INTEREST CALCULATION

Abstract: This teaching sequence involves the calculation of interest and interest rates. The students compare annual and monthly interest rates and they have to find out the right formula to calculate equivalent monthly interest rates based on annual interest rates. Furthermore the students have to inform about the real calculation of interest by a bank and to compare their results with it.

Overview	
Curriculum	financial mathematics, functions
Age of Students	15
Previous knowledge	percentage calculation, interpretations of graphs, basic knowledge of GeoGebra (handling of spreadsheet view)
Educational skills	finding and interpreting of formulas charting and interpreting of functions gathering and valuating information
Period of Time	2 hours
Special Requirements	teacher computer & projector, student computers (one computer for 2 students); internet

Web address to materials	http://www.geogebratube.org/student/m45708

Description of Lesson / Project

The problem is divided into four tasks.

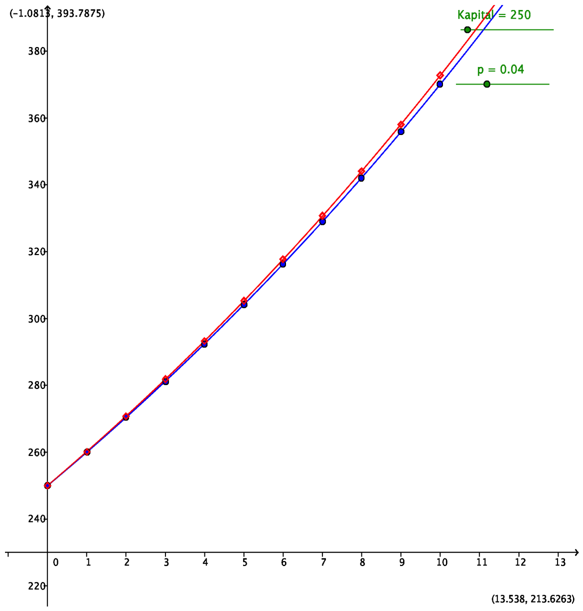
Task 1: Analysis of the growth of a given capital at an annual interest rate (compound interest)

GeoGebra: The spreadsheet view is used for the calculation of the capital growth and the results are illustrated in the graphics view. By means of a slider the interest rate and the initial value of the capital can be changed and so the influence of these two values on the capital can be demonstrated in the graphics view.

Task 2: Monthly interest rates

The students have to find a formula in order to calculate the growth of the capital if interest rates are monthly paid.

GeoGebra: as in task 1 GeoGebra is used for the calculation and illustration of the development of the initial capital in the graphics view.



Task 3: Comparison monthly – annual interest rates

In this task the students have to evaluate the growth of the capital at a higher interest rate as in task 1 and to compare monthly and annual interest rates. The students have to figure out if the formula found in task 2 is correct, that means that the formula gives the equivalent result as if the interest is paid annually. For example you can see in this picture the difference between the correct calculated capital growth (red function) and the more simply one nevertheless false calculated one.

GeoGebra: as in task 1

Task 4:

The students have to calculate the capital growth if it is not assessed throughout a whole year. Afterwards they have to inform about the real calculation of interest (internet, banks), to compare their results with the results of their calculations of the first three tasks and to discuss differences.

Your Experiences

Overview	
Teachers	Reichenberger / Lindenbauer
Type of School	Gymnasium Dachsberg / HBLA Lentia
Number (Age) of Students/Class	22 (16) / 18 (17)

The students have mostly liked this example. In fact it did not increase their interest in mathematics; nevertheless the students said that this example is useful, because they can see a real-world-application of mathematics.

Those students who were not familiar to GeoGebra had some problems at the beginning. Because it is not only a GeoGebra-applet, this example should be used only if the students have a basic knowledge of GeoGebra.
Most of the students found the use of technology useful and interesting in order to understand this application better. Also this program is simplifying the calculations; it is practical and helps students to focus more on the mathematical contents.