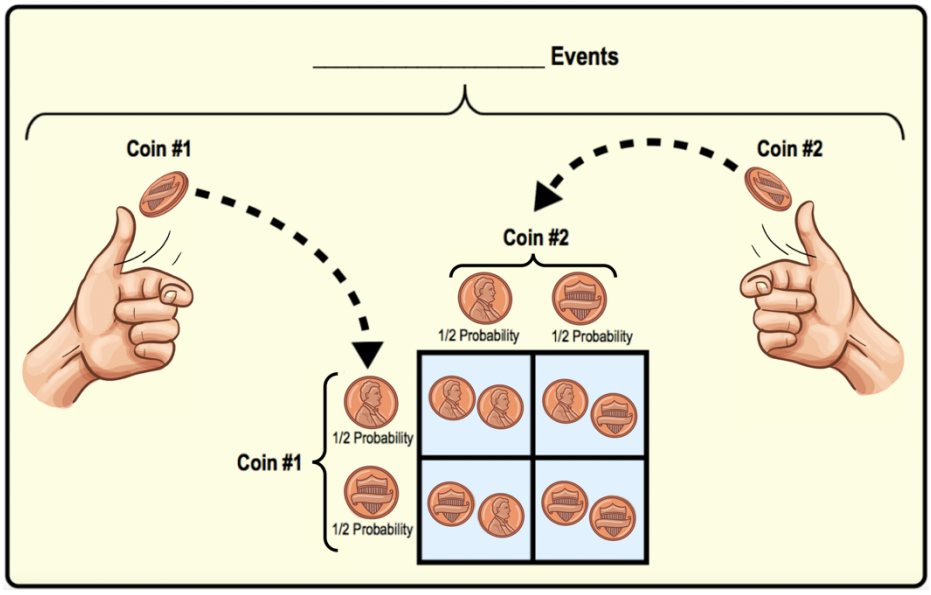
CONCEPT: PUNNETT SQUARE PROBABILITY

●Probability of *coin flips* can be related to the probabilities of a *Punnett Square*, since they are *independent* events.

□ 2 events are _____ if the outcome of 1 event does _____ affect the outcome of the other.

□ The **Rule of Multiplication** or **Rule of Addition** can be used to determine *probabilities* & predict genetic crosses.



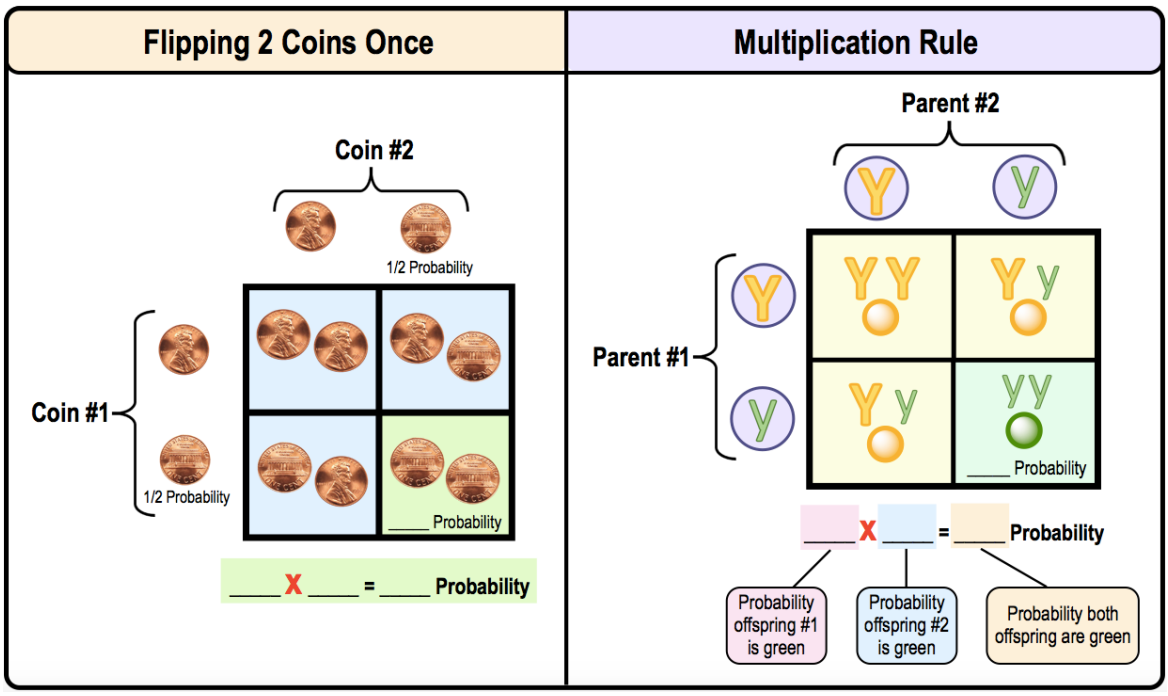
Rule of Multiplication (the AND Rule)

●The "*Rule of* _____" is also sometimes called the "*Product Rule*" or the "*AND Rule*".

●Probability for ≥ 2 *independent* events to occur *TOGETHER* is calculated by *multiplying* chances each event occurs alone.

□ For example, probability that 2 coins (coin 1 _____ coin 2) *both* land on tails = ½ **x** ½ = ¼.

