

The geographical curiosities of Danube Delta

Course at school's decision

The 11th form

Time- 35 hours

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Argument

The geographical curiosities of Danube Delta course is necessary because it offers to the students the possibility to find out and understand some geographical and chemical curiosities and phenomenon of the Danube Delta. The course is very important for the students general culture and for their right knowledge, appreciation and protection of the environment and especially the Danube Delta. Also this course is important for students to enrich their geographical and chemical information and to get thoroughly some phenomenon studied into the class courses.

The Danube River, the second largest river of the Continent has during the last 16000 years built at its mouth with the Black Sea one of the most beautiful delta in Europe, perhaps in the whole world.

Without doubt, the impressive range of habitats and species which occupy relatively small area makes the Danube Delta a vital center for biodiversity in Europe, and a natural genetic bank with incalculable value for global natural heritage.

The Danube Delta is the single Delta in the world declared a biosphere reserve and one of worldwide largest wet zones, a water birds habitat, having the 8th position according Ramsar convention (which includes 600 wet zones) chart. Is a real natural museum of biodiversity, which includes 30 types of ecosystem. The Danube Delta is the greatest reedbed expanses worldwide 1560 km. The Danube Delta is a natural genetic bank which incalculable values for the worldwide natural patrimony, the total number of flora and fauna species is 5149.

The Danube Delta Biosphere Reserve are the universal values recognized by the **Man and Biosphere (MaB) Programme of UNESCO** in August 1990, through its inclusion in the international network of biosphere reserves.

The DDBR was recognized an **internationally important humid zones, mostly in their capacity of a habitat for the aquatic birds**, in September 1990, when Romania has become a Party in the **Ramsar Convention**.

The international values of the DDBR was recognized in December 1990, when it became Party of the **Cultural and Natural World Patrimony**.

As a conclusion this course is important because the spectacular of some natural curiosities captives easily the students attention and help them to understand the geographical phenomenon.

Methods:

- Conversation
- Explanation
- Discussing
- Describing
- Deliberating
- Map and atlas working

Means of learning:

- Thematic map of the Danube Delta
- Eco- touristic map of the Danube Delta biosphere reserve
- ecosystem map of the Danube Delta biosphere reserve
- Outlines
- Plates
- Photos
- Atlases
- Dictionaries
- The Britannica encyclopedia

Nr.	Specific skills	Contents
	1.To locate chartographic and special The Danube Delta, the main geographic Units, hydrology, vegetation, fauna. 2.To analysis the Danube Delta history. 3.To analysis and interpret certain geographical phenomenon. 4.To identify the causes which determine the apparition of some geographical phenomenon 5.To analysis and identify different types and genetic landforms	1. Geographic position 2. Short historical view 3. Main geographic units 4. The Danube Delta genesis and Evolution 5 Hypsometry 6 Morphohydrographic features 7 Hydrology 8 Climate 9 Vegetation 10 Fauna
	To describe and locate different geographical phenomenon for understanding the relation with the environment. 1. To identify the touristic and economical Importance of different zones of Danube Delta. 2. To analysis and identify the natural geomorphologic process and changes Included by man.	1. History of human settlements 2. Population 3. Traditional occupations 4. Navigation 5. Land-use in the Delta 6. Natural geomorphologic process and changes included by man

