



## Methodology book

<p><b>Habit – Resolve</b></p>	<p>Description and importance in school:          One of the main difficulties that students of our school cluster have is gathering strategies to solve problems. In an inquiry addressed in the beginning of this project both students and teachers found that resolve is one of the 6 most important habits to achieve success.</p> <p>This activity aims to help improving this skill and the understanding the meaning of the following terms: habit, resolve, purpose, determination, action, solution, resolute.</p> <p>Webster’s dictionary defines resolve as: the fixity of <b>purpose</b> ; a legal or official <b>determination</b>; a resolution or determination made, as to follow some course of <b>action</b>; firmness of purpose or intent; determination in <b>finding a solution</b>; a firm determination to do something; formal strong determination to succeed in doing something; the trait of being <b>resolute</b> according to the vocabulary.com.</p> <p>Problem Solving is a teaching methodology that provides a mobilization of knowledge to find the solution to a problem. In this process, the student learns to plan strategies, reason and check if his strategy is valid, which promotes significant learning.</p>
<p><b>Activity/Game</b></p>	<p><b>My kitchen is a mess!</b></p>
<p><b>Age /year of school</b></p>	<p>10-14 years /junior high school</p>
<p><b>Duration</b></p>	<p>15min (planning) + 1h (execution of the plan)</p>
<p><b>Resources and materials</b></p>	<ul style="list-style-type: none"> <li>- Planning sheet;</li> <li>- Materials: clips, coarse salt, beans and sand;</li> <li>- Laboratory material from the different separation methods: magnetism, sifting, filtration, solvent extraction and evaporation.</li> </ul>

<p><b>Specific description</b></p> <p>lesson plan step by step</p>	<p><b>Step 1 - Presentation of the problem</b></p> <p>John was home alone during the Covi-19 school closure time. As he was missing the experimental classes of chemistry, he decided to do some experiments in the chemistry laboratory of his house, the kitchen.</p> <p>He mixed various materials at random in a container. He started by adding salt to some clips he had on his desk, then added some beans and finally went to get a piece of fine sand from his terrace.</p> <p style="text-align: center;"><b>Clips + coarse salt + beans + fine sand</b></p> <p>And mixed, stirred to see what happened. He came across a very strange mixture!</p> <p>He remembered that her mother would not like to see the mess he had made in the kitchen when she got home. And even if he threw everything in the trash, the mother was sure to notice that he had spent clips, beans and salt.</p> <p>John started to imagine a plan to separate all the components of the mixture and in the end to be able and put it in the right place without his mother noticing anything.</p> <p>How do you think John got it?</p> <p><b>Step 2 - Guidelines for solving the problem</b></p> <p>Do like John, establish a plan following the following steps:</p> <ol style="list-style-type: none"> <li>1. <u>Define the problem</u> <ul style="list-style-type: none"> <li>- write a list of what you know about the problem and identify the knowledge you will need to understand (and eventually solve it);</li> <li>- after you have a list of what you know, identify what you still don't know about the problem.</li> </ul> </li> <li>2. <u>Think about the problem</u> <ul style="list-style-type: none"> <li>- reflect on the problem;</li> <li>- gathers relevant information about the knowledge involved in solving the problem.</li> </ul> </li> <li>3. <u>Plan a solution</u> <ul style="list-style-type: none"> <li>- consider possible strategies;</li> <li>- choose the best strategy.</li> </ul> </li> <li>4. <u>Put the plan into action</u> <ul style="list-style-type: none"> <li>- be patient - the problem is not always solved on the first attempt;</li> <li>- be persistent - if the plan doesn't work immediately, don't give up and try a different strategy.</li> </ul> </li> </ol>
--	---

5. Reflect on what has been done

- after finding a solution, you should ask the following questions:

- . does the solution make sense?
- . did I answer all the questions?
- . what did I learned from this process?
- . could I have solved the problem in another way?

**Motion for a resolution**

1. Define the problem - Separate the components of a mixture. Find answer to the following questions: what is a mixture?; what types of mixtures exist ?; what are the separation methods? ...;
2. Think about the problem - Collect information about mixtures, types of mixtures (heterogeneous, homogeneous and colloidal) and methods of separating the different components of a mixture;
3. Plan a solution - Define the best strategy and plan (see attached sheet);
4. Put the plan into action – Now, that you know how you're going to make your plan and the material you need, put your plan into action and start separating the components of the mix.
5. Reflect on what was done - evaluate the result, check if all the components were separated from each other and think if you could have solved the problem using another sequence of the processes for separating the components of the mixture.