EXAMPLE: If heterozygous parental pea plants have two offspring, what is the probability they will both be green?



CONCEPT: PUNNETT SQUARE PROBABILITY

PRACTICE: If heterozygous parents have 3 offspring, what is the probability the offspring will all be homozygous recessive?

a) ¼
b) ¾
c) 1/16
d) 1/64
e) 1/3

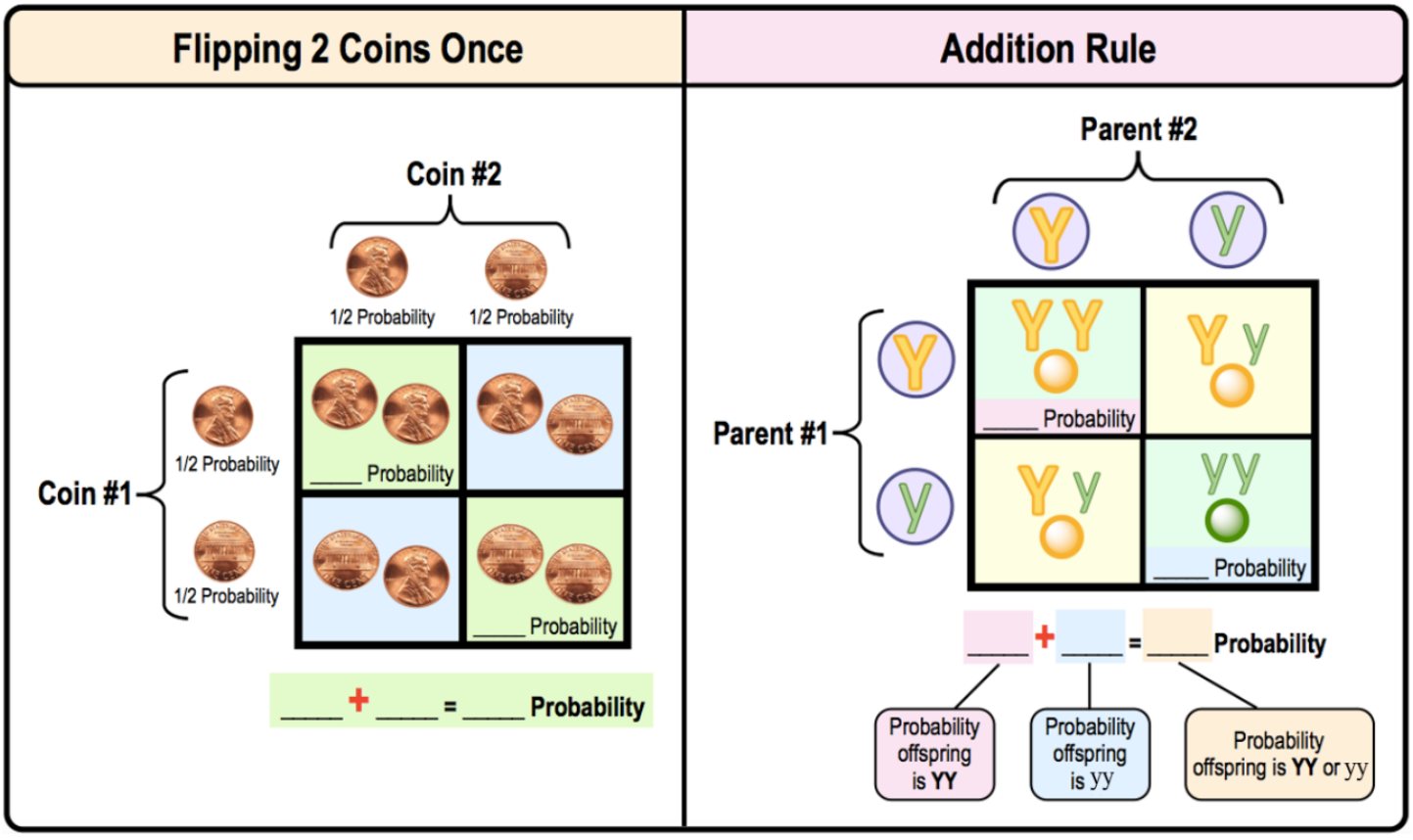
Rule of Addition (the OR Rule)

●The "*Rule of* _____" is also sometimes called the "*Sum Rule*" or the "*OR Rule*".

●Probability that one independent event _____ another will occur is calculated by _____ their probabilities.

□ For example, probability that 2 coins will both land on heads _____ both land on tails = ¼ + ¼ = _____.

EXAMPLE: Calculate the probability of having a homozygous dominant or a homozygous recessive offspring.



CONCEPT: PUNNETT SQUARE PROBABILITY

PRACTICE: What is the probability that a plant from a monohybrid cross of heterozygous parents, is homozygous dominant OR homozygous recessive?

a) ½.
b) ¼.
c) ¾.
d) 1.

PRACTICE: A blue-eyed female that is homozygous recessive and a brown-eyed male that is heterozygous mate, producing two offspring. What is the probability that one child will have blue eyes AND one will have brown eyes? (Eye color is controlled by a single gene).

a) ½.
b) ¼.
c) ¾.
d) 1.

PRACTICE: A homozygous dominant male has a child with a heterozygous female. What is the probability that the child will have the same genotype as its father OR its mother?

a) ½.
b) ¼.
c) ¾.
d) 1.