# EDUC 6735 Assessment 1 Submission Document 08/03/2010

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I declare that this work is mine and mine alone. *Robert Hemingway*

Detailed explanation of the content/concept taught during your micro-lesson and teaching strategy(ies) used

The key **concept** taught was that in order to thrive and prosper, society needs to be able to use, control and convert energy from one form to another. To this end I started with a hybrid of a discussion, board work and demonstration of the following …

different forms of energy

- chemical potential energy
- electrical energy
- heat energy
- light energy
- sound energy
- energy of motion (kinetic energy)

that we can control electrical energy and in doing so …

- change the light intensity
- change the loudness of the siren
- change the speed of the motor

that we can convert energy as follows …

- kinetic energy of the motor wheel to light energy
- kinetic energy of the motor wheel to sound energy

This was followed by a teacher guided discussion and questions about the importance of energy to society, and finally I concluded the lesson by discussing the homework assignment that was intended to get the students …

- familiar with searching the internet for facts and figures
- to answer questions on how energy consumption per capita relates to the advancement of different societies
- to think about and complete a mind map on where energy comes from
- and finally to write about how they would destroy energy, before and after an internet search on the creation and destruction of energy

The homework sheet is the way I will assess whether students have achieved the outcomes set in the lesson plan

In summary the lesson was intended to show how society depends on energy to thrive and advance. That there are different forms of energy. That we can control and use this energy, and that energy can be converted from one form to another for convenient usage.

Assessment was in the form of a homework writing for learning task consisting of three learning activities.

Strategies used include the following …

- whiteboard usage for diagrams and explanations
- interactive discussion
- teacher demonstration with questions
- homework task of writing for learning
- assessment through students writings

## Lesson Plan : Energy & Society

Date : 01/03/2010 Lesson Time : **10 mins**
Topic : **Energy, different forms, it's control and conversion**
*aka* **Society grows on Energy**
Class : Year 8 and 9 School : St. Lucia Preparatory

## Overall Aim

The overall aim is to link the concepts of using different forms of energy, and the control thereof, to advancement of living standards in society.

## Objectives / Learning outcomes

- that there are **different forms of energy**
- that we can **use and control energy** for useful things
- that we can **convert energy from one form to another**
- that **development and advancement of society are linked to energy control**

## Prior Knowledge / skills

- galvanic cells, eg AA Alkaline Batteries
- basic electronic circuits
- how to use internet search engines such as Google

## Materials

| | |
|---|---|
| Small electrical breadboard<br>9V galvanic battery, with connector clip and wires<br>one each of 3mm red, and green LED<br>one 630Ω ¼W resistor | one 10kΩ potentiometer<br>one 1-12V piezoelectric siren<br>one 6-9V DC motor<br>two 15cm insulated copper wire connectors |

## Lesson Description

This lesson is intended to get students thinking about energy and society. To understand that there are different forms of energy, and that we can use energy, control it, and convert it from one form to another. Also that we can't destroy it. Neither can we create it out of nothing. Of prime importance is to get students thinking of how energy has led to technological advancement, and the improvement of society. To get students to think critically of energy usage and control in different countries. For example comparing the energy usage and employment data for Australia versus Zimbabwe.

## Strategies used

The lesson uses the following strategies …

- whiteboard work
- questions and answers
- teacher demonstration
- discussion with questions
- Homework for learning and assessment

## Lesson Procedure

| Activity | What I do | What students do | Content | |
|---|---|---|---|---|
| Introduction | Talk to class<br>Write points on the board | Listen and look over the key learnings. | Verbally introduce the topic to the class, and write the title on the board.<br>Verbally introduce the four learning outcomes, and write them on the board | 2 mins |
| Demonstration | Perform the demonstration in the following sequence (with relevant questions) …<br>1.D**ifferent forms of energy**<br>battery, resistor, LEDs<br>battery, resistor, siren<br>battery, motor<br>**2. Control of the energy**<br>battery, resistor, potentiometer, LEDs<br>battery, resistor, potentiometer, siren<br>battery, potentiometer, motor<br>**3. Conversion from one form to another**<br>motor, LEDs (motion to light)<br>motor, siren (motion to sound) | Watch and ask and answer questions | Using the battery, resistors, LEDS, piezoelectric siren and motor, construct the circuits in sequence and demonstrate with commentary, the<br>1. forms of energy<br>2. control of energy<br>3. conversion of energy<br><br>Questions on the importance of each form are important aspects of student reflection on the demonstration. | 4 mins |
| Conclusion | I guide a discussion on the importance of energy, and introduce the concept of society growth due to use and control of energy | Listen and interact with questions and observations | How important is energy to the student ?<br>To Brisbane ?<br>To Australia ?<br>To any society – what would a society with very limited energy function ?<br><br>Introduce the concept of energy usage and control, delivering employment and income to society by comparing two dissimilar countries. One from the First World and one from the Third World. | 3 mins |
| Follow-up activities | Hand out a homework sheet and explain what students need to do at home | Accept the homework sheet and listen to the explanation. Ask any questions to clarify what is expected of them. | Internet investigation of two countries energies uses, and relate this to employment etc.<br>Complete a concept map on where energy comes from<br>Write a half page on how the student would destroy energy | 1 min |

