

Trait Detective

Observing Variations Within a Population

Today we will begin our investigation of traits (characteristics of living things) and DNA. Organisms can be described by their physical features such as color, shape, body covering, and height. Individuals within a population have the same basic physical features (which we will call traits). However, a close examination will reveal slight differences (variations) for a given trait. For example, individual polar bears vary slightly in fur color, size, and amount of insulating fat. They also vary in their ability to smell prey and swim for long periods of time without resting.

In this investigation, you will practice your qualitative and quantitative observation skills to detect variations of physical features between individuals within the same population. You will consider which traits are likely inherited and which are under environmental control.

Directions and Responses

Step 1 The first column of the table below lists some common human physical traits that can easily be observed. Read the trait variations in the other two columns and circle the variation of trait that you possess.

Human Trait	Variation "A" of Trait	Variation "B" of Trait
hands clasped together	left thumb over right	right thumb over left
wave in hair	curly	straight
hairline at forehead	"widow's peak"	straight hairline
dimples	yes	no
ear lobes	free	attached
tongue	can be rolled	can't be rolled
freckles	yes	no

For each physical trait listed above, describe variations that exist within the population.

1. How many traits of variation A do you have? _____
2. How many traits of variation B do you have? _____

Data Table: Traits and Variations (Total number of students in the class = _____)

Human Trait	Number of Students with Variation A of Trait	% of Students with Variation A of Trait	Number of Students with Variation B of Trait	% of Students with Variation B of Trait
hands clasped together				
wave in hair				
hairline at forehead				
dimples				
ear lobes				
tongue				
freckles				

3. Which **variations** of the traits are **most common** in your class (A or B)?

Inherited versus Acquired Traits

Traits which are passed from parent to offspring are called **inherited traits**. Other traits are totally influenced by the environment and are called **acquired traits**. Some human traits are the result of interactions between inherited traits with the environment. For example, a person with naturally straight hair may have a permanent to create curly hair. A person who inherits genes for tallness may not grow to be tall because of disease or poor diet.

4. In your own words explain the difference between acquired and inherited traits.

5. Analyze each of the human traits in the following chart and check the column which best describes the way that trait is controlled.

Human Trait	Inherited Trait (genetic control)	Acquired Trait (environmental control)	Both
muscle size			
height			
eye color			
favorite type of music			
artistic talent			
body weight			
freckles			
favorite food			
athletic ability			

Summary

You have observed a variety of traits both among your classmates and among members of other populations. Summarize the **key ideas you have learned from your observations**.

Application

1. Lucia grew up in Argentina and speaks fluent Spanish. Is this an example of an **inherited** trait or is the trait influenced by the environment (**acquired trait**)? Explain the reasoning behind your answer.
