## Sexual reproduction

Sexual reproduction requires 2 organisms, allowing for genetic variation.

The advantages include variation, which allows for adaptation to an environment through natural selection.

The disadvantages, however, include the need to find a mate, consuming time and energy.

## DNA

DNA stands for deoxyribonucleic acid. It is the chemical that forms all genetic material in a cell. It uses bases to create codes, which determines the characteristics of an organism. DNA is found in the nucleus of eukaryotic cells (cells with a nucleus) in structures called chromosomes. Each part of a chromosome that codes for a specific protein is called a gene. DNA is a polymer, a molecule built from a chain of smaller molecules (monomers). DNA is made of two chains twisted into the shape of a double helix. The complete set of DNA in a gene is called a genome.

The monomer for DNA is called a nucleotide. There are four different nucleotides, each with a different base. They are Adenine, Thymine, Cytosine, and Guanine, and Lare identified by their first letters (i.e. A, T, C, and G). Each base or the other strand is linked to the complimentary base on the other strand. Adenine always pairs with Thymine, and Cytosine always pairs with Guanine. They are somed by hypogen bonds. A nucleotide also contains a phosphate molecule

## Protein Presis (Highen Person)

DNA codes for proteins and controls the production of such. Proteins are made of chains of molecules called amino acids. Each protein has a different chain of amino acids. Each amino acid chain folds in a specific way, which is why enzymes have a specific shape for their active site.

Each amino acid is coded for by a sequence of three bases, called a triplet. They are joined together to create the protein that the gene coded for.

On DNA, there are many non-coding regions, which are used to identify where a gene starts and ends. Mutations are rare and random changes to an organism's DNA sequence that can be inherited. If a mutation happens, it creates a genetic variant, which could (but not always) cause the gene to code for a different sequence of amino acids, and therefore a different protein.

Protein synthesis has two steps, transcription and translation.

Transcription uses mRNA (Messenger Ribonucleic Acid). RNA is similar to DNA, but is shorter and single stranded. It also uses Uracil (U) instead of Thymine (T). RNA