Meiosis

Pg.114-119

Wait… didn’t we already learn about this?

https://www.youtube.com/watch?v=VzDMG7ke69g

Asexual Reproduction:

#1, 2

- Only one parent cell is needed
- Inside structures are copied
- Parent cell divides, making 2 exact copies (mitosis)
- Most cells in your body and most single-celled organisms reproduce this way…

Sexual Reproduction:

#1, 3

- 2 parent cells join together to form offspring that are **different** from the parents
- Parent cells are called: sex cells
- Human body cells have: 46 or 23 pairs of chromosomes

(Think “shoes”. You have two shoes, or one pair of shoes.)

Sexual Reproduction:

- Homologous chromosomes: chromosomes that carry the same set of genes
- Ex: pair of shoes
- Human sex cells (23 chromosomes)- half the usual # -sex cells have only one chromosome from each pair (one shoe!)

Meiosis:

- A copying process that produces sex cells with ½ the usual # of chromosomes
- Sex cells are made during meiosis
- Ex: human egg cell has 23 chromosomes; sperm cell has 23 chromosomes
- The new cell that forms when they join has 46 chromosomes

Two separate cells coming together

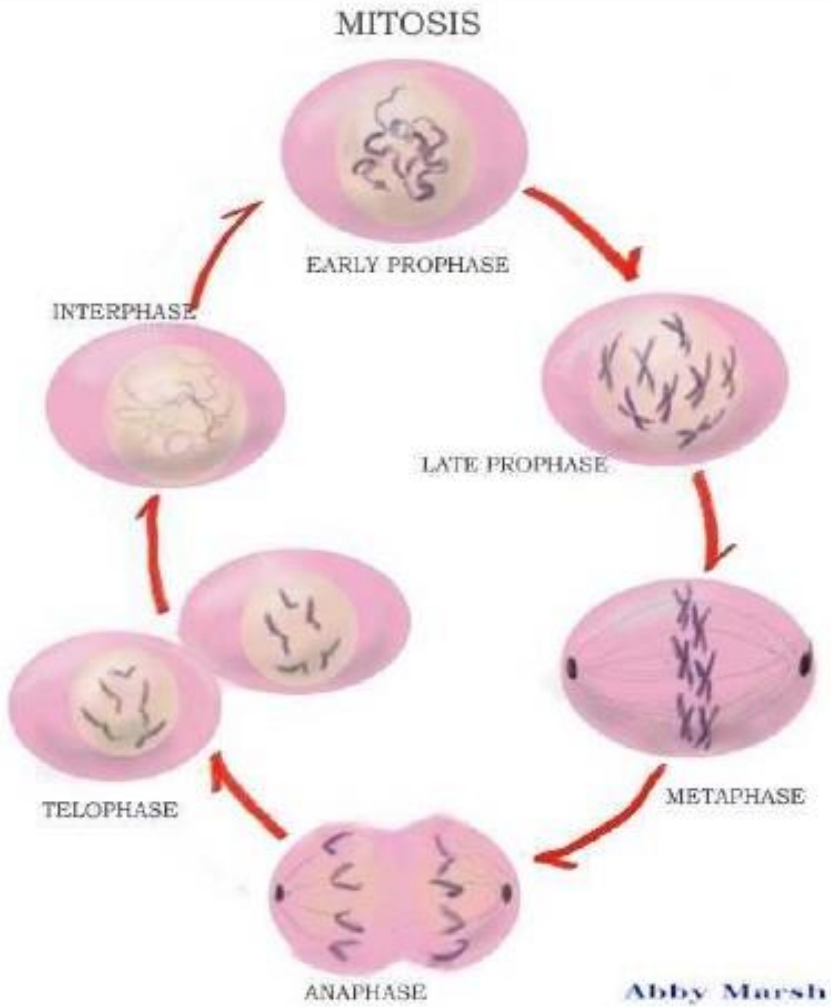
Genes & Chromosomes:

- Walter Sutton's discovery: Genes are located on chromosomes
- Meiosis- means "to make smaller"
- Mitosis – means "threads"

Making a <u>new</u> cell

Making the <u>same</u> thing

A review of mitosis:



