

Neat DNA Facts

DNA is an abbreviation for deoxyribonucleic acid

Nearly 2 metres of DNA is located in the nucleus of every cell in our body!

The base pairs that make up DNA bind together to form the classic double helix.

Humans have over 3 billion base pairs in each cell!

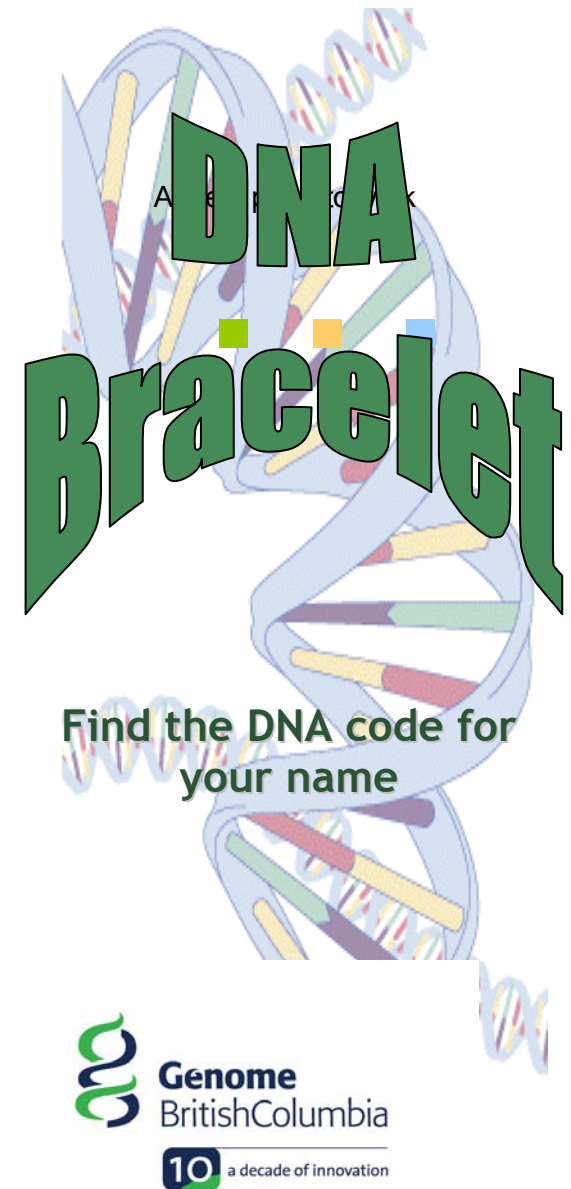
DNA is a code for what our body needs to make to survive, such as proteins, enzymes, and hormones!

Our DNA is organized into chromosomes. We have 23 chromosomes from each parent, so 46 in total!

Every person's DNA is 99.9% similar to that of another person! It is the 0.1% differences that give us a unique DNA fingerprint.

According to most estimates, the % of the chimpanzee genome that is the same as the human genome: 98.5%

Sponsors



Materials

- DNA code - see right
- String
- Beads (4 colours)

DNA Background

DNA is an 'instructional code' to make proteins for our body. It uses 4 bases to code all the information in DNA represented by A, T, C, and G. There are several steps to breaking the code. The code is stuck in the centre of the cell (nucleus). Therefore it is first written into a form that can be read outside the centre of the cell (transcription).

This new form (RNA) leaves the nucleus where it is read to make proteins (translation). The code is read in 3 letter segments (codons) to create amino acids, the smallest part of proteins.

Alias Background

Scientists have created shorthand that gives each amino acid its own letter, corresponding to 20 letters of our alphabet. You can then use this system to 'spell' the parts of a protein. The code is called the 'DNA Alias' and each letter represents a group of 3 letters (codon).

When you see the DNA Alias of a protein, you can find the original DNA sequence by reversing the coding process. For fun, it can be done with any word - like your name!

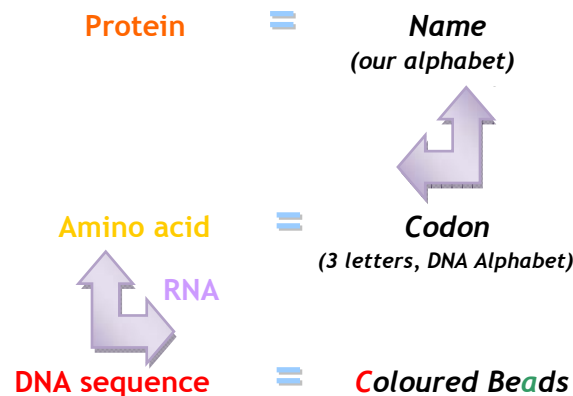
Create DNA Jewelry

Create the DNA code for your name. Imagine your name is the final protein product. We can then go back to the DNA code that created this protein.

1. Using the code on the right, figure out the 3 letter code for each letter in your name
e.g. CAT = TGC GCT ACT
2. Each letter of the code has an associated colour (see below). Match the first letter of your DNA Alias code to its colour.
e.g. A = green
3. Select the first coloured bead and string put it on the string. Repeat until all letters of the code are represented on your string.
4. Tie off the string to create a bracelet or necklace.

Remember that each letter of your name is represented by 3 letters in DNA so you will have 3 times as many beads as letters in your name.

Process



DNA Alias code

Our Alphabet	Amino Acid	Codon
A	Alanine	GCT
B		GCA
C	Cysteine	TGC
D	Aspartic acid	GAT
E	Glutamic acid	GAG
F	Phenylalanine	TTT
G	Glycine	GGG
H	Histidine	CAT
I	Isoleucine	ATA
J		ATC
K	Lysine	AAG
L	Leucine	CTC
M	Methionine	ATG
N	Asparagine	AAC
O		AAT
P	Proline	CCC
Q	Glutamine	GAG
R	Arginine	CGT
S	Serine	TCA
T	Threonine	ACT
U		ACG
V	Valine	GTC
W	Tryptophan	TGG
X		GTA
Y	Tyrosine	TAC
Z		TAT

Note: There are only 20 amino acids. We have used alternate codons for letters that aren't in the scientific DNA Alias (e.g. B = GCA = alternate codon for Alanine.)

DNA code

Base colours: A = green
C = red
T = blue
G = black