



## Super Hero Genetics

Based on an original lesson plan by Jerry Aissis; Providence, Rhode Island  
Modified for SPICE by Dimitri Blondel

### Summary:

Students will work with the concepts of phenotype, genotype, and Punnett squares. Students should already have been introduced to these concepts, as well as the concepts of genes and alleles; this activity is more to practice, reinforce and review these ideas. Students work cooperatively to pick a male and female superhero, determine their phenotypes and genotypes, and then run a cross simulation to determine the traits of a new superhero offspring. Spreadsheet skills are also developed.

### Materials:

Internet access, drawing materials, coins.

### Time:

Two 50-minute periods.

### Procedure:

Students should work in teams of four. First, they should use the internet to locate one male and one female super-hero of their choice. Once they have finalized their selection, they should pick four traits, and for each trait list the phenotype and genotype for each individual. They can decide whether a given trait is recessive or dominant, and whether individuals are homozygous or heterozygous. (As I worked with the groups, I would encourage them to use a mix of these different options)

### Example:

	<b>Wolverine</b>		<b>Elastigirl</b>	
Trait	Phenotype	Genotype	Phenotype	Genotype
Healing	Super-healer	hh	Normal healer	HH
Stretcher	Can't stretch	ss	Stretcher	Ss
Hair	Black	Bb	Brown	bb
Eyes	Green	Gg	Green	Gg

### Dominant alleles:

Normal healing (H)

Stretcher (S)

Black hair (B)

Green eyes (G); recessive allele is for brown eyes (g).

Emphasize to students that in this activity we are simplifying the genetics involved in human traits; in reality, multiple genes contribute to traits such as hair color and eye

color. However, also remind them that many phenotypic traits are indeed influenced by only one gene; for example, the “widow’s peak”.

Students should then begin the process of simulating an offspring created by their two super-heroes. This is a good opportunity to discuss the value of simulations in science, and how they are used. Students should create Punnett squares for each trait; each student should complete at least one Punnett square. A Punnett square should also be created for the sex chromosomes.

Students may now run their simulations. Any 50:50 or 25:75 outcomes should be simulated with a coin. 25:75 can be done with two coin tosses. Students should keep track of their coin flips and results on paper or on excel spreadsheets. They should clearly describe the phenotype of the offspring.

The (individual) homework assignment is to create a drawing of their new superhero. All four traits and the sex should be represented in some way on the drawing.

