

InnEscuela 3.0

Innovative Company
Notebook

This notebook belongs to:

I.E.S.: _____

COMPANY: _____

YEAR 20__ / 20 __

FOURTH COURSE ESO

This work has been developed in first edition in 2014 and in second edition in 2017 by:

- Manuel Blázquez Merino
- Federico Baeza Román

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To contact with the authors, send an email to manuel.blazquez@milnumb.com

General stages in InnoEscuela 4º ESO

First phase

1. Introduction to research

- 1.1. What do you think Research activity consists of?
- 1.2. Innovation sustained in Scientific and Technical Research Workshop
- 1.3. Do you think Research is necessary?
- 1.4. What is currently being researched that will change the world in 50 years?
- 1.5. If you were a scientific or technical researcher, what do you like to research?
- 1.6. Share your research interests.

2. Founding our innovative enterprise

- 2.1. We share our individual ideas
- 2.2. Introducing the innovative company And logging in the digital platform
- 2.3. Our responsibilities and commitments in the enterprise
- 2.4. We know about History of Science

3. Training as researchers to qualify for Innovation

- 3.1. We work the reverse engineering
- 3.2. A new perspective for researching: the remote lab

Second phase

4. We develop the design of our innovative product with Arduino

- 4.1. Arduino workshop: First steps
- 4.2. We describe the need we want to solve
- 4.3. Designing the system to solve the need
- 4.4. What components do we need to fit out with Arduino?
- 4.5. The wiring list and the wiring scheme
- 4.6. Writing software

5. We build the designed innovative product

- 5.1. Assembling the product components
- 5.2. Compiling software
- 5.3. What bugs have appeared and how to solve them?
- 5.4. Documenting the definitive version of our product
- 5.5. Calculating the cost of the system

Third phase

6. Spreading our innovative product in the web

- 6.1. HTML – CSS workshop
- 6.2. We create a web site with our brand image
- 6.3. Using our innovative enterprise blog
- 6.4. We think in other promotion ways for our product

7. We do our business plan

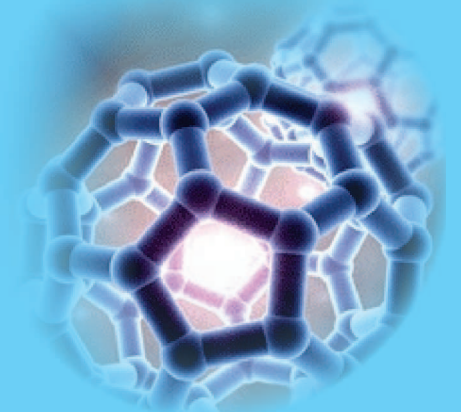
- 7.1. Researching the market: our target customers
- 7.2. What advantages do we want to transmit about our product?
- 7.3. We plan our product mass manufacturing
- 7.4. What is the economic profit we want to get?
- 7.5. Could we get financial support to implement our business plan?

8. Can we protect our innovative product?

- 8.1. Ideas protection workshop
- 8.2. What we want to protect and what we may not protect
- 8.3. Making the InnoEscuela patent document

1

Introduction to research



In this section, you will work the concept of Research and what the advantages of a Society to invest in Researching are.

1.1. WHAT DO YOU THINK RESEARCH ACTIVITY CONSISTS OF?

Write a brief article about what you think Researching is.

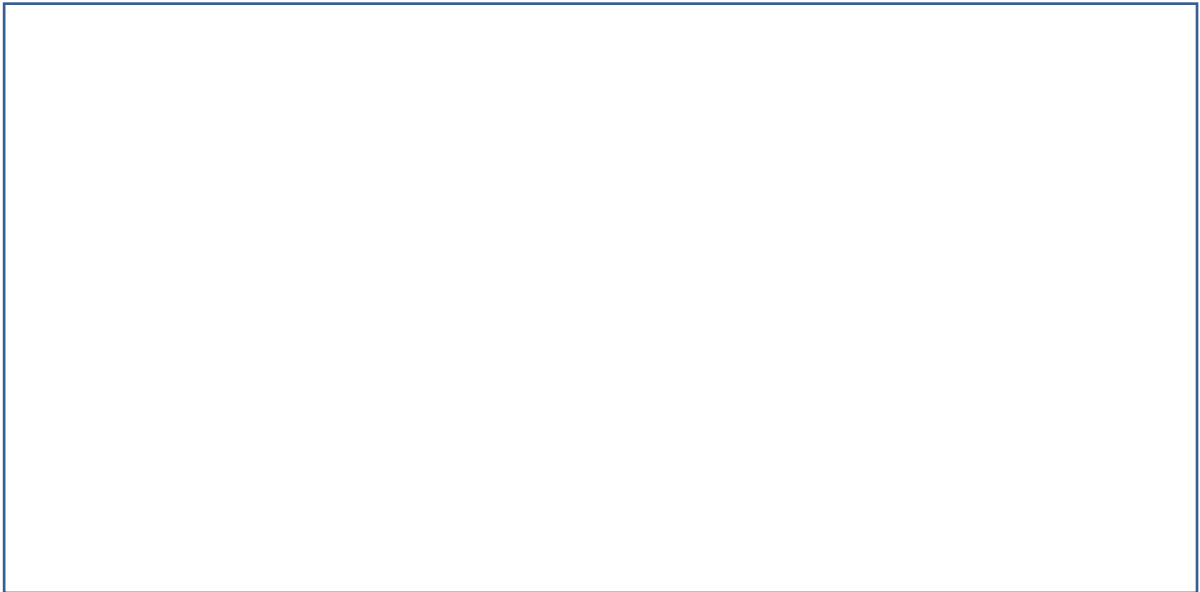
A large, empty rectangular box with a thin blue border, intended for the student to write a brief article about what they think researching is.

1.2. INNOVATION SUSTAINED IN SCIENTIFIC AND TECHNICAL RESEARCH WORKSHOP

Take a look with your teacher and classmates to the Innovation and Scientific and Technical Research Workshop. Once finished, remember to pass the test.

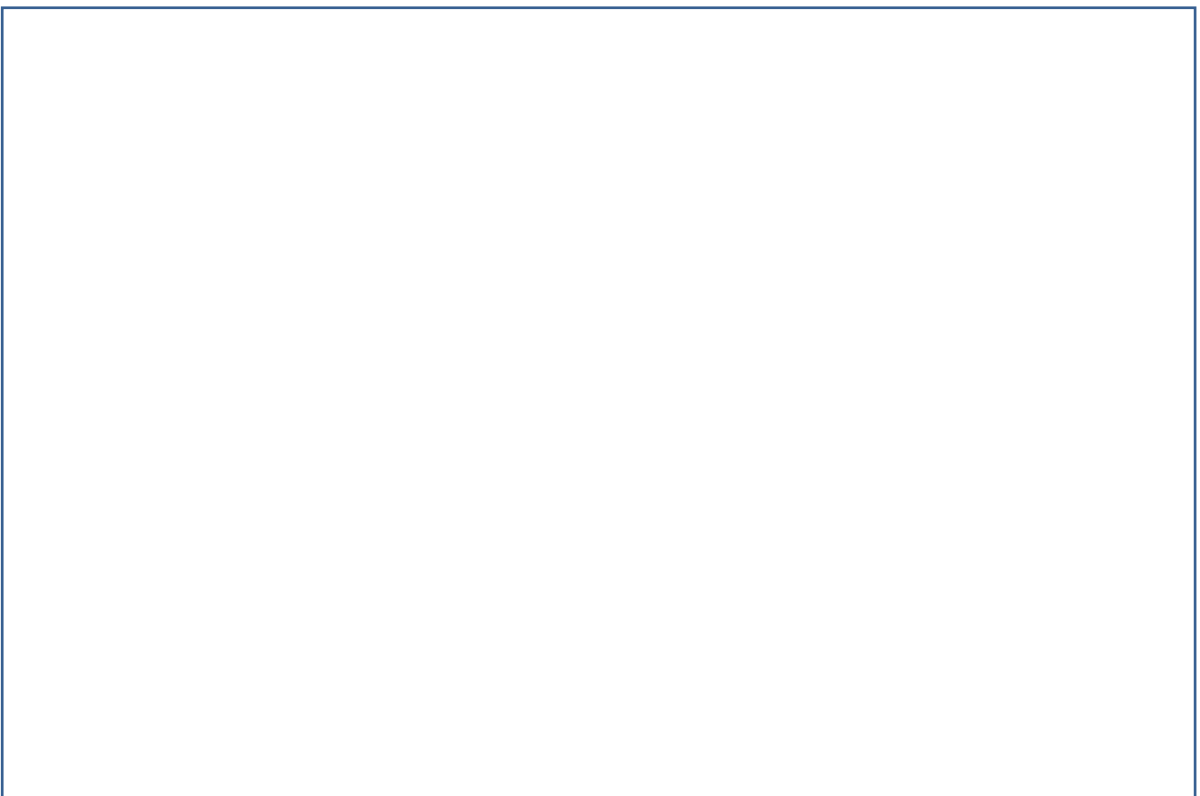
1.3. DO YOU THINK RESEARCH IS NECESSARY?

Search for information to know how much is invested in Spain in researching and what organizations invest in researching.



