C L I L TEACHING UNIT: ENERGY RESOURCES

MARIONA LÓPEZ & TERESA BADIA
with Nacho Pérez’s collaboration.

TED MASTERS DEGREE
2009-2010.
Acknowledgements

We would like to thank our university teacher and tutor María José Lobo for her support and guidance.

We would also like to thank our secondary school tutors in the Practicum, Elisabeth Eixarch and Josep Bazoco and the Science Teacher Miquel Mas and also the rest of the teachers with whom we have had the pleasure to work with: Emilia Ruíz, Sara Peiro and the speech therapist Natàlia Lagunas. They have treated us like one of them and have made our teaching experience a unique one. Thanks for your support, guidance and feedback.

We do not want to forget all our students who have been very nice and understanding and have allowed us to video record them. We have learnt a lot from them and we deeply appreciate their encouraging comments.

We would also like to thank our Master’s classmates, especially Almudena Herrera, Carlos Bardají and Arancha Domper who have accompanied us daily with their support and strength.

And finally, we would like to show our gratitude to our families for their unconditional support and for their understanding in the difficult moments.
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PART I

1.- INTRODUCTION

The unit you are about to read is the result of our first experience as teachers in a high school. We still remember very clearly our first meeting with our mentors in January when were told that we were going to work on “energy resources” and how these words puzzled or even scared us a little. Windmills and nuclear reactors were the only things that we could think of and we really did not know how to come up with a good plan to engage our students. Yet there was some thrill for chase. It was a great challenge for us. A double challenge, actually. On the one hand, we had to study this topic so new to us and choose the materials very carefully. On the other one, it was the first time our students had some CLIL lessons and we did not know how receptive they would be to learn Science in English. All in all, in these two months, all of our energies were focused on deciding what to teach and how to teach it, which we consider the most difficult part of our job. The result is a unit which is divided in two parts. The first one covers ten sessions designed for 2nd of ESO students, which were implemented from 12th March to 19th April 2010. The second part is based on a final project. The class was divided into 5 groups (four students per group) and each group had to work on a different energy resource type: Non-renewable energy resources, (Fossil Fuel and Nuclear resources) and Renewable energy resources (Solar, Wind, Biomass and Hydropower energy resources). The Final Project consists on a PowerPoint and a group oral presentation which was held on the 16th or 19th of April. We consider this final project to be the landmark of our unit, as it allowed the students to develop their oral skills, and this is something very important in the construction of their knowledge of both Science and English.
There is also an adaptation for 3rd ESO students with learning difficulties. However, it is a shorter version (in length and time) and it is mostly focused on energy resource type classification and saving tips. The result was quite good because our teacher helped us to elicit the students’ previous knowledge on this subject (and they knew a lot!) and, little by little, we started constructing from that point onwards.

Finally we just want to say that we are very lucky that our mentors gave us the opportunity to work on energy resources. It is a fascinating topic because it can be tackled from different approaches: from the scientific approach, in which the students have learned to describe definitions and processes, including the more humanistic approach, which has involved the students with thought-provoking discussions about how to save energy in their everyday life, to the artistic approach, which include the artists who have been moved to leave their personal print in their songs or writings about this topic.

We are also very grateful because we know that being a teacher and a student at the same time is a unique experience which will probably happen once in a lifetime. We really hope that our students have learned as much as we did.

Thank you very much for your attention and welcome to our unit.
PART II

1.- STUDENT’S BOOK
2.- TEACHER’S BOOK
## SESSIONS CALENDAR

### MARCH

<table>
<thead>
<tr>
<th>MONDAY</th>
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<td>Session 20th</td>
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### APRIL – FINAL PROJECT PPT PREPARATION AND PRESENTATION.

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<td>(8.30 – 9.30)</td>
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<td>1</td>
<td>- Understand the general overview of the unit: Topic, materials, goals, assessment, final project. - Introduction to both Renewable and non-renewable Energy resources and main ideas. Learn that: Electricity (light, heat) is produced from energy resources.</td>
<td>Listening Reading Speaking</td>
<td>-Warm-up activity: Brainstorming non-renewable energy resources (Wordle)</td>
<td>Energy Resources Renewable energy resources Non-renewable energy resources Fossil Fuels (oil/petroleum, natural gas, methane, coal) Nuclear fuel (Uranium-235) Solar energy (panels) Wind energy (windmills) Hydropower energy Biomass energy (organic matter)</td>
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## ENERGY RESOURCES
Mariona López & Teresa Badia with Nacho Pérez’s collaboration

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<th>SESSIONS</th>
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<td>2</td>
<td>- Get to understand the definition of renewable and non-renewable energy resources and the main differences between them (semantic VISUAL map provided).&lt;br&gt;- Learn about non-renewable energy resources (definition, types and type of fuels)</td>
<td>Listening Speaking Reading Writing Interaction</td>
<td>- Warm-up Brainstorming Activity 1 Matching activity (Non-renewable energy Resources)&lt;br&gt;- Classic Dictation (Renewable and Non-renewable Energy Resources definition)&lt;br&gt;- Peer correction of dictation</td>
<td>Non-Renewable energy Resources&lt;br&gt;Fuel&lt;br&gt;Greenhouse effect&lt;br&gt;Limited supply&lt;br&gt;Pollution&lt;br&gt;CO2&lt;br&gt;To provide Renewable energy Resources&lt;br&gt;Natural resources&lt;br&gt;Flame&lt;br&gt;Methane&lt;br&gt;Nuclear Reactor&lt;br&gt;Nuclear Plant&lt;br&gt;Polluting&lt;br&gt;Uranium Pellets&lt;br&gt;Oil Pumps&lt;br&gt;Gas Pipes&lt;br&gt;Pump Jack</td>
<td>T → S&lt;br&gt;T ↔ S&lt;br&gt;S ↔ S</td>
<td>-Be able to be participative and interact with the teachers and other classmates.&lt;br&gt;-Be able to explain properly how at least one of the energy resources produces electricity.&lt;br&gt;-Be able to prepare a PowerPoint about an energy resource type: definition, pictures, how does a power plant work to produce electricity? Advantages and disadvantages.</td>
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<td>3</td>
<td>- Learn about renewable energy resources (definition, types and type of fuels)</td>
<td>Listening Speaking Reading Writing Interaction</td>
<td>- Warm-Up (Wordle) - Activity 2 Guessing (Matching) Activity – Renewable energy resources - Activity 3 Matching activity Mixed Energy Resources - Activity 4 Classification of resources into renewable or non renewable.</td>
<td>Renewable energy resources Wind energy Wind current Solar energy Solar panels Hydropower energy Biomass energy Turbine Organic matter</td>
<td>T → S</td>
<td>T ↔ S - Be able to do a brief oral presentation about at least one of the studied energy resources in front of the class. - Be able to work collaboratively with other classmates.</td>
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<td>4</td>
<td>- Brainstorming previous ideas in order to organize them and prepare a mind map. (Visual-Semantic map)</td>
<td>Listening Speaking Writing Interaction</td>
<td>- Warm-up (Correction Activity 4) - Activity 5 Mind Map</td>
<td>Mind map Web application Diagram Category Branch To upload</td>
<td>T ↔ S</td>
<td>S ↔ S - T ↔ S</td>
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<td>SESSIONS</td>
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<td>- Be able to relate certain previously concepts with their definition.</td>
<td>Reading Speaking</td>
<td>- Warm up</td>
<td>Fossil fuel Underground area Reservoirs Atom</td>
<td>T → S</td>
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<td>- Be able to dictate a memorised sentence properly and as fast as possible.</td>
<td>Listening Writing</td>
<td>- Activity 6 Jigsaw reading (matching concept + definition)</td>
<td>To make up Heating Carbon Flow Fall</td>
<td>T ↔ S</td>
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<td>Interaction</td>
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<td>6</td>
<td>- Be able to understand the concepts of advantage and disadvantage related to energy resources</td>
<td>Speaking Listening Thinking Reading Writing</td>
<td>- Warm-up</td>
<td>Advantages Disadvantages Sunny Windy Safety To spend Remote area To supply energy Greenhouse gas Power stations Global warming Mining coal Amount Reception Windmill Dam/Dyke To build Available</td>
<td>T → S</td>
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<td>- Be able to distinguish between advantages and disadvantages and relate them to energy resources types.</td>
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<td>7</td>
<td>- Learn about the general process from which electricity/power is generated from an Energy resource. - Learn about how important saving energy is and how to save energy and be environmentally friendly (Video)</td>
<td>Speaking Reading Writing Listening</td>
<td>- Warm up (Questions for the class) - Activity 10 Jigsaw Reading Activity</td>
<td>Turbine Generator Steam Pressure Light bulbs To boil Saving tips Turn on/off Oven Thermostat Clothes dryer Container Sunshine</td>
<td>T → S T ↔ S S ↔ S S↔ T</td>
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<td>8</td>
<td>- Be aware of how much energy certain household appliances consume. - Know how to be more environmentally responsible consumers.</td>
<td>Speaking Listening Reading Writing</td>
<td>- Warm Up - Activity 12 Household appliances (rank from 1 to 5 the ones that consume more energy and add a saving tip) - Activity 13 Ways of saving energy</td>
<td>Stove Microwave Water Heater Oven Toaster</td>
<td>T → S T ↔ S S ↔ S S↔ T</td>
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<td>9</td>
<td>- Be able to understand a specific text and to ask and answer questions - Self assessment quiz</td>
<td>Speaking Reading Writing Listening</td>
<td>- Warm up Activity - Activity 14 Expert Reading Activity</td>
<td>Pollution Carbon Dioxide To combust Blanket Greenhouse effect Extinct Sulfur Dioxide To emit Precipitation Acid Rain</td>
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## ENERGY RESOURCES
Mariona López & Teresa Badia with Nacho Pérez’s collaboration

