



A Chromosomes, Genes and DNA

DNA

Deoxyribonucleic acid, better known as DNA, is the genetic code that contains the information for each plant, animal, bacteria or fungus to grow and function. It accounts for similarities between all living things. It also leads to difference.

In humans most of our DNA is found in the nucleus of our cells. DNA is the chemical that our chromosomes are made of.

The structure of DNA was not known until 1953 when two scientists, James Watson and Francis Crick, discovered that DNA was the shape of a double helix (rather like a spiral staircase or a ladder that has been twisted)

The stairs or rungs on the ladder are made from special chemicals called bases. Only four are found in DNA and are given a letter code. They are A, G, C and T. It is the order of these letters that codes for each of our features.



Genes

Genes are stretches of DNA which are the instructions that tell your body what to look like and how to work. Genes tell your hair whether to be curly or straight, whether your body should grow tall (or not so tall) and soon and soon..... for every little detail of your body!

The things you do and what happens around you also affect your body. If you dyed your hair to blonde, you might look different. If you couldn't eat a healthy diet, you might not grow as tall. These external affects are known as environmental influences. Therefore the way your body looks and functions are a combination of your genes and your environment.

genes + environment = you!

Genes can be found in almost every part of the body, contained in the nucleus of many cells. There are probably more than fifty thousand genes. Only particular genes are switched on or used in particular cells.

Chromosomes

If you were to think of your whole set of genes as a set of recipes for you, then you could imagine all these recipes arranged in 23 recipe books. Each of these recipe books is known as a chromosome. A chromosome looks a bit like this:



The genes are arranged along the length of the chromosome, in the same order in every cell in every person. The bands seen on the chromosome above are a result of a special stain - the bands do not represent specific genes. Each cell has 2 sets of chromosomes, so in each cell you have a total of 46 chromosomes - 23 from your mother and 23 from your father.

Scientists called cytogeneticists can look at your cells under a microscope to see your chromosomes. They can check if you have all 46 chromosomes. Here's what they might see if they looked at a cell:



From this they can also tell if you are male or female. Everyone has 22 chromosomes, which have numbers for names. The last pair have letters for names X and Y. These are the sex chromosomes. If you are male you will have an X and a Y. If you are female you will have two X's.