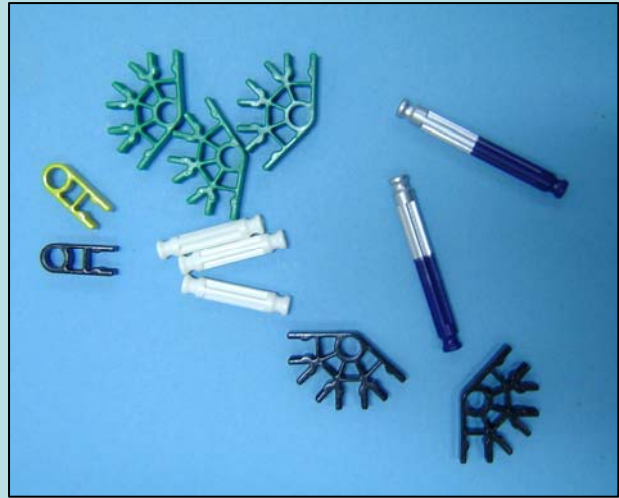




K'NEX DNA MODELLING (10 min)

APPARATUS

- 14 x green connectors
(we have painted half of ours black)
- 14 x white rods (1 5/16")
- 7 x blue rods (2 1/4")
(we have painted ours half silver)
- 4 x clip connectors



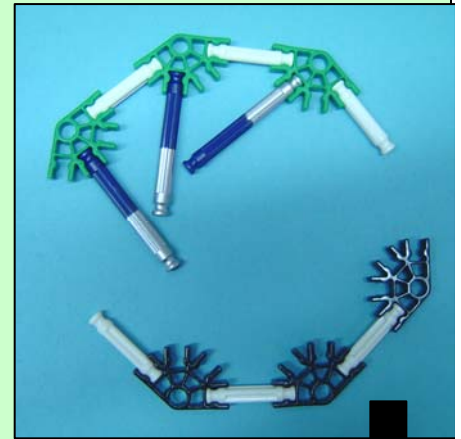
Step One

- Using 6 white rods and 6 green connectors make the two sections below



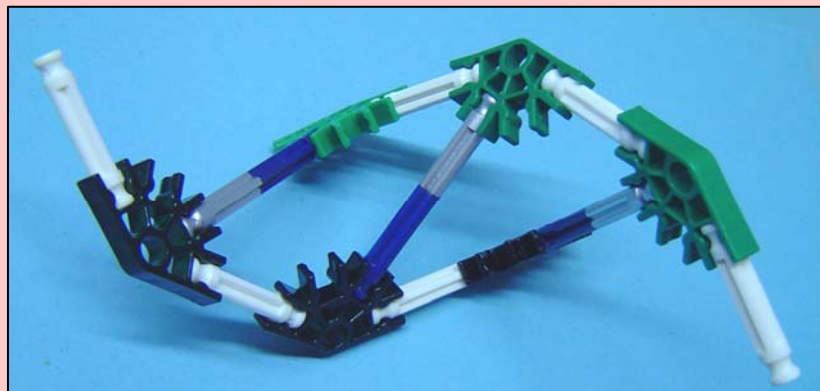
Step Two

- Add blue rods into the second slot of each green connector



Step Three

- Click the free end of each blue rod into the third slot of the black connector (painted) opposite.
- You will find the model twists round as you do this.



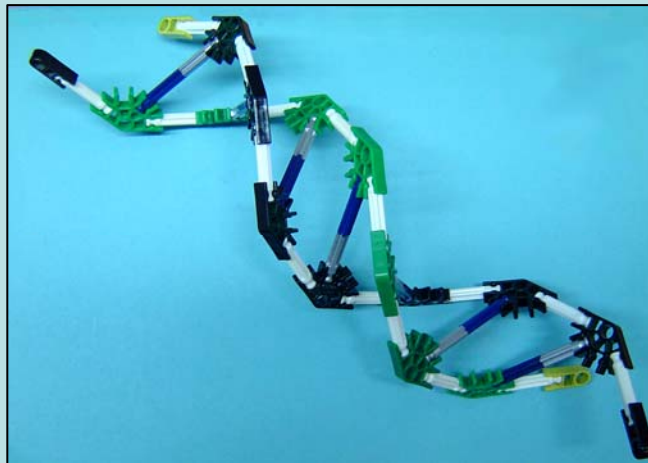


Step Four

- Continue to build the two different coloured chains in the same way, until you have used all the connectors and rods.
- You should now have two chains, each with seven connectors.
- Join the chains together with blue rods as you did in steps two and three.

Step Five

- Join the clip connectors to the white rods on each end of the two chains.
- Use different colours on each end as shown in the photograph below.



WHAT IS HAPPENING?

DNA (deoxyribonucleic acid) is a long polymer. This means that it is a large molecule made up of repeating units called monomers (poly = many and mono = one). In DNA, these repeating units are nucleotides, so the DNA polymer is also called a polynucleotide.

The backbone of the DNA is made from sugars (represented by the connectors) that are joined by phosphate groups that form phosphodiester bonds (represented by the white rods). Because these bonds are asymmetric, the DNA twists into a double helix. The ends are called the 5' (five prime) and 3' (three prime) ends (represented by the different colour clip connectors).

Along the backbone are bases. There are four types in DNA, adenine (A), cytosine (C), guanine (G) and thymine (T). Hydrogen bonds (represented by the blue rods) form between bases on opposite DNA strands, stabilising the double helix.

DNA BASE MODELLING

If you want to try modelling DNA bases, look out for the recipe sheet called "DNA Base Modelling"