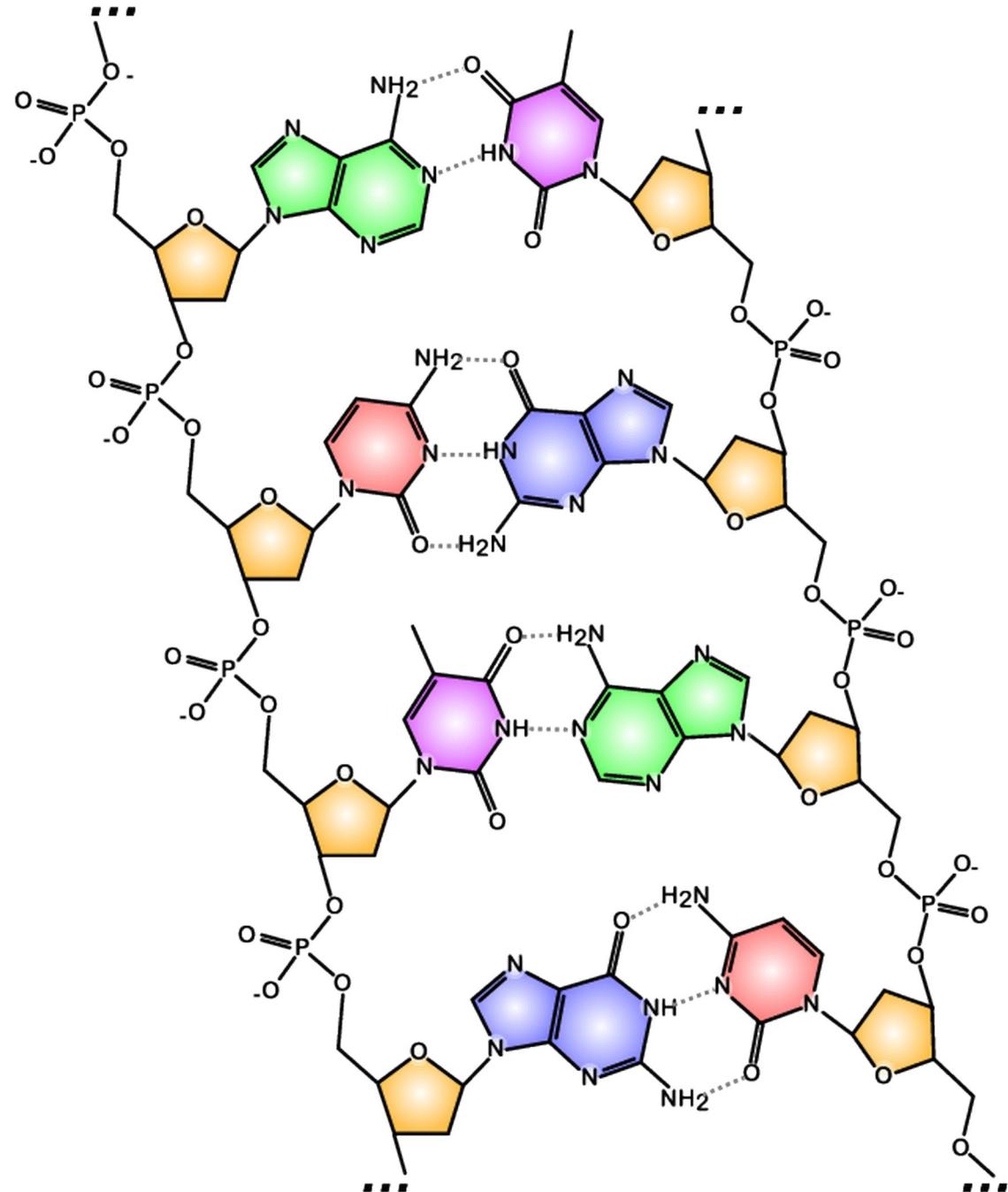


Der Abbildung rechts zeigt die Strukturformel eines Stücks DNA.

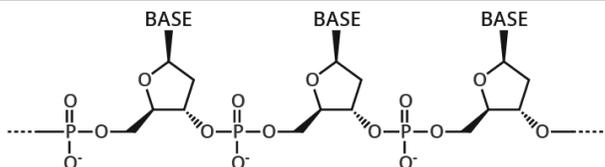
1. Markieren Sie Ihnen bekannte funktionelle Gruppen.
2. Wie werden die beiden Stränge zusammengehalten?
3. Beschriften Sie die Strukturen anhand des Miniplakats auf der folgenden Seite möglichst vollständig mit allen dort genannten Fachworten.
4. Jeder DNA-Strang hat 2 unterschiedliche Enden (3' und 5'), so wie es in einem Wort ein Anfangs- und ein Endbuchstabe gibt. Welches Strukturmerkmal ist für diese Asymmetrie verantwortlich? Markieren Sie in der Abbildung, in welcher Richtung die Enden liegen.
5. Durch einen copy-and-paste-Fehler ist der rechte Strang verloren gegangen? Kann er anhand des linken Strangs regeneriert werden? Begründen Sie.



THE CHEMICAL STRUCTURE OF DNA

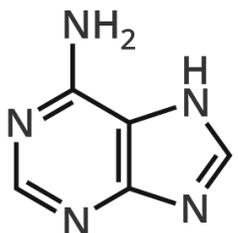
DNA (deoxyribonucleic acid) carries genetic information in all multicellular forms of life. It carries instructions for the creation of proteins, which carry out a wide range of roles in the body.

THE SUGAR PHOSPHATE 'BACKBONE'

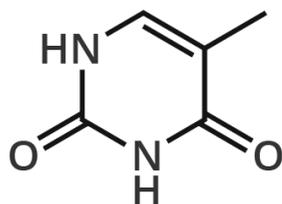


DNA is a polymer made up of units called nucleotides. The nucleotides are made of three different components: a sugar group, a phosphate group, and a base. There are four different bases: adenine, thymine, guanine & cytosine.

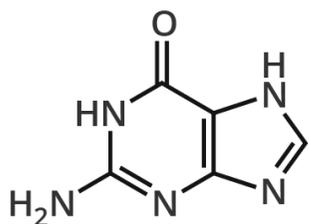
A ADENINE



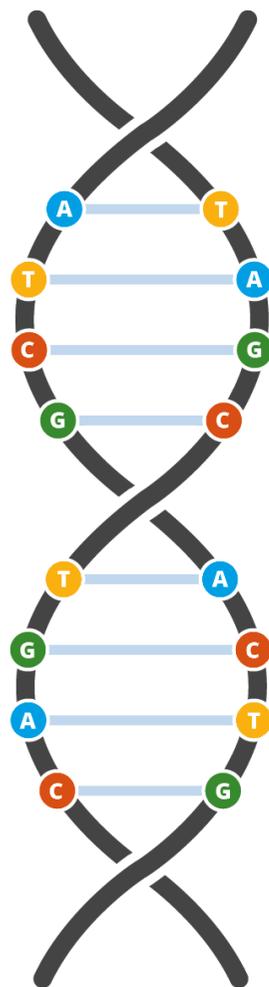
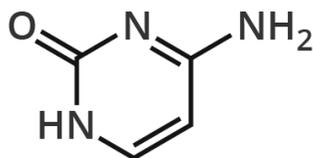
T THYMINE



G GUANINE

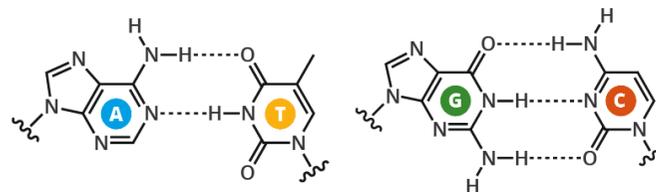


C CYTOSINE



WHAT HOLDS DNA STRANDS TOGETHER?

DNA strands are held together by hydrogen bonds between bases on adjacent strands. Adenine (A) always pairs with thymine (T), whilst guanine (G) always pairs with cytosine (C).



FROM DNA TO PROTEINS



The bases along a single strand of DNA act as a code. The letters form three letter 'words', or codons, which code for different amino acids - the building blocks of proteins.

An enzyme, RNA polymerase, transcribes DNA into mRNA (messenger ribonucleic acid). It does this by splitting apart the two strands that form the double helix, then reading a strand and copying the sequence of nucleotides. The only difference between the RNA and the original DNA is that in the place of thymine (T), another base with a similar structure is used: uracil (U).



In multicellular organisms, the mRNA carries genetic code out of the nucleus, to the cell's cytoplasm. Here, protein synthesis takes place. 'Translation' is the process of converting turning the mRNA's 'code' into proteins. Molecules called ribosomes carry out this process, building up proteins from the amino acids coded for.

