

Name: \_\_\_\_\_

Period: \_\_\_\_\_

### Heredity Study Guide (5.1/5.2)

#### 1. Define the following vocabulary words:

Allele:

Homozygous:

Heterozygous:

Genotype:

Example:

Phenotype:

Example:

Dominant:

Recessive:

#### 2. For each genotype below, indicate whether it is heterozygous (He) or homozygous (Ho)

AA \_\_\_\_\_ Bb \_\_\_\_\_ Cc \_\_\_\_\_ Dd \_\_\_\_\_ Ee \_\_\_\_\_ ff \_\_\_\_\_ GG \_\_\_\_\_ HH \_\_\_\_\_

Ii \_\_\_\_\_ Jj \_\_\_\_\_ kk \_\_\_\_\_ Ll \_\_\_\_\_ Mm \_\_\_\_\_ nn \_\_\_\_\_ OO \_\_\_\_\_ Pp \_\_\_\_\_

#### 3. For each of the genotypes below determine what phenotypes would be possible.

*Purple flowers are dominant to white*

PP \_\_\_\_\_ Pp \_\_\_\_\_ pp \_\_\_\_\_

*Round seeds are dominant to wrinkled*

RR \_\_\_\_\_ Rr \_\_\_\_\_ rr \_\_\_\_\_

*Brown eyes are dominant to blue*

BB \_\_\_\_\_ Bb \_\_\_\_\_ bb \_\_\_\_\_

*Bobtails are recessive (to long tails)*

TT \_\_\_\_\_ Tt \_\_\_\_\_ tt \_\_\_\_\_

**4. For each phenotype below, list the genotypes (remember to use the letter of the dominant trait)**

*Straight hair is dominant to curly*

\_\_\_\_\_ straight \_\_\_\_\_ straight \_\_\_\_\_ curly

*Tail spikes are dominant to plain tails*

\_\_\_\_\_ spikes \_\_\_\_\_ spikes \_\_\_\_\_ plain

**5. Show the cross of a homozygous tall plant and a homozygous short plant. Use the letter *T***

What percentage of the offspring will be tall? \_\_\_\_\_


**6. Show the cross of a Tt plant and a Tt plant.**


a. What percentage of the offspring will be short? \_\_\_\_\_

b. What percentage of offspring is tall? \_\_\_\_\_

7. In pea plants purple flowers are dominant to white flowers.

a. Two white flowered plants are crossed...

What percentage of their offspring will have white flowers? \_\_\_\_\_


b. A white flowered plant is crossed with a plant that is heterozygous for the trait.

What percentage of the offspring will have purple flowers? \_\_\_\_\_


c. Two plants, both heterozygous for the gene that controls flower color are crossed.

What percentage of their offspring will have purple flowers? \_\_\_\_\_

What percentage will have white flowers? \_\_\_\_\_


8. In guinea pigs, the allele for short hair is dominant.

a. What genotype would a long-haired guinea pig have? \_\_\_\_\_

Show the cross for two heterozygous guinea pigs.


b. What percentage of the offspring will have short hair? \_\_\_\_\_

c. What percentage of the offspring will have long hair? \_\_\_\_\_

9. What are the sex chromosomes in a human female? \_\_\_\_\_ male?

\_\_\_\_\_

**10. In humans, the gene for muscular dystrophy is sex-linked (X-linked) and recessive. Cross a normal muscle toned heterozygous female with an affected male.**

Parents: \_\_\_\_\_ x \_\_\_\_\_


a. What are all of the possible genotypes of the offspring?

\_\_\_\_\_

b. What are the possible phenotypes of the offspring?

\_\_\_\_\_

c. What is the probability they will have a muscular dystrophy son? \_\_\_\_\_% chance

d. What is the probability they will have a muscular dystrophy daughter? \_\_\_\_\_% chance

**11. What is the difference between incomplete dominance and co-dominance? Explain how the results of each cross would vary in a cross between a black furred rat and a white furred rat.**

**12. Refer to the Punnett square below. Color-blindness is an X-linked recessive trait.**

	$X^B$	$Y$
$X^B$	$X^B X^B$	$X^B Y$
$X^b$	$X^B X^b$	$X^b Y$

a. Does the father have color blindness?

b. Does the father have a recessive allele?

c. State whether the only child that could have color blindness is male or female.

