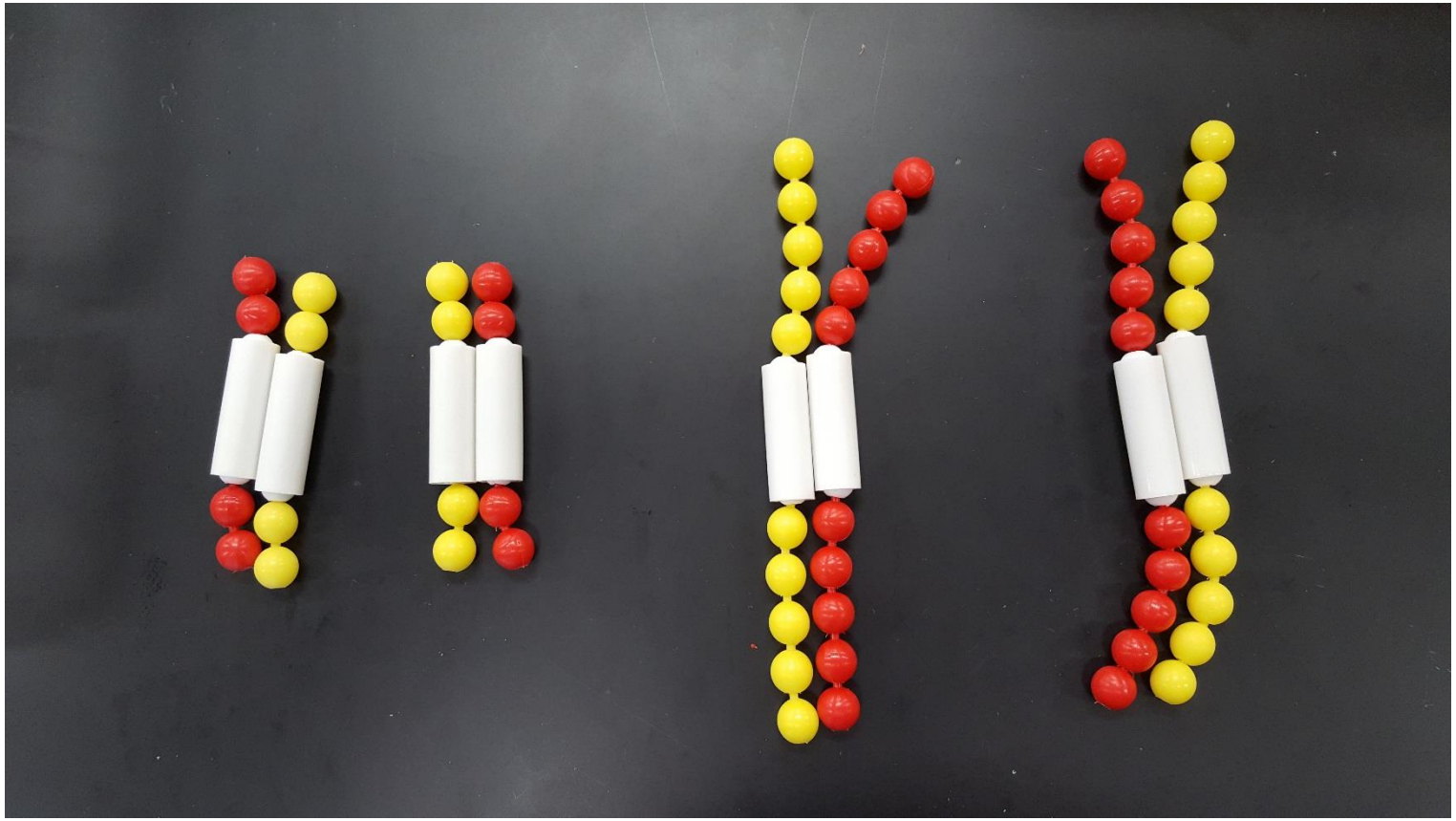
Lab Flow

- Observing HeLa cells under the microscope
- HeLa cells and Research Ethics: debate
- Meiosis with beads activity – worksheet on p.38

Homework for 02/15/17:

- Finish worksheet for Lab 4 (due Mon, Feb 20, at the beginning of the lab)
- Pre-lab quiz 5 (due Wed, Feb 15, noon)
- Reading (Lab #5 'Complementation in *Saccharomyces cerevisiae*', pp.40-45)
- Check vials, set up F2 cross

