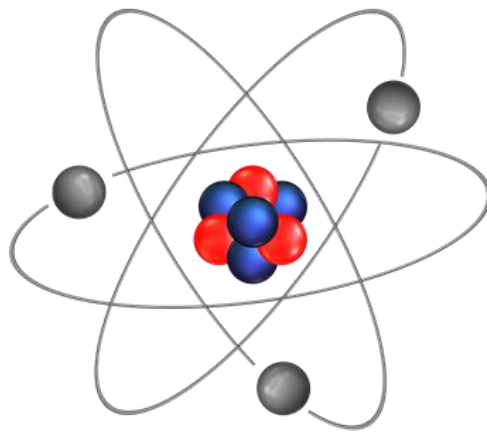


ELECTRIC CIRCUITS

First steps into CLIL



Olga Pano Ferrer
opano@xtec.cat



Generació Plurilingüe

First Year
2017-2018



Generalitat de Catalunya
Departament d'Ensenyament

Generació Plurilingüe 1

GEP session	Session 2 - The multicoloured layers of CLIL input: Fostering cognitive skills.
Title of the lesson or topic	ELECTRIC CIRCUITS
Course / year / age	2nESO/2017/13 years old
Timing	2 hours
Short description of the session/s <ul style="list-style-type: none">What is the session about?What do I want my students to do today?	<ul style="list-style-type: none">Explaining how electric circuit works and its basic parts/components.Identify and classify parts of an electric circuitDiscuss their ideas about how electric circuits work <p>We are going to do some activities in order to understand a little bit more how electric circuits work. There will be a text with some questions (explicit, implicit and referential questions) and some activities (activity 0- Introduction and Warm up, activity 1- think, pair and share and activity 1.1- interactive and dialogic one)</p>
In terms of academic content, what are the students learning and what are they	Introduce a scientific model that is good enough to explain WHY things happen as circuit components (batteries, bulbs and speakers) are changed around.

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learning to do?	
In terms of language, what are the students practicing or learning to do?	<ul style="list-style-type: none">• Students can formulate arguments related to the topic• Describe the effects of electricity verbally
In what way is this 2-hour lesson plan a good example of what we learnt in the GEP course session?	<p>The lesson plan includes different activities (Q1-Q2 Bloom's Taxonomy) such as:</p> <p>Activity 0: Visual and Written Inputs. The teacher will give the learners a sheet with different images and they will have to write down basic words to express what all of them have in common</p> <p>Activity 1: Spoken, Visual and Written Inputs. The teacher asks a question. It's an individual, pair and share activity. Then, the teacher shows a picture of a circuit and presents some questions.</p> <p>Activity 1.1: Spoken, Visual and Hands-on Inputs The teacher works with the pupils through an INTERACTIVE/DIALOGIC approach, encouraging them to suggest their ideas, and making clear their reasons, about what will happen when the BIG circuit is switched on.</p>
Other important information	

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TEXT

The main tips are:

- Autonomous and cooperative learning
- Self-asses their own progress
- Expand the language, vocabulary and symbology
- Use of authentic materials and components
- Challenging activities which require thinking
- Give students enough elements to enjoy Electricity/electronics
- Make them realize the importance of electricity/electronics in our lives

Visit the website:

<http://www.explainthatstuff.com/electricity.html> (What is electricity and electricity circuits)

Explicit questions:

What do you need for an electric/electronic current to happen?

What are the connection wires made of?

Implicit questions:

Where do you think we can find copper wire?

Why do you think it is better to use copper wire instead of another material?

Referential questions

How could you explain that clouds can be charged electrically?

What do electricity and electronics provide to a cellular?

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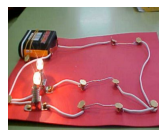
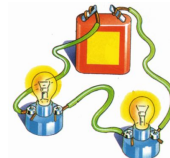
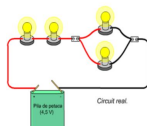
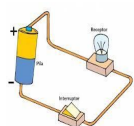
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ACTIVITY 0: Introduction and Warm Up (VISUAL and WRITTEN INPUTS)

Mode of interaction: The teacher gives this sheet and learners have to write down basic words to express what all of them have in common

Look carefully at these pictures



Possible solutions:

Circuits
Electricity
Light, bulb
Project

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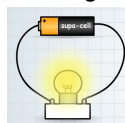
ACTIVITY 1: Thinking and talking about electric circuits. (SPOKEN, VISUAL and WRITTEN INPUTS)

Encourage students to discuss their ideas about how electric circuits work.

Motivate them to start thinking about the topic.

Mode of interaction: Individually, each learner writes down their answer to a key question. Next, in pairs, learners compare and discuss their answers with each other. Finally, have a short plenary discussion of some of the groups' answers.

