

Genetics Study Guide

1. What is the difference between dominant and recessive? *- always seen - masked by dominant TT*
2. What is the difference between homozygous dominant and homozygous recessive? *tt*
3. What does heterozygous mean? *1 dominant & 1 recessive*
4. What is the difference between phenotype and genotype? *P = physical characteristics G = genes*
5. Who is Gregor Mendel? *Father of Genetics*
6. What is an allele? How many do you have per trait/gene? *a different form of a gene (2 per trait)*
7. How did Mendel cross the P1 generation to get the F1 generation? *cross fertilization*
8. How did Mendel cross the F1 generation to get the F2 generation? *self fertilization*
9. What is the probability of having 4 daughters in a row? *-*
10. What is the probability of flipping a coin and getting 2 heads in a row? *50%*
11. Cross 2 heterozygous round seeds. List ALL of the genotypes, phenotypes, recessive and dominant amounts. *over*
12. Cross a heterozygous brown haired male and a blonde female. List all of the genotypes, phenotypes, recessive, and dominant amounts. *over*
13. How do you solve a dihybrid cross? *must FOIL the gametes*
14. Complete a dihybrid cross with a heterozygous brown hair and eyed male and female. List all the genotypes and phenotypes. *over*
15. What is incomplete dominance? *When both alleles are dominant, but mix in the heterozygote*
16. Using incomplete dominance, cross a white snapdragon and red snapdragon flower. List the phenotypes and genotypes of the resulting offspring. *over*
17. Define codominance. *When both are dominant but both seen in heterozygote*
18. Using codominance, cross 2 roan cattle. List the phenotype and genotypes of the resulting offspring.
19. What does it mean to have multiple alleles for a trait? *more than 2*
20. Explain the purpose of the Human Genome Project. *figure out all diseases/traits on all chromosomes*
21. What is a karyotype? *picture of all chromosomes aligned in order 1-23*
22. When can a karyotype be seen? *metaphase*
23. What are the male sex chromosomes? *XY*
24. What are the female sex chromosomes? *XX*
25. Why do males mostly end up having this a sex-linked disorder? *only have 1 X*
26. Why do geneticists use pedigree diagrams? *to trace a disease/trait within a family*
27. Can you identify all parts of a pedigree?
28. What does it mean to be a carrier? *are heterozygous ("carry" recessive allele but don't show it)*
29. Fill in the following information for each of the following diseases.

	Describe the disease	Population Who tends to get this disease?	Dominant/recessive	Autosomal/sex-linked
Sickle cell anemia	<i>↳ RBC</i>	<i>African American</i>	<i>recessive</i>	<i>Autosomal</i>
Huntington's disease	<i>brain degeneration</i>	<i>anyone</i>	<i>Dominant</i>	<i>Autosomal</i>
Color blindness	<i>can't see color</i>	<i>male</i>	<i>recessive</i>	<i>Sex-linked</i>
Achondroplasia	<i>dwarfism</i>	<i>anyone</i>	<i>Dominant</i>	<i>Autosomal</i>
Tay-Sach's disease	<i>brain degeneration</i>	<i>Jewish</i>	<i>recessive</i>	<i>Autosomal</i>
Cystic fibrosis	<i>lung defect</i>	<i>white</i>	<i>recessive</i>	<i>Autosomal</i>
Hemophilia	<i>blood cannot clot</i>	<i>male</i>	<i>recessive</i>	<i>Sex-linked</i>

(14)

♀	BE	Be	bE	be
BE				
Be				
bE				
bb				

♀ = BbEe

♂ = BbEe

Foil = BE, Be, bE, be

G =

P = Brown / Brown =

Brown / blue =

Blonde / Brown =

Blonde / blue =

(11) ♂ = Rr ♀ = Rr

♀	R	r	G =
R			P =
r			D =
			R =

(12) ♂ = Bb ♀ = bb

♀	B	b	G =
b			P =
b			D =
			R =

(16) ♂ = WW ♀ = RR

♀	W	W	P =
R			G =
R			

(18) ♂ = RW ♀ = RW

♀	R	W	P =
R			G =
W			

* use correct alleles

#11

♂ = Rr

♀ = Rr

♂	R	r
R	RR	Rr
r	Rr	rr

G = 1 RR 2 Rr 1 rr

P = 3 round 1 wrinkled

D = 3 round

1 = wrinkled

12

♀ = Bb

♂ = Bb

P = 3 brown hair ; 1 blonde

♀	B	b
B	BB	Bb
b	Bb	bb

G = 1 BB 2 Bb 1 bb

D = 3 brown

R = 1 blonde

16

♂ = RR

♀ = Ww

G = 4 RW

Incomplete

↳ the heterozygote is a mix

♀	R	R
W	RW	RW
w	Rw	Rw

P = 4 pink

16

♂ = RW

♀ = RW

G = 1 RR 2 R^WW 1 W^W

P = 1 red 2 roan 1 white

♀	R	W
R	RR	RW
W	RW	WW

Codominance = The heterozygote Both alleles are shown

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