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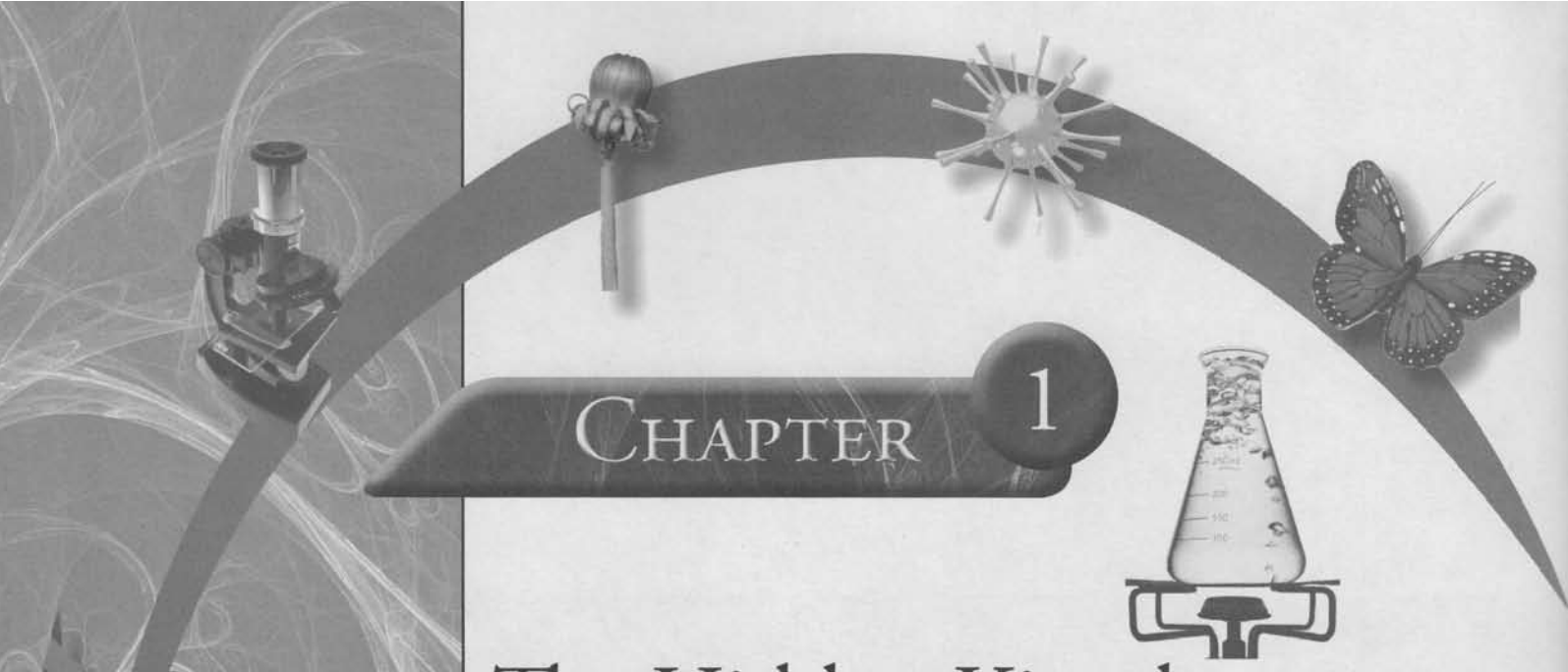


Chapter 1

The Hidden Kingdom

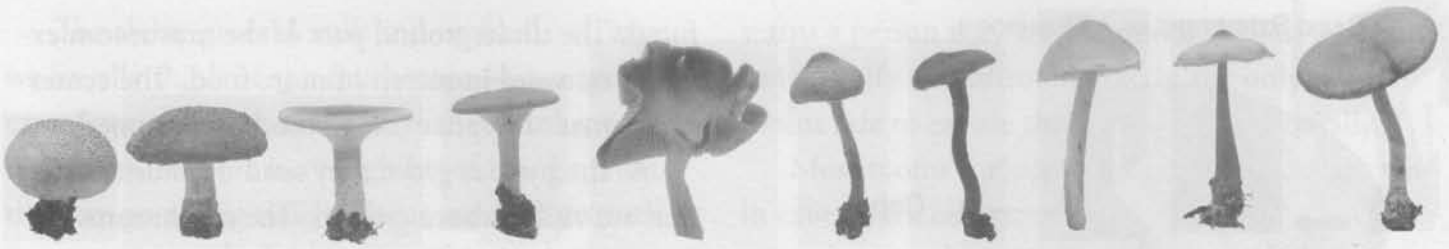
Classification is the process of grouping objects based on their similarities. For most of history, biologists organized the living world into two kingdoms of plants and animals. Grouping living things into either plant kingdom or the animal kingdom made their work easier. Biologists could easily grasp the broad design of living organisms.