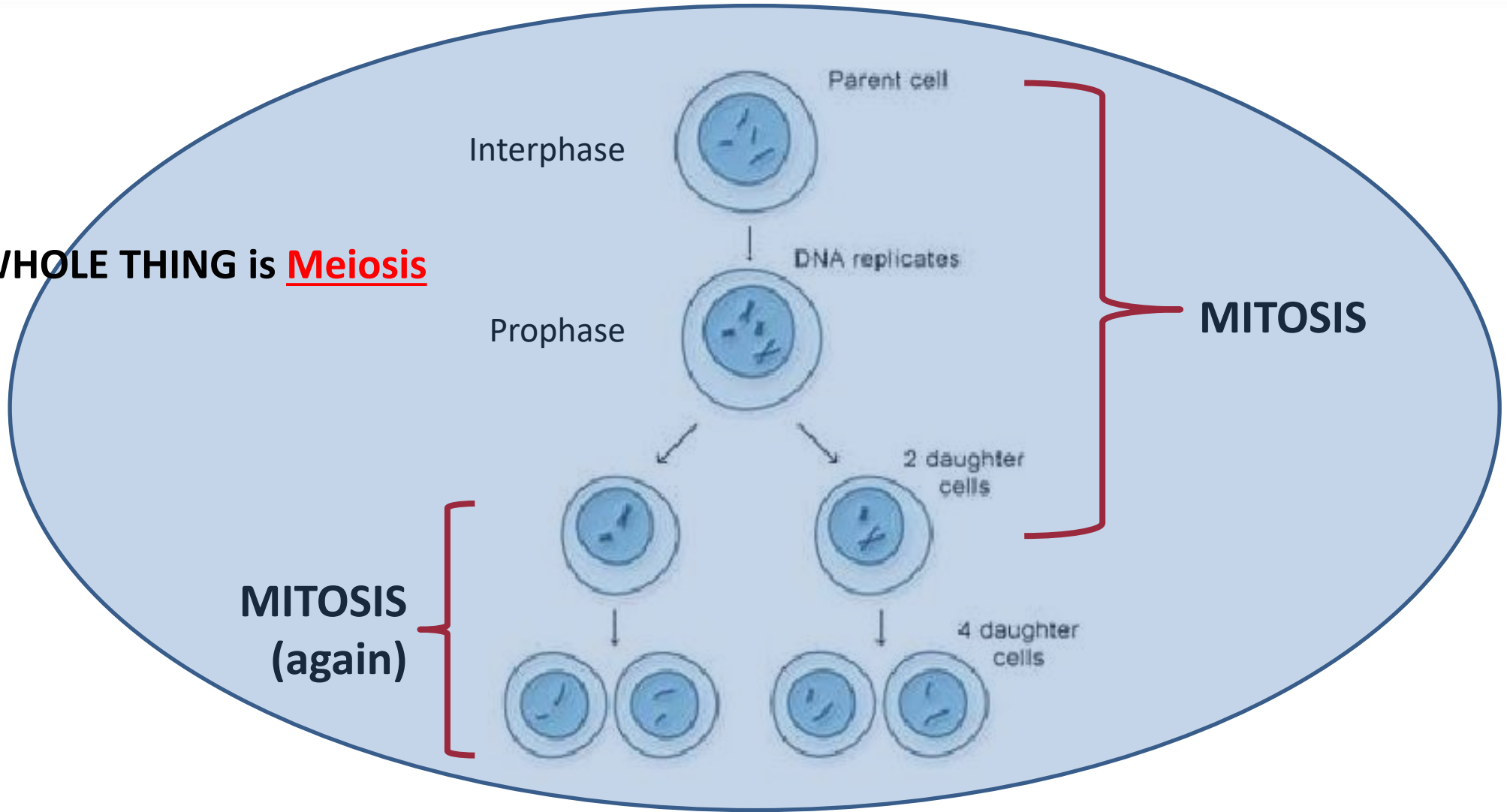
The Steps of Meiosis:

- During mitosis: chromosomes are copied once, nucleus divides once
- During meiosis: chromosomes are copied once, the nucleus divides twice
  - Resulting sperm and egg cells have ½ the # of chromosomes of a normal body cell
  - There are 8 steps to meiosis

