PHONES & EAR BUDS away Please!

Tues, Dec 19, 2017

Pick up: half sheets

Today you will:

- Check key for Co-dominance/Pedigree Practice Problems
- Notes & Practice Sex-linked Trait Punnett Squares

Homework/Planner:

Packet pg 10 & 11 & half sheet

Study what we've covered so far, DIA Tomorrow!!!

_____ 10. It was suspected that two newborn babies had been exchanged in a hospital. Mr. and Ms. Jones received baby #1 and Mr. and Ms. Simms received baby #2. Blood typing on the parents and the babies are shown in the following table.

Blood Typing Results for Jones and Simms

Mr. Jones: Type A (I^Ai) Ms. Jones: Type B (I^Bi)	Mr. Simms: Type AB (I^AI^B) Ms. Simms: Type O (ii)
Baby #1: Type A	Baby #2: Type O

Blood Type Reference Table

Type A	I^AI^A or I^Ai
Type B	I^BI^B or I^Bi
Type AB	I^AI^B
Type O	ii

Based on these blood typing results, were baby #1 and baby#2 switched at birth?

A. Yes; It is impossible for Mr. and Ms. Jones to have a baby with a Type A blood type.

B. Yes; It is impossible for Mr. and Ms. Simms to have a baby with a Type O blood type.

C. No; It is impossible for Mr. and Ms. Jones to have a baby with a Type O blood type.

D. No; It is impossible for Mr. and Ms. Simms to have a baby with a Type A blood type.

Your Job Today

ISN page 131

WRITE in ANSWERS

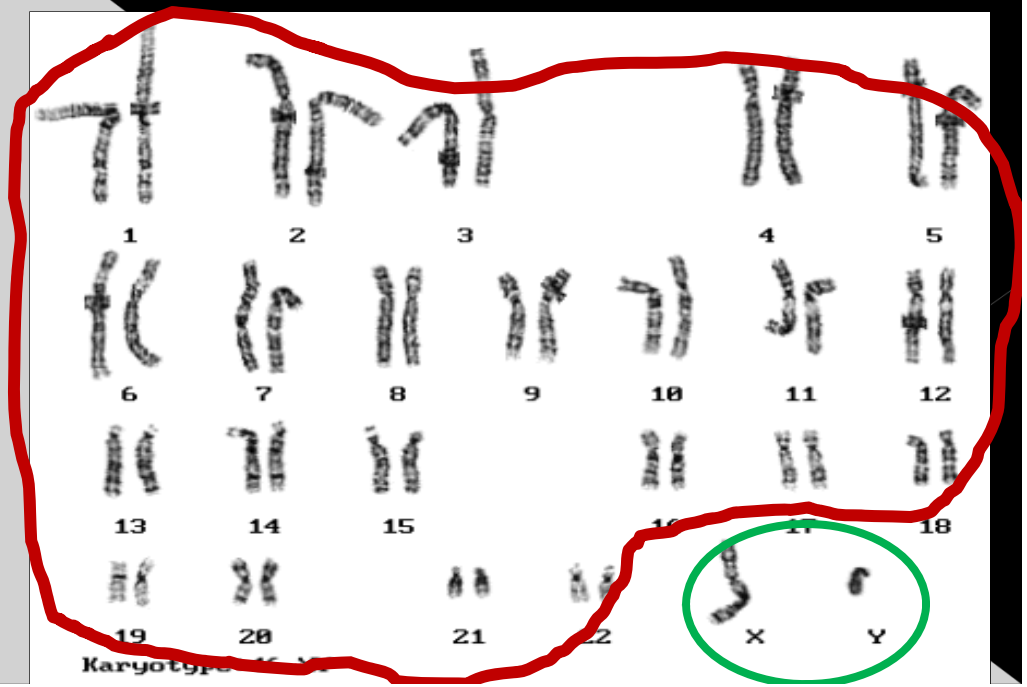
1. **Complete Qs 4-7**
2. *You will use the 'key' provided to work the Sex Linked Punnett Square on ISN p.148 after I explain…*

Notes, ISN p.131

Autosomes vs Sex Chromosomes

- Xsome pairs #1-22
- Xsome pair #23
  - XX = F
  - XY = M

Amniocentesis



MALES determine the sex of the offspring!

