Bio 1 Revised Nov 2008 Name: KEY

Genetics Practice Problems Worksheet

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.

   a. Purple flowers are dominant to white flowers.
   - PP Purple
   - Pp Purple
   - pp white

   b. Round seeds are dominant to wrinkled seeds.
   - RR Round
   - Rr Round
   - rr Wrinkled

   c. Brown eyes are dominant to blue eyes
   - BB Brown
   - Bb Brown
   - bb Blue

   d. Bobtails in cats are recessive. (long tails are dominant)
   - TT long tail
   - Tt long tail
   - tt bob tail

3. For each phenotype below, list the **genotypes**

   a. Straight hair is dominant to curly.
   - SS straight
   - Ss straight
   - ss curly

   b. Pointed heads are dominant to round heads.
   - PP pointed
   - Pp pointed
   - pp round

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Set up the Punnet squares for each of the crosses listed below.

Round seeds are dominant to wrinkled seeds.

4. Rr x rr
   a. What are the different kinds of gametes these parents can produce? R, r, r, r
   b. Make a punnett square

	R	r
r	Rr	Rr
r	rr	rr

   c. What percentage of the offspring will be round? 50%

5. RR x rr
   a. What are the different kinds of gametes these parents can produce? R, R, r, r
   b. Make a punnett square

	R	R
r	Rr	Rr
r	Rr	Rr

   c. What percentage of the offspring will be round? 100%

6. RR x Rr
   a. What are the different kinds of gametes these parents can produce? R, R, R, r
   b. Make a punnett square

	R	r
R	RR	Rr
R	RR	Rr

   c. What percentage of the offspring will be round? 100%

7. Rr x Rr
   a. What are the different kinds of gametes these parents can produce? R, r, R, r
   b. Make a punnett square

	R	r
R	RR	Rr
r	Rr	rr

   c. What percentage of the offspring will be round? 75%

8. A TT (tall) plant is crossed with a tt (short plant).
   a. What are the different kinds of gametes these parents can produce? T, T, t, t
   b. Make a punnett square

	t	t
T	Tt	Tt
T	Tt	Tt

   c. What percentage of the offspring will be tall? 100%

9. A Tt plant is crossed with a Tt plant.
   a. What are the different kinds of gametes these parents can produce? T, t, T, t
   b. Make a punnett square

	T	t
T	TT	Tt
t	Tt	tt

   c. What percentage of the offspring will be short? 25%

10. A heterozygous round seed plant (Rr) is crossed w/ a homozygous round seed plant (RR).

a. What are the different kinds of gametes these parents can produce? R, r, R, R

b. Make a punnett square

	R	R
R	RR	RR
r	Rr	Rr

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

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

a. What are the genotypes of the parents? RR x rr

b. What are the different kinds of gametes these parents can produce? R, R, r, r

c. Make a punnett square

	R	R
r	Rr	Rr
r	Rr	Rr

d. What percentage of the offspring will also be homozygous? 0%

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

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

b. What genotype would a purebred short haired guinea pig have? SS

c. What genotype would a long haired guinea pig have? ss

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

SS ss SS x ss

	S	S
s	Ss	Ss
s	Ss	Ss

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

14. Show the cross for two heterozygous guinea pigs. Ss x Ss

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

b. What percentage of the offspring will have long hair? 25%

	S	s
S	SS	Ss
s	Ss	ss