

DNA coding

Make a bracelet out of base code and create a double helix.



What you need

- Beads: yellow, red, blue, green
- Twine
- Scissors
- DNA template

1. Select one of the DNA strand template examples (see 2nd page). Cut 2 pieces of twine (15cm) and tie together at one end.



2. Pour out your beads into separate containers (yellow, red, green, blue). Following the DNA strand code you have selected, thread the appropriate coloured bead on to the twine.



3. Work all the way along template to last bead.



4. Now create the 2nd strand of beads, using base pair matching. Yellow pairs with Blue, Red pairs with Green.



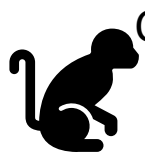
5. Twist the two strands around each other to give the DNA double helix shape and tie off.



6. Twist again and bring end together to form a circle and tie off.



DNA templates



Chimpanzee

G A T T T G T G G T A A A C C C G T G



Homosapien

T C T G A G T T C T T A C T T C G A A G G



Homosapien

T C T G A G T T C T T A C T T C G A A G G



Butterfly

A T G A T C C C G A C T T A C T A T G



The Science



The way you look and how your body works depends on the genes that you inherit from your parents. For example, there are different versions of the genes that give the instruction for hair colour. This is why some people have brown hair, others black, blonde or red. The information in your genes is coded for by deoxyribonucleic acid or DNA for short. Your genes control whether you can roll your tongue or whether you have lobed or unlobed ears.

You don't just have one gene, but around 25,000 of them! These all sit next to each other on long stretches of DNAs and are packaged really well together in special structures called chromosomes.

DNA is made up of four chemical bases known as Adenine, Thymine, Cytosine and Guanine. Each base, or letter, always pairs up with the same partner. The base A always pairs with T and the base C always pairs with G. DNA has a structure with two strands of chemical bases.

These rules allow information to be passed on down the generations and they give the body instructions to make all the proteins, cells, and molecules it needs to function.

The DNA sequence here gives the body its instructions to make a protein called KERATIN. KERATINS are a type of protein that give skin cells strength, they form rope like structures (filaments) inside a cell. These filaments form an internal protein skeleton helping the cells stay strong and help them maintain their shape. The whole of the gene for KERATIN is several thousand bases or beads long. Your template represents only a small portion of the gene, 20 or so bases in total.

In order to pack this information into the small space of a nucleus, the chains twist forming the now familiar DNA helix shape. This twists again and again to form a super coil compacting the DNA instructions further. Your DNA is arranged as coils of coils of coils of coils of coils!! This allows 3 billion base pairs to fit into a space of just 6 microns across.

