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Cross Curriculum English Science Lesson Review

Background: There is always the worry that CMI (Chinese as Medium of Instruction) students are deprived of the important exposure to a wide range of subject-related vocabulary which they might find useful in their pursuit for further studies. We are well aware of this situation and it is exactly to fill the vacuum that we have designed the Cross-Curriculum English subject. Four lessons per cycle have been put aside for teachers experienced in teaching EMI classes to help junior form CMI students master the basic concepts in the subjects of History, Geography, Mathematics and Integrated Science in English.

These teachers have worked very hard collaboratively to design the curriculum, choose the materials, develop the lessons and design the assessment tools.

We sincerely hope that with so much effort put into it, this subject is to be developed into a unique school-based cross-disciplinary subject and the experience of which is rewarding to both the teachers and the students.

The participants of this lesson study are CMI S1 students who generally have relatively fewer chances to be exposed to English than their EMI counterparts, and do not have a solid English vocabulary foundation in Science.

Objectives: With the necessary science vocabulary about global warming learnt in the Cross Curriculum English Science Lesson earlier on, students in this lesson discussed the effects of global warming. Two teaching methods were adopted: 1. teacher - student interaction and 2. student - student interaction. What is meant by teacher - student interaction in this lesson is that the teacher, being a facilitator of learning, should guide students to give appropriate responses; whilst the meaning of student - student interaction in this lesson refers to a classroom setting in which some students raise questions while others answer and discuss. With judicious use of these two teaching methods in this lesson and through praises and encouragements, students were given more chances to use learnt vocabulary to express their ideas. As a result, our two main goals can be achieved:

1. students will be able to express scientific concepts in English and
2. students will be able to think logically in Science.

Theoretical Background:

In the era of traditional science education, students used to learn passively and emphasis is put on rote learning of various science concepts. This leads to a lack of bonding between scientific knowledge and the actual daily life experience (Hui, 2009). Likewise, traditional language education focuses on grammar accuracy instead of cross-curriculum linkages and

students' other learning experiences.

The educational reform in Hong Kong and other major countries has always advocated student-centered learning. The current education reform in English and Science also has the same major direction. Hodson (2002) suggests that in a student-centered lesson, the teachers will be able to understand the nature of various students and listen to their voices and experiences. With more understanding of their students, the teacher, taking the role of a facilitator, can effectively increase student interactions, enhance learning interest, enlighten students with ideas, form think pools and construct knowledge. Dewey (1938) and Mayer (1987) advocated the kind of education that appeals to the students. They put the phrase 'teaching and learning' as the relationship between 'to provide useful experience to the students' (teaching) and 'to gather knowledge' (learning).

In conclusion, the teacher must bear in mind in order to teach well, teaching is not enough. Instead, to make learning appealing to students, the teachers should make learning interesting, fun, effective and applicable in future lives to the students. An environment that allows participation would be a good catalyst for successful discussion (Darder, 1996).

This lesson, the Cross Curriculum English Science Lesson took reference of the above suggestions and formed a student-centred lesson focusing strongly on student-student interaction. It was found that the lesson, being carried out in this way, did effectively enhance the ability of students to express scientific concepts in English and their logical thinking in

Science.

Lesson arrangement: The Lesson Plan

Cross Curriculum English Science Lesson	
Date : No. of students : Class: Medium of Instruction: Objective: Aims:	18/ 3/ 2010 36 1B English The Effect of global warming 1. To give reasons for the deaths of animals. 2. To suggest examples of effects of global warming. 3. To discuss the matter of global warming. 4. To explain the abnormal behavior of polar bears. 5. To give an overall title for the lesson.
Attention to Prior knowledge related to this lesson.	
	<ul style="list-style-type: none">- Global warming causes the melting of ice.- The principal concepts of global warming and related words- Names of certain animals.

Lesson arrangement: The Lesson Plan (Cont.)

Timeline	Content	Aim(s) achieved:	Student activity/ thoughts and theory behind	Teachers' activity / thoughts and theory behind	IT	Worksheet	Affective /interesting factors
Before the lesson			Students receive a worksheet and write down their names, class and class numbers.	Teacher distributes worksheet paper		A worksheet for students' notes	
0-5 mins	Set: A video shows animals killing themselves	1. To give reasons for the deaths of animals.	Students raise question about the video / From students center to student center, students practice using English to explain their ideas.	Teacher requestes answers of students' questions from the students themselves. / As facilitator.	Computer and video		Stunning video
5-17min	Another video is being shown showing the effects of global warming	2. To suggest examples of effects of global warming. 3. To discuss over the matter of global warming.	Students raise question about the video / From students center to student center, students practise using English to explain their ideas in English with judicious of prior knowledge.	1. Teacher encourages students to ask questions and make answers themselves. 2. Teacher does a short conclusion / As facilitator.	Computer and video Board and chalk		Intriguing video