1.4. WHAT IS CURRENTLY BEING RESEARCHED THAT WILL CHANGE THE WORLD IN 50 YEARS?

Once you have made the Innovation and Research workshop, try a little imagination. Make a searching about what is currently being researched in different scientific and technical areas and try to think what would be the influence of them in the future Society in 50 years. Make a brief written work describing your ideas.



1.5. IF YOU WERE A SCIENTIFIC OR TECHNICAL RESEARCHER, WHAT DO YOU LIKE TO RESEARCH?



1.6. SHARE YOUR RESEARCH INTERESTS

Ask your classmates about their interest to research. Have you found some similarities with them? Who would you like to make a research company with? Make a template card like the following one, fill it up and put it on your clothes or your t-shirt in order to be visible for your classmates.

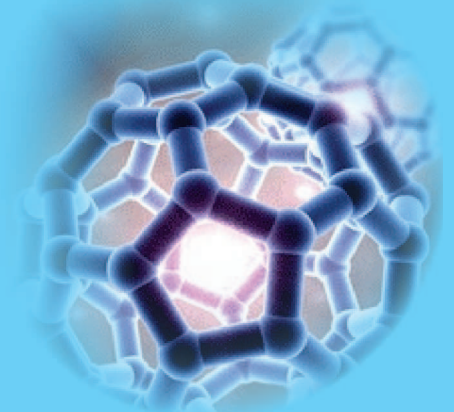
NOMBRE: _____

¿QUÉ AREA DE INVESTIGACIÓN ES LA QUE MÁS ME ATRAE?

¿QUÉ PRODUCTO INNOVADOR ME GUSTARIA DESARROLLAR?

2

Founding our innovative
company



When starting this section, you have already found some classmates with similar scientific and technical researching interest to yours. Incorporate the team as a company and discuss what you want to do together.

2.1. WE SHARE OUR INDIVIDUAL IDEAS

Make a big list of problems or needs and the ideas to solve them, from your personal list of what you want to research about and later to become an innovation.

A large, empty rectangular box with a thin blue border, intended for students to write their individual ideas and research interests. The box occupies most of the lower half of the page.

2.2. INTRODUCING THE INNOVATIVE COMPANY

Remember that the company will be made up of five or six members. What is your company name?

--

The company members' records

Name:	Last year I was studying in:			
What do I like to do in my free time?				

Name:	Last year I was studying in:			
What do I like to do in my free time?				

Name:	Last year I was studying in:			
What do I like to do in my free time?				

Name:	Last year I was studying in:			
What do I like to do in my free time?				

Name:	Last year I was studying in:			
What do I like to do in my free time?				

Name:	Last year I was studying in:			
What do I like to do in my free time?				

.... AND LOGGING IN THE DIGITAL PLATFORM.

Write your company profile and your data in the platform and annotate the date you will use in the future. This will be your company card.

COMPANY CARD

The names of each member/user in the company are

Name of the component	Name of the user

The company email is:

Company email	Mail password

Each company member's email:

Name of member	Member's email	Email password

The URL addresses for your company are:

Company blog URL address	
URL address for your web site	

Remember that the password to work with the blog and with the web site is the same than your company email.

2.3. NUESTRAS RESPONSABILIDADES Y COMPROMISOS EN LA EMPRESA

You've just incorporated a company, but a last step is left. Now you have to sign a contract for linking formally to the company members. Each of you has to determine your responsibilities and commitment and sign them. Think that you will have to make written documentation, drawings by hand, drawing by a computer, taking innovative decisions, building your own innovation and control if each step you give is the correct. Choose the role that better fits to your skills and distribute the responsibilities.

COMMITMENT CONTRACT

We, the undersigned, express our desire to be linked to form the company and indicate our agreement and tacit commitment to make decisions in the benefit of the enterprise.

Name	
Commitment	
Specialization area	
Signature and date	

Name	
Commitment	
Specialization area	
Signature and date	

Name	
Commitment	
Specialization area	
Signature and date	

Name	
Commitment	
Specialization area	
Signature and date	

Name	
Commitment	
Specialization area	
Signature and date	

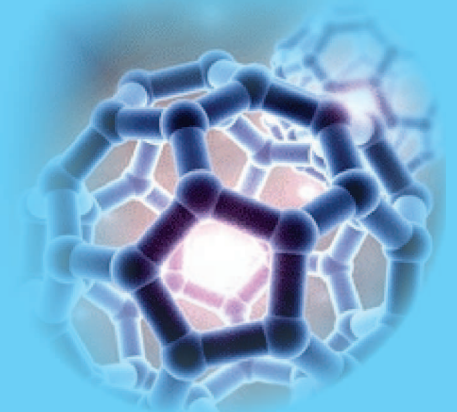
Name	
Commitment	
Specialization area	
Signature and date	

2.4. WE KNOW ABOUT HISTORY OF SCIENCE

What discoveries and researching milestones in Science and Technology do you think have been essential for Mankind in the last 500 years? Write about the Science areas in which the discoveries were carried out.

3

Training as researchers
to qualify for Innovation



3.1. WE WORK THE REVERSE ENGINEERING

Have you ever heard about the term “*Reverse Engineering*”? It seems a complex term but it actually has a very simple meaning. You have certainly applied reverse engineering sometime in your life when you have disassembled a toy or when you saw as an appliance was being disassembled to fix it. Reverse Engineering is a process used when you want to know the parts of a technical object or a computer program and that are coupled and together integrated.

In some cases, the object disassembly procedure is done without knowing how it operates. Thus, by observing each piece separately and their function within the set how the device works could be achieved to be understood. In the case of software, technicians, who apply Reverse Engineering to a software application, review the program, how it is encoded in low-level language, for instance, language used internally the machine, and encoding it in the high-level language that was originally written.

Today, information technology has evolved to the point you can scan the components of a technical object and treat them separately using CAD tools (Computer Aided Design). In this section, you must choose an object to be disassembled. It may be a little old appliance to be disposed at home, a toy that moves or makes sounds or lights, an old computer, or other similar object.

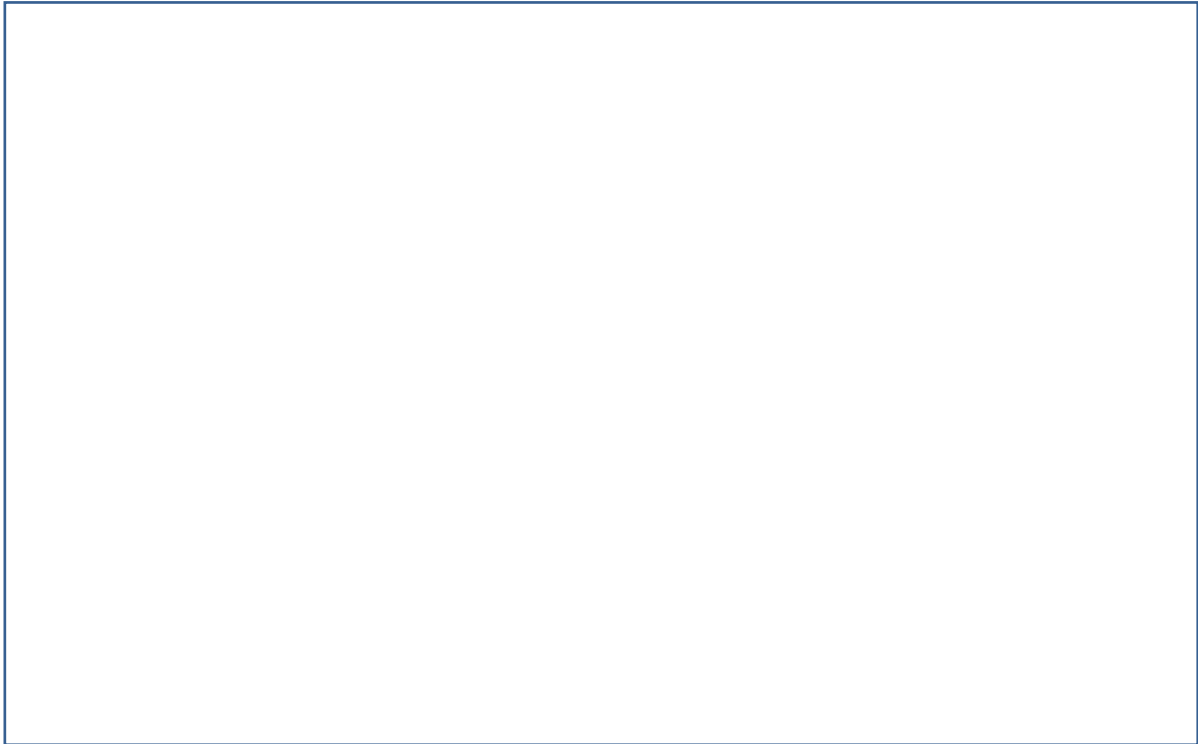
You must know that often, some companies make Reverse Engineering in order to copy a competence company’s creation. The simple fact of doing it cannot be considered as a fault, but surely the object could be protected by patent’s laws. In this case, if reverse engineering is done to copy and manufacture it as yours, you will be breaking law.

