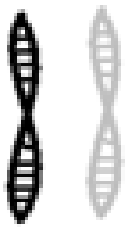
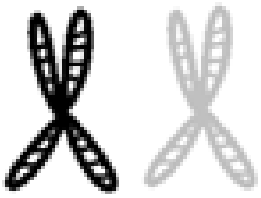
Meiosis

Homologous pairs and Chromatids



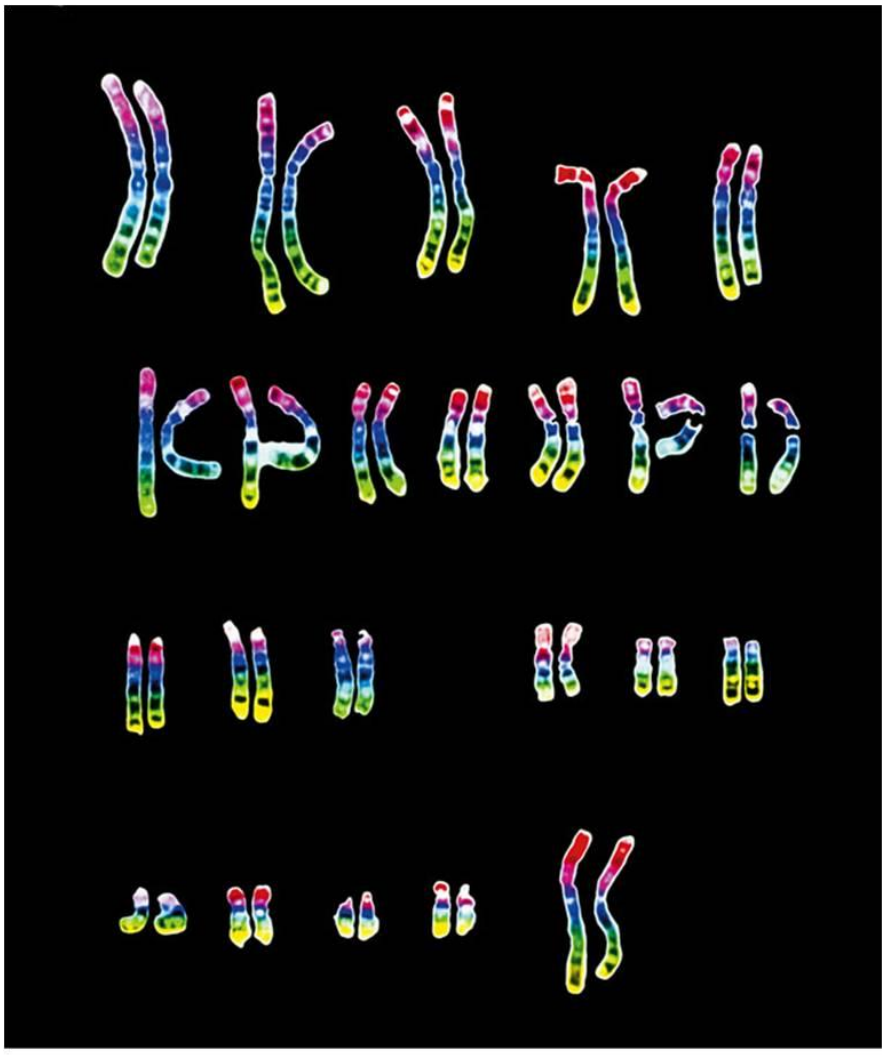
- How many **chromosomes** are represented by this drawing?
- How many **pairs** of chromosomes are represented by this drawing? What are the pairs called?
- Are there **chromatids**?



- How many chromosomes are represented by this drawing?
- How many pairs of chromosomes are represented by this drawing?
- Are there **chromatids**? What are chromatids?
- What is the specific name of the cell cycle when chromatids are created?
- What is the difference between **homologous pairs** and sister chromatids?

Meiosis

- This is a human **karyotype**.
- Is it 1N or 2N? **Haploid** or **Diploid**? How do you know?
- How many pairs are present?
- Do you think it is from a male or female? Hint: Look at chromosome number 23!



Meiosis

Steps of Meiosis

Use the drawing on the next page to go through the process of meiosis with 3 sets of chromosomes. Label all the steps and what happens at each step. (Be sure to use the biological vocabulary.)

Identify the point at which each of the following occur:

- S-phase of Interphase, Meiosis 1, Meiosis 2, Fertilization, Mitosis
- When cells are haploid and diploid
- When homologous pairs separate
- When sister chromatids separate
- When crossing over occurs
- When independent assortment occurs
- When random fertilization occurs
-