**13. Mrs. Clink is type “A” and Mr. Clink is type “O.” They have three children named Matthew, Mark, and Luke. Mark is type “O,” Matthew is type “A,” and Luke is type “AB.” Based on this information:**

a. Mr. Clink must have the genotype \_\_\_\_\_

b. Mrs. Clink must have the genotype \_\_\_\_\_ because \_\_\_\_\_ has blood type \_\_\_\_\_

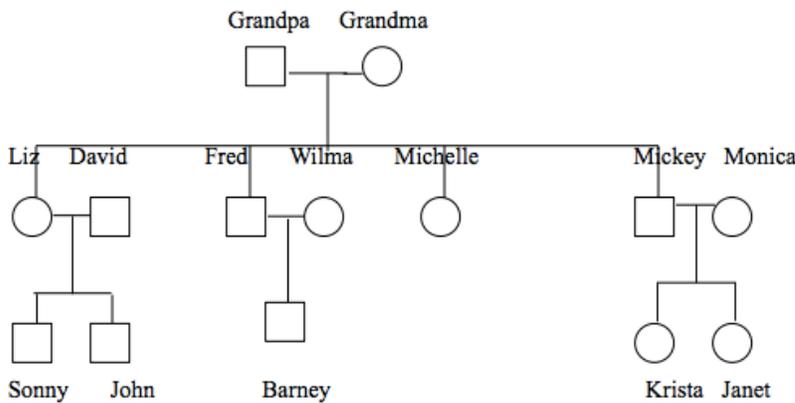
c. Luke cannot be the child of these parents because neither parent has the allele \_\_\_\_\_.

**14. Create a pedigree showing the following members of a family for the Sickle Cell Disease (recessive disease, NOT sex-linked)**

- Mother – carrier (heterozygous) for Sickle Cell Disease
- Father – carrier (heterozygous) for Sickle Cell Disease
- Son – affected by Sickle Cell Disease
- Son – carrier for Sickle Cell Disease
- Son – affected by Sickle Cell Disease
- Daughter – no Sickle Cell Disease

**15. Color in the pedigree below using the following information:**

- Colorblindness is a recessive, sex-linked disorder.
- Grandma and Grandpa are NOT colorblind.
- Mickey is colorblind; all of their other children have normal color vision.
- Sonny and John both inherited colorblindness, as did their cousins Barney and Janet.



What are the **genotypes** of Barney, Krista, and Janet?

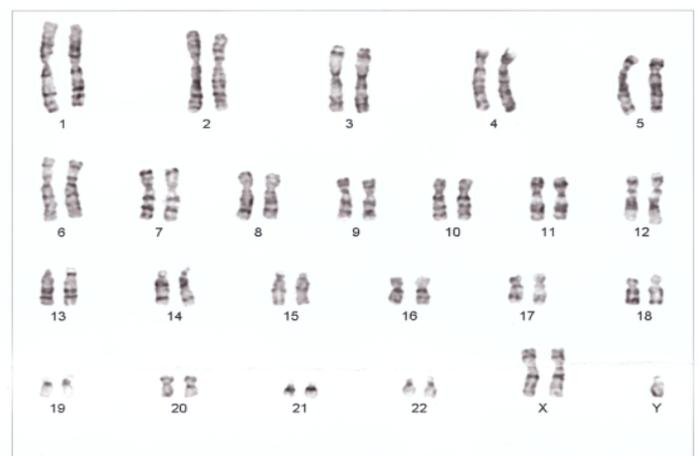
Barney's genotype: \_\_\_\_\_

Krista's genotype: \_\_\_\_\_

Janet's genotype: \_\_\_\_\_

**16. Using the karyotype to the below to answer the following questions:**

- a. Is this a typical karyotype?
- b. If your answer was no, circle the abnormality in the karyotype.
- c. If there are extra chromosomes in this karyotype, what effect would this have on an individual?
- d. What is the sex of this individual?
- e. For a normal karyotype, how many chromosomes would you see?



核型: 47, XXY

Cell No: 003

**17. How can the environment affect the phenotype of an organism? Give specific examples.**