WLHS/Biology/Monson Name_____

MONOHYBRID and DIHYBRID CROSSES – a review!

MONOHYBRID CROSSES:

1) In a certain species of rat, black fur color dominates white. Two heterozygous black rats mate. Show the Punnett Square for this cross and write out the genotype and phenotype ratios for the offspring.

PUNNETT SQUARE: genotype ratio:_____

phenotype ratio:_____

2) In watermelons, the gene for green rind is dominant color over the gene for white rind color. Cross a hybrid green rind watermelon with a white rind watermelon. As above, show the Punnett Square and write out the genotype and phenotype ratios for the offspring.

PUNNETT SQUARE: genotype ratio:_____

phenotype ratio:_____

3) In this question, assume the ability to roll the tongue is dominant to the lack of this ability. Mr. and Mrs. Jones could roll their tongues. They had a daughter, Sally, who was unable to roll her tongue. In another family, Mr. Smith could roll his tongue, but Mrs. Smith could not. They had a son, John, who could roll his tongue. Mrs. Smith and Mr. Jones died. Mr. Smith married Mrs. Jones. They had a daughter, Mary, who could roll her tongue.

A) What are the genotypes of all the individuals involved?

Mr. Jones_____ Mr. Smith_____ Mary Smith_____

Mrs. Jones_____ Mrs. Smith_____

Sally Jones_____ John Smith_____

B) What is the probability that the next child of Mr. Smith and Mrs. Jones will NOT be tongue roller? Show your work in the form of a Punnett Square.

DIHYBRID CROSSES:

4) In corn kernels, red color is dominant to white color. Smooth kernel is dominant to wrinkled kernels. In a parental cross, a true-breeding strain of red-wrinkled kernel corn is cross-pollinated with a strain of white-smooth kernel corn. (Be sure to assign letters to each trait and write out the cross)

A) What are the genotypes of the parental generation?_____ X _____

B) What is the genotype ratio for the F1 generation?_____

C) What is the phenotype ratio for the F1 generation?_____

D) Each plant from the F1 generation is self-fertilized. Show the cross using a Punnett Square. Also, list the expected phenotype ratio for the offspring of this cross.

CROSS:_____ **x** _____

Parents' gametes → / ↓				

PHENOTYPE RATIO:

5) Assume that in guinea pigs golden fur is dominant (G) to silver fur (g) and long hair (H) is dominant to short hair (h). For each problem, show the cross, the Punnett Square, genotypic ratio, and phenotypic ratio.

A) Cross a homozygous golden fur, homozygous long hair guinea pig and a heterozygous golden fur, short haired guinea pig.

CROSS:_____ x _____

Parents' gametes →				

GENOTYPE RATIO:

PHENOTYPE RATIO:

B) Cross a hybrid golden fur, hybrid long hair guinea pig and a silver, short hair guinea pig

CROSS:_____ x _____

Parents' gametes →				

GENOTYPE RATIO:

PHENOTYPE RATIO:

C) Cross a silver fur, heterozygous long haired guinea pig and a silver fur, hybrid long haired guinea pig.

CROSS:_____ x _____

Parents' gametes →				

GENOTYPE RATIO:

PHENOTYPE RATIO:

D) Cross a heterozygous golden fur, heterozygous long haired guinea pig and a heterozygous golden fur, hybrid long haired guinea pig.

CROSS:_____ x _____

Parents' gametes →				

GENOTYPE RATIO:

PHENOTYPE RATIO: