Kidney Transplantation: a natural or an artificial kidney?

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Identity of Learning Material

Subject: Biology

Students' age: High School, 2nd Grade (17 years old)

Connection with the comprehensive programme: Incorporation of the material into the Biology (Specialization course) book, 2nd Grade High School

Duration: 4 X 80'

Goals:

Conceptual understanding of: structure and function of the kidney, urine production, kidney deficiency, hemodialysis, transplantation, tissue compatibility

Investigation skills: data collection, processing and evaluation

Decision-making and argumentation skills

Communication skills and ability to announce results

SSIBL Instructional Framework

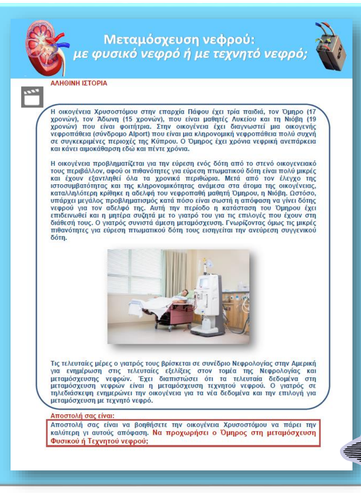
- **Stage 1** Controversial socio-scientific issue → Developing an original and attractive scenario
- **Stage 2** Inquiry → Motivating students about inquiry activities, with special emphasis on responsible research and innovation
- **Stage 3** Active Citizenship – Decision making → Making an informed decision – answering the question

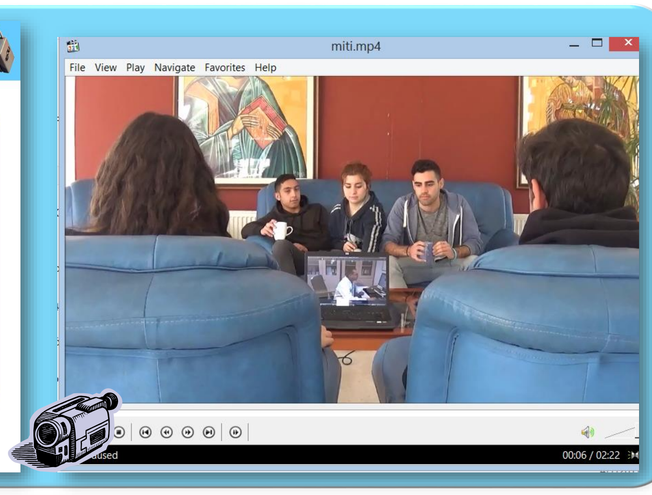
Controversial Issue – Scenario

17 year-old Omiros suffers from chronic renal deficiency and has been doing hemodialysis for the last five years. His doctor recommends immediate transplantation. The family is considering finding a donor within the immediate family since the likelihood of finding a cadaver donor is small and time for Omiros is running out. These last few days, his doctor has been attending a nephrology conference on the latest developments in nephrology and kidney transplantation. He has found out that the latest development in nephrology is the transplantation of an artificial kidney.

The students are asked to answer the following question:

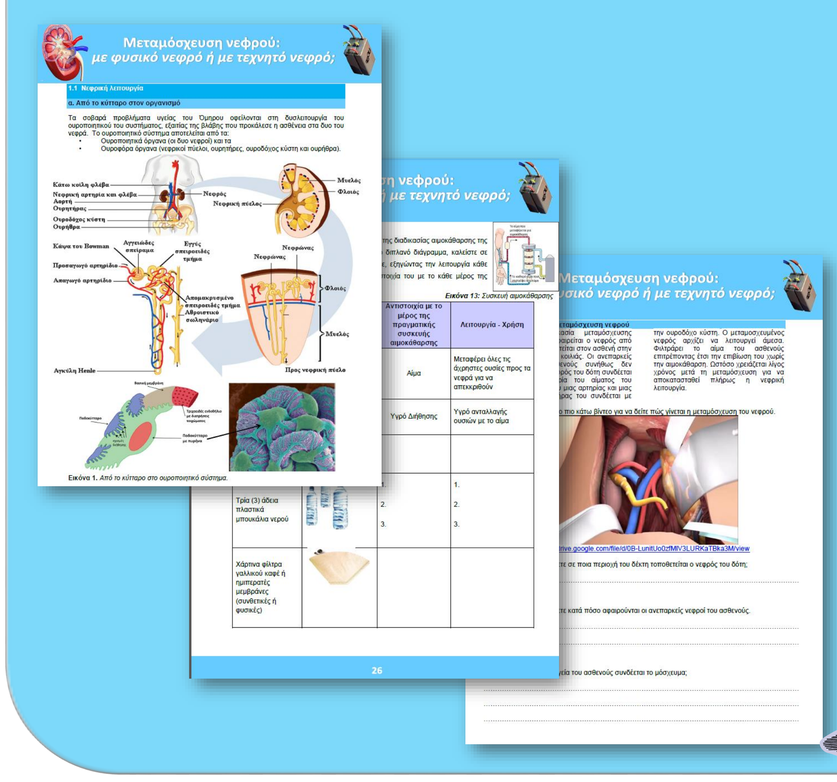
Should Omiros proceed with a natural or an artificial kidney transplantation?



