

Your genetic code has information that is read by your cells. It is made of DNA and packaged into structures called chromosomes inside of your cells. Your unique combination of genetic information was passed to you by your parents. It strongly influences your physical features, body functions, and other inherited traits. Traits can be heritable, or resulting from a specific DNA “code” passed down through families from parents to children. Freckles and other **heritable** traits usually appear on more than one relative in an extended family. Traits can also be **acquired** during your lifetime, like scars. Many heritable traits determine your health. Your lifestyle and other factors have a role too.

## More About Traits

A trait is a specific way your body functions or a feature of your body’s form. Each of your heritable traits has a set of instructions that control where, when, and how it shows up as your body develops. These sets of instructions are known as genes. Each person is born with thousands of genes collectively called the human genome. Your cells open parts of the genome and read it just like an instruction booklet. This process is happening inside you right now!



## Reading The Genome

The details of your genome are unique to you, just like a fingerprint. Billions of small units called DNA bases connect together to form your genome. We abbreviate the DNA bases’ scientific names with the letters A, C, G, and T. Unique combinations of these letters spell out the instructions used by your body to develop and maintain itself. Through genetic testing, your doctor can learn about certain health-related genetic instructions spelled out in your DNA.



## Genetic Inheritance and Your Health

- When scientists look at a specific section of the DNA in a large population of people, they see a variety of ways that the gene is spelled from person to person. Each unique spelling of a gene is called an **allele**. Changes to the sequence of letters in an allele are called DNA variants. Most DNA variants in an allele are neutral, but some can have a negative impact on health.
- Because genetic information is inherited, people who are closely related to you are likely to share many of the same alleles, and therefore the same traits. This also means that if you have relatives affected by a disease, you may also be at risk because some of your genes came from a shared **ancestor** (distant family member). Other variants are new, and appear in one person even though no other family member is affected.
- Knowing your family health history is important to understand the possible advantages or health concerns that may have been passed on to you.

Specialists called geneticists (jen-et-i-sists) involved in clinical care study connections between genes and health. Some work in the lab developing tests for disease-linked alleles. Others treat people with genetic diseases. A **genetic counselor** is another specialist that can help you understand your family health history and learn about potential disease risks.