Apple Genetics

Student Name	

Part 1: Comparing Royal Gala and Braeburn Apples

	Royal Gala Apple	Braeburn Apple
Look	Explain what you observe on the outside and inside of this particular apple. Write down what you notice, stem structure, seed layout, and coloring.	
Outside of Apple	Witte down what you notice, stem	structure, seed myour, and coloring.
Inside of Apple		
Smell	Explain what you observe	using your sense of smell.
Outside of Apple		
Inside Of Apple		
Touch	Explain what you observe about the texture of the apple. i.e. skin, meat, seed, stem	
Outside of Apple (Texture)		
Inside of Apple		
(Number of		
seeds and seed		
shape) Taste	Evolain what you observe	when you taste your apple.
Taste	Explain what you observe	
Tartness		
Sweetness		
Juiciness		
Crunchiness		





Part 2: Analyzing the Data

1. Explain what similarities you found in the Royal Gala and Braeburn apples?

2. Explain what differences you found in Royal Gala and Braeburn apples?

Part 3: Completing Punnett Squares

When making observations in Part 1, you described traits for each apple such as color, juiciness, or sweetness. These traits are determined by the genes in the apple. If we were to crossbreed blossoms on a Royal Gala apple tree with pollen from a Braeburn apple tree, the resulting fruit would look, smell, taste, and feel like a Royal Gala apple, but the seeds inside would possess genes from both of these parents. The seeds could be planted and grown into a new hybrid with fruit that has traits of both the Royal Gala and Braeburn apple.

In this activity, we will imagine that the traits you observed are determined by Mendelian inheritance in which a single gene determines a trait. Each trait is dominant or recessive and the alleles passed down from the parents determine whether the trait will be observed in the offspring. Below are examples of genotypes that the Gala and Braeburn apples may possess.

NOTE: These genotypes are to be used as examples only and do not represent accurate genotypes.

You will use this information to complete Punnett Squares on the following page and calculate probabilities for each genotype.

- a. Tartness is recessive (Gala's genotype is TT, Braeburn's genotype is tt)
- b. Sweetness is recessive (Gala's genotype is ss, Braeburn's genotype is SS)
- c. Juiciness is dominant (Gala's genotype is JJ, Braeburn's genotype is JJ)
- d. Crunchiness is dominant (Gala's genotype is Cc, Braeburn's genotype is CC)
- e. Red skin coloring is dominant (Gala's genotype is RR, Braeburn's genotype is Rr)
- f. Smooth skin texture is dominant (Gala's genotype is Bb, Braeburn's genotype is Bb)



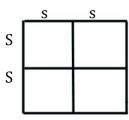


Complete the Punnett Squares and calculate the probability of each genotype for all traits.

t

Tartness: (Example) Tt Tt t Τt Tt

Sweetness



Probability of offspring genotypes:

TT=____0%__

Tt=___100%_

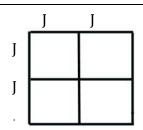
tt=____0%__

Probability of offspring genotypes:

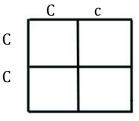
SS=____

Ss= _____

Juiciness



Crunchiness



Probability of offspring genotypes:

JJ= _____

Jj= _____

Probability of offspring genotypes:

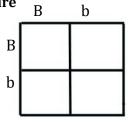
CC= _____

Cc= _____

Red Skin Coloring

	R	R
R		
r		

Smooth Skin Texture



Probability of offspring genotypes:

RR=____

Rr= _____

rr= ____

Probability of offspring genotypes:

BB= _____

Bb= ____





Part 4: Jazz Apple Observation

Observe and record observations of the traits of the Jazz apple.

Jazz Apple Observations			
Look	Explain what you observe on the outside and inside of this particular apple. Write down everything you notice, stem structure, seed layout, and coloring.		
Outside of Apple			
Inside of Apple			
Smell	Explain what you observe using your sense of smell.		
Outside of Apple			
Inside Of Apple			
Touch	Explain what you observe about the texture of the apple. i.e. skin, meat, seed, stem		
Outside of Apple			
Inside of Apple			
Taste	Explain what you observe when you taste your apple.		
Tartness			
Sweetness			
Juiciness			
Crunchiness			





Part 5: Comparing Royal Gala, Braeburn, and Jazz Apples

Similarities and differences found:

- 1. Describe similarities you found among all 3 apple varieties.
- 2. Describe differences you found among all 3 apple varieties.

Crossbreeding apples

1. Which of the three apples was your favorite? Why?

2. Why do apple breeders crossbreed apple varieties?