Now, choose an object you want to disassemble and take a picture. You can paste the picture in your company notebook or upload it to your digital company area. Once this is done, use the necessary tools (screwdrivers, wrenches, etc.) to make the dismantling in an organized way. Use the following table or your own company spreadsheet to organize the identification of each of the pieces. Note that many parts are standard, and can be purchased at any hardware or department store. However others have been manufactured specifically for a particular purpose, such as the case of racks, external parts, etc. In this case, you will need to draw each. You can use the templates that have technical drawings provided in this section or if digital drawing looks more interesting, use Inkscape to make the drawings and save views, perspectives and detail parts.

The object we have decided to apply Reverse Engineering to is:

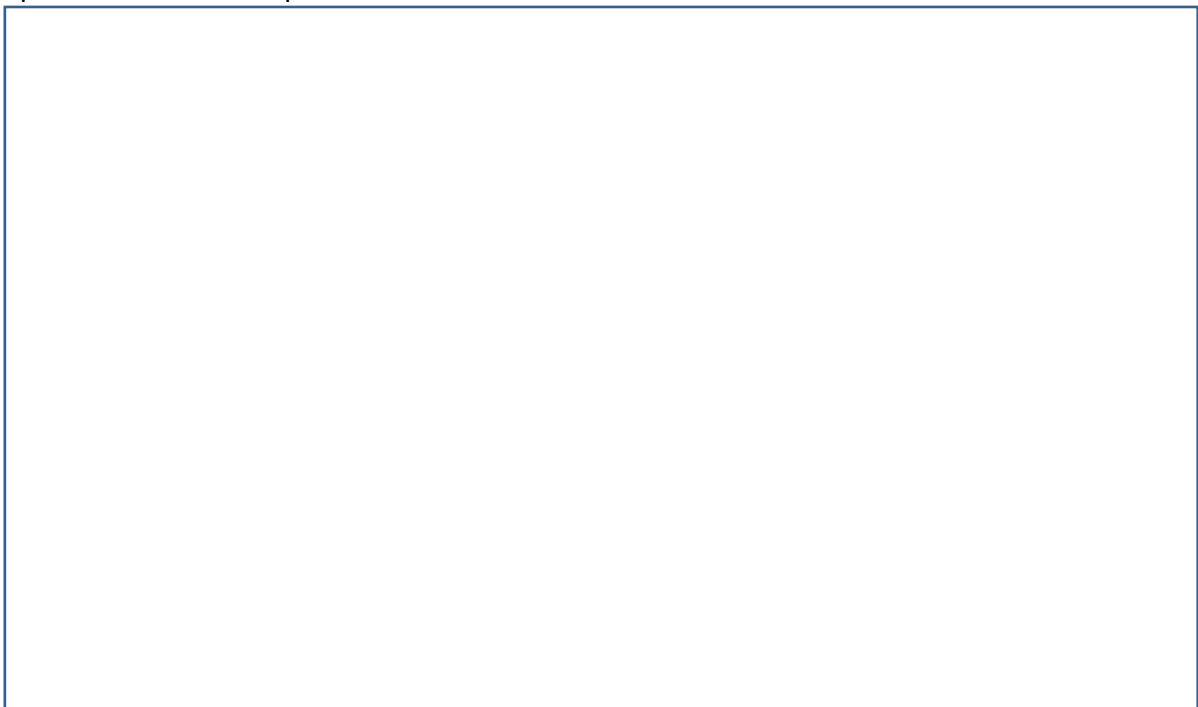
The object picture

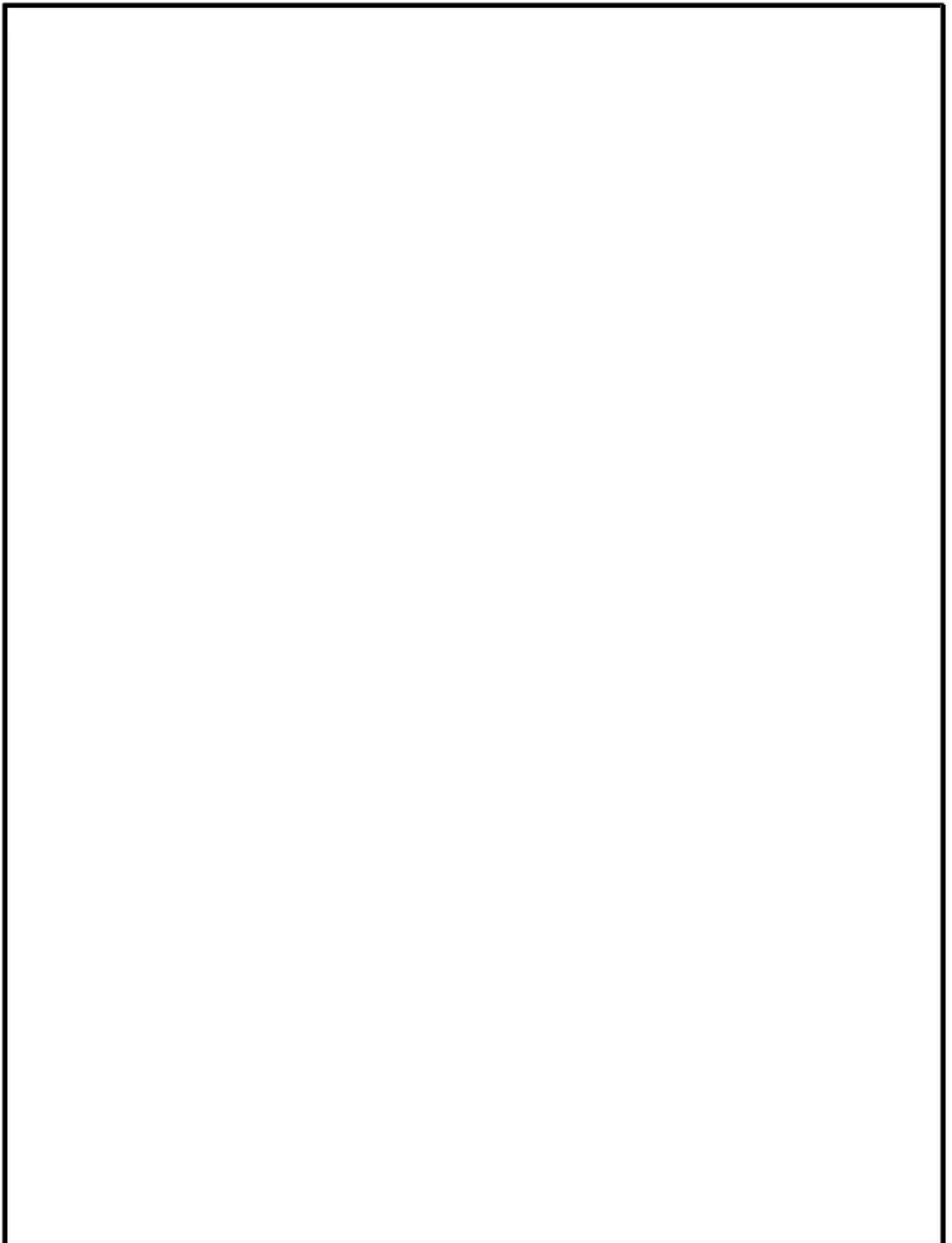
Paste here the picture of the object or upload the image file to the digital platform.