Timeline	Content	Aim(s) achieved:	Student activity/ thoughts and theory behind	Teachers' activity	IT	Worksheet	Affective /interesting factors
17- 19 mins	A picture of a polar bear eating its own offspring is shown to the students (Another picture of a polar bear standing on a small bit of ice is prepared for appropriate use during the lesson.	4. To explain the abnormal behavior of polar bear.	Students raise questions and give answers to these questions regarding the picture. / Students practise using English to explain their ideas in English with judicious of prior knowledge.	1. Teacher encourages students to ask questions and make answers themselves. 2. Teacher does a small conclusion / As facilitator	Overhead projector showing a picture of a polar bear eating another polar bear Board and chalk		interesting pictures

Timeline	Content	Aim(s) achieved:	Student activity/ thoughts and theory behind	Teachers' activity	IT	Worksheet	Affective /interesting factors
20 to 22 mins	Conclusion The topic of the lesson	5. To give an overall title for the lesson.	Students to think of a title for the lesson Different students express their ideas. / To make sure everyone participates in the lesson.	Teacher asks the students to think of a title.	Board and chalk	worksheet for students' notes	
22mins	Homework Find more examples of effects of global warming	5. Using the title derived to do a homework 'Title: The effects of Global Warming'	Students should do homework after class on the examples of effects of global warming. / To encourage after lesson research.	Teacher asks the students to do a research on the effects of global warming		worksheet for students.	

Lesson Effectiveness: As could be observed in the lesson, students were deeply interested towards the questions raised by other students. They were able to bravely share and express their thoughts and ideas. Facilitated by the teacher, students were able to construct the major elements of this lesson by listening to the point of view of other students.

Lesson Evaluation: Let's have a look at what is happening during the lesson that led the lesson to arrive at the above stated effectiveness.

Time of lesson	Evaluation
00:00	At the beginning of the lesson, Mr Chau had ensured that <ul style="list-style-type: none"> ● the computer and microphone are in good condition. ● Appropriate stationery and worksheets have been put onto the desks of students.
00:01-00:07	Prior to greetings, the teacher deliberately played a little bit of the video which will act as the set of the lesson later on. This increased the level of curiosity among the students and enhanced their attentiveness.
0:25	The teacher expressed his wish for students to ask questions from the video that will be played. He suggested that students could write down their questions and he used the school's bookmarks as encouragements.
0:35	Interesting video, the set, excited the minds of students and helps enhance the eagerness in the students to join later discussion.

1:30	<p>The video showed some animals (a monkey, a polar bear and a kangaroo) deciding to end their lives in different ways. Upon the finishing of the video, the teacher asked for questions. Students were responding actively. The teachers intentionally did not answer the questions and gave the responsibility to other students. The students answered actively. This achieved effectively the <u>'student center'</u> to <u>'student center'</u> mode of learning.</p> <p>With the teaching laying down the authority to ask questions, and forwarding this responsibility to the students so that they led the lesson, students' confidence and their intention to join the discussion were effectively enhanced.</p>
2:00	<p>The teacher spoke out the name of the students who asked a question before repeating his question. This made the student felt that he is being honoured, thus further enhancing his confidence.</p>
2:54	<p>With student asking questions and various students expressing their ideas, students were able to enhance</p> <ol style="list-style-type: none"> 1. <u>their ability of students to express scientific concepts in English and</u> 2. <u>their logical thinking in Science.</u>
3:46	<p>A student was asking a question with vocabulary learnt in the Cross Curriculum English Science Lesson earlier on.</p>
4:45	<p>A student proposed that he would like to write out what she thought on the whiteboard. The teacher encouraged her to explain what she was writing in English. This further consolidated her vocabulary.</p>
5:20	<p>The teacher requested students to explain the science concept that has been drawn onto the board. During this period of time, students made judicious use of the vocabulary that they had learnt in single words or full sentences to express their ideas.</p>

