

# Mitosis

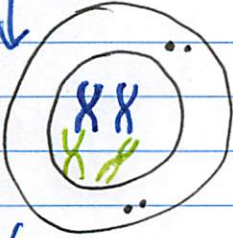
Biol. 1610 9AM MWF; 4.9.13

Interphase



Chromosomes have replicated

prophase



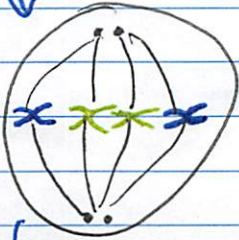
Sister chromatids condense and spindles begin to form. Membrane begins dissociating.

prometaphase



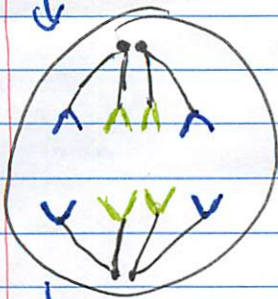
membrane is gone, spindle is fully formed, and attach to sister chromatids by kinetochore microtubules

metaphase



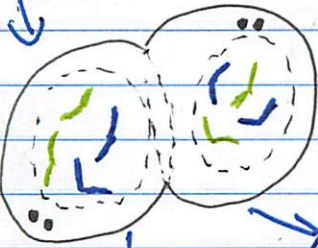
Sister chromatids align along metaphase plate

Anaphase



Sister chromatids separate and move to wards sides. Polar microtubules lengthen to push poles apart.

telophase

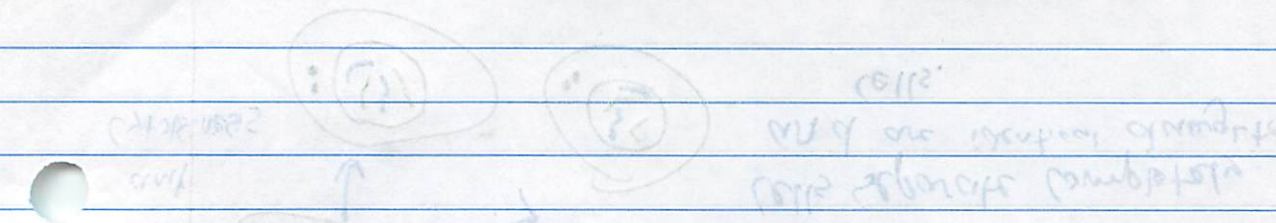


Chromosomes de condense and membrane reforms. Cleavage separates

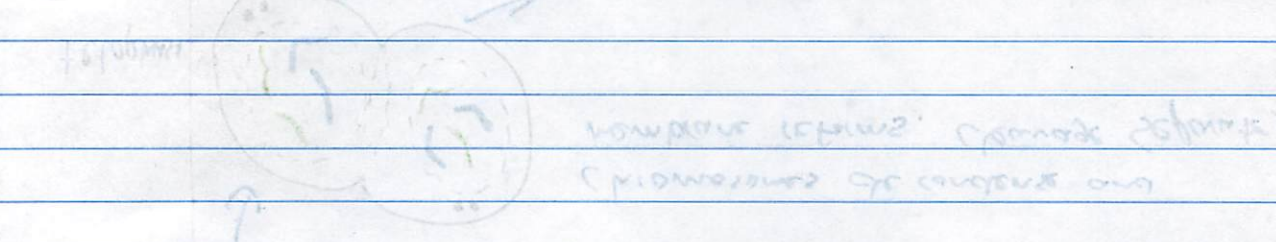
and  
Cytokinesis



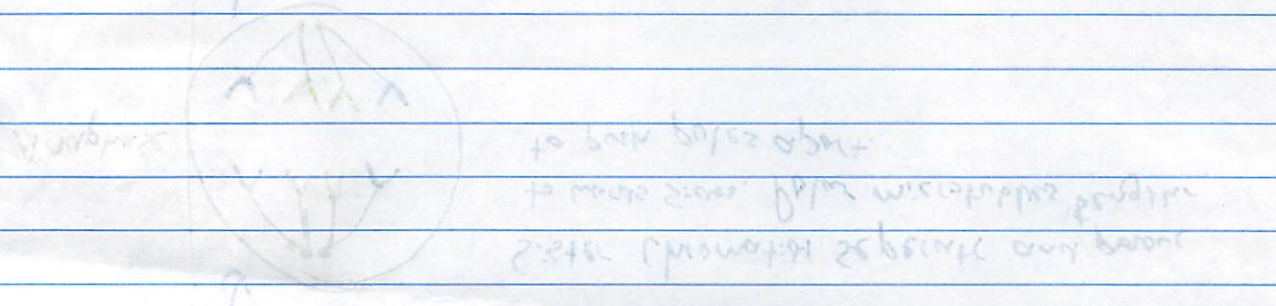
Cells separate completely and are identical daughter cells.