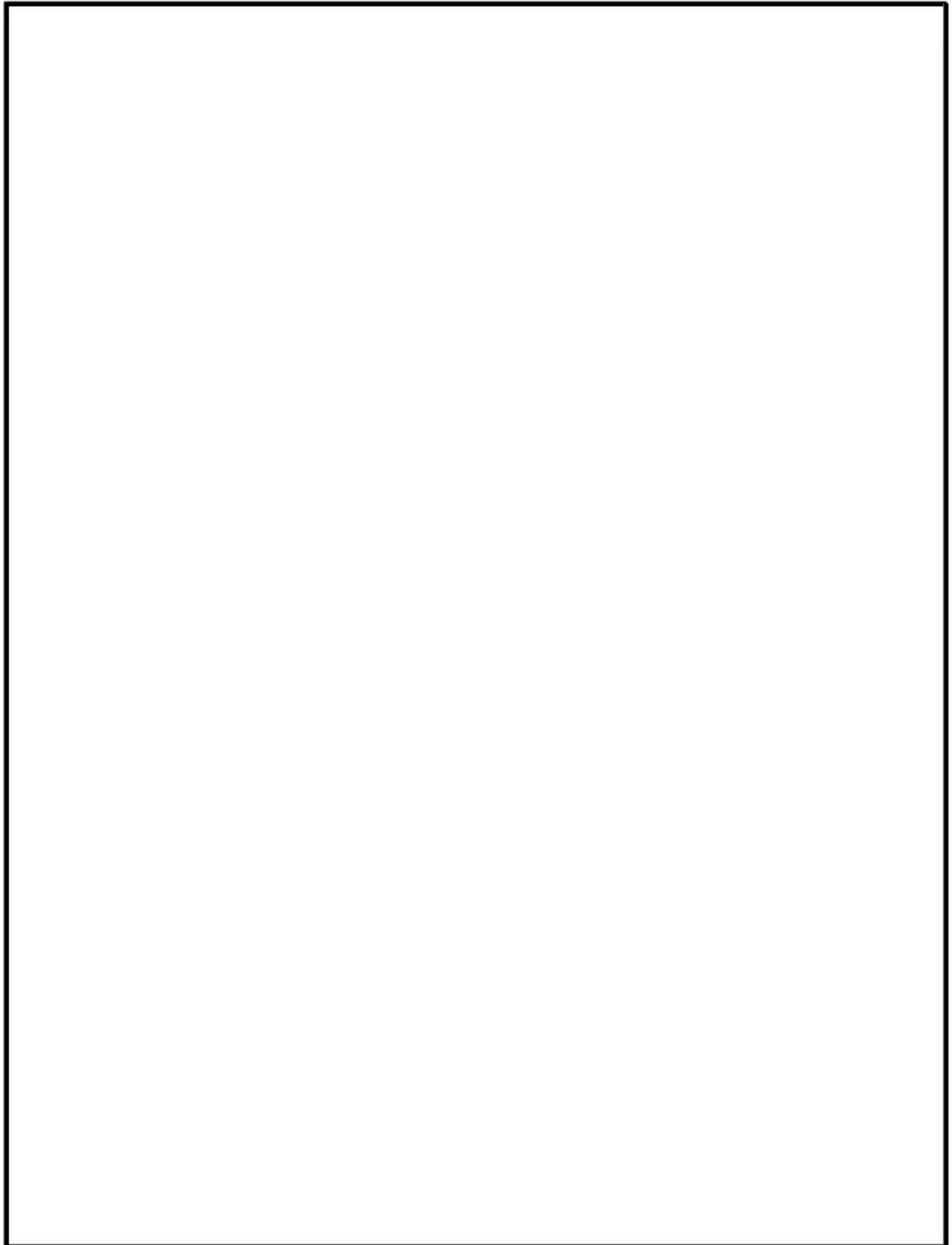
The main components block scheme

Use a software application to show a presentation with *Impress*, *PowerPoint* or similar to make a block diagram of the object. Print the scheme and paste it in this area, or upload the file to the platform.





	FECHA	NOMBRE	FIRMA	I.E.S. _____
Dibujado por:				_____
Comprobado por:				_____
Escala:	Título			Versión



	FECHA	NOMBRE	FIRMA	I.E.S. _____
Dibujado por:				_____
Comprobado por:				_____
Escala:	Titulo			Versión

Description of components blocks

To describe each of the blocks you have represented in the scheme, you can use the following template. However, it would be easier to develop your own template in a spreadsheet using LibreOffice Calc or Microsoft Excel in order to explain each of the functions. In this case, you can copy each column headers.

Item number	Description	Reference to drawing (if available)	Assemble with item number ...
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

3.2. A NEW PERSPECTIVE FOR RESEARCHING: THE REMOTE LAB

Perhaps the concept of Remote Lab is not familiar to you. When researching, the lab is the suitable place to carry out experiments, check hypothesis and contrast results. In a remote lab the same type of activities can be made with the difference you are located in a different place than the one in which the experiment is being carried out. To be able to interact with the experiment environ, a software interface is available and accessible by a web browser. In such an interface, you may interact with some software tools that control the parameters of the experiment, a web camera to be able to see the experiment live and a board where you can annotate the obtained results.

The Remote Lab Workshop is now available for you to be studied in order to be able to better understand about this kind of researching experience.

Previous test

Answer the following questions as a previous step to Access the experiment, indicating in each square the number of answers from the members of the enterprise:

A. Have you ever used a remote lab at home or in the classroom?

Answer	Members
0: No, this is the first time I Heard about this	
1: No, but I know what it is	
2: I haven't been able to use it, but I've seen someone	
3: Yes and I have seen how it was being used	
4: Yes, I have used someone at home	
5: Yes, I have used someone in the classroom	

B. Do you think that using a remote lab in the classroom would be useful?

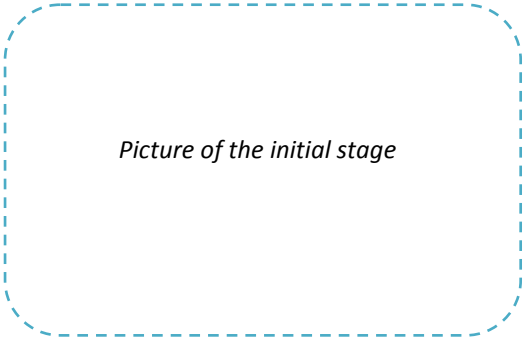
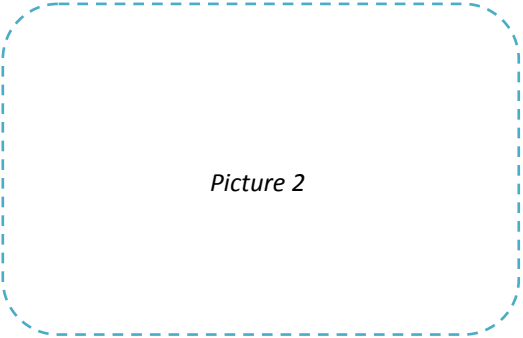
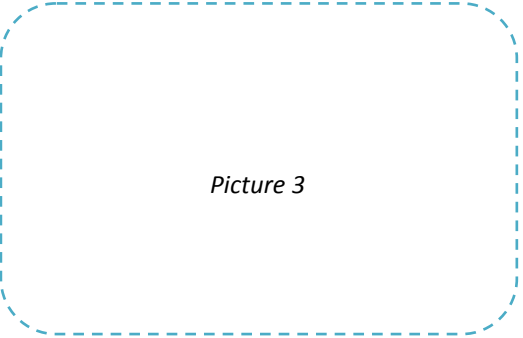
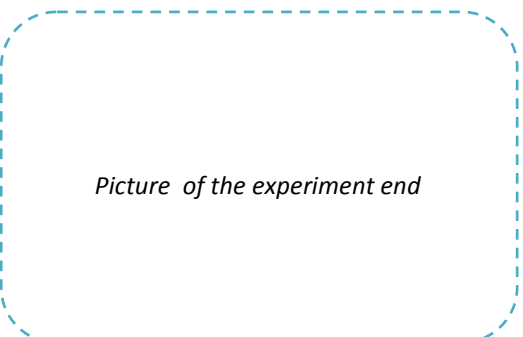
Answer	Members
0: No, no way.	
1: No, I prefer traditional classes with book or annotations.	
2: Yes, but if it wasn't part of the exam	
3: Yes, I think it would be useful	
4: Yes, it would help me to understand some theoretical contents	
5: Yes, I would like to use it as much as possible in my classes	

Access to experiment

After passing the workshop, you probably have a better knowledge about what it's about. In the following space, describe what the experiment you'll make is about and indicate some working hypothesis.

Make a documentary of the experiment environ

Make four pictures or snapshots from the web interface when accessing to the different areas of the remote lab. Paste them in the notebook or upload them to InnoEscuela digital platform. Together with the picture areas, some text boxes are available to describe the stage of the experiment in the remote lab in order to write how it's evolving.

Picture	Description of the experiment
 <p data-bbox="360 636 644 663"><i>Picture of the initial stage</i></p>	
 <p data-bbox="453 1061 549 1088"><i>Picture 2</i></p>	
 <p data-bbox="453 1451 549 1478"><i>Picture 3</i></p>	
 <p data-bbox="338 1841 676 1868"><i>Picture of the experiment end</i></p>	

Final test

Indicate the number of members that prefer each answer, writing it in the right column, once you have finished the experience with the remote lab.

A. Do you think the web interface is easy to access to the lab?

Answer	Members
0: No, it's very complex and I asked for help to teacher permanently	
1: It could be easier, I have asked for help to the teacher some time	
2: The first time the teacher helped me but then I was by my own	
3: Yes, Little by Little I have learnt to use the lab in a easy way	
4: Yes, once you've learnt, the use looks automatic	
5: Yes, I have started to use labs easy and quickly	

Do you think the use of the remote lab has been useful?

Answer	Members
0: I hasn't been useful, I was not interested to use them	
1: I used them to check how it was working some minutes	
2: I have used them just in the classroom a couple of times because it looks interesting	
3: Yes, it was useful, I have used labs to understand the theoretical aspects of the subject	
4: Yes, and it has been useful and I liked it a lot to carry out the experiment and I want to know a bit more about it and how it works	
5: Yes, and even I would like to use them at home as well	

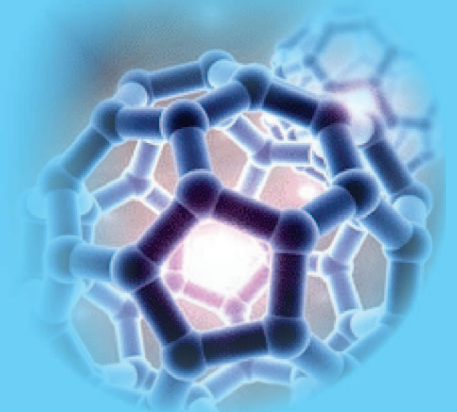
What conclusions have you got from the experiment?

Describe, in the text area or upload the text to your space in the platform, the conclusions you have got once you've done the experiment. Explain how similar are the results obtained in the lab with what you were expecting by your hypothesis previously described?

What ideas do you propose for researching by means of a remote lab?

4

We develop the design of
our innovative product
with Arduino



4.1. ARDUINO WORKSHOP: FIRST STEPS

Arduino is a programmable general purpose electronic device by which you can control a myriad of variable signals. Following the reading of the input signals, a program processes them. The device has a range of analog and digital outputs to be emitted to any electronic actuator.

