

Name Key

Period _____

GENETICS PRACTICE 1: BASIC MENDELIAN GENETICS

Solve these genetics problems. Be sure to complete the Punnett square to show how you derived your solution.

1. In humans the allele for albinism is recessive to the allele for normal skin pigmentation. If two heterozygotes have children, what is the chance that a child will have normal skin pigment? What is the chance that a child will be albino?

	A	a	
A	AA	Aa	normal pigment: 75%
a	Aa	aa	albino: 25%

- a. If the child is normal, what is the chance that it is a carrier (heterozygous) for the albino allele? (**CAREFUL!**) 66% or 2/3

2. In purple people eaters, one-horn is dominant and no horns is recessive. Show the cross of a purple people eater that is heterozygous for horns with a purple people eater that does not have horns. Summarize the genotypes & phenotypes of the possible offspring?

	H	h	geno	Pheno
h	Hh	hh	50% Hh	50% Horns
h	Hh	hh	50% hh	50% No-Horns

3. In humans a heterozygous Brown eyed man mates with a Blue eyed woman. What will be the likely genotype and phenotype ratios of the offspring.

	B	b	Genotype %	Phenotype %
b	Bb	bb	50% Bb	50% Brown
b	Bb	bb	50% bb	50% blue

4- 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.

What is the genotype of the mother? Hh

What gametes can she produce? 50% H ; 50% h

What is the genotype of the father? hh

What gametes can he produce? 100% h

e. What is the probability that the 1st child will have curly hair? 50%

f. What is the probability that the 2nd child will have curly hair? 50%

INCOMPLETE DOMINANCE

5- In radishes, the gene that controls color exhibits incomplete dominance. Pure-breeding red radishes crossed with pure-breeding white radishes make purple radishes. What are the genotypic and phenotypic ratios when you cross a purple radish with a white radish?

	R	W	geno	Pheno
W	RW	WW	50% RW	50% Purple
W	RW	WW	50% WW	50% White

6- Certain breeds of cattle show incomplete dominance in coat color. When pure breeding red cows are bred with pure breeding white cows, the offspring are roan (a pinkish coat color). Summarize the genotypes & phenotypes of the possible offspring when a roan cow is mated with a roan bull

	R	W	geno	Pheno
R	RR	RW	25% RR	25% Red
W	RW	WW	50% RW	50% Pink (Roan)
			25% WW	25% White