	<p>3. To analysis and identify the natural Ecosystem or partially man- modified ecosystem</p> <p>4. To understand the importance of the nature’s protection in order to maintain the geographic diversity.</p>	<p>7.Natural ecosystems or partially Man- modified ecosystems:</p> <p>a) Water bodies</p> <p>b) Wetlands</p> <p>c) Forest, shrubs and herbaceous vegetation</p> <p>d) Open places with little or no vegetation</p> <p>e) Agricultural and artificial areas</p>
	<p>At the and of the chapter the student will be able to:</p> <ul style="list-style-type: none"> - know the scientific terminology and the conventions regarding the chemical, physical, biological and ecological phenomena typical of the pollution dominion and of the water quality protection - evaluate the importance of the water cycle in nature, determining its defining elements, on the basis of the knowledge from connected fields (geography, physics, biology, etc.) - group the data referring to water specific properties and composition using the knowledge obtained in a formal or informal way - identify the main resources of water on the Earth as a consequence of the study of nonstandard information methods - practice scientific principles in determining and studying the water pollutant agents - formulate critical opinions referring to human health as a consequence of the documentary activities - plan investigations referring the water existence in the alive tissues and its properties - present the experimental information in logical structures <p>identify prevention and control alternatives for water and aquatic ecosystems pollution using their own experience and the nonstandard information in development strategy</p>	<p>7. Natural water classification</p> <p>a)by the provenience of the Earth recources</p> <p>b)by its use:</p> <ul style="list-style-type: none"> - Drinking water - Industrial water - Agriculture water thermal and recreation water <p>c)by its existence in nature</p> <ul style="list-style-type: none"> - free water - crystallization water - water <p>◆ Natural water classification</p> <ul style="list-style-type: none"> - by the provenience of the Earth resources - by its use: <ul style="list-style-type: none"> - drinking water - industrial water - agricultural water - thermal and recreation water - by its existence in nature <ul style="list-style-type: none"> - free water - crystallization water - constitution water - by its purity <ul style="list-style-type: none"> - drinking water - industrial water - residual water <p>◆ Water pollution sources. Pollutants.</p> <p>Pollutants classification: by their provenience</p> <ul style="list-style-type: none"> - by their nature, water pollutants can be: of chemicals, physical and biological <p>◆ Conclusive aspects of water pollution from</p>

		<p>phenomenological , ecological, economic and juridical point of view</p> <ul style="list-style-type: none"> - direct effects of water pollution upon health: diseases generated by polluted water <ul style="list-style-type: none"> - infectious diseases - noninfectious diseases ◆ physical and chemical analysis of Danube Delta water <ul style="list-style-type: none"> - determining the organoleptic properties of water: its smell - determining the acid and basic character of water ◆ Water quality protection <ul style="list-style-type: none"> - water self purification - water and aquatic ecosystem protection - legal obligation of physical and juridical persons related to water quality protection ◆ Didactic strategies – methods and didactic procedure <ul style="list-style-type: none"> - investigation - controlled discovery - heuristic conversation - experiment team working
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Methodological suggestions

For evaluation take into consideration that:

- observations
- studies
- trips
- projects

Values and attitudes

- A positive attitude about knowledge and education
- The interest for unusual geographical phenomenon
- The appreciation of diversity and natural beauty

- The interest for nature's curiosities exploring
- Knowing and protect the environment

Learning activities

1. -The analysis and interpretation of unusual geographical phenomenon
2. -The relationship between nature's curiosities and society
3. -Description exercises as real observed phenomenon
4. -The observation and selection of the main features of some geographical phenomenon
5. -Map location exercises of some geographical phenomenon
6. -Using correct the scientific language for geographical curiosities description

Evaluation types

- Initial evaluation- predictive tests
- Continuous evaluation- by observing and verbal appreciation
- Formative evaluation
- Periodical evaluation- by announced papers at the end of chapter
- Summative evaluation

References

1. *Antipa Gr. (1941)* – Marea Neagra, vol.1, Ocanografie, biomia si biologia generala a Marii Negre - Acad. Rom., Bucuresti
2. *Banu A. C. (1965)* – Contributii la cunoasterea varstei si evolutiei Deltei Dunarii, Hidrobiologia – Acad. Rom., Bucuresti
3. *Bleahu M. (1963)* – Observatii asupra evolutiei zonei Histria in ultimele trei milenii
4. *Gastescu P. (1985)* – La Delta du Danube conditions d'amenagement, valorisation des ressources naturelles et mentien de l'equilibre ecologique
5. *Gastescu P. (1993)* – The Danube Delta: Geographical and Ecological characteristics
6. *Gastescu P., Driga B. (1985)* – Delta Dunarii –Harta turistica, Ed. Sport-Turism, Bucuresti
7. *Gastescu P., Driga B. (1983)* – Caracteristici morfohidrografice ale Deltei Dunarii, Hidrobiologia, Bucuresti
8. *Gastescu P., Oltean M., Nichersu I., Constantinescu A.* – Ecosystems of the Romanian Danube Delta Biosphere Reserve