This definition is the base of the control programming and thus control systems can be easily performed. To learn more about Arduino and be able to implement its functionality in the development of your innovative ideas, make the "*Arduino Workshop: First Steps*"

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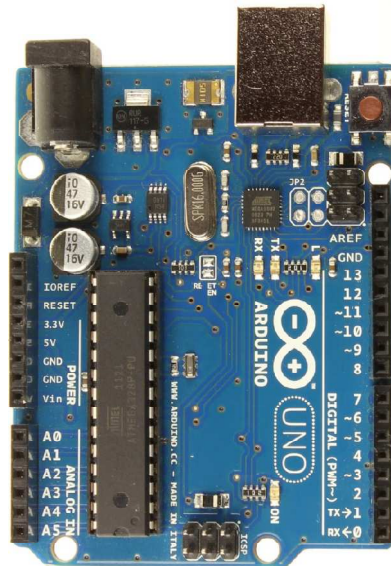
4.2. WE DESCRIBE THE NEED WE WANT TO SOLVE

Meet with the team and try to detect what needs are surrounding you. Focus to those ones that you are able to solve with the use of a control system. Open your mind when facing the needs. A good advice is to make a list of needs or problems at the same time you offer ideas to solve them respectively and fix a series of criteria as feasibility, complexity, cost, maintenance, etc. Apply the criteria to each solution and try to choose the system to develop. Use the below text area in the notebook or directly type and upload them in the digital platform in order to determine your list of solutions, make the analysis for selection, and finally, describe what system you want to build.

.

4.3. DESIGNING THE SYSTEM TO SOLVE THE NEED

Once you have chosen what product to develop, make a block diagram using the central Arduino picture. From this, indicate by means of arrows what components you need to connect to Arduino. Place the sensors and detectors directly pointing to Arduino, as well as locate the actuators connected to Arduino outlets using ongoing arrows from the digital and analog output pins. If you want to make the block diagram with a specific computer aided design application, you can use the Arduino picture available in this digital document.



4.4. WHAT COMPONENTS DO WE NEED TO FIT OUT WITH ARDUINO?

Use the spreadsheet you create in previous stages to make a component list in order to fit out Arduino with the required components to develop your innovation. Name the sheet as “Comp_List” for instance. Copy the following column headers.

Item number	Topologic reference (*)	Physical description	Technical features	Amount
1				
2				
3				
4				

You have to remember that you are in the design stage and it's probably that some of the components you have selected to use, could be substituted by some other more appropriate or by the same component but with different electric value. Access to the spreadsheet in the digital platform in order to make as many corrections as it's required throughout this section, as well as throughout the following section about the building of the system.

(*) The topologic reference is the name or key assigned to each component in the block diagram. For instance, a led diode could have been named L₁, resistors R₁, R₂, etc.

4.5. THE WIRING LIST AND THE WIRING SCHEME

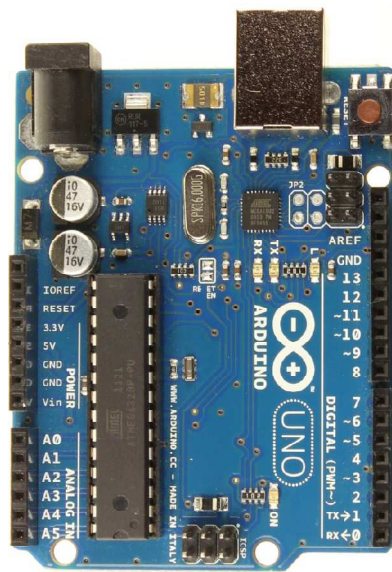
Components situation in the block diagram may help you to make the wiring connections needed to carry out the control system. Use a second sheet in your spreadsheet to describe the wiring connections between components and Arduino, using the information from the list of components.

The wiring list

Wire number	Source component topologic reference		Target component topologic reference	
	Component	Pin	Component	Pin
1				
2				
3				
4				
5				

The wiring scheme

According to the wiring list, you can make a graphical representation of the system based on the blocks diagram. Remember to name each component as done in the component list as well as each component used pins by numbers or letters in order to be able to distinguish each connection.

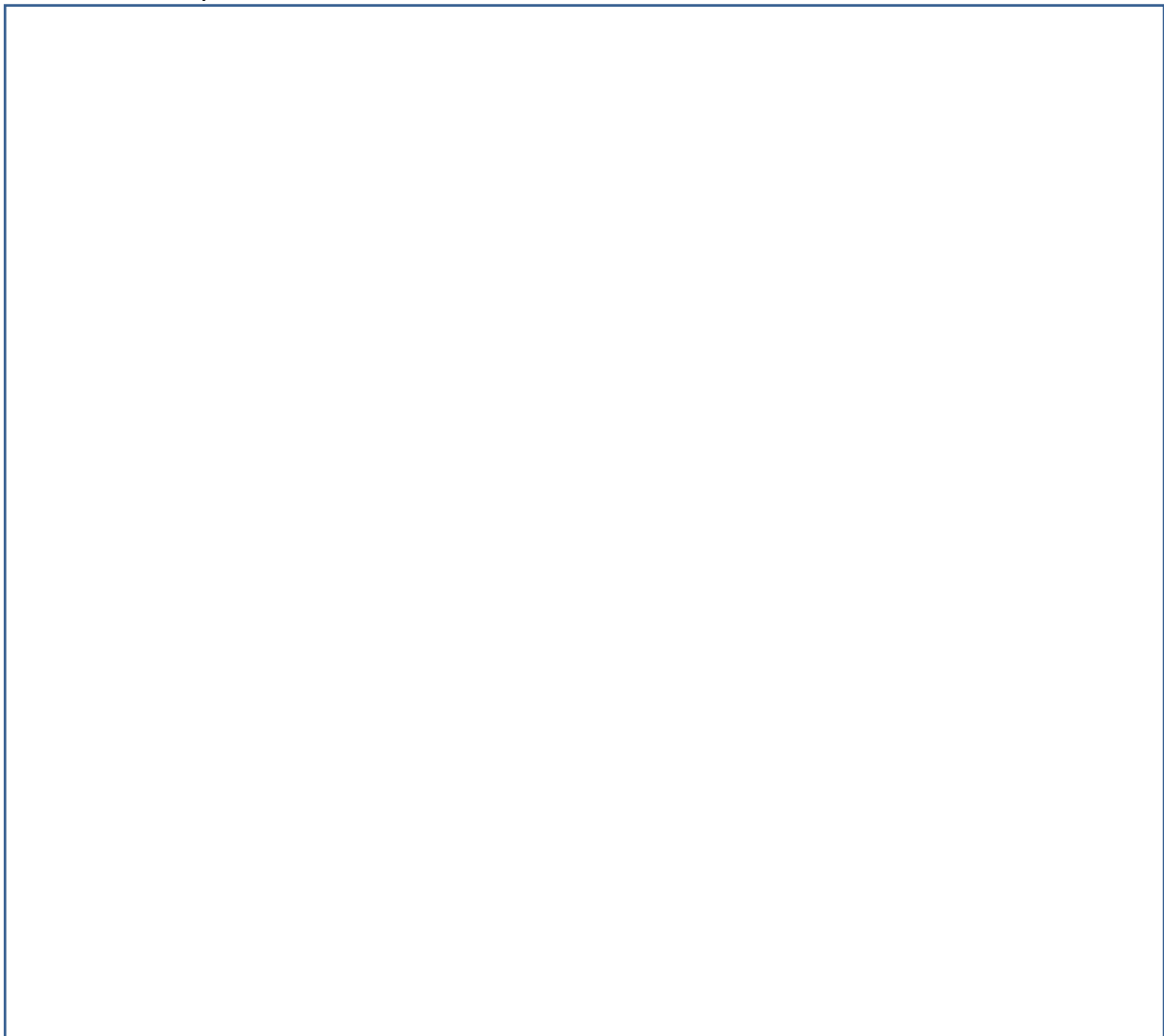


4.6. WRITING SOFTWARE

You're going to design now the software to be processed in Arduino control board according to different phases. Open a new sheet in your spreadsheet and write the input and outlet signal with specific name that are called variables. Use the following table to copy the column headers, and write the information required for each signal to manage.

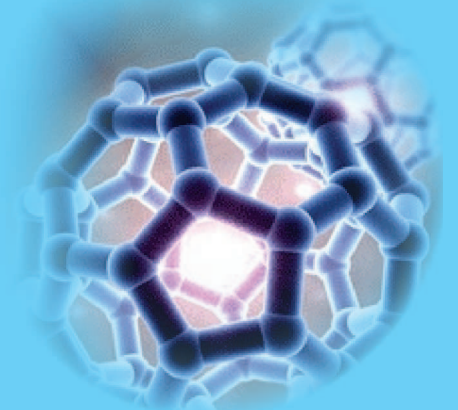
Name of the variable	Input (I) / Outlet (O)	Digital (D) / Analog (A)	Pin number	Description of the variable

Draw in this space in your InnoEscuela notebook or use a specific design software application to draw the diagram of the algorithm of your program. Make it in general terms but determine in this point those parts of the program you better know how to do. In the following section you will be able to write the source code and the diagram will then be very useful.



