

MONOHYBRID

Key

Let N be the allele for night blindness, let n be the allele for normal sight

Parent's phenotypes: Night blind x Normal eyesight

Parent's genotypes: Dd x dd

Parent's gametes: (D) (d) x (d) (d)

F1:

	(D)	(d)
(d)	Dd	Dd
(d)	Dd	dd

Genotypic ratio: Dd : dd = 1:1

Phenotypic ratio: Night blind: normal eyesight = 1:1

Conclusion: Based on the Punnett Square, there is a 50% chance of having a child who is 'night-blind'

DIHYBRID

Key

Let Y be the allele for yellow seeds, let y be the allele for green seeds

Let W be the allele for round seeds, let w be the allele for wrinkled seeds

Parent's phenotypes: Yellow, round seeds x Yellow, round seeds

Parent's genotypes: YyWw x YyWw

Parent's gametes: (YW), (Yw), (yW), (yw) x (YW), (Yw), (yW), (yw)

F1:

	(YW)	(Yw)	(yW)	(yw)
(YW)	YYWW	YYWw	YyWW	YyWw
(Yw)	YYWw	YYww	YyWw	Yyww
(yW)	YyWW	YyWw	yyWW	yyWw
(yw)	YyWw	Yyww	yyWw	yyww

Genotypic Ratio: YYWW: YYWw: YyWW: YyWw: YYww: Yyww: yyWW: yyWw: yyww = 1: 2: 2: 4: 1: 2: 2: 1: 1

Phenotypic Ratio: Yellow, Round seeds: Yellow, Wrinkled seeds: Green, Round seeds: Green, wrinkled seeds = **9: 3: 3: 1**

Conclusion: Based on the Punnett Square, ____

SEX-LINKED GENE

Let H be the allele for normal blood clotting, let h be the allele for hemophilia

Parents' Genotype: $X^H X^h$ x $X^H Y$

Parents' Phenotype: Carrier of Hemophilia x non-hemophiliac

Parents' Gametes: (X^H), (X^h) x (X^H), (Y)

F1:

	(X^H)	(Y)
(X^H)	$X^H X^H$	$X^H Y$
(X^h)	$X^H X^h$	$X^h Y$

Genotypic ratio: $X^H X^H$: $X^H Y$: $X^H X^h$: $X^h Y$ = 1: 1: 1: 1

Phenotypic ratio: Non-hemophiliac : Hemophiliac = 3: 1

Conclusion: Based on the Punnett Square, there is no chance of their daughters being hemophiliac, but their sons have a 50% chance of being a hemophiliac.