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<tr>
<td>10</td>
<td>- Become environmentally conscious about human effects on the planet.</td>
<td>Listening, Speaking Reading Writing</td>
<td>- Activity 15. Listening to “Earth Song”</td>
<td>- Activity 16. True or False Dictation</td>
<td>T → S</td>
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<td>11</td>
<td>- Work collaboratively in groups of 4 students and prepare a PowerPoint Presentation about NUCLEAR ENERGY</td>
<td>Speaking Listening Reading Writing Interaction</td>
<td>- Reading source to do the presentation, asking questions, etc.</td>
<td>- Writing PowerPoint</td>
<td>Uranium 235 Mine Engines Nuclear fission To split Atoms Neutrons Waste</td>
<td>T → S</td>
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<td>12</td>
<td>- Work collaboratively in groups of 4 students and prepare a PowerPoint Presentation about HYDROPOWER ENERGY</td>
<td>Speaking Listening Reading Writing Interaction</td>
<td>- Reading source to do the presentation, asking questions, etc.</td>
<td>- Writing PowerPoint</td>
<td>Grind To lit To trap To flow Bottom Top Reservoir high pressure To store Flood Irrigation Environment</td>
<td>T → S</td>
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<td>13</td>
<td>- Work collaboratively in groups of 4 students and prepare a PowerPoint Presentation about SOLAR ENERGY</td>
<td>Speaking Listening Reading Writing Interaction</td>
<td>- Reading source to do the presentation, asking questions, etc.</td>
<td>- Writing PowerPoint</td>
<td>Solar panels Photovoltaic cells Heat Pipes Battery chargers, Degrees Convection.</td>
<td>T → S</td>
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<td>SESSION</td>
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<td>14</td>
<td>- Work collaboratively in groups of 4 students and prepare a PowerPoint with PowerPoint about WIND ENERGY</td>
<td>Speaking, Listening, Reading, Writing, Interaction</td>
<td>Reading source to do the presentation, asking questions, etc.</td>
<td>Writing PowerPoint</td>
<td>To grind corn, Propeller blade, To rise, blow, Wind farm, Windmill</td>
<td>T → S, T ↔ S, S ↔ S, S ↔ T</td>
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<td>- Work collaboratively in groups of 4 students and prepare a PowerPoint Presentation about FOSSIL FUELS ENERGY</td>
<td>Speaking, Listening, Reading, Writing, Interaction</td>
<td>Reading source to do the presentation, asking questions, etc.</td>
<td>Writing PowerPoint</td>
<td>Remains, Dust, To condense, Cooling towers, Sulphur dioxide, To flow, Pipes, Crude oil, Coal-fired stations, Greenhouse effect</td>
<td>T → S, T ↔ S, S ↔ S, S ↔ T</td>
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<td>Speaking</td>
<td>Presentations’ REHEARSAL (5 groups)</td>
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<td>Speaking</td>
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<td>Speaking</td>
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</table>
OVERVIEW OF THE UNIT

TEACHING UNIT ON ENERGY RESOURCES

<table>
<thead>
<tr>
<th><strong>Unit title:</strong></th>
<th>Energy resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authors:</strong></td>
<td>Mariona López, Teresa Badia with Nacho Pérez’s collaboration</td>
</tr>
<tr>
<td><strong>Class/Age:</strong></td>
<td>2nd of ESO group E, group C</td>
</tr>
<tr>
<td><strong>COE Level:</strong></td>
<td>A2</td>
</tr>
<tr>
<td><strong>Subjects, languages, Teachers involved:</strong></td>
<td>English, Science and A.B. (Adapted Version) our mentors are Elisabeth Eixarch (English teacher), Josep Bazoco (A.B. teacher) and Miquel Mas (Science teacher)</td>
</tr>
</tbody>
</table>
| **Approximate number of lessons:** | First part: 10 regular sessions  
Second part: 8 (minimum) group work sessions + 2 (minimum) Sessions for Presentations. |

UNIT GOALS & TARGET COMPETENCES

By the end of the unit the students will be able to:

1. Distinguish, classify and briefly describe the main Renewable and Non-Renewable energy resource types. (Reading and writing).
2. Understand some of the key concepts related to these topics. (Thinking).
3. Interact with other classmates and the teacher to share opinions, information.
4. Use several resources (ICTs and internet). (Technological skills)
5. Improve listening, interaction skills.
6. Prepare an oral presentation and a PowerPoint about an energy resource type. (Group work, Speaking).
MAIN CONTENTS

1. The definition and differences between Renewable and Non-Renewable energy resources.
2. The main kinds of Renewable and Non-Renewable energy resources.
3. Advantages and disadvantages of using Renewable and Non-Renewable energies.
4. Listening to /watching some audiovisual material.
5. Why is saving energy so important?
6. Provide some tips for saving energy and being environmentally friendly.
7. Prepare a PowerPoint presentation about an energy resource type (definition, how it works, advantages & disadvantages, pictures, photos, video, etc.)

ATTITUDES AND VALUES

Related to Communication:

1. try to communicate in English and express ideas as clear and understanding as possible.
2. be receptive towards the classmates, student-teachers and mentors.
3. be as participative as possible.

Related to Learning involvement:

1. personally involved and attentive.
2. be responsible and have a positive attitude.
3. be collaborative in the class and in group/pair work.
Related to the unit content:

1. be aware of the contents.
2. be concerned about the importance of misusing energy and its direct relationship with the environmental issues.
3. how to save energy at home, at school, at work, etc.
4. Understand and explain how energy resources work.

ASSESSMENT

a. Participation in class + student’s dossier exercises.
b. Quiz
c. Self-evaluation sheet and other classmates’ evaluation sheet.
d. An oral presentation about how does a specific energy resource type work.
This lesson must fulfill, at least, three requirements:

A) To present and contextualize sufficiently the unit goals, the main activities that will be carried out and the main organizational traits.

Opening speech: Introducing what the student-teachers will do in both the Science and English class during the sessions. The objectives are the following ones:

- To know about the difference between renewable and non-renewable energy resources and know that the Sun is the ultimate source of our energy and that all these resources are mostly used in order to supply electricity.
- To give examples of each type and know where they come from.
- To know about advantages and disadvantages of using them.
- To know about ways to save energy.
- To know how to explain how at least one of the energy resources work.
- To use some ICTs.

Comment on the Assessment: so that the students know what is expected from them.

- Participation in class + student’s dossier exercises
- Self-evaluation sheet and other classmates’ evaluation sheet
- An oral presentation about how does some specific energy resource type work.
B) To raise students’ interest on the topic

The student-teachers are going to use a lot of audio-visual material (everything is included in their Dossier). The student-teachers will help them to understand and produce in English. Although the students are requested to hand in the dossier individually, they will work collaboratively with the help of their classmates, their mentors and the student-teachers.

C) To gather information about the student’s previous knowledge and skills related to the unit, and about their feelings towards them.

The student-teachers know about their previous knowledge and skills related to the Energy unit because we have been attending their lessons in Catalan during the first observation week. Our mentor has already introduced the definitions about the different kinds of energy (Kinetic, chemical etc) and has made the distinction about kinds of energies and energy resources. This means that the students are familiar with some of the most important names related to our unit (for example Solar energy, Nuclear power energy, Wind energy). Our perception is that the students are motivated because they can connect our mentor’s explanations in their real lives (for example they have heard about hydraulic cars, nuclear bombs, power stations). Some of the students have actively participated during these sessions.
ENERGY RESOURCES
Mariona López & Teresa Badia with Nacho Pérez’s collaboration

TASKS

1.- Warm-up activity:

**Wordle:** Each student has a wordle in their Dossier with the most important concepts dealing with Non-Renewable energies we are going to work upon. We have ours projected in the PowerPoint. We will ask them to recognize these names in their own language. The aim is to elicit their previous knowledge and start constructing the other activities from this point.

**Timing:** 5 minutes to look at it in pairs, 5 minutes to correct altogether orally. (Asking students).

**Slide of the Energy resources types:** The aim is to introduce the concept of Energy resources types and to explain why they are important.

**Timing:** Rest of the lesson.

**Interaction pattern:** fronted-teaching, the whole class

**Materials:** Wordle, PowerPoint (Session 1, slide 7), Student’s Book (p. 4)

**Resources:** [http://www.wordle.net](http://www.wordle.net)

**ANSWER KEY:**

Nuclear energy: Uranium.

Fossil Fuels: Coal, Oil, Petroleum, Natural gas.
2.- “Lemon” activity. The students are asked to count aloud from 1 to 50 when pointed by the teacher and the student whose turn is a multiple of five (5, 10, 15, 20, etc.) says the name of the energy resource type in the flashcard shown by the teacher.

Timing: 10 minutes
Interaction pattern: Teacher → Student, Student → Student
Materials: Flashcards
Resources: www.google.es/images

POSSIBLE ANSWER KEY:

One, two, three, four, Solar energy, six, seven, eight, nine, Nuclear energy, eleven, twelve, thirteen, fourteen, Hydropower energy, etc.

SUBJECT MATTER CONTENTS
Main target knowledge:
Non-renewable energy resource types.
There are Renewable and Non-renewable energy resources.
They are important because they produce electricity, heat, light, etc.

Main target skills:
Visualise the main Non-renewable energy resource types.

CONTENT OBLIGATORY LANGUAGE
Discourse genre:
Understand the names of the Non-renewable energy resources.
To understand that there is a difference between Renewable and Non-renewable.
Understand why they are important for us.
Terminology:

**Topic specific:** Fossil fuels (oil, natural gas, coal, petroleum) and Nuclear energy, uranium, Renewable energy, electricity, heat and light.

**Academic domain specific:** passive voice: *is produced by*, cause and effect connectors: therefore.
2.2.- SESSION 2

a) What will this lesson be about?

Some theoretical concepts:
1. The difference between Renewable and Non-renewable energies.
2. Definitions of fossil fuels and Nuclear power
3. Examples for each of them.

b) What is the one thing the students will remember?

Understand the definitions and differences between Renewable and Non-Renewable energy resources.
Learn there are two types of Non-Renewable energy resources (Fossil and nuclear power)

INTRODUCTION

*Slide with the definition of Renewable and Non-Renewable:* The aim is to give the students a very short and simple definition of these concepts so that they begin to understand the differences between these two energy resources.

*Timing:* 10 minutes.

*Interaction pattern:* Teachers - students.

*Materials:* PowerPoint (Session 2, slides 3-6)

*Resources:* http://www.darvill.clara.net/altenerg/
Slide with the energy resources types: The aim is that the students have a very clear picture in mind of the classification of the energy resources.

**Timing:** 15 minutes

**Interaction pattern:** Student-teachers, students

**Materials:** PowerPoint (Session 2, slide 4)

**Resources:** [http://www.darvill.clara.net/altenerg/](http://www.darvill.clara.net/altenerg/)

### TASKS

<table>
<thead>
<tr>
<th>TASK</th>
<th>Description</th>
<th>Timing</th>
<th>Interaction pattern</th>
<th>Materials</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.-</td>
<td>Matching activity: The aim is that the students identify the Non-Renewable energy resources previously classified and defined, so that they have visual and linguistic support. It consists of a slide with the photos and the names of the energies. We help them to do the matching by giving clues if necessary. The students will do the activity in pairs in the Students’ dossier and we will correct it orally.</td>
<td>15 minutes</td>
<td>In pairs</td>
<td>Student’s book (p.5) , PowerPoint (Session 2, slide 7)</td>
<td><a href="http://www.darvill.clara.net/altenerg/">http://www.darvill.clara.net/altenerg/</a></td>
</tr>
</tbody>
</table>

**ANSWER KEY:**

A) 2  B) 8  C) 1  D) 4  E) 5  F) 7  G) 6  H) 3
2.- **Classic dictation**: The student-teachers read the short definitions of the Renewable and Non-Renewable energies and the students must write down what they understand in their dossier. The aim of this activity is to see if everyone is able to understand our explanations.

