

Science

Genetics -- All About You

Purpose:

- Learn about genetics
- Learn about a variety of traits that are inherited from your parents

Genetics:

Genetics is the study of the way in which the traits of an individual are transmitted from one generation to the next. Every organism requires a set of instructions for specifying its traits. Heredity is the passage of these instructions from one generation to another. Heredity information is contained in genes, located in the chromosomes of each cell. Each gene carries a single unit of information. An inherited trait of an individual can be determined by one or by many genes, and a single gene can influence more than one trait. A human cell contains many thousands of different genes.

How tall we get is dependent on heredity? All of our traits come from our parents and their parents and their parents. Humans have 23 pairs of chromosomes in our body cells. Each chromosome, in turn, is made of smaller parts called genes. The hereditary information is lined up in twisted strands inside genes that are called DNA.

We start out life with 23 single chromosomes from a father and 23 more single chromosomes from a mother. These combine to make a normal human being with 23 pairs of genes. These genes can combine in many ways to make each of us different from any other human being. Scientists claim that a set of parents would need to give birth to 70 trillion children before having two that were exactly alike.

Activity1: Where did that come from?

There are many simple traits that are inherited that participants can investigate.

Have participants gather information about themselves and then complete it at home for as many of their family members as possible.

1. Left-handed or right-handed?
2. Have youth fold their hands together and put them in their laps. Is the right or left thumb on top? Have them try to fold their hands the opposite way of what they just did. Is it hard or easy?
3. Right or left eye dominant
4. Index finger shorter or longer than same hand ring finger?
5. Hair growing on fingers between first and second knuckle?
6. Hair naturally curly or straight?
7. Ear lobes free or attached?
8. Tongue curling/rolling possible or impossible?

Activity 2: Math activities for older youth:

- Graph data from participants, gathering percentages for tongue rolling. 70-90% of the population can roll their tongue in the shape of a "U"
- Compare data from participants for ear lobes – 70-90% of the population has free-hanging earlobes where some skin hangs from the point where the ear is joined to the face.

Adapted from *Spuds n' Bugs* University of Idaho & *Trading Traits* Iowa State University



Two activities for youth grades 3 - 8. Allow 45 - 60 minutes. Science Standard - Genetics
Colorado State University Cooperative Extension 4-H Youth Development