## Assessment / evaluation

Students are given a worksheet with activities to complete at home. This worksheet needs to be handed in after one week, for assessment, comment and feedback.

Homework Handout for Lesson on **Energy, different forms, it's control and conversion - Society grows on Energy**

**Name** **Date**

**Class**

## Activity 1.

**Using the internet, research the relative economic strengths of Australia and Zimbabwe.**

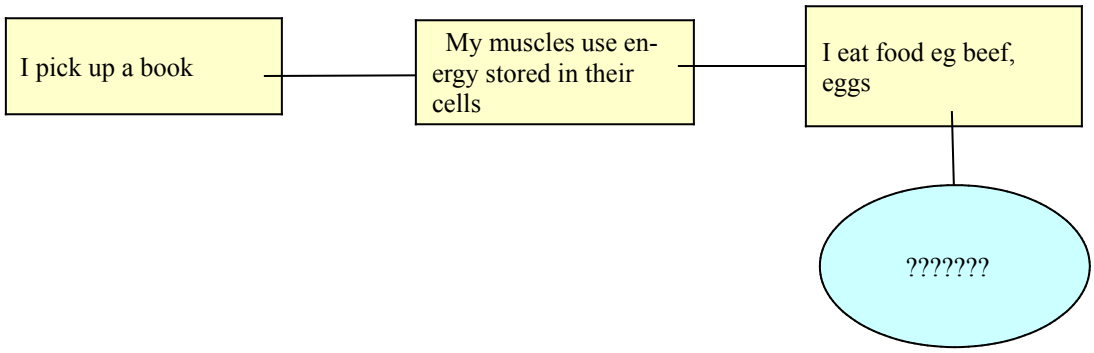
Strike up your Google search engine. Search for 'CIA World Factbook'
Open their website and find the locations of interest

| Item of interest | Australia | Zimbabwe |
|---|---|---|
| Population (estimated 2009) | | |
| Electricity consumption (billion kWh 2007) | | |
| Electricity consumption per capita (divide consumption by population) | | |
| Number in labor force | | |
| Unemployment rate | | |
| Percentage population below poverty line | | |

Using this data, write a short paragraph on the relationship between energy consumption per capita and the unemployment rate, and number of workers in the work force. Use your answer to highlight the importance of energy control and use in advancing society.

## Activity 2.

**Complete the concept map on where energy comes from**




## Activity 3.

**On the back of this sheet, write half a page on how you could destroy energy.**

*A half to one page commentary of the micro-teaching experience and feedback received by your peers on whether your teaching strategies were appropriate or not, was your timing required for tasks misjudged*

The micro-teaching experience was very valuable. I planned extensively ! I drafted and re-drafted my lesson plan, trying to stay loyal to 10 minutes, but also deliver a 'thoughtful' lesson of some significant content, that had relevance to student's real-world life.

I found I was nervous. I mentally 'played and re-played' the lesson with what and how I would deliver the lesson. Writing down good commentary that came to mind, and sequencing the lesson into a written plan of delivery that I could glance at if I lost my place or direction.

The delivery went well, but 10 minutes delivering seemed much shorter than 10 minutes listening. I stuck closely to my plan, but it didn't go exactly as I had planned. The sentences didn't flow like they did in my mind ! I was a bit nervous, but I approached the task with a sense of anticipation of enjoyment, and I did enjoy it. I knew I was in time problems because the demonstration of different energies and their control took much longer than I anticipated – the little wires would not go into the holes first time, and my hands were a little shaky !

I felt that I had delivered the lesson in such an order and content that clearly led the student's thinking from one stage to another, and arriving at the importance of energy to society – the intended outcome. However the demonstration could have proceeded smoother, and possibly with less content. My timing was way out – 13 minutes when it was only meant to last 10 minutes. I also felt the central 'computer whiteboard' restricted my board writing to the small rectangular section on the side – this meant statements written on the board to cement ideas, and sequence concepts, were broken over more than one line, and thus lacked the impact I wanted.

