YOUNG CARDIOLOGISTS

ABSTRACT

The "Young cardiologists" is an embodied learning app designed for promoting 5th-8th graders' conceptual understanding about the heart circulatory system. 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 "Young cardiologists" aims at supporting students in enriching their knowledge about the function and structure of the heart, the systemic and pneumonic blood circulation as well as about how our lifestyle choices affect the heart. In particular, when using the embodied digital app students are invited to take the role of young cardiologists for traveling in the human body and focusing on the circulatory system and its significance via a playful and educative experience.

GENERAL INFORMATION
- **Lesson:** Science education
- **Link to the curriculum:** The circulatory system
- **Grade:** 5th grade primary students – 9th grade secondary students
- **Learning context:** Mainstream classroom

LEVELS

The "Young Cardiologists" application is consisted of three levels. At each level the goal is different as follows:

- **Level 1: Structure and function of the heart**
  At the first level, students are introduced to the structure and the function of the heart, as the main circulatory system vital organ.

- **Level 2: Large and small blood circulation**
  At the second level, students are introduced to the large and small blood circulation as well as to the reasons why there are two circulations that blood follows in the human body.

- **Level 3: Circulatory system's health**
  At the third level, the students are introduced to the habits that affect the circulatory system's health (e.g., unhealthy Vs balanced diet, systematic exercise Vs sedentary life).
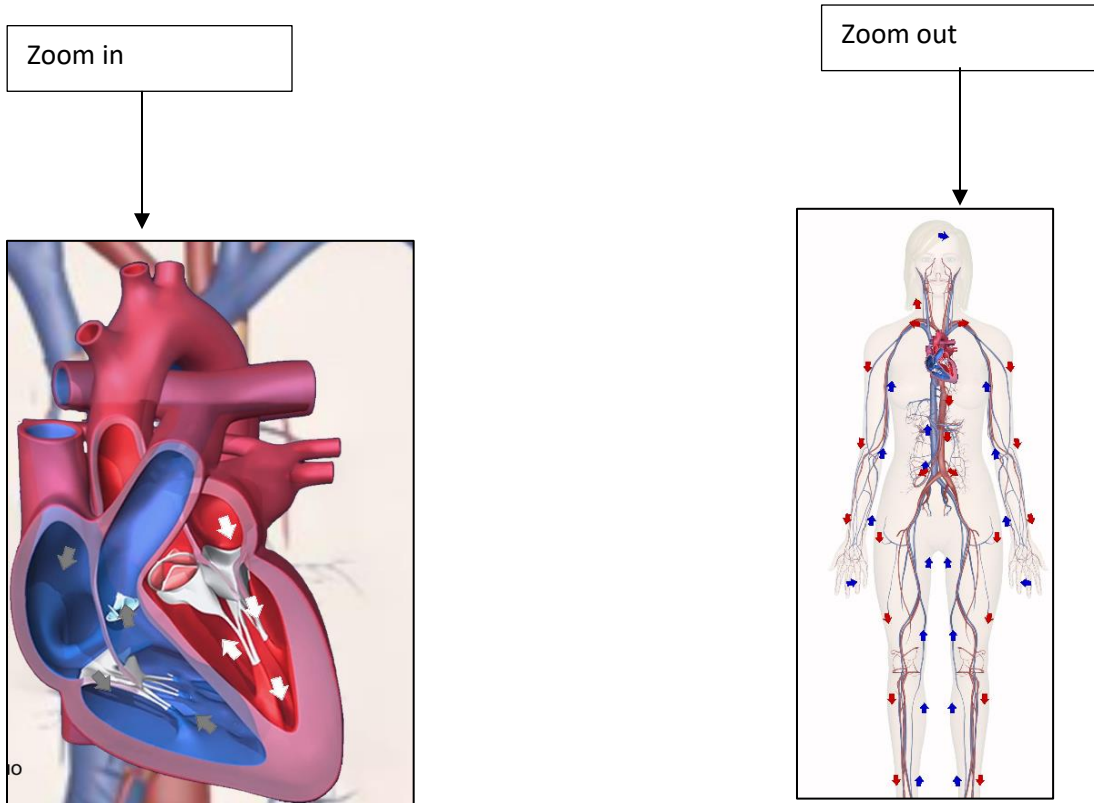

GENERAL USE INSTRUCTIONS – SETTINGS

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

- Place your palms above the leap motion technology in a downward direction.
- At the right side of the screen there is a human feature. Make sure that it says "I'm ready".
- While opening and closing your palms, the heart starts beating. At the same time, the human feature is moving on the same tempo.

