LOGO BASICS

CHAPTER 5

ΥΠΟΥΡΓΕΙΟ ΕΘΝΙΚΗΣ ΠΑΙΔΕΙΑΣ & ΘΡΗΣΚΕΥΜΑΤΩΝ
ΠΑΙΔΑΓΩΓΙΚΟ ΙΝΣΤΙΤΟΥΤΟ

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ΠΛΗΡΟΦΟΡΙΚΗ
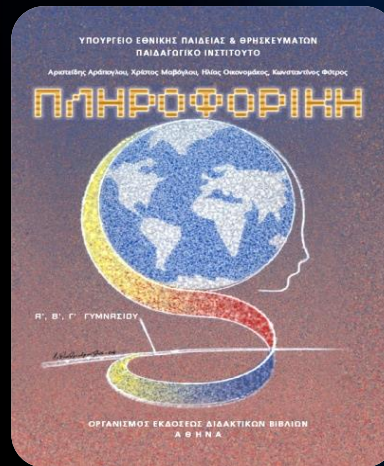
Α΄, Β΄, Γ΄ ΓΥΜΝΑΣΙΟΥ

ΟΡΓΑΝΙΣΜΟΣ ΕΚΔΟΣΕΩΣ ΔΙΔΑΚΤΙΚΩΝ ΒΙΒΛΙΩΝ
Α Θ Η Ν Α

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INTRODUCTION TO LOGO

- Logo is a programming language.

- In contrast with other natural human languages, it has a smaller vocabulary as well as a simpler set of grammatical rules.

- While a natural language creates sentences to express itself, Logo has **instructions**.

- To form instructions in Logo, we must follow a set of rules which are simpler but stricter and constitute the "**grammar**" of Logo.

VOCABULARY

- In MicroWorlds, every word is interpreted as a **request** to do something.

- There are some words that MicroWorlds already knows about because they are built in.

- Words that are built into MicroWorlds are called *primitives* e.g. forward, right, setcolor, setshape etc.

- The MicroWorlds vocabulary has an extensive list of primitives that are used as **reserved words** by the Logo language and have a special meaning.

- However, there are also some words that the **user can define** and add them to the vocabulary such as:

  - The **names** of the **objects** he creates (e.g. buttons, text boxes, shapes etc.).

  - The names of the **procedures** he creates (when procedures are sets of his own commands which have a name).

- In fact, adding objects and procedures to MicroWorlds vocabulary is what programming in MicroWorlds is all about.

COMMANDS & REPORTERS

■ All of the words used in MicroWorlds, **primitives**, **procedures** and **object names** included, can be classified into two categories:

COMMANDS

REPORTERS

COMMANDS

- **Commands do something.**

  For example, forward, show, right and page1 are commands.

forward 100	forward tells MicroWorlds to move the turtle a given amount.
show heading	show tells MicroWorlds to display the turtle's heading in the Command Center.
right 90	right tells MicroWorlds to turn the turtle 90 degrees to the right
page1	opens page1 of our project (given that you do have a page with that name).

REPORTERS

■ **Reporters report something.**

They tell us the answer to a calculation or the state of an object.

For example, heading, 15, first and text1 are reporters.

show heading	heading reports the current heading of the turtle to the show command.
setc 15	15 reports the color number (red) of the turtle to the setc command
setsh 2	2 reports the current shape of the turtle to the setsh command
show text1	reports the contents of the text box, given that we have a text box with that name

DATA TYPES

- MicroWorlds can work with three kinds of data: **numbers**, **words**, and **lists**.

- These data can be used as:

| input to procedure | result that a procedure reports | value of a variable |

NUMBERS

- They are **integer** or **floating point** (real) values used in arithmetic operations or functions (we use a comma or a period to express the decimal point).

```
113
15.2
-16.03
323.     (equals 323.0)
  .5      (equals 0.5)
1E4      (equals 1*10⁴ = 10000)
```

- Both the **- (minus)** sign and the **+ (plus)** sign must immediately precede the number to indicate a negative or positive number e.g.

  show -2 + 5
  3

- If a space is inserted between the "-" sign and the number, the "-" is interpreted as the subtraction operation.

  show - 2 + 5
  - needs more inputs

WORDS

- A **word** is made from a **sequence of characters** (e.g. letters, digits or punctuation) which are called **elements** and must always begin with **quotation marks "**.

```
"Hello          (word with 5 elements)
"Hi             (word with 2 elements)
"x              (word with 1 element)
"3.14           (word with 4 elements)
"314            (word with 3 elements)
"MICROWORLDS    (word with 11 elements)
"Micro.Pro      (word with 9 elements)
"Maria35        (word with 7 elements)
"who?           (word with 4 elements)
```

EXAMPLES

show hello

I don't know how to hello

show "hello

hello

show "hello"

hello"

LISTS

- A list is a **sequence of words** separated by **spaces** and enclosed in **square brackets [ ]**.