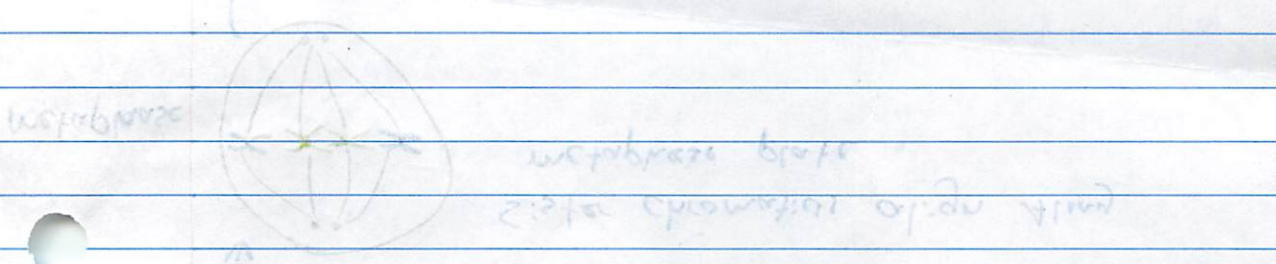
Interphase  
 DNA is replicated and grows  
 larger storage of energy



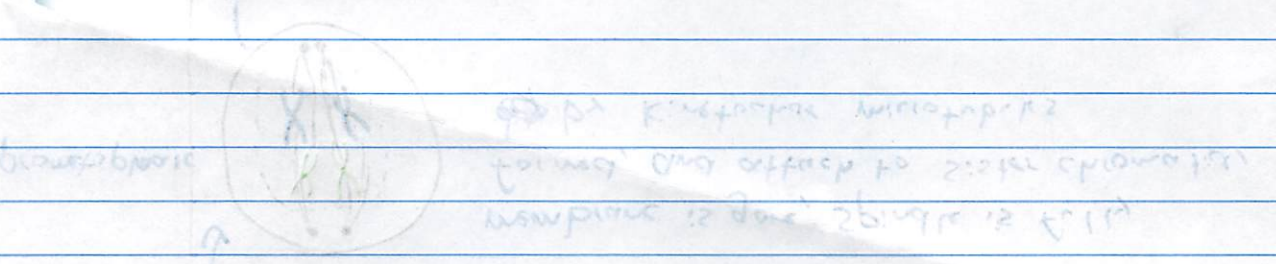
Prophase  
 Condensing of chromosomes  
 spindle fibers



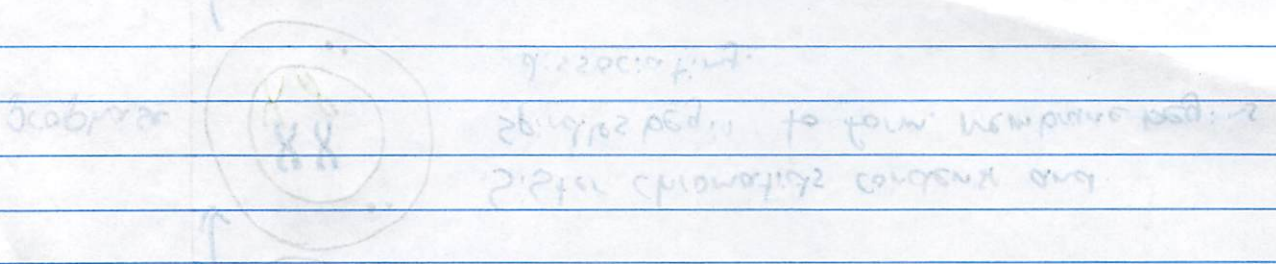
Metaphase  
 Spindle fibers attach to centromeres  
 chromosomes align at equator



