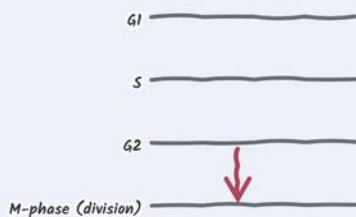


the cell cycle, amitosis, mitosis and the two meiotic divisions that halve the chromosome number

The Cell Cycle

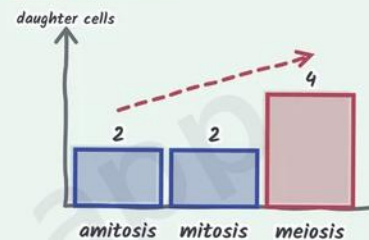
- the cell cycle : two alternating phases, interphase and M-phase
- interphase is the longest phase: metabolically active, preparing to divide; splits into G1, S, G2
- G1, first gap or growth : right after division; RNA (mRNA, rRNA, tRNA), protein and membrane synthesis
- S, synthesis : DNA is replicated, doubling the DNA per cell; histones are made too
- G2, second growth : nuclear volume increases; proteins for division are made; RNA synthesis continues
- animal cells: a daughter pair of centrioles appears near the existing pair, in G2
- M-phase : mitosis or meiosis; karyokinesis (nucleus divides) then cytokinesis (cytoplasm divides)



the cycle read downward: G1, then S, then G2, then the step down into M-phase division

Three Kinds of Cell Division *

- amitosis (direct division), mitosis (indirect, equational) and meiosis (reductional division)
- mitosis occurs in haploid or diploid cells; meiosis only in diploid cells
- honey bee: drones develop from haploid unfertilised eggs, by mitosis
- Marchantia: haploid spores build the gametophyte, by mitosis
- one parent cell gives two daughter cells by amitosis or mitosis, four by meiosis



daughter cells from one parent cell: two by amitosis and by mitosis, four by meiosis

every multicellular organism traces back to one dividing zygote: every cell arises from a pre-existing cell

Amitosis

- amitosis, the simplest mode: the nucleus elongates, a constriction along its length deepens
- it splits the nucleus UNEQUALLY into two daughter nuclei
- cytoplasm divides after, giving two daughter cells
- occurs in unicellular organisms, abnormal cells, old cells, and foetal membrane cells

