Unit 1: Technology

Autor: Guillermo Gómez

Contents

Textos Marea Verde

Prior knowledge

Activity: Summarize your general knowledge on this topic.

Keywords

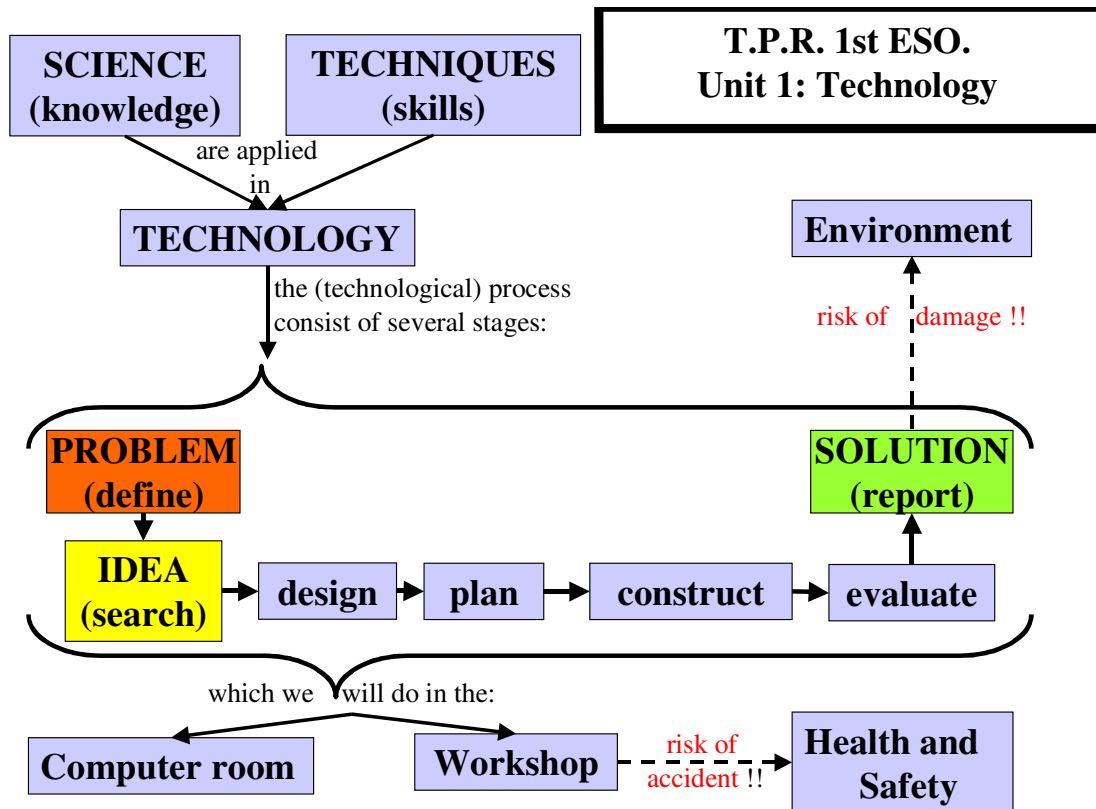**Activity:** Copy following keywords, explaining their meaning and translate them into Spanish.

Satisfy our needs   Labour
Develop   Estimate
Properties   Report
Constraints   Safety
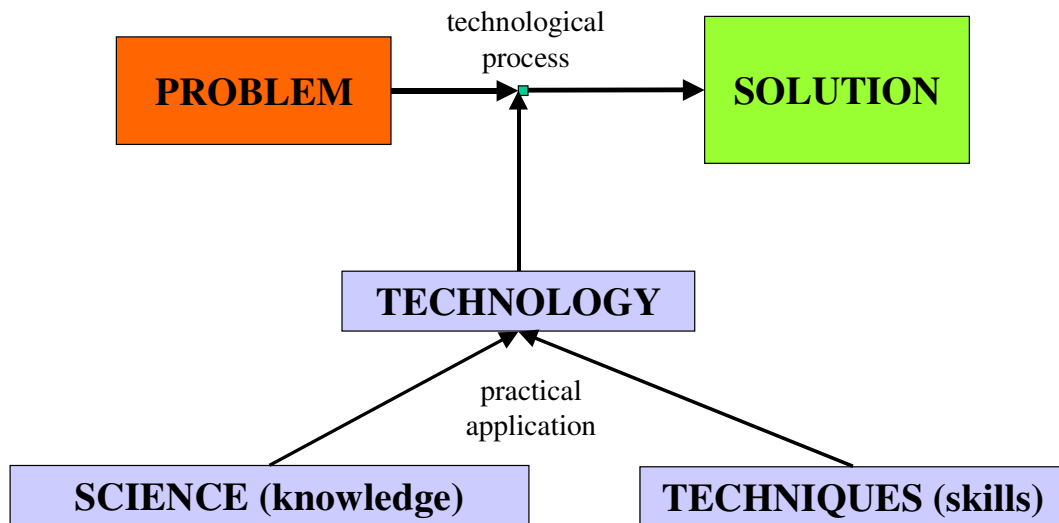
Mindmap of the unit

Activity: Analize and try to understand following mindmap

1.1. What is technology?

Activity: Think about the following questions: How do human beings impact their environment? What are the reasons that lead the human beings to create objects and processes? What allows humans to invent them? Does human inventions impact the environment positively or negatively?

Activity: Copy following scheme and write your own definition of technology:

technological process

| PROBLEM | → | SOLUTION |

TECHNOLOGY

practical application

| SCIENCE (knowledge) | | TECHNIQUES (skills) |

DEFINITION

> ***Technology** is the practical application of knowledge (**science**) and skills (**techniques**) to create **solutions** which satisfy our needs or solve our **problems***

Activity: Copy and fill in the following table listing 5 technological objects found in your immediate environment and make big drawings of each of them labelling their different parts.

Technological object	Need that it satisfies	Alternative solutions	Materials	Drawing with details	Proposed improvements
1					
2					
3					
4					
5					

Textos Marea Verde

Activity: Look for information about three (spanish) inventions and summarize it in your notebook. The work must have following sections: 1.Title, 2 index, 3.Inventions:

For each invention you should indicate:
   *Name of the invention *Name of the inventor   *Year of the invention
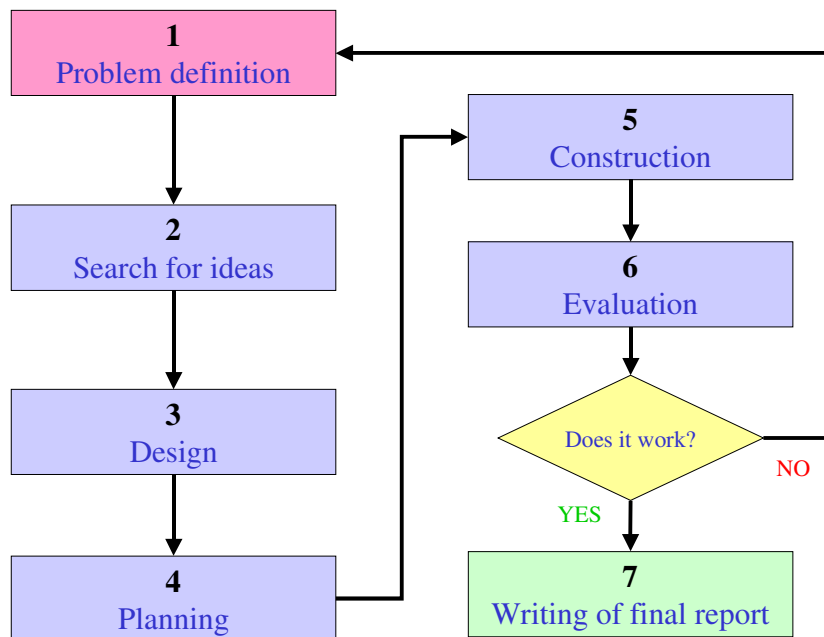   *Interesting elements of the invention and its creation.
   *Analysis of the invention
      1) Analysis of the shape:1.1) Shape 1.2) Dimensions
      2) Technical analysis: 2.1) Number of pieces   2.2) Material
      3) Functional analysis: 3.1) Function   3.2) Objects with the same function
               3.3) Risks
      4) Aesthetics: 4.1) Texture 4.2) Colour 4.3) Proportions
               4.4) Feeling
      5) Socioeconomical analysis: 5.1) What problem does it solve?
                  5.2) How did society solve it before?
                  5.3) Environmental impact.
                  5.4) Price and where it is sold.

