



บันทึกข้อความ

ส่วนราชการ โรงเรียนถนนหักพิทยาคม

ที่ วันที่ พฤษภาคม 2556

เรื่อง รายงานการเข้าร่วมโครงการส่งเสริมการจัดการเรียนรู้วิทยาศาสตร์ คณิตศาสตร์
เป็นภาษาอังกฤษ
เรียน ผู้อำนวยการโรงเรียนถนนหักพิทยาคม

ด้วยข้าพเจ้านางสาวกมลรัตน์ ฉิมพาลี ตำแหน่ง ครู คศ.1 ตำแหน่งเลขที่ 1446(ส) สถานศึกษา โรงเรียนถนนหักพิทยาคม สังกัด สำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน ได้รับอนุญาตให้ศึกษาต่อระดับปริญญาเอก สาขาหลักสูตรและการสอน ตามคำสั่งที่ 82/2554 ตามที่ สสวท. ได้ทำหนังสือเชิญเพื่อขออนุญาตให้ข้าพเจ้าเข้ารับการอบรมครูแกนนำจัดการเรียนรู้ วิทยาศาสตร์ คณิตศาสตร์ เป็นภาษาอังกฤษ ณ โรงแรมแอมบาสซาเดอร์ สุขุมวิท ๑๑ กรุงเทพฯ ระหว่างเดือน มีนาคม – พฤษภาคม 2556 จำนวน 4 ครั้ง ครั้งละ 2 วัน ในวันหยุดเสาร์-อาทิตย์ (ข้าพเจ้าไม่สามารถเข้าร่วมกิจกรรมได้ 1 ครั้ง เนื่องจากไปเดินทางไปต่างประเทศ) เพื่อรวบรวม องค์ความรู้และนำไปกำหนดแนวทางการสนับสนุนการจัดการศึกษาวิทยาศาสตร์ คณิตศาสตร์ เป็นภาษาอังกฤษ สรรหาและพัฒนาครูแกนนำที่มีความรู้ความชำนาญในการจัดการเรียนรู้ วิทยาศาสตร์ คณิตศาสตร์ เป็นภาษาอังกฤษ สามารถให้ข้อคิดเห็นในกระบวนการพัฒนาสื่อประกอบ หลักสูตร และมีศักยภาพเป็นครูแกนนำในการพัฒนาขยายผลได้ เมื่อเสร็จสิ้นภารกิจดังกล่าว จึงจัดทำรายงานเรื่อง "Train the Teacher" Teaching Science in English ตามที่แนบพร้อมหนังสือนี้

จึงเรียนมาเพื่อโปรดทราบและพิจารณา

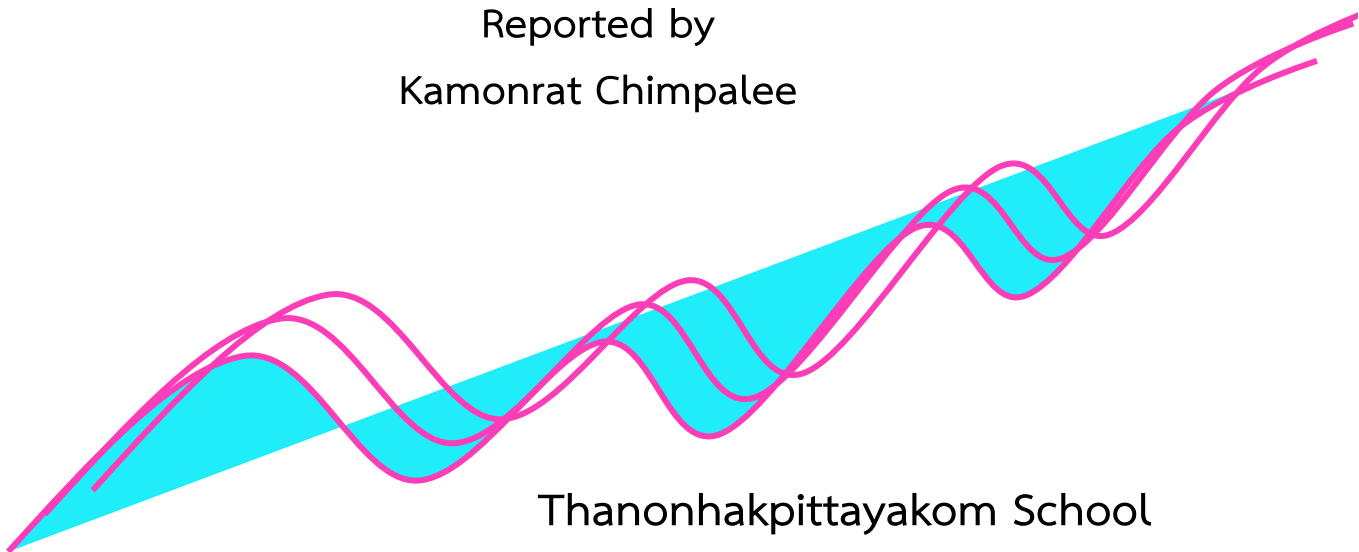
(นางสาวกมลรัตน์ ฉิมพาลี)

ตำแหน่ง ครู คศ. 1 โรงเรียนถนนหักพิทยาคม

“Train the Teachers” Teaching Science in English
Workshop series sponsored by the IPST



Reported by
Kamonrat Chimpalee



Thanonhakupittayakom School
The Secondary Educational Service Area Office 32
Office of the Ministry of Education

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“Train the Teachers” Teaching Science in English
Workshop series sponsored by the IPST
(Institute for the Promotion of
Teaching Science and Technology)

9-10 March 2013, At Ambassador Bangkok



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Thanonhakupittayakom School
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**“Train the Teachers” workshop series sponsored by the IPST
(Institute for the Promotion of Teaching Science and Technology)**

9-10 March 2013, At Ambassador Bangkok

Science High School

Expert



Teacher David Byrum began teaching in 1972, He have experience Teaching in Chemistry, Physic, Earth Science Mathematic and programmer in high school and University of Education and Science faculty. Now a day, He is head staff of Science Department and Science Teacher at Ruamrudee International School Thailand.

Reported by



I'm Kamonrat Chimpalee, Biology Teacher at High School, I have been teaching since 2009. Now, I'm Ph.D. Candidate in Curriculum and Instruction at Mahasarakham University.

Before join in Workshop series Teacher David send email for us about record our classroom and school for sharing with all participant.

“Training for Trainer: Teaching Science in English Language”
Saturday 9, March at Peony Room
Activity 1 : Demonstrate Science Inquiry 1

1. After Teacher David greet and told his profile, we got Outline for today acitivity.
We were doing activity with partner.

This Outline :

Workshop #1

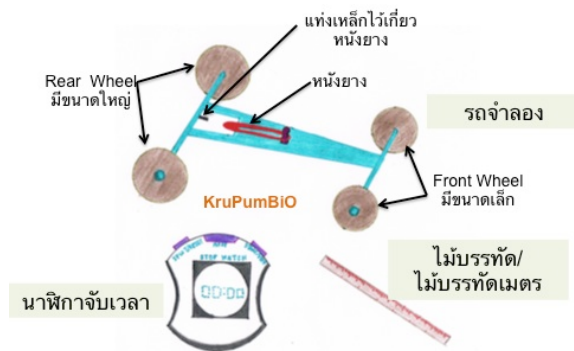
Workshop Objectives

- 1-1 Introduction** of workshop leader and overall plan for the eight workshops
- 1-2 Compare and Contrast** the benefits and rational for using Two inquiry activities to introduce students to a science class.
- 1-3 Introduction** of participants and individual goal setting for these workshops.

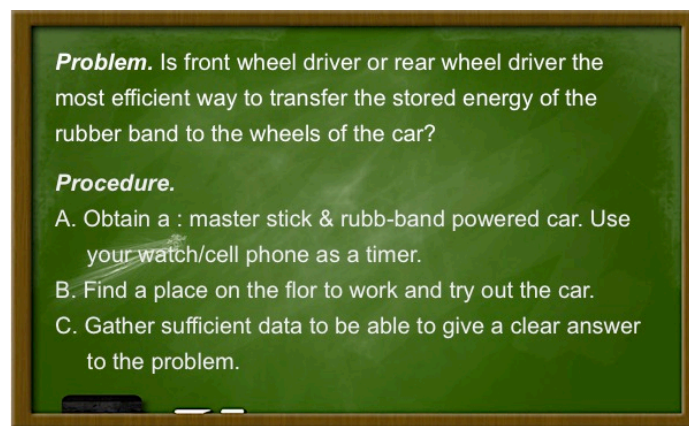
Workshop Agenda

1. Introduction of instructor including background, teaching experience, and expectation for this workshop series.
2. Activity: Front wheel drive vs. Rear wheel drive-which is most efficient?
3. Discussion of the results of the activity.
4. Activity: Penny Lab-Can you explain the data?
5. Discussion of the results of the activity.
6. Comparing these two activities with an emphasis on what pitfalls an ELL might have, the teachers' role, and how to teach these activities.
7. Lunch with time for informal discussion about the morning's activities.
8. Introductions: Individual participants show their video of their classroom and describe what their goals are for their students and for themselves, and what they need to achieve these goal.
9. Participants learn how to access, setup and use the workshop Edmodo website.
10. Participants start their personal journal.

1. Material



2. Problem

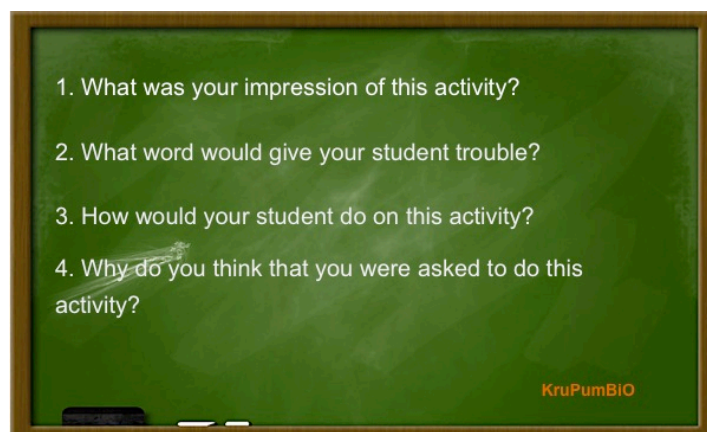


3. Every group (2 people) design experiment and record data on newsprint paper.

Explain answer from you data.

