Mitosis and the Cell Cycle

Cell reproduction

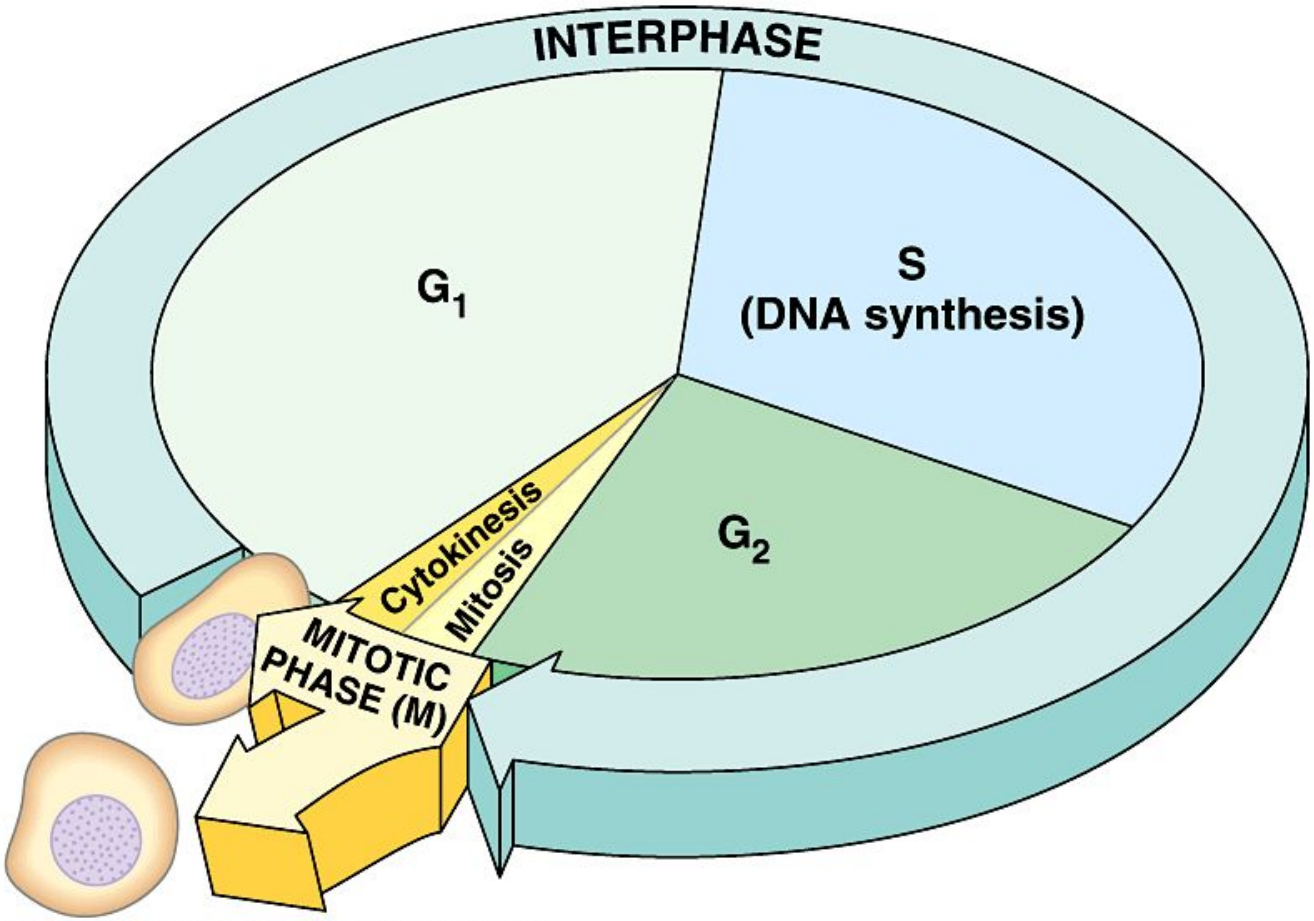
Some Definitions

- Somatic Cells – body cells
  - Produced through mitosis
  - Has 46 chromosomes (23 pairs)
- Homolog – each member of a chromosome pair
- Diploid (2n) – total of 46 chromosomes in people – zygote & somatic cells
- Haploid (n) – total of 23 chromosomes in people, gametes (sperm & egg)

The Cell Cycle

- The sequence of growth and division of a cell.
- 95% of cell cycle in interphase
- 5% of cell cycle in mitosis