- **M** = Main menu
- **A=** Heart beats automatically. The heart beats normally but the user can interrupt the process, open and close the palms in order to make the heart beats faster or slower.
- **T**= Show / Hide text. Shows or hides the related concepts linked to the different parts of the heart (e.g. pulmonary vein, pulmonary artery, artery etc.).
- **Tab**= Change text language. Firstly, press "T" to appear the text and then press **tab** to change the language.
- **1,2,3=** Select level
- **Esc**= Exit
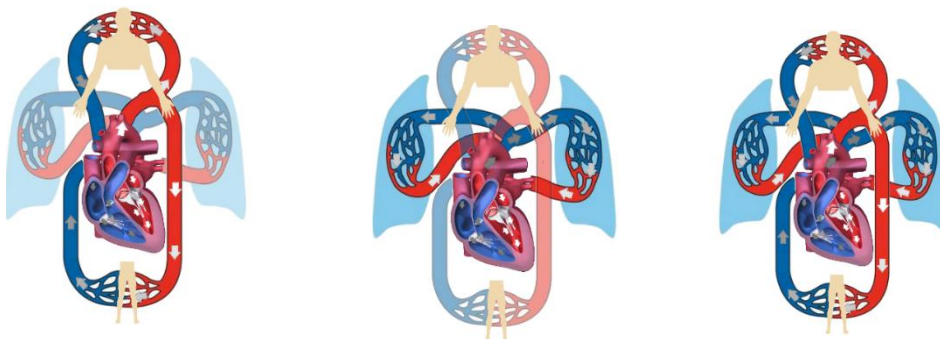
INSTRUCTIONS – SETTINGS FOR EACH LEVEL

Level 1= Structure and function of the heart
- Press number 1 to proceed to the 1st level.
- **F**= Picture reflection (change objects' aspect)
- **Z** = Zoom out – features the human body / Zoom in- features the heart

Zoom in

Zoom out

Level 2= Large and small blood circulation
- Press the number 2 to proceed to the 2nd level.
- **S**= Large circulation function is displayed
- **P**= Small circulation function is displayed.
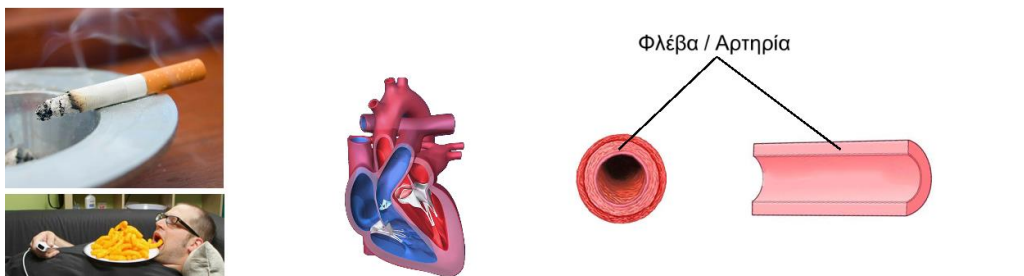- **A**= Both large and small circulation are displayed.

Level 3= Circulation systems' health
- Press the number 3 to proceed to the 3rd level.
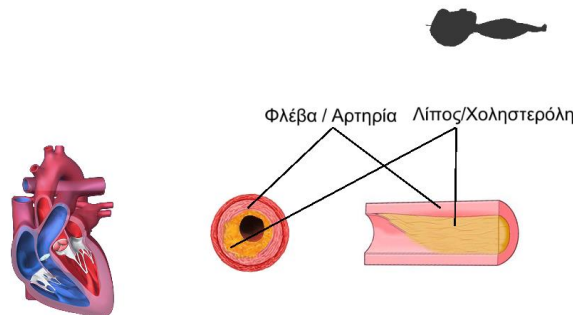
Βάλε και τα δυο σου χέρια

