

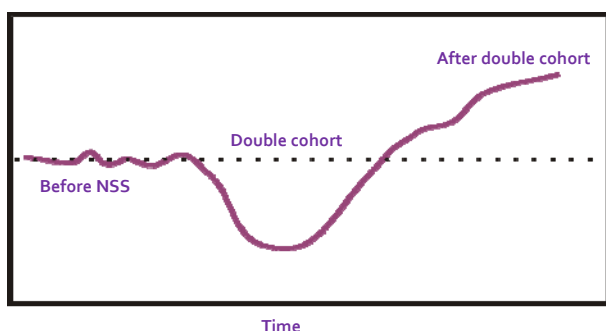
Seminar Series for Middle Managers: NSS Curriculum and Assessment Planning for Chemistry and Combined Science (Chemistry part)

Science Education Section, EDB
18 April 2011 (Monday)

Seminar Series for Middle Managers: NSS Curriculum and Assessment Planning

- This is a continuation of the support for the implementation of the NSS Curriculum after the seminars entitled "Seminar Series for Middle Managers: Catering for Learner Diversity under the New Academic Structure" held between 19 November 2010 and 15 January 2011.
- While the last series focuses on strategies of catering for learner diversity, this series will address key concerns about the 3-year curriculum and assessment planning to optimize lesson time and to adjust teaching to suit students' abilities. Discussion will also be made on the adaptation of assessments in different stages, from S4 to S6, to facilitate students' learning.

Implementation Challenges



Curriculum Planning

See holistic planning slides

Curriculum Planning (P.85, CAG(E))

- design the school-based Chemistry curriculum with reference to the curriculum aims, learning targets and students' abilities so as to bring about pleasurable, meaningful and productive learning experiences;
- facilitate continuity with the junior secondary Science Curriculum through a comprehensive coverage of the learning targets to promote integrative use of skills and a balanced development of learning experiences;
- plan and devise appropriate and purposeful learning and teaching activities to develop students' knowledge and understanding, skills and processes, values and attitudes, problem-solving skills, critical thinking skills, creativity, and strategies for learning to learn;
- make flexible use of lesson time to facilitate learning;
- review and plan the curriculum flexibly and make appropriate re-adjustments when necessary, taking into account the SBA implementation arrangements for the subject as specified in Chapter 5 – Assessment.

Curriculum Planning (P.97, CAG(E))

- It is important to plan for the interface with the junior secondary Science Curriculum and provide a balanced foundation in science education for students.

Relationship between Syllabus for Science (S1-3) and the Chemistry Curriculum (P.89, CAG(E))

Unit	Topic	Chemistry
4.3	Fuels	Fossil fuels and carbon compounds
5.1	Water purification	I Planet earth
5.2	Further treatment of water	
5.5	Dissolving	
5.6	Growing crystals	
6.1	State of matter	II Microscopic world I
6.3	Particle model for the three states of matter	
7.2	Burning	V Fossil fuels and carbon compounds
7.6	Balance of carbon dioxide and oxygen in nature	I Planet earth
10.1	Common acids and alkalis	IV Acids and bases
10.2	Indicators for testing acids and alkalis	III Metals
10.3	Acid and corrosion	III Metals
10.5	Neutralisation	
10.6	Every day uses of acids, alkalis and neutralisation	
13.2	How to obtain metals	
13.3	Properties and uses of metals	III Metals
13.4	Making metals more useful	
14.1	Making plastics from crude oil	V Fossil fuels and carbon compounds
14.2	Environmental problems associated with the disposal of plastics	XI Chemistry of carbon compounds XIV Materials chemistry

Curriculum Planning (P.97, CAG(E))

- Schools have to develop a holistic plan for school-based curriculum development in Science Education to ensure vertical and lateral coherence among different science subjects and with other subjects.
- E.g. 1: Microscopic World II
<> "vector" (Maths)
- E.g. 2: Chemical Reactions and Energy
<> $\Delta H = mc\Delta T$ (Physics)

Suggested Learning and Teaching Sequence (P.90-91, CAG(E))

