



Concepts for teaching units

Title	Real-life exponential models
Age of students/grade	Upper-secondary students – 16 and more
Length of the unit	Approximately 4 x 45 minutes
Materials needed	Descriptions of real-life situations – population growth, spread of diseases, interest calculation, combinatorics problems
Objectives	<ul style="list-style-type: none">• to apply mathematics in real-world problems• to use of IT tools in Mathematics (Geogebra, a spreadsheet)• to improve students' ability to understand a scientific text or article or a video with a scientific content• to develop students' ability to collect, analyze and study a set of data• to cooperate in a group of students
Content related anchor points	<ul style="list-style-type: none">• exponential functions – properties, graphs• number sequences and their properties• solving of simple equations using exponentials and logarithms• collecting and recording a data set• creating, reading and interpreting graphs (on the paper or using a computer)
Methodology related anchor points	<ul style="list-style-type: none">• work in groups preferred• presentation of results in front of the whole class• use of electronic devices and tools• interdisciplinary work – possible cooperation with other teachers• use of tools for chemistry (Petri dish, microscope)
Language related anchor points	<ul style="list-style-type: none">• Dealing with specific vocabulary can enhance cooperation in a group, some scientific concepts can be international and either understandable also for migrant students or not know also for home students.• Basic knowledge of some concepts from biology, chemistry or economy – use of scientific concepts.• Non-standard and not every-day vocabulary – animals, bacteria, plants, financial mathematics...

Appendixes

Example of a situation – growth of a population of locusts (based on a problem from Khan Academy)

On the first day of spring, an entire field of flowering trees blossoms. The population of locusts consuming these flowers rapidly increases as the trees blossom.

The relationship between the elapsed time t , in days, since the beginning of spring, and the total number of locusts $L(t)$, is modelled by the following function.

We estimated that, at the beginning, there were 750 locusts and the population increases by 85 % a day.

Make a model of the situation, answer some questions or make some predictions using the model, change some values to observe the changes in the model...

Khan Academy link: <https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:exp-model/x2ec2f6f830c9fb89:exp-change/v/interpreting-change-in-exponential-models>