8:00	<p>After showing another video to the students, the lesson entered a stage that required deeper scientific thinking. The students are asking questions that probe deeper and deeper into the issue being discussed. Both the questions and the answers of require a lot of scientific vocabulary that has just been learnt. When a student wanted to clearer explain what s/he meant, the teachers often allowed them to come out and draw in order to better illustrate what they are saying. This allowed the combination of the ability of English and the ability in drawing, further consolidating their vocabulary and English communication skills.</p> <p>During the process, the teacher intentionally created a thrilling environment that gave a positive boost the learning environment.</p>
13:30	<p>The teacher made a small conclusion to what has been discussed so far and encouraged further questions from other students. From the answers of various students, consolidation of scientific concepts was seen and that students also had their English communication skills.</p>
15:00	<p>One particular student, with the intention to make other students understand why the water level will rise, came out by himself to draw and explain what he meant. This led the lesson to another climax, bringing on a thicker discussion phenomenon. The students' vocabulary and English communication skills were put to use to their greatest extent.</p>
15:58	<p>The teacher encouraged students to clap their hands so as to praise those who speak up.</p>
16:00	<p>The teacher made a small conclusion to what has been discussed so far to consolidate the vocabulary and science concepts in the minds of the students.</p>

17:46	<p>A new picture shown by the teacher led to another climax where many questions were raised, challenging the students again to use their learnt vocabulary to express themselves.</p> <p>The teacher's request for the students to take side by raising their hands towards the answer of a student ensured that most students are catching up.</p>
19:25	<p>When a student had difficulties expressing himself, the teacher used his body language to make clarification. This improved the understanding of all other students and consolidated the meaning of the vocabulary.</p>
19:40	<p>When a student tried to explain his idea, the teacher showed a picture that has exactly the same meaning of what he says, this enhanced the understanding of all students and consolidated the meaning of the relevant English vocabulary.</p> <p>' From this part of the lesson, it can be seen that during lesson preparation prior to the lesson, the teacher also prepared for the students. He estimated the kind of questions that may be raised in the lesson and prepared relevant teaching material that can be shown at the right time to enhance teaching effectiveness.'</p>
20:36	<p>To ensure that all students were joining in the learning, and to cater for individual difference, the teacher had the following elements added to the final conclusion of the lesson:</p> <p>Requesting different students to make a title for the lesson and asking everyone to write down what they said, and to write down what had been agreed upon the final title for the lesson.</p>
22:12	<p>Arrangement of homework: Upon decision of the title as 'The effects of Global Warming', the teacher consequently arranged an assignment so as to allow students to do more research over the effects of global warming. This enhanced</p>

	the power of reading and writing of the students and unleashed self-motivation within the students themselves to search for scientific knowledge.
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Self reflections :

1. Students enjoy being encouraged. With the belief that every student is able, encouragement serves as an effective tool to enhance the confidence of a student. In this lesson, with the appropriate encouragement of the teacher, even students equipped with only inadequate English abilities put great efforts in expressing themselves. Every student managed to express themselves and make others understand in the end.
2. We should not abandon any students. With the hope that every student should contribute towards the success of a lesson, a teacher should frequently provide appropriate guidance and instructions. Throughout the lesson, the teacher used short videos, pictures, explanations, as well as body language to provide appropriate guidance and instructions. Students were thus prompted to frequently use English to ask, to answer and to make logical deduction of various levels. This effectively enhanced their ability in expression scientific knowledge in English as well as their deductive ability in Science.

3. The mode of teaching adopted in this lesson helped to build confidence in the students. With the teaching as a facilitator, learning propagates in a student-centered to student-centered pattern in the sense that students were guiding other students to raise or answer questions. This pattern of learning boosts the morale of students and enhances their confidence. With enough confidence, even the students who are expected to achieve the least can actively express themselves so as to maximize their potential. In this lesson, the teacher fully experienced that when confidence bloomed within the students, they pushed to their very limit to better express themselves with the best English they possess. These proactive attitudes and relentless minds were just what every concerned teacher yearns for students to possess during his/her teaching life. The time when the students are pushing themselves to their limits is the time when they will improve the most.
4. The teacher has to make preparations in multiple perspectives. Not only should the content be well prepared, but the teacher should also prepare the students as well. What is meant here is attention to individual differences between students. A suggestion here is that students who are strong could be invited to raise questions first to bring out the discussion atmosphere, so that the weaker students can be encouraged to express their ideas. The teacher should have in mind what the students may ask and get ready to respond before the lesson. This can help deepen and consolidate the students' confidence and ability in expressing themselves in English so that they will be positively reinforced to speak up again in the future. One point for future improvements is that the students' ability in

English could be enhanced if the teacher can fortify the answers of the students with a number of similar words or phrases and ask every student to write them down.