4. Every group learns from others group for sharing knowledge.

3. Everyone answer 4 questions.



Item 2 : Everyone share on newsprint paper in front of class.

My Answer.

1. I'm very enjoy when I do activity. I want to find method, data for the problem, not fear about right or wrong answer. I plan to experiment with friend and think about how to explain by data.

My Answer.

2. Speed/Factor of distance

My Answer.

3. I'll show a map of town for them, choose start point and end point. Let them think "how to go place by Model car" condition: distance about 1.5 m., car must to stop when arrived end point.

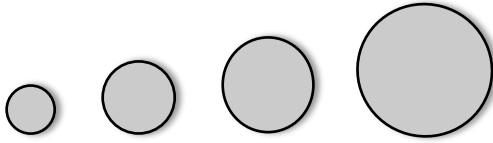
My Answer.

4. This activity based on curiosity, begin with question, set of situation and equipment. Thinking plan to experiment, find data to support your answer. This activity let me think about inquiry.

Activity 2 : Demonstrate Science Inquiry 2

1. Material

1. Different years of Penny
2. Digital scale



2. Problem

Problem. Does the weight (in grams) of a penny depend upon the year in which it was minted? If there are any relationships between weight and year of minting, what are they and how do they change?

Procedure.

- Every group of you will weigh FIVE different pennies . Record each pennies WEIGHT as accurately as possible and YEAR of minting
- All the data from the class needs to be pooled, and each group will analyze the collected information.
- Each group will illustrate the collected data by making a **hand drawn graph** of the data.

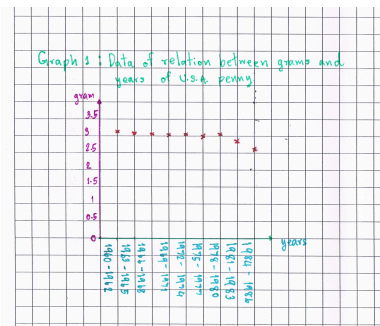
KruPumBIO

Example : recording data

year	g	year	g
1910	3.30	1917	
1911	3.40	1918	
1912	3.01	1919	
1919	3.22, 3.03, 3.11	1920	
1920	3.10	1921	
1921	3.15	1922	
1922	3.02, 3.15	1923	2.50
1923	3.12, 3.07	1924	
1924	3.12, 3.07, 3.18, 3.30, 3.14	1925	
1925	3.04, 3.08, 3.13	1926	
1926	3.00, 3.18, 3.15, 3.05, 3.11	1927	
1927	3.12, 3.10, 3.09, 3.06, 3.11	1928	2.50
1928	3.14, 3.12	1929	
1929	3.10, 3.02, 3.06, 3.08, 3.11	1930	
1930	3.07, 3.14, 3.12, 3.09	1931	
1931	3.08, 3.04, 3.05, 3.14, 3.11	1932	
1932	3.00	1933	
1933	2.53, 2.67, 2.52	1934	
1934	2.53, 2.67, 2.57, 2.55	1935	
1935	2.56, 2.44, 2.48, 2.50	1936	
1936		1937	

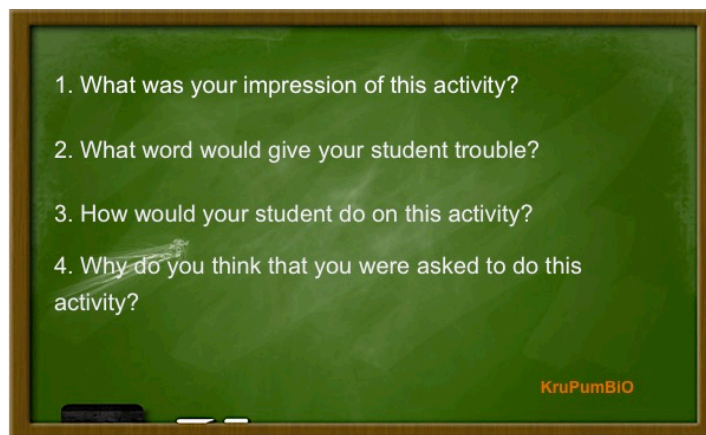
2. Present data by hand writing graph : drawing graph upon your design. You must learn how to organize data.

Example of drawing graph



3 years of record the different
0.5 weights

3. Answer 4 Questions.



My Answer.

1. This activity based on collect data, analyze data, try to explain and find relationship between data. It's motivating us to think about way to present data.

My Answer.

2. relation/explanation/prediction/Trend to

My Answer.

3.

- ✚ Give situation "Year and weight have relation of penny"
- ✚ Give different penny and digital scale

My Answer.

4. It's very important when we must to present data and explain data. In science always present data in graph, concept mapping, diagram.

Principle of Activity

IPST: Sec. Sci. Workshop #1

Inquiry Activity #2 - Follow up

Principle 1: Give ELLs Many Opportunities to Read, to Write, to Listen to, and to Discuss Oral and Written English Texts Expressed in a Variety of Ways

Principle 2: Draw Attention to Patterns of English Language Structure

Principle 3: Give ELLs Classroom Time to Use their English Productively

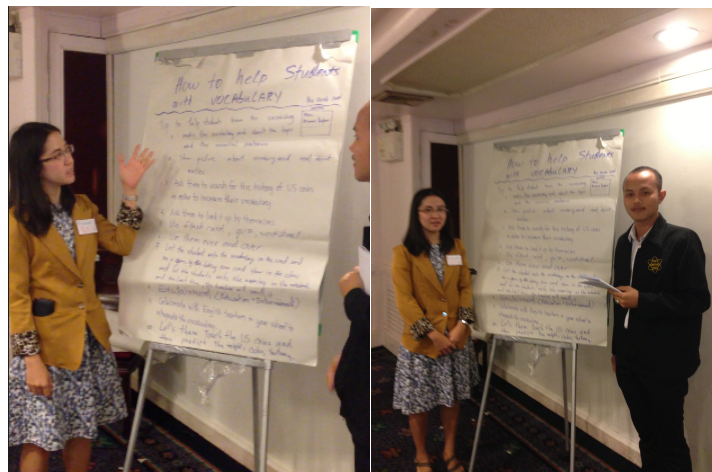
Principle 4: Give ELLs Opportunities to Notice their Errors and to Correct their English

Principle 5: Construct Activities that Maximize Opportunities for ELLs to Interact With Others in English

Teaching Science to English Language Learners
Nutta, Bautista, Butler (c) 2010 - Routledge (UK)

Brain storming

“How to help student with Vocabulary”

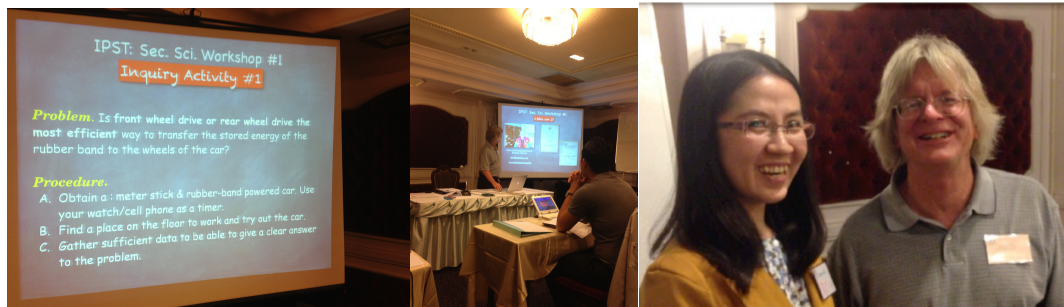


Teacher David introduce : Edmodo => <http://www.edmodo.com/home#/> which create group for communicating between us.

Poll maker at => <http://www.polleverywhere.com>

*****Finish this day by Watch our Video*****

Picture



Sunday 10 March at Peony Room

Activity 3 : Demonstrate Science Inquiry 3

Outline:

Workshop #2

Workshop Objectives

- 2-1 Discuss** the differences between Curriculum Goals and Instructional Objectives and **Demonstrate** their ability to organize a body of curriculum into short instructional units with the appropriate instructional objectives.
- 2-2 Describe** how to teach a set of objectives in multiple ways.

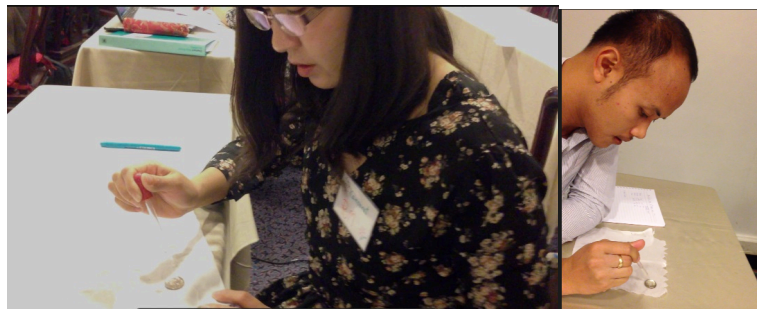
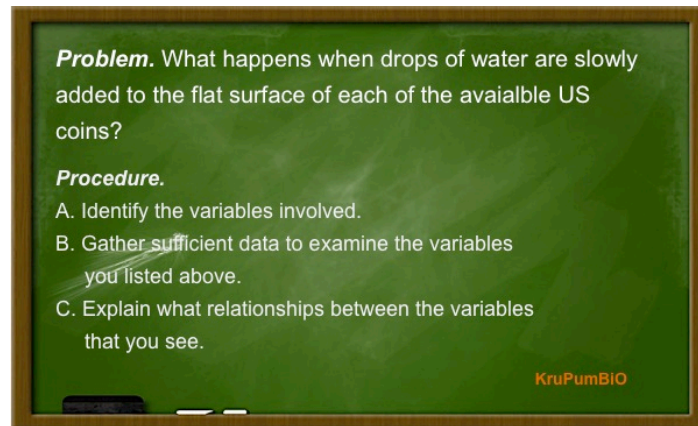
Workshop Agenda

1. Activity: Deciding what should be taught in one semester.
2. Activity: Deciding how the semester's work should be broken up into 6-10 day segments.
3. Discussion about how these two activities impact ELL.
4. Activity: Use Thai National Science curriculum and decide what should be taught in one semester.
5. Discussion about strategies that can be used to help ELL with their learning.
6. Lunch with time for informal discussions about the morning's activities.
7. Activity: Search for learning activities that will help ELL master the curriculum in several of the 6-10 day segments.
8. Discussion about how different learning activities impact ELL.
9. Participants work on their personal journal.

