

# Section 1: Applied Genetics



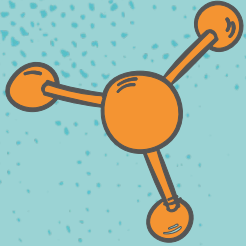


# MAIN IDEA

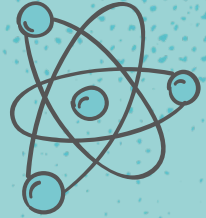


Selective breeding is used to produce organisms with desired traits.

<b>K</b> <i>What I Know</i>	<b>W</b> <i>What I Want to Find Out</i>	<b>L</b> <i>What I Learned</i>



# ESSENTIAL QUESTIONS



- How is selective breeding used to produce organisms with desired traits?
- What are similarities and differences between inbreeding and hybridization?
- How does a Punnett square test cross help assess the genotypes of organisms?

# VOCABULARY01



Review

- Hybrid

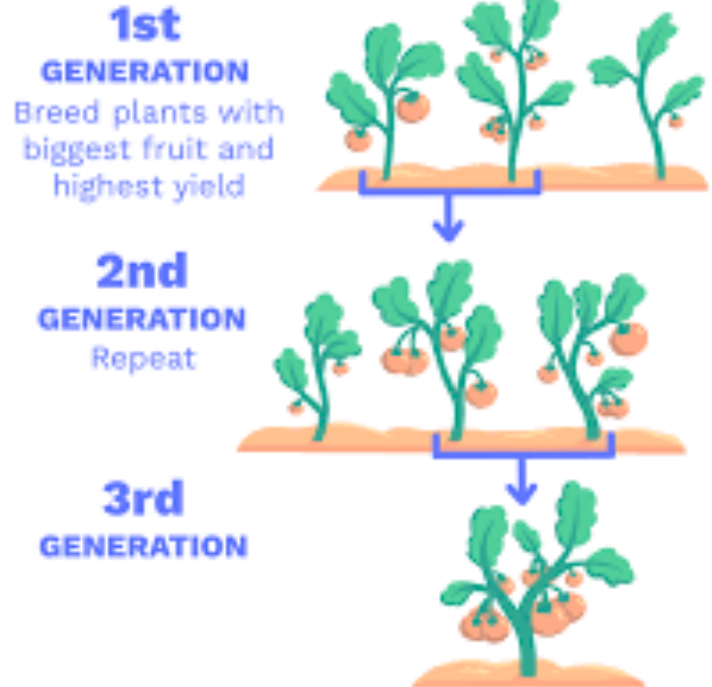
New

- selective breeding
- inbreeding
- test cross

# SELECTIVE BREEDING

- The process by which desired traits of certain plants and animals are selected and passed on to their future generations is called selective breeding.
- Desired traits can be passed on through hybridization and inbreeding.

## Selective Breeding: Breed best-performing plants

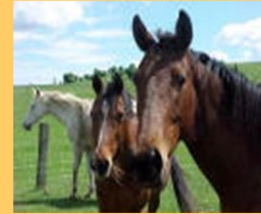


# SELECTIVE BREEDING HYBRIDIZATION

## Hybridization

- Hybridization involves crossing parent organisms with different forms of a trait to produce offspring with specific traits.
- Hybrid organisms can be bred to be more disease-resistant, to produce more offspring, or to grow faster.
- A disadvantage of hybridization is that it is time consuming and expensive.

## Real Example of Hybridization:



**Horse**

**Big, Fast,  
Excitable**

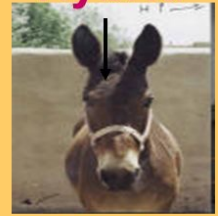
+



**Donkey**

**Small, Slow,  
Calm**

=



**Mule**

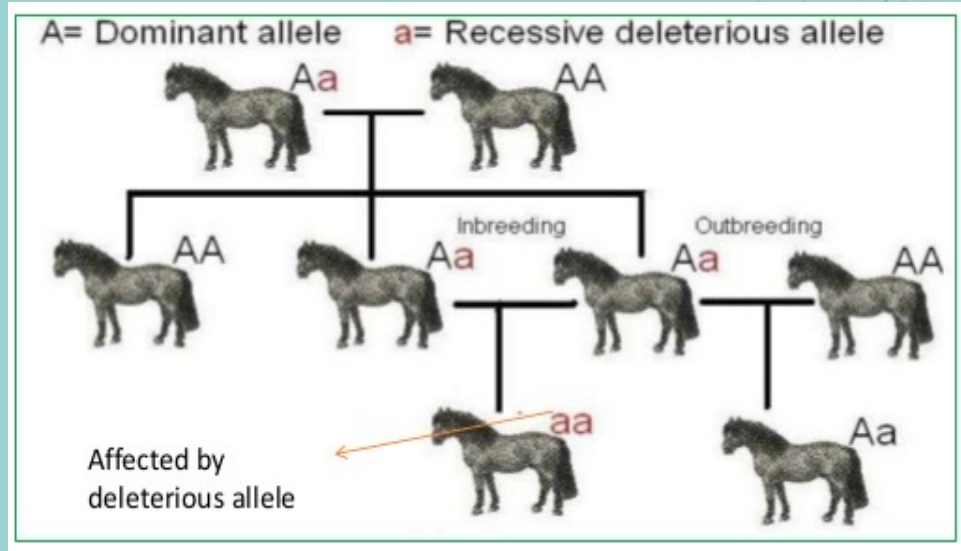
**Strong, Calm  
Endurance**

**The hybrid is often stronger and harder than its parents: Hybrid Vigor**

# SELECTIVE BREEDING INBREEDING

## Inbreeding

- Inbreeding is the process in which two closely related organisms are bred to pass on a desirable trait to future generations.
- Inbreeding can increase the chance of homozygous recessive offspring that may have harmful traits.





