

Mitosis and Meiosis Web Quest
(adapted from Burlingame California High School Biology materials)

Part 1. Mitosis

Mitosis Animation

On this site the phases of mitosis can be studied in more detail

Go to <http://www.stolaf.edu/people/giannini/flashanimat/celldivision/crome3.swf>

Click the arrow to play the animation one step at a time.

Click once. (G1)

1. How many chromosomes are there? _____

Click once. (S)

2. What happened to each chromosome? _____

Click once. (G2)

3. What is happening to the chromosomes? _____

What do you think those grey rectangles represent? _____

Click once. (Prophase)

4. Summarize what has happened?

Click once (Metaphase)

5. How are the chromosomes aligned (where are they in the cell)?

What is attaching to the chromosome? _____

What do you hypothesize the purpose of these structures are? _____

Click once (Anaphase)

6. What is happening to each chromosome pair

Click once and click again (Telophase and Cytokinesis)

7. Summarize what has happened to each chromosome pair in telophase?

8. Summarize what has happened during cytokinesis?

Part 2 Meiosis

Meiosis Tutorial

Go to <http://www.biology.arizona.edu/cell_bio/tutorials/meiosis/main.html>

On the Meiosis Tutorial page click on Reproduction and answer the following questions or fill in the blanks.

Sexual reproduction

1. New individuals are formed by a combination of two _____ cells. (_____).
2. What is fertilization? _____
3. What are the gametes in females? _____ in males? _____.
4. Are the gametes haploid? _____. What does that mean in terms of their chromosome number? _____.
5. What is the new individual called? _____. How many chromosome sets does the individual have? _____.

What does diploid mean? _____.

6. Summarize the process of meiosis.

Return to the Meiosis Tutorial page. Click on Chromosomes in a Diploid Cell.

1. A diploid ($2n$) of human chromosome consists of _____ chromosomes
2. The haploid (n) number of human chromosomes consists of _____ chromosomes.
3. Autosomes are all the chromosomes except the sex chromosomes. You receive how many autosome chromosomes from each parent? _____
4. You receive one sex chromosome from each parent. If you are a female what combination did you receive? _____ a male? _____
5. Define haploid _____, diploid? _____
6. Most plants and animals are made of _____ cells
7. Eggs and sperm are _____.

Meiosis Animation

Go to <http://www.stolaf.edu/people/giannini/flashanimat/celldivision/meiosis.swf>

Click on the animation until you reach Telophase 1 Cytokinesis. Repeat as many times as necessary to answer questions and summarize the first stage of meiosis.

1. At the start of this example how many chromosomes are in the cell? _____

2. What happens in the "S" phase to the chromosomes? _____

3. If a chromosome replicates but remains attached does it count as one or two chromosomes?

4. What happens to the chromosomes at the end of prophase 1 that is different from mitosis?

_____ Did you notice any trading of pieces between the red and blue chromosomes? _____

5. At which phase do the chromosomes separate? _____

6. At the end of telophase 1 and cytokinesis what do you end up with?
Number of cells _____ number of chromosomes in each cell? _____
Is each cell haploid or diploid? _____. Notice again that some trading of chromosome pieces has occurred. This is called crossing over.

Continue to click on the animation until you reach the end of Meiosis 2. Repeat as many times as necessary to answer questions and summarize the second stage of meiosis.

1. How many cells are there in prophase 2? _____

2. If a chromosome has replicated and the two pieces are still attached is that considered one chromosome or two?

3. How many chromosomes are in each cell in prophase 2? _____

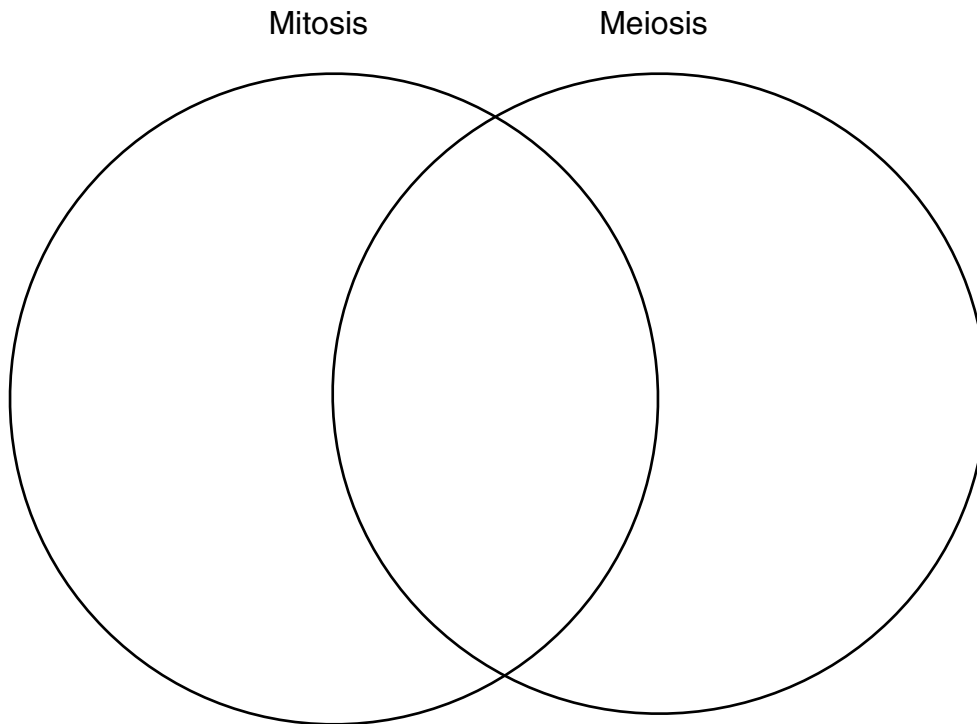
4. What happens to the chromosomes in Anaphase 2? _____

5. What is the final product of this example of meiosis at Telophase 2 and Cytokinesis?

6. Summarize the process of meiosis.

Part 3 Putting it all together

Using all the previous sites plus the mitosis graphic website <http://www.accessexcellence.org/AB/GG/meiosis.html> compare and contrast mitosis and meiosis on the Venn Diagram below.



Review

Go back to the meiosis tutorial website http://www.biology.arizona.edu/cell_bio/tutorials/meiosis/main.html

Click on the Test yourself (10 problems) link. See how well you do!!