Bulb light



1. Explain in as much detail as you can (thinking about both battery and bulb) why you think the bulb lights.

The bulb lights because

I think that the bulb lights because

Electrons are running through that's why

2. a) How could you change the circuit to make the bulb brighter?

I would change

Maybe if we change the battery/bulb

- b) Explain why this would work

It works because ...

I think it is because....

3. If the circuit is left on, why will the battery stop working?

Because ...

I think the battery will stop working because ...

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ACTIVITY 1.1: A BIG circuit (SPOKEN, VISUAL and HANDS-ON INPUTS)

- Enable students to recognise the questions involved in coming to understand how an electric circuit works.
- Probe students' existing ideas about how an electric circuit works.

Mode of interaction

The teacher works with the pupils through an INTERACTIVE/DIALOGIC approach, encouraging them to suggest their ideas, and making clear their reasons, about what will happen when the BIG circuit is switched on.

The BIG circuit consists of a 1.5-volt power supply connected through long wires to a speaker. (we will use the Drawdio project)

'What will happen when the circuit is closed?'

'Will the speaker sound straight away?'

'Do you think there will be a short delay?'



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GEP session	Session 5 - Reading and Writing in CLIL
Title of the lesson or topic	ELECTRIC CIRCUITS
Course / year / age	2nESO/2017/13 years old
Timing	2 hours
Short description of the session/s <ul style="list-style-type: none">What is the session about?What do I want my students to do today?	<p>We are still talking about how electric circuits work</p> <ul style="list-style-type: none">Explaining how and why electric circuit worksThe importance of the atom and its subatomic particlesWho is the responsible of electricity?Where does electricity come from? <p>Students will learn new vocabulary, how to write a composition and giving their own opinions</p>
In terms of academic content, what are the students learning and what are they	LEARNING Find out about

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learning to do?	<ul style="list-style-type: none">• The meaning of words related to electricity• Causes and consequences of electricity• Effects of electricity <p>LEARNING TO DO</p> <p>know how to</p> <ul style="list-style-type: none">• Understand and discuss the importance of electricity in our lives• Describe and Write about what electricity is and where it comes from.• Work in groups to exchange opinions and see different points of view <p>Introduce a scientific model that is good enough to explain WHY things happen</p>
In terms of language, what are the students practicing or learning to do?	<p>LANGUAGE OF LEARNING</p> <p>Terminology related to explain what electricity is and where it comes from.</p> <p>Understand and explain the topic related to the video (Powtoon)</p> <p>Meaning and use of the passive narrative tenses.</p> <p>LANGUAGE FOR LEARNING</p> <p>Describing experiences</p> <p>Writing skills</p> <p>Asking and answer questions</p> <p>Speaking skills</p>

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	<p>Restrictive clauses Linking words: Instead, So, Whereas, First, Second... Last Giving opinions: In my opinion, I believe that, I agree with, Verb+Preposition Adverbs</p>
<p>In what way is this 2-hour lesson plan a good example of what we learnt in the GEP course session?</p>	<p>The lesson plan includes 2 activities within different parts Different types of input: video, pictures, games Inputs for multiple intelligences</p> <p>INSTRUCTIONS Activity 0: Introduction To introduce the topic: I'm going to ask students what they remember from the previous class about Electricity. To do that, we are going to use the ANSWER GARDEN tool which is used for real time audience participation, online brainstorming and classroom feedback. Students can share their ideas</p> <p>Activity 1: Working on the topic First of all, we are going to discover new vocabulary related to the main topic. The teacher will guide them to know the most important words they need. It will be useful for the comprehension of the video.</p> <p>Worksheet 1. Vocabulary</p>

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	<p>Then, we are going to watch, at least twice, a 2 minute-video created by Powtoon tool. After that, in groups of 2 and then all the class together, students will answer different questions in order to know if they understood the video and they are capable to make a writing activity.</p> <ul style="list-style-type: none">-Answer different questions. Oral activity and all the class together. Worksheet 2. Think and Share-Create a mind map related to the main ideas in the video using bubbl.us website.-Writing activity. They have images and they need to write about the topic and relate it to the pictures. <p>Worksheet 3. Writing</p> <p>After all these activities, we are going to review the vocabulary with a matching game. Worksheet 4. Match game</p> <p>And finally, to sum up, we are going to create a new ANSWER GARDEN to share all the new ideas and vocabulary that the students have learnt.</p>
Other important information	<p>Answer garden: https://answergarden.ch/645254</p> <p>Worksheet 1. Vocabulary</p> <p>Powtoon Video</p> <p>Worksheet 2. Think and share</p> <p>Creating a Mind Map: bubbl.us</p> <p>Worksheet 3. Writing</p> <p>Worksheet 4. Match game</p> <p>All the pictures are taken from pixabay.com</p>

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Activity 0: Introduction

AnswerGarden 

What is electricity?