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						

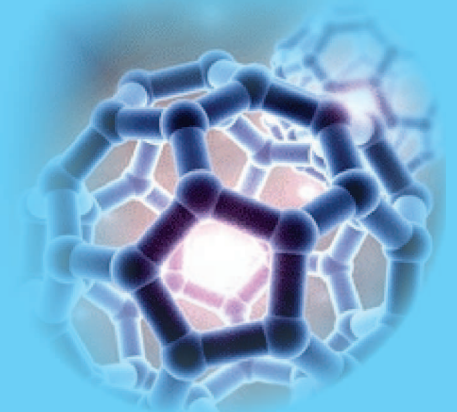
TOTAL PROJECT	
Cost / hour	
Labour workforce total sum	

The final cost of the project is

_____ €

6

Spreading our innovative
product in the Web

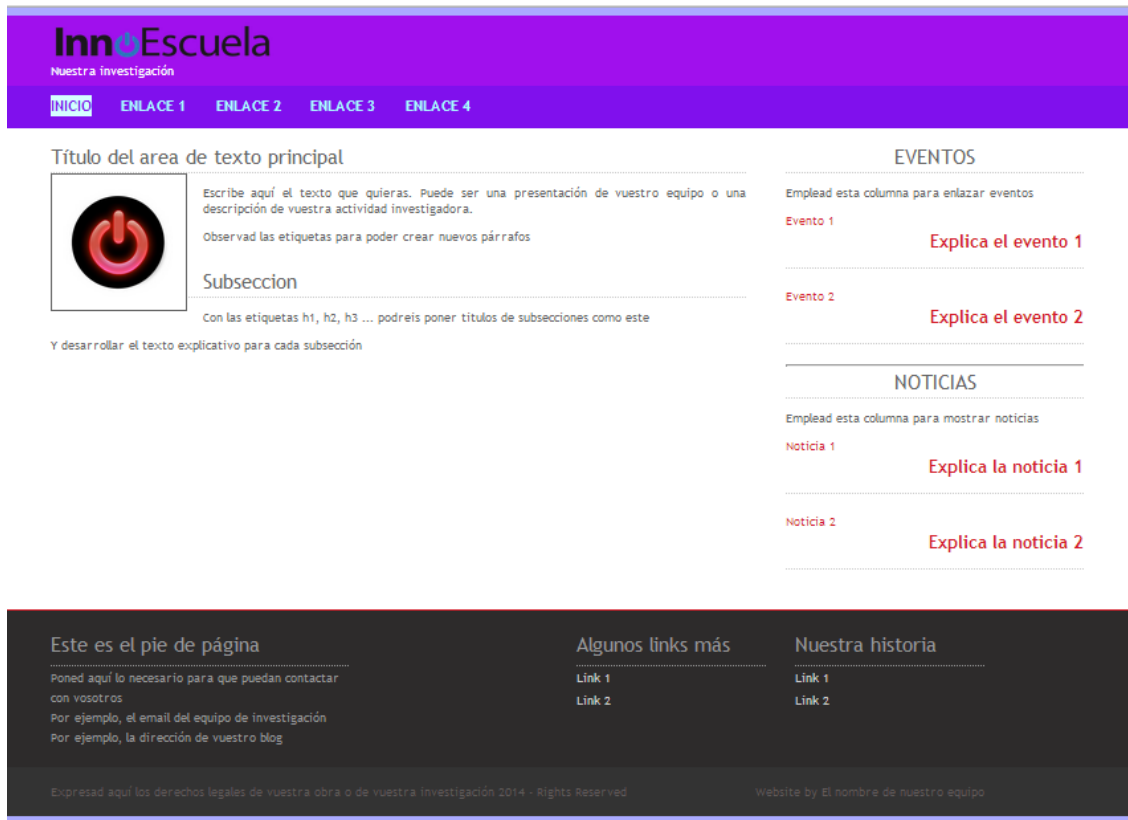


6.1. HTML – CSS WORKSHOP

Probably you have developed a web page. As you know, the used language for programming web pages is HTML (*HyperText Marking Language*). As an addition, the CSS style sheet (*Cascade Style Sheet*) is a wonderful tool to enhance web pages as well as it offers a homogeneous and serious format to your web site. However, it's good to refresh ideas and learn about new things in relations with software programming. Do the HTML-CSS workshop and take annotations of all that you feel interesting to apply to your website. Use the following space to annotate some comment or to write some useful annotations in relation with the web development.

6.2. WE CREATE A WEB SITE WITH OUR OWN BRAND IMAGE

A website is not easy to develop. In some cases, wide knowledge about programming is required in order to make your site to get a professional look. In this case, the making of your webpage could be easier for you. Download from the digital platform the files structure to create your own website. Ask your teacher for help anyway. You can use the file “*home.html*” as the main page of your site. As you can see in the figure below, a representation of this template is shown. Copy the file as many times as pages you want your website to be made up. The just rename with a specific name each copy.



In each page you would have to adapt texts, images and hyperlinks according to the purpose of each of them. Anyway, you have to remember that inside the folders, some programming files are located and you have to avoid the deletion of any of them to maintain the functionality of the CSS pages. On the other side, you can change the format of your website by modifying part of the source code. This requires you to put in practice what you have learnt about Reverse Engineering among the different files. Try to find where to change the background colour, the font size and colours, the width of columns, etc.

Zip the file structure and upload the zip file to the platform

Once you have finished the web site, use a zip application to compress software to make the whole files structure to be compacted from the root folder. You can generate zip or rar to create the file to upload to the digital platform for your teacher.

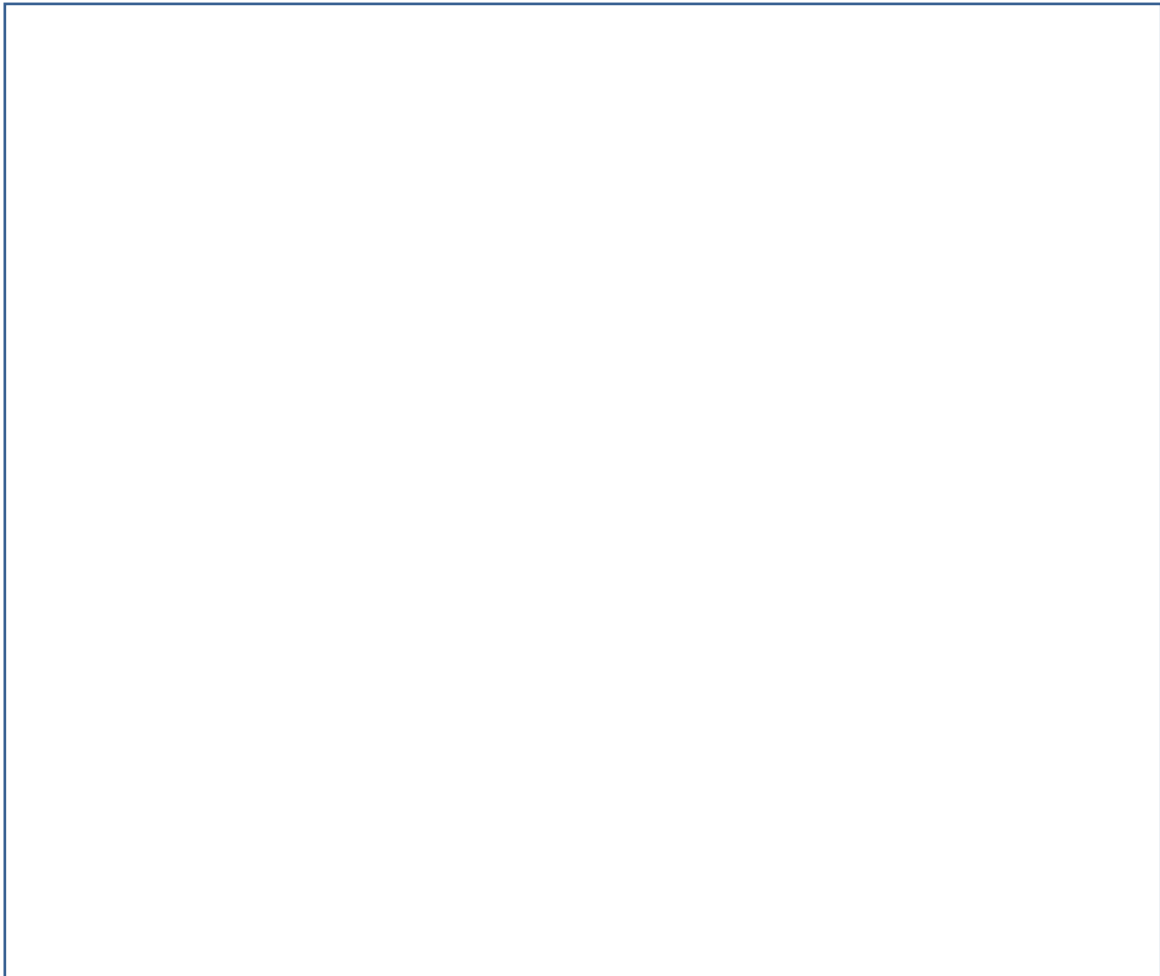
6.3. USING OUR INNOVATIVE ENTERPRISE BLOG

Your company blog is also a fantastic tool to spread your ideas, very appropriate because of its simplicity and easy usefulness. The blog can have multiple uses, as its use as a simple website to show others how your advances in researching as well as to be used as a diary in which you write how your works are evolving.

