# THE ANGLE MAKERS

**Abstract**

The "Angle-makers" is an embodied learning app designed for promoting 4-6th graders' conceptual understanding about angles in geometry. As part this app students have the opportunity to participate in an embodied digital environment grounded in contemporary kinesthetic and embodied learning approaches. Using interactive and motion-based technologies, the "Angle-makers" aims at supporting young students in enriching their knowledge about the angles and their measurement, the different types of angles and subsequently, the different types of triangles. In particular, when using the embodied digital app students are invited to take the role of angle-makers for experiencing the world of mathematics and geometry via a playful and educative experience.

## GENERAL INFORMATION

- **Lesson:** Mathematics
- **Link to the curriculum:** Geometry, Learning angles
- **Grade:** 3rd - 6th grade primary students
- **Learning context:** Mainstream classroom

## LEVELS

The "Angle makers" app is consisted of two levels. At each level the goal is different as follows:

- **Level 1: Introduction to the concept and construction of an angle**
  At the first level, students are introduced to the concept of the angle and through a sequence of representations they have the opportunity to understand what an angle is and how it is constructed.

- **Level 2: Introduction to the different types of angles**
  At the second level, students are introduced to the different types of angles. Specifically through a sequence of activities they are called to identify, name and construct right, obtuse, acute and straight angles.

## GENERAL USE INSTRUCTION – APP SETTINGS

To control the application settings, you will use the letters (in English) and the numbers (not the number pad) on your keyboard.
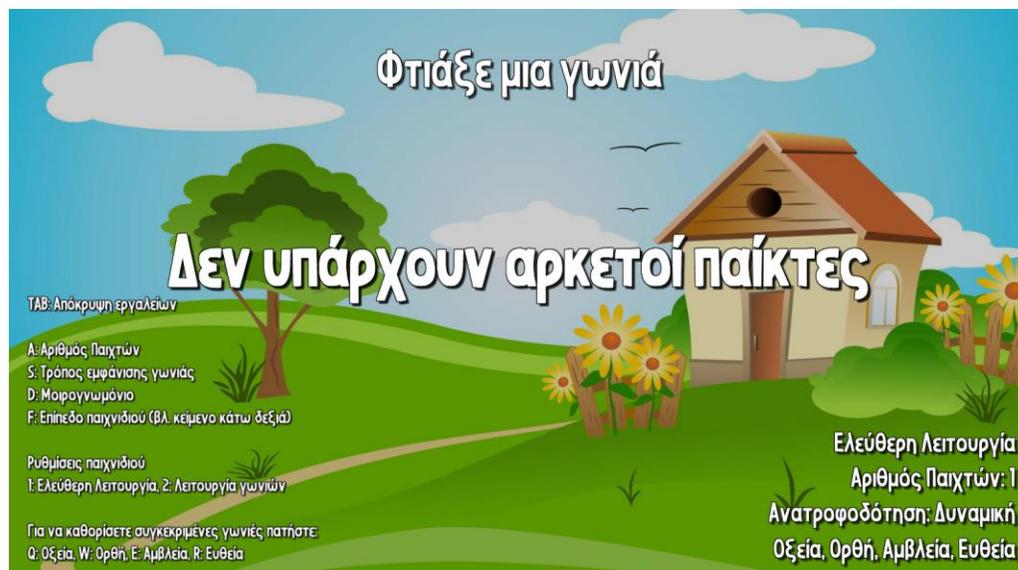


**TAB** = Show / Hide the menu

**A** = Number of players (1 ή 2).

**S** = The way an angle appears
- **Feedback - Static** = The students create angles with their hands anywhere on the screen. The app displays the angle at a pre-defined spot on the screen.
- **Feedback – Dynamic** = The students create angles with their hands anywhere on the screen. The app displays the angle at the spot where students have created it.

**D** = Show / Hide protractor

**1, 2** = Select level

**F** = Show / Hide text (at the bottom, on the right)

**ESC** = Exit

**INSTRUCTIONS – SETTINGS FOR EACH LEVEL**

**Level 1** = Free- form mode

At the first level of the app, students are introduced to the concept of the angle and through a sequence of representations they have the opportunity to understand what an angle is and how it is made.

- Students create various angles
- Instructions: «Make an angle»
- Feedback about the angle degrees is provided
- The possible number of users is 1 or 2.

