STUDENT WORKSHEET
MAKING A NEW APPLE CULTIVAR
PART A: *APPLE - HOW DOES IT GROW?*
www.youtube.com/watch?v=UWLmEh1HIBw

Name _____ Date _____ Class/Hour _____

1. What is meant by the statement "Each apple seed is genetically unique?" _____
   _____
   _____

2. Explain how grafting is used to propagate new apple trees. _____
   _____
   _____

3. Explain the importance of pollinators in the production of the apple crop. _____
   _____
   _____

4. Describe some methods that apple growers use to control pests. _____
   _____
   _____

5. If apples are only harvested in the late summer and fall, how are they available to consumers all year round? _____
   _____
   _____

6. How does the United States compare to other countries in the amount of apples produced? _____
   _____
   _____

Name _____ Date _____ Class/Hour _____

You will carry out a simulated, apple breeding activity, similar to the process of crossbreeding, to create your own new apple cultivar. You will do this simulation by choosing the two "parents" from the apple variety cards provided and simulate the crossbreeding of those parents by flipping a coin. The purpose of this activity is to replicate how long it takes to produce new apple cultivars.

1. Review the Apple Cultivar Cards.

2. Choose the parent apple cultivars – "mother" and "father" – that have the traits (color, size, shape, flavor, and resistance) that you want for your new apple cultivar. You will crossbreed these parents to produce your new apple cultivar. Write the names of your two parent cultivars on the lines below. Your mother cultivar will be represented by heads on your coin; your father cultivar will be represented by tails. At least one of your parents must have the trait you want to have in your new apple cultivar.

   Mother apple cultivar – heads _____

   Father apple cultivar – tails _____

3. List the five traits, including one resistance trait, you want for your new apple cultivar.

Desired traits of your new apple cultivar	
Fruit color	
Fruit size	
Fruit shape	
Flavor	
Choose 1 resistance trait and cross-out the others	
Browning	
Scab	
Mildew	
Fire blight	
Cedar Apple Rust	

4. You will flip a coin to determine if the trait is inherited from the mother apple or the father apple. If the coin is heads, the apple inherits the trait from the mother; if the coin is tails, the apple inherits the trait from the father (this is a very simplified model for inheritance). Count the number of flips for **each** trait until you get the desired trait. Record that data in the table below. Complete the selection of each trait before you start the next one.

New Apple Cultivar Trait	Mother	Father	Number of flips to get desired trait
Fruit color:			
Fruit size:			
Fruit shape:			
Flavor:			
Resistance to:			
Total number of coin flips to get all of the desired traits			

Report:

1. How many times (coin flips) did it take for you to get all the traits you want in your apple? _____

2. If it takes up to 5 years for a tree to mature enough to produce an apple, how many years would this process have taken you to produce your new cultivar? (Multiply the number of times (flips) it took you to replicate the variety, times 5 years.) _____

3. You can now patent and name your new apple. What will you call it? _____

4. Why did you pick the name? _____

_____

5. Draw a picture of your new apple cultivar below: