

HUMAN BODY- general properties

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Subject: Biology.

Country of creation: Slovenia.

Countries of testing: Austria, Czech Republic, Portugal and Lithuania.



Aims of the GP

Understanding of the key facts in human anatomy and physiology; finding out what typical human body characteristics are; performing simple measurements; drawing conclusions about the human body and presenting findings.

Teaching material

Simple lab equipment, PC with Vernier temperature and blood pressure sensors, work sheets, video, short article.

Age of the students

15 – 17

Preparation and teaching time

Preparation: 45 min. Class time: 90 min.

Lesson plan

Activity	Procedure	Time
Motivation activity	<ul style="list-style-type: none">• Set up small groups (3-5 students).• Identify morphological similarities and differences among the group members. Compare two individuals by the given criteria.	10 min
Group activities	Each activity is focused on one of the organ systems in the human body. <ol style="list-style-type: none">1. <i>Locomotor system</i>: Students will observe different positions of the human body during daily activities. They will draw conclusions about possible health risks during these activities. Using ergometrical principles, written recommendations are prepared by each group.2. <i>Senses</i>: Students observe the way we respond to different stimuli with simple tools from everyday life. <i>Nerve system</i>: Measurement of reaction time. Data collection. Three members of the group do the experiment.	45 min

	<p>3. <i>Digestive tract</i>: Students test samples of food to find out if they contain sugar. They test different fruit juices for vitamin C and compare the vitamin C content. Students calculate the number of calories per day that they eat. Finally, they learn what information is given on the label of different food samples from the local store.</p> <p>4. <i>Blood and heart</i>: Students measure blood pressure using computer sensors. They also measure the heart beat rate. Compare the results in the group and discuss possible causes for the differences.</p> <p>5. <i>Immune system</i>: Students get information on HIV and AIDS. They are informed about the immune system, the way the diseases are transmitted. Students see and hear other young people who have contracted the disease, and how they are dealing with it, as well as young people who don't have the disease, and what they are doing not to contract it.</p> <p>6. <i>Respiration</i>: Students make a simple model of the lungs to demonstrate how air enters and leaves the lungs. They will also demonstrate the relationship between breathing rate and exercise.</p> <p>7. <i>Excretion</i>: Students are given visual materials to explore parts of the excretory system in the human body. http://www.youtube.com/watch?v=6Wc4f2KnBYo http://www.youtube.com/watch?v=AdlfxBooqIA</p> <p>8. <i>Reproductive system</i>: Students compare parts of male and female reproductive systems. The main similarities and the main differences are discussed.</p> <p>9. <i>Homeostasis</i>: Students compare body temperature before and after a short activity. They are also given a short article about homeostasis.</p>	
Pro- duction work	Students prepare a short presentation on their findings.	35 min
Con- clusion	Each group reports about one organ system.	10 min

Questionnaire

Life style, physical activity and nutrition affect the human skeleton

Permanently from birth to death.

Only until adolescence.

Less than genetic factors.

None of the above; they do not have any effect at all.

Hormones are transported through the bloodstream to all body parts but their activity is targeted only on some organs.

Yes / No

The nervous system is part of the body's regulatory system. A typical reaction to stimulus is called

Adaptation

Synapse

Simple reflex

Repolarisation

The infusion used for intravenous nutrition is a solution of

Water and starch.

Water and vitamin C.

Water and glucose.

Water and amylase.

Inhalation of air is stimulated by

A low concentration of carbon dioxide in the blood.

A low concentration of oxygen in the blood.

A high concentration of oxygen in the blood.

A high concentration of carbon dioxide in the blood.

What are the possible consequences of renal function failure?

Carbon monoxide and water accumulate in the human body.

Enzymes, hormones and glucose accumulate in the body.

Toxic metabolites, especially nitrogen, accumulate in the body.

Oxygen accumulates in the blood and the respiration rate is higher.

A woman decided to use a contraceptive method that involves a small pill being implanted under the skin. The implanted pill excretes

Testosterone / Estrogens / Progesterone / LCH

Colour blindness is

The consequence of exposure to low illumination of the working place.

A genetic defect in being able to see pigment formation.

The consequence of a low level of vitamins.

The consequence of reading from too short a distance.

A high ratio of IgG antibodies in the blood is the consequence of

Low body immunity.

Active immunisation/vaccination.

Fresh infection with blood parasites.

Loss of a large amount of blood.

Teacher reviews

This GP is based on a topic that is present in all national curricula and, as the Portuguese teacher mentioned, “these contents are usually taught with the use of partial exposure or some movies, but the fact that the GP suggested laboratory activities as well as group research work, allows students to understand the content more easily”. For the other two implementers this GP was a success, but as they had to teach it in classes with younger students it was not easy for the students to understand all the concepts as quickly as intended in the GP; therefore the implementation took slightly longer, but the students were motivated about their work.

The SPICE project

SPICE was a two-year project (December 2009 – November 2011) carried out by **European Schoolnet** (<http://europeanschoolnet.org>) together with **Direção Geral de Inovação e Desenvolvimento Curricular** (<http://sitio.dgicd.min-edu.pt/Paginas/default.aspx>) from Portugal and **Dum Zahranicnich Sluzeb MSMT** (<http://www.dzs.cz/>) from the Czech Republic.

The primary objective of the SPICE project was to collect, analyse, validate and share innovative pedagogical practices, particularly those using inquiry-based learning, whilst enhancing pupils' interest in the sciences. SPICE supported this objective by singling out, analysing and validating good practice pedagogies and practices in maths, science and technology (mostly ICT-based) and disseminating them across Europe. SPICE involved 24 teachers from 16 different educational systems (from 15 different countries). This teachers' panel helped the SPICE partners in defining good practices that were then tested in classes by 41 teachers during the school year 2010-2011.

For more information see: <http://spice.eun.org>



Lifelong Learning Programme



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