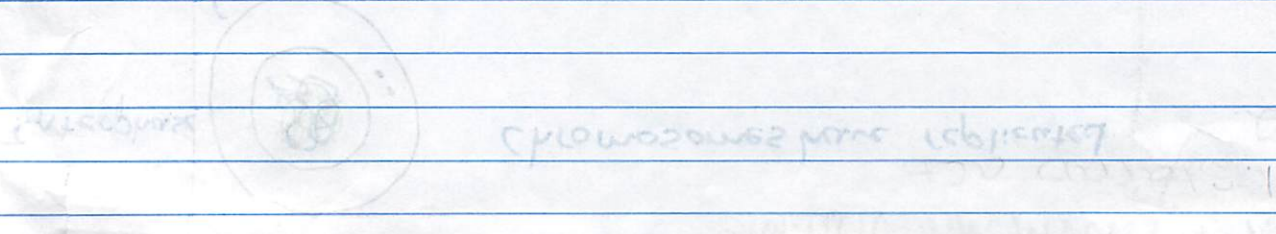
Anaphase  
 Spindle fibers pull chromatids apart



Telophase  
 Spindle fibers break down  
 nuclear envelopes reform



Cytokinesis  
 Spindle fibers break down  
 cell membrane pinches

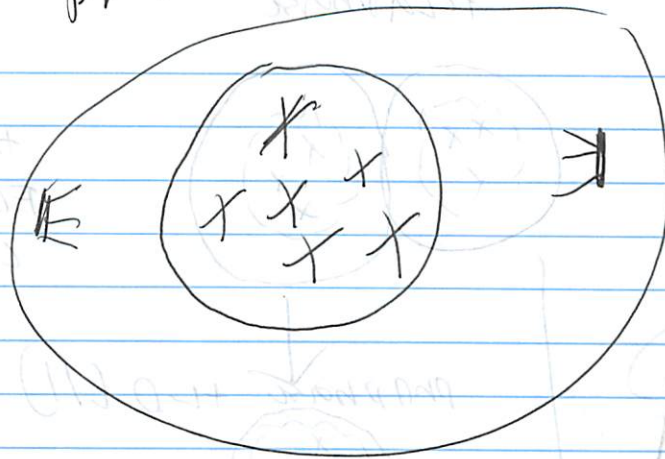


Two daughter cells

2:20 P.M.

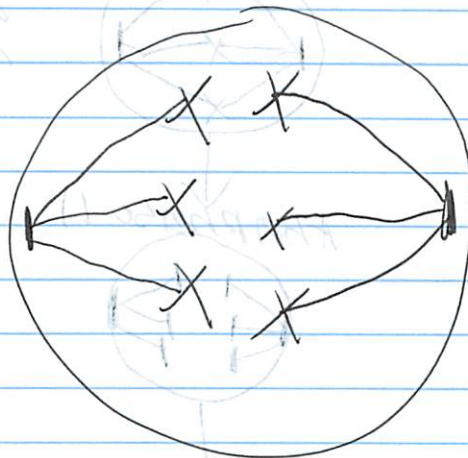
# Meiosis (I)

prophase



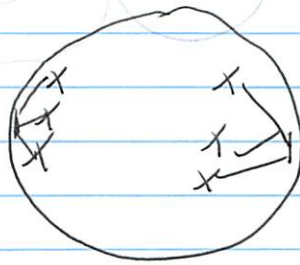
Chasing  
Our cell happens  
in this stage

meta phase



the chromosomes are  
lining up side by  
side are pairing to  
split

Anaphase



the chromosomes are  
being separated and  
the splitting of the  
cell begins

tclaphase



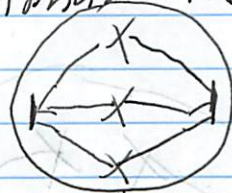
the cell begins forming two cells

meiosis (II)

prophase +LO (II)

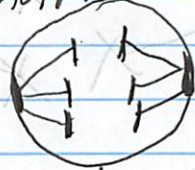


metaphase +LO (II)



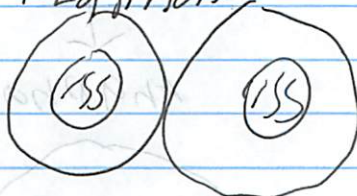
the chromosomes are lining up on the axes

Anaphase I)



this is when the sister chromatids separate

tclaphase



the cell begins and has 4 haploid cells



4.9.13  
Biol. 1610  
9am MWF

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9/11/13

## 4 misconceptions

1) The first misconception was where a cell would stop in cycle if a molecule blocking the formation of spindle fibers. At first we assumed the cells would be unable to begin M phase, but after continuous research we were able to determine that the cells would actually immediately die.

2) Another misconception was the idea that cyclin-dependent kinase was only present before the cell cycle. As a group, we learned that it is present through out the whole cycle and is independently affected. We also learned that it is an enzyme that speeds the rate of reaction by attaching phosphate groups to other proteins.

