



Erasmus+  
Programme Your Future



## COMPUTATIONAL THINKING - LESSON SCRIPT

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| <b>Lesson information:</b> | Subject:     | Biology   |
|                            | Duration:    | 2x45 min  |
|                            | Grade/level: | 3 <sup>rd</sup> grade of middle school / 8 <sup>th</sup> grade of primary school  |
|                            | Age:         | 15  |
|                            | Topic:       | From seed to seed. From burgeoning seed to flowering.<br>The whole topic consists of 3 subunits:<br>1) From dormant seed to burgeoning seed<br>2) From burgeoning seed to flowering<br>3) From flowering to dormant seed.<br>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. |

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| <b>The curriculum specifications and requirements:</b> | <p>The core curriculum of Biology for the 3<sup>rd</sup> educational stage</p> <p>V. Structure and functioning of vegetative organism on the basis of angiospermae plant. Pupil:</p> <p>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;</p> <p>4) differentiates elements of how flower is built (perianth: epicalyx, crown petals and plant ovaries, androecium) and determines their role in reproduction.</p> <p>Since 2017 the core curriculum of teaching Biology in grades 5<sup>th</sup> - 8<sup>th</sup>:</p> <p>4) Angiospermae. Pupil:</p> <p>c) identifies organs of angiospermae plant and describes their external structure and functions (root, stem, leaf, flower, fruit),</p> <p>k) performs observation of phases of development of a plant.</p> |
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| <b>The aims of the lesson:</b> | <p>Pupil:</p> <ul style="list-style-type: none"><li>• Recognizes and gives the names of organs in burgeoning bean’s seed</li><li>• Names organs which build angiospermous flower</li></ul> |
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- 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 the structure of bean's seed
  - Names individual elements of bean's seed
  - Points: rind, endosperm, germ.

- The forms of work:**
- individual work,
  - group work
  - pair work

- The methods of work:**
- Modeling,
  - observation,
  - work with e-textbook,
  - "divide and win" decomposition method

**Teaching aids:** For teacher: computer with the access to the Internet, interactive board or projector

For students: the ICT classroom with the access to the Internet (one computer for two students or tablets)

- 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.

Stating the problem: „How is a burgeoning bean's seed built?“. Pupils look at picture 5 from e-textbook. It shows stages of burgeoning seed:

[http://www.epodreczniki.pl/reader/c/130053/v/latest/t/student-canon/m/ii7vfgFEPJ#ii7vfgFEPJ\\_d5e613](http://www.epodreczniki.pl/reader/c/130053/v/latest/t/student-canon/m/ii7vfgFEPJ#ii7vfgFEPJ_d5e613) They point: rind, endosperm, leaves, seed leaf.

Here comes the problem: What is the first to come from the burgeoning bean's seed? Pupils analyse the picture and think about the answer (root). As a summary pupils do exercise 4 from e-textbook:

[https://www.epodreczniki.pl/reader/c/130053/v/57/t/student-canon/m/ii7vfgFEPJ#ii7vfgFEPJ\\_d5e1000](https://www.epodreczniki.pl/reader/c/130053/v/57/t/student-canon/m/ii7vfgFEPJ#ii7vfgFEPJ_d5e1000)

Pupils read the fragment presented on the interactive whiteboard:

<https://eszkola.pl/biologia/organy-wegetatywne-3506.html>. Then teacher asks them to write a short note into their notebooks.

The teacher presents next illustration and states the problem: Your task is to show vegetative and generative organs

<https://www.epodreczniki.pl/reader/c/130053/v/latest/t/student->

[canon/m/iqyDTzu2wI#iqyDTzu2wI\\_d5e196](http://www.bing.com/images/search?view=detailV2&ccid=7Cff6f00&id=026297BA73C0599B57D5EDEF354D48D898657C29&thid=OIP.7Cff6f00DsCRnwA-Ra9JWAEScy&q=budowa+kwiatu+okrytnasiennych&simid=608013362145856818&selectedIndex=14&ajaxhist=0)

The teacher describes the structure of angiospermous flower:

<https://www.bing.com/images/search?view=detailV2&ccid=7Cff6f00&id=026297BA73C0599B57D5EDEF354D48D898657C29&thid=OIP.7Cff6f00DsCRnwA->

[Ra9JWAEScy&q=budowa+kwiatu+okrytnasiennych&simid=608013362145856818&selectedIndex=14&ajaxhist=0](https://www.bing.com/images/search?view=detailV2&ccid=7Cff6f00&id=026297BA73C0599B57D5EDEF354D48D898657C29&thid=OIP.7Cff6f00DsCRnwA-Ra9JWAEScy&q=budowa+kwiatu+okrytnasiennych&simid=608013362145856818&selectedIndex=14&ajaxhist=0)

**40min**

3. Students open an application in Scratch on their computers

<https://scratch.mit.edu/projects/236566489/> and they square an animation away.

**30min**

4. Evaluation:

Exercise from e-textbook – checking whether pupils know how the flower is built: [http://www.epodreczniki.pl/reader/c/130053/v/latest/t/student-canon/m/iqyDTzu2wI#iqyDTzu2wI\\_d5e877](http://www.epodreczniki.pl/reader/c/130053/v/latest/t/student-canon/m/iqyDTzu2wI#iqyDTzu2wI_d5e877)

**10 min**

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**Specific information:**

- Programs
- Links
- Etc

Materials on <http://www.epodreczniki.pl> available under GNU GPL licence (CC BY 3.0 Poland)

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**Attachments:**

- Worksheets
- Programs
- files necessary
- Etc

<http://content.epodreczniki.pl/content/womi/54106/classic-980.png>  
<https://scratch.mit.edu/projects/236566489/>

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