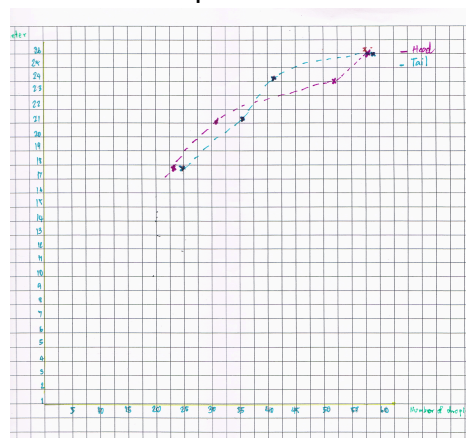
1. Material

1. Different diameter of 4 Penny (26.3 mm, 24.1 mm, 21.0 mm และ 17.8 mm)
2. Dropper 3. glass of water 4. tissue paper

2. Problem



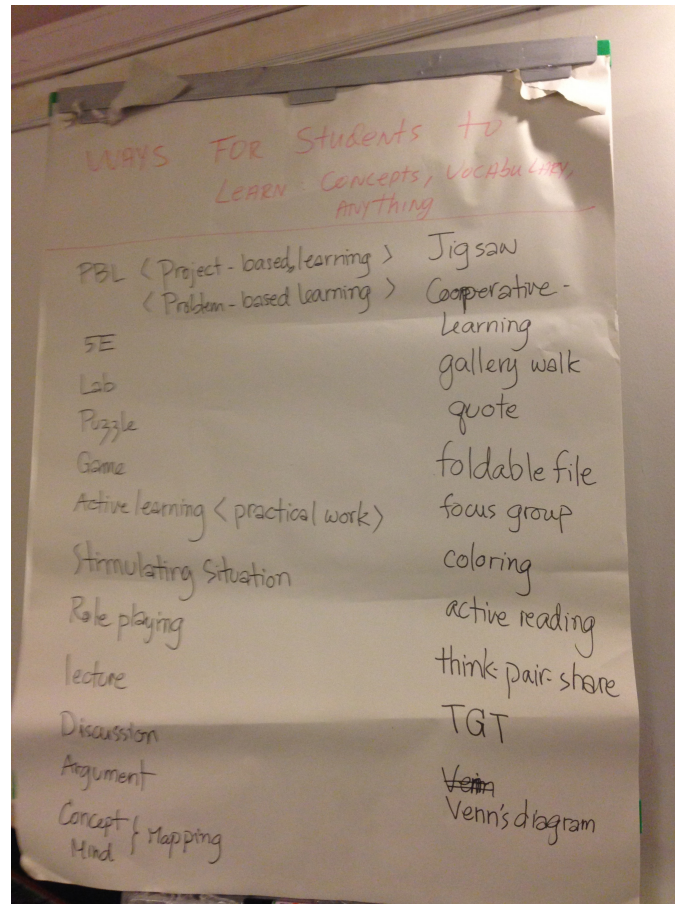
Report data



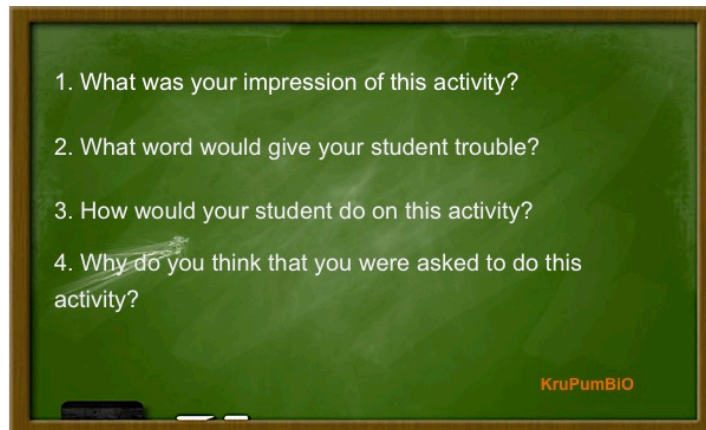
This activity try to explain your data/evident.

Brain storming

“Way for students to Learn concept, vocabulary anything”



3. Answer 4 questions.

**My Answer.**

1. This activity must to be carefully because the experiment contains validity and reliability.

My Answer.

2. variable/tension

My Answer.

3.

- ✚ Give Problem “what are factor of dropping on surface of penny”

My Answer.

4. This activity can teach basic skill of scientist. Design experimental, control extraneous variable and interpret data and make conclusion.

Activity 4 : Analyze aim of curriculum and design learning activities

1. Material

1. Course Outline 2. Unit plan 3. lesson plan 4. Paper of Teacher English Language

1. Corse Outline

CHEMISTRY: Course Outline and Due Dates

1st & 2nd Semester

UNIT #	DESCRIPTION	DUE DATE
1.	What is Chemistry	Aug. 27th (9 days)
2.	Metric System and Matter	Sept. 10th (8 days)
3.	Elements and Compounds	Sept. 24th (10 days)
4.	Formation of Compounds	Sept. 23rd (9 days)
5.	REVIEW of Units 1 - 4	Sept. 27th (2 days)
6.	Chemical Reactions	Oct. 7th (8 days)
7.	The Mole	Oct. 14th (5 days)
<u>End of 1st Quarter : Oct. 15th</u>		
8.	Stoichiometry	Oct. 29th (9 days)
9.	Energy in Reactions	Nov. 8th (6 days)
10.	REVIEW of Units 6 - 9	Nov. 10th (2 days)
11.	Atoms	Nov. 18th (5 days)
12.	Electronic Structure	Dec. 1st (7 days)
13.	Periodic Law	Dec. 10th (7 days)
14.	REVIEW of Units 1 - 13	Dec. 17th (3 days)
<u>End of First Semester : Dec. 17th</u>		
15.	Chemical Bonds	Jan. 10th (6 days)
16.	Molecules in Motion	Jan. 14th (4 days)
17.	Gases	Jan. 28th (8 days)
18.	Pollution	Feb. 8th (7 days)
19.	Solutions	Feb. 21st (7 days)
20.	REVIEW of Units 15 - 19	Feb. 23rd (2 days)
21.	Acids and Bases	Mar. 9th (8 days)
<u>End of 3rd Quarter : Mar. 11th</u>		
22.	Why Reactions Occur	Mar. 25th (9 days)
23.	Equilibrium	Apr. 12th (6 days)
24.	Oxidation-Reduction Reactions	Apr. 22nd (8 days)
25.	REVIEW of Units 21 - 24	Apr. 26th (2 days)
26.	Electrochemistry	May 5th (6 days)
27.	Organic Chemistry	May 13th (6 days)
28.	Semester Review of Units 15 - 27	May 18th (3 days)
<u>End of Second Semester : May 19th</u>		

OPTIONAL UNITS

Four (4) Optional Units are required to earn the grade of "A" for each semester. You may choose your optional units from those listed below. Substitutions are always possible, so if you don't see something of interest, please suggest your own idea for an optional unit to your instructor.

Elementary School Demonstrations	Read & Analyze any (5) science related articles	Glassworking Unit
Write 5 Aunt Gladys Letters	Watch and Analyze any (5) science related T.V. shows	Independent Study
Three (3) CHEM LAB computer exps.	Final Exam Score above 80% = 1 grade, above 90% = 2 grades	
	Any five (5) Crime and Punishment mysteries correctly solved.	

Any three (3) units completed on or before their due dates.

2.

* Important
*

Stoichiometry
IB Chemistry (HL & SL)
Ruamrudee International School

5

Leading Question: How do chemists accurately predict mass-mol relationships between reactants and products?

Topic Titles	Standard(s)	Benchmark(s)
1. Mass/mole relationships in chemical reactions	1	1.1 - 1.3; 1.5-1.7
2. Limiting reagent and reagent in excess	9	9.1
3. Experimental vs theoretical yields		Understands the complete mole concept and ways in which it can be used (e.g., actual mass vs. relative mass; relationship between the mole, mass, concentration of a solution, and quantities of products and reactants in chemical reaction).
4. Titrations		

Instructional Objectives

- 5-1 Identify the mol ratios of any two species in balanced chemical equation
- 5-2 Given a chemical equation and number of grams or mols of one species in the reaction, Calculate the number of grams or mols of another species
- 5-3 Given a chemical equation and the initial amounts of two or more reactants, (a) Identify the limiting reagent, (b) Calculate the theoretical yield of a product, and (c) calculate the amount of the reactant in excess remaining after the reaction is complete
- 5-4 Given the amount of one species participating in a chemical reaction occurring in solution, Calculate the amount of another species, where the amount of species is given either in (a) grams or (b) the concentration and the volume of a solution

Chapter 9 – All Chapter 14 – 14.6-14.7

For this unit the test questions will be based on the questions similar to the following found at the end of Chapter 9 and 14.

General Stoichiometry: p267-271: 3, 4, 30, 32, 34, 36, 38, 40

Stoichiometry of Solution Reactions: p449: 64, 66, 68

Limiting Reactant: p271-272: 52, 54, 56, 58

Titrations (Neutralization Reactions): p449: 70, 72, 74

Percent Yield: p273: 64, 66

General Questions: p 273-275: 68, 70, 72, 84, 86, 90, 92

Instructional Activities

Text Reference: Chapters 9 & 14

To receive full credit for your assignments, please have all assignments checked and initialed as you complete them.