Biologists put into the plant kingdom life that can make food from nonliving material. Chlorophyll (KLOR-uh-fil) is a chemical that gives plants their green color. Plants use chlorophyll and the energy of sunlight to combine water and carbon dioxide to make simple sugars. The process is called photosynthesis (foh-toh-SIN-thuh-siss). Plants use the sugar for growth and to supply energy for building other chemicals, such as cellulose, which makes their cell walls.

Explore

1. **What were the first two categories of living things?**
2. **Why were mushrooms difficult to classify as plants?**
3. **What classification did scientists give to mushrooms?**

Progress



A variety of woodland mushrooms

Biologists put into the animal kingdom forms of life that have sense organs to detect what is around them. Most animals can see and hear. They have a nervous system to interpret what they sense and react to the presence of food or danger. They can move about. Animals cannot make food directly from nonliving minerals. Instead, they must eat plants or other animals.

Biological classification is a system developed by biologists based on their studies and opinions. Once an idea has been accepted for a long time, scientists are reluctant to make changes. From the time of the ancient Greeks — about 400 B.C. — the entire living world was considered made of either plants or animals. But some forms of life, such as mushrooms, did not easily fall into either category.

Although mushrooms looked like plants in some ways, they differ from plants in other ways. The greatest difference was that mushrooms did not have chlorophyll. Mushrooms did not need light. They could live quite well in dark caves, provided they had a source of dead plant or animal matter.

To preserve the two-kingdom classification system, most biologists stubbornly kept mushrooms in the plant kingdom. They insisted upon describing mushrooms as plants without chlorophyll.

The word *mushroom* comes from a French word meaning "moss" or "foam." It is a good choice, because mushrooms are light and airy. Since ancient times, mushrooms have been added to foods to give them a distinctive texture or pleasing taste.

However, scientists did not study mushrooms in detail until the 1700s. They knew that plants had cell walls made of strong cellulose. This gave the cell strength and allowed plants, such as trees, to grow tall despite their immense weight. But study showed mushrooms did not have cellulose.

Biologists discovered that mushroom cell walls were more like those of animals than plants. In addition, mushrooms, like animals, absorbed nutrients from other plants and animals. But biologists could not group mushrooms with animals. Mushrooms had no sense organs, no nervous systems, and no way to move about.

Mushrooms were members of a larger group of similar organisms known as fungi (FUHNG-gye). The singular of fungi is fungus (FUHN-guhss). As biologists learned more about mushrooms, they realized that mushrooms and other fungi did not fit well in either the plant or animal kingdoms.

By the 1960s, biologists agreed that fungi needed a kingdom of their own. They created kingdom Fungi. Into the fungi kingdom they put mushrooms, puffballs, yeasts, molds, mildews, and truffles. The word *fungi* comes from

Discover the world of life as God created it!

The field of biology focuses on living things, from the smallest microscopic protozoa to the largest mammal. In this book you will read and explore the life of plants, insects, spiders and other arachnids, life in water, reptiles, birds, and mammals, highlighting God's amazing creation. You will learn about the following and so much more:

- How does biological classification give each different type of plant or animal a unique name?
- In what ways are seeds spread around the world?
- What food does the body use for long-term storage of energy?
- How did biologists learn how the stomach digested food?
- What plant gave George de Mestral the idea for Velcro?

For most of history, biologists used the visible appearance of plants or animals to classify them. They grouped plants or animals with similar-looking features into families. Starting in the 1990s, biologists have extracted DNA and RNA from cells as a guide to how plants or animals should be grouped. Like visual structures, these reveal the underlying design of creation.

The newest book in our Exploring series, *Exploring the World of Biology* is a fascinating look at life – from the smallest proteins and spores, to the complex life systems of humans and animals.

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