Overall I was happy with the lesson presentation, but knew straight away that it could be improved in a number of ways 1) too much content 2) time management needed improvement

The peer review comments were interesting, and identified four areas that need improvement...

- the introduction was not clear and engaging (3 responses)
- my time management was not good (3 responses)
- I needed to move around the room better (2 responses)
- too much for 10 minutes (3 responses)

On the positive side the following comments all received 4 or more responses …

- good use of hands, and eye contact
- question quality and instructions were good
- lesson structure and the use of aids was good
- body posture was relaxed and appropriate

Overall they enjoyed the lesson.

*a reflection and evaluation of the lesson*

I enjoyed this experience. The research was interesting, the design and planning challenging, and the delivery exciting. The planning took the longest time, as I mentally rehearsed and rehearsed the actual presentation. Looking for better flow and language.

The lesson never went strictly to plan, but the flow was good, and the students seemed to be engaged throughout. There was an obvious time issue, which needs addressing. I don't believe the content was too difficult for the year 8 students, neither do I believe I can leave anything out.

The lesson could have allowed for the students to interact with the batteries, lights etc. In a longer lesson this would be a positive alternative to the teacher directed demonstration.

I believe I try to put too much into a lesson. I need to pace the lesson in time and content. Also I need to work on better eye contact and voice pitch to keep student attention focused when I'm talking.

Overall I feel the lesson went well ! The students received a lesson on an important current topic, and I believe they will think deeply on the main topic, whilst doing the homework material. I can improve the lesson by being better prepared at the start of the lesson, and during the demonstration of the different forms of energy. As this was this lesson's first presentation, I feel it went well.

*a new lesson plan with evidence of changes*

## Lesson Plan : Energy & Society (revision 1)

Date : 10/03/2010 Lesson Time : **10 mins**
Topic : **Energy, different forms, it's control and conversion**
*aka* **Society grows on Energy**
Class : Year 8 and 9 School : St. Lucia Preparatory

### Overall Aim

I want the students to understand and link the concepts of using different forms of energy, and the control thereof, to advancement of living standards in society.

### Objectives / Learning outcomes

After completing this lesson students will be able to understand and explain ...

- that there are **different forms of energy**
- that we can **use and control energy** for useful things
- that we can **convert energy from one form to another**
- that **development and advancement of society are linked to energy control**

### Prior Knowledge / skills

Students need an understanding of
- galvanic cells, eg AA Alkaline Batteries
- basic electronic circuits
- how to use internet search engines such as Google

### Materials

| | |
|---|---|
| Small electrical breadboard<br>9V galvanic battery, with connector clip and wires<br>one each of 3mm red, and green LED<br>one 630Ω ¼W resistor | one 10kΩ potentiometer<br>one 1-12V piezoelectric siren<br>one 6-9V DC motor<br>two 15cm insulated copper wire connectors |

### Lesson Description

This lesson is intended to get students thinking about energy. Different forms of energy, and that we can use energy, control it, and convert it from one form to another. Also that we can't destroy it. Neither can we create it out of nothing. Of prime importance is to get students thinking of how energy has led to technological advancement, and the improvement of society. To get students to think critically of energy usage and control in different countries. For example comparing Australia versus Zimbabwe in energy usage, total work-force numbers, and unemployment.

### Strategies used

The lesson uses the following strategies …
- whiteboard work
- powerpoint slide for introduction
- questions and answers
- teacher demonstration with pre-built electrical circuits
- discussion with questions
- homework for learning and assessment