Improvements:

1. It would be better if the teacher can find effective ways to rectify students' wrong grammar in speaking. As can be seen in the first 5 minutes, though the students were doing their best in answering, there were different levels of grammar inaccuracy. e.g. at the beginning of the lesson, when a student asked a question, saying ' Why was the monkey so sad?', another student answered with this sentence 'because there is so dry, and no water and they can not be live be dead.'. The sentence was understandable but there are grammatical errors. The teacher can immediately correct his sentence, put it onto the screen and ask everybody to write down the correct sentence. If this point can be achieved, the whole class, including the student who made this sentence, can benefit.

2. From the aspect of science learning, the teacher can also request for deeper elaboration using scientific logical thinking during the lesson. Let's take the same question as an example: 'Why was the monkey so sad?'. During the lesson, some students responded by saying 'without water' and 'without food', and if the teacher asked more questions over these answer, such as 'Why was there not enough food?', collected the answers of students from multiple perspectives, and asked students to evaluate on the possibilities of these answers, it is likely that the ability of scientific thinking and deductive power of the students could have been improved.

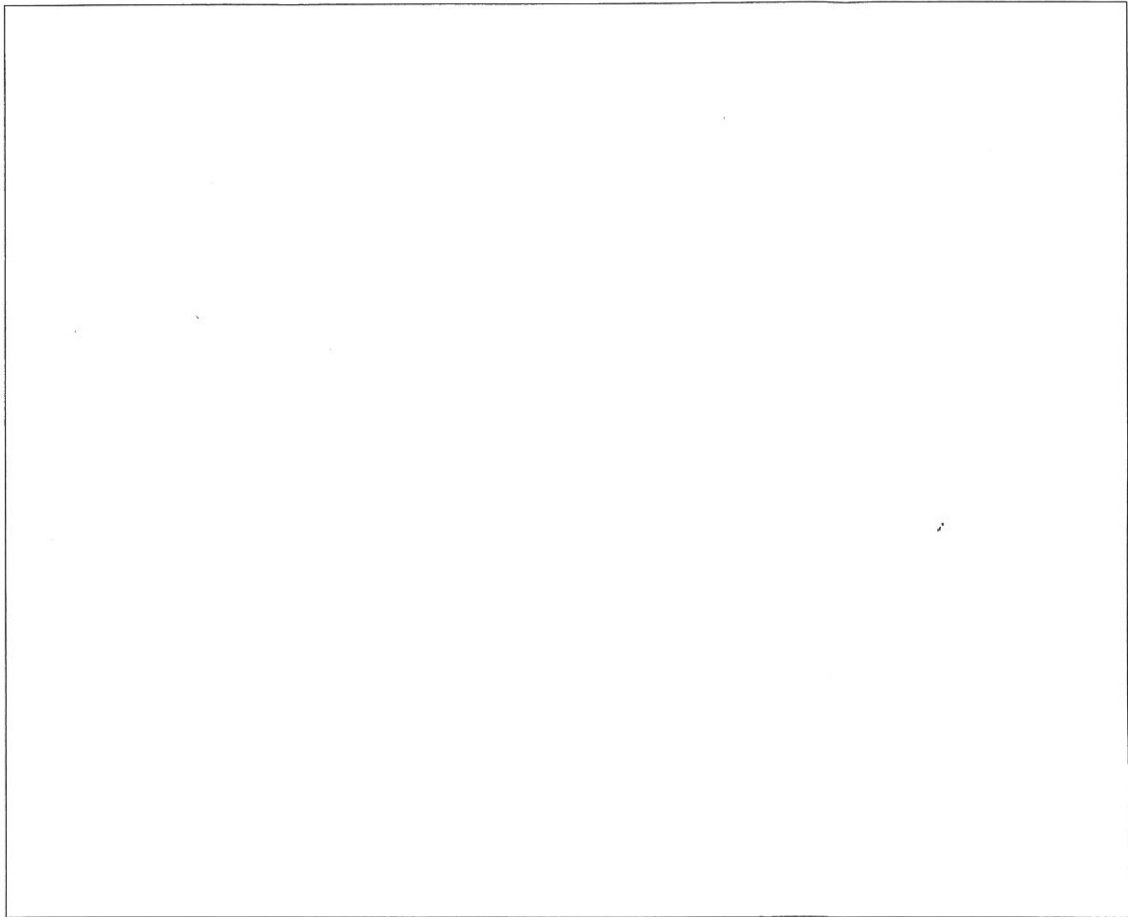
Fukien Secondary School
Cross Curriculum English Science Lesson
Worksheet

Name: _____ Class: _____ () Date: _____ Grade: _____

Title: _____

1. Write down the questions that you want to ask about this video.

2. Write down your ideas and or draw them in the box below.



End