

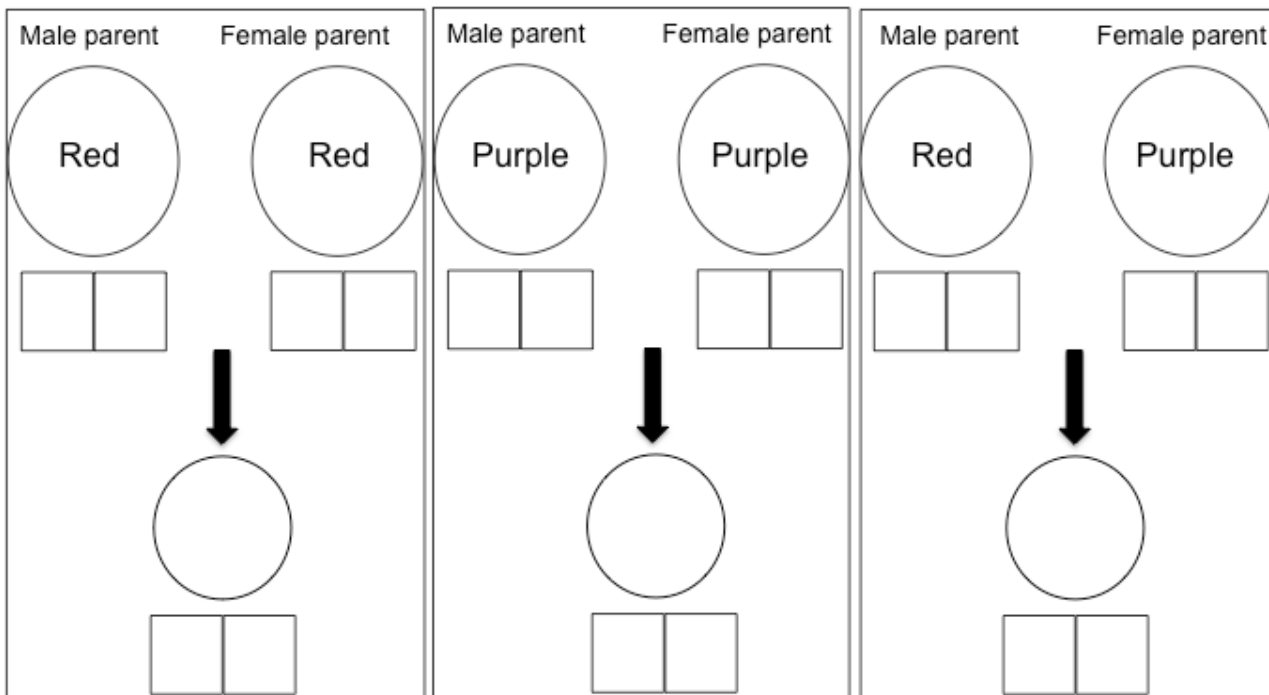
Name _____ Teacher _____
 School _____



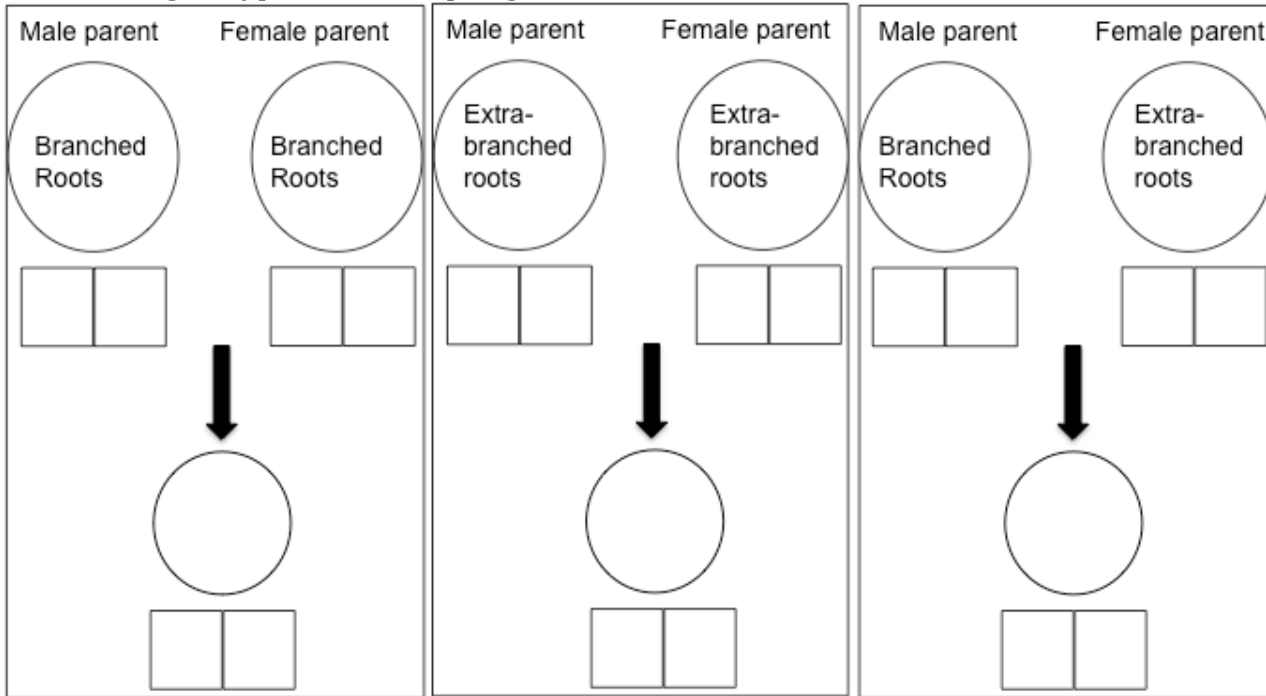
With your partner, examine these pictures of young tomato seedlings. One of them is Red Heinz and one is Purple Heinz. Discuss the differences between the two varieties that you can see in the pictures. Hypothesize which variety is Purple Heinz, and why it would be more successful in drought conditions. Support your answer with evidence based on what you have just learned.

Each diagram below represents a cross between two parents.

1. Predict the fruit color phenotype of the offspring from each cross, and write it in the circle at the bottom of the diagram.