DIDACTIC PROJECT IN CHEMISTRY

1. Topic: WATER POLLUTION

2. Activity description

- interpreting the information contained in the explanatory mini dictionary referring to water physical, chemical and biological pollutants: nitrates, pesticides, insecticides, fungicides, etc
- correlating notions related to water state transformations in nature, its physical and chemical properties, its role in the photosynthesis process with its importance as a universal asset
- practice of interpretation and correlation of images, diagrams, tables
- elaborating tables enhancing the water composition and properties: physical constants, caloric properties, solubility, chemical reactivity
- interpreting information obtained from tables, statistics, etc, related to hydrological cycle links from the atmosphere, from seas and oceans or continental water
- practicing differentiated documentation in order to establish the human activities and the pollutant technologies impact upon the quality of water and upon the environment
- documentary work about: "The water of the planet...in a continuous moving. Is it important to know as much as possible about the environment?"
- determining the composition of the alive tissues and water properties using the methods of observation and investigation
- practicing the logical primness of the necessary operations needed in practical activities
- finding solutions for the quality water and aquatic ecosystem protection by elaborating essays on this issue
- making a series of portfolio type activities on the "Water" topic



3. Objectives

At the end of the chapter the student will be able to:

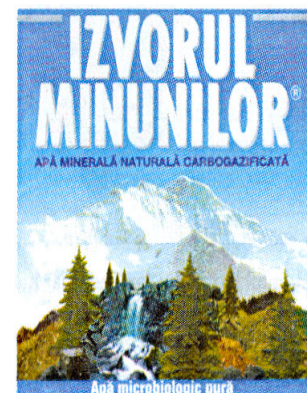
- know the scientific terminology and the conventions regarding the chemical, physical, biological and ecological phenomena typical of the pollution dominion and of the water quality protection
- evaluate the importance of the water cycle in nature, determining its defining elements, on the basis of the knowledge from connected fields (geography, physics, biology, etc.)
- group the data referring to water specific properties and composition using the knowledge obtained in a formal or informal way
- identify the main resources of water on the Earth as a consequence of the study of nonstandard information methods
- practice scientific principles in determining and studying the water pollutant agents
- formulate critical opinions referring to human health as a consequence of the documentary activities
- plan investigations referring the water existence in the alive tissues and its properties
- present the experimental information in logical structures
- identify prevention and control alternatives for water and aquatic ecosystems pollution using their own experience and the nonstandard information in development strategy



4. Contents:

◆ *Natural water classification*

- by the provenience of the Earth resources
- by its use:
 - drinking water
 - industrial water
 - agricultural water
 - thermal and recreation water
- by its existence in nature
 - free water
 - crystallization water
 - constitution water
- by its purity

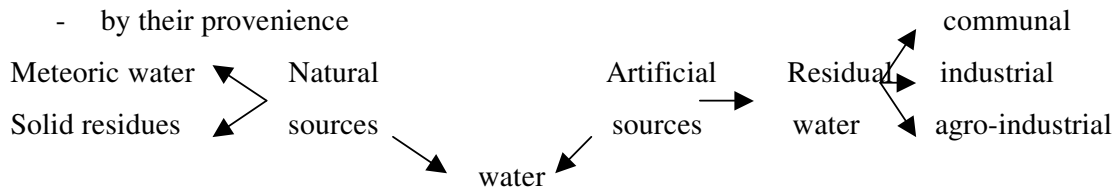


- drinking water
- industrial water
- residual water

◆ Water pollution sources. Pollutants.