**Timing**: 10 minutes.

**Interaction**: Student-teachers, class.

**Materials**: Student’s book (p. 5), PowerPoint (Slide 3)

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**ENERGY RESOURCES TYPES:**

1. **- NON-RENEWABLE ENERGY RESOURCES**
   Those forms of energy that have a limited supply (they can be finished). They are also used to provide electricity. They cause the *greenhouse effect*.

2. **- RENEWABLE ENERGY RESOURCES**
   Those forms of energy generated from natural *resources* (the Sun, the wind, etc.) and they are mostly used to provide electricity and they *don’t* cause *pollution*.

   *Can you give some examples of each one?*

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3.- **Making a list of Renewable vs. non-renewable energy resources**: The students are now able to classify the energies into two columns. First, they will write them down, then we will correct them orally.

**Timing**: 10 minutes.

**Interaction patterns**: In pairs.

**Materials**: Student’s book (p.9), PowerPoint (Session 2, slide 10).

**Resources**: [http://www.darvill.clara.net/altenerg/](http://www.darvill.clara.net/altenerg/)
ANSWER KEY:

<table>
<thead>
<tr>
<th>RENEWABLE ENERGIES</th>
<th>NON-RENEWABLE ENERGIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exemple: Wind energy</td>
<td>Petrol</td>
</tr>
<tr>
<td>Solar energy</td>
<td>Natural gas</td>
</tr>
<tr>
<td>Hydropower energy</td>
<td>Oil</td>
</tr>
<tr>
<td>Biomass energy</td>
<td>Nuclear (uranium)</td>
</tr>
</tbody>
</table>

SUBJECT MATTER CONTENTS

Main target knowledge:
Understand the differences between Renewable and Non-renewable energy resources.
Understand the definitions of fossil fuels energy and Nuclear fuel energy.
Establish some connection between the pictures and each of the Non-renewable energies.

Main target skills:
Establish a visual connection between the Non-renewable energy resources and some pictures.
Be able to understand the explanations in English.
Be able to assess a partner’s writing.

CONTENT OBLIGATORY LANGUAGE

Discourse genre:
Understand the differences between Renewable and Non-renewable energy resources.
Understand the definition of Non-renewable energy resources.
Understand the examples for each of them.
Terminology:

**Topic specific:** Organic matter, uranium U-235, polluting, refinery, pellets, oil pumps, gas pipes, nuclear reactor.

**Academic domain specific:** passive voice: *organic materials made from plants, uranium is the most used nuclear power.* Kind of: *kind of uranium.*
a) What will this lesson be about?

Providing some definitions about Renewable energy resources types with the help of a Wordle and the slides of PowerPoint. The students will be able to understand better these definitions thanks to the pictures. By the end of the lesson they will begin to structure the knowledge they have about both types of energy resources.

b) What is the one thing the students will remember?

Identify the main Renewable energy resources and deal with their definitions.

INTRODUCTION

Slide with the definition of Renewable energy resources: The aim is to give the students a very short and simple definition so that they begin to understand the main characteristics of these resources.

Timing: 10 minutes.

Interaction pattern: Teachers - students.

Materials: PowerPoint (session 3, slide 6)

Resources: http://www.darvill.clara.net/altenerg/

Slide with the Renewable energy resources types: The aim is that the students bear in mind that there are four main Renewable energy resources: solar, wind, hydropower and biomass energies.

Timing: 15 minutes

Interaction pattern: Student-teachers, students

Materials: PowerPoint (Session 3, slide 7)

Resources: http://www.scienceonline.co.uk/energy/nonrenewable.html
TASKS

1.- **Wordle: warm-up.** Each student has a wordle in their Dossier with the most important words and the names of the Renewable energy resources we are going to work upon. We have ours projected in the PowerPoint. We will ask them to recognize these names in their own language. The aim is to elicit their previous knowledge and start constructing the other activities from this point.

**Timing:** 15 minutes

**Interaction pattern:** teacher and the whole class.

**Materials:** Student’s book (p. 6), PowerPoint (Session3, slide 4).

**Resources:** [http://www.wordle.net](http://www.wordle.net)

**ANSWER KEY:**


2.- **Matching activity:** The aim is that the students identify the Renewable energy resources previously classified and defined, so that they have visual and linguistic support. It consists of a slide with the photos and the names of the energies. We help them to do the matching by giving clues if it is necessary. The students will do the activity in pairs in the Students’ dossier and we will correct it orally.

**Timing:** 10 minutes.

**Interaction:** student-teachers, class.

**Materials:** Student’s book (p.7, 8), Powerpoint (Session 3, slide 8 and 10).
**ANSWER KEY:**
A) 1  B) 2  C) 4  D) 3  E) 5  F) 6

**SUBJECT MATTER CONTENTS**

**Main target knowledge:**
Renewable energy resources types definitions.
Identify the most important Renewable energy resources.
Establish some connection between the pictures and each of the Renewable energies.

**Main target skills:**
Establish a visual connection between the Non-renewable energies and some pictures.
Be able to understand our explanations in English.
Be able to assess their partners’ writing.
Begin to know how to classify both Renewable and Non-renewable energy Resources.

**CONTENT OBLIGATORY LANGUAGE**

**Discourse genre:**
Understand the definitions for each of the Renewable energy resources.
Understand the examples for each of them.

**Terminology:**
*Topic specific:* solar, wind, biomass (organic matter), hydropower, water dike, solar panels, turbines, flowing, water, burn.

*Academic domain specific:* passive voice: *it is generated by the flowing water through a turbine; organic matter can be burned to provide heat.*
2.4.- SESSION 4

a) What will this lesson be about?

The main goal is to create a mind map with all the different types of energy resources: Renewable (Solar, Wind, Biomass, Hydropower); Non-Renewable (Nuclear, fossil fuels, which are Oil, Coal, Petroleum, and Natural Gas). The students will work in pairs and will be able to use this ICT due to our previous instructions.

b) What is the one thing the students will remember?

A very useful ICT they can use to structure theoretical concepts.

Energy resources’ classification.

INTRODUCTION:

1.- Reviewing the Renewable vs. Non-Renewable energy resources: the student-teachers will elicit the key concepts that have been covered so far. The students will be asked to draw a visual map of the energy resources on the blackboard.

Timing: 10 minutes

Interaction: student-teachers and the class

Material: Blackboard, chalk.
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**ANSWER KEY:**

Energies:

Renewable: Solar
- Wind
- Hydropower
- Biomass

Non-renewable:

Fossil fuels:
- Coal
- Petroleum/oil
- Natural Gas
- Nuclear fuel
- Uranium

2.- **Giving the ICT instructions:** The student-teachers show the students how to use this ICT. We will use internet to do so. We will get into the page and then we will show how the web works. The instructions are easy because an example with the months of the year is provided, but we need to explain how to write the most general terms and the more specific ones because the indentation is different in general and specific categories.
Creating the mind map:

In pairs, the students create their mind maps. We will ask them to save them in their pen drives and upload them in a folder in their Moodle.

Timing: 10 minutes

Interaction pattern: student-teachers, class.

Material: PowerPoint (Session 4, slides 4 and 5), computers. Student’s book (p. 10)

Resources: www.text2mindmap.com

ANSWER KEY:
3.- Writing activity: Write a brief text explaining the different types of energy resources you have used in the mindmap.

**Timing:** 10 minutes

**Interaction pattern:** Individual work.

**Material:** Student’s book (p.11).

**POSSIBLE ANSWER KEY:**

This mind map is a graphic representation of how energy resources can be divided. On the one hand, we have got the Non-renewable energies. These are divided into Fossil fuels, which include Oil / Petroleum, Coal and Natural gas and the Nuclear energy which includes the Uranium. On the other one, we have the Renewable energies. These are the Solar, Wind, Hydropower and Biomass energies.

**SUBJECT MATTER CONTENTS**

**Main target knowledge:**
Types of energy resources

**Main target skills:**
Classify the Renewable and Non-renewable Energy resources.

Technological skills: creating the mind map and saving it in their Moodle.

**CONTENT OBLIGATORY LANGUAGE:**

**Discourse genre:**
To understand the two main categories: Renewable and Non-renewable energy resources.
To understand and generate a mind map using a webpage specifically designed for it.

**Terminology:**

*Topic specific:* energy resources types: Renewable and Non-renewable, Solar energy, Wind energy, Biomass, Hydropower energy, Fossil fuels (oil, coal, natural gas, petroleum), Nuclear energy, uranium.

*Academic domain specific:* classifying.
a) What will this lesson be about?

Working on some more complex definitions of the energy resources types we have studied so far. Perform a running dictation with sentences that point out the importance of using the energy resources in everyday life. For example: *Energy lights our cities or energy is used to warm our homes.*

b) What is the one thing the students will remember?

Students should remember that our daily routine, we need electricity that is generated by these energy resources.

**TASKS**

1. **Matching concepts with its definitions:** The students are asked to understand some elaborate definitions of all the energy resource types which are now mixed up and match them with its name. For example:

   **Definition:** It is a fossil fuel. It is a liquid and it is usually found in underground areas called reservoirs.

   **Name:** Coal

   **Timing:** 15 minutes

   **Interaction pattern:** In pairs

   **Materials:** Student’s book (p. 12), PowerPoint (Session 5, slide 3).

   **Resources:** [http://www.darvill.clara.net/altenerg/](http://www.darvill.clara.net/altenerg/)
ENERGY RESOURCES
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ANSWER KEY:

1. WIND ENERGY  D. It is air in motion. It is caused by the uneven heating of the Earth’s surface by the sun.

2. SOLAR ENERGY  F. It is the sun’s rays (solar radiation) that reach the Earth. This energy can be converted into other forms of energy, such as heat and electricity.

3. COAL  E. Fossil energy. It is a combustible, black, sedimentary rock composed of carbon.

4. NUCLEAR ENERGY (Uranium)  C. The energy in the nucleus (core) of an atom (tiny particles that make up every object in the universe). There is enormous energy in the bombs that hold atoms together.

5. PETROL (OIL)  A. It is a fossil fuel. It is a liquid and it is usually found in underground areas called reservoirs.

6. HYDROPOWER ENERGY  H. The amount of available energy in moving water is determined by its flow or fall. Rapidly flowing water in a big river, water descending from a waterfall has lots of energy!

7. BIOMASS ENERGY (organic waste, for example: wood chips)  G. It is organic material made from plants and animals. It contains stored energy from the sun.

8. NATURAL GAS (methane)  B. It is a fossil fuel. The main ingredient is methane, a gas (or compound) composed of one carbon atom and four hydrogen atoms.

