

## We are the makers – Smart home I

Activity elaborated by WeMakers Romania team in collaboration with Gabriel State, Physics teacher

<b>1. Title of the Scenario</b>	<b>Smart home – Gas leakage monitoring and control system</b>
<b>2. Target group</b>	10 - 18 years
<b>3. Duration</b>	min. 2 hours
<b>4. Learning needs</b>	<ul style="list-style-type: none"> <li>- Basic electronics knowledge</li> <li>- Basic programming knowledge</li> </ul>
<b>5. Expected learning outcomes</b>	<ul style="list-style-type: none"> <li>- Understanding the concept of smart home</li> <li>- Forming an algorithmic way of thinking</li> <li>- Developing skills for using and understanding the operation of electronic circuits and making connections between them</li> <li>- Creating teamwork skills</li> </ul>
<b>6. Methodologies</b>	<ul style="list-style-type: none"> <li>- Project based learning</li> <li>- Inquiry based learning</li> <li>- Cooperative learning</li> <li>- Heuristic conversation</li> </ul>
<b>7. Place / Environment</b>	Computer/Physics lab
<b>8. Tools / Materials / Resources</b>	<ul style="list-style-type: none"> <li>- projector;</li> <li>- S4A or Snap4Arduino (10-14 years) or IDE ARDUINO (15-18 years)</li> <li>- Arduino UNO, gas sensor buzzer, (GSM module for older students), servomotor – one set for each group of students</li> <li>- printed instructions;</li> </ul>
<b>9. Step by step description of the activity / content</b>	<p>Lesson 1</p> <ul style="list-style-type: none"> <li>- Presentation of smart home concept and the future possible developments</li> <li>- Students will search on Internet examples of applications for smart homes which they will present to their colleagues</li> <li>- Presentation of programming environment S4A/Snap4Arduino / Ide Arduino and how to implement the project with the help of printed guide</li> </ul> <p>Lesson 2</p> <p>Implement the project by completing the following steps</p> <ol style="list-style-type: none"> <li>1. Making electrical connections according to written instructions</li> <li>2. Writing the code (including a user interface created in S4A/Snap4Arduino)</li> <li>3. Verify the functionality of the project and solve any hardware or software errors</li> </ol> <p><i>Obs. More experienced students in using Arduino and coding may use their imagination and create their own version of a gas leakage monitoring and control system</i></p> <ul style="list-style-type: none"> <li>- Discussion – Identification of other application which can be done using the same hardware platform</li> </ul>
<b>10. Feedback</b>	The students from each group will present their project to the class
<b>11. Assessment &amp; Evaluation</b>	Final project evaluation: functionality and creativity