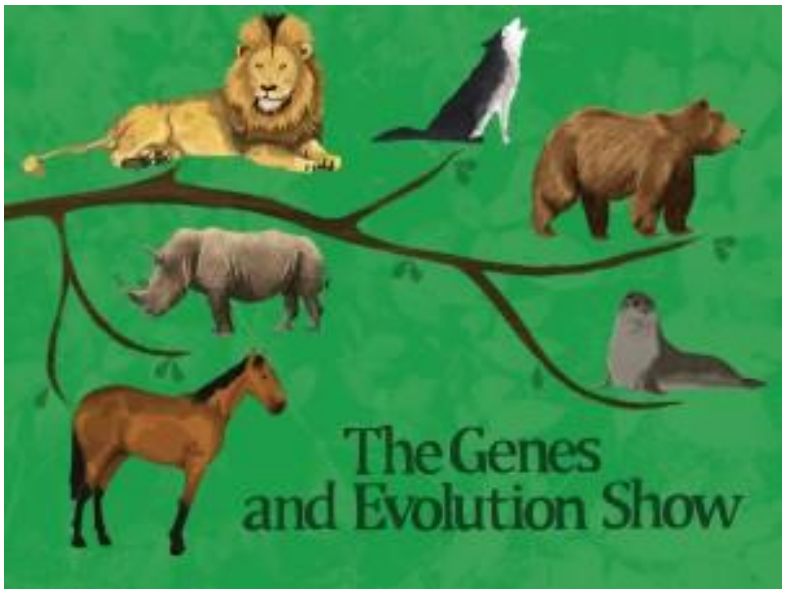
AGES 7-12

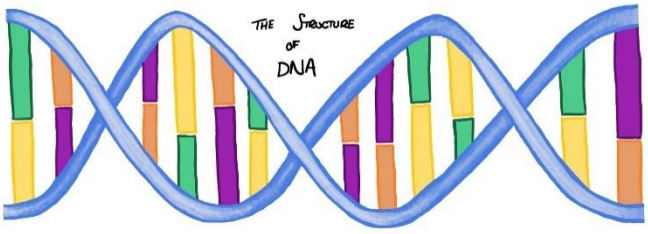
Centre of the Cell's 'Genes and Evolution' Challenge



The Genes and Evolution Show is all about the instructions, also known as genes, and how these genes can change over time due to a process called natural selection. In this challenge we are going to focus on what our genes are and where they come from.

What is a gene?

A gene is a small part of DNA. Our DNA (deoxyribonucleic acid- try saying that mouthful!) is found inside the nucleus of almost all of our cells. We can think of our DNA like a big instruction manual on how to make us. So if our DNA is a big instruction manual, one gene is a small set of instructions for one specific thing that happens in our body. For example there is a gene for our eye colour, another for our hair colour and even genes for what kinds of food you like.



Where do our genes come from?

Our genes are passed down from our parents, we get half from our mum, and half from our dad. That makes us a mix of both our parents and makes us completely unique. Have you ever noticed that you look a little bit like the other members of your family? This is because you all share some of the same genes. In fact, we share about 99.5% of our DNA with people who we aren't related to. Can you think of anyone who shares 100% of their DNA with someone else? Find the answer on the next page!

Let us know how your challenge goes on social media @CentreoftheCell!

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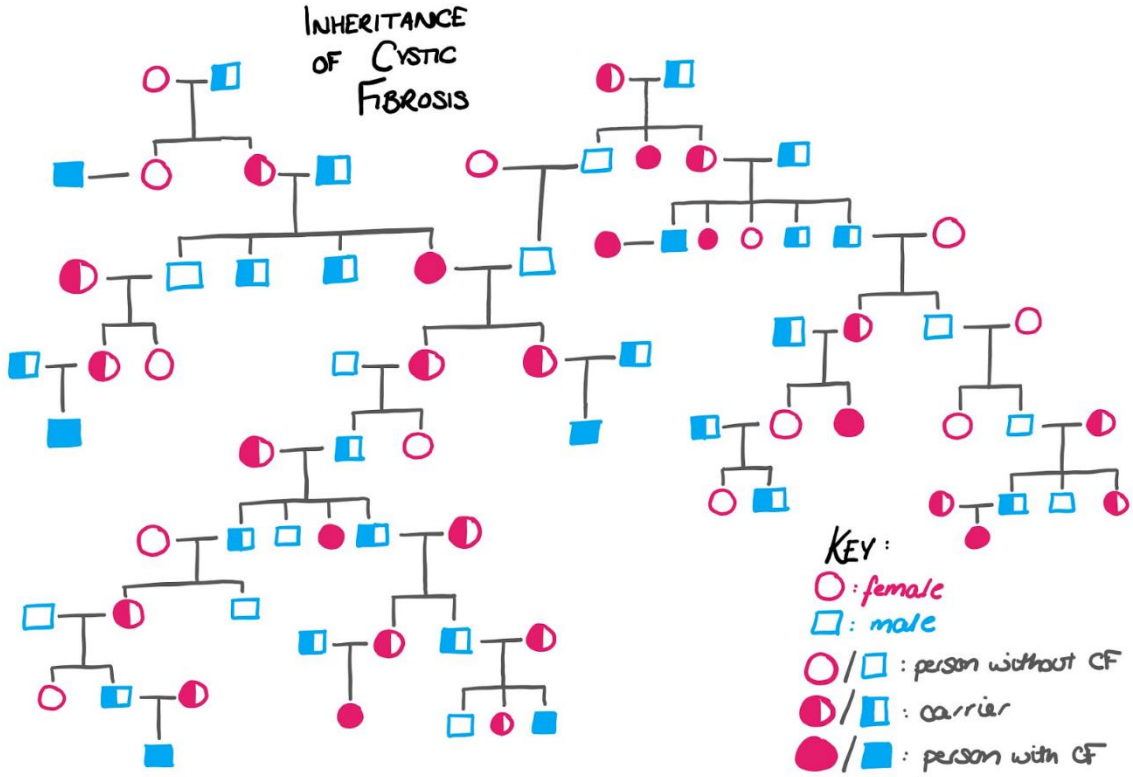
The Challenge:

We can make something known as a pedigree diagram to track a gene that has been passed down through a family. It is a little bit like a family tree, see our example below.



This pedigree diagram is showing how cystic fibrosis can be passed through a family. Cystic fibrosis is a condition which affects our lungs and is caused by a faulty gene. We get one copy of a gene from each of our parents. To get cystic fibrosis we need both copies of the faulty gene. So a carrier in the diagram only has one copy of the gene - meaning they won't have cystic fibrosis but may have a child with it!

Try drawing a pedigree diagram of your own family. You could try tracking eye colour or hair colour - but there are lots of other characteristics you could try as well!

Does anyone share 100% of their DNA?

Yes - identical or conjoined siblings share 100% of their DNA when they are first born. However as we grow older, changes in our environment can affect our DNA. For example, if you get a sunburn this could damage the DNA in your skin.