

LESSON PLAN

National High School of Computer Science“Tudor Vianu”

Teacher: Marinescu Mirela

Subject: Biology

11th Grade

Topic: the cardiovascular system (the normal structure and functioning of the heart, the circulation of blood in the human body, from the heart to the rest of the body and back to the heart)

Lesson Aim: understanding and learning the structure of the heart and of its mechanisms, as well as the circulation of blood

Type of lesson: acquiring new information

Types of interaction: teacher-students, student-student.

Targeted aims	Objectives
A1 Identifying the main components of the human organs and their structure and mechanisms	O1 – be able to identify the main elements of the circulatory system.
A2 Describing the main characteristics of tissues and systems of organs.	O2 – be able to describe the structure of the heart using accurate and scientific terminology.
A3 Explaining some physiological processes of the human body using adequate scientific terminology.	O3 – be able to explain the functioning mechanisms for the heart, as well as the circulation of blood from and towards the heart (the first and second order circulatory systems). O4 –be able to explain how the electrical impulses generated by the sinoatrial/sinuatrial/sinus node travel down the myocardium and trigger the contraction of the heart.

Didactic materials: atlas of human anatomy, large illustrations of the structure of the heart, models of a section of a human heart, educational software

Methods: explanation, conversation, demonstration

Bibliography: 1. I. ARINIS, M. NANEA, A. VASILE – Biology textbook 11th grade, Sigma Publishing House

2. T. TIPLIC – Human anatomy and physiology. Aktis Publishing House

3. I. GHERMAN – Histology compendium, All Publishing House

4. I.C. PETRICU, I.C. VOICULESCU- Human anatomy and physiology, Medical Publishing House

LESSON PLAN

No.	Aim	Targeted aims	Teacher activity	Students' activity
1.	Anticipatory set - Identifying the students' prior knowledge	A1	The teacher asks questions about some of the previous lessons ("The Digestion" and "The Respiration"); the teacher helps students make the connection with the new lesson, and also presents its title and objectives.	The students answer the questions.
2.	Direct instruction - Presenting the main components of the lesson	A1 A2 A3	The teacher presents the structure of the circulatory system; using the illustrations and the computer generated models, the students discover the structure of the heart, the types of blood vessels (arteries, capillaries, veins) and the connections formed between these elements. The images illustrating the positioning of the sinoatrial node and the functioning of the heart due to contractions generated by the SA node are analyzed. Finally, the teacher draws attention to the heart as a unitary mechanism and to the way blood circulates in the body.	The students write down the newly acquired information and analyze the images.
3.	Consolidating knowledge	A2 A3	The teacher asks questions based on the lesson just taught.	Students answer the questions.
4.	Guided practice		The teacher asks students to turn in their solved hand-outs.	The students solve the given exercises from the hand-outs.
5.	Assessment		The teacher corrects the hand-outs and rewards the students who were active participants during the class.	The students check their solutions/answers and correct any mistakes.
6.	Written assignment		The teacher asks the students to design a schematic representation of the connection between the 3 systems which make nutrition possible.	

EVALUATION HAND-OUT

Types of items

Objective items

1. – multiple choice

Arteries transport :

- a. only oxygenated blood
- b. blood from the heart to the body
- c. blood from the body to the heart
- d. only non-oxygenated blood

The pulmonary artery:

- a. contains CO₂
- b. starts from the left ventricle
- c. carries oxygen
- d. reaches the left atrium

2. – fill-in

Fill in the following, identifying the type of circulation:

Heart (LV) $\xrightarrow{\quad ? \quad}$ Body $\xrightarrow{\quad ? \quad}$ Heart (?) Circulation.....

Heart (?) $\xrightarrow[\text{artery}]{\text{pulmonary}}$ Lungs $\xrightarrow{\quad ? \quad}$ Heart (?) Circulation.....

3. – pairing/matching

Match the notions from the 1st column with those from the 2nd:

Column A

- 1. sinoatrial node
- 2. atrioventricular node
- 3. the Hiss bundle
- 4. Purkinje fibres

Column B

- a. ventricular myocardium
- b. right atrium wall
- c. interatrial septum
- d. interventricular septum

4. – double choice

The atria communicate with the ventricles through the atrioventricular orifices, as these have one-way valves.

(...../.....)

The myocardium contracts rhythmically because it receives regular electrical impulses from the sinoatrial node.

(...../.....)

EVALUATION HAND-OUT

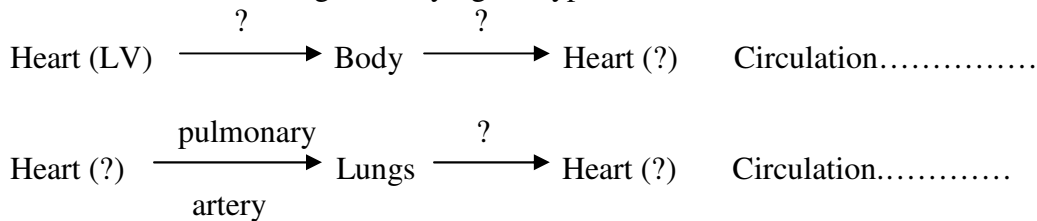
1. Arteries transport :

- | | |
|-------------------------------------|-------------------------------------|
| c. only oxygenated blood | c. blood from the body to the heart |
| d. blood from the heart to the body | d. only non-oxygenated blood |

2. The pulmonary artery:

- | | |
|-------------------------------------|----------------------------|
| b. contains CO ₂ | c. carries oxygen |
| b. starts from the left ventricle . | d. reaches the left atrium |

3. Fill in the following, identifying the type of circulation:



4. Match the notions from the 1st column with those from the 2nd:

Column A

1. sinoatrial node
2. atrioventricular node
3. the Hiss bundle
4. Purkinje fibres

Column B

- a. ventricular myocardium
- b. right atrium wall
- c. interatrial septum
- d. interventricular septum

5. The atria communicate with the ventricles through the atrioventricular orifices, as these have one-way valves.

(...../.....)

6. The myocardium contracts rhythmically because it receives regular electrical impulses from the sinoatrial node.

(...../.....)

SCHEMATICS ON WHITEBOARD

THE CARDIOVASCULAR SYSTEM

The structure of the heart and the circulation of blood (schematic representation)

