VIRTUALMINE WORKSHOP SCENARIO

Workshop title	Former mine - creative possibilities		
Main objective / objectives	General educational goals: experiencing, learning about art and enjoying it; exploring and learning about geographical phenomena and processes in different ways (direct observation); learning about the lives of miners in the past. Specific educational goals: learning about drawing material - wax crayons and their composition (wax and pigment); learning about the natural and cultural heritage of the hometown/home landscape; developing expressive possibilities by designing in two dimensions and thus developing individual artistic expression.		
Key words (2-5)	former mine, art, cultural heritage, mining heritage		
Target age group	6 – 12 -16 [x]	19 -24 [ ]	
Duration divided into stages	1. PART ONE (Introducing pupils to educational process – introductory thoughts on the topic of mining heritage and cave paintings.) 2. PART TWO (Introducing new visual and other concepts, artistic creation.) 3. FINAL PART (Discussing the creation of one joint product, how to bring it to the kindergarten and present it to children who have not participated at the workshop.)		
Teaching methods and tools used	Method of practical work, conversation, explanation, observation, working with pictorial material.	Teaching aids	Wax crayons, pigments, table protection material, black canvas.
Detailed course of workshop divided into stages	1. PART ONE (Introducing pupils to educational process – introductory thoughts on the topic of mining heritage and cave paintings.) Explain the difference between natural caves and man-made mines. What could be done in caves and what in mines? Who lives in caves? Explain that in ancient times there were also people living in caves. Why did people draw and paint on the walls of caves/mines in the ancient times? 2. PART TWO (Introducing new visual and other concepts, artistic creation.) Explain to the pupils that they will be working in groups, creating together in large format (black canvas) using wax crayons. They will depict the animals living in the caves and the cave environment, either by their experience, memory or imagination. They will also answer the questions about who and what is hidden in the cave trenches. 3. FINAL PART (Discussing the creation of one joint product, how to bring it to the kindergarten and present it to children who have not participated at the workshop.) What could be done with the group art product? All group products are observed put together to present an even longer picture.		
Awaited educational results	Developing artistic expression that comes from experiencing space and talking about mining heritage and cave art. Expressing individual's creativity through teamwork.		
Signature			

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VIRTUALMINE WORKSHOP SCENARIO

Workshop title	From Exploration to Exploitation: A Mineral Adventure		
Main objective / objectives	Familiarization of undergraduate students with the concepts of Mineral Research and the Exploitation of a given ore deposit		
Key words (2-5)	Mineral Exploration, Mine Exploitation		
Target age group	7 – 12 -16 ☐	19 -24 ☒	
Duration divided into stages	120 minutes (30 + 15 + 75)		
Teaching methods and tools used	Educational Presentation, Interactive exercise	Teaching aids	A computer wirelessly connected to an overhead projector, mobile smartphones or laptops owned by the students http://www.geostatistics.eu/introduction.html# http://www.geostatistics.eu/exercise.php
Detailed course of workshop divided into stages	I. Lead in In this part of the class, students are first presented a brief historical chronicle of mining from the stone age up to date and then they are introduced to the concepts of mineral exploration and mining. The underlying concept is that mining is an activity related to the development of the mankind and therefore it should follow the needs of the society, not only regarding its secure supply of raw materials but also its commitment for environmental protection. II. Presentation of the interactive game by the instructor After the introduction on the basic principles of minerals exploration and exploitation, the students are introduced to the interactive exercise which is in the form of an online entrepreneurship game. The operational environment is developed in a network application, where the participants, through their computer or smart phone, are invited to play the geoscientist's role and direct mineral research activities from the preliminary research phase to the possible exploitation of the orebody. More specifically, the participants undertake the exploration of an area where there are indications of presence of an orebody of economic interest. An overview of the recorded experience of similar exploitations in the wider region reveals the a priori probability of existence of a deposit, as well as its expected size. Because this probability is not satisfactory, and in order to increase the information on the existence or not of a deposit, there is the possibility to conduct a geophysical survey of the subsoil, which, as also shown by the experience in the wider area, has a certain credibility. If decided to proceed to the next stage of main investigation, funding for exploration drilling should be sought. The amount of funding, and ultimately the number of boreholes that can be executed, will depend on the final probability of finding a deposit. This probability will have to be calculated based on the results of the survey so far.		

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	However, in any case, the probability to be reported to the sponsor will be examined by an independent researcher for a crosscheck. In case of a dispute, there will be a pecuniary penalty, which will reduce the number of drillings available. Drilling takes place on a predetermined square grid. After a drilling has been carried out, the value of the useful ingredient content will be assigned to the entire block. The survey should end with ore reserves estimation. The grade of a block is calculated as the average of the samples surrounding it. Upon completion of the survey, and if results are encouraging, the user has the possibility to proceed with the exploitation of the field. In this case, economic data are given, concerning the marginal content of the useful ingredient, the price of the ore, its specific weight and the extraction costs of each block. By selecting a block, the user proceeds automatically to the mining and then to forward it for further processing and sale, if its actual content exceeds the marginal value, or, if it is not, to store it in a stockpile. Up to all blocks can be mined, but the user should also keep track of his current balance. He can stop the operation at any time, so he will be informed about his performance score. The final score of each participant will be determined according to the profit from the sale of the ore he has mined in relation to the best he could have achieved. Finally, he has the opportunity to enter his score in a list, where he competes with the rest of the participants to get the best position. III. Involvement of students Following the introduction to the exercise/game, the students were able to play using their mobile phones or computers and register their score. Most of the students actively participated by playing the game on their mobile phones and the ability to register their scores on the high-score board gave an extra incentive to their participation. Overall, we registered a significantly higher degree of involvement with respect to traditional educational tools (e.g. slides etc.).
Awaited educational results	Students will possess knowledge about mining, its history and contemporary status. Students will understand the procedure of mineral exploration. Students will understand the processes of setting up a mine. Students will develop basic engineering thinking, decision making and hey will also practice management and economics.
Signature	

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