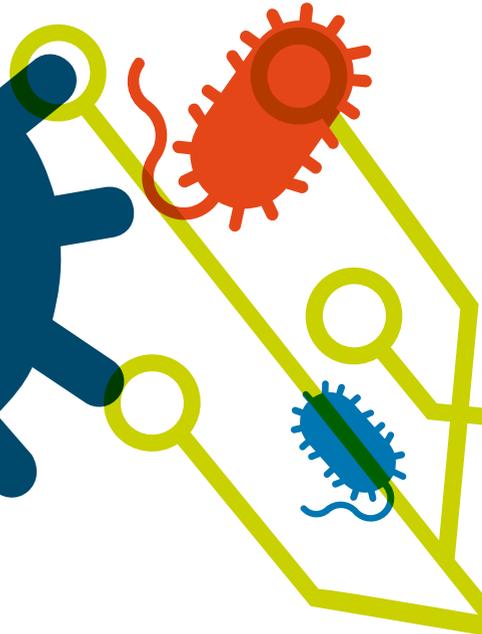
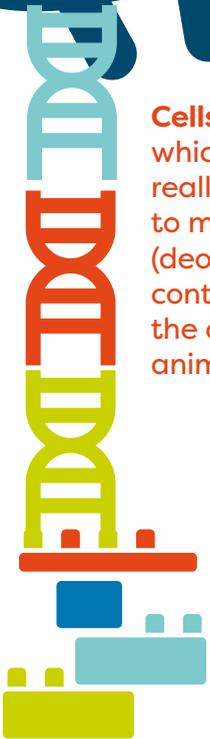


What is Synthetic Biology?

From small dogs to big whales, bacteria to giant trees, we are all made of tiny blobs called cells – these walking, running, and sometimes slobbering mini-factories – that work together to carry out all the processes needed for us to be alive.

Cells are made of even tinier pieces called molecules, which come in many different shapes and sizes – but all really, really small – that mix and match and dance with each other to make up our cells. Some of these molecules are called DNA (deoxyribonucleic acid) and provide the instructions for the cell, controlling the production of other molecules that determine the characteristics of the cell. All living things are a bit like animated Lego constructions made of ever smaller Lego pieces.

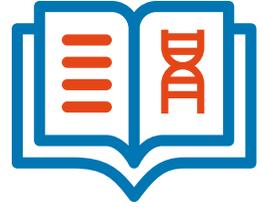
Synthetic biology is a new way that scientists have come up with to make changes to cells, cells belonging to bacteria or even belonging to us. They can make them do things that they didn't do before – like sniffing out poisons or producing new medicines.



How do scientists “do” Synthetic Biology?

There are many ways scientists can use **SYNTHETIC BIOLOGY** to change living organisms.

One way is to add some new instructions to a cell’s DNA manual to teach them to make a new molecule or a whole new set of molecules.



Another way is to build cells with an entirely new instruction manual, or genome. This fresh new manual can teach cells to do... **well almost anything really.**

What are the applications of Synthetic Biology?



Scientists can change cells to make **biosensors** – huge molecular noses that can smell pollution in large oceans of water that might be harmful to wildlife



Scientists can change cells into **therapeutic systems** so that they make new medicines to make us feel better when we are feeling poorly. Scientists can even give these cells weapons so that they can attack the other nasty cells inside our body that make us sick.



Another really cool thing that scientists can do is to get cells to spin completely **new biomaterials** that can be used for loads of different things, like mending our bones or making new clothes.



Cells can also be changed to make **biofuels** that keep our cars moving, but create much less pollution and a healthier environment.



Scientists can also turn cells into **biological computers** that can do really complicated maths and even store loads of information.