SIOP LESSON PLANNING: Energy

Date: **3rd July 2008**

Grade/Class/Subject: **4th Year ESO – Science**
Unit/Theme: **Unit 2: Energy**
Standards: **Junta de Andalucía (Consejería de Educación) - Curriculum for Science in E.S.O.**

Background

This lesson starts class work on a physic unit about energy.
English proficiency levels: Advanced beginners to intermediate
Grades: 4th Year ESO
Standards: **Junta de Andalucia** Curriculum for Science

Preparation

Content Objective(s): Students will be able to:

1. Distinguish the different forms of energy
2. Know about how energy transfer from one to another: energy inputs & outputs
3. Differenciat the different sources of energy: non-renewable energy & renewable energy
4. Be familiar with the different ways of saving energy
5. Be concious of the energy crisis

Language Objective(s): Students will be able to:

Become familiar with a variety of different **text types** in the four skills (writing, reading, listening and speaking) and for such purposes as:

- describing how energy works
- classifying the different types of energy and sources of energy
- predicting what will happen if we don't save energy
- instructing about ways to save energy
- summarising how energy transfer
- arguing how to save energy
- explaining energy transformations

Develop vocabulary related to the content that is the focus of the lesson, as well as functional language for academic and social tasks at school.

New vocabulary should be presented in context and not as isolated lists of unrelated words, together with the fixed expressions most usual to that topic.

Integrate the four language skills: reading, writing, listening and speaking.

Key Vocabulary and expressions
Source of energy
energy resources
forms of energy
chemical energy
thermal energy (heat)
geothermal energy
light energy
sound energy
elastic or strain energy
gravitational energy
kinetic energy
electrical energy
nuclear energy
renewable energy
non-renewable energy
energy can be converted
energy can't be destroyed
Earth's crust
radioactive decay
atomic isotopes

Supplementary materials
Energy Glossary
Energy Glosary from Energy Kid's Page
Realia posters
POEM: **Build another power plant near Sumas, WA?**
Presentations:
The Energy Story - A Writing Across Curriculum Activity
Energy Lesson - My own presentation
Web Sites:
Energy Kid's Page
BBC School Physics Energy
Alliant Energy Kids
National Energy Education Development Project – Putting Energy into Education
Web Quests:
Energy Quest - Stephanie Brook - Grade: 6-8 9-12 English/Language Arts Science Social Studies
Energy Quest Room - California Energy Commission
Energy Sources - K. Cordiner, S. Chung - Grade: 9-12Science

SIOP Features

Preparation
_X_ Adaptation of Content
_X_ Links to Background
_X_ Links to Past Learning
_X_ Strategies incorporated

Scaffolding
_X_ Modeling
_X_ Guided practice
_X_ Independent practice
_X_ Comprehensible input

Grouping Options
_X_ Whole class
_X_ Small groups
_X_ Partners
_X_ Independent

Integration of Processes
_X_ Reading
_X_ Writing
_X_ Speaking
_X_ Listening

Application
_X_ Hands-on
_X_ Meaningful
_X_ Linked to objectives
_X_ Promotes engagement

Assessment
_X_ Individual
_X_ Group
_X_ Written
_X_ Oral

Lesson Sequence

First Session

Motivation

• Setting Stage: listen, read, speak, writing • Social affective • Links to students' background experiences • Links to past learning	We should first try to bring forward students' previous knowledge on this topic by asking them *What do you need to make any work?* (walk, jump, stand up, ...), *what does a car need to move?*, ... You will try to elicit the word **energy**. See how they connect the word energy to the word **work** as it is used in Physics .Ask them questions on the topic (don't worry very much at this stage if they use Spanish). Once you have elicited the word **energy** and **work** you have to be familiar with what they alredy know about this topic. We need to explicitly link concepts to students' backgrounds and experiences and relate new concepts to what has been previously learned.

Presentation

• Explanation academic task • Large Group • Teacher > Students • Time: 20	The teacher and students will read the content and language objectives. Key vocabulary will be explored in a small group word study activity. Then the small groups will share with the whole group what the term means, The teacher will give them the dictionary definition of the word energy (Enery Lesson p.2) and ask them to relate it to the concept of energy in physics (Energy Lesson p.3). After that the teacher will tell then how energy work (Energy Lesson p.4) Teacher will introduce the different types of Energy..page 8 in *Physics for You* Chapter 2. In pairs, they have to match the types of Energy with the picture in Energy Lesson p. 9, Activity 2. Introduce them to the topic of Energy Efficiency &

	Conservation of Energy (Energy Lesson p. 10 & 11)

Procedure

• Whole-small-whole group • Linking previous learning • Informal pre-assessment • Questions – basic • Comprehensible Input – *realia* pictures and maps • Social affective • Linking previous learning • Pre-assessment • Time: 20 minutes	Next, students will visit four realia posters, and label the items they know with “post-its” and pose questions related to energy about things they want to learn. Each student must post at least one yellow for what they know and one blue for questions. After a four to five minute exploration, the whole group will discuss what was written on the “post-its. After discussing what students know and want to learn, the teacher will ask questions to get students to brainstorm examples of types of energy, *What sort of energy you need to run 100 metres*?, ...
• Clear explanation of tasks • Modeling • Listening • Comprehension • Meaningful activity	To close the session the whole group will listen to the teacher read a poem telling us it's necessary to change our way of life: **Build another power plant near Sumas, WA?** , and as the teacher reads aloud the students draw what they think the poem is about. The teacher reads and models at first and then allows the students to listen and reflect to complete the activity. Students are informed that this will be used in opening the next session.

• Time: 15	

Second Sesion

• Speaking, listening, • Adaptation of content • Key vocabulary • Modeling • Comprehensible Input • Questions – Higher order • Large group • Individual work • group work • Time: 30 minutes	After students review the previous session going over the vocabulary and using it to describe why they drew what they drew as they listened to the poem. Teacher makes students think about the importance of **saving energy**. Teacher asks some questions in order to facilitate students interaction: *Will energy be exhausted in the future?*, *what will happen when we have no more energy?*. Students discuss these questions in groups and share their answers with the large group. Now the teacher will try to make students undestand the concept of **energy transfare** and energy imput and energy output. He goes with them through page 12 to 18 of Energy Lesson and they have to take notes and sumarize and teacher asks students to do individually activity 4 in Energy Lesson page 19. Students will read again page 8 in *Physics for* You Chapter 2 and make in groups of four activities in page 9.
• Reading about content concept • Copy for imprinting-meaningful Activity • Adapted text • Pair work • Listening • Complete text using specific vocabulary • Homework:	While students are completing the activity and reading the section of the textbook, the teachers gives students an adapted gapped text. Students have to complete it in pairs. Teacher reads text aloud to help students complete the text. Once they have completed, students are given the original text and are asked to make a graphic organizer, which will be seen in class the next day.

Graphic Organizer • Time: 25 minutes	