Φλέβα / Αρτηρία

Πατήστε 1: 1ο Στάδιο | 2: 2ο Στάδιο | 3: 3ο Στάδιο | Esc: Έξοδος
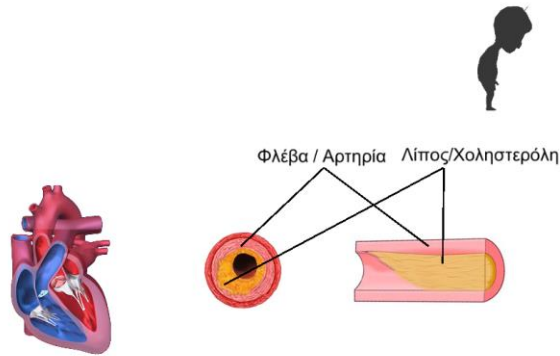Χρησιμοποιείστε τους αριθμούς του πληκρολογίου (όχι το numpad)

Πατήστε S: Εγκεφαλικό | H: Καρδιακή Προσβολή
F: Θρόμβωση | Space bar: Επανεκκίνηση
N: Επόμενο | A: Εναλλαγή αυτόματης λειτουργίας

M - Menu

- **S**= Stroke. Press "S". You will not notice any difference on the display. At this level, the veins and arteries fill in with fat (cholesterol), but the heart is still beating. The human feature falls down.
- **H**= Heart attack. Press "H". You will not notice any difference on the display. Start opening and closing your palms. At this level, the veins and arteries fill in with fat (cholesterol), but heart is not beating anymore. The human feature falls down.
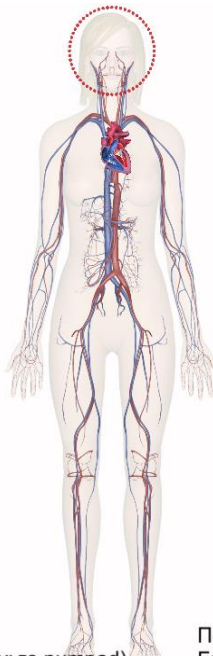
Φλέβα / Αρτηρία   Λίπος/Χοληστερόλη

- **F**= Thrombosis. Press "F". You will not notice any difference on the display. Start opening and closing your palms. At this level, the veins and arteries fill in with fat (cholesterol), but heart is still beating. The human feature does not fall down.
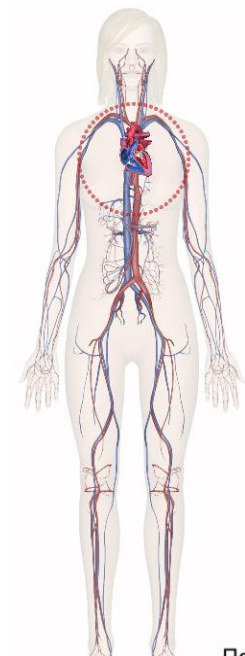
4

Φλέβα / Αρτηρία   Λίπος/Χοληστερόλη

- **Space bar**= Restart level.
- **N**= Next. The human body feature is appeared. Pressing "S", "F" or "H", the dysfunctional organ in the body is circled.
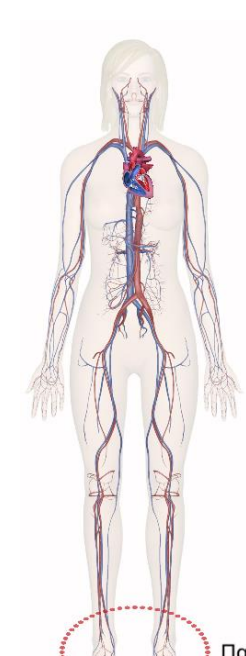

Πατ
F: Θ
N: E

χι το numpad)

Πατή
F: Θρ

χι το numpad)

Πα
F: (
N:

χι το numpad)

S= Stroke. The head is circled.

H= Heart attack. The heart is circled.

F= Thrombosis. An illustrative example is given. Feet are circled.