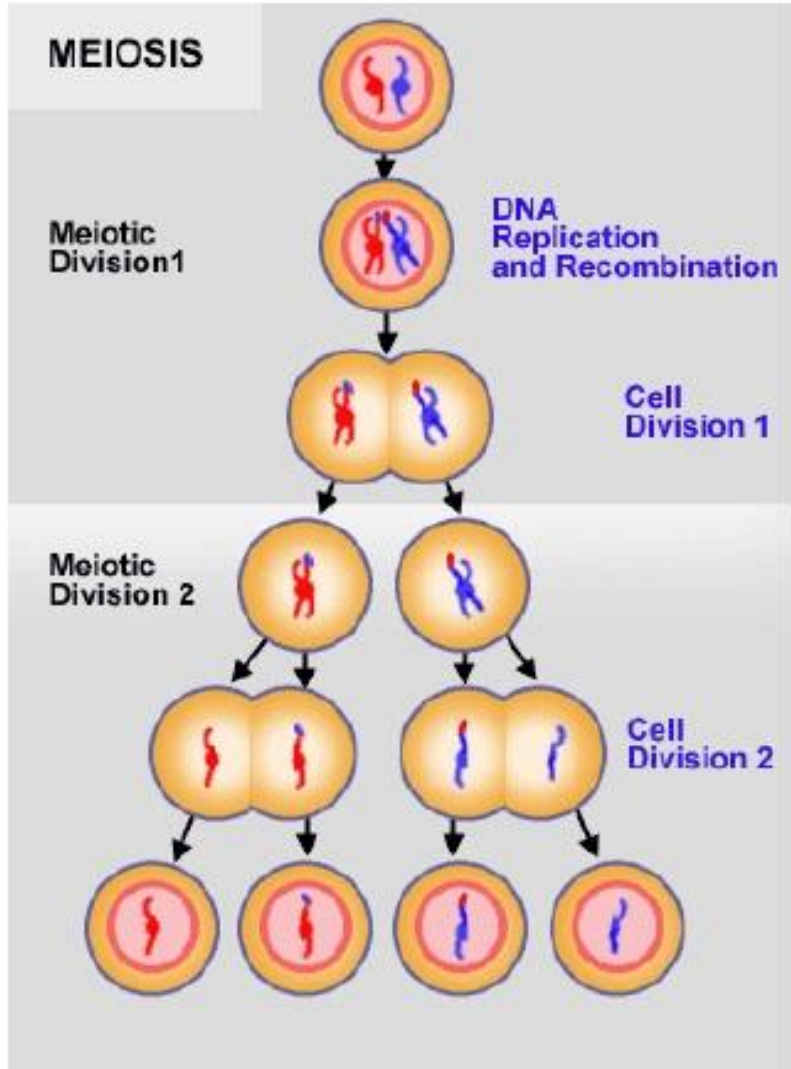
This is good because… sex cells combine later to get the full number

The Steps of Meiosis:

This WHOLE THING is Meiosis



Meiosis:


MEIOSIS
Meiotic Division1
DNA Replication and Recombination
Cell Division 1
Meiotic Division 2
Cell Division 2

Sex Chromosomes:

#12, 13

- Sex chromosomes carry genes that determine the gender of the offspring
- Females have two X chromosomes (XX)
- Males have one X and one Y chromosome (XY)
- During meiosis, one of each of the chromosome pairs ends up in a sex cell

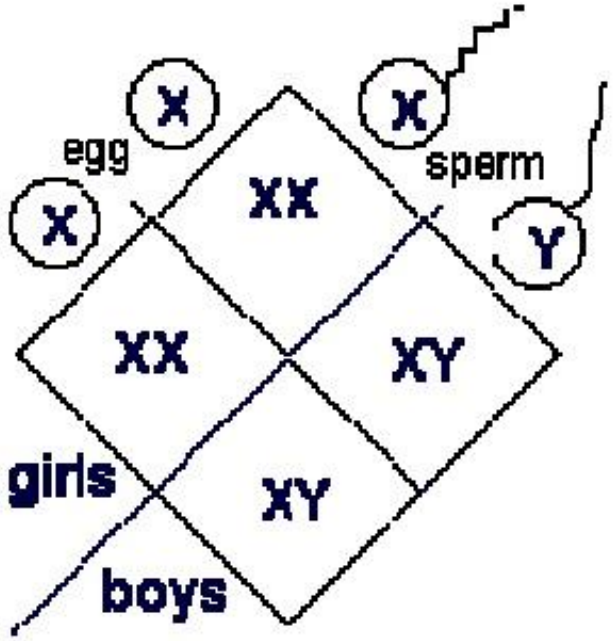
Either this or this

Either this or this

Sex Chromosomes:

