



SfS Away from the Classroom!

AP04: Phenotypes, Genotypes and the Environment (Recommended for Grades 6-8)

Please use the following resources to learn about phenotypes and genotypes.

Watch these Videos: [How Mendel's pea plants helped us understand genetics - Hortensia Jiménez Díaz](#) and [play_circle_outline What is Inheritance?](#)

Answer these questions:

- Why were the offspring of yellow and green peas only yellow?
- The two yellow peas had one green offspring. What genotype did the green pea baby have?
- What is the physical expression of a genotype?
- When a couple has children, how many copies of each gene are passed on?

Activities: Follow these directions to investigate family traits!

You will need:

<ul style="list-style-type: none"> • 4 each of 8 colors of Legos (e.g., red, pink, purple, white, brown, blue, orange, and yellow) 	<ul style="list-style-type: none"> • Paper • Pencil
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1. Work with a lab partner - one will be Parent 1 and the other will be Parent 2
2. The following table shows the dominance of alleles:

Trait	Dominant trait - Allele - Color	Recessive trait - Allele - Color
<i>Tongue rolling</i>	Rolling - R - red	Non-rolling - r - pink
<i>Eyelashes</i>	Long - L - purple	Short - l - white
<i>Eye color</i>	Brown - B - brown; (Hazel - G)	Blue - b - blue; (It green - g)
<i>Earlobes</i>	Detached - D - orange	Attached - d - yellow

3. Each person should select a pair of alleles for each trait (tongue rolling, eyelash length etc.) that is true to their own phenotype. You can choose to be heterozygous or homozygous for any trait when applicable. For example, if you cannot roll your tongue you are homozygous (rr) and must use two pink (r) legos. But if you can roll your tongue, you may be homozygous (RR) or heterozygous (Rr) and may choose to use either two red (R) legos or a red and a pink. Record your genotype choices in the table below.

Trait	Parent 1 Genotype	Parent 2 Genotype
<i>Tongue rolling</i>		
<i>Eyelashes</i>		
<i>Eye color</i>		
<i>Earlobes</i>		



4. Each person blindly chooses (close your eyes!) one of their two alleles for each trait to give their offspring.
5. Combine the allele from Parent 1 with the allele from Parent 2 to create the genotype and phenotype of the offspring. For example if Parent 1 chooses a Long/purple eyelash allele and Parent 2 chooses a Short/white eyelash allele then the offspring would then be heterozygous LI with long eyelashes. A blank Punnett Square is below if you want to practice!

Trait	Allele from Parent 1 and Allele from Parent 2	Phenotype
<i>Tongue rolling</i>		
<i>Eyelashes</i>		
<i>Eye color</i>		
<i>Earlobes</i>		

Watch this video if you need help with the activity: [AP04 Phenotypes, Genotypes, and Environment.mp4](#)

Make observations & use Claims, Evidence, and Reasoning!

1. **Claim:** Offspring do not always have the same phenotypes as their parents.
 - **Evidence:**

 - **Reasoning:**

2. **Claim:** Siblings born from the same parents do not always have the same phenotypes.
 - **Evidence:**

 - **Reasoning:**