

LAW OF SEGREGATION:

Allele pairs segregate during gamete formation (meiosis)

				T = tall t = short		P = purple p = white	
Two Tra	IT CROSS					٣ ٣	
Tall & Purple TTPP		nerat	ion	No.	Short & white ttpp		
			<	\Im			
	Tall & Purple TtPp	all & Jrple F1 Generation				1	
			(
		TP	Тр		tP	tp	
	TP	TTPP	TTP	b	TtPP	TtPp	
	Тр	ттрр	ттр	p	TtPp	Ttpp	
	tP	TtPP	TtP	p	ttPP	ttPp	
	tp	TtPp	Ttp	p	ttPp	ttpp	

LAW OF INDEPENDENT ASSORTMENT Each allele pair segregates independently of other allele pairs during gamete formation

LAWS OF PROBABILITY

RULE OF MULTIPLICATION:

Probability that two independent events will occur in combination (spontaneously) is equal to the PRODUCT of the probabilities they will occurndividually.

Example #1: You have 2 coins, what is the probability that you will flip two heads?

Coin 1 = 1 in 2 chance heads = 1/2Coin 2 = 1 in 2 chance heads = 1/2

 $1/2 \times 1/2 = 1/4$ Answer = 1 in 4 chance

Example #2: What is the probability that offspring of an F_1 generation cross will be homozygous recessive? (Pp x Pp \rightarrow pp)

```
Mom = 1 in 2 chance for p = 1/2
Dad = 1 in 2 chance for p = 1/2
```

1/2 x 1/2 = 1/4 Answer = 1 in 4 chance

RULE OF ADDITION: The probability of an event that can occur in two or more independent ways is equal to the SUM of the separate probabilities of those different ways. Example #1: You have 2 coins. What is the probability that you will flip a heads and a tails? Possibility #1 Coin 1 = 1/2 Heads Possibility #2 Answer: Coin 1 = 1/2 Tails1/4 + 1/4 = 1/2Coin 2 = 1/2 Heads Coin 2 = 1/2 Tails $1/2 \times 1/2 = 1/4$ $1/2 \times 1/2 = 1/4$ Example #2: What is the probability that two heterozygous parents will produce heterozygous offspring? (Pp x Pp \rightarrow Pp) Possibility #1 Mom = 1/2 prussidility #1 Mom = 1/2 P Dad= 1/2 p Answer: 1/4 + 1/4 = 1/2 Dad= 1/2 P $1/2 \times 1/2 = 1/4 \quad 1/2 \times 1/2 = 1/4$ Example #3: What is the probability that two parents heterozygous for both height and flower color will produce tall offspring with purple flowers? Probability of Tt Mom = 1/2 T Mom = 1/2 T Dad = 1/2 tDad = 1/2 t1/4 + 1/4 = 1/21/2 x 1/2 = 1/4 1/2 x 1/2 = 1/4 Probability of Pp = 1/2Answer = 1/2 (Tt) x 1/2 (Pp) = 1/4 chance