Objective 8.1: I can apply my understanding of haploid and diploid cells to different types of cells in an organism.

1. What is the difference between a Haploid and diploid cell?

2. For each of the following state if the cell is haploid or diploid.
   - Sperm cell = ____________
   - Liver cell = ____________
   - Egg cell = ______________
   - Stomach cell = ______________

3. If the diploid number in a liver cell is 52, how many chromosomes are there in the egg of this organism?

4. The combination of a ____________ and an ____________ produces a zygote with 46 chromosomes.

5. During meiosis, the chromosome number:
   a) is doubled
   b) is reduced
   c) remains the same
   d) becomes diploid

5. Name the 2 human gametes & tell their chromosome number.

8.2: I can label the different forms or structures of a chromosome.

**Chromosomes vs. Chromatin**

**Chromosomes**
- Tightly packaged DNA
- Found only during cell division
- DNA is not being used for macromolecule synthesis

**Chromatin**
- Unwound DNA
- Found throughout Interphase
- DNA is being used for macromolecule synthesis
**Objective 8.3:** I can explain the events of Interphase (G1, S, G2).

1. Describe what occurs in the following:
   G1:
   
   S:
   
   G2:

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**Objective 8.4:** I can explain the events of Mitosis and label the phases.

1. Explain what events occur in mitosis. Just explain, prophase, metaphase, anaphase, and telophase.

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**Objective 8.5:** I can explain the events of cytokinesis and how it differs in plant and animal cells.

1. What is Cytokinesis?

2. How is Cytokinesis Different in Plant and Animal cells?
Objective 8.6: I can explain the events of Meiosis and label the phases.

1. What are homologous chromosomes?

2. What is crossing over? When does it occur?

3. Explain what events occurs during each phase of meiosis. Remember to use the terms homologous chromosomes when discussing Meiosis I and sister chromatids when discussing Meiosis II.
Objective 8.7: I can explain how the formation of the egg and sperm differ.

1. How does the formation of egg and sperm differ?

Objective 8.8: I can explain three ways mechanisms that allow for variation within a population.

1. _________________________
2. _________________________
3. _________________________
Objective 8.9: I can explain nondisjunction and interpret a patient’s karyotype to determine if they are male or female and if the individual has a disorder (i.e., Turner’s, Kleinfelter’s, Down syndrome).

You must be able to write the disorder using the correct notation. Look at level 4 for help.

1. Define nondisjunction. (Diagram of nondisjunction)

2. Is the patient male or female? How do you know?

3. Is the patient male or female? How do you know?

- Turner’s Syndrome Karyotype
  - Diagram showing a missing X chromosome (XO)
  - Diagram showing a normal karyotype

- Klinefelter Syndrome
  - Diagram showing an extra X chromosome (XXY)
  - Diagram showing a normal karyotype

- Down Syndrome Karyotype
  - Diagram showing an extra chromosome 21 (trisomy 21)
Objective 8.10: I can compare and contrast Mitosis and Meiosis.
1. Place the phrases below under the correct type of cell division.

- Oogenesis makes 1 mature egg and 3 polar bodies
- Makes 4 genetically different cells
- 1 cell division
- Types of cell divisions
- 2 cell divisions
- Formation of body cells
- Formation of somatic cells
- $2n \rightarrow n$
- Occurs to make gametes
- $2n \rightarrow 2n$
- Crossing over occurs
- No crossing over occurs
- Phases include PMAT
- Spermatogenesis makes 4 sperm cells
- Occurs in somatic cells
- Makes 2 genetically the same cells
- Uses homologous chromosomes