2.- Running dictation: The students-teachers will make groups of four people. Each student will have a number (1, 2, 3 or 4). When the teacher calls their number, the students have to run to the teacher in order to read and memorize a sentence. Then, they run back to the group and dictate the sentence. Of course, runners cannot write the sentence. We have a total of eight sentences. That means that each student will come to the teacher twice. Then we will correct the sentences orally and students will write the sentences on the blackboard.

Timing: The rest of the class.

Interaction pattern: In groups and student-teachers-class.

Materials: Student’s book (p. 13), PowerPoint (Session 5, slide 5)

Resources: http://www.darvill.clara.net/altenerg/
ANSWER KEY:

1. Energy is used to do many things.
2. Energy warms our homes.
3. Energy lights our cities.
4. Energy powers our trains and planes.
5. Energy plays our music.
6. Energy gives us pictures on tv
7. The sun gives us light during the day.
8. Solar energy helps plants grow.

SUBJECT MATTER CONTENTS

Main target knowledge:
To identify and understand more elaborate definitions of both Renewable and Non-renewable energy resources types.
How we use energy in everyday life.

Main target skills:
Reading
Memorise a short sentence
Writing
Group work

CONTENT OBLIGATORY LANGUAGE:

Discourse genre:
To understand some key words related to the energy resources.
To understand and generate sentences which deal with some practical energy resources usages.
Terminology:

**Topic specific:** underground, reservoir, methane, hydrogen atoms, tiny, available energy, amount of water.

**Academic domain specific:** Energy is used to + infinitive: *to do many things*, for example *to warm our homes*.
2.6.- SESSION 6

a) What will this lesson be about?

Thinking and talking about the advantages and disadvantages of both Renewable and Non-Renewable energies.

b) What is the one thing the students will remember?

That every single energy resource type has both advantages and disadvantages.

TASKS

1.- Distinguishing the advantages and disadvantages of Renewable and Non-Renewable energies: The students must think whether the statements presented to them are an advantage or a disadvantage. First we will read the 21 statements together, and then they will discuss them in pairs. After that, they will have to write down a list for both the advantages and disadvantages. We will correct this orally.

Timing: 20 minutes

Interaction pattern: in pairs, student-teachers and the class.

Materials: Student’s book (p. 14-15); PowerPoint (Session 6, Slides 3-4)

Resources: http://www.darvill.clara.net/altenerg/
ANSWER KEY:

1. They may not work if it is not very sunny or windy. **Disadvantage**
2. A lot of money has to be spent on safety - if it goes wrong, a nuclear accident can be a terrible disaster. **Disadvantage**
3. It is a good method of supplying energy to remote areas. **Advantage**
4. It produces no waste, greenhouse effects or pollution. **Advantage**
5. We burn the biomass fuel, so it makes greenhouse gases. **Disadvantage**
6. Transporting oil and gas to the power stations is easy. **Advantage**
7. Burning any fossil fuel produces carbon dioxide, which contributes to the “greenhouse effect”, warming the Earth. **Disadvantage**
8. Mining coal can be difficult and dangerous. **Disadvantage**
9. Nuclear power is not expensive to generate. **Advantage**
10. It does not produce smoke or carbon dioxide, so it does not contribute to the greenhouse effect. **Advantage**
11. It produces huge amounts of energy from small amounts of fuel. **Advantage**
12. It is very, very dangerous because of the radioactivity. **Disadvantage**
13. It can affect television reception if you live nearby. **Disadvantage**
14. The windmills are noisy. **Disadvantage**
15. A fossil-fuelled (gas-fired) power station can be built almost anywhere. **Advantage**
16. It (solar energy) does not work at night. **Advantage**
17. It tends to be cheap. **Advantage**
18. You need a lot of water and space to build a dam (or dyke). **Disadvantage**
19. We need a lot of quantity to produce energy. **Disadvantage**
20. It is very expensive to build a dam. **Disadvantage**
21. It is usually available. **Advantage**

2.- Relating the advantages and disadvantages to each of the energy resources type:
The students must write an advantage and a disadvantage of each of the energy resource types and then read them orally in front of the class.

**Timing:** 20 minutes.

**Interaction:** In pairs, student-teachers and the class.

**Materials:** Student’s book (p. 16-17), PowerPoint (Session 6, Slides 5-7).

**Resources:** http://www.darvill.clara.net/altenerg/
POSSIBLE ANSWER KEY:

Solar energy:
- Advantage: It is a good method to supply energy to remote areas.
- Disadvantage: Solar energy does not work at night.

Wind energy:
- Advantage: It produces no waste or greenhouse effects.
- Disadvantage: It can affect television reception if you live nearby.

Hydropower energy:
- Advantage: Electricity can be generated constantly
- Disadvantage: The dams are very expensive to build.

Biomass energy:
- Advantage: The fuel tends to be cheap.
- Disadvantage: Some waste materials are not easy to get all the year.

Fossil fuels:
- Advantage: Transporting oil and gas to the power stations is easy.
- Disadvantage: Burning any fossil fuel produces carbon dioxide, which contributes to the "greenhouse effect", warming the Earth.

Nuclear energy:
- Advantage: It does not produce smoke or carbon dioxide, so it does not contribute to the greenhouse effect.
- Disadvantage: It is very, very dangerous because of the radioactivity.

SUBJECT MATTER CONTENTS

Main target knowledge:
To know about the advantages and disadvantages for each of the energies.
To be able to write at least two sentences dealing with the advantages and disadvantages of each of the energy resources.

Main target skills:
Reading
Thinking
Writing
Pair work
CONTENT OBLIGATORY LANGUAGE:

Discourse genre:
To understand some key words related to the energy resources.
To understand and generate sentences which deal with the advantages and disadvantages of the energy resources usages.

Terminology:
Topic specific: Supplying, safety, greenhouse gases, carbon dioxide, radioactivity, power stations, amounts.
Academic domain specific: First conditional: they may not work if it is not very sunny or windy. Some modal verbs like “can”, “may”, as in it can affect TV reception if you live nearby. Cause and effect connectors such as so, as in: it does not produce carbon dioxide, so it does not contribute to the greenhouse effect. We burn the biofuel, so it makes greenhouse gases.
2.7.- SESSION 7

a) What will this lesson be about?
Making the students aware of the need to spend less Non-Renewable energy and use more Renewable energy instead. Provide some specific structures and vocabulary to be able to introduce a list of tips for saving energy at home and outdoors.

b) What is the one thing the students will remember?
The students will become aware of how many of their household appliances need electricity to be used and how much electricity do they spend in just one day.

1.- Discussion in Groups of four.
   a) Why is saving energy so important?
   b) Do we get more energy from renewable or non-renewable resources?
   c) Which one is more polluting?
   d) What will happen if non-renewable energy resources finish?
Discussion: Steps to follow: The student-teacher(s) will ask the students why renewable energy resources are so important and why we should try to avoid Non-renewable ones. Depending on the students’ answers, the student-teachers will give ideas (Non-renewable energies are limited and polluting, Renewable energies are clean and not polluting) or key words (such as pollution, greenhouse effect, limited, unlimited, clean, green energies, CO2, gas emissions, etc) to help students to answer them. The main ideas will be written down on the blackboard and students will have to write them in their dossier.

Timing: Approximately 15 minutes

Interaction pattern: Student → Student, Teacher → Students

Materials: Student’s book (p. 18), PowerPoint (Session 7, slide 3-4).

POSSIBLE ANSWER KEY:

1. Non-renewable energies are limited
   - It takes a lot of dead organisms and millions of years to make oil and coal. We are using these resources very quickly, and need to save some for the future.
   - For example, the electricity that runs our homes is usually generated at a power plant that uses coal. Another example: the gas for our cars comes from oil. We do not have much oil left in the world.

2. They are very polluting to the environment
   - The combustion of coal produces several types of emissions that pollute the environment. For example, CO2 which is the gas responsible for the greenhouse effect.
   - Pollution of the air and water.

3. Renewable energies, on the contrary, are clean (do not pollute the environment), free, and get renewed (as long as the natural resources do not get finished).
2.- Watching the video “Let’s save it”: The aim of this video is to provide some examples of misusing energy at home and how not to do this. Since the video has no voice, the students will have to focus on the images that are shown to answer a quiz afterwards.

**Timing:** 10 minutes

**Interaction pattern:** groups of 4.

**Materials:** video, Student’s book (p. 18), PowerPoint (Session 7, Slide 5-6).

**Resources:**
- [http://www.youtube.com/watch?v=1-g73ty9v04&feature=related](http://www.youtube.com/watch?v=1-g73ty9v04&feature=related)
- [http://www.tvakids.com/electricity/conservation.htm](http://www.tvakids.com/electricity/conservation.htm)

**Quiz:** The students will answer some questions about the images they have just seen in the video. The question number six provides examples of some tips for saving energy at home and outdoors. They will use this information to verbalize all the information that is made implicit in the video.

**Timing:** the rest of the class.

**Interaction:** groups of 4.

**Materials:** video, Student’s book (p. 19-20); PowerPoint (Session 7, Slides 7-9)

**ANSWER KEY:**
ENERGY RESOURCES

Mariona López & Teresa Badia with Nacho Pérez’s collaboration

1. Which is the first type of energy resource that appears in the video?
   a) The wind
   b) The sun
   c) Hydropower energy.

2. Is it Renewable or Non-Renewable? Why?
   It is Renewable because the sun rises everyday.

3. Circle the household appliances that appear in the video:
   Thermostat, Dishwasher, TV, Radio, Computer, MP3, Washing machine, Stove, Light bulbs, Mobile phone, Water heater, Microwave, Stereo, Clothes dryer.

4. What are the news on TV?
   a) The Global warming
   b) Acid rain
   c) Water cycle

5. What of these two effects does this phenomenon have?
   a) It provokes rain
   b) Melting of the Ice Poles
   c) It provokes fumes
   d) Disappearance of some animal species

6. Circle what do the Superkids do to save some energy:
   Put the thermostat a few degrees lower.
   Turn off lights and electronics (computers, TVs, bulbs).
   Use the microwave instead of the oven for cooking.
   Take short showers instead of baths.
   Turn off water while you brush your teeth.
   Ride a bicycle or use public transport.
   Do not use the elevator.
   Dry your clothes in the sun instead of using a clothes dryer.
   Recycle items such as newspaper, aluminum cans and plastic and glass bottles, etc.
   Wash clothes in cold water.
   Use the right containers to throw used batteries.
   Keep the doors and windows closed properly.
   Open the curtains on sunny winter days to let sunshine into their home.
SUBJECT MATTER CONTENTS

Main target knowledge:
To be aware of the household appliances the students have at home and how do they use them.
Oralise the information in the video.

Main target skills:
Thinking
Writing
Speaking
Pair work

CONTENT OBLIGATORY LANGUAGE:

Discourse genre:
To understand some key words related to the energy saving tips at home
To understand and generate sentences which deal with the household appliances the students have at home and how do they use them.