- 46 Chromosomes total in humans!
- 2 are sex xsomes:
  - XX or XY
  - Eggs = X or X
  - sperm - X or Y

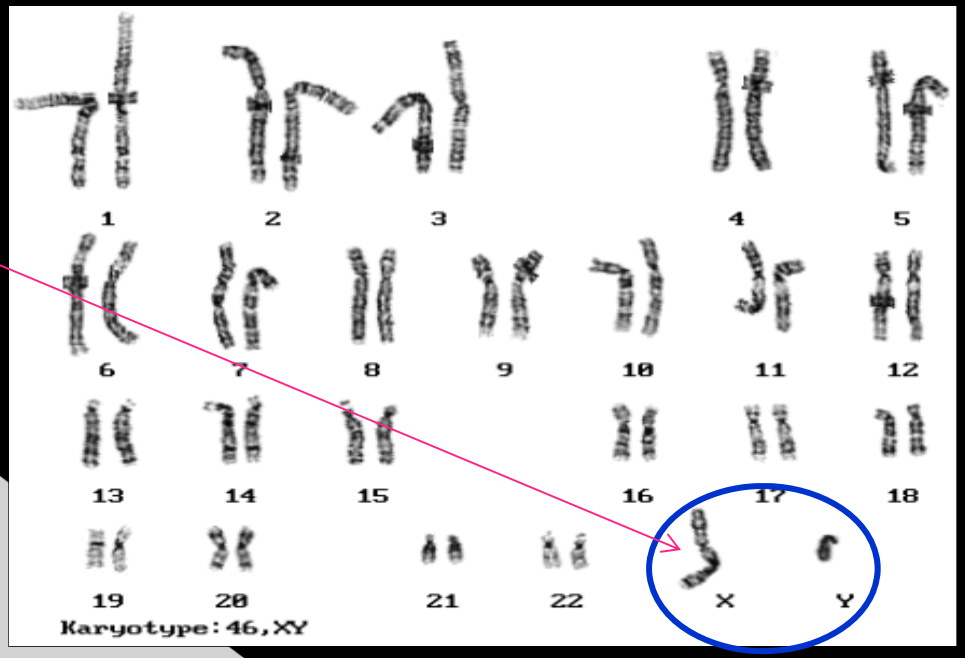
Sperm determines sex of the offspring

GIRL BOY

Sex Linked Traits

1. **Traits found ONLY on the Sex Xsomes → specifically the X**

2. **EXAMPLES:**
   1. **Colorblindness…**
   2. **Hemophilia…**
   3. **Muscular Dystrophy…**



- **Traits** *found on* ***Autosomes*** *– the first 22 pair - are written as letters like* ***Dd*** *or* ***FF*** *(dimples & freckles)*
- *But when a trait is on the* ***Sex Xsome****, you change the way you write the gene… →*

Notes

What is a "Carrier"? Why are they "normal"?

