MAIN IDEA

Genetic drift is a change in allele frequencies due to chance.

Imagine a patch of 100 flowers growing in a field. Fifty are white and fifty are purple. If you randomly pick flowers from this patch to create a bouquet, you would expect about half white and half purple flowers. The more flowers you randomly pick, the more likely you are to get these proportions. However, the fewer flowers you pick, the more likely you are to have a bouquet that is not representative of the patch. It might even be all one color.

A similar situation can occur in small populations. Small populations, like small sample sizes, are more likely to be affected by chance. Due to chance alone, some alleles are likely to decrease in frequency and become eliminated. Other alleles are likely to increase in frequency and become fixed. These changes in allele frequencies that are due to chance are called **genetic drift.** Genetic drift causes a loss of genetic diversity in a population.

Two processes commonly cause populations to become small enough for genetic drift to occur. Each of these processes results in a population with different allele frequencies than existed in the original population.

READING TOOLBOX

VOCABULARY

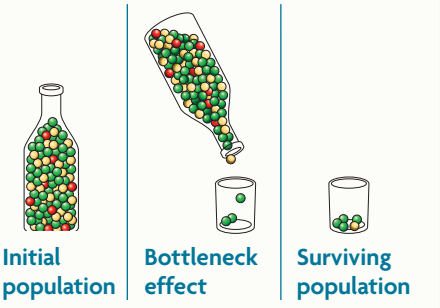
Fixed means "not subject to change." If an allele increases to a frequency of 1.0 (100%), it is said to be fixed in the population.

Bottleneck Effect

The **bottleneck effect** is genetic drift that occurs after an event greatly reduces the size of a population. One example of the bottleneck effect is the overhunting of northern elephant seals during the 1800s. By the 1890s, the population was reduced to about 20 individuals. These 20 seals did not represent the genetic diversity of the original population. Since hunting has ended, the population has grown to over 100,000 individuals. However, it has very little genetic variation. Through genetic drift, certain alleles have become fixed while others have been lost completely from the gene pool.

VISUAL VOCAB

The **bottleneck effect** describes the effect of a destructive event that leaves only a few survivors in a population.



Founder Effect

As shown in **FIGURE 3.2,** the **founder effect** is genetic drift that occurs after a small number of individuals colonize a new area. The gene pools of these populations are often very different from those of the larger populations. The founder effect can be studied in human populations, such as Old Order Amish communities. These communities were founded in North America by small numbers of migrants from Europe. For example, the Amish of Lancaster County, Pennsylvania, have a high rate of Ellis–van Creveld syndrome. Although this form of dwarfism is rare in other human populations, it has become common in this Amish population through genetic drift. Geneticists have traced this syndrome back to one of the community's founding couples.