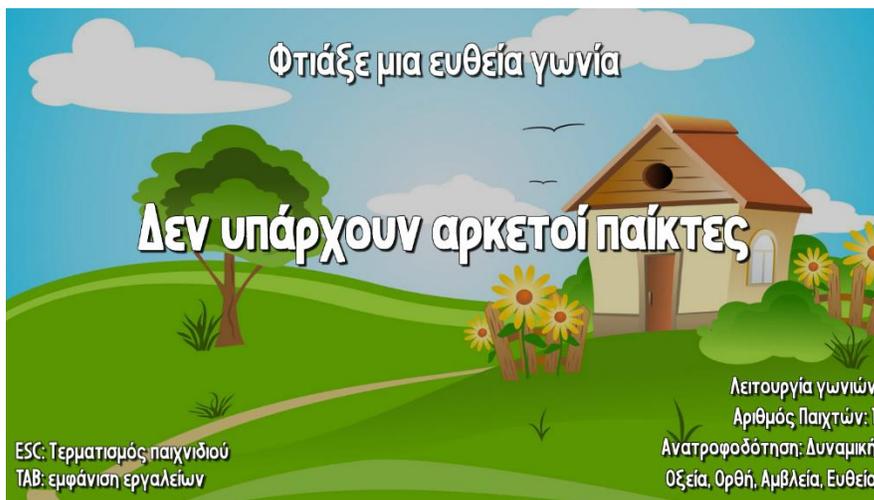Example of instructions at the 1st level.
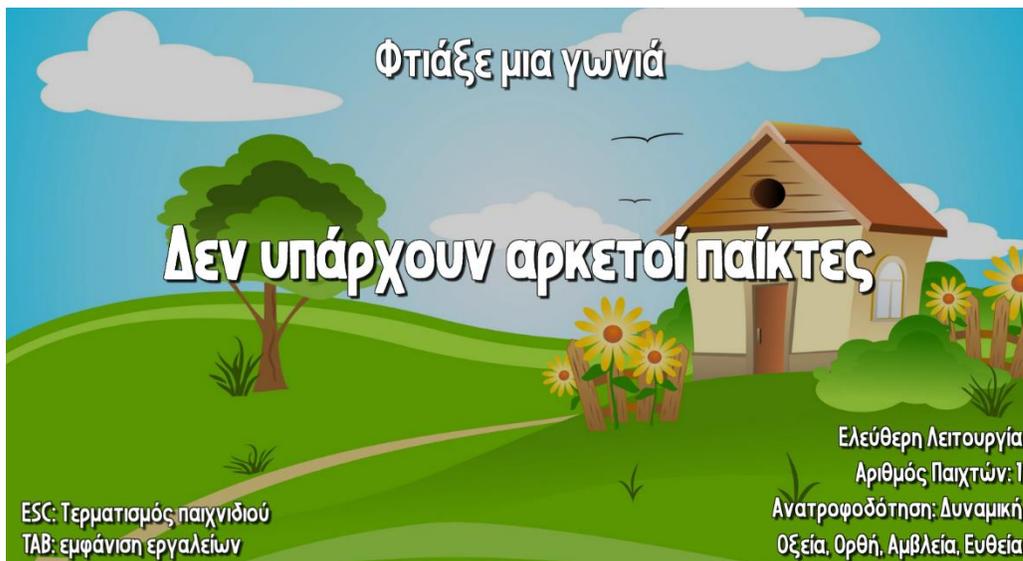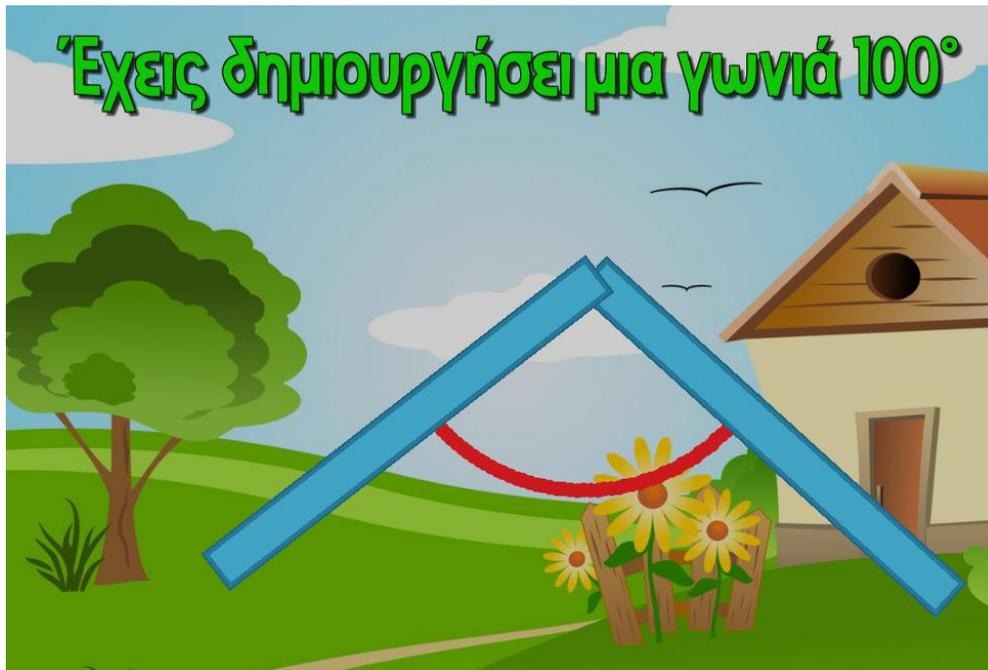
Example of feedback given at Level 1

**Level 2** = Angle-type mode

On the second level students are introduced to the different types of angles. Specifically through a sequence of activities they are called to identify, name and create right, straight, obtuse and acute angles.

- Students create specific angles
- Instructions: «Make a straight angle »
- Every time the app provides appropriate feedback (in case of right or false answer)
- The possible number of users is 1 or 2



Example of instructions at the 2nd level

**Μπράβο! Έχεις δημιουργήσει μια ευθεία γωνιά με 180°**

Example of feedback given in case of a correct answer.

**Έχεις δημιουργήσει μια γωνιά με 70°. Μια ορθή γωνιά πρέπει να είναι ίση με 90°**

Λειτουργία γωνιών

Example of feedback given in case of a wrong answer.

To set an angle press:

**Q** = Acute, **W** = Right, **E** = Obtuse, **R** = Straight

Για να καθορίσετε συγκεκριμένες γωνιές πατήστε:
Q: Οξεία, W: Ορθή, E: Αμβλεία, R: Ευθεία