



Erasmus+  
Programme Your Future



## COMPUTATIONAL THINKING - LESSON SCRIPT

---

<b>Author information:</b>	Name:	Izabela Giergiel
	School:	Primary School no 4 under the name of Maria Konopnicka in Sieradz, Poland

---

<b>Lesson information:</b>	Subject:	Chemistry
	Duration:	2x45 min
	Grade/level:	7th grade of primary school/2nd educational stage
	Age:	13-14
	Topic:	Percentage concentration of solution.

---

**The curriculum specifications and requirements:** The core curriculum of teaching Chemistry for the 3<sup>rd</sup> educational stage. Point no. 5. Water and hydrous solutions.

---

**The aims of the lesson:** Pupil:

- do calculations with the use of concepts: percentage concentration, mass of substance, mass of solvent, mass of solution, density of solution,
- calculates percentage concentration of saturated solution in given temperature (with the use of table of solubility or chart of solubility)

---

**Previous knowledge:** Water and hydrous solutions. Pupil:

- defines idea of solubility; reads solubility of substance from table of solubility or from chart of solubility;
- calculates the amount of substance that can be dissolved in given amount of water in given temperature; gives examples of substances that don't dissolve in water and examples of substances that dissolve in water creating proper solutions; gives examples of substances that make colloidal solutions and suspensions;
- tells difference between saturated and unsaturated solution.

---

**The forms of work:**

- working in pairs
- individual work

---

**The methods of work:**

- practical method

---

**Teaching aids:**

- computer with the access to the Internet (one computer for two students),
- teacher's computer with projector and interactive board.

---

**The range of using ICT:**

- practicing and consolidating the skill of calculating
- presenting information
- searching for information

---

**The course of lesson:**

- Teacher's activities
- Pupils' 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. Reminding information about solutions and their division. Teacher opens website [www.learningapps.org](http://www.learningapps.org) and asks students to choose category chemistry and search for entry: water and hydrous solutions. Students do exercises: water as solvent (<https://learningapps.org/1195276>), proper solution and colloidal solution and suspension (<https://learningapps.org/1847603>) and kinds of solutions (<https://learningapps.org/4753030>). After some time teacher displays app on the interactive board and asks to solve a few tasks. Students check correctness of their answers.

**15 min**

3. Teacher enters website [https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv\\_d5e171](https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv_d5e171) and gives information about content of components. Next teacher enters formula for percentage concentration and opens website [https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv\\_d5e171](https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv_d5e171). Teacher discusses exemplary tasks concerning percentage concentration of solution with given mass and mass of dissolved solution. Teacher transforms formula for percentage concentration of solution and gives formulas to calculate mass of dissolved substance and mass of solution ([https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv\\_d5e339](https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv_d5e339)). Later teacher explains how to calculate mass of substance needed to prepare solution with given concentration [https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv\\_d5e339](https://epodreczniki.pl/reader/c/141001/v/latest/t/student-canon/m/iTyYZpziNv#iTyYZpziNv_d5e339).

**10 min**

4. Students do exercises with mathematical calculations [http://calcoolator.pl/stezenie\\_procentowe\\_wagowe.html](http://calcoolator.pl/stezenie_procentowe_wagowe.html)

Students have to do 3 exercises:

Ex 1

There is 15 g of salt in 150 g of solution. Calculate percentage concentration of solution.

Ex 2

Calculate how many grams of sugar must be dissolved in water to get 200g of solution of 3% concentration.

Ex3

Student dissolved 50g of salt in 150cm<sup>3</sup> of water. Calculate percentage concentration of this solution.

( density of water is 1g/cm<sup>3</sup>).

Students can use app added to the script to check their calculations.

<https://onlinegdb.com/HJY-XjXNX>

Teacher shows app on his computer and asks to start it. Students enter the

---

data.

**15 min**

5. Stating the problem: testing app in Scratch program

<https://scratch.mit.edu/projects/237177692/> – a calculator used to calculate percentage concentration of substance. Pupils' discussion:

a) what kind of information is needed to create such app? (mass of substance, mass of solution)

b) what should be the effect of action of such app? (calculation of percentage concentration of substance)

c) what formulas should be used to make that program work?

d) what should be the sequence of activities in the program (algorithm)?

Students test the accuracy of app in pairs. They enter test examples, search for and correct errors.

**30 min**

6. Evaluation

After scheduled time teacher checks improved apps and displays them on the screen. Students check correctness of this task by entering test examples.

**15 min**

---

**Specific information:**

- Programs
- Links
- Etc

Students can use app added to the script to check their calculations

<https://onlinegdb.com/HJY-XjXNX>

Teacher shows the app on the computer and asks to activate it (click Run) . Students enter the data.

Google maps: [www.google.com/maps](http://www.google.com/maps)

All materials on e-podreczniki.pl are available under CC-BY 3.0 license.

---

**Attachments:**

- Worksheets
- Programs
- files necessary
- Etc

<https://onlinegdb.com/HJY-XjXNX>

<https://scratch.mit.edu/projects/237177692/>

---