Important: make a detailed colour drawing identifying the different parts (half page)

1.2. The stages of technological processes

In Technology we look for a solution to a problem using the technological process which consists of the following stages:

1) Problem definition: Analyse the posible constraints and study similar cases
2) Search for ideas: Propose one or several solutions and choose the best one
3) Design: Prepare plans and measurements
4) Planning: Choose the tools and plan the construction. Define time frame. Cost estimation.
5) Construction: Build according to the design and planning.
6) Evaluation.
7) Write the final report.

The final report should have e.g. the following sections:
1) Front page with detailed information
2) Index
3) Objective of the project
4) Design
5) Tools and construction plan
6) Incident report
7) Instructions on how to use and mantain.

Activities: Copy the following exercises and solve them in your note book

1) Copy and fill in the following table:

Object	Need it satisfies	Alternative objects
Pencil	To write things	Pen
Bike		
Vacuum cleaner		
Screw		

2) Copy and fill in the following table:

Need which is satisfied	Object	Alternative object
Listening to music		
Cooking		
Transport of persons		
Communicating		

3) Copy and fill in the following table:

Need	Characteristic of the object that satisfies the need				
	1	2	3	4	5
Contain food					
Collect dust in the school					
Write					
Protect us from the rain					

Example of characteristics: *quick to use, easy to carry, soft, resistant, small enough to hold, easy to draw with, with an hermetic lid, impermeable*

4) Which of the following elements should be included in the cost estimation of your project? Cost of recycling , Cost of material, Cost of labour, Costs of tools.

5) Identify, draw and explain how an object works that can be used to clean breadcrumbs off a tablecloth?.

Textos Marea Verde

6) Copy and fill in the following table:

Object	Need it satisfies	Alternative objects
Clock		
Washing machine		
Mobile phone		
Trainers		
Bicycle		

7) Copy and fill next table on your notebook:

Object	Characteristic of the object that satisfies the need				
	1	2	3	4	5
Tent	impermeable	opaque	big enough to sleep in	...	...
Bungee jumping cord					
Helmet					
Corkscrew					
Glass door of an microwave oven					

8) The following sentences describe the different steps to replace the heel of a shoe. Copy the steps while respecting the chronological order.
   a. Put the new heel on the base and press firmly.
   b. Spread glue on the base of the shoe and the new heel
   c. Cut the edges of the heel to the correct size
   d. Remove the old heel with pliers and a cutter
   e. Use nails to fix the heel more securely

9) Prepare an estimate for a wooden drawbridge based on the following data:
   a. Half a plywood board (€ 1,10 each)
   b. 300 sticks of wood (€ 0,02 each)
   c. one pot of glue (€ 2,10 each)
   d. Four hinges (€ 0,25 each)
   e. 40 nails (€ 0,01 each) and 16 screws (€ 0,02 each)
   f. 3 m of cord (€ 1,00 per 10 m)

CONCEPT	AMOUNT	INDIVIDUAL PRICE (€)	TOTAL COST (€)
TOTAL COST ESTIMATION			

10) **Project:** With a teammate in class, execute the technological process for the following problem.:

You need a desktop object that will help organize desktop stationery (pens, pencils, rubber, ruler, sharpener, clips and headphones).

