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Programme Your Future

COMPUTATIONAL THINKING - LESSON SCRIPT

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Lesson information:	Subject:	Biology
	Duration:	45 min
	Grade/level:	3rd grade of middle school / 8th grade of primary school
	Age:	15
	Topic:	From seed to seed. From flowering to dormant seed. The whole topic consists of 3 subunits: 1) From dormant seed to burgeoning seed 2) From burgeoning seed to flowering 3) From flowering to dormant seed. On the basis of the cycle of decomposed topics students can see that Biology is a cycle of transitions. These topics are an example of decomposition method "divide and win" and infinite loop in programming.
The curriculum specifications and requirements:	The core curriculum of Biology for the 3rd educational stage V. Structure and functioning of vegetative organism on the basis of angiospermae plant. Pupil: 2) identifies (for example on the diagram, photo, picture or on the basis of a description) and describes organs of angiospermae plant (root, shoot, stem, leaf, flower, fruit) and shows their functions; 4) differentiates elements of how flower is built (perianth: epicalyx, crown petals and plant ovaries, androecium) and determines their role in reproduction. Since 2017 the core curriculum of teaching Biology in grades 5th- 8th: 4) Angiospermae. Pupil: c) identifies organs of angiospermae plant and describes their external structure and functions (root, stem, leaf, flower, fruit), k) performs observation of phases of development of a plant.	
The aims of the lesson:	Pupil: • Recognizes and gives the names of organs in burgeoning bean's seed • Names organs which build angiospermous flower	

	• Names vegetative and generative organs in flower • Knows the role of vegetative and generative organs • Consolidates terminology: seed coat, skin, endosperm, nutritional tissue, stem, seed leaf, root, flower, mark, ovary, germ • Points: endosperm, seed coat, seed leaf • Knows the meaning: stem, endosperm, seed leaf, root, flower, ovary, pistil.
Previous knowledge:	• knows names of organs of flower • Identifies organs that build flower • Knows the role of flowers.
The forms of work:	• individual work, • group work
The methods of work:	• observation, • experimenting, • informal discussion, • modeling, • "divide and win" – decomposition method
Teaching aids:	computer with the access to the Internet, interactive board or projector, natural samples of flowers, magnifying glasses, bristol board
The range of using ICT:	• observation of nature • presenting the knowledge • presenting and processing information
The course of lesson: • **Teacher activities** • **Pupil activities** • **The schedule**	1. Introduction - organisational activities. Greeting the pupils, checking the register, giving the topic of the lesson and introducing the aims of the lesson **5 min** 2. The teaching of computational thinking. Students read presented extract on interactive whiteboard https://pl.wikipedia.org/wiki/Kwiatostan and search for answers: What is a flower? What is inflorescense? and take notes. On the basis of the second presented picture https://www.bing.com/images/search?q=kwiaty+kwiatostany&FORM=HDRSC2 points flowers and inflorescence. Students can define conclusion that flower is a single organ and inflorescence is a group of flowers. Students recognize types of inflorescence https://www.epodreczniki.pl/reader/c/130053/v/latest/t/student-canon/m/iqyDTzu2wl#iqyDTzu2wl_d5e337 Students practice the skill of learning types of inflorescence. They draw in pairs types of inflorescence: bulb, spike, bunch, capitulum. Next teacher wants to see drawings of types of inflorescence. Recalling from the previous lesson: generative organs. Students show them on the picture: http://www.epodreczniki.pl/reader/c/130053/v/latest/t/student-canon/m/iqyDtzu2wl#iqyDtzu2wl_d5e477 Students do exercises 4 and 5 from e-textbook:

https://www.epodreczniki.pl/reader/c/130053/v/latest/student-canon/m/iqyDTzu2wl#iqyDTzu2wl_d5e477
Students analyze the process of pollination and fertilization in flower on the basis of picture from e-textbook: https://www.epodreczniki.pl/reader/c/130053/v/latest/t/student-canon/m/iqyDTzu2wl#iqyDTzu2wl_d5e477
Students predict what will happen in ovary after previous discussed processes and come to conclusions on the basis of pictures from e-textbook: https://www.epodreczniki.pl/reader/c/130053/v/57/t/student-canon/m/ii7vfgFEPJ_d5e201
Students experiment – from natural samples of flower they abstract pistil. They unfold mark, necking and ovary.
Students continue experimenting – they abstract germ from ovary.
Students work in groups. They create the structure of flower on Bristol board.
30min
3.Evaluation
The summary of lesson – exercise 6 from e-textbook. Inference – Biology is a cycle of related transitions.
10 min

Specific information:
- **Programs**
- **Links**
- **Etc**

Attachments:
- **Worksheets**
- **Programs**
- **files necessary**
- **Etc**