



THEORETICAL DESIGN

STEP #1 (AGE: 10 – 14): Preparing a fundament

A: Contents: Discovering elementary geometrical objects

(square, rectangle, regular polygons, circle)

⇒ OUTCOME / AIM: Concept of the function

Representation form: ICONIC

B: Contents: Experimenting with basic logical functions

(conjunction, disjunction, implementation, equivalence; modus ponens, De Morgans theorem)

⇒ OUTCOME / AIM: Concept of the function

Representation form: SYMBOLIC

Teaching method (A, B): Activity – oriented, experimental teaching

STEP #2 (AGE: 15 ascending): Going beyond the basics

A: Contents: Applications in economics

(weighted graphs, tables, Product matrices)

⇒ OUTCOME / AIM: functions as models for real world problems

Representation form: ICONIC, NUMERICAL, SYMBOLIC

Teaching method (A): Application – oriented teaching

B: Contents: Making generalizations on arguments – for example: Theorem of Transitivity

(design, flow – chart – techniques, control structures (recursion))

⇒ OUTCOME / AIM: functions as powerful instrument for modeling mathematical theorems

Representation form: ICONIC, SYMBOLIC

Teaching method (B): Project – oriented working in groups

FUNCTIONAL MODELING BEYOND THE TURTLE