The explicit teaching of a laboratory report in a science lesson

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My school

- It has varied over recent years between using English as MOI and Chinese as MOI. Now, we use English as the MOI in the following:
  - Integrated Humanities & Integrated Science in Forms 1 to 3
  - Electives in Physics, Chemistry, Biology, BAFS, Economics, and Geography for Forms 4 to 6.

My challenge

- The use of English to teach Science.
- My solution was to join the 5-day course organised by PolyU:

  In-service Professional Development Programme: Course for Secondary School Teachers on Teaching Science Education KLA in the English Medium

- There is post-course support provided.

Sample lesson on ‘gases in the air’

Expected outcomes are that students should be able to:

- distinguish between a procedure and an observation
- write the procedure first in the “past tense and active voice”
- rewrite the procedural recount in the “past tense and passive voice”.

Designing the sample lesson

- Teaching material:
  - Choose some suitable steps of the procedure.
  - Design worksheet according to the teaching sequence: from present tense–active voice, to past tense–active voice, and finally to past tense–passive voice.
- Assess students' learning by analysing some other steps of a procedure, eg A test for CO_2.

Activities in the sample lesson

- T wrote one step of the Method on the blackboard.
- T asked a less confident student (in both science and English) to come out and stick a green sticker below the action (expressed through the verb).
- Ss formed pairs and each pair had:
  - one A4 paper
  - two paper strips of the steps of the Method
  - one roll of tape.
- Ss had to tear the paper into parts, and rearrange the sentence.

Strategy

- A green, red and blue analysis of the **scientific knowledge**.
- A Teaching and Learning Cycle in which there are four stages:
  - Setting the Context (SC)
  - Modelling & Deconstruction (MD)
  - Guided Construction (GC)
  - Independent Construction (IC)

Green, Red and Blue analysis using wh-questions

Why? ➔Purpose ➔ Aim ➔ Objective

Who heats the solid? (Doer)

What is heated? (Done to — What is the action done to?)

What do we have to do? What is happening? What happens? (➔Action)

How long is it heated for?

What is it heated with?

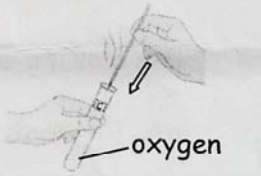
Where should we heat it?

Students' work

To rewrite the procedure by:

- highlighting in green the actions (the verbal group) of the procedure

B: Materials (or apparatus): Your teacher will give you two test tubes of oxygen.

C: Steps		Procedure What action should you do?	observation What can you see?	
5.	a.	Light a wooden splint until it burns		
	b.	and then blow the flame out to get a glowing splint.		
6.	a.	Remove the stopper of test tube.		
	b.	Quickly put the glowing splint into the test tube.		
			What happens to the glowing splint? Answer:	

Rewrite: **C. Procedure: How can we test for oxygen?**

(i) Present tense, active voice → Past tense, active voice

5. (i) We lit a wooden splint until it burned

and then blew the flame out to get a glowing splint.

Students' work

To rewrite the procedure in the "past tense and passive voice" by:

- changing the verbal group, which is in green.
- highlighting in red the "doer" and "done-to" of the actions, which answer the who or what questions
- highlighting in blue the remaining groups of words, which answer the where, when, how, what with questions.

Remove the stopper of test tube.

removed

6. The stopper of test tube was removed.

Quickly put the glowing splint into the test tube.

The glowing splint was quickly put into the test tube.

6. We removed the stopper of test tube.

We quickly put the glowing splint into the test tube.

(ii) Past tense, active voice → Past participle, passive voice

5. (ii) A wooden splint was lit until it burned and then blew the flame out to get a glowing splint.

6. The stopper of test tube was removed.
The glowing splint was quickly put into the test tube.

Procedure: Test for carbon dioxide:

(Hint:

present tense,	past tense,	past participle
pass,	**passed,**	**passed;**
skake,	**shook,**	**shaken)**

1. Pass the gas into lime water.

(i) Pased the gas into lime water.

(ii) Lime water was pased into the gas.

Reflection

- The worksheets contain too many pages.
- The green, red and blue analysis of the scientific knowledge needs to be carried out in stages.
  - identify the actions first
- Teacher should continuously check the students' learning by various means (*Assessment for Learning*).
- Students need time to internalise what they are learning.
- All students, despite their different language abilities, can participate in classroom activities such as these.

Thank you!