Pollutants classification:

- by their provenience



- by their nature, water pollutants can be: of chemicals, physical and biological

◆ Conclusive aspects of water pollution from phenomenological , ecological, economic and juridical point of view

- direct effects of water pollution upon health: diseases generated by polluted water
 - infectious diseases
 - noninfectious diseases

◆ physical and chemical analysis of Danube Delta water

- determining the organoleptic properties of water: its smell
- determining the acid and basic character of water



◆ Water quality protection

- water self purification
- water and aquatic ecosystem protection
- legal obligation of physic and juridical persons related to water quality protection

◆ Didactic strategies – methods and didactic procedure

- investigation
- controlled discovery
- heuristic conversation
- experiment
- team working

5. Whom is the activity addressed to

The learning unit is addressed to the 9th and 10th grade students, Natural Science field, involved in the project

6. Duration: 6 classes

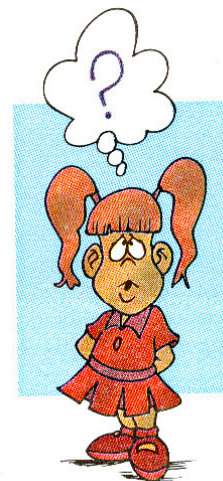
7. Involved fields: chemistry, biology, geography, ecology

8. Materials and tools

- laboratory tools: Berzelius glasses, test tube, graduated cylinder, pH or neuter pH indicator, pincers, AgNO₃, BaCl₂
- didactic film
- working sheet

9. Students evaluation

Traditional evaluating methods are used: oral evaluation, fill up quizzes and also complementary methods of evaluation: essays and projects



Să reflectăm împreună.

Let's think together

An adult is using daily

1. water for cooking and drinking:

- a) 4 l b) 6 l c) 2 l d) 10 l

2. water for car washing:

- a) 5 l b) 10 l c) 8 l d) 20 l

3. water for dishes washing:

- a) 5 l b) 10 l c) 15 l d) 25 l

4. water for corporal hygiene:

- a) 5 l b) 10 l c) 20 l d) 50 l

5. water for toilet:

- a) 20 l b) 25 l c) 35 l d) 50 l

6. water for cloths washing and cleaning the house:

- a) 10 l b) 30 l c) 60 l d) 90 l

7. water for taking showers or baths:

- a) 20 l b) 50 l c) 100 l d) 150 l

Fiecare persoană folosește zilnic...



MINIDICIONARY OF USUAL AND SPECIFIC TERMS

- Subsoil water** ➤ the first layer of water found at small depth and which influences the soil formation and properties. Subsoil water usually feeds the springs and the wells
- Fossil water** ➤ water existing between rocks from the period of their formation. It represents a part of the water from the basin in which the rocks had been deposited. It is generally salted and can't reach the surface, but it can burst while drilling
- Industrial water** ➤ natural water, sometimes treated, used in the industrial technological processes with different purposes. Sometimes it needs to be purified before and after it is evacuated into rivers or lakes because it contains certain impurities and toxic substances
- Thermal water** ➤ subsoil water with a higher temperature than the average of the warmest month of a region
- Fuel inhibitor** ➤ chemical substance (tetraethyl lead, iron carbonyl) which is mixed in small proportions with the fuel (gasoline or Diesel oil) in order to increase the octane number
- Biomass** ➤ it is a raw material very rich in proteins separated from the used nutrient medium (carbonate sources, industrial and alimentary subprojects, etc) from which, through successive processing, protean concentrate it is obtained
- Water circuit in nature** ➤ complex process of water circuit in the geographic layer. The main factors generating this process are the solar radiation and the gravitational force. The process contains the evaporation, the transport of the water steam through the atmospheric circulation, its condensation, rain dropping, water infiltration in the soil, the subsoil link and the surface flowing towards the ocean.
- Germ** ➤ generic name given to some microscopic unicellular living beings which are living in the soil, in the water, in

the air, in the plants and animals organism and which are the agents of the infectious diseases, of fermentation and putrefaction, etc

Osmosis

- a process of diffusion of one or more substances (from a solution) through a permeable or semipermeable membrane

Solvent (dissolvent)