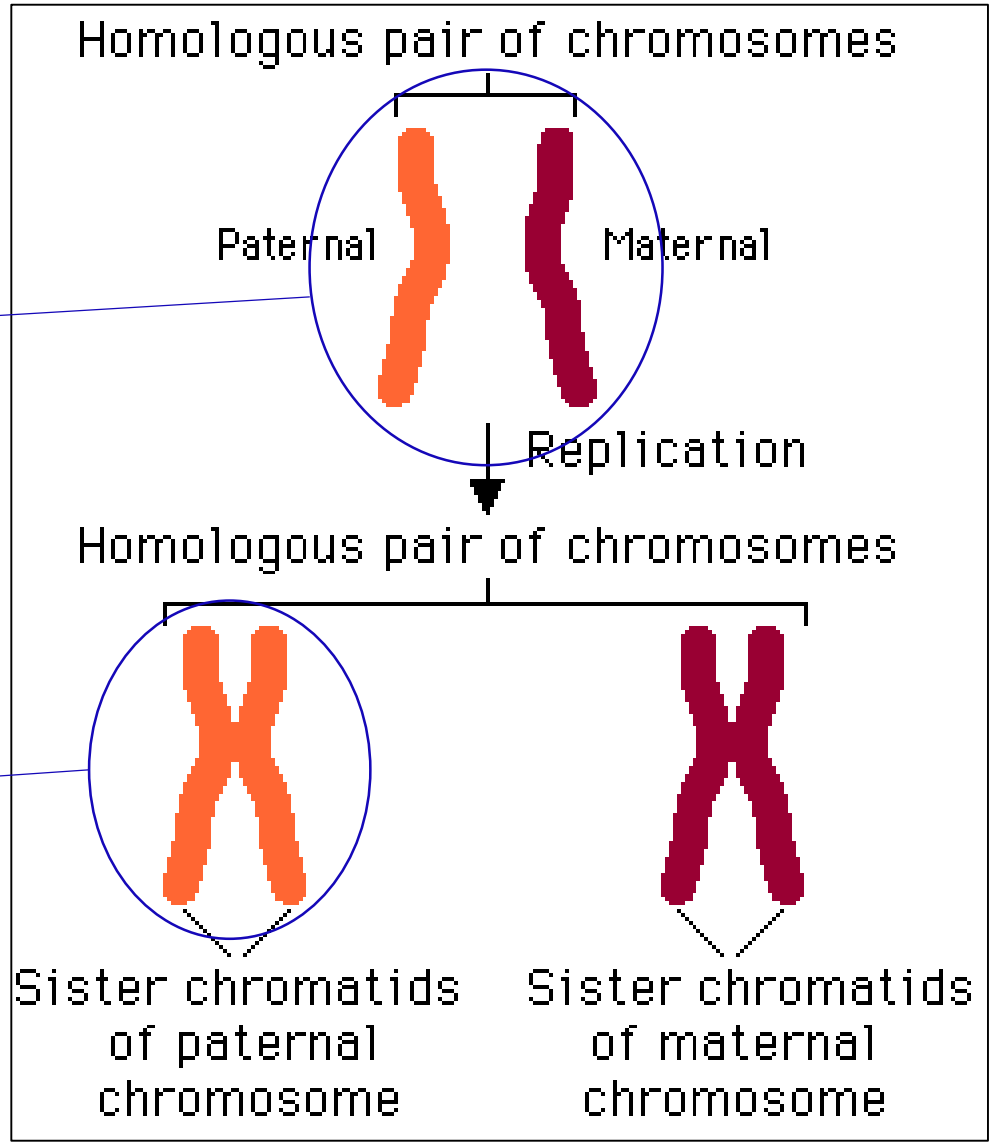
Lab # 5 : Meiosis with beads activity



Chromosomes

Homologous chromosomes

Identical chromosomes
(=sister chromatids)



