Accessible Text for Figure 12.6.1

Overview

The diagram is divided in half horizontally into color-coded zones that represent the two phases of the alternation of generations life cycle:

Haploid zone (upper half, yellow background): Labeled “Haploid (1n)” in bold on the left. This zone contains the gametophyte — depicted as a large oval filled with a grid-like pattern of cells — and small white circles representing individual spores.

Diploid zone (lower half, green background): Labeled “Diploid (2n)” in bold on the left. This zone contains the sporophyte — depicted as a large dark-green oval filled with a pattern of cells — and a single filled green circle representing the zygote.

A central box in the middle of the diagram reads “Alternation of generations,” identifying the process shown.

The Cycle (Step by Step)

The cycle proceeds as follows, following the direction of the arrows:

1. Spores (haploid, 1n): Several small white circles in the upper-left represent spores. These are haploid cells produced by meiosis.
2. Mitosis → Gametophyte: An arrow labeled “Mitosis” leads from the spores to the gametophyte (top-center). The haploid spores divide by mitosis to produce the multicellular gametophyte.
3. Gametes: An arrow leads from the gametophyte to a point labeled “Gametes” on the upper-right. The gametophyte produces haploid gametes (such as eggs and sperm).
4. Fusion → Zygote: An arrow labeled “Fusion” leads downward from gametes to the zygote (a filled green circle at bottom-right). Two gametes fuse to form a zygote (diploid 2n), crossing from the haploid zone into the diploid zone.
5. Mitosis → Sporophyte: An arrow labeled “Mitosis” leads from the zygote to the sporophyte (bottom-center). The diploid zygote divides by mitosis to produce the multicellular sporophyte.
6. Meiosis → Spores: An arrow labeled “Meiosis” leads from the sporophyte back up to the spores (upper-left), completing the cycle. Specialized cells within the sporophyte undergo meiosis to produce haploid spores, crossing back from the diploid zone into the haploid zone.

Key Terms

Term	Definition
Haploid (1n)	Having one set of chromosomes. Applies to spores and gametes.
Diploid (2n)	Having two sets of chromosomes. Applies to the zygote and sporophyte.
Gametophyte	The multicellular haploid stage that produces gametes.
Sporophyte	The multicellular diploid stage that produces spores via meiosis.
Mitosis	Cell division producing genetically identical daughter cells; used for growth.
Meiosis	Cell division that halves chromosome number; produces haploid spores.
Gametes	Haploid reproductive cells (e.g., egg and sperm) that fuse during fertilization.
Zygote	The diploid cell formed by the fusion of two gametes.