LESSON
PROTEIN SYNTHESIS IN MINECRAFT

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PROTEIN SYNTHESIS IN MINECRAFT

IThe excercise trains the students understanding of the processes behind protein synthesis in a visual manner.

Subject and level
Biology, upper secondary school

Connection to curriculum
The excercise requires an understanding of the structure of the DNA molecule, the steps involved in protein synthesis and naming of amino acids.

Didactic and pedagogic considerations
The excercise requires a minecraft acount but can be done in other similar games if needed.

Time estimate
30-60 minutes

Group size
Individual

Overall introduction to exercise
The students are provided with a base sequence for the coding strand consisting of 9 base pairs and a colour code. From that they must build their way through the rest of the DNA molecule and the individual steps of the central dogma.

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Exercise as presented to the students

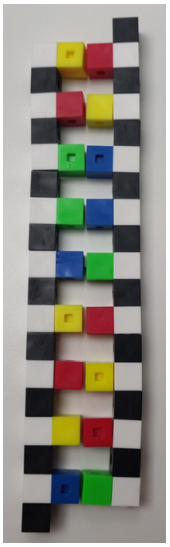
DNA contains the recipe for all the proteins that the cell can build.
In this assignment, you will work with the structure of DNA and how the code is translated into the correct composition of amino acids in the finished proteins.

You must now build a DNA strand and subsequently perform protein synthesis.
You can build your DNA strand in Minecraft or a similar game.

Each of the building blocks of DNA, RNA, and three different amino acids is assigned a color;

- Sugar = White
- Phosphate group = Black
- Guanine = Light green
- Cytosine = Blue
- Adenine = Yellow
- Thymine = Red
- Uracile = Orange
- 1st amino acid – RNA-code GCA = Brown
- 2nd amino acid – RNA code AUG = Pink
- 3rd amino acid – RNA code UAC = Dark Green

- Build a DNA strand with the following base sequence in the
- coding strand;
  - ATGGCATAC
  - The picture shows what it would look like in centicubes
- Build the complimentary template strand of the DNA molecule
- Build the RNA strand from the template strand
- Translate the RNA strand into amino acids
- Which three amino acids does the protein consist of?



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