

## Nature vs. Nurture

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What makes you...you? You could be described by many of your characteristics, or **traits**, such as hair color, height, style of dress, favorite foods, body type or sense of humor. Some of the traits mentioned here you have **inherited**, and some are the result of environmental influences. It is the combination of both that makes you...you!

Traits that are controlled by an organism's **genes** and passed from one generation to the next are **hereditary**. There are two or more **variations** (forms) of each gene called **alleles**. An offspring can inherit the same pair of alleles from the parent or two different alleles. The variation of the trait that is seen depends on which allele expresses itself. If two different alleles are inherited, then one will "hide" behind the other allele. We say that one is **dominant** over its corresponding **recessive** allele. For example, there are two variations for freckles—having them or not having them. A baby receives a dominant allele from mom for freckles and a recessive allele for no freckles from dad. The baby will end up with freckles because the dominant allele will mask or hide the recessive allele. In a case where two of the same alleles are inherited, both will be expressed equally and show the same variation of the trait.

Let's further explore this topic by investigating many different traits during this activity so you can determine which traits are controlled by nature (heredity) or nurture (environment) to learn more about what makes you...you!

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### Focus Questions

- 1) What are some inherited traits in humans?
- 2) Can you distinguish between traits that are inherited and those that are not?
- 3) What is the difference between dominant and recessive traits?

### Before You Begin

Identify no more than five traits that humans have in the space provided.

### Directions

The following is a chart of some common human traits that are under genetic control. Circle the form of the trait that you have.

Trait	Dominant Variation	Recessive Variation
Wave in hair	Curly	Straight
Hairline in forehead	"widow's peak"	Straight hairline
Dimples	Yes	No
Ear lobes	Free	Attached
Tongue	Can roll	Can't roll
Freckles	Yes	No
Hand clasping	Left thumb over right	Right thumb over left
Thumb	Straight	Curved ("hitchhiker's thumb")

**Analysis**

1. How many of the dominant traits do you have?
2. How many of the recessive traits do you have?
3. For the dominant traits you actually see in yourself, is there any way to know by looking at you if you have 2 dominant alleles for the trait or if you have a dominant and recessive allele? Explain.

All of the above traits we just evaluated in ourselves are traits inherited by our parents and under genetic control. However, some of the traits that humans acquire through inheritance can be modified by the influence of the **environment**, while others cannot. Blood type is an inherited trait that will not change, whereas the tendency to be tall or short can be modified by what you eat, how fast you grow, illnesses and other factors. Another example, a woman with naturally brown hair may wish to have blond hair, so she will dye it the color she desires. Finally, a person living in China may speak Chinese because of where he/she lives, but that doesn't mean he/she is incapable of learning English if they move to America. Traits are the result of genetics, the environment or a combination of both.

Consider each of the following traits and place a check in the column for which best describes the way the trait is controlled.

<b>Trait</b>	<b>Genetics</b>	<b>Environment</b>	<b>Combination of both</b>
Height			
Eye color			
Hair color			
Muscle size			
Artistic talent			
Favorite food			
Athletic ability			
Favorite music genre			
Freckles			
Body weight			

4. Pick any of the traits from above that you think is controlled by a combination of both genetics and the environment and explain how both factors contribute to controlling the trait.
5. What are some other traits not listed on the page that you think are controlled by a combination of both genetics and the environment? Provide details with your examples.