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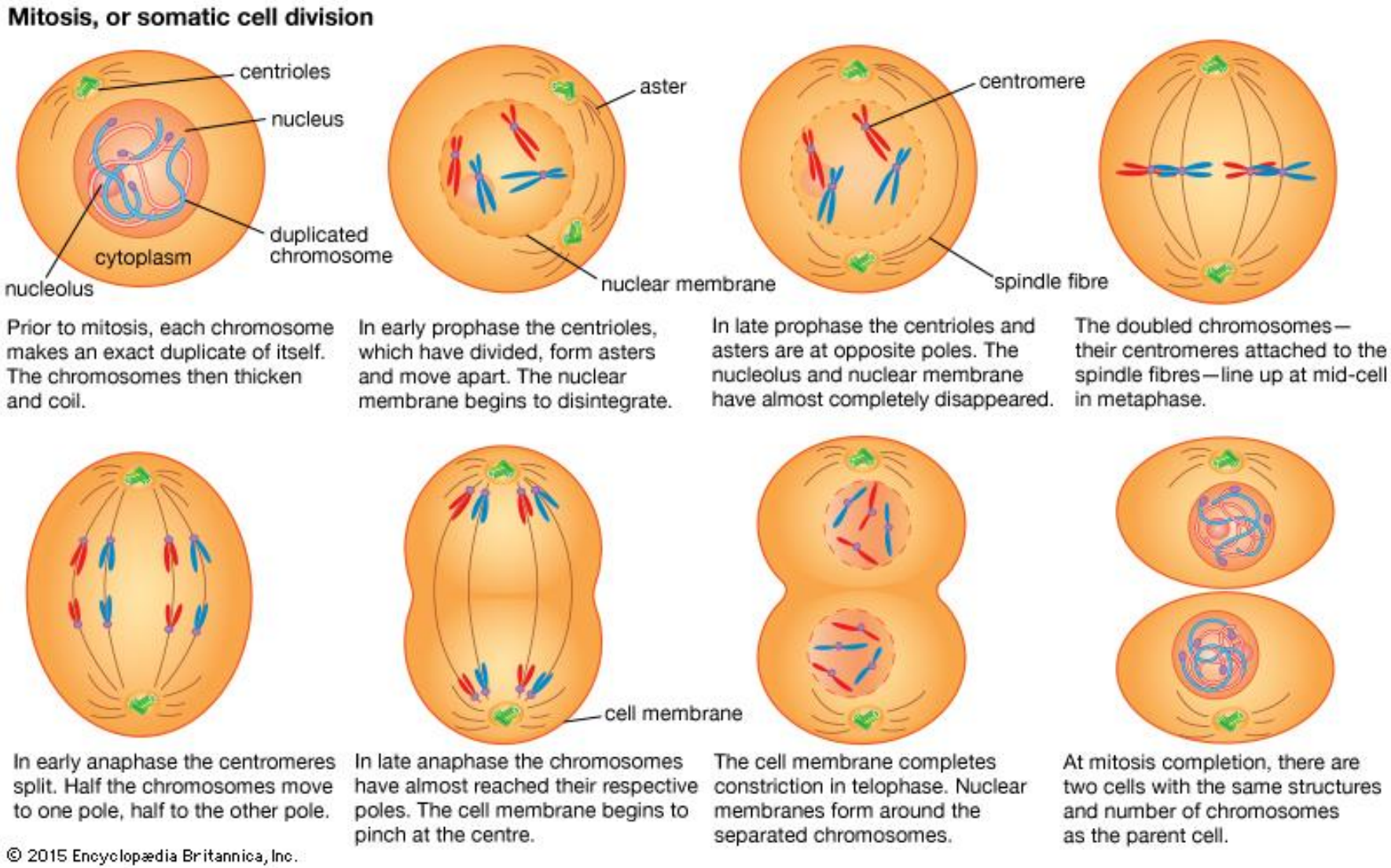
Mitosis