The most important feature of your blog is the capability for interacting with other users by their comments. Any could write opinions in the comments area. Try to be polite, positive and constructive in your comments in other blogs. Take into consideration you are a corporation and if you are sharing your ideas and knowledge with other companies, your researching activity will be enhanced and enriched.

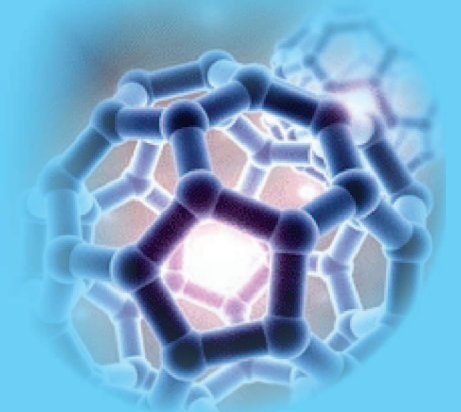
6.4. WE THINK IN OTHER PROMOTION WAYS FOR OUR PRODUCT

With your website to show your work and your blog as a means of interaction you have two good ways to spread your advances and innovations. However, think that other media and channels could be useful as well to let people knowing your innovation. Write in the following text space and upload it to the provided area in the platform about other ways and actions to take in order to make some other promotions of your product.



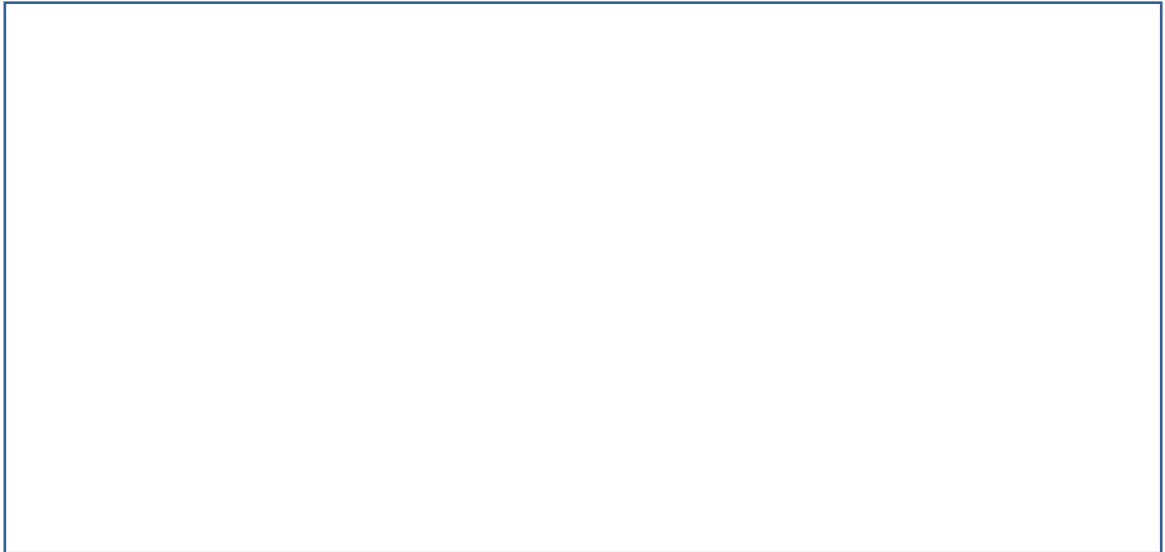
7

We do our business plan



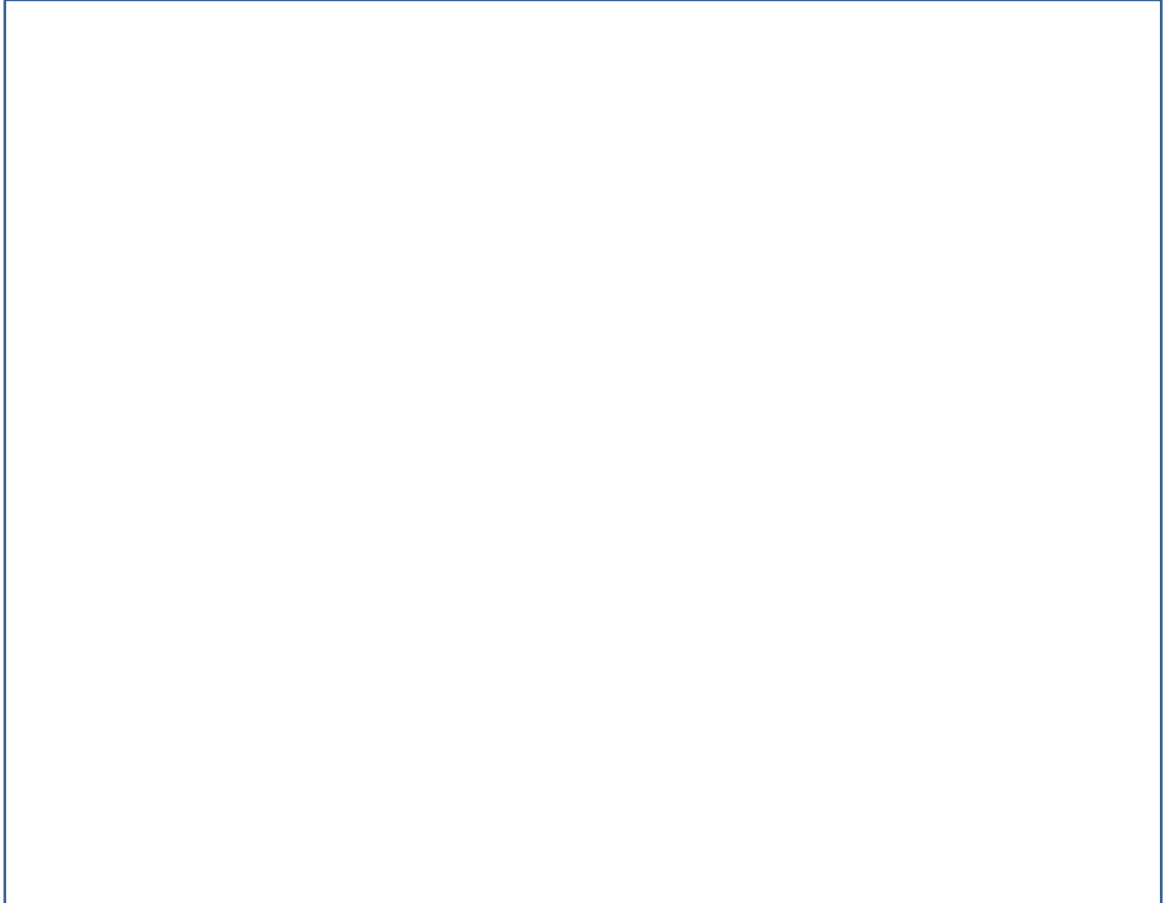
7.1. RESEARCHING THE MARKET: OUR TARGET CUSTOMERS

Describe what the profile of the people who could purchase your product is. Where to focus your promotion efforts? Use the following space to explain your descriptions.



7.2. WHAT ADVANTAGES DO WE WANT TO TRANSMIT ABOUT OUR PRODUCT?

Try to think in the advantages you want to transmit for your potential customers to acquire your product. What are the main features you want to show?



7.3. WE PLAN OUR PRODUCT MASS MANUFACTURING

You've previously calculated the cost of your prototype. Now think to manufacture a great amount of units, for instance, ten thousands. There are a lot of things you have to consider when manufacturing massively a product or a system.

The first thing you have to determine is how long your manufacturing will have to be. Calculate, based on your experience with the prototype, the time to invest in the manufacturing of a finished product and the workers to hire.

In addition, you have to consider that a manufacturing process is made in lots. This is considered as a batch process. A lot is the amount of products that are made simultaneously or in the same period of time. Once you have defined these data, you could know:

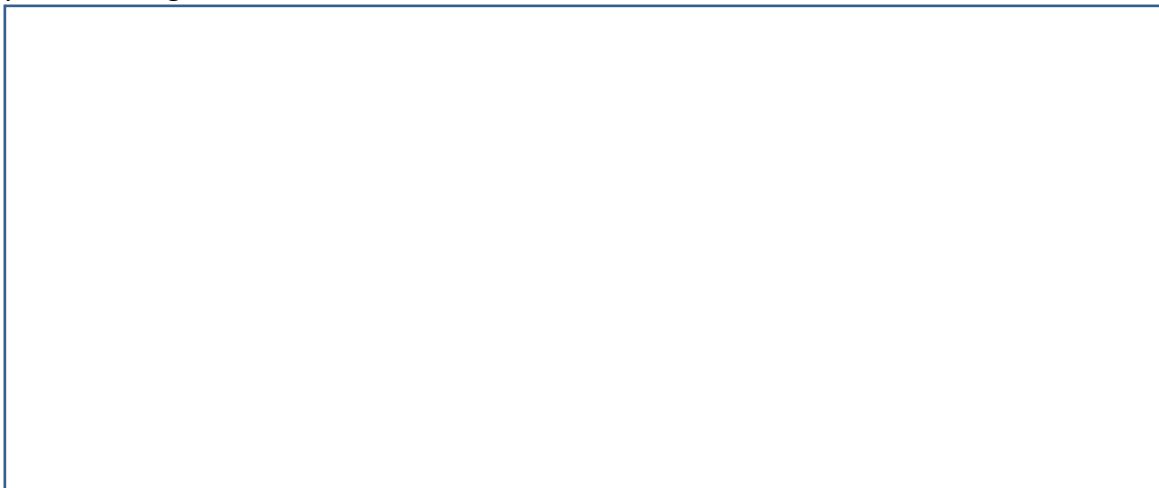
- Assembly workers and tasks distribution
- Size of the lot
- Delivery time for each lot

Once you know how many people are hired, you have to find the place where to manufacture. Search a location for your facilities, first in your town, then in towns close to yours. Ask the price of facility rents, for example a 100 m² office or small factory to allocate the work places. Look at some wider or more reduced spaces alternatives to better fit the size of your company.

