

Name: Answer Key

Genetics Practice Problems - Worksheet

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

AA <u>Ho</u>	Ee <u>He</u>	Ii <u>He</u>	Mm <u>He</u>
Bb <u>He</u>	ff <u>Ho</u>	Jj <u>He</u>	nn <u>Ho</u>
Cc <u>He</u>	Gg <u>He</u>	kk <u>Ho</u>	oo <u>Ho</u>
DD <u>Ho</u>	HH <u>Ho</u>	LL <u>Ho</u>	Pp <u>He</u>

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

Purple flowers are dominant to white flowers. Brown eyes are dominant to blue eyes

PP Purple

Pp Purple

pp white

BB Brown

Bb Brown

bb blue

Round seeds are dominant to wrinkled seeds.

RR Round

Rr Round

rr wrinkles

Bobtails in cats are recessive.

TT Long tail

Tt Long tail

tt Bobtail

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

Straight hair is dominant to curly.

SS straight

Ss straight

ss curly

Pointed heads are dominant to round heads.

PP pointed

Pp pointed

pp round

4. Set up the Punnet squares for each of the crosses listed below. Round seeds are dominant to wrinkled seeds.

		R	r
Rr x	r	Rr	rr
rr	r	Rr	rr

What percentage of the offspring will be round? 50%

		RR	R
RR x	r	Rr	Kr
rr	r	Rr	Kr

What percentage of the offspring will be round? 100%

		R	R
RR x	R	RR	KR
Rr	r	Rr	Kr

What percentage of the offspring will be round? 100%

		R	r
Rr x	R	RR	Kr
Rr	r	Rr	rr

What percentage of the offspring will be round? 75%

Practice with Crosses. SHOW YOUR PUNNETT SQUARE!

5. A tall plant (TT) is crossed with a short plant (tt).

		T	T
+	+	T+	T+
+	+	T+	T+

Name: _____

What percentage of the offspring will be tall? 100%

6. A heterozygous tall plant (Tt) is crossed with another heterozygous tall plant (Tt).

What percentage of the offspring will be short? 25%

	T	t
T	TT	Tt
t	Tt	tt

7. A heterozygous round seeded plant (Rr) is crossed with a homozygous round seeded plant (RR).

What percentage of the offspring will be homozygous (RR)? 50%

	R	r
R	RR	Rr
R	RR	Rr

8. A homozygous round seeded plant is crossed with a homozygous wrinkled seeded plant.

What are the genotypes of the parents? RR x rr

What percentage of the offspring will also be homozygous? 0

	R	R
r	Rr	Rr
r	Rr	Rr

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

If two white flowered plants are crossed, what percentage of their offspring will be white flowered? 100%

	r	r
r	rr	rr
r	rr	rr

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

	r	r
R	Rr	Rr
r	rr	rr

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What percentage of the offspring will have purple flowers? 50%

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

What percentage of their offspring will have purple flowers?

75%

What percentage will have white flowers? 25%

	R	r
R	RR	Rr
r	Rr	rr

12. In guinea pigs, the allele for short hair is dominant. *S-dominant s-recessive*

What genotype would a heterozygous short haired guinea pig have?

Ss

What genotype would a pure breeding short haired guinea pig have?

SS

What genotype would a long haired guinea pig have? ss

13. Show the cross for a pure breeding short haired guinea pig and a long haired guinea pig.

	S	s
S	SS	Ss
s	Ss	ss

What percentage of the offspring will have short hair? 100%

14. Show the cross for two heterozygous guinea pigs.

	S	s
S	SS	Ss
s	Ss	ss

What percentage of the offspring will have short hair? 75%

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What percentage of the offspring will have long hair? _____

15. Two short haired guinea pigs are mated several times. Out of 100 offspring, 25 of them have long hair. What are the probable genotypes of the parents?

ss x ss

Show the cross to prove it!

	S	s
S	SS	Ss
s	Ss	ss

16. A cross between a purebred variety with red flowers (RR) and a purebred variety with white flowers (rr) results in a plant with pink flowers (Rr). Using a Punnett square, show the genotypes and phenotypes of the offspring.

	R	R
r	Rr	Rr
r	Rr	Rr

If 120 flowers are produced from crossing the hybrid offspring, predict how many will have the genotype:

RR 30 Rr 60 rr 30

	R	r
R	RR	Rr
r	Rr	rr

17. Draw a Punnett square showing a cross between a father with genotype Ao and a mother with genotype AB.

	A	O
A	AA	AO
B	AB	BO

What percentage of the offspring will have blood Type A? 50%

What percentage of the offspring will have blood Type B? 25%

18. In a cross between a white-eyed female fruit fly and red-eyed male, what percent of the female offspring will have white eyes? (White eyes are X-linked, recessive) Show your Punnett square!

	X ^r	X ^r
X ^R	X ^R X ^r	X ^R X ^r
Y	X ^r Y	X ^r Y

No female offspring have white eyes.

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19. A white-eyed female fruit fly is crossed with a red-eyed male. Red eyes are dominant, and X-linked. What are the expected phenotypes of the offspring?

	X^R	X^r
X^R	$X^R X^R$	$X^R X^r$
Y	$X^R Y$	$X^r Y$

50% Female with Red eyes

50% male with white eyes