Mitosis, or somatic cell division
centrioles
nucleus
duplicated chromosome
cytoplasm
nucleolus
aster
nuclear membrane
centromere
spindle fibre
Prior to mitosis, each chromosome makes an exact duplicate of itself. The chromosomes then thicken and coil.
In early prophase the centrioles, which have divided, form asters and move apart. The nuclear membrane begins to disintegrate.
In late prophase the centrioles and asters are at opposite poles. The nucleolus and nuclear membrane have almost completely disappeared.
The doubled chromosomes—their centromeres attached to the spindle fibres—line up at mid-cell in metaphase.
cell membrane
In early anaphase the centromeres split. Half the chromosomes move to one pole, half to the other pole.
In late anaphase the chromosomes have almost reached their respective poles. The cell membrane begins to pinch at the centre.
The cell membrane completes constriction in telophase. Nuclear membranes form around the separated chromosomes.
At mitosis completion, there are two cells with the same structures and number of chromosomes as the parent cell.
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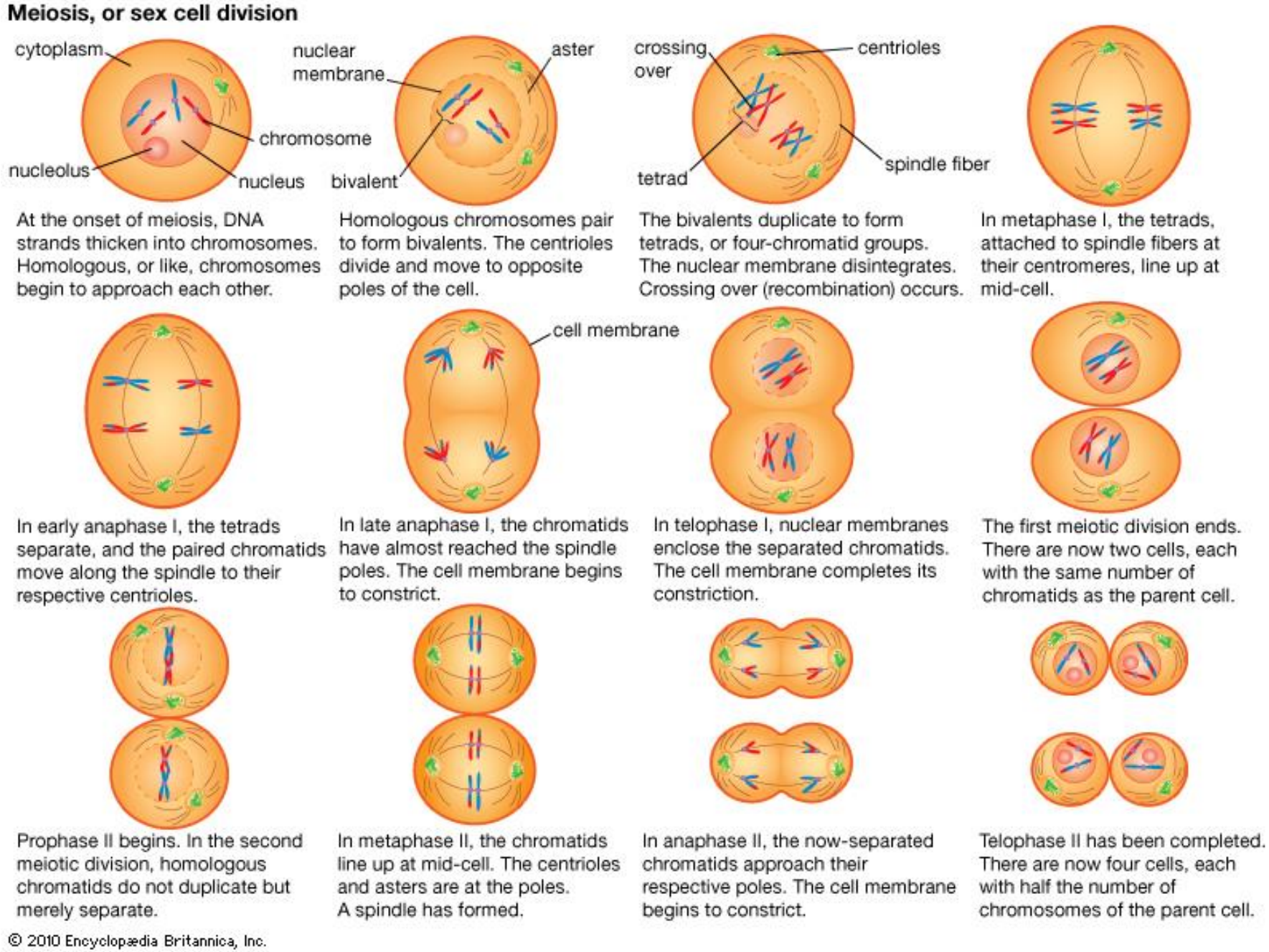
Meiosis


Meiosis, or sex cell division
cytoplasm
nucleolus
chromosome
nucleus
At the onset of meiosis, DNA strands thicken into chromosomes. Homologous, or like, chromosomes begin to approach each other.
nuclear membrane
aster
bivalent
Homologous chromosomes pair to form bivalents. The centrioles divide and move to opposite poles of the cell.
crossing over
centrioles
tetrad
spindle fiber
The bivalents duplicate to form tetrads, or four-chromatid groups. The nuclear membrane disintegrates. Crossing over (recombination) occurs.
In metaphase I, the tetrads, attached to spindle fibers at their centromeres, line up at mid-cell.
In early anaphase I, the tetrads separate, and the paired chromatids move along the spindle to their respective centrioles.
cell membrane
In late anaphase I, the chromatids have almost reached the spindle poles. The cell membrane begins to constrict.
In telophase I, nuclear membranes enclose the separated chromatids. The cell membrane completes its constriction.
The first meiotic division ends. There are now two cells, each with the same number of chromatids as the parent cell.
Prophase II begins. In the second meiotic division, homologous chromatids do not duplicate but merely separate.
In metaphase II, the chromatids line up at mid-cell. The centrioles and asters are at the poles. A spindle has formed.
In anaphase II, the now-separated chromatids approach their respective poles. The cell membrane begins to constrict.
Telophase II has been completed. There are now four cells, each with half the number of chromosomes of the parent cell.
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Beads activity

1

Mitosis

- go through each phase and demonstrate what happens with chromosomes on each phase

2

Meiosis

- How is it different from mitosis?
- What does happen with chromosomes during each phase of meiosis?
- What is crossing over?

3

- Show what homologous and identical chromosomes look like?
- Show crossing over and examples of mutations

4

In your worksheet:

- Draw a scheme of mitosis and meiosis showing chromosomes only
- Label identical chromosomes, homologous chromosomes, sister chromatids, centromeres, and when the replication occurs