



PHONES & EAR BUDS away Please!

Wed, Jan 18, 2017

Pick up:

Today you will:

- Complete DSQ on Sex-linked traits
- Learn about Pedigrees

Homework/Planner:

Pedigree Worksheet

Study what we've covered so far, Quiz Fri, Jan 20!

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

|       |           |         |
|-------|-----------|---------|
|       | $X^R$     | $Y$     |
| $X^R$ | $X^R X^R$ | $X^R Y$ |
| $X^r$ | $X^R X^r$ | $X^r Y$ |

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.



|       |           |         |
|-------|-----------|---------|
|       | $X^c$     | $Y$     |
| $X^C$ | $X^C X^c$ | $X^C Y$ |
| $X^C$ | $X^C X^c$ | $X^C Y$ |

| Genotype | Phenotype |
|----------|-----------|
|----------|-----------|



Carrier are  
NORMAL! = 50%



M, normal  
vision = 50%

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

$X^h X^h \times X^H Y$

|       |           |         |
|-------|-----------|---------|
|       | $X^H$     | $Y$     |
| $X^h$ | $X^H X^h$ | $X^h Y$ |
| $X^h$ | $X^H X^h$ | $X^h Y$ |

| Genotype      | Phenotype           |
|---------------|---------------------|
| $X^H X^h = 2$ | Carrier = 50%       |
| $X^h Y = 2$   | 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

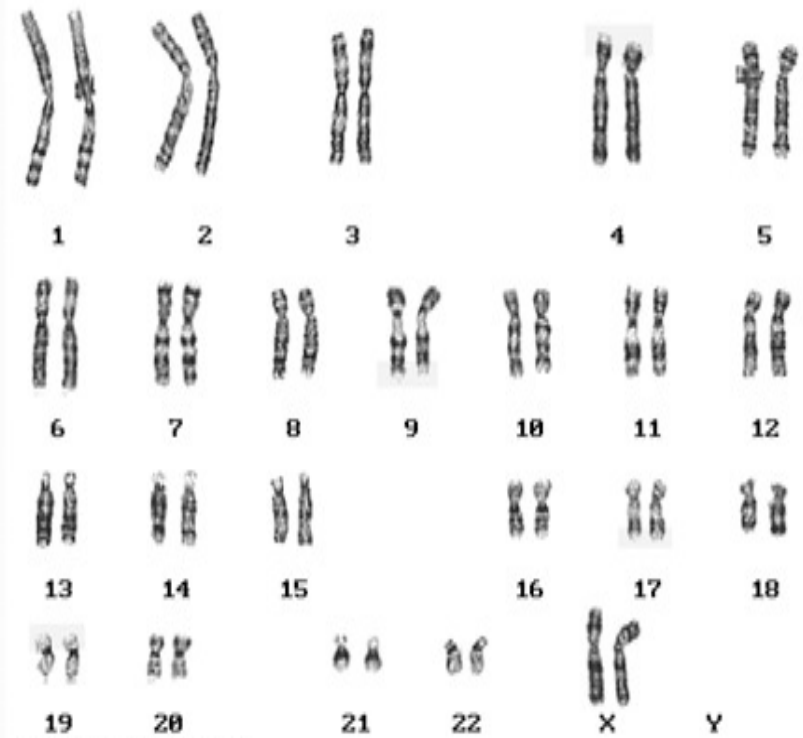
## Normal Male



2n = 46

5

## Normal Female



Karyotype: 46,XX

2n = 46

6

# REVIEW: Karyotype

- Male or female?
- Normal or abnormal?



# REVIEW:

- What indicates this is a male?
  - Normal or abnormal?
- How many *PAIRS* of xsomes do we have?





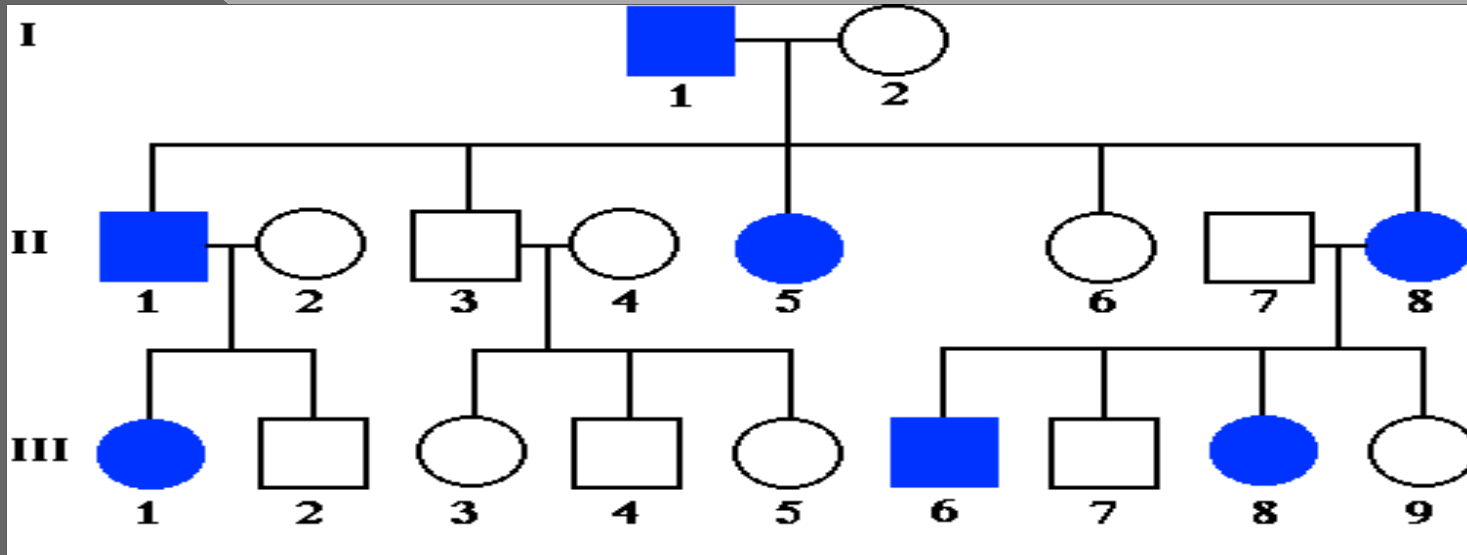
# What is a Pedigree

- 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**