- The words in a list do not need quotation marks and extra spaces are ignored.

- The outer brackets are not displayed when **show** is used.

```
[Hello my dear friend]        (list with 4 words)
[My name is Maria]            (list with 4 words)
[Hello]                       (list with 1 word)
[today is 24/5/13]            (list with 3 words)
```

EXAMPLES

show [hello   my friend]
hello my friend

show [red GREEN blue]
red GREEN blue

show [Today is 10/12/2013]
Today is 10/12/2013

THE SHOW COMMAND

- It is an **output command** because it prints pieces of information in the command center such as:

    - **numbers**

    - **words**

    - **lists**

    - **sentences**

A **sentence** is a list of items that can be either words or lists.

SHOW NUMBERS

- MicroWorlds can do all the arithmetic operations

+ - * /

- In an arithmetic expression we should always place a **space** before and after the sign of operation.

show 7	show 3 * 8	show 45 / (5 * 3)	show 18 / 3 * 4
7	24	3	24

- Otherwise, the system gives back a **syntax error**.

show 5*6	show 5 + 15/5
I don't know how to 5*6	I don't know how to 15/5

SHOW WORDS

- We should not forget the quotation marks "

show "hello
hello

show "hello"
hello"

show "2+3
2+3

SHOW LISTS

■ We should not forget the square brackets **[ ]**

show [My name is Evangelos Zioulas]
My name is Evangelos Zioulas

show [Programming in Logo]
Programming in Logo

SHOW SENTENCES

- We should not forget the **se** command.

- **If a sentence** includes more than 2 items, they should be enclosed in **parentheses**.

show (se [Cost of the trip is] 200 / 25 "euro)
Cost of the trip is 8 euro

THE ANNOUNCE COMMAND

- It is an **output command** that displays the *word-or-list* message that follows in an **alert box**.

- To close the box, we should click OK.

announce [Programming in Logo...]
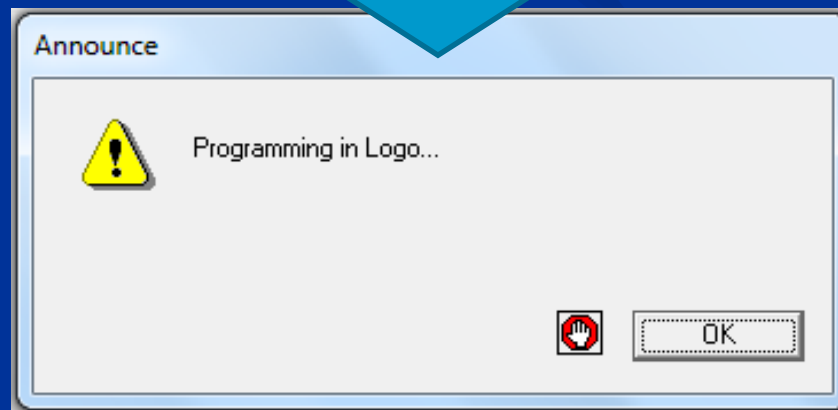
THE QUESTION COMMAND

- It opens a **dialogue box** displaying the **question** and an **area to type** the answer.

- The **answer** command after that, reports what was typed in the dialogue box.

- If we write a very long question, only the part that fits is displayed.

- Question is an **input command** that allows us to insert a value as an answer to the system.

question [How are you today?]

Let's say the answer is **fine**

Question

how are you today?

fine

OK   Cancel
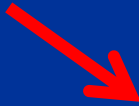
THE ANSWER REPORTER

- It is an **output reporter** that reports the contents of the last answer typed in the **question** dialogue box.

- The value reported by answer is always overwritten by the last usage of a **question** or a dialogue box.

- Using the **question** and **answer** commands, we can create an interactive program that performs a dialogue between the system and the user.

announce (se [Today you feel] answer)

Announce

Today you feel fine

OK