## Lesson Procedure

| Activity | What I do | What students do | Content | |
|---|---|---|---|---|
| Introduction | Explain to class, whilst powerpoint slide with title and key learnings is shown | Listen and look | Verbally introduce the topic and key learnings to the class. | 1 mins |
| Demonstration | Perform the demonstration in the following sequence (with relevant questions, using **pre-built circuits**) …<br>1.D**ifferent forms of energy and their control**<br>battery, resistor, potentiometer, LEDs<br>battery, resistor, potentiometer, siren<br>battery, potentiometer, motor<br>**2. Conversion from one form to another**<br>motor, LEDs (motion to light)<br>motor, siren (motion to sound) | Watch and ask and answer questions | Using the battery, resistors, LEDS, piezoelectric siren and motor, use pre-constructed circuits in sequence and demonstrate with commentary, the<br>forms of energy<br>control of energy<br>conversion of energy<br><br>Questions on the importance of each form are important aspects of student reflection on the demonstration. | 4 mins |
| Conclusion | I guide a discussion on the importance of energy, and introduce the concept of society growth due to use and control of energy | Listen and interact with questions and observations | How important is energy to the student ?<br>At home ?<br>To Brisbane ?<br>To Australia ?<br>To any society – what would a society with very limited energy function ?<br><br>Introduce the concept of energy usage and control, delivering employment and income to society by comparing two dissimilar countries. One from the First World and one from the Third World. | 3 mins |
| Follow-up activities | Hand out a homework sheet and explain what students need to do at home | Accept the homework sheet and listen to the explanation. Ask any questions to clarify what is expected of them. | Internet investigation of two countries energies uses, and relate this to employment etc.<br>Complete a mind map on where energy comes from<br>Write a half page on how the student would destroy energy | 2 min |

*(The revised plan :- the main differences are having a ppt slide for the introduction to engage the students and shorten the time spent on the explanation; and using pre-constructed circuits for the demonstration. I don't believe I can leave anything out and still make a useful lesson that flows properly)*

## Assessment / evaluation

Students are given a worksheet with activities to complete at home. This worksheet needs to be handed in after one week, for assessment, comment and feedback.

*a photocopy of resources or appropriate reference to books/URLs*

https://www.cia.gov/library/publications/the-world-factbook/geos/as.html *site for information on Australia*

https://www.cia.gov/library/publications/the-world-factbook/geos/zi.html *site for information on Zimbabwe*

http://www.answerbag.com/q_view/18750 *a site related to creation and destruction of energy*

http://secondlaw.oxy.edu/two.html *a good site for thinking about destroying energy*

*any student worksheets you develop to go with your activity and resources*

The following sheet is the homework sheet.  This sheet was intended to be handed in the following week for me to asses if the student had achieved the outcomes determined for the lesson.

The rest of this page is blank on purpose

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**Class**

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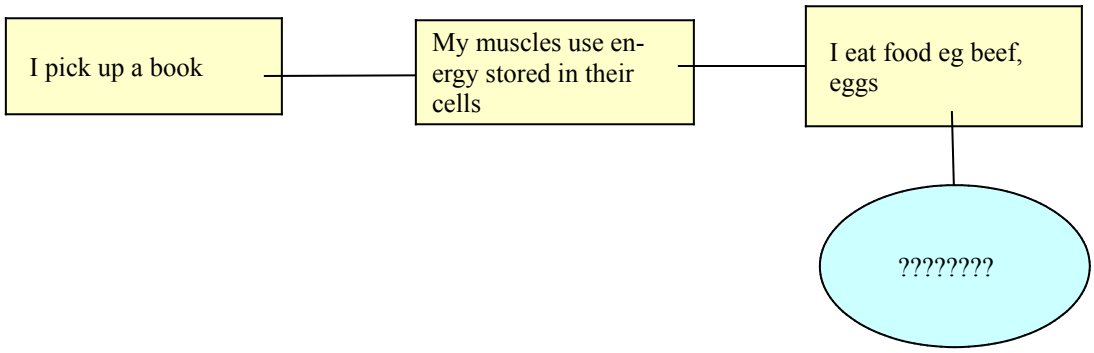
## Activity 2.

**Complete the mind map on where energy comes from**




## Activity 3.

**On the back of this sheet, write half a page on how you could destroy energy.**

# Peer review data analysis

From the presentation feedback sheets

| The Comment | Number issued FOR | Number issued AGAINST |
|---|---|---|
| Good use of hands | IIIII | |
| Kept attention well | II | |
| Eye contact was effective | IIIII | I |
| Moved around the room effectively | III | II |
| Good use of diagrams on the board | I | I |
| Good use of board | III | |
| Board writings were clear | II | I |
| Questions quality was good | IIIII | |
| Instructions were good | IIII | I |
| Lesson flow was good | III | I |
| Lesson structure was good | IIII | |
| Information was logical | III | |
| Conclusion was good | I | |
| Relevance was good | II | |
| Question asking technique was good | II | |
| Body posture was good | IIII | |
| Use of aids was good | IIII | |
| Were there spelling errors | | I |
| Was the introduction clear & engaging | II | III |
| Did you enjoy the lesson | III | |
| Time management was good | | III |
| Too much content | | II |

The areas needing improving are …

- the introduction was not clear and engaging
- time management was poor
- there was too much content
- my movement around the room was not good