Submit

20 characters remaining

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Activity 1. Worksheet 1: Vocabulary

WORD	DEFINITION
Electron	A fundamental particle that has a negative charge and exists outside the nucleus of an atom
Power Lines	A cable carrying electrical power
Neutron	A particle found in the nucleus of most atoms, having no charge
Transformer station	A station of an electricity generation, transmission and distribution system
Atom	The smallest part of an element that still has the chemical properties of the element
Proton	A positively charged elementary particle that is fundamental constituent of all atomic nucleus
Nucleus	The positively charged mass within an atom, composed of neutrons and protons
To be attracted	To cause to approach or come near
To be delivered	To provide a service for carrying a product

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[Powtoon Video](#)

Activity 1. Worksheet 2: Think and answer

Why do you think machines need energy?

- a) In order to work
- b) Because it's a kind of food
- c) Machines don't need energy.

What is an atom?

- a) It's a particle that human eyes can see
- b) It's a particle in nature
- c) It's the smallest building block of matter

In the atom, which are the subatomic particles?

- a) Protons, Electrons
- b) Neutrons, Protons
- c) Electrons, Protons, Neutrons
- d) Protons, Neutrons, Electrons, Positrons

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Protons are:

- a) With no charges
- b) Positively Charged
- c) Negatively Charged

Electrons are:

- a) With no charges
- b) Positively Charged
- c) Negatively Charged

Neutrons are:

- a) With no charges
- b) Positively Charged
- c) Negatively Charged

Which particles are in the nucleus and which ones are encircling it?

- a) **Nucleus:** Neutrons and Electrons. **Encircling nucleus:** Protons
- b) **Nucleus:** Neutrons and Protons. **Encircling nucleus:** Electrons
- c) **Nucleus:** Protons and Electrons. **Encircling nucleus:** Neutrons

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Which particle moves very quickly and is the responsible of electricity?

- a) Protons
- b) Neutrons
- c) Electrons

Where is electricity made at?

- a) Power lines
- b) Power plants
- c) Transformer station

Electricity can be delivered straight to our home from huge power lines?

- a) No
- b) Yes

What is the main purpose of a transformer station?

- a) To reduce the electricity and send it to smaller power lines for delivering straight to our house
- b) To increase the electricity and send it to smaller power lines for delivering straight to our house
- c) To reduce the electricity and send it to huge power lines for delivering straight to our house



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[Activity 1. Worksheet 3: Writing](#) (you can find a text below each picture as a possible solution)

Activity 1. Worksheet 4: Match game

WORD	DEFINITION
Electron	A station of an electricity generation, transmission and distribution system
Power Lines	To cause to approach or come near
Neutron	To provide a service for carrying a product
Transformer station	A positively charged elementary particle that is fundamental constituent of all atomic nucleus
Atom	A cable carrying electrical power
Proton	The positively charged mass within an atom, composed of neutrons and protons
Nucleus	A fundamental particle that has a negative charge and exists outside the nucleus of an atom
To be attracted	The smallest part of an element that still has the chemical properties of the element
To be delivered	A particle found in the nucleus of most atoms, having no charge

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Generació Plurilingüe 1

GEP session	Session 6 - Collaborative Learning
Title of the lesson or topic	ELECTRIC CIRCUITS
Course / year / age	2nESO/2017/13 years old
Timing	2 hours
Short description of the session/s <ul style="list-style-type: none">What is the session about?What do I want my students to do today?	<p>We are still talking about how electric circuits work</p> <ul style="list-style-type: none">Explaining how and why electric circuit worksThe importance of the atom and its subatomic particlesWho is the responsible of electricity?Where does electricity come from? <p>Students already know new vocabulary, how to write a composition and giving their own opinions</p>
In terms of academic content, what are the students learning and what are they learning to do?	<p>LEARNING</p> <p>Find out about</p> <ul style="list-style-type: none">The meaning of words related to electricity

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	<ul style="list-style-type: none">• Causes and consequences of electricity• Effects of electricity <p>LEARNING TO DO</p> <p>know how to</p> <ul style="list-style-type: none">• Understand and discuss the importance of electricity in our lives• Describe about what electricity is and where it comes from. <p>Introduce a scientific model that is good enough to explain WHY things happen</p>
In terms of language, what are the students practicing or learning to do?	<p>LANGUAGE OF LEARNING</p> <p>Terminology related to explain what electricity is and where it comes from.</p> <p>Understand and explain the topic related to the topic</p> <p>Meaning and use of the passive narrative tenses.</p> <p>LANGUAGE FOR LEARNING</p> <p>Asking and answer questions</p> <p>Speaking skills</p> <p>Restrictive clauses</p> <p>Linking words: Instead, So, Whereas, First, Second... Last</p> <p>Giving opinions: In my opinion, I believe that, I agree with,</p> <p>Verb+Preposition, Adverbs</p>

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In what way is this 2-hour lesson plan a good example of what we learnt in the GEP course session?