2. Write the genotype of each parent in the boxes below the parent circles. In this example, all parents are homozygous (both genes are the same).
3. Write the genotype for the offspring in the boxes at the bottom.

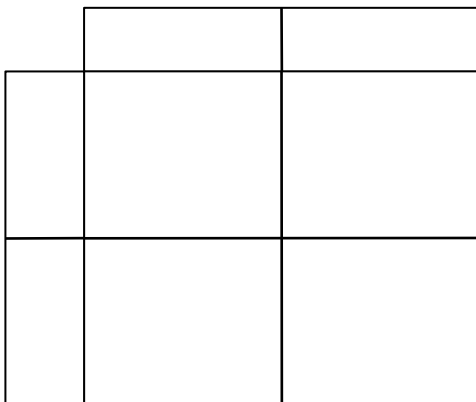


1. Predict the root structure phenotype of the offspring from each cross, and write it in the circle at the bottom of the diagram.
2. Write the genotype of each parent in the boxes. In this example, all parents are homozygous (both genes are the same).
3. Write the genotype for the offspring in the boxes at the bottom.

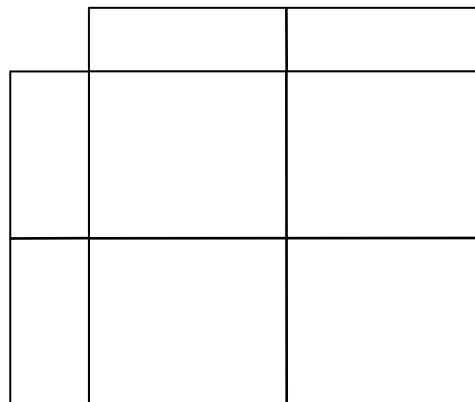


Use the Punnett Square diagrams to predict the offspring of the following crosses.