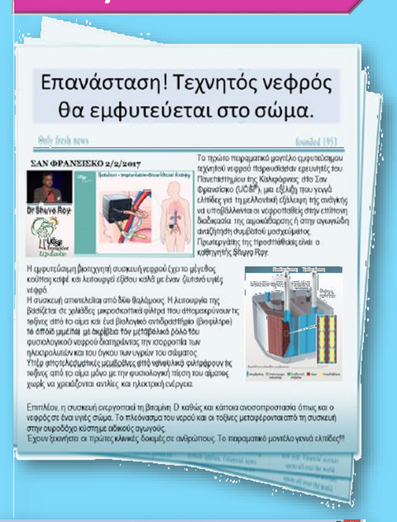


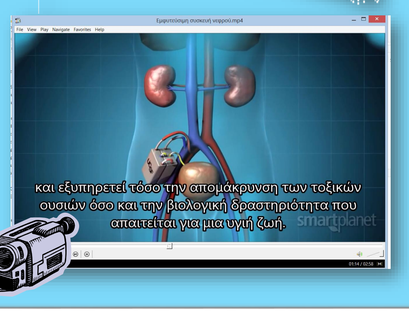
Inquiry – Specialist Teams – The Jigsaw Method

Kidney function, kidney deficiency, hemodialysis, transplantation, tissue compatibility

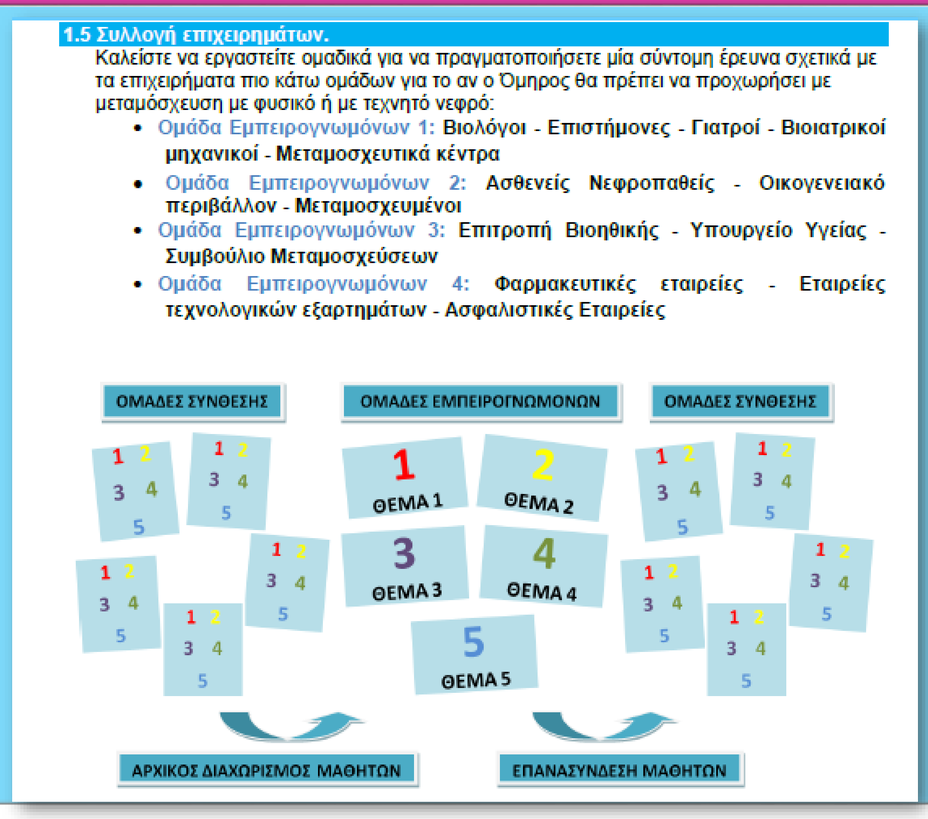


Artificial implantable kidney device





Controversial issue and conflicting opinions

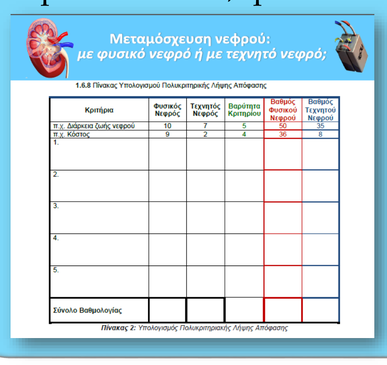


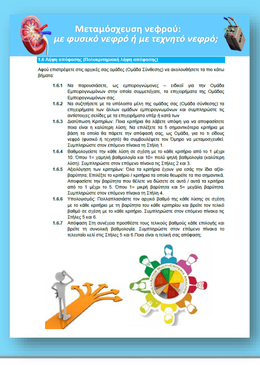
Decision-making – Resolving the controversial issue

The students are asked to express their opinion about the initial question:

Kidney transplantation: a natural or an artificial kidney?

Using the information they managed to get from the specialist teams, the students participate in making a multi-criteria decision. Each individual and each team has its own point of view, presents the criteria and evaluates the importance of each criterion.



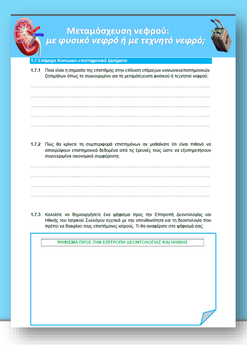


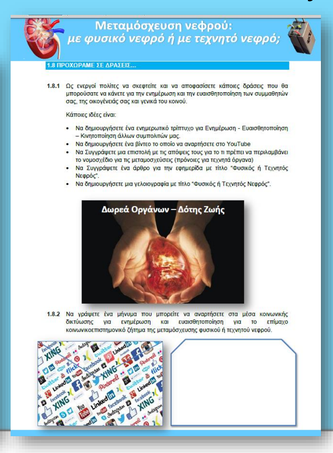
The students realize the important role they play as citizens, in relation to the socio -scientific issue they are investigating and generally in relation to such issues. They propose individual and collective actions.

At the same time, they realize the importance of science and of the society in such issues.

Actions on an individual level

Actions on a collective level





The PARRISE Project has received funding from the European Community under grant agreement no. 612438.

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