Constraints:
- ✓ *You can only use scissors as a cutting tool and glue as a binding agent.*
- ✓ *The measurements of the object cannot exceed 20 X 15 X 15 cm*
- ✓ *You can't spend more than 1 € for material.*

Examples of projects:

office organizer (video)
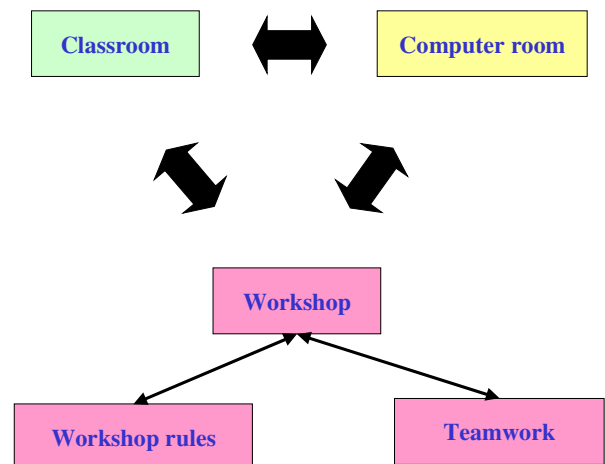https://www.youtube.com/watch?v=tluMBj3_o8g

wooden calendar (video)
https://www.youtube.com/watch?v=81DSZoxDj1w

wooden calendar (final report)
https://drive.google.com/file/d/0BzBjo7sjdRyRTEp3ZXhuSnNaMUk/view?usp=sharing

---

1.3. The workshop

In technology we will use three types of rooms that appear in the diagram. We will pay special attention to the <u>workshop rules</u> and <u>teamwork</u>.

Classroom	⬌	**Computer room**

Workshop

Workshop rules   **Teamwork**

Activity: Copy the scheme on the board, make an illustrative drawing for each box and explain in your own words what it means.

Activities and organisation:
In the workshop we do two types of work:
1. <u>Academic activities:</u> Listening to the teacher's explanation, analysing problems, thinking of ideas, designing...
2. <u>Manual activities:</u> e.g. cutting, gluing, sawing, drilling...

Working in a team requires a good organisation. Each member of the team will have individual responsibilities that we will rotate throughout the year. These charges are:

1. <u>Coordinator</u>, is responsible for organising the work of each group member in order to achieve <u>efficient teamwork</u>. This person represents the group.

2. <u>Secretary</u>, collects, checks and organises all the <u>written documents</u> from each group member (plans, process reports, estimates, etc)

Textos Marea Verde

3. Responsible for tools and materials, collects the material needed and looks after the tools assigned to the team. He or she is responsible for recycling leftover materials, returning tools and storing the project.

4. Responsible for health, safety and cleaning, makes sure that the team follows the workshop rules and that each workstation is left completely clean.

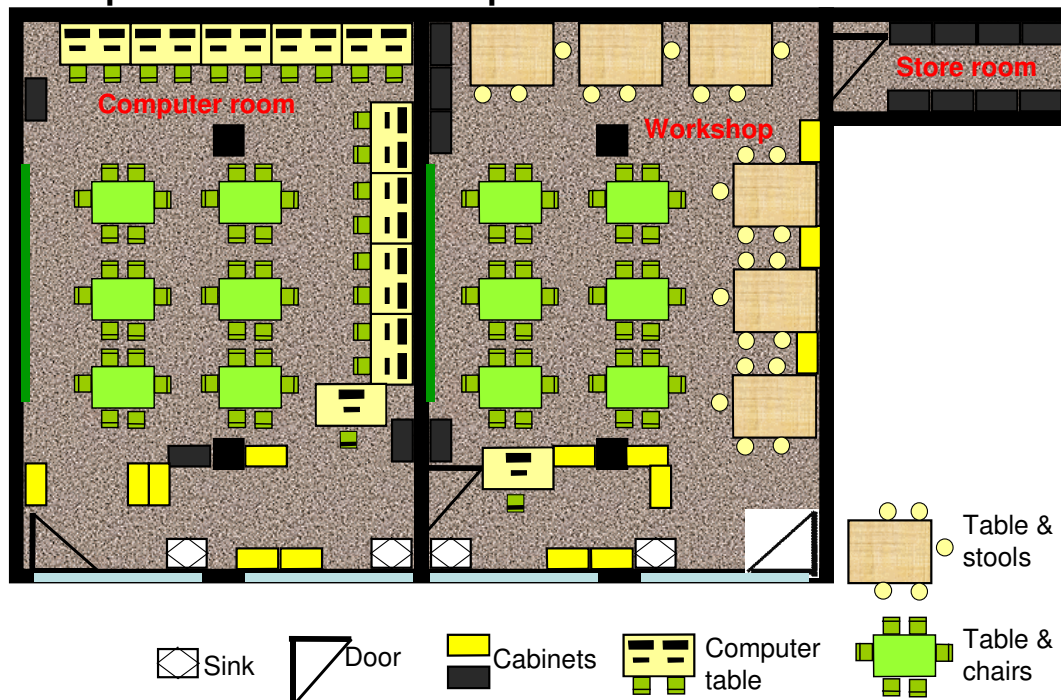> **Activity:** Within each team, decide how to rotate these responsibilities and write down your agreements into your notebook