1. Red Heinz crossed to Purple Heinz, using the genes for fruit color (R & r).

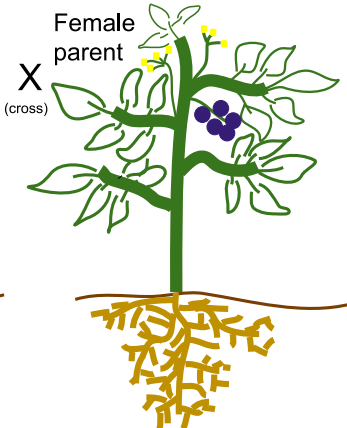
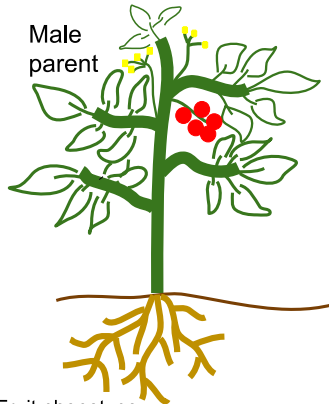


2. A cross of the offspring of cross #1.



3. Red Heinz crossed to Purple Heinz, using the genes for root structure (*B* & *b*).

4. A cross of the offspring of cross #3.

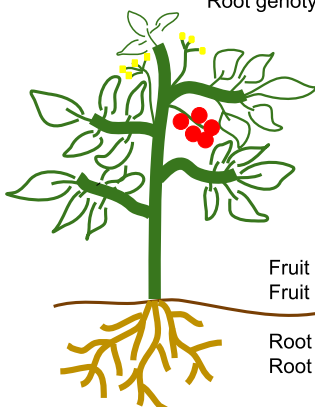


X
(cross)

Fruit phenotype: _____
 Fruit genotype:
 Root phenotype: _____
 Root genotype:

Fruit phenotype: _____
 Fruit genotype:
 Root phenotype: _____
 Root genotype:

