(KEY)

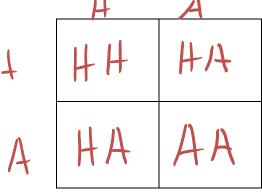# PREDICTING THE INHERITANCE OF 1 TRAIT WHEN MULTIPLE ALLELES ARE INVOLVED!!

Sometimes there are more than two alleles which are possible for a particular trait. See the examples below and solve the inheritance problems using the knowledge you've acquired thus far.

1. In rabbits, there are four alleles that determine coat color:

  F= fully colored
  C= chinchilla colored
  H= Himalayan colored
  A= albino

The alleles listed above are in order of dominance. For example, F is dominant over C, H, and A. C is dominant over H and A. H is dominant over A. A is recessive to all. Use this information in order to answer the questions that follow. Provide a punnet square as evidence for your answers!!

  a. What genotypes and phenotypes would you expect if two Himalayan rabbits with heterozygous genotypes were mated?
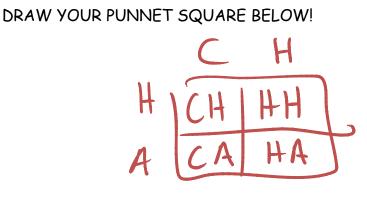
	H	A
H	HH	HA
A	HA	AA

GENOTYPIC RATIOS/PERCENTAGES

1-HH | 2 HA | 1 AA

PHENOTYPIC RATIOS/PERCENTAGES
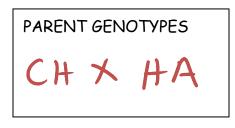
3- Himalayan
1- Albino

  b. For the example above, what is the probability that these rabbits will produce a litter of 5 himalayan colored rabbits? What is the probability that they will produce a litter of 5 albino colored rabbits? Provide mathematical evidence to support your answer!!

5 Himalayan → 23.7%

$$\left(\frac{3}{4}\right)^5$$

5 albino .1%

$$\left(\frac{1}{4}\right)^5$$

c. In a litter of 8 rabbits, 4 have chinchilla colored coats and 4 have Himalayan colored coats. Neither parent is of a pure breed!! Pure breeds have homozygous genotypes. What are the possible genotypes for these two parents?? Provide a punnet square to support your answer!

DRAW YOUR PUNNET SQUARE BELOW!

	C	H
H	CH	HH
A	CA	HA

PARENT GENOTYPES
CH X HA

2. Hair color in humans is represented by multiple alleles.

BB= brown   bb= blond   RR= red

BR= auburn   Bb= light brown   Rb= carrot red

In a cross between a father with auburn hair and a mother with light brown hair, what percentage have the phenotypes listed below?? Use a punnet square to support your answer!

	B	R
B	BB	BR
b	Bb	Rb

BROWN HAIR
25%
BLOND HAIR
0%
CARROT RED
25%
AUBURN HAIR
25%