- | | |
|---------------------------|---|
| 1. SQ3R for Understanding | 8. Limiting Reagents-1 |
| 2. Activity: Mole Review | 9. Lab: Quantitative Precipitation of Ba ₃ (PO ₄) ₂ |
| 3. Mole Review Problems | 10. Limiting Reagents-2 |
| 4. Lec: Stoichiometry | 11. Limiting Reagents-3 |
| 5. Stoichiometry-1 | 12. Molarity Review-1 |
| 6. Stoichiometry-2 | |
| 7. Lec: Limiting Reagents | |

→ Concept Map *is important to know CM*

→ Unit Review → *Poll help to decide what activity* Concept Map video

Unit Test _____

Test Date _____

Vocabulary – Unit 5

- **End point** – an experimentally determined point in a titration when it is estimated that enough of one reactant has been added to react with a second reactant
- **Equivalence point** – the point in a titration at which one reactant has been exactly consumed by the addition of a second reactant
- **Limiting reactant** – in a chemical reaction, the reactant that is completely consumed, and thus determines the maximum amount of product formed.
- **Molarity (M)** – the number of moles of solute per litre of solution
- **Percent yield** – the ratio of actual yield to theoretical yield multiplied by 100.
- **Titration** – a procedure for the quantitative analysis of a substance by means of a reaction in solution with a reagent of known concentration.

3. Lesson Plan



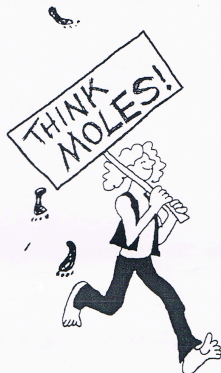
Stoichiometry

A Chemistry unit at Flowing Wells High School

8

INTRODUCTION

By now you have learned the secrets of formula writing, equation balancing and writing complete chemical equations according to their "reaction type", and much more. The final question to be asked is, how much of the reactants will you need and how much of the product will you make? AH! That is THE question!! Knowing how to do these other skills (formula writing, etc.) is very important, but when you ask and find the answer to the question, HOW MUCH?, then you are really becoming a chemist!



INSTRUCTIONAL OBJECTIVES

When you complete the activities in this unit, you should with 90% accuracy be able to:

- 8-1 **APPLY-the-RULES** for solving stoichiometric mass-mass problems to determine the moles and/or grams of reactants used and the moles and/or grams of products produced for each reaction given to you.
- 8-2 **DEMONSTRATE** your ability to write, balance and predict *HOW MUCH* product will be produced by:
- Using your knowledge of *reaction types* to correctly write and then balance the equation for a given chemical reaction.
 - Calculating the *moles and grams* of product expected.
 - Devising an *experimental procedure* to recover the expected product and calculating your percent error.

LEARNING ACTIVITIES / Unit 8

How to make your life as a student easier.

In General

Read the unit objectives.

Compare the objectives to the activities you're going to do.

Read the chapter title, the **bold** print and the section headings.

Doing the Activities

Read and understand how to do the activity before you try to do it.

Find the objectives that the activity is teaching.

Identify and learn the vocabulary for the activity.

Tips

Work with your group.

Don't PROCRASTINATE!

Use all of the available resources.

When all else fails, read the book!

Have fun and enjoy learning!

To REVIEW what you need to know about formula and equation writing:

- ☞ COMPLETE the worksheet: "*Formula and Equation Review for Unit 8*"

To Learn about: Objective 1-1

- ☞ DO **one (1)** of the following:

- a) READ the Instructor's Notes: "*Stoichiometry*"
- b) READ pages 169 - 177 in your text.
- c) LISTEN to the A-T Lesson: "*Chemical Equations - Meaning and Use*"

To learn about: Objective 8-2

- ☞ READ and COMPLETE the worksheet: "*Solving Mole Problems*"

- ☞ DO any **two (2)** of the following:

- a) Worksheet: "*Stoichiometry I*"
- b) Worksheet: "*Stoichiometry II*"
- c) Worksheet: "*Stoichiometry III*"
- d) Computer Lesson: *STOICHIOMETRY*
- e) A-T Lesson: "*Chemical Equations - Learning by Practice*"

- ☞ DO the Exp.: "*Quantitative Precipitation of Barium Phosphate*"

To MAKE SURE that you UNDERSTAND the OBJECTIVES for this unit:

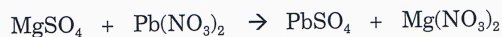
- ☞ ASK your instructor QUESTIONS
- ☞ Take the Unit's SELF-TEST

SELF-TEST / Unit 8

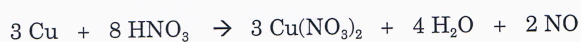
If you can answer these questions without having to look at your assignments or your book, than you probably understand the objectives well enough to take the quiz for this unit.

For Objective 8-1

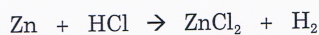
- 1 According to this equation, 3.0 moles of MgSO_4 will produce how many moles of PbSO_4 ?



- 2 Calculate how many moles of NO is formed when 0.025 moles of HNO_3 reacts as follows:



3. Calculate the weight of hydrogen formed by the reaction of 25 g of zinc with HCl (according to the following unbalanced equation).

*For Objective 8-2*

4. When 20 g of Chile saltpeter (NaNO_3), reacts with potassium chloride, what weight of potassium nitrate could be formed (along with one other product)?
5. How much sulfur, in grams, will be required to react with 28 g of iron (producing only one product)?

4. Teacher English Language

Pongji

Teacher English Language Proficiency & Inquiry Matrix

English language abilities of the teachers coupled with an inquiry pedagogical approach will bring about the greatest change in the science and math classrooms.

All Thai English Language Use by the classroom teacher	Inquiry Approach in the Classroom			
	Lecture driven			Inquiry based
<p><i>Language:</i> all Thai <i>Teacher:</i> all lecture <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> all Thai <i>Teacher:</i> mostly lectures with teacher demonstrations <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> all Thai <i>Teacher:</i> provides question and procedure for hands-on investigation to confirm known outcomes, constructs some personal meaning</p>	<p><i>Language:</i> all Thai <i>Teacher:</i> guides student research <i>Student:</i> poses question, conducts research and creates their own meaning</p>	
<p><i>Language:</i> mostly Thai <i>Teacher:</i> all lecture <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> mostly Thai <i>Teacher:</i> mostly lectures with teacher demonstrations <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> mostly Thai <i>Teacher:</i> provides question and procedure for hands-on investigation to confirm known outcomes, constructs some personal meaning</p>	<p><i>Language:</i> mostly Thai <i>Teacher:</i> guides student research <i>Student:</i> poses question, conducts research and creates their own meaning</p>	
<p><i>Language:</i> mostly English <i>Teacher:</i> all lecture <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> mostly English <i>Teacher:</i> mostly lectures with teacher demonstrations <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> mostly English <i>Teacher:</i> provides question and procedure for hands-on investigation to confirm known outcomes, constructs some personal meaning</p>	<p><i>Language:</i> mostly English <i>Teacher:</i> guides student research <i>Student:</i> poses question, conducts research and creates their own meaning</p>	
<p><i>Language:</i> all English <i>Teacher:</i> all lecture <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> all English <i>Teacher:</i> mostly lectures with teacher demonstrations <i>Student:</i> receives teacher information passively, memorizes and recites</p>	<p><i>Language:</i> all English <i>Teacher:</i> provides question and procedure for hands-on investigation to confirm known outcomes, constructs some personal meaning</p>	<p><i>Language:</i> all English <i>Teacher:</i> guides student research <i>Student:</i> poses question, conducts research and creates their own meaning</p>	

BIOLOGY Grade 12 : Course Outline and Due Dates
1st and 2nd Semester

Unit	Description	Due Date		
1	Heredity of Human (Sc 1.2 and Sc 8.1)			10 hours
2	Mendel's Model (Sc 1.2 and Sc 8.1)			10 hours
3	Crossing principles (Sc 1.2 and Sc 8.1)			12 hours
4	Many human traits (Sc 1.2 and Sc 8.1)			12 hours
5	Chromosomal Basics of Inheritance (Sc 1.2 and Sc 8.1)			12 hours
6	Review of Units 1-5			2 hours
7	Testing			2 hours
End of 1st Quarter : Oct.				

Unit	Description	Due Date		
8	Molecular genetics (Sc 1.2 and Sc 8.1)			9 hours
9	Protein synthesis (Sc 1.2 and Sc 8.1)			9 hours
10	Mutant (Sc 1.2 and Sc 8.1)			3 hours
11	Application of Biotechnology (Sc 1.2 and Sc 8.1)			6 hours
12	Review of Units 8-11			2 hours
13	Theories Evolution			6 hours
14	Evidences of evolution			9 hours
15	The process of evolution			6 hours
16	The evolution of human			6 hours
17	Review of Units 13-16			2 hours
18	Test			2 hours
End of 1st Quarter : Oct.				

Unit	Description	Due Date		
19	Ecology and Environmental Issue (Sc 2.1 and Sc 8.1)			12 hours
20	Global Climate (Sc 2.1 and Sc 8.1)			12 hours
21	Biomes (Sc 2.1 and Sc 8.1)			9 hours
22	Ecological succession (Sc 2.1 Sc 5.1 and Sc 8.1)			9 hours
23	Ecosystems (Sc 2.1 and Sc 8.1)			9 hours
24	The Cycling of matter through ecosystems (Sc 2.1 Sc 5.1 and Sc 8.1)			5 hours
25	Review of Units 19-24			2 hours
26	Testing			2 hours
End of 3rd Quarter: Mar.				

27	Introduction Population (Sc 1.2 and Sc 8.1)			10 hours
28	Human population (Sc 2.1 and Sc 8.1)			6 hours
29	Community (Sc 2.1 and Sc 8.1)			15 hours
30	Energy Transfer (Sc 2.1 Sc 5.1 and Sc 8.1)			8 hours
31	Conversation of Ecology			12 hours
32	Conversation of population			6 hours
33	Review of Units 19-22			2 hours
34	Testing			2 hours
End of second Semester: May				

Global Climate: Thanonhakkpittayakom School

Leading Question: What is the evidence of Global Warming?

