CLIL LESSON

1. TITLE OF THE UNIT: ***Robots in medicine***
2. SUBJECTS: Science, Chemistry, Biology, ICT
3. STUDENTS’ LEVEL /AGE: 14-16 years
4. OBJECTIVES:

4.1. Content objectives:

* Understanding the importance of using robots;
* Awareness of benefits and characteristics;
* Acknowledge the impact on the people;
* Experimenting an interdisciplinary lesson.

4.2. Language objectives:

* Acquiring new specific vocabulary related to robots;
* Using the achieved knowledge in different contexts;
* Developing skills as: reading, listening, speaking and writing.

5. ACTIVITIES:  
  
Activities are divided in 3 sessions, covering:

* What is a robot used in medicine? Characteristics and benefits;
* The use of robots in autism;
* Advantages and disadvantages;

6. DETAILED SESSIONS:  
  
 The first session is based on discovering the most important aspects about the robots in medicine, their use, skills and required jobs.

The second session presents the benefits and utility of robots in treating different diseases, focusing on the autism.

The third session covers the advantages and disadvantages of using such robots.

Students will learn related phrases/ expressions of the topic; they will consider the impact of robots on people’s lives.

**SESSION 1**

***MEDICAL*** ***ROBOTS - PROGRESS - SUCCESS***

***Time:*** 45-50 minutes

***Class management:*** group work (Ss are divided into 6 groups)

***Introduction*** - The teacher shortly presents the three sessions of the lesson. ***Time:*** 2”; T-Ss

***Activity 1*** - Brainstorming

***Task 1***: The teacher asks the following question: What is a robot?

Students need to think of a concept/ definition to answer the question.

***Time:*** 3”; T-Ss

***Activity 2*** - Presenting the first session - ***MEDICAL ROBOTS - PROGRESS - SUCCESS***

<https://docs.google.com/presentation/d/1QPMFdq1I-MDkL8ZB77urTFp5cBmngk6T4Ec_-s0rykA/edit#slide=id.p>

***Task 1:*** Do an exercise of imagination, choose your future job and then discover if a robot can take your job in the future.

Ss access a link and play a game to find out. <http://www.bbc.com/news/technology-34066941>

***Time:*** 5”; Ss- Ss

***Activity 3*** - Identifying the key words

***Task 1*:** The groups get a link. They introduce it and find a thematic text.

They need to read it attentively; each group selects the keywords and try to explain their meaning.

<https://docs.google.com/document/d/1NMCLkjDbKzw0MgTdbWq8VfzYKbWvZUzImlLnNoEUCuU/edit?ts=59024a91>

***Time:*** 8”; Ss-Ss; Ss-T

***Selected keywords***

Medical robotics is very recent in the medicine field. Robots can be used to send some drugs or archives in a certain place in the hospital.

A medical robot is a machine, controlled by a doctor through a console. The console doesn’t have to be in the same room with the patient. This helps on the control of the robot arm to perform the operation.

The doctor must introduce certain pieces of information before the operation, so that the robot can function properly.

The use of robots in medicine was thought as an advantage for diagnosis and more delicate and immediate interventions.

Manufacturers have introduced a number of new robots to better provide care to remote patients, help with various physical therapies and - similar to the da Vinci system - help perform surgery.

***Activity 4*** - SWOT analysis

***Task 1:*** The teacher asks students to think and then freely expose their opinion related to medical robots **s**trengths, **w**eaknesses, **o**pportunities and **t**hreats.

Students perform the task.

The teacher writes down on a flipchart the appropriate pieces of information.

***Time:*** 5” Ss-Ss; Ss-T

***Possible answers:***

* ***S:*** safety; reliability; never get tired; immune to radiation and infections.
* ***W:*** extremely high cost of systems; insufficient data from the research needed to work with the robotic system; lack of judgment; there is a risk of having the robot wrongly programmed before surgery; a robot can not make certain adjustments during the operation, while a doctor can make a different decision at any time.
* ***O:*** other robots can be manufactured in order to treat more diseases; continuing the research, robots which function nowadays may be improved, removing dysfunctions.
* ***T:*** increasing the number of robots can increase unemployment; the society could be dominated by robots, which no matter the advantages they have, they are still, inanimate objects, without judgment, incapable of feelings.

***Activity 5 -*** Robots manufacturers

***Task 1:*** The teacher asks students to build a futuristic robot, using the materials they received: cardboards, glue, markers, paper, matches, toothpicks, plastic bottles, cans, scissors.

They must give the robot a name, price and skills (what would they like it to do). Students need to present their prototype, motivating their choice.

***Time:*** 10”; Ss-Ss.

**SESSION 2**

***MEDICAL FIELDS OF USING ROBOTS***

***THE AUTISM***

***Time:*** 45 minutes  
***Class management:*** Group work (students are divided into 6 groups)

***Activity 1*** - Brainstorming

***Task 1:*** Watch attentively a video; <https://www.youtube.com/watch?v=Z_eG8vjJEfI>

***Task 2:***  Answer the question: What fields are medical robots used in, nowadays?

Students express their opinion or knowledge.

