



**ICT in SES**

## **Example project in Biology**

Lesson №27



# Demonstration

# Demonstration

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## Example project „DNA games“

- Introduction to the topic
- Additional information
- 3D animation
- Two DNA games

DNA Games

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## DNA Games

Demonstration example | Pavel Boytchev | 2015 (translated 2020)

DNA is an abbreviation for *deoxyribonucleic acid*. It stores the genetic information that is specific to an organism. The DNA molecule consists of two twisted polymers composed of 4 types of nucleotides. Nucleotides have the same basic structure (monosaccharides and phosphate groups), but have attached *nucleobases* – special molecules whose sequence determines the encoded genetic information.


### NUCLEOBASES

The four types of nucleotides are grouped into successive triplets called *codons*. There are 64 different codons, but they correspond to 20 amino acids. The codon and amino acid mapping is called *Genetic Code*.

Nucleobases

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


◀ **ADENINE**

**Adenine** ( $C_5H_5N_5$ ) takes part in cell breathing and protein synthesis. In the DNA it always bonds with **thymine** ( $C_5H_6N_2O_2$ ).

**THYMINE** ▶





◀ **GUANINE**


**Guanine** ( $C_5H_5N_5O$ ) is the third nucleobase

DNA Matching

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wrong pairs do not. There is a penalty of 5 seconds for each error. Will you be able to get 100% correct strand in time?



**TIME: 108.9**


DNA Building


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## Game "DNA Building"

Click the nucleobases in the top row to create DNA that matches the sequence of amino acids shown below. Initially, the chain contains only a start codon (ATG) and a stop codon (TAG). New bases will be added just before the stop codon. If you click on a complex nucleotide, it will be removed. You have 2 minutes.





**HIS-ALA-GLU-ARG-MET**

TRY IT



# Discussion



**ICT in SES**

**The end**

Comments, questions