Topic Title	Strand	Core content
1. Climate Change	2	2.2
2. The Greenhouse Effect	8	8/3 Search and collect data, taking into consideration important factors or variables, including factors that may affect other factors that are uncontrollable, and the number of repeats in an investigation, to ensure reliable and sufficient data.
3. Human actions and Climate Change		
4. Global Warming		

Instructional Objectives

20-1 Identify evidence of Climate Change

20-2 Explanation effect of climate Change

20-3 Communication: They can communicate with their friend, family how to prevent Global warming.

20-4 Application: They can understand and interpret news or information about Climate change and Global warming.

Worksheet

1-Monthly Tropopause Temperature 3 – Black bag

2- Changes in Sea 4 – Human Actions

Instructional Activities	
1. Key Question	7. Global Climate 1
2. Activity: Management data	8. Global Climate 2
3. Gallery walk	9. The atmospheric heat budget
4. Argumentation	10. Greenhouse Gases
5. Lec : Video : Global Climate	11. Pollutants
6. Simulation: Global Warming	12. How to prevent Global warming

Concept Map

Unit Review

Unit Test _____

Test Date

Vocabulary- Unit 20

- ✚ **Climate** - the long-term weather conditions for a region, generally determined by 30 or more years of records.
- ✚ **Global warming** an increase of Earth’s average temperature which could lead to climate change. Scientists are concerned that human activities are altering the concentration of greenhouse gases and might cause such global warming. See definition of greenhouse effect.

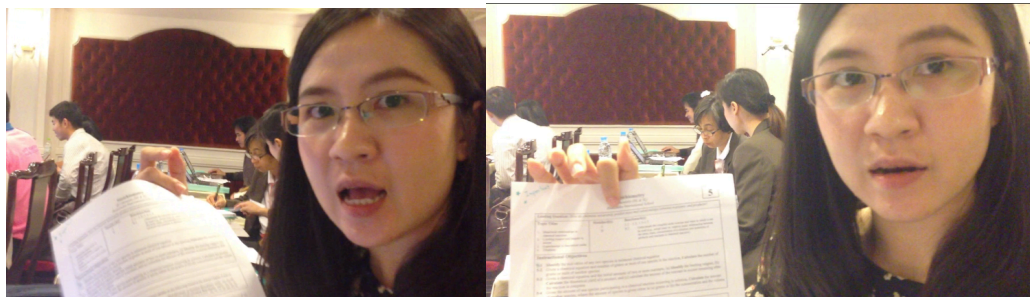
Reflective Journal of Teaching Science to English Language

Kru PUM

I'm (KruPum) a Biology teacher at Thanonhakkpittayakom, Thanonhak Sub-district, Nangrong District, Buriram Province. I was really nervous about my English. I decided writing mail to David, He's very kindness teacher who cheer up me to confident to learn. In 1st workshop, I study how to engage student in inquiry way. The activities change role of teacher who not talk and chalk but teacher must to design how to learn by inquiry. David teaches me to know principle of Teaching Science in English Language; I must to give their student opportunity to use English. I imagine about my classroom, begin with powerful activity, learn vocabulary, let student use English. How to help student to do that? They should study partner or group. A Study partner can share and help each other in hard time; sometimes one can't communicate in English or ones can't understand science, partner can help you. I very impressed with workshop reasons by:

1. I have opportunity to use English with teacher David and all participants
2. I love to learn how to design Science activities; Teacher can demonstrate good activities in inquiry, Science clip and any media.
3. I believe Teacher David can develop my skill.
4. I learn how to improve my English: Just speak, write and listen more and more.

Picture



“Train the Teachers” Teaching Science in English
workshop series sponsored
by the IPST (Institute for the Promotion of
Teaching Science and Technology)

27-28 March 2013, At Ambassador Bangkok



Reported by
Kamonrat Chimpalee

Thanonhakupittayakom School
The Secondary Educational Service Area Office 32
Office of the Ministry of Education

“Training for Trainer: Teaching Science in English Language”
Saturday 23, March at Peony Room
Activity 1 : Demonstrate Science Inquiry 1

This Outline :

Workshop #1

Workshop Objectives

3-1 Discuss the differences between Curriculum Goals and Instructional Objectives and Demonstrate the ability to organize a body of curriculum into short instructional units with the appropriate instructional objectives.

3-2 List 5 research based methods for helping ELL be more successful and Discuss the strengths and weaknesses of each method.

3-3 Describe how to teach a set of objectives in multiple ways.

Workshop Agenda

1. Start-up activity: Cartesian Divers
2. Pairs: Ways to Praise Student Work in English
3. Activity: 50 most common Academic Words and Quizlet.com
4. Set up work groups by subject taught: Biology, Chemistry, Physics, and General Science. Share each other’s unit and discuss strengths and weaknesses.
5. Activity: Create a second unit of instruction.
6. Lunch with time for informal discussions about the morning’s activities.
7. Activity: Ways to check for Understanding in English.
8. Activity: Search for learning activities that will help ELL master the objectives in the two units that have been created.
9. Discussion about how different learning activities impact ELLs.
10. Sharing of classroom management activities.
11. Participants work on their personal journal.

1. Material

1. Bottle 2. Dropper

Take the empty soda bottle and fill it completely with water. Fill the water glass with water and place the medicine dropper in the glass. Get some water inside the dropper by squeezing the rubber bulb while the end is in the water. You want to get the dropper to just barely float upright in the water. Once you've done this, place the dropper in the soda bottle and screw on the cap tightly. Don't allow much air to be between the top of the bottle and the cap. Gently squeeze the bottle. As you squeeze, the diver will dive (sink) to the bottom of the bottle. If you stop squeezing, the diver floats back to the top.

(<http://www.fatlion.com/science/cartesian.html>)



2. Problem

Can you explain what happens when you gently squeeze the water bottle?

1. Identify the variables involved.

Answer

Independent variable	Independent variable
Pressure	Weight of dropper

2. Gather sufficient data to examine the variables you listed above.

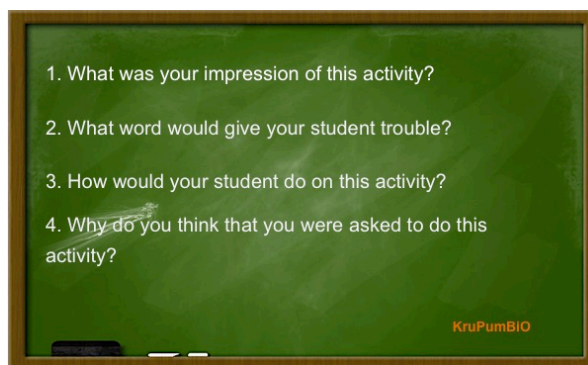
Answer Density, Volume, air and weight

3. Explain what relationships between the variables that you see.

Answer When I add pressure to the bottle, as add pressure to the air bubble in the dropper reducing its size. As the bubble's size reduces, the dropper becomes less dropper and begins to sink. Release the pressure on the bottle and the dropper begins to rise back to the top.



3. Everyone answer 4 questions.



My Answer.

1. This activity use only bottle and dropper that make model for teaching bout density, volume and pressure. This model can improve science skill about observation.

My Answer.

2. Aquanaut/driving/movement of dropper/submarine

My Answer.

3. - Observation

- Squeeze
- Find/discuss variable
- Study of law, theory about this subject
- Transfer to knowledge in daily life

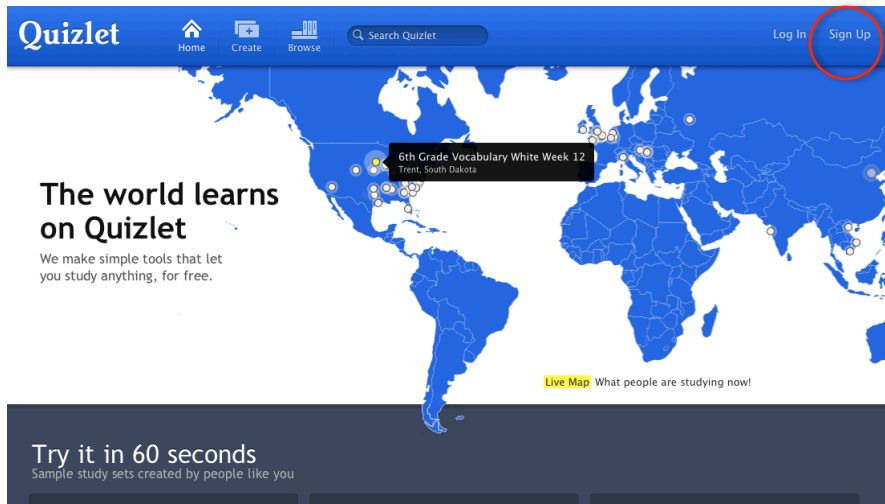
How to use <http://quizlet.com>

1. Go to www.quizlet.com

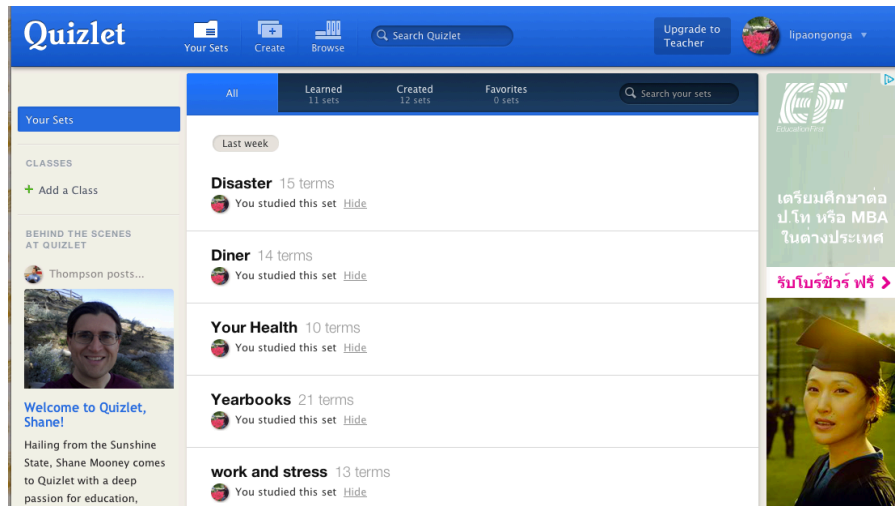
My Answer.

