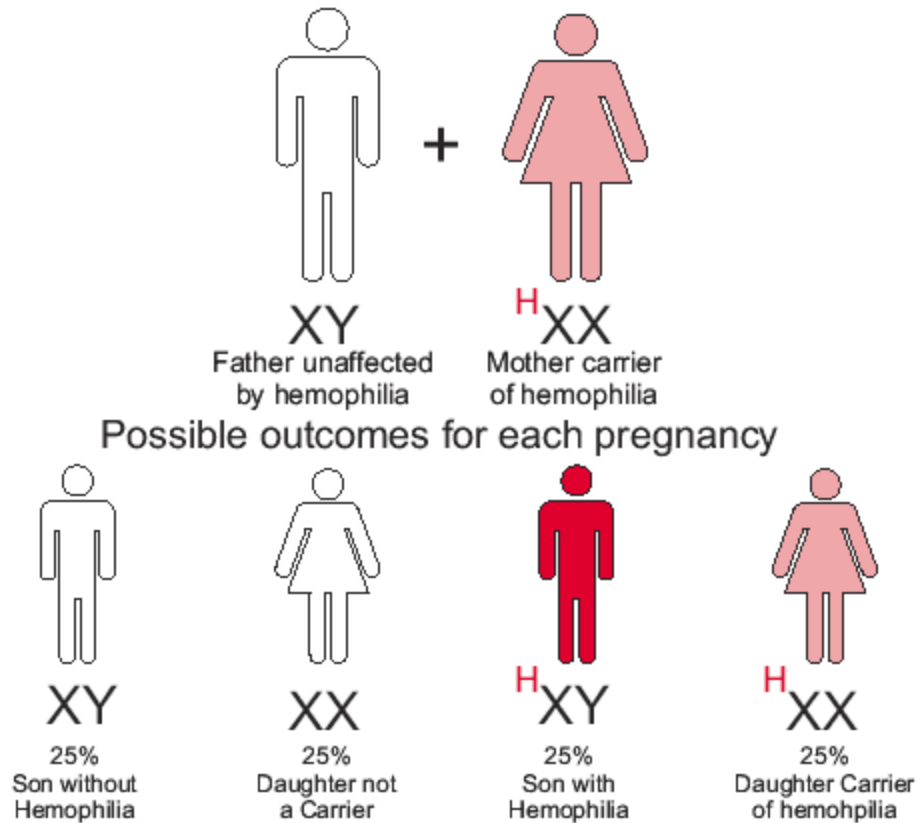
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- ▶ **Characteristics Shared by Living Organisms:**
 1. All organisms are made of one or more cells.
 2. All organisms reproduce.
 3. All organisms **respond to their environment**



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- Characteristics Shared by Living Organisms:
 - All organisms have **DNA** that they pass on to offspring



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- An organism is any individual living thing.
 - All are made of one or more **cells**.
 - All need **energy** for metabolism.
 - All **respond to their environment**.
 - All have **DNA** that they pass on to offspring.

