

**MIDDLE SCHOOL**

**Biotechnology**

**Lucky Brand Genes:**

**What is a genetic trait?**

**This optional lesson is an introduction to genetic terms. The terms learned in this lesson are necessary for the next portion of Lucky Brand Genes.**

**Goals**: Students will gain knowledge of genetic terms (trait, allele, genotype, phenotype, homozygous, heterozygous, dominant, recessive) and to determine several personal single-gene traits.

**Objectives**: Students will…

* Watch a video on called “What is a trait?”
* Understand several genetic terms
* Determine several of their single-gene traits

**Materials**:

* Internet access (either each group on a computer or one computer with presenter)
* Genetic Trait Vocabulary Sheet
* My Single-Gene Traits Sheet (one per student) (save paper, copy back to back)
* Large Poster Paper (optional)

**Time Required**: 45 – 60 minute class period

**Standards Met:**

* Life science: Structure and function in living systems
* Life science: Reproduction and heredity

**Procedure:**

* Ask the class to think of what makes them alike and different.
* Make a list of these on the board (eye color, height, gender, hair color, interests, abilities will probably be a few examples)
* Ask the class if they know what determines these traits. (parents)
* Then ask each student to think of a parent. Are they exactly like this parent?
* Are they exactly like their brothers/sisters? What makes them different?
* Pass out the vocabulary sheet
* Watch the video, *What Is A Trait?* <http://learn.genetics.utah.edu/content/begin/tour/>
* Click on “What is a trait?”(the last title)
* As the students watch and listen to the video, they should be filling in the vocabulary sheet.
* When the video is over, discuss the terms.
* Pass out the Single-Gene Trait sheet (unless this was copied on the back of vocabulary)
  + Inform the students how to find each of these traits
  + They writer their phenotype and then their possible genotype
  + If they do not have the dominant trait, they are homozygous recessive. If they have the dominant trait they are either homozygous dominant or heterozygous.
* Optional- Create graphs showing the class population for each trait.
  + Each group could be assigned a trait or each group could create a chart showing their results
  + Graphs could be bar graphs, pictographs, pie charts.
  + Do most of the students have dominant or recessive traits?

**Homework extension:**

* Ask the students to find out the phenotypes of their family members (parents, siblings, grandparents…)

**Assessment:**

* Accurate completion of vocabulary sheet
* Understanding of phenotypes and genotypes

**Lucky Brand Genes : Genetic Trait Vocabulary**

|  |  |
| --- | --- |
| Vocabulary Word | Definition/Examples |
| Trait  Physical  Behavioral  Medical Conditions  Genetic  Environmental |  |
| Allele |  |
| Homozygous |  |
| Dominant |  |
| Recessive |  |
| Heterozygous |  |
| Phenotype | The actual expressed trait, such as curly hair. *Since we both have brown eyes, we have the same phenotype, but we may have different genotypes*. |
| Genotype | An organism’s genetic makeup for a specific trait. The combination of alleles. *I don’t know if my genotype is Bb or BB, but my phenotype is brown eyes.* |

**Lucky Brand Genes : My Single-Gene Traits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Single-Gene**  **Traits** | **Allele** | **My Phenotype** | **My possible Genotype/s** |
| Mid-Digital Hair  No Mid Digital Hair | H  h |  |  |
| Tongue Roller  Can’t Roll Tongue | R  r |  |  |
| Bent Pinkies  Straight Pinkies | B  b |  |  |
| Widow’s Peak  No Widow’s Peak | W  w |  |  |
| Loose Earlobes  Attached Earlobes | E  e |  |  |
| 2nd Toe Longer than 1st Toe  2nd Toe Shorter than 1st Toe | B  b |  |  |
| Dimples  No Dimples | D  d |  |  |
| Freckles  No Freckles | F  f |  |  |
| Hand Clasping  (left thumb over right thumb)  (right thumb over left thumb) | C  c |  |  |