- basic component of a solution found in greater quantity than the dissolved substance. By their nature the solvents can be polarized or non polarized. The polarized solvents (example: water) can dissolve polarized or ionized substances. The non polarized solvents, carbohydrate type, (example: benzene, toluene, etc) can dissolve non polarized substances. Conforming with Bronsted theory, non polarized solvents are also called aprotic, because they can't accept or cede protons, and the polarized solvents are also called protic . Water is the most frequently used solvent, because it dissolves a great number of solid, liquid and gas substances

Tissues

- Ensemble of animal or vegetal cells having the same structure and the same functions in an organism

DIDACTIC PROJECT IN GEOGRAPHY

1. Topic: Flora

2. Activities description:

- gathering information related to the Danube Delta flora by enterprising a study trip at the National Institute of the Danube Delta
- analysing and interpreting the biographic material related to flora: Danube Delta ecosystems and landscapes
- observing and enhancing the flora main characteristics
- practicing the description of the Danube Delta ecosystems and landscapes observed on the spot (as a result of the trip)
- using the specific language and identifying the rare species of flora
- analysing and interpreting of tables containing elements of the Eurasian, European cosmopolite and adventitious flora from the Danube Delta
- analysing and interpreting of images, diagrams, maps, tables related to the Danube Delta flora
- identifying and analysing of the floristic species proportions: hydrophilic, hygrophilic, xerophilic, euriphilic, halophilic, psamphilic.
- getting informed about their repercussions upon the landscapes and ecosystems from the Danube Delta
- doing essays, portfolios, herbariums about the Danube Delta flora

3. Objectives

At the end of the course the students will be able to:

- use correctly the new terms (scientific terms) related to the floristic species from the Danube Delta and at its characteristic landscapes and ecosystems
- identify and use the information provided by cartographic supports and by the graphics related to the Danube Delta flora
- transform the graphic and cartographic information into a written one
- use minimum basic investigation procedures related to the characteristics of the Danube Delta flora and to the antropic impact upon the Danube Delta ecosystems and landscapes
- to acquire knowledge about the Danube Delta flora
- to point out on the map the landscapes and the ecosystem of this form of relief

- identify the rare species of flora, hydrophilic, hygrophilic, xerophilic, euriphilic, halophilic, psamphilic.

4. Contents:

- Elements of flora: Eurasian, Eastern, European, cosmopolite and adventitious
 - Clasification of the floristic species by their need for water: hygrophilic, xerophilic, euriphilic, halophilic, psamphilic, mesophilic.
- Rare species of flora from the Danube Delta
- Proportion and characteristic of the vegetation types from the Danube Delta:
 - red plot swamp vegetation (78%)
 - salting vegetation (6%)
 - riverside coppices (6%)
 - sandy steppe meadows (3%)
 - mesophilic bank meadows (3%)
 - aquatic vegetation in lakes, pools and backwaters (2%)
 - vegetation of bushes developed on the sandy marine active coasts (1%)
 - forests on the marine fields (0,8%)
- Danube Delta ecosystems (27)
 - Aquatic 11
 - Baluster 4
 - Terrestrial 5
 - Antropizat 7
- Landscapes from the Danube Delta
 - The fluvial Danube landscape
 1. High
 2. Low
 - The marine Delta landscape
 1. Low
 2. Landscapes of the high marine fields
 - Landscapes of the Danube branches
 1. Chilia
 2. Sulina
 3. Tulcea

4. Sf. Gheorghe
- Landscape of the minor Delta
 1. Chilia
 2. Sf. Gheorghe
- lagoons landscapes
- lagoon and deltaic shore
- landscape of polders arranged for agriculture

5. Whom are the activities addressed to

The course is addressed to the students of 9th and 10th grade having the natural science profile and who are involved in the project.

6. Duration: 5 classes

7. Involved subjects: geography, biology, ecology

8. Materials and resources:

- maps,
- drawings,
- photographs,
- atlases,
- video cassettes,
- CD,
- dictionaries,
- bibliographic materials (books, magazines, articles),
- web sites.

9. Didactic strategies:

- conversation,
- explanation,
- description,
- working with the map and the atlas,
- trip,
- investigation

10. Students evaluation:

- oral evaluation,
- written evaluation,
- essays,
- projects, portfolios