**SESSION 6**

**MICROSCENARIO**

**Study of the function** 

**Subject**: Algebra

**Class**: 4th grade High School

**Lesson**: **Study of the function** 

**Estimated time**: At least one teaching hour

**Purpose**: Ss must understand the graph of the function .

**Objectives**: Ss must be rendered able to:

(a) draw the graph of the function ,

(β) determine the top of the parabola and its axis of symmetry

(γ) draw conclusions on its monotony and

(δ) calculate the extremalities of the f function.

**Teaching approach**: Inquiry-based learning with guided self-acting and induction elements.

**Digital sources**: Use of computers and the following link: <http://photodentro.edu.gr/v/item/ds/8521/1767> .

**Short description/ Basic notion**: Ss will work on computers in small groups. Ss will process the micro-experiment in the link <http://photodentro.edu.gr/v/item/ds/8521/1767>, so as to grasp the horizontal and vertical shift of the function , moving the cursor to the right or to the left, up or down each time and will record results. Based on the worksheet instructions, ss are expected to be able to correlate the graph of the function  with the initial function . Next, ss are expected to be able to determine the monotony and the extremalities of the function, as well as the top and the axis of symmetry.

**Additional benefits**: Working in groups, ss can interact and have constructive conversation so as to observe, comment, draw conclusions, make models and, finally, generalize. Thus, knowledge is substantial and teaching objectives are achieved by ss themselves.

**WORKSHEET**

**1ST teaching hour**

**Subject**: Algebra

**Class**: 4th grade High School

**Student’s name**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Lesson**: **Study of the function** 

**1st teaching hour:** horizontal and vertical shift of the function 

Each group having taken its place in front of a computer, you will work on the micro-experiment in the link <http://photodentro.edu.gr/v/item/ds/8521/1767> so that you can understand, both algebraically and geometrically, the horizontal and vertical shift of the function .

In the micro-experiment of this link you are given the function.

**Activity 1**: Move cursor k and observe how the graph of the function is shifted.

Can you write the form of the function g(x) that ensues from the vertical shift of the f function by k points up?

Can you write the form of the function g(x) that ensues from the vertical shift of the f function by k points down?

**Activity 2**: Move cursor k and observe how the graph of the function is shifted one time to the right and one time to the left.

Can you write the form of the function g(x) that ensues from the horizontal shift of the f function by l points to the right?

Can you write the form of the function g(x) that ensues from the horizontal shift of the f function by l points to the right?

**Activity 3**: Simultaneously move cursors k and l and observe how the form of the f(x) function changes. Write the general form of the function that you think ensues from the concurrent shift by k points vertically and l points horizontally.

**Activity 4**: In the ‘’insert’’ box write the form of the function  and move the cursors so that the graph of the function coincides with function f.

What shifts did you make?

For which x value does function f present a minimum?

Can you observe the relationship between k and l and the f minimum?