Terminology:
Topic specific: Thermostat, washing machine, lower, clothes dryer, stove, bulbs, cans, turn off.

Academic domain specific: Imperatives: Use the microwave instead of the oven, put the thermostat a few degrees lower, and use public transport.
Some connectors such as Instead of: dry the clothes in the sun instead of using the clothes dryer.
a) What will this lesson be about?

This lesson will be focused on becoming aware of the importance of saving energy and knowing about tips for doing so.

b) What is the one thing the students will remember?

Some tips for saving energy.

1. Jigsaw Reading: The students will be asked to organise the process by which energy resources generate electricity.

Timing: 10 minutes

Interaction pattern: individual work.

Materials: Student’s book (p. 21), PowerPoint (Session 8, slides 4-5)

Resources: http://www.newton.dep.anl.gov/askasci/gen01/gen01673.htm
http://www.epa.gov/reg5rcra/wptdiv/p2pages/energy.pdf

ANSWER KEY:

<table>
<thead>
<tr>
<th>STEPS</th>
<th>ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbine turns an electric generator --&gt;</td>
<td>5</td>
</tr>
<tr>
<td>Heat boils water --&gt;</td>
<td>2</td>
</tr>
<tr>
<td>Steam pressure turns a turbine --&gt;</td>
<td>4</td>
</tr>
<tr>
<td>Light bulbs give off light and heat --&gt;</td>
<td>8</td>
</tr>
<tr>
<td>Generator produces electricity --&gt;</td>
<td>6</td>
</tr>
<tr>
<td>Electricity powers light bulbs --&gt;</td>
<td>7</td>
</tr>
<tr>
<td>Water turns to steam --&gt;</td>
<td>3</td>
</tr>
<tr>
<td>Oil burns to make heat --&gt;</td>
<td>1</td>
</tr>
</tbody>
</table>
2.- Activity: The students will be asked to add the household appliances given in the chart and then they will have to number them according to the amount of energy they need (from 1 (lowest to 5 – highest)

Timing: 10 minutes

Interaction pattern: groups of 4.

Materials: Video, Student’s book (p. 22), PowerPoint (Session 8, slide 6-7).

Resources: http://www.newton.dep.anl.gov/askasci/gen01/gen01673.htm
http://www.epa.gov/reg5rcra/wptdiv/p2pages/energy.pdf

ANSWER KEY:

<table>
<thead>
<tr>
<th>HOUSE APPLIANCES</th>
<th>RANKING</th>
<th>SAVING TIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVEN</td>
<td>4</td>
<td>Use the microwave instead of the oven for cooking your FOOD.</td>
</tr>
<tr>
<td>TV</td>
<td>3</td>
<td>Turn off the TV when you are not using it.</td>
</tr>
<tr>
<td>Water heater</td>
<td>10</td>
<td>Take showers instead of baths.</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>8</td>
<td>Try to buy food everyday.</td>
</tr>
<tr>
<td>Washing machine</td>
<td>4</td>
<td>Dry as much clothes as possible in the sun.</td>
</tr>
</tbody>
</table>
3. **Writing activity**: The students are given a list with some names such as recycling, thermostat, washing machine, bike and so on, and they must make sentences to give us some tips for saving energy. (They had seen examples in the previous session). Then, the student-teachers provide a list with some of the most important tips for saving energy indoors and outdoors and they can add some more “green tips” if they want. The aim is to compare what they have just written with the list containing some saving tips.

**Timing**: 10 minutes group work and 5 minutes for correction.

**Interaction**: In pairs

**Materials**: Student’s book (p. 23). PowerPoint (Session 8, slides 9-10)

**Resources**: http://www.newton.dep.anl.gov/askasci/gen01/gen01673.htm

http://www.epa.gov/reg5rcra/wptdiv/p2pages/energy.pdf

**ANSWER KEY**:

Examples:
1. Use the washing machine or the dishwasher when they are full.
2. Wash clothes in cold water.
3. Keep your windows and doors properly closed.
4. Put the thermostat a few degrees lower.
5. Use the public transport instead of the car.
6. Recycle newspapers and aluminium cans
7. Close properly all the doors and windows at home.
8. Take short showers instead of baths.
SUBJECT MATTER CONTENTS
Main target knowledge:
To understand why is saving energy so important.
Be able to write sentences with a few number of words.
Main target skills:
Thinking
Writing
Pair work

CONTENT OBLIGATORY LANGUAGE:
Discourse genre:
To understand some key words related to the energy saving tips at home
Write sentences about saving energy in our everyday life.
Terminology:
Topic specific: (some new words from the previous session) limited, polluting, switch off, oven.
Academic domain specific: Imperatives: Ride a bike instead of using a car.
2.9.- SESSION 9

1.- Expert Reading: Read your text and then ask the three questions to your partner, then write them on your paper.

Timing: 25 minutes

Interaction Pattern: Pair work, S → S, T → S

Material: Reading. Student’s book (p. 24), PowerPoint (Session 9, slides 3-7)

READINGS:

TEXT A:

Non-renewable energy resources are limited on Earth. That is why it is important to conserve our Non-renewable sources or to use more frequently renewable sources. The consumption of Non-renewable sources impacts the environment. Specifically, our use of fossil fuels contributes to air and water pollution. For example, carbon dioxide is produced when oil, coal, and gas combust in power stations, heating systems, and car engines. Carbon dioxide in the atmosphere acts as a transparent blanket that contributes to the global warming of the earth, or "greenhouse effect." It is possible that this global warming could significantly change our weather.

QUESTIONS FOR STUDENT B

1. Which are the other impacts of Non-renewable energies?

2. Which gas is emitted when burning coal?

3. What is acid rain?
TEXT B:

Other environmental impacts are rising sea levels that can damage coastal areas, and major changes in vegetation growth that could cause some plant and animal species to become extinct. Sulfur dioxide is also emitted into the air when coal is burned. The sulfur dioxide reacts with water and oxygen in the clouds to form precipitation known as "acid rain." Acid rain can kill fish and trees. By contrast, Renewable energies effectively utilises natural resources such as sunlight, wind, hydropower and biomass, which are not limited.

QUESTIONS FOR STUDENT A

1. Why is important to use renewable resources?
2. Which is a polluting gas?
3. What is the Greenhouse effect?

ANSWER KEY:

QUESTIONS FOR STUDENT B

1. Which are the other impacts of Non-renewable energies?
   The sea levels may rise, some changes in vegetation growth.
2. Which gas is emitted when burning coal?
   Sulfur Dioxide
3. What is acid rain?
   A chemical reaction produced when the Sulfur Dioxide reacts with water and oxygen in the clouds. This causes some precipitation which is called Acid rain.
**QUESTIONS FOR STUDENT A**

1. Why is important to use renewable resources?

   **Because Non-Renewable energies are limited on Earth.**

2. Which is a polluting gas?

   **Carbon Dioxide**

3. What is the Greenhouse effect?

   **Carbon dioxide in the atmosphere acts as a transparent blanket that contributes to the global warming of the earth, or "greenhouse effect."**
2. QUIZ

STUDENT’S NAME AND SURNAME: ______________________________________
1/2

QUIZ

1. Most of the energy we use originally comes from:
   a. the sun   b. the air   c. the oil   d. the gas

2. Coal, petroleum, natural gas are fossil fuels. They are called fossil fuels because:
   a. they are burned to release energy and they cause air pollution
   b. they were formed from the buried remains of plants and animals that lived hundred of millions of years ago
   c. they are non-renewable and will get finished
   d. they are mixed with fossils to provide energy

3. Gasoline is produced by refining which fossil fuel?
   a. natural gas   b. coal   c. petroleum   d. methane

4. Global warming is an increase in the level of which gas in the atmosphere?
   a. ozone   b. sulfur dioxide   c. carbon dioxide   d. nitrous oxide

5. Solar, biomass, wind, and hydro-power energy are all renewable resources of energy. They are called renewable because they ...
   1. are clean and free to use
   2. can be converted directly into heat and electricity
   3. can be renewed by nature in a short period of time
   4. do not produce air pollution

6. Name two fossil fuels
   1. Natural gas   2. Oil

7. Name a non-renewable energy resource that is not a fossil fuel.
   Nuclear energy

8. Name two advantages of using nuclear power.
   Small amounts of fuel produce huge quantities of energy.
   It does not contribute to the greenhouse effect.
9. Describe two disadvantages of wind power.
   1) Windmills are noisy  2) It does not work if it is not very windy.

10. Name the energy resource that involves producing electricity from flowing water.
    Hydropower energy

11. Name two materials that we can burn in order to get energy from “Biomass”
    Wood and Plants

12. Match the words with the right sentences:
    a) Nuclear energy  b) Fossil fuels  c) Uranium
    d) Biomass  e) Sun
    f) Wind power  g) Coal  h) Photovoltaic cells
    i) Methane

1. Energy from waste plant or animal material. **Biomass**
2. Powered by movements of water in a dam/river **Hydropower energy**
3. Uranium is the fuel **Nuclear energy**
4. Black, sedimentary rock **Coal**
5. Where the Earth gets most of its energy from. **The sun**
6. The chemical name for natural gas. **Methane**
7. Coal, oil and natural gas are called... **Fossil fuels**
8. Convert the Sun’s energy directly into electricity. **Photovoltaic cells**
9. Powered by natural air movement **Wind power**
10. A metal mined in various parts of the world. **Uranium**
2.10.- SESSION 10

a) What will this lesson be about?

This lesson is aimed at improving the students’ listening skills. We will work with Michael Jackson’s *Earth song*, as it is a song related to the misuse and abuse of natural resources and the destructive effects that this has upon people, animals and nature.

b) What is the one thing the students will remember?

That we must protect our planet, that is to say, we must become environmentally friendlier. Besides, it is our responsibility to do our best for ourselves and the future generations.

TASKS

1. **Warm-up**: Elicit vocabulary related to our planet.

   **Timing**: 10 minutes.

   **Interaction pattern**: T-Class, S-S, S-T.

   **POSSIBLE ANSWER KEY**:

   1. Earth, sky, mountains, animals, the sun, wind, water, pollution, fumes, wildlife, Carbon Dioxide, Acid rain, Greenhouse effect, saving tips, the sea, clouds, recycle, Renewable energy, non-renewable energy.
2. **Listening Activity:** Listening to the song (once). The students will be divided in groups of 6 people.

**Timing:** 10 minutes.

**Interaction pattern:** groups of 6.

**Materials:** the song (YouTube video). Student’s book (p. 27), PowerPoint (Session 10, slides 3)


**Competition activity:** The song will be played again and then each group will have to write down as many words from the song as they remember. The song is subtitled in English. The winner is the group that has more correct words.

