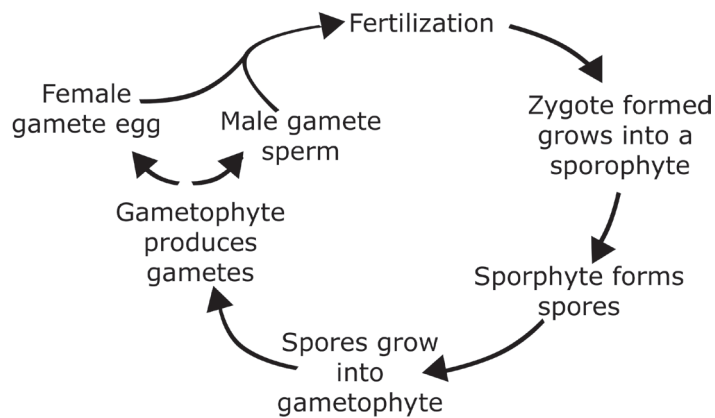


### 13.3 SEXUAL PLANT REPRODUCTION: GENERAL

One of the characteristics of all organisms in Plantae is their common reproductive cycle. The life cycle of all plants can be divided into two parts, or phases. During one phase, the plant lives as a spore-producing plant. This is called the **sporophyte phase**. A **sporophyte** is a plant that produces spores. When a spore grows, it grows into a plant that produces gametes. This is the next phase, the **gametophyte phase**. A **gametophyte** is a plant that produces gametes. When a male gamete—sperm—fertilizes the female gamete—the egg—it forms a zygote. The zygote then grows into a sporophyte plant and the cycle starts over.

To be clear, the sporophyte and gametophyte phases are actual plants. Instead of being called a “plant”, biologists call “plants” that produce gametes “gametophytes” and plants that produce spores “sporophytes”. The general cycle between sporophyte and gametophyte is shown in Figure 13.3.1. Remember during all of this discussion that all a “gametophyte” is a plant that produces male and female gametes (eggs and sperm) and all a “sporophyte” is a plant that produces spores. The fertilized female gamete is called a zygote and grows into a sporophyte. Spores grow into gametophytes. Usually, the gametophyte phase and the sporophyte phase plants do not look the same. For example, the fern gametophyte is a small plant no larger than a nickel. A fern sporophyte, though, grows into the plant that you commonly think of when you see a fern. It is a little confusing but come back to this section for clarification.



**Figure 13.3.1**

#### General Plant Reproductive Cycles

All plants follow the life cycle pattern shown here. During the sporophyte phase, the plant is called a “sporophyte”. “Sporophyte” is just the generic name for a plant that forms spores to reproduce. Sporophytes produce the spores through meiosis. A spore then grows into a “gametophyte”. “Gametophyte” is the generic name for a plant that forms gametes to reproduce. Gametes - sperm and eggs - are produced by mitosis. Sperm (the male gamete) fertilizes the egg (the female gamete) and then the combined sperm and egg (called a zygote) will grow into a sporophyte plant and the cycle starts over.

### 13.4 PLANT REPRODUCTION: NONVASCULAR PLANTS

The nonvascular plants do not produce seeds, but they do make spores (all plants make spores). The nonvascular plants are classified into the divisions Bryophyta (hornworts), Hepatophyta (liverworts), and Anthocerotophyta (mosses). Recall these plants are all small in size and live in moist environments. This is to be sure they reproduce properly. During the gamete phase, the male gametes (sperm) swims to the female gamete (the egg). Without the moist environment, the sperm would not be able to swim to the egg to fertilize it. The sperm fuses to the egg and injects its DNA into the egg. The DNA of the sperm combines with the egg. **Fertilization** is the name of the process of the sperm uniting with the egg and their chromosomes combining. After fertilization, the new cell grows into a sporophyte plant. The sporophyte produces spores by mitosis. When a spore lands in a spot favorable for it to grow, it grows into a gametophyte plant, and the cycle starts all over.