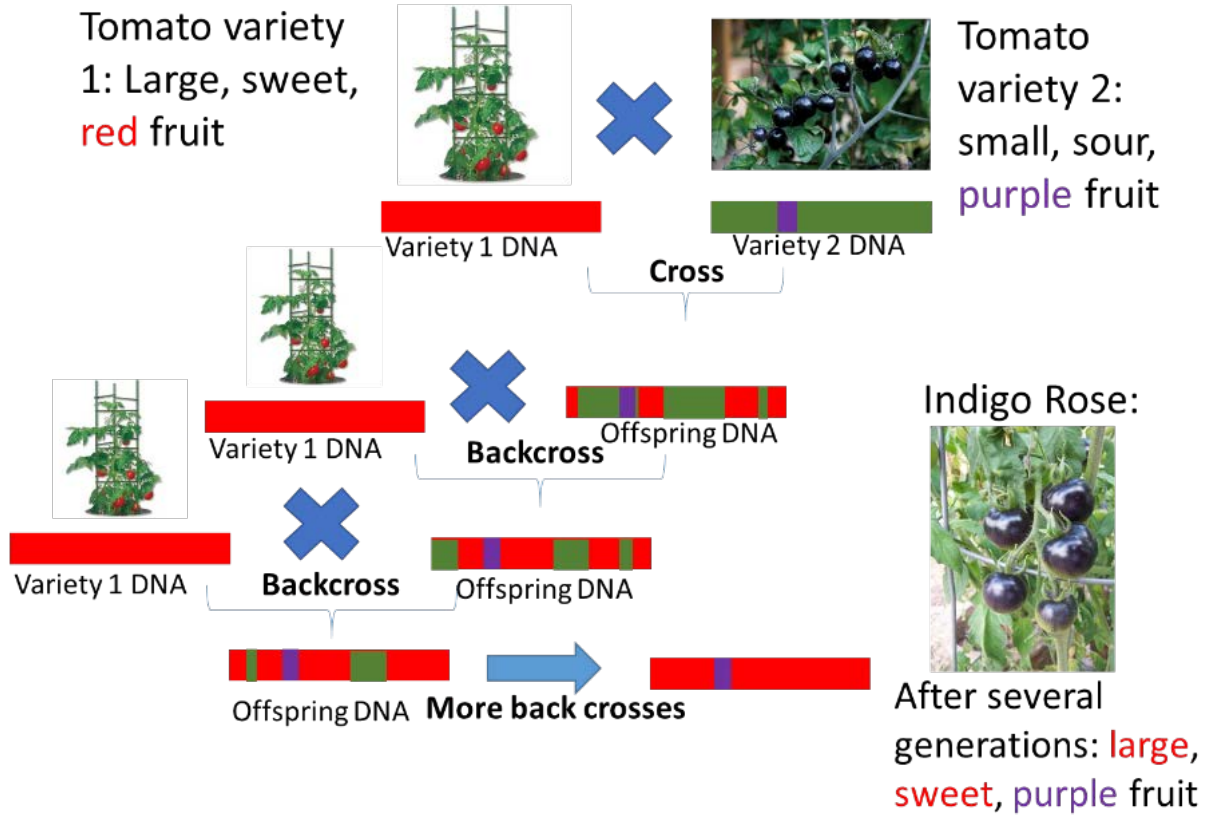
Offspring



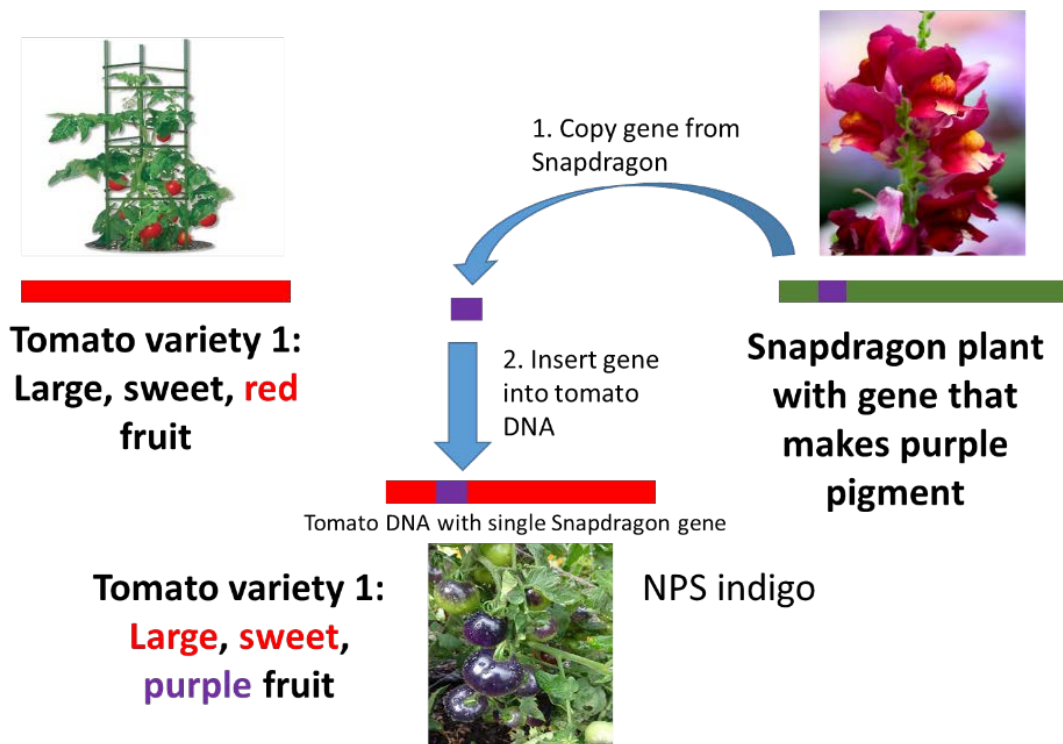
Fruit phenotype: _____
 Fruit genotype:
 Root phenotype: _____
 Root genotype:

Is it possible to get offspring that have red fruits but extra branched roots? Write the fruit and root phenotypes and genotypes for each parent. Then do the same for the offspring.

Selective Breeding



Genetic Modification



As of 2016, 8 GMO crops are currently grown in the US

Crop	% GMO of total grown	Main Uses	Extra trait added by genetic modification
Corn	90%	corn oil, corn syrup, corn meal, corn starch; all also used in processed foods	Insect resistance, herbicide resistance
Soybeans	95%	soybean oil, soy lecithin, soy protein; all also used in processed foods	Herbicide resistance
Cotton	95%	cottonseed oil, also used in processed foods	Insect resistance, herbicide resistance
Canola	90%	canola oil, also used in processed foods	Herbicide resistance
Sugar beets	90%	sugar, also used in processed foods	Herbicide resistance
Alfalfa	32%	animal feed	Herbicide resistance
Papaya	75%	eaten fresh	Virus resistance
Squash	12%	eaten fresh	Virus resistance