$X^C X^c$ or $X^C X^C$ $X^c X^c$ $X^C Y$ $X^c Y$

Carrier = only F = do NOT exhibit trait, just carry it & MIGHT pass it on

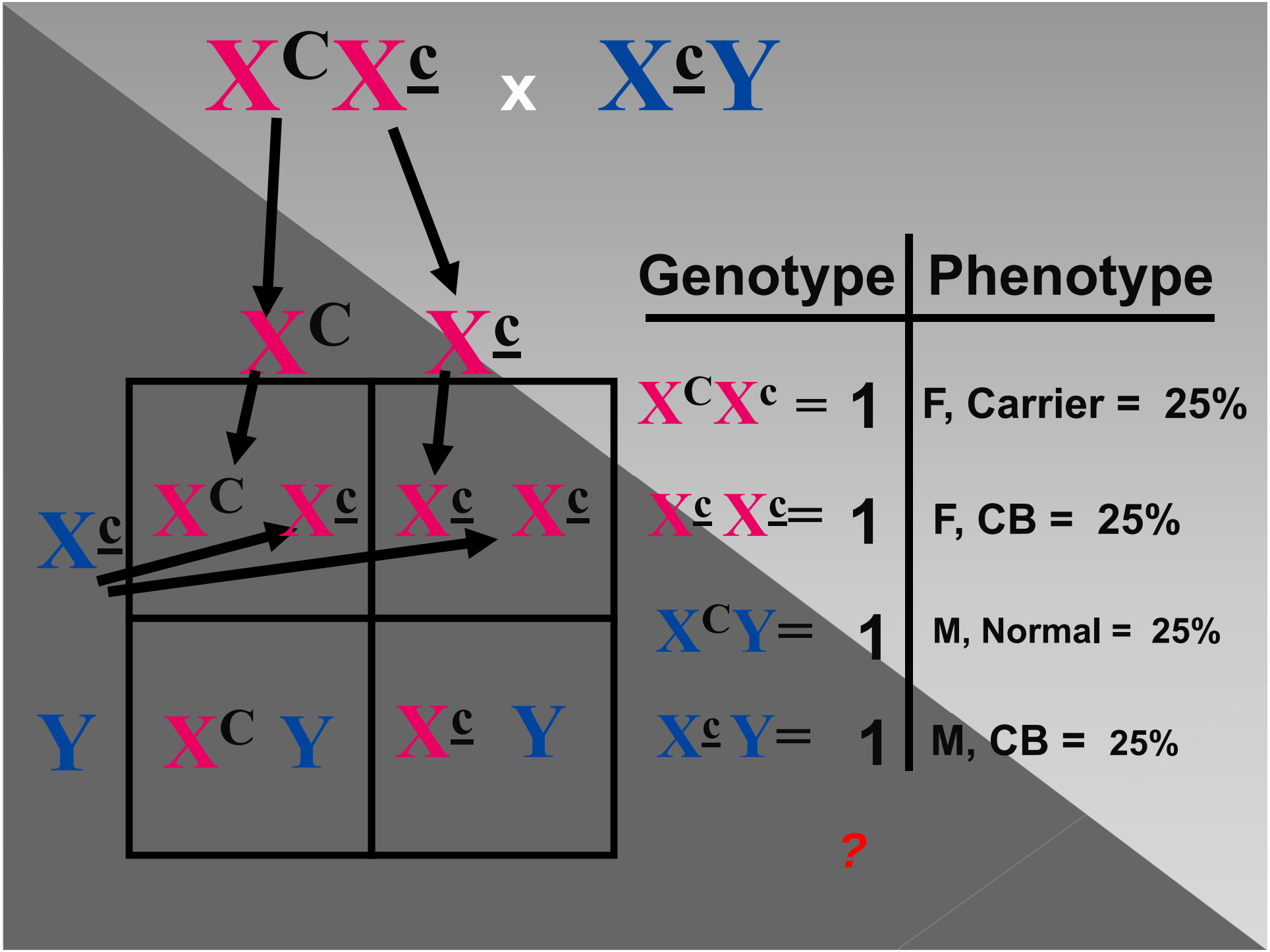
So why can't men be carriers AND why do more men have Sex-Linked Genetic Disorders????

$X^c X^c$ $X^c Y$

Sex Linked Punnett Square

- **Cross a Heterozygous Normal Color Vision Female with a colorblind male.**

$$X^{C}X^{c} \times X^{c}Y$$


X^CX^c x X^cY
X^C X^c
X^c X^C X^c X^c X^c
Y X^C Y X^c Y
Genotype | Phenotype
X^CX^c = 1 | F, Carrier = 25%
X^cX^c = 1 | F, CB = 25%
X^CY = 1 | M, Normal = 25%
X^cY = 1 | M, CB = 25%
?

