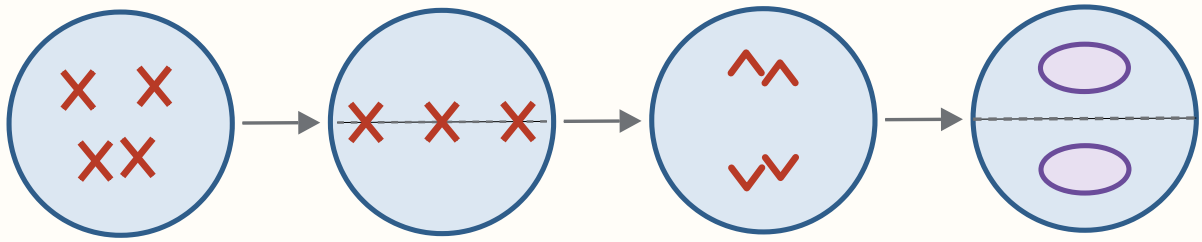
Mitosis and the Cell Cycle: Stages

DNA is copied in interphase; mitosis then shares it out in four stages, ending in two identical daughter cells.

DNA is copied in interphase: every chromosome is already two chromatids



prophase — chromosomes condense

metaphase — line up at equator

anaphase — chromatids pulled apart

telophase — two nuclei form

Key terms

interphase	most of the cycle; the cell grows, makes proteins and organelles, and the DNA is replicated.
chromatid	one of two identical copies of a chromosome, joined at the centromere.
centromere	the region where the two chromatids are joined; spindle fibres attach here.
metaphase	chromosomes line up across the equator, with spindle fibres attached to the centromeres.
anaphase	the centromeres divide and the chromatids are pulled to opposite poles.
cytokinesis	the division of the cytoplasm, which finishes the job and gives two daughter cells.

I can...

- [ ] Not all cells in multicellular organisms retain ability to divide
- [ ] Cell cycle: DNA replication in interphase
- [ ] Mitosis produces two daughter cells each with identical DNA copies
- [ ] Behaviour of chromosomes in interphase, prophase, metaphase, anaphase, telophase
- [ ] Spindle fibres attached to centromeres separate chromatids
- [ ] Cytokinesis
- [ ] Recognise stages and explain appearance of cells in each

EXAM TRAP

DNA replicates in interphase, never in prophase. In metaphase each chromosome is still two chromatids, and it is chromatids, not chromosomes, that are pulled apart in anaphase.

4 marks: what earns them

1. Metaphase
   Not: prophase, anaphase or mitosis alone
2. Chromosomes are at the equator / middle because spindle fibres are attached to their centromeres
   Not: chromosomes are in the middle, with no reason; spindle fibres attached to chromosomes, with no centromere
3. Each chromosome has two chromatids because DNA was replicated in interphase
   Not: DNA replicates in prophase / metaphase; chromosomes have split
4. The two chromatids are identical and joined at the centromere, ready to be separated and pulled to opposite poles in anaphase
   Not: chromosomes are pulled apart (should be chromatids); chromatids are different

Remember

Copy in interphase, line up in metaphase.
Pull apart in anaphase.
Two daughter cells at the end.

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