- Females have two X chromosomes in each body cell
- Each egg cell gets one X chromosome during meiosis
- Males have one X and one Y chromosome in each body cell
- Sperm cells are produced during meiosis with either an X or a Y

Results:



Confused about meiosis? Try this video: https://youtu.be/nMEyeKQClqI?t=124

Sex-Linked Disorders:

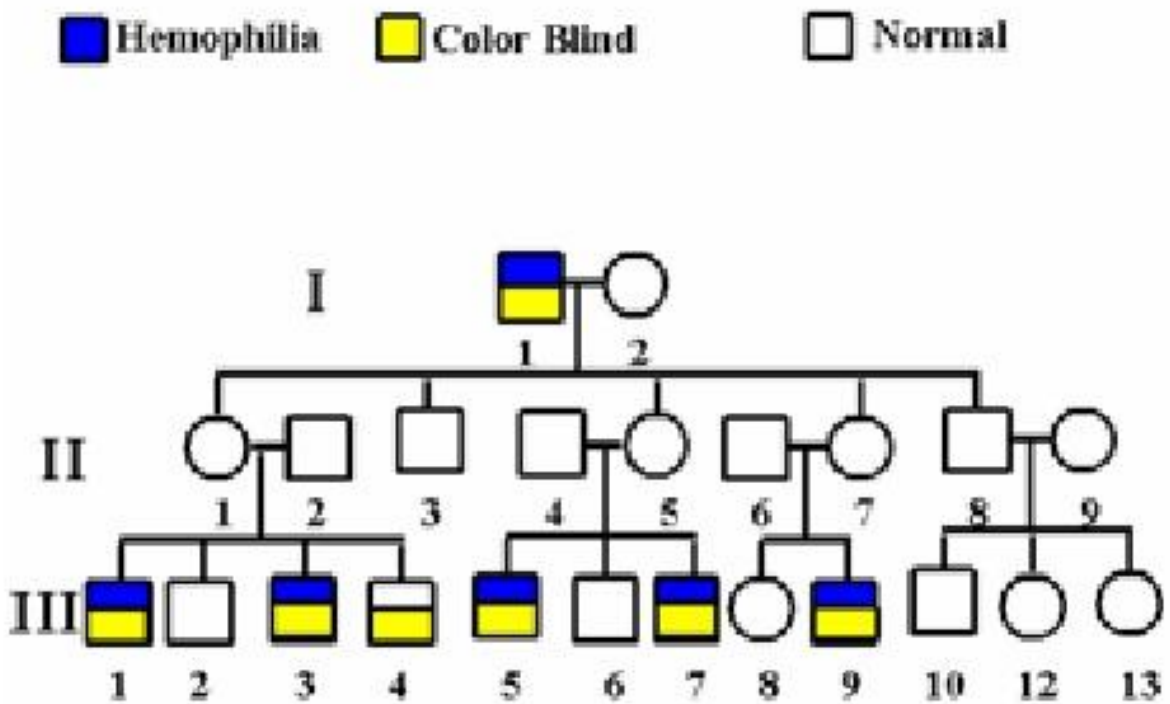
- Females have two X chromosomes; they carry two copies of each gene found on the X chromosome
- Males have only one copy of each gene on the X chromosome
- Sex-linked disorders (carried on the X)
  - Ex. colorblindness
  - Men are more likely to have sex-linked disorders … Why?
  - Amoeba Sisters video- Punnett Squares and Sex-Linked Traits

Sex-Linked Disorders:

- **Hemophilia-** prevents blood from clotting; can be fatal
- On a recessive gene
- Men more likely to have hemophilia

- Can be traced through family trees…

Pedigree:


Hemophilia
Color Blind
Normal
I
1
2
II
1
2
3
4
5
6
7
8
9
III
1
2
3
4
5
6
7
8
9
10
12
13

Selective Breeding:

- In plants and animals
- Organisms with desirable characteristics are mated
- Examples
  - dogs (labradoodle)
  - roses that produce large flowers