Your Job Today

page 10

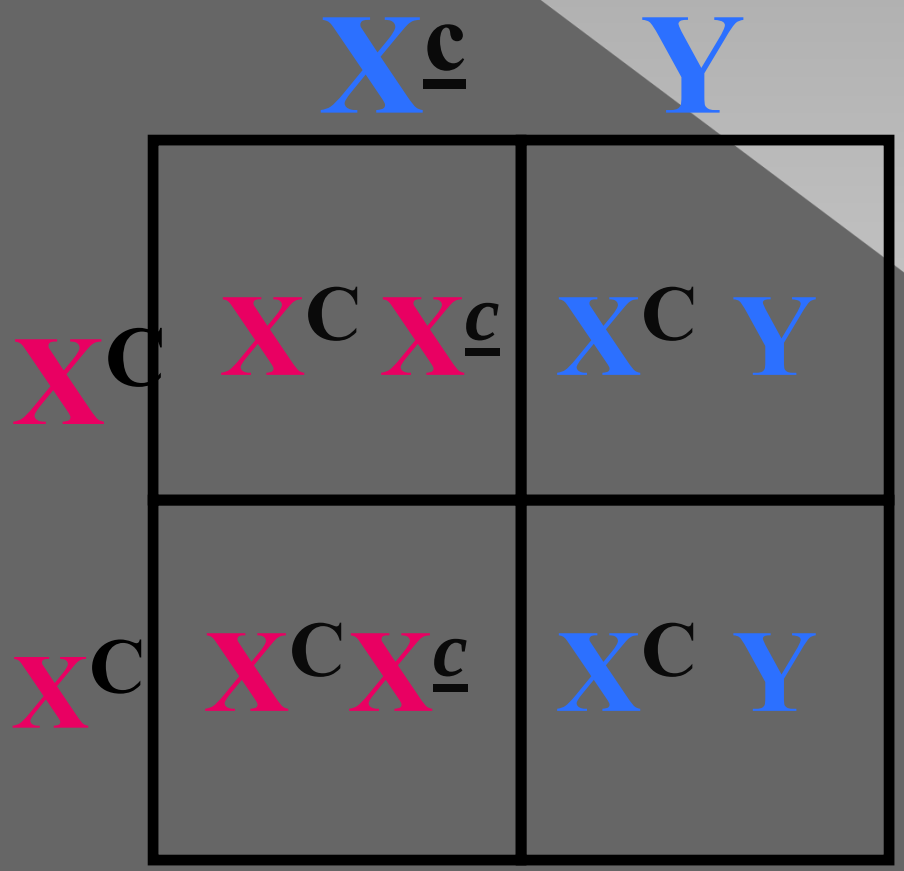
WORK the 2 Sex Linked Punnett Squares

1st = Color Vision

2nd = Hemophilia

Use the Keys on pg 9

$X^{\underline{c}}Y \times X^{C}X^{C}$



Genotype	Phenotype
$X^{C}X^{\underline{c}} = 2$	Carrier are NORMAL! = 50%
$X^{C}Y = 2$	M, normal vision = 50%

*% children w/ normal vision???*100%

$X^{\underline{h}}X^{\underline{h}}$ x $X^{H}Y$

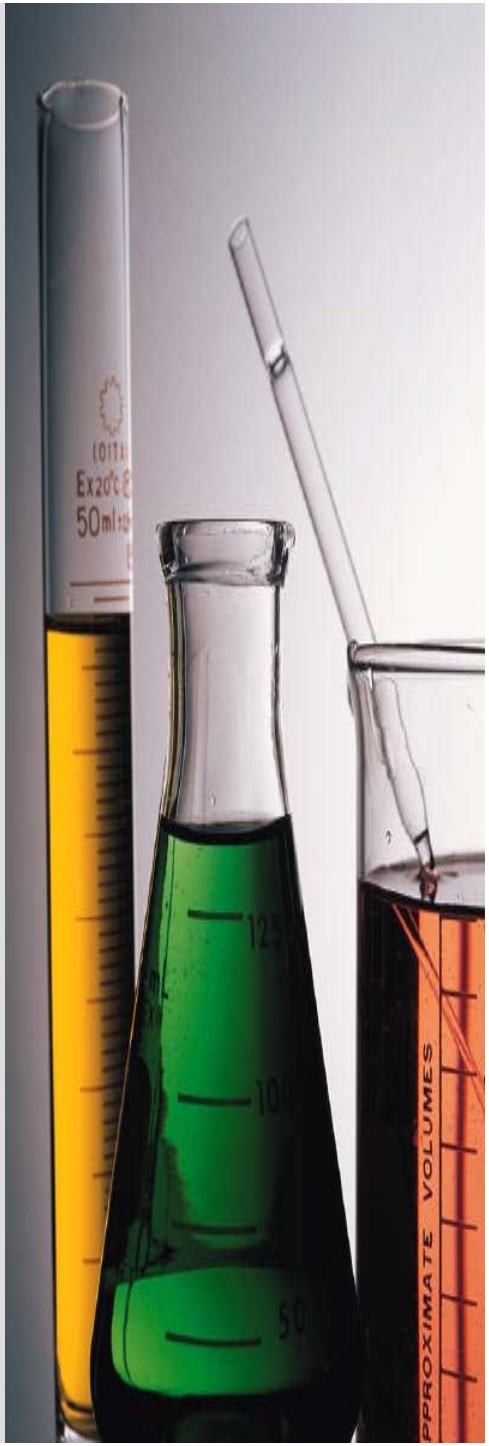
	X^{H}	Y
$X^{\underline{h}}$	$X^{H}X^{\underline{h}}$	$X^{h}Y$
$X^{\underline{h}}$	$X^{H}X^{\underline{h}}$	$X^{h}Y$