With all these concepts and as many as you can imagine, meet your fellows and calculate the cost to initiate the manufacturing activities. Use the company spreadsheet to introduce costs. Finally, divide the total sum of costs by the number of units to manufacture in order to obtain the cost price of your innovative product.

7.4. WHAT IS THE ECONOMIC PROFIT WE WANT TO GET?

Try to investigate some other similar products. Get the purchase price in shops and stores and compare these prices with your innovative product cost price. These data are very useful to be able to fix your own purchase according to the margin of profit you want to get



7.5. COULD WE GET FINANCIAL SUPPORT TO IMPLEMENT OUR BUSINESS PLAN?

To carry out the implementation of a business, it's very important to consider the financial support. As you realized when planning your project, it's necessary to assume some initial costs to start the company up. Among them, you will have to pay providers who are serving the material for the first manufacturing lots, to pay the salaries of your workers and the rest of the personnel, including your wages and the payment of taxes.

In sum, you have to go to banks and credit institutions to apply for the money you need. The first is to have information about what the application for credit consists of. When ordering an amount of money, there are three essential factors: the capital you want to borrow, the interest you will be charged and finally, the repayment period. Go to a bank office for the information you may need or take the information from the online bank websites.

You can calculate by your own how much money you have to monthly give back to the bank to repay the loan. Open a new sheet in your company spreadsheet and select the appropriate formula for the repayment of a loan. Observe the example of the figure, where the repayment of a loan of 10,000 Euros has been simulated in two different periods (3 and 6 years) and using interest rates of 4% and 5%.

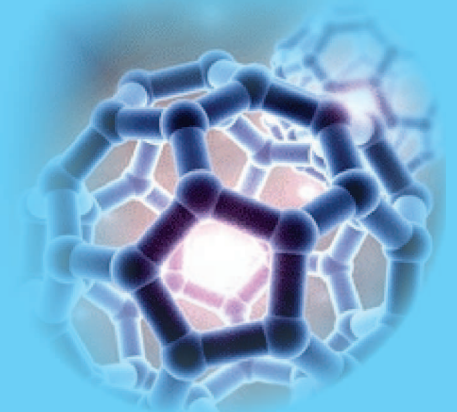
	Payback period	
	3 years	6 years
Money to pay back	10.000,00 €	10.000,00 €
Annual rate	4,00%	5,00%
Number of periods (months)	36	72
Monthly payment	-295,24 €	-161,05 €
Total payback	-10.628,63 €	-11.595,55 €

Answer now the following questions:

- What bank is offering better loan conditions?
- What is the annual rate offered?
- Could you assume the monthly payment to pay back the loan without compromising your profit? Access to the company spreadsheet and recalculate the costs
- What will the final price for your innovative product according the costs recalculation?

8

Can we protect our
innovative product?

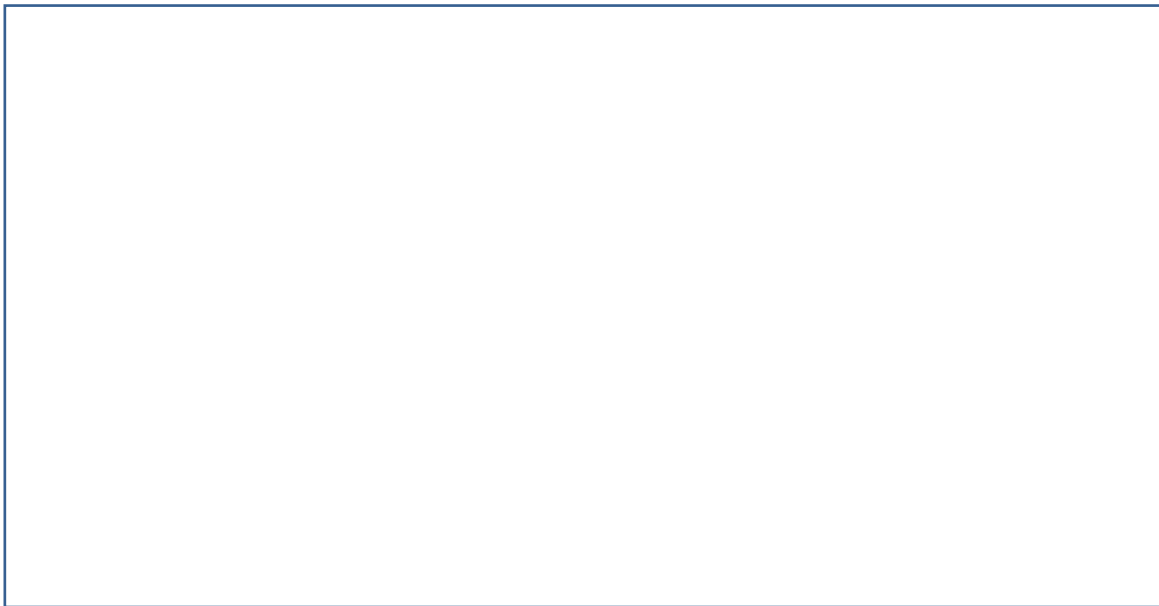


8.1. IDEAS PROTECTION WORKSHOP

Throughout this course you have demonstrate your capabilities as researchers and entrepreneurs. You have been applying the scientific method and the project method, using your observation capability and team working. You have spread your activities, results and conclusions as well as the design and manufacturing of an innovative product. However, any creator has to be able to claim for his own innovative ideas by means of legal mechanisms to protect them. As you may observe in the following ideas protection workshop, scientific and technical discoveries cannot be patented but you can patent their practical applications. Once you will finish the workshop, you will know how to protect your researching activities and your innovative product.

8.2. WHAT WE WANT TO PROTECT AND WHAT WE MAY NOT PROTECT

Obviously, Arduino is an invented device and thus, protected by patent laws. However, the innovative product you have developed by using Arduino can be patented since it's an original innovation. According to the workshop contents, the most important thing in a patent document is how to formulate the claims which, in a direct way, are the list of innovations that an original idea is incorporating. Debate in your team what you can claim as innovative and make a list in the following text space. Remember that this will be what you will write in the InnoEscuela patent document.



8.3. CREATION OF THE INNOESCUELA PATENT DOCUMENT

This is the time in which you have to create the document to include the features derived from the practical application of your researching activities: the InnoEscuela patent. According as suggested in the previous workshop, the objective is not protecting the researching activity but to protect products and practical applications that could be built from the results. Be concise and direct in the description of the innovative features of your product.

InnoEscuela

INNOVATION PATENT APPLICATION

Applicators data

Application Date:

Name of the inventors:

Web address:

High School Data

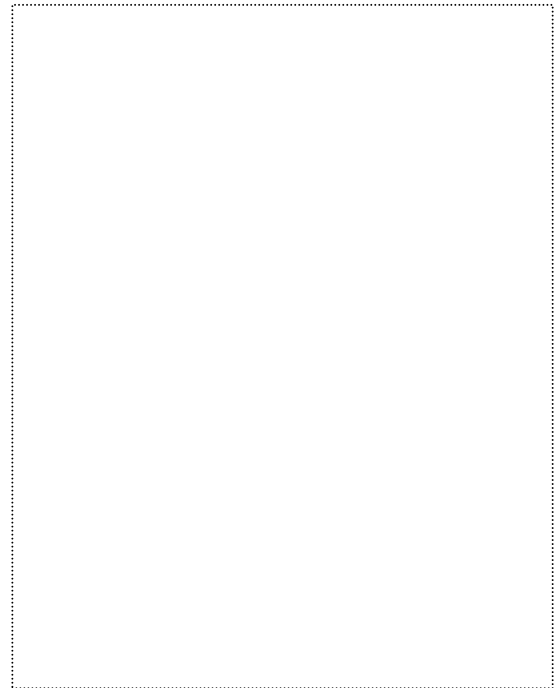
Name:

Address:

Telephone:

Web address:

Title of the innovation

Abstract of the innovation

Description of the State of the Art

Textual description of the Innovation

Description of the innovation – Designs and drawings

Claims

To whom this may concern, hereby the components of the innovative company are signing this patent application, ensuring that all that has been written is true and corresponds with an original idea.

THE INNOVATIVE COMPANY

(Signature of all the members of the innovative company)

[City or Town]

[Month, Day, Year]