# TEST CROSS

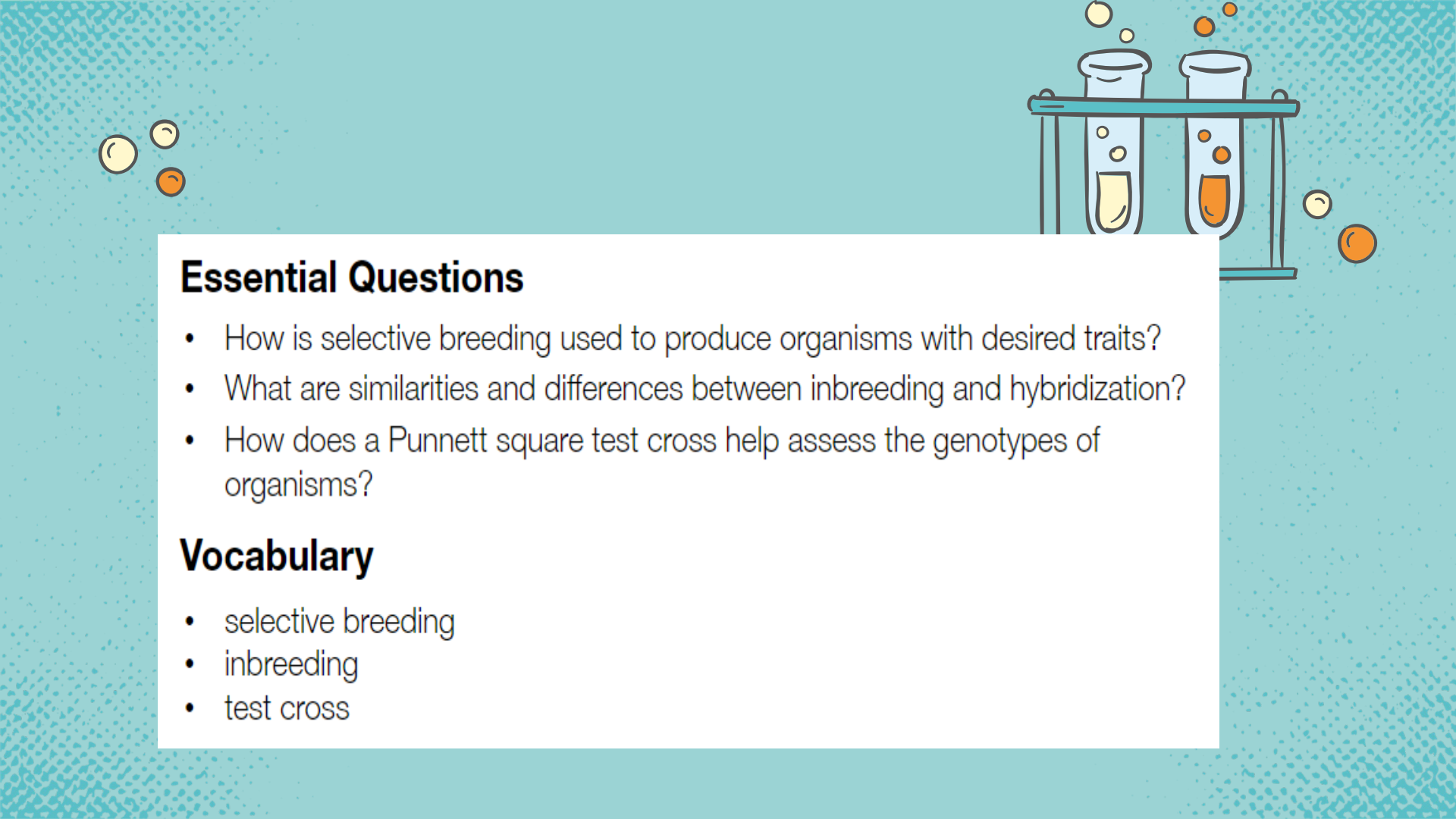
- A test cross involves breeding an organism that has the unknown genotype with one that is homozygous recessive for the desired trait.
- If the unknown parent genotype is homozygous dominant, all the offspring will have the dominant phenotype.
- If the unknown parent genotype is heterozygous, the offspring will show a 1:1 phenotypic ratio.

Homozygous white grapefruit			
		w	W
Homozygous red grapefruit	w	Ww	Ww
	w	Ww	Ww

Heterozygous white grapefruit			
		W	w
Homozygous red grapefruit	w	Ww	ww
	w	Ww	ww





## Essential Questions

- How is selective breeding used to produce organisms with desired traits?
- What are similarities and differences between inbreeding and hybridization?
- How does a Punnett square test cross help assess the genotypes of organisms?

## Vocabulary

- selective breeding
- inbreeding
- test cross



THANK  
YOU!!