Genotype	Phenotype
$X^{H}X^{\underline{h}} = 2$	Carrier = 50%
$X^{\underline{h}}Y = 2$	M, hemophilia = 50%

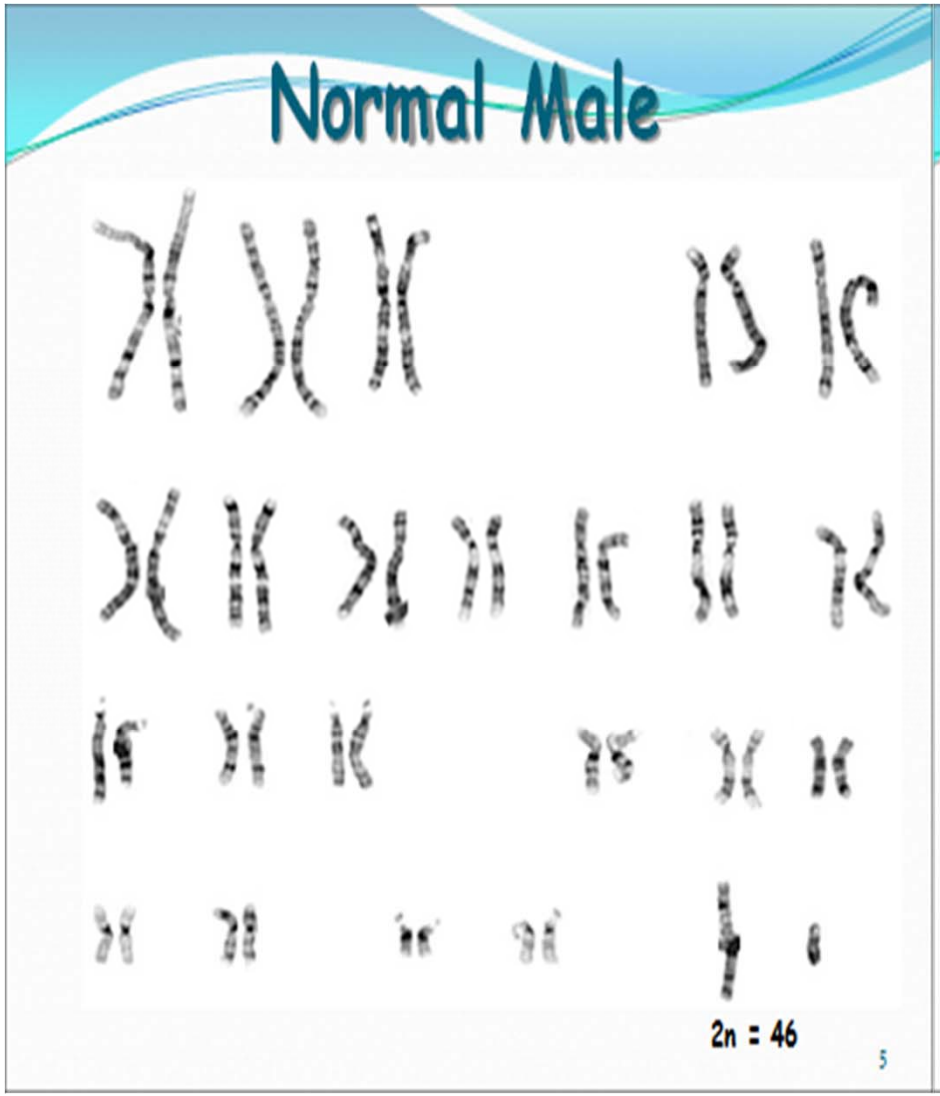
50/50 chance children will be normal

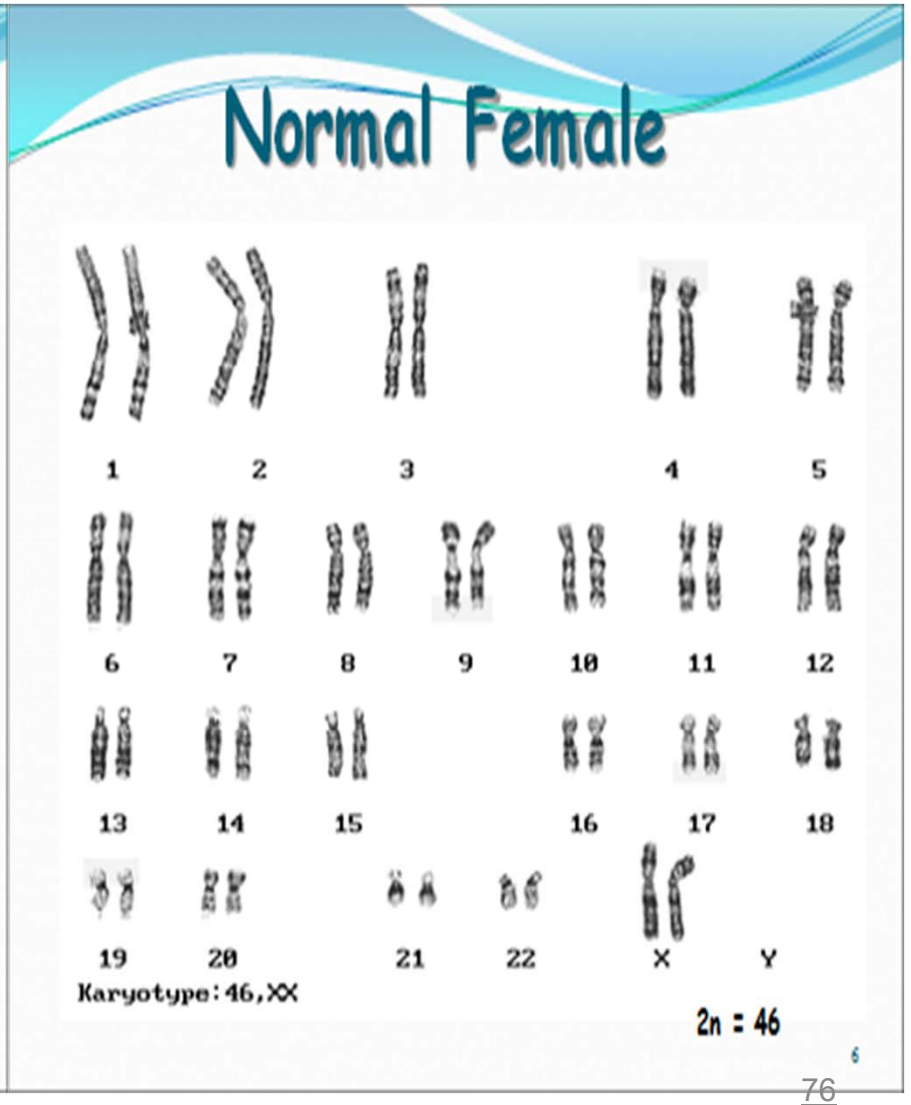
Karyotyping

- Cell biologists photograph cells in mitosis, when the chromosomes are fully condensed and easy to see.
- The chromosomes are then placed in pairs in order of descending size. The sex chromosomes are placed at the end.



Karyotype


Normal Male
2n = 46
5


Normal Female
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
X
Y
Karyotype: 46,XX
2n = 46
6

REVIEW: Karyotype

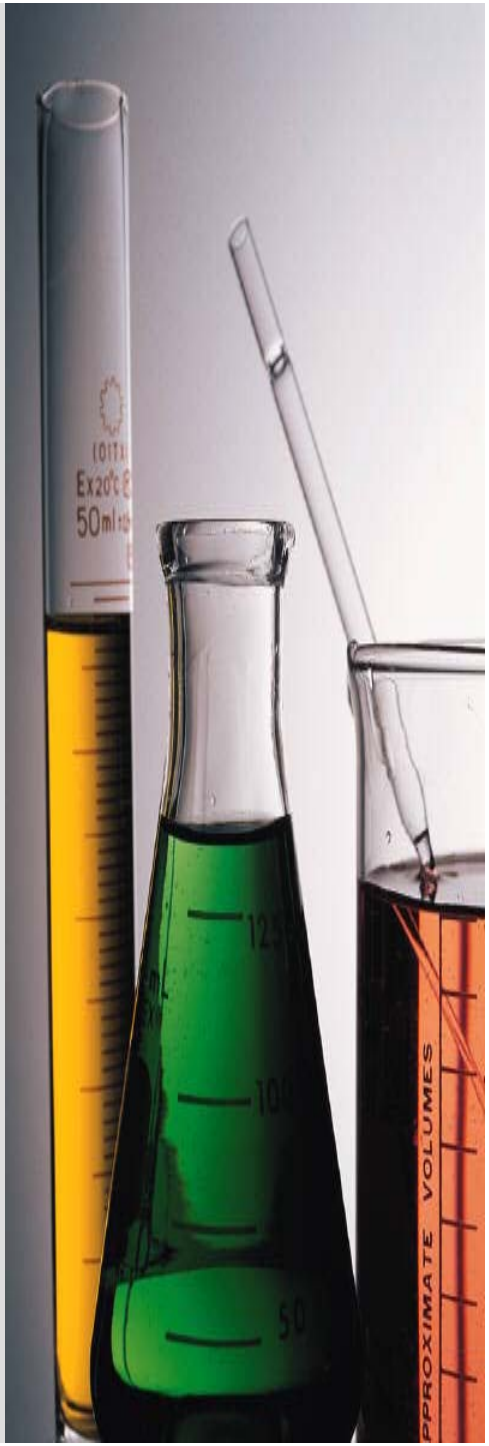
- *Male or female? – Correct number of chromosomes?*

REVIEW:

- *What indicates this is a male?*
- *Correct # of chromosomes?*

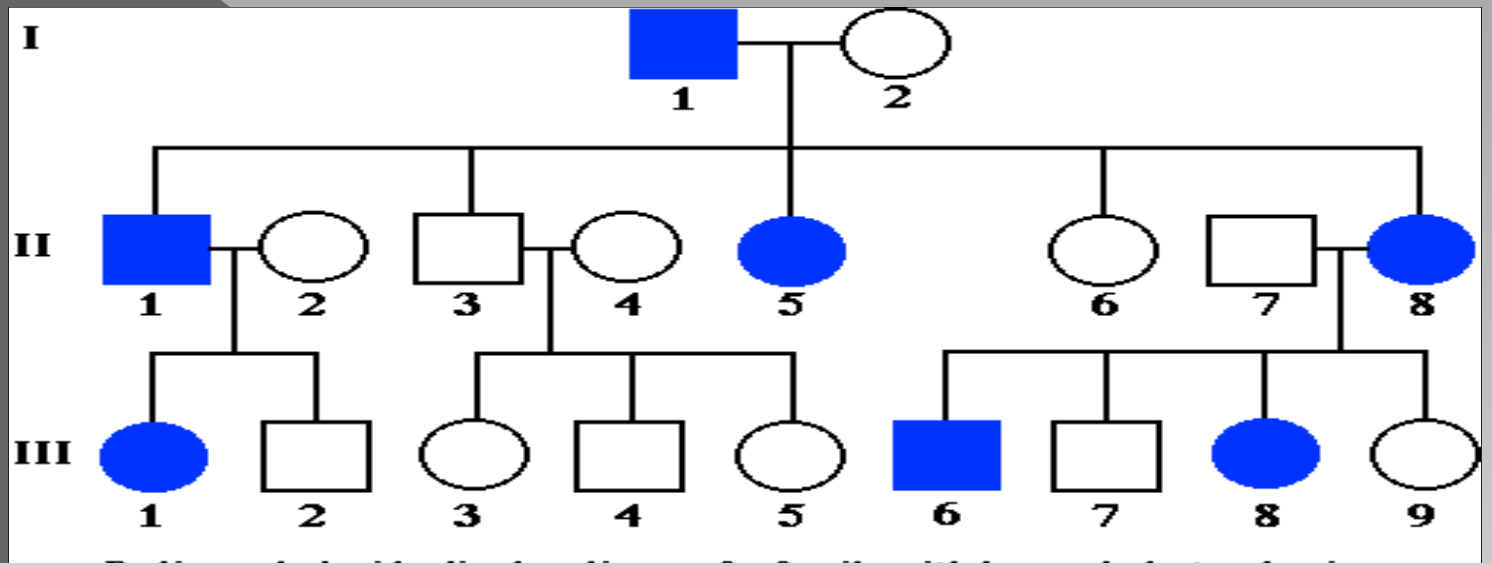
What is a Pedigree

- A pedigree is a chart of the genetic history of family over several generations.
- Scientists or a genetic counselor would find out about your family history and make this chart to analyze.