Cell cycle

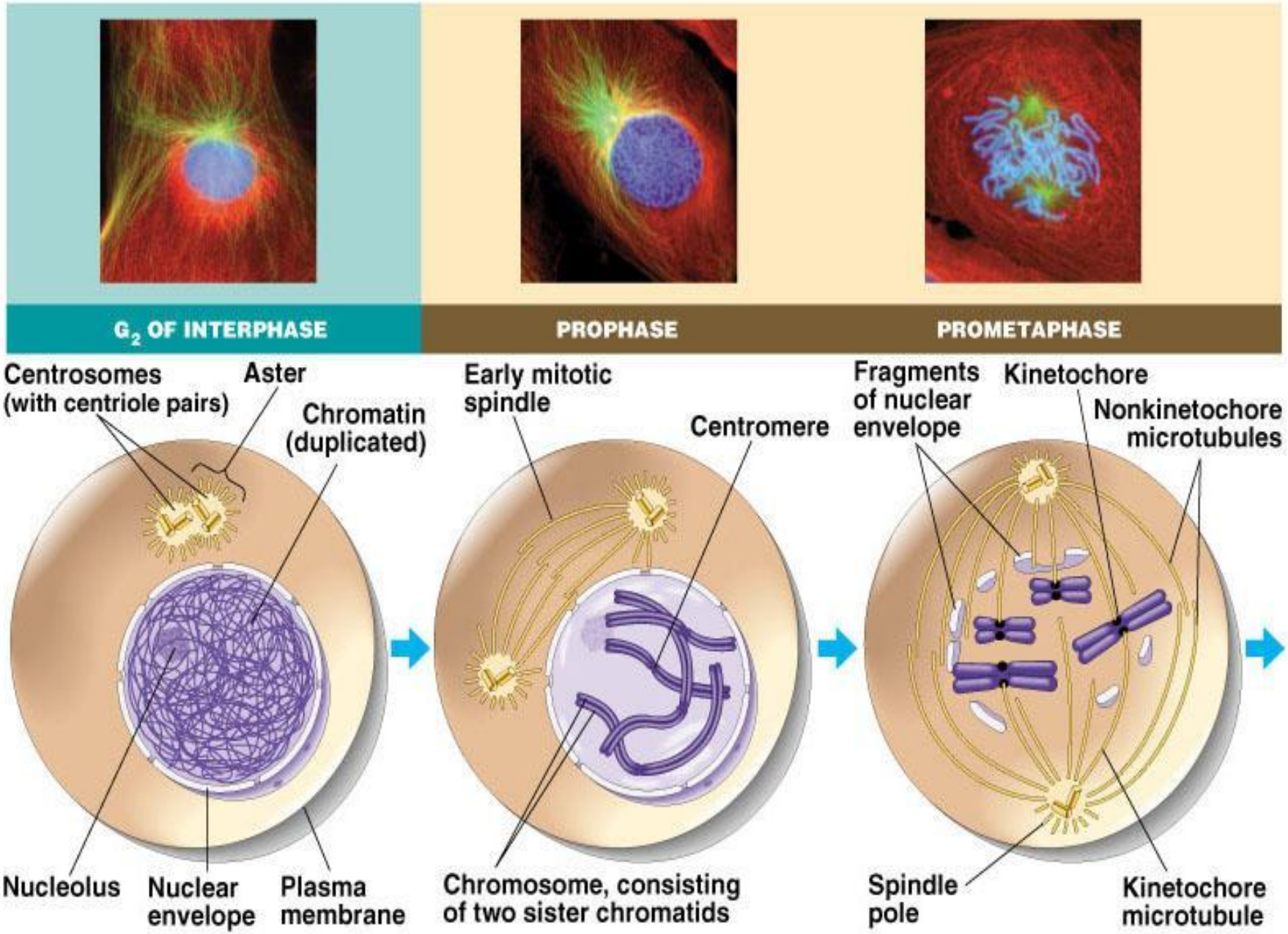


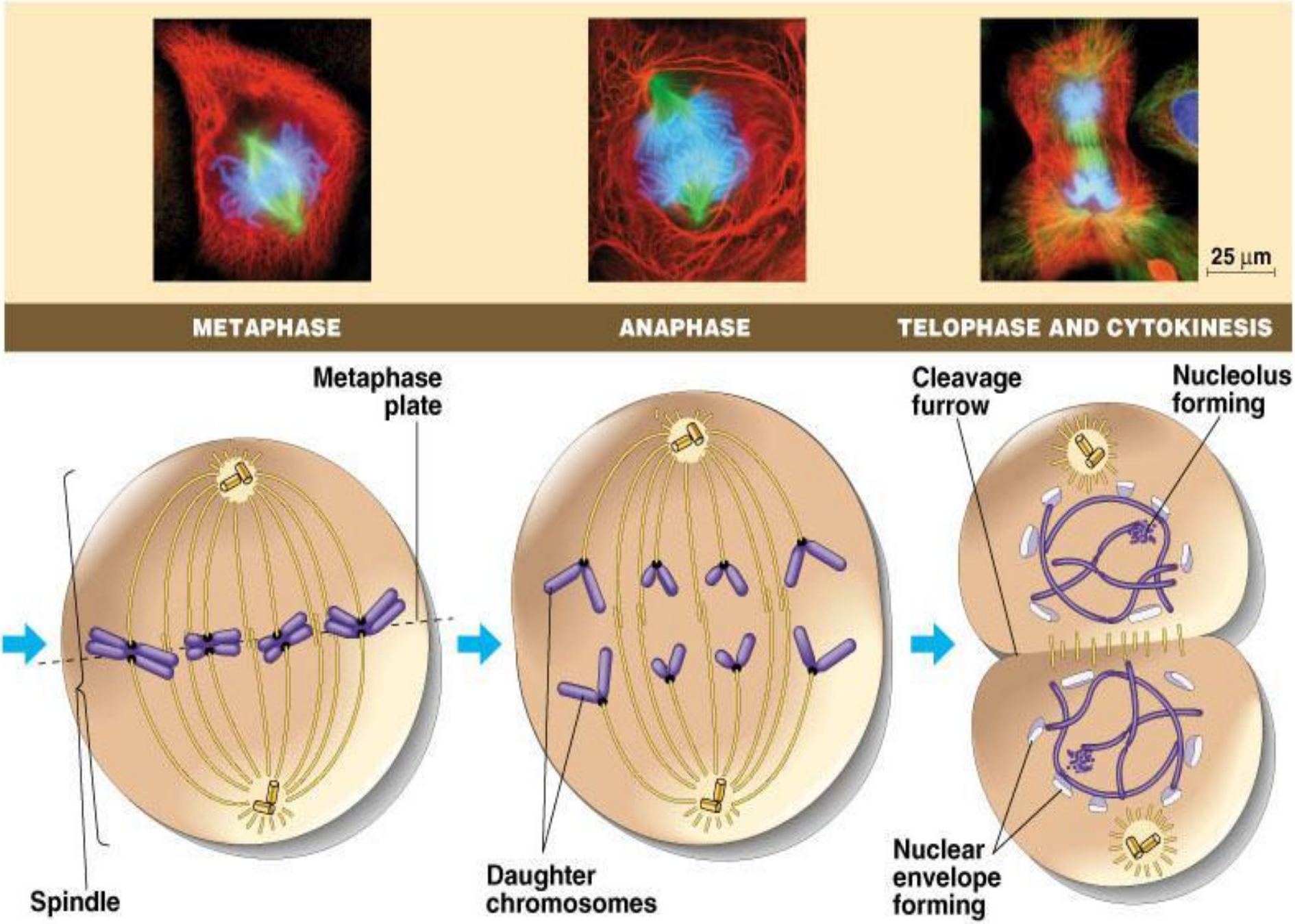
Interphase

- Growth Stage 1 (G_1) – metabolic activity of the cell
- Synthesis Stage (S) – metabolic activity of the cell, replication of DNA
- Growth Stage 2 (G_2) – metabolic activity of the cell, prepare for division

Mitosis

- Happens in **all** cells
- Cell division process
- 5 major stages

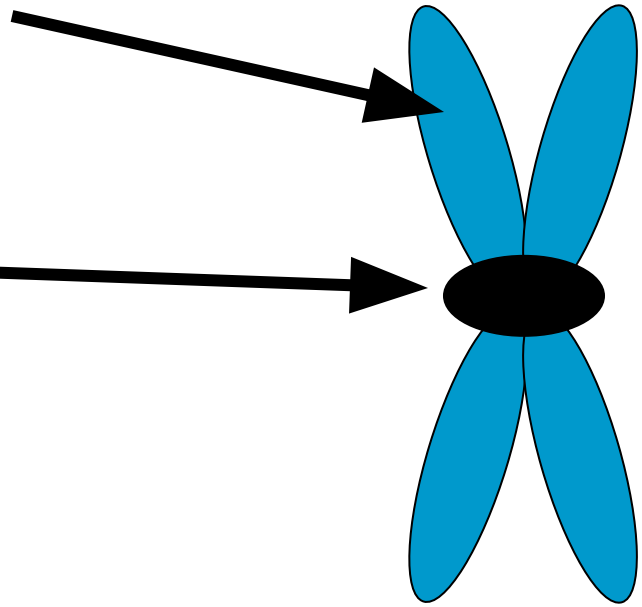




Prophase

- Nuclear envelope disappears
- Chromosomes condense – can see sister chromatids

  and centromere
- Spindle forms



Metaphase

- Chromosomes move to the equator of spindle
- Each chromatid is attached to spindle with centromere

Anaphase

- Centromeres split
- Sister chromatids are pulled apart to opposite poles of the cell
- Each chromatid is now a separate chromosome

Telophase

- Nuclear envelopes (2) reform
- Chromosomes begin to uncoil

Cytokinesis

- Cytoplasm divides
- Two new **daughter cells** are now separate