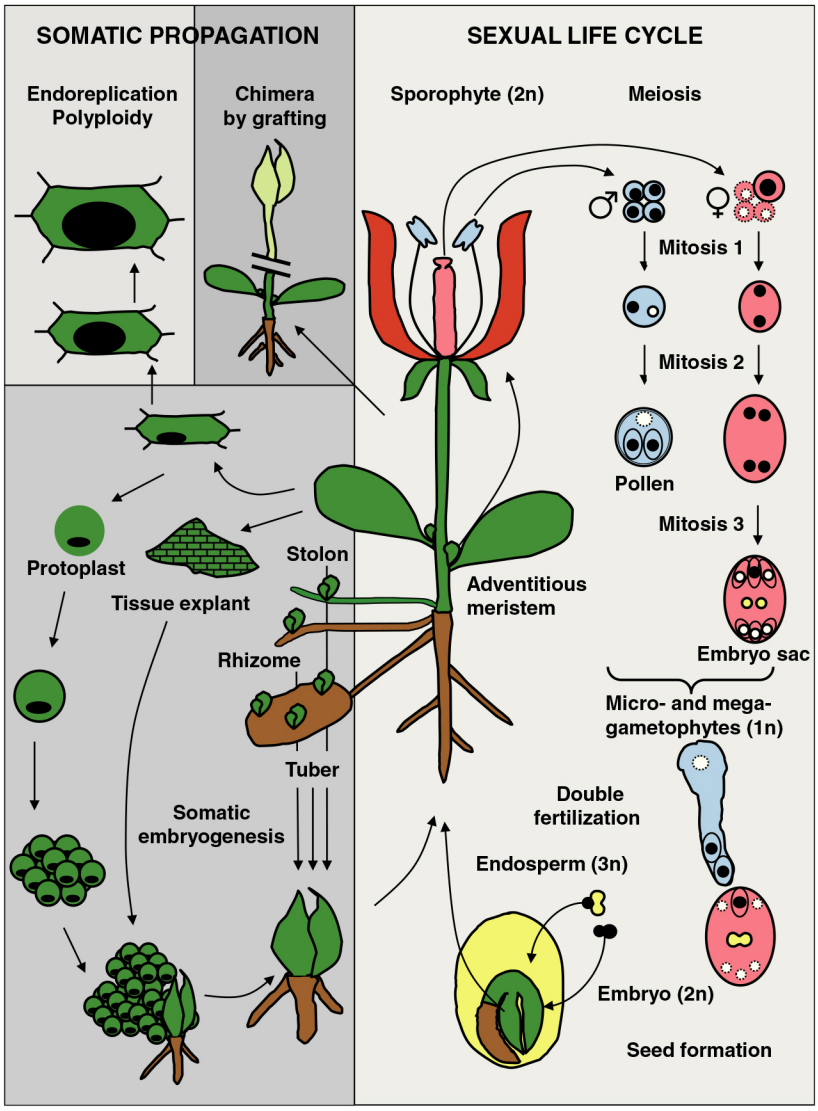

Figure 1. Unique aspects of the plant life cycle. Plants can propagate sexually (gametogenesis, fertilization, and seed formation; *right*) as well as somatically (vegetative explants, cell de- and re-differentiation, or somatic embryogenesis; *left*). The body of higher plants with roots, stem, leaves, and flowers is the diploid sporophyte. During meiosis, the chromosome number is reduced by half. Whereas in animals the meiotic products become the gametes without further division and fuse directly to produce the diploid embryo, plants form haploid male or female gametophytes via two or three mitotic divisions to form pollen or embryo sacs, respectively. The pollen grain ultimately contains one vegetative (white) and two generative (black) nuclei. The two generative nuclei fertilize the egg cell (black) and the central cell, the latter having a diploid nucleus derived from fusion of the two polar nuclei (yellow). This double fertilization gives rise to a diploid embryo and a triploid endosperm, the latter providing a nutrient source for the developing embryo. After seed germination, the embryo will grow into a new sporophyte. Most plants also have the potential for vegetative propagation through activation of lateral meristems, outgrowth of specialized organs (tubers, rhizomes or stolons), amplification in tissue culture, or regeneration from individual somatic cells after removal of the cell wall (protoplasts). Endoreduplication is frequent in plants, producing polyploid cells or tissues. Plants can be grafted to produce chimeras.