4. - How to product media/innovation/ technique to engage student.

- Play, way to find variable.



2. You can sign up/Log in by create new account or Facebook



1. On the top of page that you can see Your sets, Create, Browse and Search Quizlet
 - Your sets = If you set your vocabulary, you can find it.
 - Browse and Search Quizlet = find others vocabulary in Quizlet.
 - Create = you can crate set of vocabulary

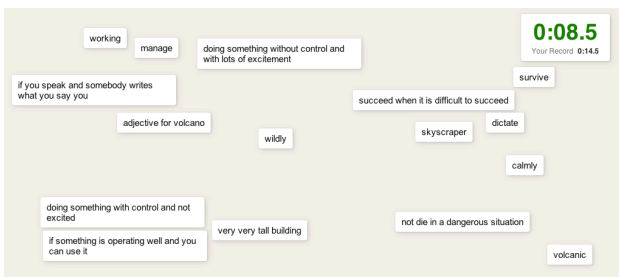
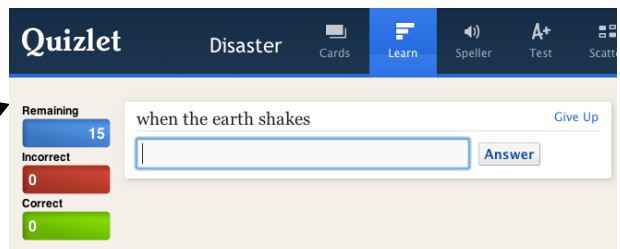
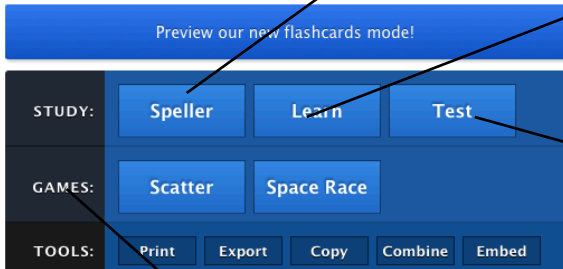
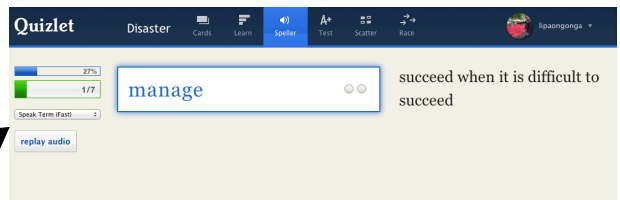
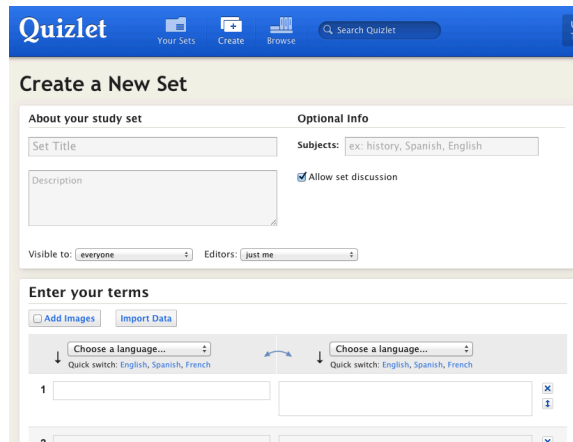
1. Method of setting vocabulary

About your study set

- Set Title = Name of your set for instance academic words, cross culture
- Subjects = Ex. Science, Education
- Description = detail of your vocabulary set

Enter your terms

- Choose a language = English
- You must create 2 words at least



5 Written Questions

- fall down
- explosion up
- go quickly, move quickly
- doing something with control and not excited
- if you speak and somebody writes what you say you

5 Multiple Choice Questions

- doing something without control and with lots of excitement
 - a. calmly
 - b. thick
 - c. manage
 - d. wildly

Create set of vocabulary: How to compliment your students.

Well done.	Good job.	I like that.	That's good.
You've got it.	Super	That's right	That's good.
Good work	That's it	Great!	Congratulations
You are really working hard today	You are very good at that	That's coming along nicely.	I'm happy to see you working like that.
That's much, much better!	I knew you could do it.	I'm proud of you.	You are learning fast.
Now you have it!	wow!	Nice going.	That's the way!
Keep up the good work.	That's the way to do it.	You did that very well.	You're really improving
That's better.	Excellent!	Perfect!	Much better!
Wonderful!	Outstanding!	Fantastic!	Superb!
You certainly did well today.	You are really learning a lot.	That kind of work makes me happy.	I think you're doing the right thing.
Keep it up.	You're doing fine!	That's really nice.	

Techniques to check for Understanding

1. Index Card summaries and Questions

Periodically, distribute index cards and ask students to write on both sides, with these instructions:

(Side 1)

Based on our study of (unit topic), list a big idea that you understand and word it as a summary statement.

(Side 2)

Identity something about (unit topic) that you do not yet fully understand and word it as a statement or question.

2. Hand Signals

Ask students to display a designated hand signal to indicate their understand and word it as a statement or question

- I understand.....and can explain it. (e.g. thumbs up)
- I do not yet understand(e.g. thumb down)
- I'm not completely sure about.....(e.g. wave hand)

3. Question Box or Board

Establish a location (e.g. question box, bulletin board, or e-mail address) where students may leave or post questions about concepts, principles, or processes that they do not understand. This technique may benefit students who are uncomfortable saying aloud that they do not understand.

4. Analogy Prompt

Periodically, present students with an analogy prompt:
 (A designated concept, principle, or process) is like.....
 because.....

5. Visual Representation (Web or concept Map)

Ask students to create a visual representation (e.g. web, concept map, flow chart, or time line) to show the elements or components of a topic or process. This technique effectively reveals whether students understand the relationships among the elements.

6. Oral Questioning

Use the following questions and follow-up probes regularly to check for understanding:

- How issimilar to/different from.....?
- What are the characteristics/parts of.....?
- In what other ways might we show/illustrate.....?
- What is the big idea, key concept, moral in?
- How doesrelate to?
- What ideas/details can you add to?
- Give an example of?
- What is wrong with.....?
- What might you infer from?
- What conclusions might be draw from.....?
- What question are we trying to answer? What problem are we trying to solve?
- What are you assuming about.....?
- What might happen if?
- What criteria would you use to judge/evaluate?
- What evidence supports?
- How might we prove/confirm?
- How might this be viewed from the perspective of?

- What alternatives should be considered
- What approach/strategy could you use to

7. Follow-Up Probes

- Why
- How do you know?
- Do you agree?
- Explain.
- Give your reasons.
- But what about.....?
- What do you mean by
- Could you give an example?
- Tell me more.
- Can you find that in the next?
- What data support your position?

8. Misconception Check

Present students with common or predictable misconceptions about a designated concept, principle, or process. Ask them whether they agree and explain why. The misconception check can also be presented in the form of a multiple-choice or true-false quiz.

Reflective Journal

Today, I learn how to engage students by using inquiry method. I'm aware to pose leading question for engage students, prepare material for activity and learn to use Quizlet that very helpful for my pronouncing and spelling vocabulary.

In afternoon I design lesson plan and techniques to check for understanding of students thinking.

“Training for Trainer: Teaching Science in English Language”

Sunday 24, March at Peony Room

Activity: Wind up doll.

1. Material

1. Wind up dolls.

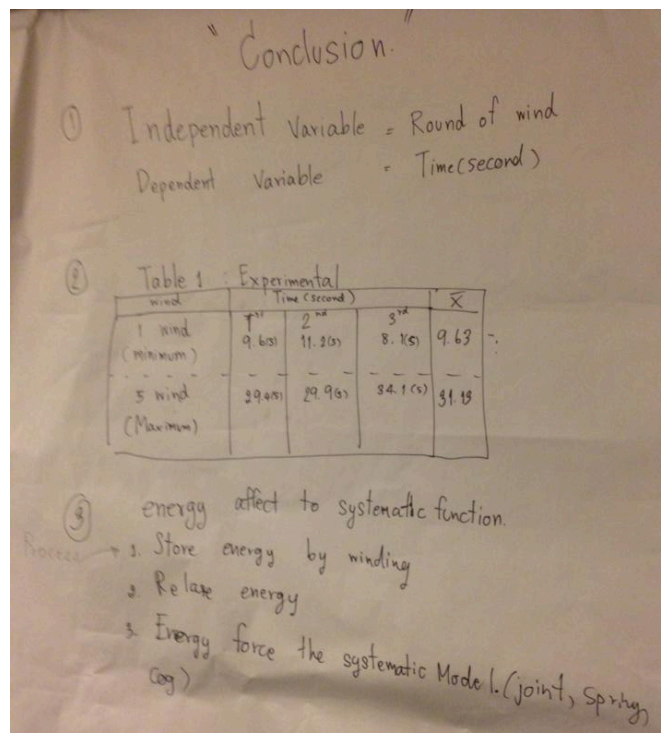
2. Task: Pick a toy and find out what it does.



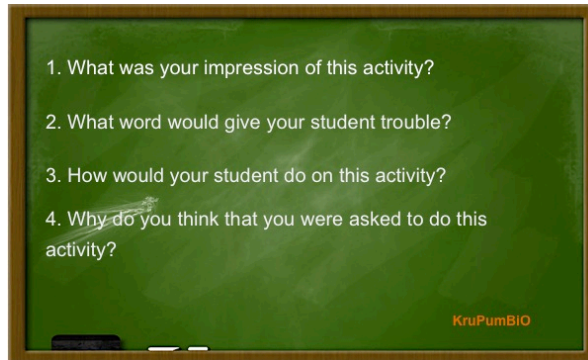
3. Identify the variable involved.

