

Name: _____

Date: _____

Life Science

Period: _____

Genetics

punnett square practice

1. Let's say that in seals, the gene for the length of the whiskers has two alleles. The dominant allele (W) codes long whiskers and the recessive allele (w) codes for short whiskers.
- a. What is the probability of producing offspring that have short whiskers from a cross of two long-whiskered seals, one that is homozygous dominant and one that is heterozygous? Show your work on the punnett square.

	W	W
W	WW	WW
w	Ww	Ww

100 % long whiskers

0 % short whiskers

- b. If one parent seal is a heterozygous long-whisker and the other is short-whiskered, what is the probability that the offspring will have short whiskers?

	W	w
w	Ww	ww
w	Ww	ww

50 % long whiskers

50 % short whiskers

2. In purple people eaters, one horn (H) is dominant and no horns (h) is recessive. Complete the punnett square to show the cross of two hybrid purple people eaters. Summarize the genotypes and phenotypes of the possible offspring.

	H	h
H	HH	Hh
h	Hh	hh

Possible genotypes of offspring:

HH, Hh, hh

Possible phenotypes of offspring:

75% One Horn 25% No Horns

#2 ANSWERS p2

3. In cats, long hair (L) is dominant over short hair (l). Complete the punnett square to show a cross between two short-haired cats.

	l	l
l	ll	ll
l	ll	ll

What is the probability that the parents will produce a short-haired kitten?

100 %

4. In Noombats, yellow bellies (Y) are dominant over green bellies (y).

- a. Complete the punnett square to show a cross between a purebred yellow bellied noombat and a noombat that is a hybrid for belly color. What is the probability that the parents will have yellow bellied offspring?

	Y	Y
Y	YY	YY
y	Yy	Yy

100 % yellow bellied

0 % green bellied

- b. Is it possible for two yellow bellied noombats to have a green bellied child? Identify the genotypes of the parents and complete the cross on the punnett square.

	Y	y
Y	YY	Yy
y	Yy	yy

- a. Genotypes of the parents:

Yy and Yy

- b. Can the yellow bellied parents produce a green bellied child?

YES

- c. If yes, explain how and identify what the probability would be.

25% green bellied

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Genetics Practice Problems

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

AA Ho

Ee He

Ii He

Mm He

Bb He

ff Ho

Jj He

nn Ho

Cc He

Gg He

kk Ho

oo Ho

DD Ho

HH Ho

LL Ho

Pp He

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

Purple flowers are dominant to white flowers.

PP Purple

Pp Purple

pp White

Brown eyes are dominant to blue eyes

BB Brown

Bb Brown

bb Blue

Round seeds are dominant to wrinkled seeds.

RR Round

Rr Round

rr Wrinkled

Bobtails in cats are recessive to long tails.

TT Long tail

Tt Long Tail

tt Bobtail

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 rr	r	Rr	rr
	r	Rr	rr

What percentage of the offspring will be round? 50

		R	R
RR x rr	r	Rr	Rr
	r	Rr	Rr

What percentage of the offspring will be round? 100

		R	R
RR x Rr	R	RR	RR
	r	Rr	Rr

What percentage of the offspring will be round? 100

		R	r
Rr x Rr	R	RR	Rr
	r	Rr	rr

What percentage of the offspring will be round? 75

Practice with Crosses.

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

What percentage of the offspring will be tall? 100

Show all work!

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

6. A Tt plant is crossed with a Tt plant.

What percentage of the offspring will be short? 25

		T	+
T	T	TT	T+
	+	T+	++

#2 Answers p5

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 cross, what percentage of their offspring will be white flowered? 100

	P	p
p	pp	pp
p	pp	pp

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

What percentage of the offspring will have purple flowers? 50

	p	P
P	Pp	Pp
p	pp	pp

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

	D	d
D	DD	Dd
d	Dd	dd

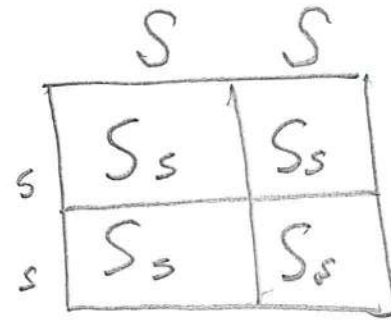
#2 ANSWERS p6

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

What genotype would a heterozygous short haired guinea pig have? Ss

What genotype would a purebreeding short haired guinea pig have? SS

What genotype would a long haired guinea pig have? ss



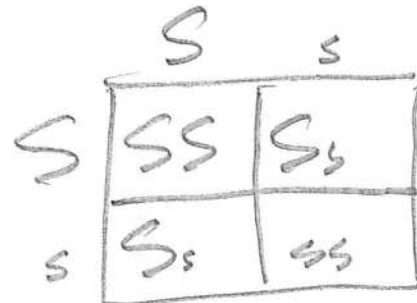
13. Show the cross for a pure breeding short haired guinea pig and a long haired guinea pig.

What percentage of the offspring will have short hair? 100

14. Show the cross for two heterozygous guinea pigs.

What percentage of the offspring will have short hair? 75

What percentage of the offspring will have long hair? 25



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!