Year	Sequence I	Sequence II	Sequence III
S4	Planet earth	Planet earth	Planet earth
	⊖	⊖	⊖
	Microscopic world I	Microscopic world I	Microscopic world I
	⊖	⊖	⊖
	Metals	Metals	Microscopic world II
S5	⊖	⊖	⊖
	Acids and bases	Acids and bases	Metals
	⊖	⊖	⊖
	Fossil fuels and carbon compounds	Chemical reactions and energy	Acids and bases
	⊖	⊖	⊖
S5	Microscopic world II	Rate of reaction	Redox reactions, chemical cells and electrolysis
	⊖	⊖	⊖
	Redox reactions, chemical cells and electrolysis	Redox reactions, chemical cells and electrolysis	Fossil fuels and carbon compounds

Curriculum Planning

- Organisation:
 - Simple to complex
 - Concrete to abstract
 - Revisit regularly
 - Teachers need to identify the "building blocks" of learning and systematically make them available to students in manageable chunks that do not exceed their capacities, P.118 CAG(E)

Curriculum Planning

- Resources:
 - Textbooks, workbooks and other resources from publishers
 - Active Reading and Writing Tasks (2008), Investigative Study (2009), Chemistry Specific Genre (2010), EdBlog (2010) from CDI, EDB
 - Exemplars from HKEAA
 - Video clips on practical skills (2011)
 - Chemistry SBA Sharing Platform
 - <http://edblog.hkcity.net/sbachem> (2011)

* 校本評核分類	
1. 實驗有關作業	(6)
1.1 容量分析	(4)
1.2 定性分析	(1)
1.3 實驗	(3)
2. 探究研習	(0)
3. 非實驗有關的作業	(0)

Curriculum Planning

Blog on Chemistry SBA
(<http://edblog.hkcity.net/sbachem>)



Sharing:
One upload for many downloads

Email:
raymond.fong@edb.gov.hk or
sophiaslcheng@edb.gov.hk

Curriculum Planning

Video clips on practical skills (2011)

03 Use of Electronic Balance (with CHI VO and subtitle) (19 Mar 2011).mpg
NSSChemTech 20 觀看 0 訂閱



Assessment Planning

The research by Professor Paul Black and Dylan William on assessment and classroom learning revealed that improving learning through assessment depends on 5 key factors:

1. The provision of feedback to pupils;
2. The active involvement of pupils in their own learning;
3. Adjusting teaching to take account of the results of assessment;
4. A recognition of the profound influence assessment has on the motivation and self-esteem of pupils, both of which are crucial influences on learning;
5. The needs for pupils to be able to assess themselves and understand how to improve.

Assessment Planning 1

- When to assess?
 - S4: Concepts and some basic practical related skills
 - S5: Concepts and practical related skills
 - S6: Concepts and practical related skills (continuation)
- What to assess?
 - Knowledge and Understanding
 - Skills: SBA and sba
- Opportunities for learning practical related concepts and skills are _____

Assessment Planning 2

1. Clear objectives
 - assessment for learning (sba)
 - assessment of learning (SBA)
2. Understand your student
 - NSS students do not have public examination experiences
 - NSS students are "fearless"
 - Less mature when compared with AL students
3. Valid and reliable tools
4. Communicate with students

SBA (& sba) Planning 1

- Understand the requirements
- Pre-SBA:
 - Provide students with suitable number of training sessions to learn before they are being assessed
 - Understand students' competencies
 - Fit assessment tasks neatly into learning and teaching
 - Coordinate the assessments in the Chemistry groups, and with other subjects



SBA (& sba) Planning 2

- SBA:
 - Understand the aims of assessment
 - Assess with worksheets and/or observations?
 - Provide feedbacks
 - Deliberate on the implementation strategies



SBA (& sba) Planning 3

- Post SBA:
 - Review the implementation and work out how to improve
 - Understand the scores
 - School-based moderation
 - Submit the scores



NSS Chemistry Public Assessment

Chemistry					Combined Science (Chemistry Part)		
Papers	Sections	Parts	Topics examined	Questions	Questions	Sections	Papers
Paper 1 (2.5 hours)	Section A (18%)	I	Topics 1-8	24 M.C.	24 M.C.	Section A (12%)	One paper only (100 mins)
		II	Topics 1-12*	32 M.C.			
	Section B (42%)	I	Topics 1-8	structured questions (47 marks) essay (9 marks)	structured questions (47 marks) essay (9 marks)	Section B (28%)	
		II	Topics 1-12*	structured questions (28 marks)			
Paper 2 (1 hour)	20%		Topics 13-15*	structured questions 20 marks per elective (40 marks)			
SBA	20%					10%	SBA
Total	100%					50%	Total

