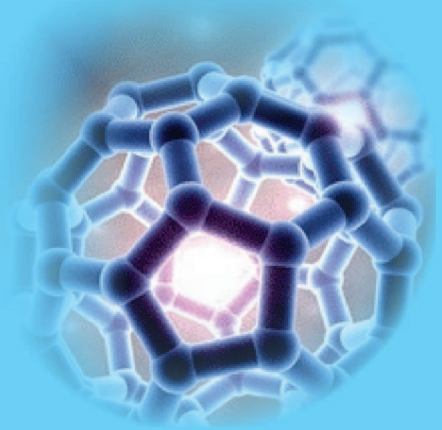
5

We build the designed innovative product



5.1. ASSEMBLING THE PRODUCT COMPONENTS

You've just designed your system. Now it's the time to implement it. The first step consists of the acquisition of materials, devices and components. Start by fitting out your Arduino board and follow the instructions you have described in the wiring schemes and lists.

Remember that if you have forgotten any component or wire, now it's the time to fix it in the spreadsheet, block diagram and connections in order to keep the last version always available. Take it as a trial and error process until the system will be completely finished with the more appropriate components and wiring according to your purposes.

Once you have achieved your hardware definitive version, take a picture of your system and paste it in the following space in your notebook or upload it to your platform space.

5.2. COMPILING SOFTWARE

Set up the appropriate software utilities in the computer you will use to manage your Arduino software. Then, connect Arduino board to the computer with an USB wire. You're ready to use the IDE development interface to write the source code to make your innovative product working.

Take into consideration the syntax rules you have studied in Technology for the Arduino programming language. Remember that the compiling bugs have to be solved before loading your Arduino program. Copy the source code you are developing in the following notebook text box or upload the text file to the digital platform. Update the file with the corrections as soon as you're fixing them.

The source code of our program is:

(Use this space to continue writing the code)

5.3. WHAT BUGS HAVE APPEARED AND HOW TO SOLVE THEM?

In the definition process of a program, the appearance of bugs is very common. Many mistakes are made even when the program has been correctly compiled. Annotate every time you detect an error (bug) and write what solution to apply. You can do this in your company spreadsheet, copying the template table shown below. Remember that solving errors is the best way to learn. Be patient and concentrate in solving problems. And if you find extra difficulties, ask your teacher for help.

Type of bug	Proposed solution	Observations

5.4. DOCUMENTING THE DEFINITIVE VERSION OF OUR PRODUCT

At this moment, you've just tested your Arduino based hardware as well as the software and it works ok according the requirements of the design.

Review the spreadsheet numbers, the wiring schemes and lists and the rest of documentation you have created along the process of design and implementation of your innovative product.

5.5. CALCULATING THE COST OF THE SYSTEM

To value how much your innovative system costs, so the materials cost as the labour workforce cost have to be calculated. To do this, copy the following table in your company spreadsheet. As you can see it is the same table than you use for the components list, in which we have added the columns about the costs. So, copy the components list and paste it in an additional sheet in which you only have to add the cost columns:

Item numb.	Topologic ref.	Physical Descript.	Amount	Unit cost	Total cost
1					
2					
…….					
n					
				Total cost sum	
				V.A.T. (_____ %)	
				Materials total sum	

Once you have calculated the cost of materials you have to calculate the cost of your labour workforce. To make the calculations easier, two types of data are going to be used. The first is how much a worked hour will cost. Take into account that this is a valuation of your work and it has to be a fair amount. Ask your teacher what amount is the more appropriate.

Secondly, you have to value how long each component of the company has been working in each of the project definition phases. Use the following template to estimate the worked hours by each member in your company. Finally, make the total sum of the individual hours and the total sum in the project..

Project phases	Innovative enterprise members					
	#1	#2	#3	#4	#5	#6
Hardware design						
Materials acquisition						
Hardware manufacturing						
Software design						
Program development						
Bugs fixing						
TOTAL PER MEMBER						

TOTAL PROJECT	
Cost / hour	
Labour workforce total sum	

The final cost of the project is …….. _____ €