In this phase homologous pairs move along to

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In this phase proteins are grown in G phase and chromosomes are replicated in S phase. This is the longest phase of meiosis here the chromosomes condense and pair up. Each chromosome carefully lines up with its homologue partner so that two match up at corresponding positions along their full length.

The process in which the homologous chromosomes trade parts is called crossing over. This is easily done by the help of protein structure called synaptonemal complex as it hold together the homologues, the chromosomes are positioned on top of another throughout the crossing over. Crossovers can be identified under a microscope as chiasmata, they are the cross-shaped structures where homologues are joined together. Chiasmata keep the homologues connected to each other after the synaptonemal complex breaks down, so each homologous pair needs at least one. After crossing over, the spindle begins to capture chromosomes and move them towards the center of the cell. Each chromosome attaches to microtubules from just one pole of the spindle, and the two homologues of a pair bind to microtubules from opposite poles. During this phase homologous pairs move along to metaphase plate for seperation.

Independent assortment decides the orientation of each bivalent and make sures that half of each chromosome pair is oriented to each pole. This is to ensure that homologous chromosomes do not end up in the same cell. In this phase the homologous are pulled apart and move apart to opposite ends of the cell. However the sister chromatids of each chromosome stay attached together. This is the final stage of meiosis I and here the chromosomes of each homologous pair arrive at the opposite poles of the cell.

The nuclear membrane reforms and the chromosomes decondense, Cytokinesis usually occurs at the same time as telophase I, forming two haploid daughter cells. During this the chromatin condenses to form visible chromosomes again and the nuclear envelope and nucleolus disintegrate, and spindle fibers begin to appear. No crossing over occurs. The chromosomes line up individually along the metaphase plate.

In anaphase the remaining centromeric cohesion is cleaved allowing the sister chromatids to segregate. The sister chromatids by convention are now called sister chromosomes as they move toward opposing poles. Meiosis II ends when the sister chromosomes have reached opposing poles. The spindle disintegrates, and the chromosomes recoil, forming chromatin. Nuclear envelopes reform and cleavage or cell plate formation eventually produces a total of four daughter cells, each with a haploid set of chromosomes