NSS Chemistry School-based Assessment

SBA TASKS				
Weighting	20% of Public Assessment			
Mode	Practical Related			Non-practical Related
Task type	Basic Chemical Analysis	Experiment	Investigative Study	Assignment
Task code	BCA	EXPT	IS	ASSN

Basic Chemical Analysis

Task content (student's work)	<ul style="list-style-type: none"> • Volumetric Analysis • Worksheet 	<ul style="list-style-type: none"> • Detection for cations or anions or both • Worksheet
In-class time	80 mins	20 mins
Out-of-school time	0 mins	0 mins
Means of assessment (teacher's work)	Mark worksheet	Mark worksheet
Percentage in SBA	10%	10%
Authentication	<ul style="list-style-type: none"> • Individual work • Hand in worksheets in class time 	

Experiment

Task content (student's work)	<ul style="list-style-type: none"> • Perform experiments suggested in the C & A Guide (other than VA & QA) • Worksheet / simple report / detailed report on experiments performed; AND/OR Quiz on experimental procedures, data manipulation, results interpretation, safety measures, etc.
In-class time	80 mins
Out-of-school time	0 – 60 mins
Means of assessment (teacher's work)	Mark worksheet / simple report / detailed report / quiz
Percentage in SBA	30%
Authentication	<ul style="list-style-type: none"> • Allow group work but individual students should hand in worksheet / simple report / raw data sheet (if detailed report to be finished at home) in class time AND/OR • quiz

Investigative Study

Task content (student's work)	Design	Process	Report
In-class time	20 hours		
Out-of-school time	2 hours		
Means of assessment (teacher's work)	<ul style="list-style-type: none"> •Mark proposal •Assess lab/process skills •Mark written/oral reports, etc. 		
Percentage in SBA	10%	10%	10%
Authentication	<ul style="list-style-type: none"> •Allow group work & group reporting •Individual students to be questioned by teacher in class time 		

Assignment

Task content (student's work)	Examples: <ul style="list-style-type: none"> • Design a poster • Develop a multimedia artefact • Write a report after visiting industrial plant • Read materials and write a review
In-class time	1 hour
Out-of-school time	3 hours
Means of assessment (teacher's work)	Mark assignments
Percentage in SBA	20%
Authentication	<ul style="list-style-type: none"> • Individual work • Preparation performed at home • Main part to be finished in class time • May ask students some related questions or even require them to make very short presentation, if needed

Implementation Schedule

Cohort	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015
1		BCA EXPT	EXPT			
2			BCA EXPT	EXPT		
3				BCA EXPT / IS	EXPT NRPT	
4					BCA EXPT / IS	EXPT NRPT



Further information: science@edb.gov.hk

■ <http://334.edb.hkedcity.net/EN/110409.php>



典範重現

我希望引用自己剛出道教書的一個經歷，去剖析本地課程發展的成功模式。筆者當年主教授學，剛巧高級程度化學實驗考試，剛到香港大學的實驗室，進行定章及定性分析兩類實驗考試，改為校本考核和教師評審，學校可安排多元化的實驗以配合預科化學科課程，而教師評審學生表現的結果會交由中央進行統計上的調整，以確保學生成績不會因學校評分鬆緊而引起不公平。這進改革的大方向雖然正確，但老師卻有不少疑慮，包括由兩類變成多元化實驗所產生的工作量、儀器和老師對評審學生表現欠缺經驗等。那末改革從何開始？當時一群充滿理想的學者、教師和官員聯合起來，啟動了化學實驗和評估的改革，並借助改革促進了教師的專業發展。當時港大化學系和教育學院的講師，在輔導學系處、考試局和數理教育學會的協助下，率先舉辦了有關的教師培訓課程，政府則按區域組織教師網絡，讓教師交流心得、推廣成功經驗、互相觀摩、收集有關的實驗並結集出版。這個群策群力的過程，不但減輕了教師的心理和工作負擔，更匯聚了大學的知識和教師的專業力量。這個結合課程和考試改革，促進教師專業網絡和發展的典範，是否可在教育界重現？



教室內外
戴希立

Thank you!