

Name: Key
 Genetics Practice 4: Probability

Date: _____

1. In humans, curly hair is dominant over straight hair. A woman heterozygous for hair curl marries a man with straight hair and they have children.

- a. What is the genotype of the mother? Hh
- b. What gametes can she produce? H or h
- c. What is the genotype of the father? hh
- d. What gametes can he produce? h or h
- e. What is the probability that their first child will have curly hair? 50%
- f. What is the probability that their second child will have curly hair? 50%

	H	h
h	Hh	hh
h	Hh	hh

2. List all the gametes that are possible with each of the following genotypes:

- a. Aabb Ab, ab
- b. AaBB AB, aB
- c. AaBb AB, aB, Ab, ab
- d. AABb AB, Ab
- e. AAbb Ab
- f. aabb ab

3. What is the probability of getting the gamete (ab) from each of the following parents?

- a. Aabb 50%
- b. aaBb 50%
- c. AaBb 25%
- d. AABb 0%
- e. AAbb 0%
- f. aabb 100%

4. In a certain strain of mice, black coat (B) is dominant over white coat (b). Describe what you would do to determine the genotype of a male with a black coat and how this would enable you to choose between the genotypes BB or Bb.

Perform a test cross. Cross the male with a white-coated female: [♂] x bb. If any offspring have white coats, the male is Bb. If all are black, the male is BB.

	B	B
b	Bb	Bb
b	Bb	Bb

OR

	B	b
b	Bb	bb
b	Bb	bb

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5. What is the genotype of each of the following sets of parents producing the given genotypes in their offspring?

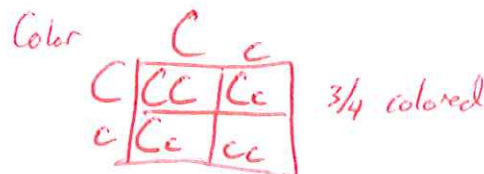
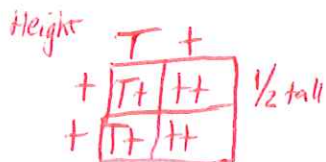
Parents' Genotype	Offspring Genotype	Probability
Aa x Aa	Aa	50% ($\frac{1}{2}$)
Aa x aa	Aa	50% ($\frac{1}{2}$)
AaBb x AaBB	AABB	12.5% ($\frac{1}{8}$)
AaBb x AABb	aabb	0%
AaBb x AaBb	AaBb	(25%) $\frac{1}{4}$

6. If an offspring has the genotype Aa, what possible combinations of parental genotypes could have produced this offspring?

$AA \times aa$ $AA \times Aa$
 $Aa \times Aa$ $Aa \times aa$

7. In corn, the trait for tall plants (T) is dominant to the trait for dwarf plants (t) and the trait for colored kernels (C) is dominant to the trait for white kernels (c). In a particular cross of corn plants, the probability of an offspring being tall is $\frac{1}{2}$ and the probability of a kernel being colored is $\frac{3}{4}$. Which of the following most probably represents the parental genotype?

a. TtCc x ttCc



b. TtCc x TtCc

c. TtCc x ttcc

d. TTCc x ttCc

e. TTCc x TtCC

8. In humans, the allele for albinism is recessive to the allele for normal skin pigmentation.

a. If two heterozygous parents have children, what is the chance that the child will be albino? 25%

b. If the child is normal, what is the chance that it is a carrier (heterozygous) for the albino allele? 50%

c. If normal parents have an albino child, what is the probability that their next child will be normal for pigment? 75%