Independent variable	Dependent
Swirl wind (Energy)	Spring, joint, jump, cog

4. Gather sufficient data to examine the variables you list above



5. Everyone answer 4 questions.



1. How to set questions for motivate students do activities and enjoy playing toys. Teacher should motivate students to pose questions and find out answer by using inquiry approach.

2. wind/force/energy/round/time/spring

3.1 Play toys.
3.2 Find variable by multiple ways.
3.3 Collect data.
3.4 Explanation that they found.

4. Learning pose questions that related all phenomena in daily life.

Activity: Lesson Plan

- Task :**
1. With a partner who teaches the same subject as you
 2. Search the internet for 2 different ways to teach each of the objectives in the 2 unit that you have created
 3. Add these to the activities that you have already included in these unit.

Biology Group

Leading question : How do we explain the process of heredity?

Objectives : 1. Identify the various genetic characters of Living thing
2. Explain the process of heredity.

Learning activity : Activity I : Who is my parents?

Activity II : My Tree

Activity I

1. Start-up activity
2. Matching Character
3. Gallery walk
4. List words
5. Lec.1

Activity II

1. Start-up game activity
2. Collect cards
3. Create the tree character
4. Presentation
5. Lcc. 2

Unit Test

- Situation problem
- Matching
- Calculation
- Reflection

1. Make a list of how when a student understood what the was all about.

- Concept mapping
- Testing
- Reading Comprehension
- Reflective Journal

Activity I	
1. Start-up activity	6.
2. Matching Character	1.
3. Gallery walk	3.,5.
4. List words	6.
5. Lec.1	7.

Activity II	
1. Start-up game activity	6.
2. Collect cards	1.
3. Create the tree character	5.
4. Presentation	5.
5. Lcc. 2	7.

UNIT 2 : Molecular Genetics

Leading question : How do we explain the process of heredity?

Objectives : 1. Identify the various genetic characters of Living thing
2. Describe the molecular structure of a chromosome.

Teacher Material

California Standards Addressed: Grade 7 Science: Focus Life Sciences

- 1e. *Cell Biology*. Students know cells divide to increase their numbers through a process of mitosis, which results in tow daughter cells with identical sets of chromosomes.

California Standards Addressed: 9-12 Grade Biology/Life Science

- 2a. *Genetics*. Students know meiosis is an early step in sexual reproduction in which the pairs of chromosomes separate and segregate randomly during cell division to produce gametes containing one chromosome of each type.
- 2b. *Genetics*. Students know only certain cells in a multicellular organism undergo meiosis.
- 2c. *Genetics*. Students know how random chromosome segregation explains the probability that a particular allele will be in a gamete.
- 2d. *Genetics*. Students know new combinations of alleles may be generated in a zygote through the fusion of mail and female gametes (fertilization).

- 2e. *Genetics*. Students know approximately half of an individual's DNA sequence comes from each parent.

Synopsis:

In this guided inquiry lesson, students create and use paper models of chromosomes to model the processes of mitosis and meiosis. They use these models to understand how mitosis yields two cells with identical chromosomes, and how meiosis yields four cells with half the number of chromosomes as the parent cell. Students can also use the models to discover that the process of meiosis can yield cells with different combinations of chromosomes and mating these sex cells will yield offspring with different traits.

Suggested Class Time: 1 – 3 class periods depending on whether the optional Part III is implemented.

Background Information:

Cells divide by two processes – mitosis and meiosis. Mitosis, which is by far the more common process, yields two cells with identical chromosomes as the parent cell. Meiosis only occurs in the sex cells or gametes. This process yields four cells, each with half the number of chromosomes as the parent cell. The combinations of chromosomes in each of the daughter cells can vary, and different repetitions of meiosis can yield many different combinations of chromosomes. After mating, these different sex cells will yield offspring with different combinations of traits.

Advance Preparation/Materials:

- Photocopies of student handouts
- Photocopies of chromosome models on blue and pink paper. Each student will need one pink sheet and one blue sheet.
- Scissors
- Tape

Engagement:

1. Draw a picture of an imaginary animal on the board and label it “frimpanzee.” Ask the students what they know about “frimpanzees.” Discuss with them that even though they have never heard of such an

animal, they still can make some guesses about what it does and how it lives by looking at its structure.

2. Ask the students if they can tell you anything about what it's mother and/or father looked like. They should be able to make some guesses – if they do not, lead them into the idea that probably the parents had the same number of arms, same number of legs, probably similar features, etc. Ask them if they look like their parents, or their brothers and/or sisters.
3. Now ask them why.... Why do people and animals look similar to their parents? And what does this have to do with meiosis??

Exploration/Activities:

Students work individually or in groups of 2 or 3 for this activity. The Student Handout has detailed instructions and quite a bit of background information. It guides the students through the construction of the models, modeling mitosis, modeling meiosis, and applying these concepts to real traits – in this case, chimpanzee hair color and type. The instructor may wish to supplement this by allowing the students to look in their textbooks for help. Although the students will be doing hands-on activities, the success of this lesson lies in the teacher's ability to make sure that the students are moving through the processes of mitosis and meiosis correctly. The teacher and any other helpers should circulate around the room, helping groups of students as they become confused. The instructor can also go demonstrate the stages step-by-step by moving a set of the chromosome models on an overhead projector. The students won't be able to see the colors, but they will be able to see where the chromosomes are during each stage of the process.

Part III of this activity is optional and could be skipped. However, this part of the lesson helps emphasize that genes for various traits are located on the chromosomes and that meiosis can result in different combinations of alleles that will yield offspring with different combinations of traits after mating.

Concept Application/Assessment:

Part III is really the concept application of this activity. Students apply what they know about meiosis and attach real traits to the chromosomes to discover how different combinations are possible from the same parent.

Student Handout.

The Chromosomes of a Frimpanzee: An Imaginary Animal

Introduction

By now, you have heard the terms **chromosome**, **mitosis**, and **meiosis**. You probably also know that chromosomes contain genetic information in the form of DNA and that every person has 23 pairs of chromosomes containing exactly the same genetic information in every cell in his/her body (except the sex cells). But have you ever seen a chromosome? Have you ever seen mitosis or meiosis as it was happening? Almost certainly not, because chromosomes are too small to see with the naked eye. One way that scientists try to understand processes that are too small (or too big) to see is to build simple models and to use them to try to understand how things work.

In this activity, we will use colored paper to make models of the chromosomes in a cell of a make-believe animal called a frimpanzee that has a total of 6 chromosomes per cell. Then we will use these models to try to answer some questions such as:

1. What combinations of chromosomes result from the process of mitosis?
2. What combinations of chromosomes result from the process of meiosis?
3. How does the formation of gametes from meiosis relate to heredity and Punnett Squares?

Making your chromosome models is easy:

1. Fold the blue sheet in half lengthwise (along the solid line).
2. Keeping the sheet folded, cut on the dotted lines - Keep the four folded pieces of paper that have a shape that looks like this <.
3. Repeat steps 1 and 2 with the pink sheet of paper.

You should end up with 6 pieces of paper that have the < shape. ***For now, keep them folded!*** These are the chromosomes in a normal frimpanzee cell. Trace the outline of your set of chromosomes in the space below. Be sure to label the size, shape, number, and colors of the chromosomes.

What happens during interphase?

With your models folded, you are looking at a chromatids, not chromosomes. A chromosome is actually two identical chromatids joined together at the center by a structure called the centromere. Before mitosis or meiosis can occur, the DNA making up the chromatid must be copied. This happens during a phase in the cell cycle called interphase. Many other things happen during interphase such as cell growth and formation of some organelles.

1. Unfold all of your chromosomes so that the model looks like an X. The unfolding represents the copying of the DNA in the chromatid. Notice that the two sides of the X are identical.
2. Draw a circle in the center of each chromosome to represent the centromere.

PART I. Modeling Mitosis

You have already learned the phases of mitosis, so let's try to model them with our new chromosome models. Remember that it's OK for models to be simplified versions of reality. In this activity, we will just concentrate on the activity of the chromosomes (we will ignore the important functions of structures such as the centrioles, the spindle fibers and the nuclear envelope). Move the chromosomes around on the table to represent their movement during mitosis:

Prophase - Chromosomes become visible (under a microscope!) as the DNA in the form of **chromatin** coils up. Chromosomes can be seen as two chromatids joined by a centromere - this is the way your chromosome models already look. Congratulations! - you have already finished prophase...

Metaphase - Chromosomes line up on the equator (an imaginary line in the middle of the cell).

Anaphase - Chromosomes split at centromere (you will have to use your scissors during this step) and the individual chromatids get moved to opposite ends of the cell, forming two groups

Telophase - Chromatids begin to uncoil and cell begins to divide... It is not possible to show this phase with your paper chromosome models, but keep in mind that shortly after telophase, the cell will divide into two cells with one of the groups of chromosomes in each cell.

QUESTIONS

1. Compare the two groups of chromatids that have resulted from your modeling of mitosis.

- a. What is the total number of chromatids in each group? _____
 - b. How many pink chromatids are in each group? _____
 - c. How many large chromatids are in each group? _____
 - d. Are the two groups identical? _____
2. Now compare the two groups of chromatids with your observations and drawings of the chromatids on the first page. How do they compare?
3. Use a small piece of tape to rejoin the indential chromatids at the centromere. What do you notice about where the individual chromatids are located?

PART II. Modeling Meiosis

Now that we understand something about mitosis, let's consider meiosis. But before we begin, let's think about sex. First of all, why do you think some of the chromosomes are blue and some are pink?

Frimpanzees are animals and each frimpanzee has a mother and a father. When frimpanzee males mate with frimpanzee females, a sperm cell from the father joins an egg cell from the mother. The sperm cell from the father and the egg cell from the mother both contain DNA in the form of chromosomes. They join together and their chromosomes mix in an embryo cell which will eventually become a baby frimpanzee (after a great deal of mitosis!). In our model, the chromosomes that are blue have come from the father frimpanzee, while the chromosomes that are pink have come from the mother frimpanzee.

Now let's model the steps of meiosis...