**Timing:** 15 minutes.

**Interaction pattern:** groups of 6.

**Materials:** the song (YouTube video). Student’s book (28), PowerPoint (Session 10, Slide 4)


**POSSIBLE ANSWER KEY:**
Sunrise, rain, fields, time, things, what, about, Earth, shores, world, peace, son, dreams, children, war, stop, notice, stars, yesterday, us, breathe, everything, nature, planet, animals, kingdom, dust, whales, forest, land, man, free, cry, wrong, boy, joy, man, etc.
3.- True or False activity: The students are given several statements about the ideas in the song and they will decide if they are true or false. They will be requested to stand up if they are true or sit down if they are false.

**Timing:** 10 minutes

**Interaction pattern:** T→S

**Materials:** the song (YouTube video) + statements. Student’s book (p. 28), PowerPoint (Session 10, slide 5)

**POSSIBLE ANSWER KEY:**

1. The song is about the destruction of our planet. Stand up.
2. The song mentions the animal kingdoms. Stand up.
3. The song does not refer to nature. Sit down.
4. The song talks about war and children. Stand up.
5. The song talks about watching TV at night. Sit down.
6. The song mentions solar panels. Sit down.
7. The song is inspired by natural disasters. Stand up.
8. The song says we live in a perfect world. Sit down.
9. The song says that men are responsible for the destruction of the planet. Stand up.
10. I like this song very much. Stand up/sit down.

5.- Karaoke session: The students will listen to the song again and try to sing the song following the lyrics.

**Timing:** 10 minutes

**Interaction pattern:** T-S

**Materials:** the song (YouTube video), PowerPoint (Session 10, slide 3)
SUBJECT MATTER CONTENTS

Main target knowledge:

Improve students’ listening skills.

Getting to know some new vocabulary related to our planet.

Main target skills:

Listening
Writing
Group work

CONTENT OBLIGATORY LANGUAGE:

Discourse genre:

To understand some key words related to the song.
To understand some statements related to the song.

Terminology:

Topic specific: Sunrise, fields, shores, Earth, war, dead, seas, shores, womb, kingdom, trust, whales, forest, pleas, free, holy land.

Academic domain specific: Questions like did you ever stop to notice, what about sunrise? What about natures ‘worth?”
2.11.- CATERING FOR DIVERSITY
CATERING FOR DIVERSITY

Besides the student’s dossier that includes a wide range of activities, some extra activities have been included in this section in order for the teacher to cater for the problems of mixed-ability classes, fostering students’ autonomy so that students can take responsibility for their own learning. The best way of catering for diversity in class is by introducing more personalised activities, favouring flexibility and allowing strong and weak students to work on their own pace.

Therefore, in this section, there are different types of activities that can be used by the teacher to cater diversity in class. On the one hand, weaker students or late finishers can go ahead by doing type A activities (even instead of some of the more complex activities in the Student’s Dossier). On the other hand, stronger students or also called early finishers can go for type B activities.

It is not necessary that students finish all the activities in this section.

Other examples of catering for diversity in the unit:

- Most of the activities can be discussed in pairs or in groups.
- Different levels of scaffolding should be provided depending on the students.
- Most of the activities have examples.
- Teachers should try to form mixed ability students for group tasks.
- The final project groups should be formed by mixed ability students.
SESSION 2

A) Later Finishers.

Find the words related to non-renewable energy resources in the Word Search below.

<table>
<thead>
<tr>
<th>FOSSIL FUELS</th>
<th>COAL</th>
<th>URANIUM</th>
<th>NATURAL GAS</th>
<th>METHANE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAS PIPES</td>
<td>OIL PUMPS</td>
<td>REFINERY</td>
<td>OIL</td>
<td>PETROLEUM</td>
</tr>
<tr>
<td>PETROL STATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C R O R W H F K S V N Z M P T O L T V R
H K A I S R S B D J U X O D H Z O A A H
P N F Y L I R N N K R X F O P I M W O J
E V T U T P Q F P H A K E X J O T E Y C
T U E G X E U E O O N U K R I J P J J R
R E E K W E Y M E Z I P P E W V S D F D
O D S Y W V W T P R U E V F A G X D O J
L S A K J P U X O S M T N I B E I O S Y
S S G I T O X I I C P R H N O P L K S J
T N L J H Z K T H C Y O F E B I H Q I O
A E A T N S Q J N B K L Z R O H S U L E
T T R P N S Z N G A S E N Y C G K S F N
I L U S N E Q F F I F U D J X V W N U A
O V T F E P B M Z H J M D H E B B I E H
N N A U A I N K Q P M G Q A O K Y A L T
N Q N C L P X Y X B M Q E X J P R O S E
Z E Q D J S Y W C M I J H E Q E V J H M
M J K L J A Z S N I Q W X E H H U T G S
Y P G L Q G P E A P Q C S L B O P D C D
M V L X M U L B Y D V O K Z T G Z L O I

65
B) Early Finishers
Nonrenewable energy sources related vocabulary. Which words are hidden?

1) UEILSF FOSLS ____ 2) IOL ____ 3) OETUMREPL ____
4) A SARTALUNG ____ 5) LOCA ____ 6) AUIRNUM ____
7) ETNAHME ____ 8) L TINOPSORATET ____ 9) IFNYERRE ____
10) ULOM PSPI ____ 11) I SAEPPGS ____ 12) ARCO

ANSWER KEY:
SESSION 3

A and B. READING:

The Tale of Johnny Energy Seed

I’m Johnny Energy Seed. I plant energy seeds in a big field on my farm. The sun shines. There is energy in the sun’s rays. It helps my seeds grow into tall plants. My plants store the sun’s energy in their roots, stalks, leaves and ears. Soon my energy plants look like this.

I can use the energy in my plants for many things. I can eat the seeds for energy for my body. This energy will help me grow and move and think.

I can feed my energy plants to my chickens, pigs, cows and horses. The energy will make my animals grow big and strong.
I can hang my energy plants in my barn to dry. Then I can burn them in my fireplace. The energy in my plants can keep me warm on cold winter nights. I can put my energy plants into a big container that keeps out the air. As my plants decay, they can make a gas that I can burn in my stove to cook my food.

I can also turn my energy plants into fuel for my tractor. I turn them into alcohol, like grapes are turned into wine. This alcohol fuel, called ethanol, can run my tractor. As you can see, a seed of corn really is an energy seed. Why don’t you plant some corn seeds and explore the ways you can use the energy in the plants you grow.

A) Late Finishers

A) Comprehension Check questions related to the reading.

1) What is Johny’s profession?
2) Where is the energy from the sun’s rays stored?
3) How does Johnny use the energy?
4) What animals does he feed?
5) Do you know any other animals that you can feed?
6) What does he do with his dry plants in his barn?

ANSWER KEY:

1) Johny is a farmer and he plants energy seeds.
2) The energy is stored in roots, stalks and leaves.
3) He eats vegetables and fruits to grow, move and think.
4) He feeds chickens, pigs, cows and horses.
5) Bulls, ducks, dogs, cats, rabbits, hens, cocks, etc.
6) He burns them to be warm in cold days.
B) Early Finishers.

Imagine you are a farmer. Describe your daily routine. You may also need to use these words (morning, afternoon, night, breakfast, have lunch, have dinners, grow vegetables and fruits, plant seeds, feed animals, the sun, fields, tractor, water the plants, etc.)

Images taken from http://www.fotosearch.com/IMZ005/bon0037/
Text taken from http://www.eia.doe.gov/kids/
SESSION 5

A) Late Finishers

Energy resources quiz with clues. Fill in the gaps.

Most of the Earth’s energy comes from the a) __________ (big hot thing in the sky). Most power stations burn b) __________ (coal, gas, oil are called ... fuels) fuels, releasing energy that was stored long ago. A c) __________ (the same type of energy that is stored in food) energy resource is one that won't run out.

Wind Energy Quiz with clues. Fill in the gaps.

Fuel generators noisy pollution reliable renewable strong

Wind power is a) __________ (it will not become extinguished), does not need any b) __________ (coal is the ... for a coal power station) and does not produce any c) __________ (waste that ruins the environment). However, you need a lot of d) __________ (they turn energy into electricity) to make a large amount of power, and you must put them where the winds are e) __________ (not weak) and f) __________ (you can trust on it). Wind farms can be g) __________ (not quiet) if you live close.

ANSWER KEY:

Energy Resources Quiz: a) sun b) fossil c) solar energy

Wind Energy Quiz: a) renewable b) fuel c) pollution d) generators e) strong f) reliable g) noisy

70
B) Early Finishers

Use these words to answer the questions:

<table>
<thead>
<tr>
<th>Nuclear</th>
<th>burn</th>
<th>chain</th>
<th>dangerous</th>
<th>energy</th>
<th>no</th>
<th>reactor</th>
<th>robot</th>
<th>rods</th>
<th>shielding</th>
<th>turbines</th>
<th>uranium</th>
<th>waste</th>
<th>water</th>
</tr>
</thead>
</table>

1. Is nuclear power renewable? [yes/no].
2. Nuclear power stations use _________ as fuel. They need very little, compared to a "fossil" power station because there is much more _________ in nuclear fuel.
3. The _________ reaction inside the _________ creates heat, which turns _________ into steam to drive _________, which drive generators to make electricity.
4. The fuel _________ are safe to handle before they go into the reactor, it's only when they come out that you need to handle them with _________ arms and heavy _________.
5. _________ power stations do not create atmospheric pollution, because they do not _________ anything. However, the small amount of _________ that they do produce is very _________.

ANSWER KEY:

1) No  2) uranium / power   3) chain/ reactor /water/ turbines  
4) rods/robot/shielding   5) nuclear/burn/waste/dangerous

Taken from http://home.clara.net/darvill/altenerg/index.htm
SESSION 6

A) Late Finishers:

Read the following questions and ask them to your partner, then write down the answers.

1. How many people live in your house? ________________
2. Each bathroom has ________ bulbs. How many are in all the bathrooms? ________
3. The family room, kitchen, utility room, hall and TV/computer room each have ________ bulbs. How many are there in the whole house? ______________.
4. Each person uses one bulb for four hours each day. How many hours a day are they used in all? __________
5. Each person uses ten cents (0,10) worth of electricity per hour. How much does

Taken from http://www.eia.doe.gov/kids/
ENERGY RESOURCES
Mariona López & Teresa Badia with Nacho Pérez’s collaboration

ANSWER KEY:

1) 4 people  
2) 2/2 = 4  
3) 3 x5= 15  
4) 4 x 4= 16 hours  
5) 1, 60€ /per day.

B) Early Finishers:

READING

Petrol vs Electricity

SUV (sports utility vehicle) this car requires petrol and more than the average car. This is a very popular car because it has lots of space and is very safe. It is designed to be taken off road so people can go camping. Many women drive this car because of safety and space for children as well as for their shopping.