RESPONSIBILITIES ROTATION (TABLE No __)				
NAME	**1st turn**	**2nd turn**	**3rd turn**	**4th turn**
	Coordinator	Secretary	Tools & materials	Health & cleaning
	Secretary	Tools & materials	Health & cleaning	Coordinator
	Tools & materials	Health & cleaning	Coordinator	Secretary
	Health & cleaning	Coordinator	Secretary	Tools & materials

Parts:
The workshop consists of
1 work area with tables,
2. storage room for materials and equipment,
3 storage room for projects
4 area for machines

> **Activity:** Make a drawing, at least half a page in length, of the class in which you are, indicating its different areas, so that anybody can recognize what it is and where you sit.

Computer room & Workshop * IES CERVANTES* Oct. 2014

Textos Marea Verde

Health and safety rules:

Most accidents are due to the human factor. Thus, in order to prevent them you should know and follow the Workshop rules.

Activity: Read, comment and copy the workshop rules in your notebook. E.g.
https://drive.google.com/file/d/0BzBjo7sjdRyRRWpJV19fYnZwU1U/view?usp=sharing

You also have to understand and follow these signs.

Always remember:

We have to foster **sustainable development** so that the advantages of the technology do not cause:
- ✖ Overexploitation
- ✖ Pollution
- ✖ Toxic waste

Mandatory signs
(this protection is obligatory)

for hands   for eyes

Danger signs
(warn of possible danger)

toxic material   electric shock

First aid and emergency signs
(give information)

first aid   emergency exit this way

Prohibition signs
(forbid certain activities)

no smoking   no eating

Activities: Copy the following exercicies and solve them in your note book

11) Copy and fill in the following table:

Place	Signs you might find			
	Mandatory	Danger	First aid & emergency	Prohibition
Building site	Use helmet	Danger	First aid	No smoking
School				
Hospital				
Public building				

12) Copy and complete these sentences regarding health and safety in the workshop:
   a. You must keep your workstation clean and tidy because_____.
   b. You must keep your hands clean and dry because_____.
   c. You mustn´t wear rings or necklaces because_____.
   d. You mustn't make too much noise because _____.

Textos Marea Verde

13) Copy and fill in the following table:

Actions in the workshop	Do you think it is dangerous?	Why?
Running	Yes	You might fall
Working		
Jumping		
Drawing		
Pushing		
Having loose hair		
Shoving		

14) Draw the following signs:
  a. Use goggles
  b. Danger of fire
  c. First aid equipment
  d. Flammable

15) Copy and complete the table about signs in your note book:

Type of sign	Background colour	Edge colour	Image colour	Shape
	Green			
Danger				
			White	
				Circular

16) Find out and write down the environmental problems that can come from these processes:
  a. Recycling plastic
  b. Making paper
  c. Processing oil
  d. Recycling glass

17) What types of waste products are produced in your school daily? What can we do to recycle or reuse them?

18) Write in your exercise book where you can find these objects in your technology workshop: finished work , projector, hammer, chalk and rubber, fire extinguisher, stool, library, wooden boards, motor.

19) Which rule is important to help the following class begin their work promptly in the technology workshop?

20) Discuss these human needs (Is there a solution? Will there be a solution? Why?)
  a. We need a cure for cancer and other diseases.
  b. We need renewable energy.
  c. We need green (environmentally responsible) transport solutions.
  d. We need protection against natural disasters such as earthquakes.

21) In the 19th and the 20th centuries people osed to thinkt that natural resources (coal, oil,...) were unlimited. Why do you think they thought that?

Textos Marea Verde