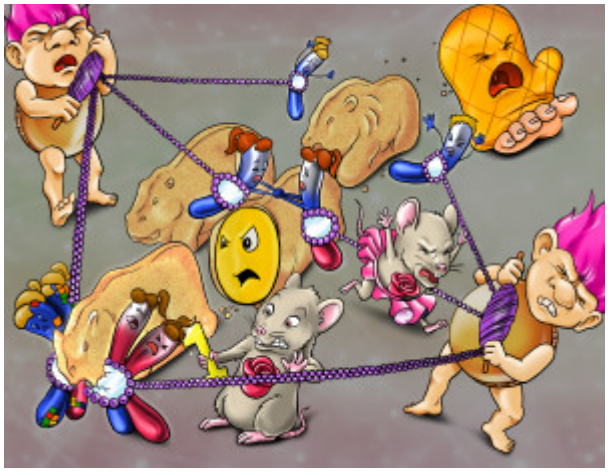
Anaphase

Anaphase is the third phase of cell division and is characterized by the splitting of pairs previously lined up along the metaphase plate. This occurs by spindle microtubules from each centriole pulling the chromosome its attached to towards the individual poles. In meiosis I anaphase, homologous chromosome pairs are being separated so that each new cell gets only one parent’s copy of each chromosome (1-23). Whether the cell gets the mom’s chromosome or dad’s chromosome for each of the 23 chromosomes is random which creates genetic diversity. In meiosis II anaphase, sister chromatids pairs are being separated, but these chromatids may not be genetically identical because of crossing over from meiosis I prophase. Finally, in mitosis anaphase, sister chromatid pairs are being separated but are genetically identical because crossing over does not occur in mitosis.



PLAY PICMONIC

Spindle Microtubules from Centrioles Split Pairs
Cent-troll Spindle with Globular-ropes Splitting Pairs
Spindle microtubules extend from the centrioles and pull pairs of chromosomes apart and toward the poles.

Meiosis I Tetrad Splits into Two Sister Chromatid Pairs
Mouse-rose (1) Wand splitting Tetris-chromosomes into Two Sister Chrome-kid Pairs
Tetrads are pulled apart during meiosis I. This is a source of genetic diversity as the chromosome from either parent can be separated into either cell and genetic material exchange has already happened.

Meiosis II Sister Chromatid Pair Splits into Two Chromatids
Mouse-rose in (2) Tutu Sister Chrome-kid Pair Splits into Two Chrome-kids
In meiosis II, sister chromatids are separated and moved towards each centriole, though the sister chromatids may not be homozygous anymore due to genetic material exchange.

Mitosis Sister Chromatid Pair Splits into Two Chromatids
Mitt-toes Sister Chrome-kid Pair Splits into Two Chrome-kids
In mitosis, sister chromatids are separated and pulled towards each centriole. Each centriole has one chromatid from the pair attached to it via microtubules. These chromatids are genetically identical because crossing over and genetic diversification does not occur in mitosis. Mitosis produces genetically identical daughter cells.