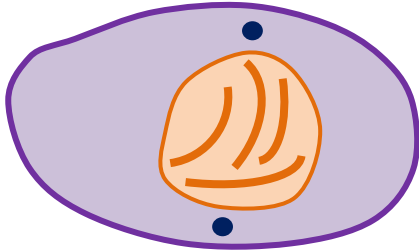


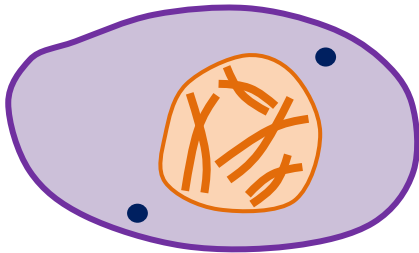
MITOSIS

Cell division for growth, repair and replacement

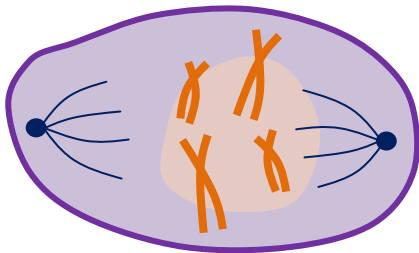
Mitosis refers to the type of cell division where two genetically-identical nuclei are formed from one parent cell nucleus. The process happens in a number of stages:



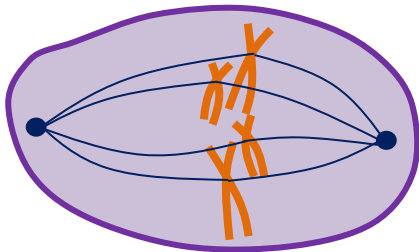
Interphase refers to the state a complete parent cell is in when it has all 46 chromosomes that have been replicated. There are two **centrioles** situated at opposite ends of the cell



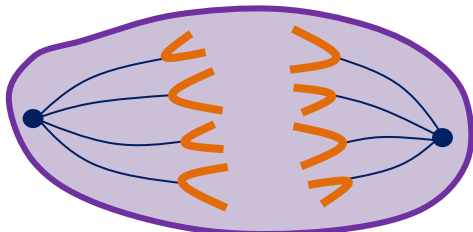
Early prophase occurs when the chromosomes **supercoil** (shorten and thicken). At this point they consist of a pair of sister **chromatids**. The two daughter centrioles begin to move around the cell



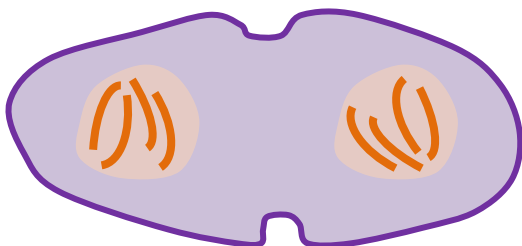
Late prophase involves the centrioles moving completely round to opposite ends of the cell (opposite **poles**). Each centriole begins to make the **spindle**, a structure made of protein threads. The nuclear envelope has broken down at this point



Metaphase happens next. The individual chromosomes move to the central region of the spindle (the **equator**) and align themselves. Each chromosome becomes attached to the spindle thread as the spindle locks onto the **centromere** of each chromosome



Anaphase happens when the centromeres split and each individual chromatid (now effectively its own chromosome). The spindle fibres shorten, which pulls the chromatids further apart to opposite poles of the cell. They have a V-shaped appearance because they are being pulled by the centromere, which leads



Telophase is the final stage of nuclear division where a new nuclear envelope reforms around each individual set of chromatids to create two new nuclei. The spindle breaks down and disappears and the chromosomes uncoil again. The cell then splits in two, so that the two daughter cells each have a nucleus and are genetically identical. This splitting action is called **cytokinesis**