| Smart Education.Explore CLIL by using Robotics.<br>By Andrzej Szczepanek | |
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| **Topick:** | Food - building material and source of Energy |
| **Age:** | 15 |
| **Time:** | 45min |
| **Competences:** | … |
| **Aim of this lesson:** | • Provide the names of the essential nutrients<br>• stressing the importance of healthy eating<br>• conducting experiments |
| **Introduction:** | • Presentation of the aims of the lesson<br>• Talking about the term ‘nutricion’/brainstorming<br>(What is the importance of carbohydrates, proteins, fats, vitamins, minerals and water in the proper functioning of the body?/Indication of the sources of individual nutrients/Detection of starch, proteins and fat in various foods, protein denaturation, detection of vitamin C in fruit juice) |
| **Tools:** | • interactive whiteboad/screen<br>• projector<br>• a computer<br>• PPT Presentation<br>• real food |
| **Process** | |
| | **Step 1** 10 min |
| | A teacher shows a short presentation on the importance of nutrients. |
| **Teachers notes** (if needed) | |
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| | **Step 2** 30 min |
| | After the presentation students do some experiments, thanks to which they can find out what nutrients are contained in the foods we eat. |
| **Teachers notes (if needed)** | **Experiment 1**: Detection of starch in various food products<br>Research problem: Do the tested products contain starch?<br>Hypothesis: Yes, all products contain starch.<br>Equipment: Petri dishes, dropper<br>Aids: iodine, banana, potato, pasta, apple, cucumber, egg, potato flour,<br>Performance of the experiment: |

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| | Put all food products on Petri dishes. Add 2-3 drops of iodine and observe the color changes.<br><br>**Observations:**<br><br>a. potato flour with the addition of iodine has the color .....<br><br>b. banana pieces with the addition of iodine have the color .....<br><br>c. pieces of potato with the addition of iodine have the color .....<br><br>d. pieces of apple with the addition of iodine have the color .....<br><br>e. pieces of cucumber with the addition of iodine have the color .....<br><br>f. pieces of egg with the addition of iodine have the color .....<br><br>g. pasta with the addition of iodine has the color .....<br><br>Proposal/conclusion: hypothesis confirmed or rejected |
| | **Experiment 2:** Detection of fats in food products<br>Research problem: What products contain fats?<br><br>Hypothesis: Only some products contain fats<br><br>Equipment: white sheets of paper, a hammer<br><br>Aids: sunflower seeds, peanuts, hazelnut seeds, apple, egg, almonds, yellow cheese<br>Performance of the experiment:<br><br>Put each product into a separate sheet of paper and crush it. We observe oily spots left on the pages. Check which products have left fat spots.<br><br>Observations:<br><br>Product: Sunflower Seeds PeanutsHazelnut Seeds Egg Almonds Yellow Cheese Apple<br><br>Fat spots<br><br>Proposal/conclusion: hypothesis confirmed or rejected |
| | **Experiment 3** Detection of protein in products.<br><br>Research problem: What foods contain protein?<br><br>Hypothesis: Only some products contain protein.<br><br>Equipment: test tubes, teaspoon<br><br>Aids: potato flour, egg white, white cheese, vegetable oil, sugar, nitric acid<br><br>Performance of the experiment:<br><br>We put every food in the tube. Then we add a few drops of nitric acid to each tube and observe the color change.<br><br>Observations:<br><br>Conclusions: hypothesis confirmed or rejected |

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| | **Experiment 4** Detection of vitamin C in fruit juice<br><br>Research problem: Does lemon juice contain vitamin C?<br><br>Hypothesis: Lemon juice contains vitamin C.<br><br>Aids: starch gruel, iodine, lemon juice, a dish with tap water, two glasses, a spoon, a dropper.<br><br>Performance of the experiment:<br><br>1. Fill two glasses halfway with tap water. Add a spoonful of starch gruel to both and mix the contents.<br><br>2. Add a drop of iodine to each glass. The color will turn dark blue.<br><br>3. Then add a few drops of lemon juice to one glass.<br><br>Result: Compare the glasses. Check the color of each glass.<br><br>Proposal/conclusion: hypothesis confirmed or rejected |
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| **Step 3** | 5 min |
| Summary<br>Teachers gives students envelopes containing phrases about the nutrients, their role and sources. Students have to paste them in the appropriate places in the table. | |