Name: _____ Date: _____ Block: _____

Introduction to Punnett Squares (Science 10)

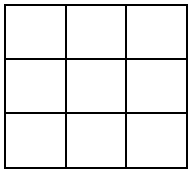
Punnett Square: tool used to predict the genotypes and phenotypes of offspring of a cross between two parents whose genotypes are known

Monohybrid Cross: an intentional mating (cross) between two parents that only considers one trait

Genotypic Ratio: expected proportions of offspring genotypes, in lowest terms (e.g. 1 rr : 2Rr : 1RR); can also be expressed as a percentage (e.g. 25% rr, 50% Rr, 25% RR)

Phenotypic Ratio: expected proportions of offspring phenotypes, in lowest terms (e.g. 1 short : 3 long); can also be expressed as a percentage (e.g. 25% short, 75% long)

How to Draw a Punnett Square for a Monohybrid Cross



1) Determine the genotypes of the parents.
2) Write the genotypes of the parents in the Punnett square.
3) Determine the possible genotypes of the offspring. Write the genotypic ratio.
   - Note for heterozygote genotypes: write the dominant allele first. E.g. *Tt*, not *tT*.
4) Interpret the genotypes to determine the possible phenotypes of the offspring. Write the phenotypic ratio.

Example 1: In mice, fur colour is determined by a single gene, where brown (B) is dominant to white (b). A heterozygote is crossed with a homozygous recessive mouse.		
Step 1	Heterozygote =	Homozygous recessive =
Steps 2 + 3		Genotypic ratio:
Step 4	Phenotypic ratio:	

Example 2: Nematodes can have a normal body shape or a dumpy (shorter) body shape. Dumpiness is a recessive trait. A dumpy nematode is crossed with a homozygous 'normal' nematode.		
Step 1	Dumpy nematode =	Homozygous normal =
Steps 2 + 3		Genotypic ratio:
Step 4	Phenotypic ratio:	

Example 3: Pea plants can be round (*R*) or wrinkled (*r*). Two heterozygote pea plants are crossed. Determine the genotypic and phenotypic ratios of the offspring.