***Time:*** 10”; T-Ss

***Activity 2 -*** Presentation of contents - The teacher introduces the material

<https://docs.google.com/presentation/d/1UyBbuwAJX-73ScfmNUtFQbBN90awoyDHvouAJcJlt_w/edit#slide=id.p>

***Task 1:*** Each group of students access the Internet and look for two pieces of information:

1.- the name of a robot used in treating autism;

2. - two of the robot functions.

Students perform the task and present it aloud to the other groups.

***Time:*** 10”; T-Ss; Ss-Ss

***Possible solution:***

1- Bandit Camera; Keepon;

2- it uses motion sensors and surveillance cameras to calculate the child position; it attracts

them into social games; it can perceive and synchronize to a person’s move­ments; it focuses on improving the system of rhythmic intelli­gence.

***Activity 3***: Didactic game - ATA (answer - throw - ask)

***Task 1:*** The teacher has a little ball; she asks a question related to the topic of the lesson and throws it to a member of a group.

The student who gets the ball has to answer the question, throw it to a member from another group and asking her/him a question.

The game continues until all the members ask and answer.

If a student gives a wrong answer or doesn’t know the answer, her/his team will be eliminated; and so on, until only one team remains, being nominated as winner.

***Time***: 10”; T-Ss; Ss-Ss

***Activity 4 -***  Advertising campaign

***Task 1:***  Students are asked to militate for a cause - helping children diagnosed with autism to enhance their chances of being integrated, determining people to accept them more easily.

They have to make a flyer, using the most appropriate words to transmit the most sensitive message, in order to achieve their goal. (5”) Then, students share the flyers to the other groups.

***Time:*** 15”; T-Ss; Ss-Ss

***SESSION 3***

***USING ROBOTS IN MEDICINE -***

***ADVANTAGES AND DISADVANTAGES***

***Time:***  45 minutes  
***Class management:*** group work (students are divided in three groups)

***Activity 1 -*** Brainstorming

***Task 1:*** The teacher challenges students to use their general knowledge to perform this task. The leaders of the groups are invited to pick up an envelope. Inside the envelope there are the following themes:

* Doctor’s advantages of using robots;
* Patient’s advantages of using robots;
* Disadvantages of using robots.

The leaders present teams’ tasks, after the working time has expired (5”). ***Time:*** 10” T-Ss; Ss-Ss

***Possible answers:***

* Doctor’s advantages of using robots:

- he operates seated, in a comfortable position, being more relaxed;

- he benefits of 3D viewing and does not depend on help for repositioning the room.

* Patient’s advantages of using robots: - reducing incision size; - diminishing intraoperative hemorrhages and diminishing transfusion needs; - reducing the pain;
* Disadvantages of using robots:

- imposes a large number of training hours;

- the space occupied by such a system in the operating room is large;

- more people are needed to operate the robotic system.

***Activity 2 -*** Presenting the content

<https://docs.google.com/presentation/d/1VkG4_b3KlQ0AYt6H4LAYoGT2p5ytyRIt_iQxmVvz4Tc/edit#slide=id.p>

***Time:*** 12”; T-Ss

***Task 1:*** Word order.

Students get little notes with scrambled words. They need to unscramble them to build complete sentences. Each sentence is different and has another message. Each group must express pros and cons related to the message they got. Then they share them aloud, to the other groups. (5”)

***Time:*** 13”; T-Ss; Ss-Ss

***Note 1***

***Unscramble the words to make correct phrases:***

the that robot can interesting therapy doctors for make using more consider children

***Note 2***

***Unscramble the words to make correct phrases:***

future a with present the thing also of still many robotics the opportunities but a thing job is of

***Note 3***

***Unscramble the words to make correct phrases:***

help reduce robots care waste and save improve costs patient hospitals

***Keys***

***Note 1***: Doctors consider that using the robot can make therapy more interesting for children. ***Note 2***: Robotics is still a thing of the future, but also a thing of the present with many job opportunities. ***Note 3***: Robots help hospitals save costs, reduce waste, and improve patient care.

***Activity 3 -*** Writing a short composition

***Task 1:*** Each group of students get worksheets. They need to be creative and imagine they are a robot and think of a name, type of robot and functions they could have in order to help people. Students fill in the worksheet and then each leader shares the groups’ ideas. (5”)

***Time:*** 10”; T-Ss; Ss-Ss

***Worksheet***

*If I was a robot, my name would be ……………............................................................................. I would do …………………………………………………………………………………………………... ………………………………………………………………………………………………………………… I would help people …………………………………………………………………………. because ………………………………………………………………………………………………………………….. I would like to live in …………………………………………………………………………. because …………………………………………………………………………………………………………………...*

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