The electric car has been invented since the 1990’s but you never see them. Requires no petrol at all and you can plug it in at home over night. It’s very fast and cleaner than petrol cars. Most of them are small and are not as big as a SUV. Owning this car is much cheaper because of no petrol and doesn’t need to be maintained as much.

Second picture taken from: www.blog.thesietch.org/.../2008/03/ev2.jpg
Discuss with your partner about the advantages and disadvantages of buying an electric car. Provide a short list for each one.

**ANSWER KEY:**

**Possible advantages:**

- It is cleaner than petrol cars (it does not pollute).
- It can be plugged in at home and overnight.
- It is fast.
- It is cheaper because you do not need to buy petrol.

**Possible disadvantages:**

- They think that it won’t be powerful enough.
- They think it is not as safe.
- They want a car that is big not small.
- They want to do up their car but think that they can’t do up an electric car.
- Some people will lose their job, for example, the truck driver who carries the tank and the petrol station attendant.
- The mechanic will no longer be needed because the electric car doesn’t need spare parts.
SESSION 7

A) Late Finishers

Write a report on pollution. Can you finish the passage? Look at the pictures and the words given in the box.

<table>
<thead>
<tr>
<th>Dangerous</th>
<th>land</th>
<th>fresh air</th>
<th>late</th>
<th>problem</th>
<th>noise</th>
<th>air</th>
</tr>
</thead>
<tbody>
<tr>
<td>rubbish</td>
<td>serious</td>
<td>water</td>
<td>roadworks</td>
<td>smoke</td>
<td>safe</td>
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</tr>
</tbody>
</table>

The pollution in Hong Kong is a __________ problem.

We have __________ pollution which makes the rivers and the sea very dirty. Some seafood is no longer ______ to eat now.

We have ______ pollution because of the ______ made by cars and factories.

________ pollution is also getting worse because of the ______ and traffic in our streets.

If we allow this to go on, Hong Kong will become a ______ place to live in. Therefore we must do something before it is too ______.

If we don't stop making a lot of smoke, we won't have ______ to breathe.
ANSWER KEY:

The pollution in Hong Kong is a serious problem.

We have water pollution which makes the rivers and the sea very dirty. Some seafood is no longer safe to eat now.
We have air pollution because of the smoke made by cars and factories. Noise pollution is also getting worse because of the roadworks and traffic in our streets. If we allow this to go on, Hong Kong will become a dangerous place to live in. Therefore we must do something before it is too late.
If we don’t stop making a lot of smoke, we won’t have fresh air to breathe.

Taken from “Based on New Welcome to English, Book 6B – Our dirty Earth; designed by Amy Wong.”

B) Early Finishers

Match the words in column A with the words in column B. Then, write your answers below.

<table>
<thead>
<tr>
<th>1.- Oil</th>
<th>a.- Rain</th>
<th>2.- Exhaust</th>
<th>b.- Spill</th>
<th>3.- Catalytic</th>
<th>c.- Fumes</th>
<th>4.- Ecological</th>
<th>d.- Disaster</th>
<th>5.- Greenhouse</th>
<th>e.- Layer</th>
<th>6.- Acid</th>
<th>f.- Effect</th>
<th>7.- Ozone</th>
<th>g.- Warming</th>
<th>8.- Global</th>
<th>h.- Converter</th>
</tr>
</thead>
</table>
Read the sentences below and fill the gaps with the word partners from the previous activity.

1.- I think that the smoke from factories is more dangerous to the atmosphere than the __________ from cars. It contributes to __________ which can destroy forests.
2.- I don’t believe that there is a hole in the __________ because I cannot see it.
3.- I like the fact that the __________ is making the planet hotter. I like hot weather so I don’t think that __________ is a problem.
4.- I think the __________ in Galapagos islands was a preventable __________.

Taken from http://www.tefl.net/esl-lesson-plans/TBW_Environment-Pollution.pdf

**ANSWER KEYS:**

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<tbody>
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<td>1 Oil</td>
<td>Spill</td>
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<td>2 Exhaust</td>
<td>fumes</td>
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<td>3 Ecological</td>
<td>disaster</td>
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<td>4 Catalytic</td>
<td>Converter</td>
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<td>5 Greenhouse</td>
<td>Effect</td>
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<tr>
<td>6 Acid</td>
<td>Rain</td>
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<td>7 Ozone</td>
<td>Layer</td>
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<tr>
<td>8 Global</td>
<td>Warming</td>
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</tbody>
</table>

1.- I think that the smoke from factories is more dangerous to the atmosphere than the **exhaust fumes** from cars. It contributes to **acid rain** which can destroy forests.
2.- I don’t believe that there is a hole in the **ozone layer** because I cannot see it.
3.- I like the fact that the **global warming** is making the planet hotter. I like hot weather so I don’t think that **greenhouse effect** is a problem.
4.- I think the **oil spill** in Galapagos islands was a preventable **ecological disaster**.
2.12.- FINAL PROJECT
**2.12. - FINAL PROJECT**

**Objectives:** the aim of this project is to make students be able to present a short Presentation (4 to 6 slides) about one of the Energy resources types we have studied in class.

**Methodology:** each of the groups will work together with the student-teachers for two or three sessions (one hour each minimum) before the final presentation. During these sessions, the student-teachers will provide the necessary scaffolding for the students to be able to write a short PPT presentation about their energy resource type. The student-teachers will also provide a sample of a presentation about Biomass energy for the students to see exactly what is expected from them.

**The instructions** will be as follows:

In groups of four, you will prepare a PowerPoint which will be presented in front of your classmates. You oral presentations should take from 5 to 10 minutes per group.

The **Presentation** should have from 4 to 6 slides including:

1. A short definition of the energy resource you are working with.
2. Some pictures, photos or a video to illustrate it.
3. The process by which energy we need is produced from your resource type.
4. Some advantages and disadvantages of your energy resource.
TIPS:

Bring one pen drive per group so as to save the information.

Do not copy and paste, try to use your own words.

Do not memorize everything. Try to understand the main ideas to be presented, as you are not expected to read all the time.

MAIN SOURCE:

http://www.darvill.clara.net/altenerg/

More information in:

http://tonto.eia.doe.gov/kids/energy.cfm
EXAMPLE OF PRESENTATION:

WHAT IS BIOMASS?
- Biomass is the organic matter (wood, vegetation, etc.) grown or produced to use as fuel.
- Biomass fuels examples:
  - agricultural grains, crops, wastes and residues
  - wood and forest wastes and residues
  - animal manure and waste
  - aquatic plants
  - municipal waste

BIOMASS ENERGY RESOURCE

BIOMASS: HOW DOES IT WORK?
1. The organic matter is collected.
2. Then, it is transported to a biomass plant.
3. There the organic matter is burned.
4. The heat created is used to boil water.
5. The steam is used to rotate turbines and generators.
6. The generators produce electricity.

BIOMASS. ADVANTAGES AND DISADVANTAGES

ADVANTAGES
- The fuel is usually cheap.
- Because of biomass fuels, we need less fossil fuels.

DISADVANTAGES
- We burn the bio-fuel, so it makes greenhouse gases almost like fossil fuels do.
- Collecting or growing the fuel in sufficient quantities can be difficult.
The **groups** must be assigned with the help of our mentors (Science and English teachers) paying attention to student’s mixed abilities, so that not only the teachers but the students who have more difficulties in learning English or Science will be helped by their classmates.

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<tr>
<th>STUDENT’S NAME</th>
<th>ENERGY RESOURCE</th>
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<td>SOLAR ENERGY</td>
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</table>
SESSION 1: Nuclear energy

SUBJECT MATTER CONTENTS

Main target knowledge:
Read and understand the main ideas from the website sources.
Be able to extract the main ideas and summarise them.
Discuss with their classmates.
Write sentences on their own.

Main target skills:
Thinking
Reading
Speaking / Interaction
Writing

CONTENT OBLIGATORY LANGUAGE

Discourse genre:
To understand how is Nuclear energy generated.
How do power stations work?
Why is it important for us?
know some advantages and disadvantages.

Terminology:
Topic specific: Uranium 235, mine, engines, nuclear fission, splitting atoms, neutrons, waste.
Academic domain specific: passive voice: Nuclear power is generated by using Uranium.
Relative clauses: neutrons smash into the nucleus of the uranium atoms, which split roughly in half and release energy in the form of heat. Connector “as”: Modern nuclear power stations use the same type of turbines and generators as conventional power stations.
SESSION 2: Hydropower energy

SUBJECT MATTER CONTENTS

Main target knowledge:
Read and understand the main ideas from the website sources.
Be able to extract the main ideas and summarise them.
Discuss with their classmates.
Write sentences on their own.

Main target skills:
Thinking
Reading
Speaking / Interaction
Writing

CONTENT OBLIGATORY LANGUAGE

Discourse genre:
To understand how Hydropower energy is generated.
How do Hydropower energy plants work (dam)?
Why is it important for us?
Know some advantages and disadvantages.

Terminology:

Topic specific: Grind, corn, lit, trap, flow, bottom, top, reservoir, high pressure, stored water, flood, irrigation, environment, and plant life.
Academic domain specific: passive voice: Water is allowed to flow through tunnels in the dam.
Comparatives: the dam is much thicker at the bottom than at the top. Connector “because of”:
Because of the great height of the water, it will arrive at the turbines at high pressure.
SESSION 3: Solar energy

SUBJECT MATTER CONTENTS

Main target knowledge:
Read and understand the main ideas from the website sources.
Be able to extract the main ideas and summarise them.
Discuss with their classmates.
Write sentences on their own.

Main target skills:
Thinking
Reading
Speaking / Interaction
Writing

CONTENT OBLIGATORY LANGUAGE

Discourse genre:
Understand why Solar energy is the most important energy resource in the world.
How do solar panels work?
Know some advantages and disadvantages.

Terminology:
Topic specific: harness, available, solar panels, photovoltaic cells, roof, dark, shiny, heat, worthwhile, pipes, supplier, battery chargers, unreliable, degrees, bottom, top, convection.
Academic domain specific: present perfect: We've used the Sun for drying clothes and food for thousands of years, relative clauses and passive voice: Solar water heating, where heat from the Sun is used to heat water in glass panels on your roof. Connectors: “so that”: The water is pumped in at the bottom so that convection helps the flow of hot water out of the top.
SESSION 4: Wind energy

SUBJECT MATTER CONTENTS

Main target knowledge:
Read and understand the main ideas from the website sources.
Be able to extract the main ideas and summarise them.
Discuss with their classmates.
Write sentences on their own.

Main target skills:
Thinking
Reading
Speaking / Interaction
Writing

CONTENT OBLIGATORY LANGUAGE

Discourse genre:
Understand where this energy resource comes from
How do the windmills work?
Know some advantages and disadvantages.