PEDIGREE;

Since it is unethical to use humans as test subjects, and it would take too long to get results anyway, one of the best ways to study human patterns of inheritance is to go back in time



1. **Which symbol represents Males? Females?** Squares Circles
2. **Which are the oldest? Youngest?** Left Right
3. **How many generations?** III
4. **What does the shaded symbol mean?** Genetically Affected
5. **How many children did II-7 & 8 have?** Four
6. **How many children did I-1 & 2 have?** Five
7. **If III-1 produced a child, what is the chance she will produce a child who is affected?** 50% if husband hetero – 0% if he is homozygous

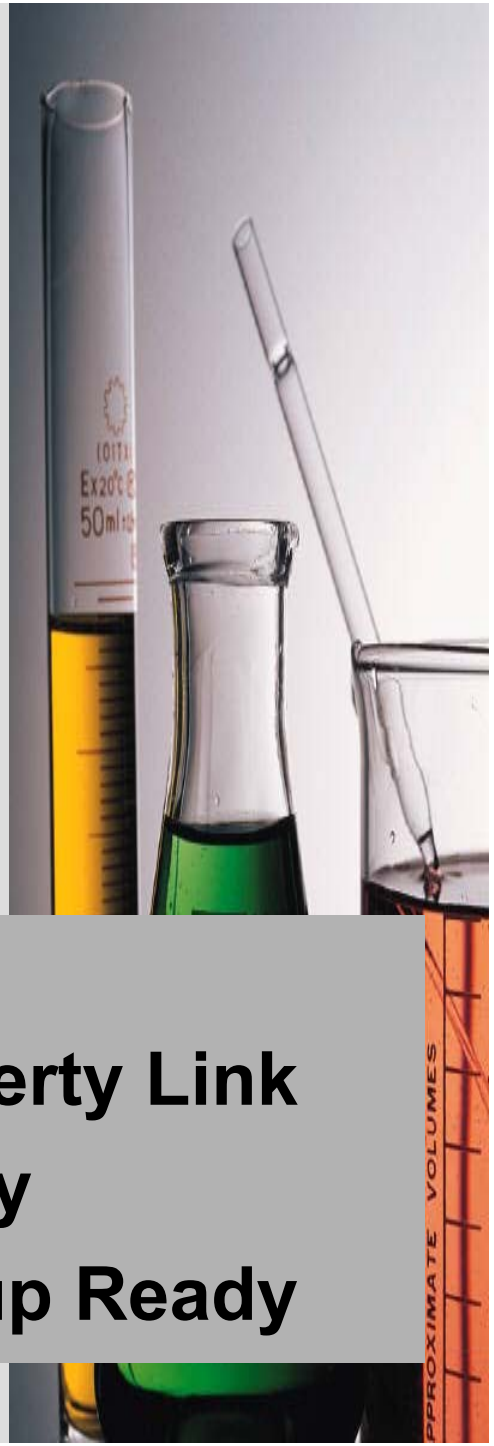
Transgenic Organisms

- ***Recombinant DNA technology:***
- **1 organism w/ two different genes –**

- *Resulting organism called "genetically modified organisms (GMOs)," "genetically engineered," or "transgenic."*

Herbicide Resistant Crops

+ CP4 EPSPS=Roundup gene Ready



- **Soybeans: Roundup Ready**
- **Corn: Roundup Ready, Liberty Link**
- **Cotton: BXN, Roundup Ready**
- **Canola: Liberty Link, Roundup Ready**

Environmental Benefits

- **Reduced pesticide** use
- **Lower energy** requirements
- **Cleaner water**
- **Less soil erosion**

_____ 4. In fruit flies the trait of red eyes (R) is dominant to white eyes (r). The trait is carried on the X chromosome.

	X^R	Y
X^R	X^RX^R	X^RY
X^r	X^RX^r	X^rY

Based on the Punnett square above, which statement best describes the eye color of the fruit fly offspring?

A. There is a 50% probability that female offspring will have red eyes.

B. There is a 75% probability that female offspring will have red eyes.

C. There is a 50% probability that male offspring will have red eyes.

D. There is a 75% probability that male offspring will have red eyes.

Something to think about

DNA testing – good or bad?

13 min.

https://www.youtube.com/watch?v=0XxDBcguYII