3) We did not know much about why Mendel repeated his experiment, we originally believed it was to observe whether the dominant trait would reappear. However, we learned he repeated it to see if a recessive trait would show up again. With this, he proved that one can be heterozygous containing a dominant and recessive allele with the dominant hiding the phenotype of the recessive.

4) The last misconception we made was that the 2 daughter cells created after

meiosis I were still diploid, but as we studied further we learned these cells resulting after telophase I and cytokinesis were haploid and not identical.

Mattie Knebel  
 Kyler Sabzar  
 Jared Hansen

$\frac{1}{4}$  so lot  $\frac{1}{3}$  pt of 3 pts

**Genetics Oompah Loompah worksheet:**

(modified from <http://www.biologycorner.com/worksheets/oompahgenetics.html>)

Oompahs generally have blue faces which is caused by a dominant gene, B. The recessive allele, b, codes for orange face.

Genotype	Phenotype
Homozygous Dominant, BB	Blue Faces
Heterozygous, Bb	Blue Faces
Homozygous Recessive, bb	orange faces

Using this information for possible Oompah Loompah genotypes and phenotypes, answer the questions below. Write your answer and show the punnett square you used to solve each problem.

1.. Two heterozygous Oompahs are crossed. **What proportion of the offspring will have orange faces.**

	B	b
B	BB	Bb
b	Bb	bb

25% of the offspring will have orange faces.

2. A blue faced Oompah (homozygous) is married to an orange faced Oompah. They have 8 children. **How many of these children would you predict to have blue faces?**

	B	B
b	Bb	Bb
b	Bb	Bb

All of the 8 children will have blue faces.

3. Otis Oompah has an orange face and is married to Ona Oompah who has a blue face. They have 60 children, 31 of them have orange faces. **What are the genotypes of the parents? Explain how you know.**

	B	b
b	Bb	bb
b	Bb	bb
	$\frac{30}{60}$	

Otis is homozygous recessive and Ona is heterozygous. 50% of their children received orange faces which is the outcome of a homozygous recessive and a heterozygous crossing

50% have orange

4. Odie Oompah has a blue face. In fact, everyone in Odie's family has a blue face, and the family boasts that it is a "pure" line. Much to his family's horror, he married Ondi Oompah who "gasp" has an orange face. All their children have blue faces (Phew...). **What are the genotypes of their children? Is Odie's line still "pure"?**

(explain why or why not)

	B	B
b	Bb	Bb
b	Bb	Bb

The genotype of the children are heterozygous; however, Odie's line is not still pure. The children do have blue faces because they are heterozygous and blue is a dominant trait. The children would have to be homozygous in order to be completely "pure".

5. Oompahs can have red, blue or purple hair. Purple hair results from the heterozygous condition of the hair alleles,  $H^B$  and  $H^R$ . Complete the "key" showing the genotypes and phenotypes for hair color. Is this an example of simple dominance, codominance or incomplete dominance?

13  
 $H^B H^B$  = Blue  
 $H^B H^R$  = Purple  
 $H^R H^R$  = Red

Codominance

- if this the  $H^B H^R$  would be red to blue, it's a mix (purple)

6. Orville Oompah ( $H^B H^R$ ) has purple hair and is married to Opal Oompah ( $H^B H^B$ ) who brags that she has the bluest hair in the valley. How many of Opal's children will be able to brag about their blue hair also?

	B	R
B	BB	BR
B	BB	BR

50% of Opal's children will be able to brag about their blue hair.

7. Olga Oompah has red hair and marries Oliver Oompah who has blue hair. They have 32 children. What color is their children's hair? (how do you know?)

	R	R
B	BR	BR
B	BR	BR

Their children have purple hair, all of the offspring are heterozygous containing the purple trait.

8. Olivia Oompah is married to Odo Oompah and they both have purple hair. What color hair and in what proportion would you expect their children to have?

	B	R
B	BB	BR
R	BR	RR

25% will have blue hair, 25% will have red hair, and 50% will have purple hair.

9. In the land of Oompah, blue hair is highly valued, blue haired Oompahs even get special benefits. Oscar Oompah has purple hair but he wants to find a wife that will give him blue haired children. What color hair should his ideal wife have? What should be his second choice? Which choice will give him no blue haired kids?

	B	R
B	BB	BR
B	BB	BR
	B	R
B	BB	BR
R	BR	RR

his 1st choice will be a wife with blue hair and his second choice will be a wife with purple hair. If he marry's someone with red hair, he will produce no blue haired children.