Terminology:

Topic specific: To grind corn, unevenly, patches, propeller blade, rise, blow, tall tower, wind farm, suitable areas, landscape, migrating flocks.
Academic domain specific: present perfect: We’ve used the wind as an energy source for a long time. Comparatives: The Sun heats our atmosphere unevenly, so some patches become warmer than others. Relative clauses: The wind blows the propeller round, which turns a generator to produce electricity.
SESSION 5: Fossil fuels

SUBJECT MATTER CONTENTS

Main target knowledge:
Read and understand the main ideas from the website sources.
Be able to extract the main ideas and summarise them.
Discuss with their classmates.
Write sentences on their own.

Main target skills:
Thinking
Reading
Speaking / Interaction
Writing

CONTENT OBLIGATORY LANGUAGE

Discourse genre:
To understand how coal, oil and gas are generated.
How Fossil fuel power stations work.
Why is this energy resource important?
To know some advantages and disadvantages

Terminology:

Topic specific: Remains, dust, condense, cooling towers, sulphur dioxide, flow, pipes, release, crude oil, ground, coal-fired stations, and greenhouse effect.

Academic domain specific: Passive voice: Coal, oil and gas are called "fossil fuels" because they have been formed from the organic remains of prehistoric plants and animals. Present perfect: The steam that has passed through the power station's turbines has to be cooled.
Comparatives: Crude oil (called "petroleum") is easier to get out of the ground than coal.
2.13.- ASSESSMENT
**A) NUCLEAR ENERGY WRITTEN PRESENTATION CHECKLIST.**

Tick each category from 1 (lowest) to 5 (highest mark).

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<thead>
<tr>
<th>CATEGORY</th>
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B) **FOSSIL FUELS ENERGY** WRITTEN PRESENTATION CHECKLIST.

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<th>CATEGORY</th>
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</table>
C) **WIND ENERGY** WRITTEN PRESENTATION CHECKLIST.

Tick each category from 1 (lowest) to 5 (highest mark).

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</table>
D) **HYDROPOWER ENERGY** WRITTEN PRESENTATION CHECKLIST.

Tick each category from 1 (lowest) to 5 (highest mark).

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E) **SOLAR ENERGY** WRITTEN PRESENTATION CHECKLIST.

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2.- TEACHER GROUP ORAL PRESENTATION ASSESSMENT

TEACHER - GROUP ASSESSMENT RUBRIC (FINAL PROJECT): **NUCLEAR POWER**

Mark from 1 (lowest) to 5 (highest) the following categories regarding each of the student’s performance (Student 1, student 2, student 3 student 4 and student 5) within the group:

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<thead>
<tr>
<th>CATEGORY</th>
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<th>ST5</th>
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<td>Posture and eye contact of the STUDENT</td>
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<tr>
<td>(Does the student use body language properly?)</td>
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</tr>
</tbody>
</table>
TEACHER - GROUP ASSESSMENT RUBRIC (FINAL PROJECT): FOSSIL FUELS ENERGY

Mark from 1 (lowest) to 5 (highest) the following categories regarding each of the student’s performance within the group:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>ST1</th>
<th>ST2</th>
<th>ST3</th>
<th>ST4</th>
<th>ST5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Performance of the STUDENT</td>
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</tr>
</tbody>
</table>
TEACHER - GROUP ASSESSMENT RUBRIC (FINAL PROJECT): **WIND ENERGY**

Mark from 1 (lowest) to 5 (highest) the following categories regarding each of the student's performance within the group:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>ST1</th>
<th>ST2</th>
<th>ST3</th>
<th>ST4</th>
<th>ST5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oral Performance of the STUDENT</strong> (Does the student speak fluently and clearly?)</td>
<td></td>
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<td></td>
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</tbody>
</table>
**TEACHER - GROUP ASSESSMENT RUBRIC (FINAL PROJECT): HYDROPOWER ENERGY**

Mark from 1 (lowest) to 5 (highest) the following categories regarding each of the student’s performance within the group:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>ST1</th>
<th>ST2</th>
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</tr>
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<tbody>
<tr>
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<td></td>
</tr>
</tbody>
</table>
**TEACHER - GROUP ASSESSMENT RUBRIC (FINAL PROJECT): SOLAR ENERGY**

Mark from 1 (lowest) to 5 (highest) the following categories regarding each of the student’s performance within the group:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>ST1</th>
<th>ST2</th>
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</tr>
</tbody>
</table>
2.- PEER GROUP ORAL PRESENTATION ASSESSMENT

PEER GROUP ASSESSMENT RUBRIC (ORAL PRESENTATION): **NUCLEAR ENERGY**

Tick from 1 (lowest) to 5 (highest) the following categories:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Performance of the group</td>
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PEER GROUP ASSESSMENT RUBRIC (FINAL PROJECT): FOSSIL FUELS ENERGY

Tick from 1 (lowest) to 5 (highest) the following categories:

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<tr>
<th>CATEGORY</th>
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<th>2</th>
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**PEER GROUP ASSESSMENT RUBRIC (FINAL PROJECT): WIND ENERGY**

Tick from 1 (lowest) to 5 (highest) the following categories:

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>5</th>
</tr>
</thead>
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<tr>
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<tr>
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PEER GROUP ASSESSMENT RUBRIC (FINAL PROJECT): **HYDROPOWER ENERGY**

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</tbody>
</table>
PEER GROUP ASSESSMENT RUBRIC (FINAL PROJECT): **SOLAR ENERGY**

Tick from 1 (lowest) to 5 (highest) the following categories:

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<th>5</th>
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</tr>
</tbody>
</table>
3. - PEER ASSESSMENT (agreed and written by the students)

STUDENTS ORAL PRESENTATION

NAME OF THE GROUP ASSESSED:

STUDENT ASSESSING:

2ND ESO                              Date:

<table>
<thead>
<tr>
<th>Physical Appearance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>He/she seems relaxed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/she looks at the camera and the mates when explaining</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/she seems very confident</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>He/she uses words from other languages to make us understand</td>
</tr>
<tr>
<td>We understand him/her well</td>
</tr>
<tr>
<td>He/she speaks slowly and loud</td>
</tr>
<tr>
<td>He/she repeats some words and/or sentences</td>
</tr>
<tr>
<td>His/her sentences have good concordance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>He/she introduce him/herself and says goodbye to us</td>
</tr>
<tr>
<td>The explanation follows an structure</td>
</tr>
<tr>
<td>He/she explain what he/she has learnt</td>
</tr>
<tr>
<td>He/she knows about the subject they talk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resources to make the audience pay attention and be interested</th>
</tr>
</thead>
<tbody>
<tr>
<td>He/she mimes to make it more understandable</td>
</tr>
<tr>
<td>He/She has worked hard to get a good presentation</td>
</tr>
<tr>
<td>He/She often stops while explaining</td>
</tr>
</tbody>
</table>

Other comments:

General mark for the group presentation from 1 (very bad) to 10 (very good):

---

105
4.- STUDENT UNIT ASSESSMENT (VALORACIÓ FINAL DE LA UNITAT)

| Nom i cognom: ___________________________ | 
| Curs: _______________ | 
| Data: _______________ | 

Respon sincerament a aquestes preguntes.

<table>
<thead>
<tr>
<th>Pregunta</th>
<th>Resposta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has pogut seguir les classes en anglès?</td>
<td></td>
</tr>
<tr>
<td>2. T’ha costat fer les activitats?</td>
<td></td>
</tr>
<tr>
<td>3. Què és el que t’ha agradat més de la unitat?</td>
<td></td>
</tr>
<tr>
<td>4. Què és el que menys t’ha agradat?</td>
<td></td>
</tr>
<tr>
<td>5. Què és el que t’ha quedat més clar?</td>
<td></td>
</tr>
<tr>
<td>6. Què és el que no has acabat d’entendre?</td>
<td></td>
</tr>
<tr>
<td>7. T’han agradat els materials (PowerPoint + dossier estudiant)?</td>
<td></td>
</tr>
<tr>
<td>8. T’agradaria repetir l’experiència amb un altre tema l’any vinent?</td>
<td></td>
</tr>
<tr>
<td>9. T’agradaria tractar algun tema en especial?</td>
<td></td>
</tr>
<tr>
<td>10. Tens algun suggeriment o comentari a fer?</td>
<td></td>
</tr>
</tbody>
</table>
Valora del 1 (el pitjor) al 10 (el millor):

<table>
<thead>
<tr>
<th>Nivell d’anglès de les explicacions a classe: (de més fàcil a més difícil)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinàmica de les classes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Teacher’s PowerPoint</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Student’s book (activitats)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Les Professores de pràctiques</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>El teu profitament del treball en grup</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>El teu interès</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>El teu aprenentatge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>La teva actitud</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>La teva participació</td>
<td>1</td>
<td>2</td>
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5.- UNIT MARKS GRID
PART III

1.- TEACHER’S MATERIALS
1.1.- TEACHER’S POWERPOINT
1.2.- TEACHER’S FLASHCARDS
1.3.- TEACHER’S REFERENCES
3.- REFERENCES / SOURCES FOR TEACHING UNIT

SCIENCE COURSEBOOK:


THEORY:

http://www.darvill.clara.net/altenerg/
http://tonto.eia.doe.gov/kids/energy.cfm?page=2
http://www.bbc.co.uk/schools/teachers/ks3bitesize/science/energy.shtml
http://www.scienceonline.co.uk/energy/nonrenewable.html

SAVING ENERGY TIPS:

http://www.newton.dep.anl.gov/askasci/gen01/gen01673.htm
http://www.epa.gov/reg5rcra/wptdiv/p2pages/energy.pdf

RUNNING DICTATION:

http://www.epa.gov/reg5rcra/wptdiv/p2pages/energy.pdf

SESSION 8 VIDEO:

http://www.youtube.com/watch?v=1-g73ty9v04&feature=related
http://www.tvakids.com/electricity/conservation.htm
EXTRA ACTIVITIES

http://tonto.eia.doe.gov/kids/

http://tonto.eia.doe.gov/kids/energy.cfm?page=riddles


PHOTOS

http://www.fotosearch.com/photos-images/petroleum.html

http://www.freefoto.com/index.jsp

http://www.freedigitalphotos.net/images/Energy_and_Environment_g160.html

FINAL PROJECT

http://www.darvill.clara.net/altenerg/

http://tonto.eia.doe.gov/kids/energy.cfm?page=2

Extra Links:

http://www.videojug.com/film/how-to-reduce-your-electric-bill

http://www.videojug.com/film/how-to-save-energy-in-your-home


http://www.videojug.com/interview/reduce-recycle-reuse-2

OTHERS

http://www.eslflow.com/environmentlessonplans.html
1.4- OTHER MATERIALS
(CDs, DVDs)
1.- TEACHING UNIT

ENERGY RESOURCES

ADAPTED VERSION

(A.B. 3rd ESO)
1.1.- TEACHER’S POWERPOINT