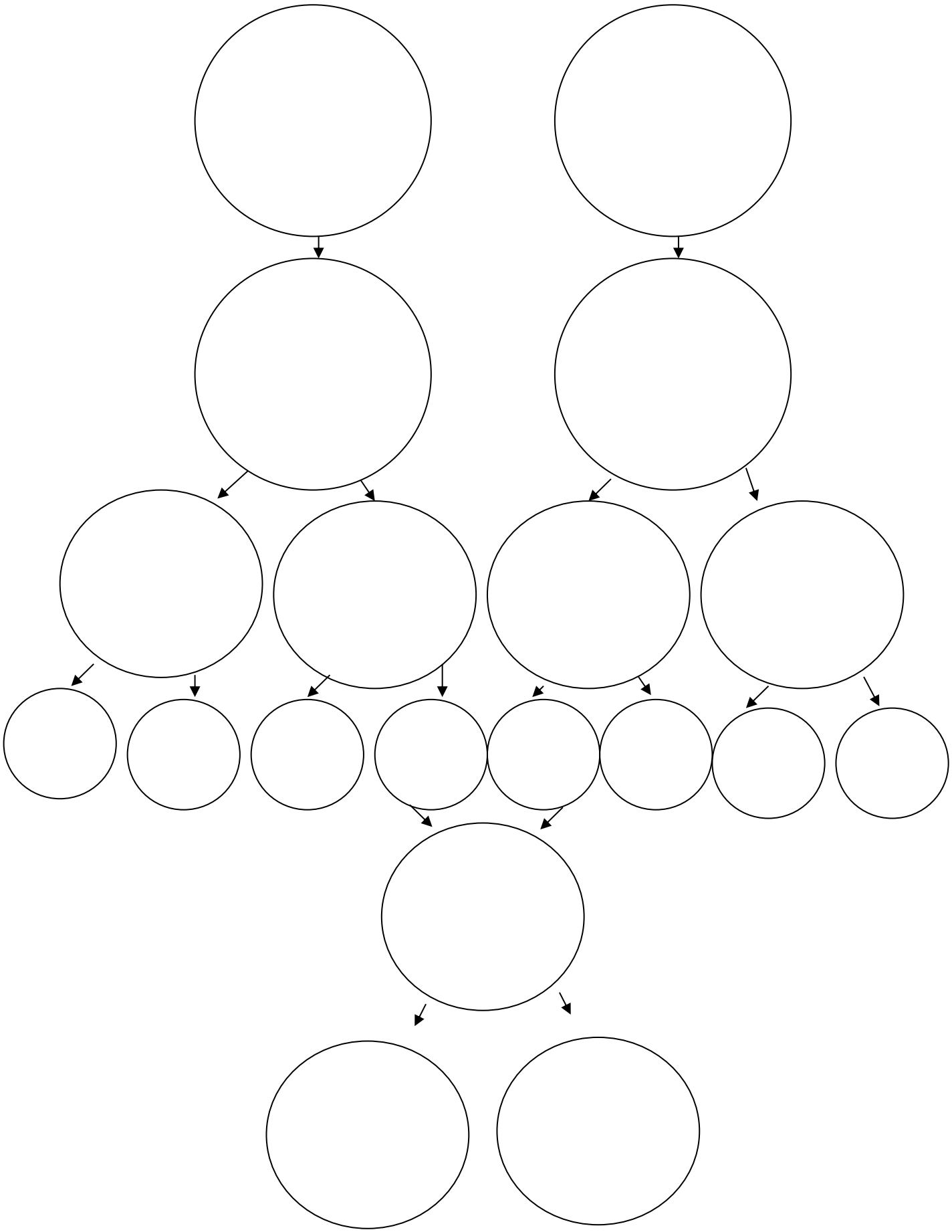
Genetic Variation

- What is **crossing over**?
- What is **independent assortment**?
- What is **random fertilization**?
- What does it mean to have a **haploid** or **diploid** cell?
- What happens after the egg is fertilized? What is the cell called? By what process does it become 2 cells? 4 cells? 8 cells? These "copies" of the cell, how do they compare to the first cell genetically?

Meiosis

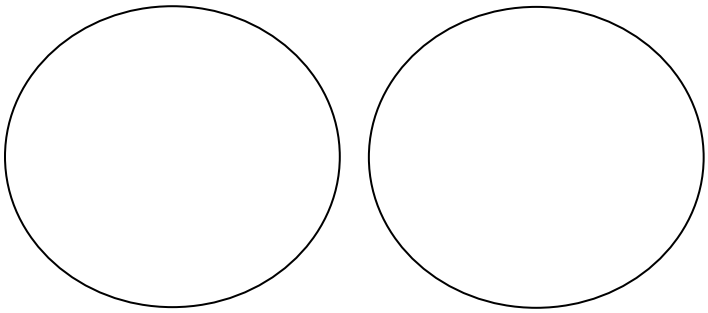
Mother

Father



Meiosis

Redraw your two cells that resulted from Meiosis 1 from above.



- What two events happened during meiosis 1 that increase genetic variation?

- Are these cells haploid or diploid?

- How many chromosomes are in each cell?

- How many pairs are present?

Meiosis

More Review

- What is a **homologous pair**? What are **sister chromatids**?
- Where do *your* homologous pairs come from, in your own **genome**?
- What is the name for the alternative form of a gene on the same place on each homologous pair?
- Give an example of one that you may have in your own chromosome. Hint: What are differences in your parents' phenotypes?
- When does **crossing over** happen?
- What is crossing over? Why is it important?
- What is **independent assortment**?
- When does independent assortment happen during meiosis?
- Why is independent assortment important?
- What is **random fertilization**?
- Why is it important?
- What is a **diploid** cell?
- What is **haploid**?
- If a cell has homologous pairs, is it diploid or haploid?
- If a cell has no homologous pairs, is it diploid or haploid?
- If a cell has no homologous pairs but has sister chromatids, is it diploid or haploid?
- During meiosis, when does the cell become haploid? What happens to make it haploid?
- If a liver cell of a sloth has 38 chromosomes, how many chromosomes does its eye cell have? How many does its sperm cell have? How many does a sloth zygote have?
- Which of these cells is haploid? Which is diploid?
- Which cell type goes through meiosis?

Meiosis

- Which cell type goes through mitosis?
- What is the cell called after a sperm fertilizes an egg?
- Is this cell haploid or diploid?
- If a human egg has 23 chromosomes, how many does a human zygote have? How many does a human skin cell have?
- What is the process for replication of a zygote's cells?
- Why does this need to happen in all multicellular organisms?