

Name: _____ Date: _____ Period: _____

Review: Genetics

Gregor Mendel, an Austrian monk, was the first person to succeed in predicting how traits are inherited from generation to generation. He worked with pea plants and studied how genes are passed down from the parent generation (P_1) to their offspring (F_1). While many human traits are not as simple as the ones Mendel studied in peas, they follow the same basic rules.

SIMPLE DOMINANCE:

1. Genes are segments of _____ that contain information about our traits.
2. A(n) _____ is an alternate form of a gene.
3. An individual that has two of the same alleles for a particular gene (RR or rr) is called: _____.
4. An individual who has two different alleles for a particular trait (Rr) is called: _____.

5. Fill in the following chart:

Description	Genotype	Phenotype
Homozygous for tongue rolling		
Heterozygous for Free Earlobes		
Homozygous for non-tasting		
Homozygous for polydactyly		

The following are the dominant traits: the ability to roll your tongue, free earlobes, tasting PTC paper, and having polydactyly (6-fingers)

Monohybrid Cross: Cross two people who are heterozygous for Polydactyly.

Phenotypes of parents: _____ x _____

Genotypes of parents: _____ x _____

Punnett Square:

Write the ratio for the following results.

Genotypic Ratio: _____

Phenotypic Ratio: _____

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INCOMPLETE DOMINANCE:

7. What is incomplete dominance? _____.
8. In snapdragon flowers, the genotype (RR) is what color? _____ The genotype (R'R') is what color? _____ The genotype (R R') is what color? _____
9. Cross a red snapdragon with a white snapdragon flower. **Show** your Punnett square and the genotypic and phenotypic results.

Parent genotypes: _____ x _____

Genotypic Results: _____

Phenotypic Results: _____

10. The offspring of the above generation are called the F₁ generation. When two F₁ individuals are crossed, and F₂ generation is formed. Cross two pink flowers to form an F₂ generation. **Show** your Punnett square and the genotypic and phenotypic results.

Parent genotypes: _____ x _____

Genotypic Ratio: _____

Phenotypic Ratio: _____

SEX - LINKED TRAITS

11. Each human body cell contains 23 pairs of chromosomes. One of these pairs is different in the male and female. What is this 23rd pair called? _____
12. What is the genotype of a female? _____ of a male? _____
13. Why does the "X" chromosome carry some genes that are missing on the "Y"?

14. In humans, Colorblindness is a sex-linked gene. The normal gene (X^C) is dominant over the colorblindness gene (X^c). Write the phenotypes of the following people. Be sure to include if they are male or female as well as what their condition is.

X^C X^C _____

X^CY _____

X^cY _____

X^CX^c _____

X^cX^c _____

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15. a) How many of the recessive sex-linked genes does the male need to get in order to show the recessive trait? _____
b) How many of the recessive sex-linked genes does the female need to have in order to show the recessive trait? _____
c) Why does the recessive sex-linked trait show up in males more often than in females?

16. Muscular Dystrophy is another sex-linked trait. A Homozygous normal female is crossed with a man afflicted with muscular dystrophy. Make a Punnett square to show the offspring expected.

Genotypes of Parent: _____ x _____

Phenotypic results: _____

CODOMINANCE / MULTIPLE ALLELES

17. When a particular trait shows codominance, a heterozygote individual expresses both alleles _____.
18. What is it called when a trait has more than two alleles, but still only inherits one from each parent?

Blood types in humans exhibit both multiple alleles and codominance. Blood types A and B are codominant. However, both of these alleles are dominant over blood type O.

<u>Phenotypes</u>	<u>Genotypes</u>	<u>Phenotypes</u>	<u>Genotypes</u>
Type A	$I^A I^A$ or $I^A i$	Type B	$I^B I^B$ or $I^B i$
Type AB	$I^A I^B$	Type O	ii

19. Cross a woman who is homozygous for Type A with a man who is heterozygous for Type B

Parent genotypes: _____ x _____

Genotypic Ratio: _____

Phenotypic Ratio: _____

20. Can an individual who is blood Type O have parents who are blood Type A and blood Type B? Show the cross.

Parent genotypes: _____ x _____

Genotypic Ratio: _____

Phenotypic Ratio: _____

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MEIOSIS

35. A cell with two of 2n chromosome number is called: _____ n : _____

36. Crossing over helps to provide _____.

37. Sex cells or _____ are formed during meiosis and have _____ chromosomes in humans.

38. Chromosomes coil up and come together in tetrads in _____.

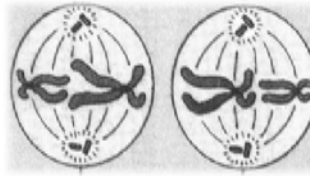
39. Homologous chromosomes separate and move to opposite sides during _____.

40. Sister chromatids separate during _____.

41. Label the phase the cells are currently in.

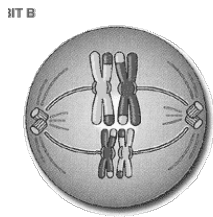
a. Phase : _____

b. Phase: _____



c. Phase : _____

d. Phase: _____



42. Fill in the chart to compare Mitosis and Meiosis

Characteristic	Meiosis	Mitosis
Location		
# of Daughter Cells		
# of Divisions		
Purpose		

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