

## CONCEPT 2

# Reproduction transfers genetic information from parents to offspring.

**E**very species has its own strategies for reproduction. As shown in **Figure 1.3**, the flowers of many plants have colours and scents that attract animals so that they can pick up and transfer pollen to other flowers (**A**). Many animals have courtship rituals that enable sexually mature individuals of a species to become mating pairs (**B**). Microbes such as bacteria reproduce on their own and form offspring by dividing in two (**C**).

**Figure 1.3** Examples of different strategies for reproduction



**asexual reproduction**  
reproduction that requires only one parent and produces genetically identical offspring

**sexual reproduction**  
reproduction that requires two parents and produces genetically different offspring

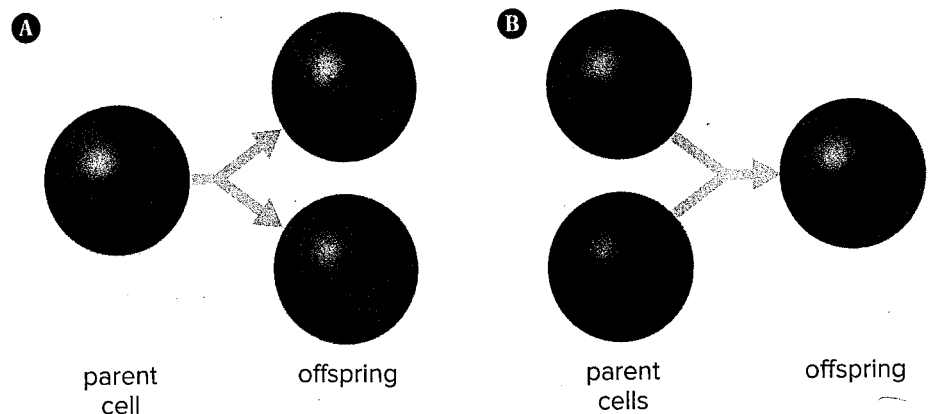
Despite these differences, there are just two basic ways that living things reproduce. They may reproduce asexually or sexually. **Figure 1.4** summarizes the two types of reproduction.

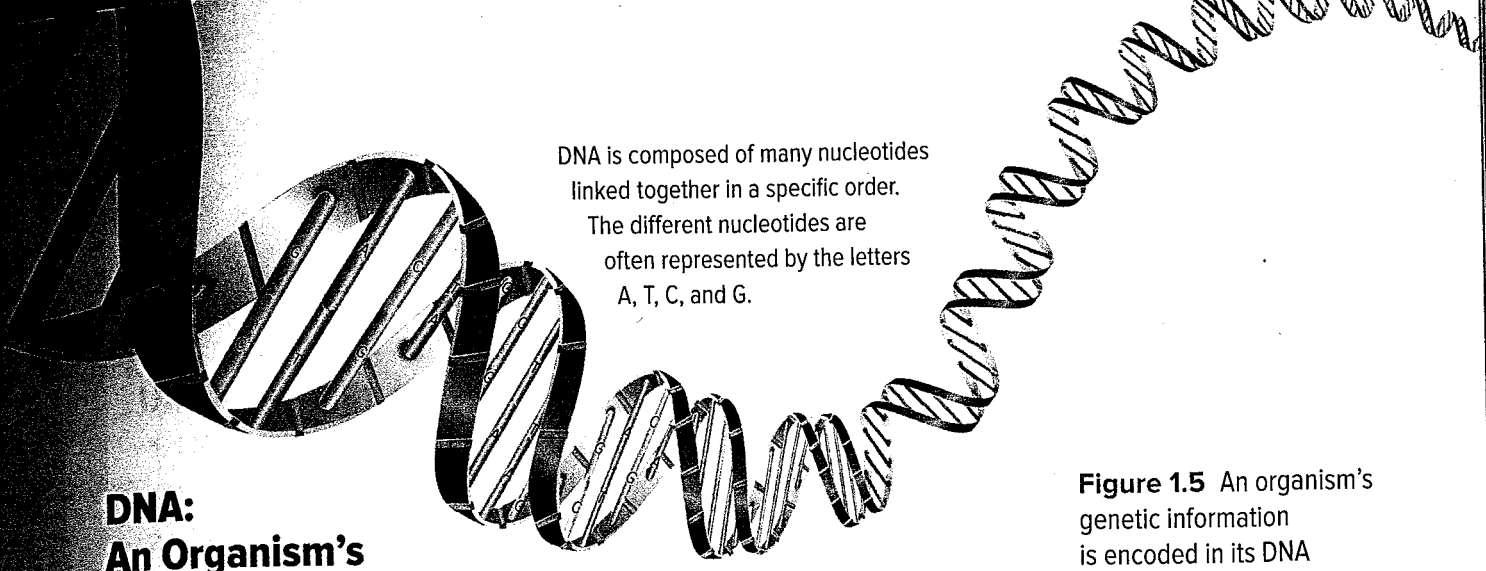
In **asexual reproduction**, offspring come from a single parent. Each offspring receives a copy of the parent's genetic material. As a result, offspring are genetically identical to the parent and to each other.

In **sexual reproduction**, two parents each contribute half of the offspring's genetic material. As a result, the offspring have genetic information that is different from either parent's, so the offspring are not identical to their parents or, in most cases, to each other.

In both asexual and sexual reproduction, the genetic material and the information it holds is passed on to the offspring. This information is contained within what is often called the molecule of life: DNA.

**Figure 1.4** Asexual reproduction **A** results in offspring that are identical to the parent. Sexual reproduction **B** results in offspring that are different from each other and their parents.





DNA is composed of many nucleotides linked together in a specific order. The different nucleotides are often represented by the letters A, T, C, and G.

## DNA: An Organism's Genetic Material

An organism's genetic material determines how it looks, functions, and in many cases, behaves. Genetic material carries these instructions in a molecule called DNA. **DNA** is short for *deoxyribonucleic acid*. As shown in **Figure 1.5**, DNA exists as two long strands shaped like a twisted ladder. It consists of many copies of four different chemical building blocks that are linked together. These building blocks are called *nucleotides*. The specific order in which they are linked together is called an organism's *DNA sequence*. It is like a code that holds the genetic information of an organism.

An organism's DNA is contained within each of its cells. To fit into such a small space, DNA molecules coil and compact into a condensed form called *chromatin*. When a cell is ready to reproduce, it is condensed even more into structures called **chromosomes**. When an organism reproduces, copies of its chromosomes, and therefore its DNA, are transferred to the offspring.

No matter how an organism reproduces, it all begins with the transfer of genetic information and the reproduction of a cell. That cell may be the organism itself or it may be the beginning of a new multicelled organism.

**Figure 1.5** An organism's genetic information is encoded in its DNA sequence.

**DNA** stores the genetic information of an organism; short for deoxyribonucleic acid

**chromosome** genetic material that is a condensed form of DNA

**Connect to Investigation**  
1-C on page 18

## Extending the Connections

### Investigating DNA

The structure and function of DNA have been studied by scientists for decades. Find out more about nucleotides and how they link together to produce the three-dimensional structure of DNA, which is so essential to life.

### Before you leave this page . . .

1. What is the function of DNA?
2. How is sexual reproduction different from asexual reproduction?