Understandings:

1. Explain what happens before meiosis.

- Do you remember the cell cycle? Mitosis is a part of the cell cycle, but meiosis is not a cycle! However, the preparation is the same.

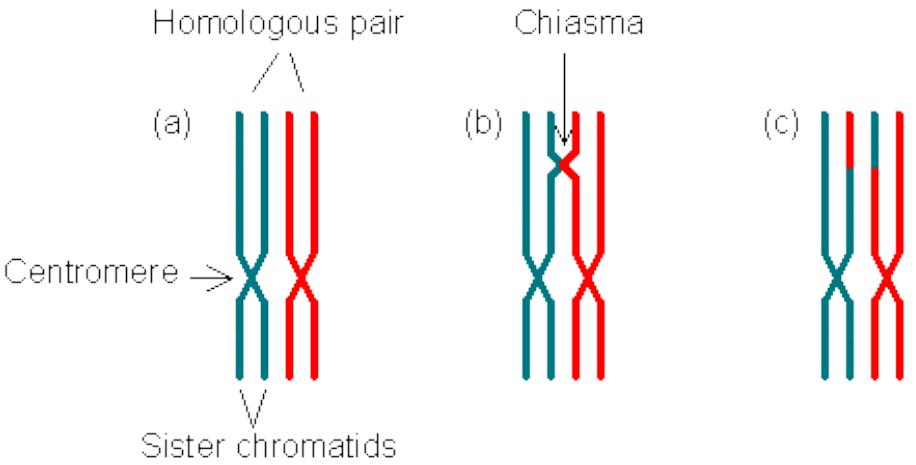
Before the actual division, the cell has to prepare itself, and does that by replication of DNA. The whole process is called interphase and consists of three phases: G1, S and G2. Review chapter one if forgotten.

The chromosomes condense, and then we have the pairing or synapsis. The combination is called tetrad/bivalent since it has 4 chromatids or 4 DNA molecules. Now, that is the precursor for meiosis. Now we enter prophase 1.

2. Explain what crossing over is.

- Crossing over is when the exchange of alleles happens. This happens between non-sister chromatids.

The non-sister chromatid exchange information and the crossing over point is called the chiasma because it forms a "chi" or X in Greek!



3. Explain the reasons for chiasmata formation.

- Again, chiasmata formation is for the variation due to crossing over, but also for stability of the bivalents. The crossing overs can break bonds of the homologous pairs, hence enable independent assortment.

4. Explain the result of crossing over.

- Result of crossing over is genetic variation and new combination of alleles. Crossing over happens at prophase 1!

5. Distinguish between Meiosis 1 and Meiosis 2.

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1. First meiosis is reduction division from 2n to n.

2. Sister chromatids do not split in meiosis 1.

3. Also, meiosis 1 is responsible for the independent assortment and crossing over that enables the genetic variation. Meiosis 2 is awfully a lot like mitosis to be honest.

6. Explain the cause of independent assortment.

- This is due to the random orientation of homologous chromosomes.

7. Outline briefly what happens in Meiosis 2.

- This is just like mitosis as mentioned.

Applications and skills:

1. Be able to illustrate how chiasmata is formed through crossing over.

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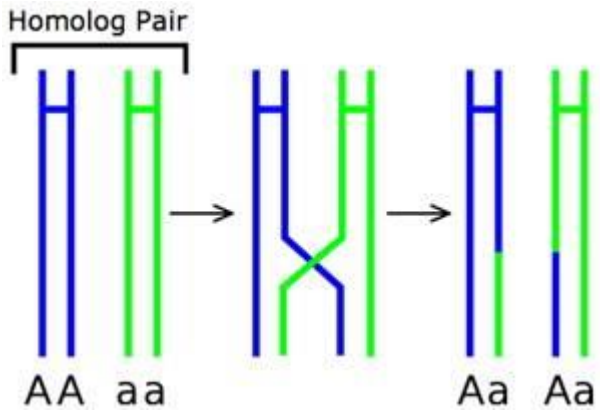

Tadaa. Just don't forget to mention some keywords! The keywords are:

1. Synapsis – pairing of the blue and green

2. Tetrad – pairing of blue and green will form a tetrad

3. Chisama – they will overlap and form a chiasma

4. Sister chromatids and non-sister chromatids – non-sister chromatids exchange alleles