Life Science 7 Chapter 5-3 "Meiosis" p126-133

Objectives	P
ullet Explain the difference between mitosis and meiosis	
• Describe how chromosomes determine sex	
• Explain why sex-linked disorders occur in one sex more often than	in the other
• Interpret a pedigree	
Quick Review	
• <u>asexual reproduction</u> : reproduces genetically ide	entical offspring
• <u>sexual reproduction:</u> produce genetical	ly different
offspring	
possess homologous chromosomes:	
(but not necessarily the	e same alleles)
The Point of Meiosis	,
• When organisms reproduce sexually, two <u>sex cells</u> (ex: fuse together to produce a new organism	)
<ul> <li>If all of the chromosomes are present in both a human sperm and chromosomes would a zygote have?</li> <li>O ans:! CAN'T HAVE THAT!</li> </ul>	l egg, how many
To solve this problem, the sex cells are produced by a process of	alled
Meiosis	
• meiosis-	
<ul> <li>i.e in meiosis, cells go from the diploid (2n) state, to the hapl</li> </ul>	loid (n) state
• crucial in maintaining the number of chromosomes in a species from generation	n generation to
Phases of Meiosis	
• two cell divisions- meiosis I and meiosis II  Meiosis I	
• chromatin replicates before meiosis begins (same as in mitosis)	
• step 1 (prophase I)- homologous pairs (s	synapsis),
forming (4 chromatids)	
nuclear membrane disappears, chromosomes appear	

• step 2 (metaphase I)- tetrads	
Meiosis I	
• step 3 (anaphase I)- homologous chromosomes	_
• step 4 (telophase I), but chromosomes do not	
elongate into chromatin	
• cytokinesis then occurs, resulting in daughter cells	
Meiosis II	
step 5 (prophase II)- no replication has taken place!	
chromosomes do not form homologous pairs	
otherwise same as step 1	
• <u>step 6 (metaphase II)-</u> chromosomes	
• <u>step 7 (anaphase II)</u> chromosomes	-
• <u>step 8 (telophase II)-</u> nuclei reorganize, chromosomes elongate into chromatin	
• cytokinesis occurs, resulting indaughter cells, each haploid	
Meiosis and Mendel	
Mendel realized that the pair of alleles in each pea plant who the serve calls were formed.	en
the sex cells were formed.	
• Meiosis explains, as they are or	í.
homologous chromosomes separate during mojecis	
Male or Female?	
$\bigcirc$ 22 of the 23 pairs of chromosomes in the human cell match poarly identically	
The 23 <sup>rd</sup> pairs of chromosomes in the human cell match hearty identically	
• The 23 pair are the	
Carry genes that determine whether an individual is male or female Male or Female?	
There are two types of say shremesomes	
X chromosome: contains	
<ul> <li>Y chromosome: contains genes</li> <li>Y chromosome: contains genes</li> </ul>	
Females have "     "	
thus, during meiosis, all the eggs produced have "X"	
• Males have " "	
during meiosis, 50% of the sperm will have "X", the other 50% will have "Y"	
So, when a sperm fertilizes an egg, the resulting baby's gender depends on	
whether the sperm has an X or a Y!	
Gender Punnet Square	
Draw below	

## Sex-Linked Disorders

- If a faulty gene is located on a sex chromosome, it is inherited with your gender
- If the faulty gene is on an X chromosome, males will show the disease more often than females. Why?
  - Ans: \_\_\_\_\_
  - Females have two X chromosomes, so they have two chances to get the normal gene, and if the normal gene is dominant, the faulty one is \_\_\_\_\_!

## Examples of Sex-Linked Disorders

- color blindness:
- <u>link to online color test</u>
- Example 2:
- hemophilia:
- Very serious disease, can be fatal!
- Medications can be taken to treat it, to replace the missing clotting factors.

## **Genetic Counseling**

- If a disease "runs in the family", parents may seek advice from a genetic counselor to make decisions about having children
- Genetic counselors often use a chart called a \_\_\_\_\_\_ to predict whether a couple carry a given disease

Turn over  $\rightarrow$ 

Pedigree example



## **Selective Breeding**

- Humans have been modifying the genes of domesticated organisms for thousands of years
- $\ensuremath{\textcircled{\bullet}}$  By selecting parents with desirable traits, over many generations those traits tend to show up every time
- ex: \_\_\_\_\_\_, etc