

GLOSSARY AND CREDITS

We start out as a single cell in our mother's womb and gradually develop limbs and organs. We grow in size and weight. But how do we grow from a single cell? How does that single cell become fertilized in the first place? In this unit, you will learn about the different types of reproduction and cell division. You will also learn how cells differentiate into specialized tissues and organs and how cells are regulated.

VOCABULARY

anaphase	the stage of mitosis in which the chromosomes move to opposite ends of the cell
anaphase I	the stage on the first meiotic division in which sister chromatids of a chromosome split and migrate to opposite poles
anaphase II	the stage in the second meiotic division in which sister chromatids of a chromosome split and migrate to opposite poles
angiosperm	flower-bearing plant
anisogamy	the condition of having anisogametes—gametes similar in shape but different in size
asexual reproduction	the replication of a parent cell or organism, producing a genetically identical offspring
binary fission	asexual reproduction in which a single cell divides into two with no exchange of genetic material; reproduction method of bacteria
budding	asexual reproduction involving the growth of a new individual from part of an older organism; uneven distribution of cells that results in one cell receiving most of the cell contents; in grafting, reducing the scion to a single bud

cell plate	a structure that forms across the middle of a higher plant cell in telophase; the beginning of a new cell wall which divides the two daughter cells from one another to finish mitosis
centriole	forms the ends of the spindle fibers in the cell during mitosis; normally found in animal cells
centromere	part of a chromosome that attaches to the spindle apparatus during mitosis or meiosis
chromatin	material in the cell nucleus that carries hereditary information; made up of DNA and various kinds of protein
cleavage furrow	a structure that forms around animal cells in telophase; a constriction in the middle of the parent cell that remains until the two halves of the cell divide into two, new daughter cells to finish mitosis
colony	a group of organisms attached to one another after undergoing asexual reproduction from a common parent
conjugation	an act of fertilization involving the transfer of cell contents to another cell; usually occurs in simpler organisms
crossing over	a condition in which non-sister chromatids of homologous chromosomes exchange genes
cytokinesis	the part of the cell division that causes the separation of the cytoplasm
daughter cell	the cell produced as a result of cell division
differentiation	the maturation of a cell for a specific function
diploid	having chromosomes in homologous pairs

elongation	in the maturation process of cells, the first step after production by a meristem; a lengthening of the cell assisted by water intake in living things; an organic catalyst
external fertilization	a type of mating pattern in which eggs and sperm are released into the water after the mating partners come near one another; occurs outside the body of the female
fertilization	the fusion of gametes to produce a new cell or zygote; often said to be the union of egg and sperm
fragmentation	a phenomenon in which organisms break into two or more parts and then each part grows into a new individual
G0 phase	period during the life of a cell when it has finished mitotic division
G1 phase	period during the life of a cell between the end of mitosis and the synthesis of more genetic material for another mitotic division
G2 phase	period during interphase between the synthesis of new genetic material and the beginning of mitosis
gametangium (pl. gametangia)	an organ of lower plants, some protists and some fungi, that produces gametes
gamete	the reproductive cell in sexual reproduction—for example, the egg or sperm
gonad	gamete-producing organ in animals
gymnosperm	cone-bearing plant; often called evergreen
haploid	having a single, complete set of chromosomes, or one half of each pair of homologous chromosomes

homologous chromosomes	chromosomes that are the same in size and shape and control the same characteristics; occur in pairs in higher animals and plants
homologous pair	pair of identical chromosomes (chromosomes that contain the same genes) from each parent, which all organisms produced by sexual reproduction receive
internal fertilization	a mating pattern in which the male and female come close together, the male introduces the sperm into the body of the female, and fertilization occurs
interphase	period between two periods of mitosis
isogamy	the condition of having isogametes—gametes of the same size and shape
M phase	a period in the life of the cell when it is conducting cell division
meiosis	the process involving the division of the nucleus in a reproductive cell; responsible for genetic recombination
meristem	the youthful, undifferentiated cells of root and shoot tips and other plant parts that produce new cells for growth in size and girth
metaphase	the phase of mitosis in which the daughter chromosomes line up across the middle of the cell
metaphase I	the stage in the first meiotic division in which the homologous chromosomes line up as a pair, forming a tetrad of chromatids at the equator of the cell
metaphase II	the stage in the second meiotic division in which the chromatid pair lines up at the equator of the cell
mitosis	the process involving the division of the nucleus of a body cell

multiple fission	asexual reproduction in which a single cell undergoes many mitotic divisions in the nucleus and a number of daughter cells are produced all at once
oogamy	the condition of having oogametes—gametes of different sizes and shapes; usually have eggs and sperm
ovum (pl. ova)	the egg cell; a female gamete
parent cell	the cell that begins the process of cell division
pollination	transfer of pollen from male to female cones in gymnosperms, or from anther to stigma in flowering plants
prophase	the first part of mitosis in which the chromosomes shorten and thicken, the nucleolus breaks down, and the nuclear envelope disintegrates
prophase I	the stage in the first meiotic division in which the doubled chromosomes become visible and the nuclear membrane disappears
prophase II	the stage in the second meiotic division in which the chromatid pair becomes visible and the nuclear membrane disappears
S phase	the period of interphase when the genetic information is being duplicated
sexual reproduction	the form of production of new individuals by two parents in which the offspring obtains half of its hereditary information from each parent
sister chromatids	two rod-like strands replicated by a chromosome during interphase; becomes a daughter chromosome by the end of cell division
sperm	a small, flagellated male gamete that swims to the egg to fertilize it
spindle apparatus	a system of fibers stretching from one end of a mitotic cell to the other

synapsis	the meiotic process in prophase I in which the tetrads line up side-by-side; initiates the crossing over process
telophase	the phase of mitosis in which the daughter chromosomes have reached opposite ends of the cell, the nuclear envelope and nucleolus reform, and the process of cytokinesis begins
telophase I	the stage of the first meiotic division when the cell divides into two cells, each containing one member of each pair of homologous chromosomes
telophase II	the stage of the second meiotic division when the cell divides into two haploid cells that become the gametes
tetrad	during prophase I, when the two pairs of chromatids of the homologous pair of chromosomes come together to form a four chromatid unit; time when crossing-over can occur
zygote	the result of fertilization in which two gametes have fused together; often simply called a fertilized egg