The lesson plan includes 3 activities within different parts
Different types of input: debate, pictures, games
Inputs for multiple intelligences

INSTRUCTIONS

Activity 0: Introduction

To remember the topic: I'm going to ask students what they remember from the previous class about Electricity. I let them talk about it before starting with some collaborative activities.

Activity 1: Quiz Game (worksheet 1)

The teacher will give them a sheet with some questions about the topic. They must work with a partner in order to answer as soon as they can all the questions.

Activity 2: The fishbowl (worksheet 2)

The teacher is going to pick four pupils. One of them is the "expert" who tries to answer all the questions. The second one is the interviewer who can ask questions to the expert (the questions are previously written down). The third one also has some questions in a paper to ask them to the expert.

And the last one can ask any questions that he/she wants.

The rest of the group is outside around these four students and they must pay attention because whenever the teacher wants, there will be an student-role exchange. The theme is about "What electricity is and where it comes from".





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	<p>Activity 3: Electricity vocabulary Memory Card (worksheet 3).</p> <p>The objective of the game is matching picture cards with its word cards.</p> <p>We will work in teams of three students (two of them are the players and the third one is the jury). First of all, the teacher must cut the cards and the pictures and give them to each group. All the cards must be upside down. Students can't see anything. And of course, the cards must be mixed up. Teacher tells when the game starts. The first team who matches correctly the pictures with the words is the winner. Students can turn just two cards each time. If they don't match, they must face them down and try it again.</p> <p>They are also going to create their own Memory Card Game and we will play and share them.</p> <p>And finally, to sum up, we are going to create a word poster with all they have learnt in order to leave it in the classroom until the end of the course.</p>
Other important information	<p>Introduction: debate</p> <p>Worksheet 1. Quiz Game</p> <p>Worksheet 2. Fishbowl</p> <p>Worksheet 3. Memory Card</p> <p>Create their own memory card game</p> <p>Worksheet 4. Word Poster</p> <p>All the pictures are taken from pixabay.com</p>

Activity 0: Little talking/debate

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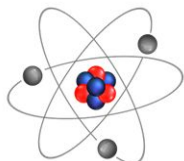
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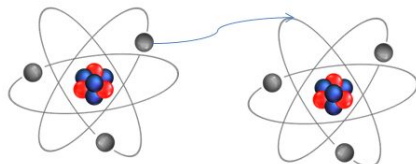
Activity 1. Worksheet 1: Quiz Game: What is electricity?

Be the first one to answer the questions and show how good at your understanding of how electricity works you are.

1. Label the parts of the atom and their charges



2. Label and explain what is happening with the two atoms



3. All matter is made of.....

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4. Small particles in an atom have an charge
5. Electrons have a charge
6. Protons have a charge
7. Inner orbiting electrons are called
8. Outer orbiting electrons are called
9. Electricity is created in
10. Before arriving to our homes, electricity must go to



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Activity 2. Worksheet 2: Fish bowl

PAPER 1 (THE EXPERT)

The student is going to explain what electricity is for for him/her and where it comes from.

PAPER 2 (INTERVIEWER 1)

The interviewer 1 is going to ask some questions whenever he/she wants and according the expert explanations.

- *What is an atom?*
- *Which are the parts of an atom?*
- *Why do we need energy?*
- *Which charges are in the nucleus of the atom?*
- *Explain how machines work.*
- *Invent a question!*

PAPER 3 (INTERVIEWER 2)

The interviewer 2 is going to make different questions whenever he/she wants and according the expert explanations.

- *Why electrons are so important?*
- *Why electricity must go to a transformer station?*
- *Can you explain how we get electricity straight to our homes?*
- *Is electricity dangerous? Which charge is positively charged?*
- *Invent a question!*

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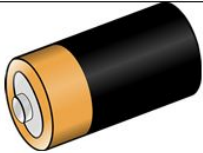



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Activity 3. Worksheet 3: Memory Card

Match the 'electricity' word with the correct picture

			
ATOM	TRANSFORMER STATION	POWER PLANT	OPPOSITE CHARGES
			
SOLAR PANEL	WIND TURBINES	BATTERY	BULB

Activity 4. Word Poster

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