

Apple Genetics

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		
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	Explain what you observe when you taste your apple.	
Tartness		
Sweetness		
Juiciness		
Crunchiness		

Apple Genetics (continued)

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

<p>Tartness: (Example)</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="padding: 5px;">T</td> <td style="padding: 5px;">T</td> </tr> <tr> <td style="padding: 5px;">t</td> <td style="border: 1px solid black; padding: 5px;">Tt</td> <td style="border: 1px solid black; padding: 5px;">Tt</td> </tr> <tr> <td style="padding: 5px;">t</td> <td style="border: 1px solid black; padding: 5px;">Tt</td> <td style="border: 1px solid black; padding: 5px;">Tt</td> </tr> </table> <p>Probability of offspring genotypes:</p> <p>TT= _____0%_</p> <p>Tt= _____100%_</p> <p>tt= _____0%_</p>		T	T	t	Tt	Tt	t	Tt	Tt	<p>Sweetness</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="padding: 5px;">s</td> <td style="padding: 5px;">s</td> </tr> <tr> <td style="padding: 5px;">S</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> <tr> <td style="padding: 5px;">S</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> </table> <p>Probability of offspring genotypes:</p> <p>SS= _____</p> <p>Ss= _____</p> <p>ss= _____</p>		s	s	S			S		
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t	Tt	Tt																	
t	Tt	Tt																	
	s	s																	
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<p>Juiciness</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="padding: 5px;">J</td> <td style="padding: 5px;">J</td> </tr> <tr> <td style="padding: 5px;">J</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> <tr> <td style="padding: 5px;">J</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> </table> <p>Probability of offspring genotypes:</p> <p>JJ= _____</p> <p>Jj= _____</p> <p>jj= _____</p>		J	J	J			J			<p>Crunchiness</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="padding: 5px;">C</td> <td style="padding: 5px;">c</td> </tr> <tr> <td style="padding: 5px;">C</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> <tr> <td style="padding: 5px;">C</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> </table> <p>Probability of offspring genotypes:</p> <p>CC= _____</p> <p>Cc= _____</p> <p>cc= _____</p>		C	c	C			C		
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<p>Red Skin Coloring</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="padding: 5px;">R</td> <td style="padding: 5px;">R</td> </tr> <tr> <td style="padding: 5px;">R</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> <tr> <td style="padding: 5px;">r</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> </table> <p>Probability of offspring genotypes:</p> <p>RR= _____</p> <p>Rr= _____</p> <p>rr= _____</p>		R	R	R			r			<p>Smooth Skin Texture</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td style="padding: 5px;">B</td> <td style="padding: 5px;">b</td> </tr> <tr> <td style="padding: 5px;">B</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> <tr> <td style="padding: 5px;">b</td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> <td style="border: 1px solid black; width: 40px; height: 40px;"></td> </tr> </table> <p>Probability of offspring genotypes:</p> <p>BB= _____</p> <p>Bb= _____</p> <p>bb= _____</p>		B	b	B			b		
	R	R																	
R																			
r																			
	B	b																	
B																			
b																			

Apple Genetics (continued)

Part 4: Jazz Apple Observation: Observe and record 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	

Apple Genetics (continued)

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?