MEIOSIS I

Prophase I - Chromosomes become visible (under a microscope!). **Homologous chromosomes** move towards each other. Homologous chromosomes are

chromosomes of the same size that contain the same kind of genes. One of the homologous chromosomes comes from each parent.

Metaphase I - Homologous chromosomes line up on the equator. Note that not the blue and the pink chromosomes do not always have to be on the same side of the equator when the pairs move to the center.

Anaphase I - Homologous chromosomes separate and move to opposite sides of the cell.

Telophase I - Two new cells form.

MEIOSIS II - This will be a **separate** process in each of the two new cells.

Prophase II - Chromosomes become visible (under a microscope).

Metaphase II - Chromosomes line up at the equator.

Anaphase II - Chromosomes split at centromere (you will have to use your scissors during this step) and the individual chromatids get moved to opposite ends of the cell.

Telophase II - The cells split and a total of four new cells is formed. These cells are called **gametes** - they are the sex cells that will become either chimpanzee sperm or egg cells.

QUESTIONS

1. How many chromatids are in each of the new cells? _____
2. Each of the chromatids is either large, medium or small, and either blue or pink. Describe each of the chromatids in each of the new cells:

	chromatid 1	chromatid 2	chromatid 3
Cell 1:	_____	_____	_____
Cell 2:	_____	_____	_____
Cell 3:	_____	_____	_____
Cell 4:	_____	_____	_____

- Is the combination of chromatids the same in all four of the cells? _____
- Compare the combination of chromatids with your picture and description on page 1. How does the number and combination of chromatids in the frimpanzee cells after meiosis compare with the number and combination of chromatids in the original frimpanzee cells?
- Compare your results with those of another group - did they get the same combinations of chromatids? _____

Did they start with the same combinations of chromatids (compare your pictures on page 1). _____
- Cells resulting from mitosis all have the same chromatids as the original cell, but cells resulting from have different combinations of chromatids. During which phase of meiosis does this difference start to occur? _____

PART III. Meiosis, Genes, and Frimpanzee hair

We've now spent a lot of time learning about chromosome movement and meiosis, but what does this have to do with frimpanzees and how they look? Let's look at just one aspect of frimpanzees looks - hair color. Frimpanzees have either brown or blue hair and it can be either curly or straight. The gene for hair color is on the big chromosome and the gene for hair type is on the small chromosome. There are two **alleles** (which are expressions of a gene) for each. Brown hair (B) is dominant over blue (b) and curly hair (C) is dominant over straight (c). We are going to locate these alleles on our chromosome models to see what happens to them during meiosis.

1. Use tape to put your chromosomes back together just as they were when you drew them on page 1 (a normal frimpanzee cell). Make sure to fold the chromosomes so that only one chromatid is showing.
2. The frimpanzee hair color gene is on the large chromatid. Our frimpanzee got an allele for brown hair color from its mother and an allele for blue hair color from its father. Write these alleles **on the same location** on the chromatids.
3. The frimpanzee hair type gene is on the small chromatid. Our frimpanzee got an allele for straight hair from its mother and an allele for curly hair from its father. Write these alleles **on the same location** on the chromatids. Be sure your C's can be distinguished from your c's.
4. Remember that before any cell division can take place the DNA making up the chromatid must be copied. Represent this by unfolding your chromatids to make a chromosomes. Since the two chromatids are exact copies, you should know which alleles are on the new copies. Write those letters on the new copies.

QUESTIONS

1. What alleles does our frimpanzee have for hair (what is its genotype?).
What does its hair look like?
2. What combinations of alleles did you have in your frimpanzee gametes after meiosis was finished?
3. Can you use meiosis to get other combinations of alleles in the frimpanzee gametes? What other combinations are possible? All these combinations of alleles are the possible combinations that could wind up in the sperm or egg of a frimpanzee.
4. Now your frimpanzee is ready to mate! Pick one of your gametes to use to mate with the frimpanzee of another group. The other group should pick one of their gametes use in the mating with your frimpanzee. Put the chromosomes together - what combination of alleles did you create for your new baby frimpanzee?
5. Look to see if there are other combinations of alleles that you could make if you used different gametes for the mating.

6. A Punnett square helps to show geneticists the possible combinations of alleles that are possible from the mating. The possible combinations of alleles from one parent are listed across the top, and the possible combinations of alleles from the other parent are listed across the bottom. Since in your mating of frimpanzees, both parents are BbCc, complete the following Punnett Square for (BbCc x BbCc)

reference : The Chromosomes of a Frimpanzee Developed by: B. Wang & E. Leon

Costa's Levels of Inquiry

Inquiry (questioning) is a very important part of learning. Being able to recognize, ask, and answer different levels of questions is critical for ALL students to be able to do in every area of learning. Through appropriate questioning we deepen our understanding and the ability to remember many things. An educator named Art Costa created the following levels of questioning.

<p style="text-align: center;">Level One Questions (Answers can be found in the text.)</p> <p>Readers can find the correct answer right in the text. Words found in these questions include:</p> <ul style="list-style-type: none"> · define · observe · describe · name · identify · recite · note · list 	<p style="text-align: center;">Level 1 Examples</p> <ul style="list-style-type: none"> · Define irony. (English) · Identify the starting date of the American Revolution. (History) · Define tangent. (Math) · Define photosynthesis. (Science)
<p style="text-align: center;">Level Two Questions (Answers can be inferred from the text.)</p> <p>Readers infer answers from what the text implicitly states, finding answers in several places in the text. Words found in these questions include:</p> <ul style="list-style-type: none"> · analyze · group · synthesize · compare/contrast · infer · sequence 	<p style="text-align: center;">Level 2 Examples</p> <ul style="list-style-type: none"> · Compare and contrast Mr. Frank and Mr. Van Daan in <i>Anne Frank: Diary of a Young Girl</i>. (English) · Analyze the causes of the American Revolution. (History) · Compare the square root of 49 to the square root of 64. Which is greater? (Math) · Diagram and order the stages of photosynthesis. (Science)
<p style="text-align: center;">Level Three Questions (Answers go beyond the text.)</p> <p>Readers think beyond what the text states. Answers are based on the reader's prior knowledge/experience and will vary. Words found in these questions include:</p> <ul style="list-style-type: none"> · evaluate · judge · apply a principle · speculate · imagine · predict · hypothesize 	<p style="text-align: center;">Level 3 Examples</p> <ul style="list-style-type: none"> · Predict how Charlie Gordon will change after his operation in <i>Flowers for Algernon</i>. (English) · Imagine you were a soldier fighting in the Civil War. How would you feel? (History) · Apply the Pythagorean theorem to find the measurement of this triangle. (Math) · Diagram the stages of photosynthesis and predict how long each takes. (Science)

Task : Use Coat's level of inquiring hand out and with a partner, write a question for each level for the course that you teach.

Level one Question - Defining	- Define process of in heredity.
Level Two questions - Inferring	This example Inference Mendel law to different condition.
Level Three questions - Predicting	- Predicting offspring of example family

Essential Feature	Variations			
1. Learner engages in scientifically oriented question	Learner poses a question	Learner selects among questions, poses new questions	Learner sharpens or clarifies question provided by teacher, materials, or other source	Learner engages in question provided by teacher, materials, or other source
2. Learner gives priority to evidence in responding to questions	Learner determines what constitutes evidence and collects	Learner directed to collect certain data	Learner given data and asked to analyze	Learner given data and told how to analyze
3. Learner formulate explanations from evidence	Learner formulates explanation after summarizing evidence	Learner guided in process of formulating explanations from evidence	Learner given possible ways to use evidence to formulate explanation	Learner provided with evidence and how to use evidence to formulate explanation
4. Learner connects explanations to scientific knowledge	Learner independently examines other resources and forms the links to explanations	Learner directed toward areas and sources of scientific knowledge	Learner given possible connections	
5. Learner communicates and justifies explanations	Learner forms reasonable and logical argument to communicate explanations	Learner coached in development of communication	Learner provide broad guidelines to use sharpen communication	Learner given steps and procedures for communication

Reflective Journal

This weekend, I learn to use the Internet for helping my ability to teach students in English such as Quizlet for pronouncing and meaning of vocabulary. In science class we can bring toy like a wind up toy to engage student for posing questions and improving observation skill. This time we use real material that is Mealworms for practicing observation skill and learning about qualitative observation.

I enjoy all of activities and try to involve my experience to build Biology classroom activity. Creating activity can engage students to learn science.



“Train the Teachers” Teaching Science in English
workshop series sponsored by the IPST
(Institute for the Promotion of
Teaching Science and Technology)

11-12 April 2013, At Ambassador Bangkok



Reported by
Kamonrat Chimpalee

Thanonhakkpittayakom School
The Secondary Educational Service Area Office 32
Office of the Ministry of Education

“Training for Trainer: Teaching Science in English Language”
Saturday 11, April at Peony Room
Activity 1 : Sealed Box

1. After Teacher David greet and told his profile, we got Outline for today acitivity. We were doing activity with partner.

This Outline :

Workshop #1

Workshop Objectives

7-1 Identify and Describe several different methods for assessing student learning and then **Compare and Contrast** the strengths and weakness of each one.

Workshop Agenda

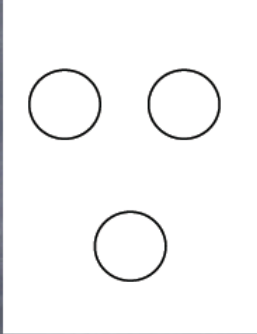
1. Start-up activity: Creating a mental model.
2. Why assess? What are some assessment strategies?
3. Comparing formative and summative assessments?
4. Applying Assessment Strategies in Biology/Chemistry/Physics
5. Lunch with time for informal discussions about the morning's activities.
6. Comparing different types of summative assessments
7. Applying Assessment Strategies in Biology/Chemistry/Physics
8. Description of this workshop series summative assessment
9. Participants work on their person journal.

1. Black box.

IPST: Sec. Sci Workshop #7
Getting Starting Activity

- **Task :** Identify what is inside the black dish **WITHOUT** opening it!

Draw 3 circles on a piece of paper.
 BE SURE to record the NUMBER of each container!



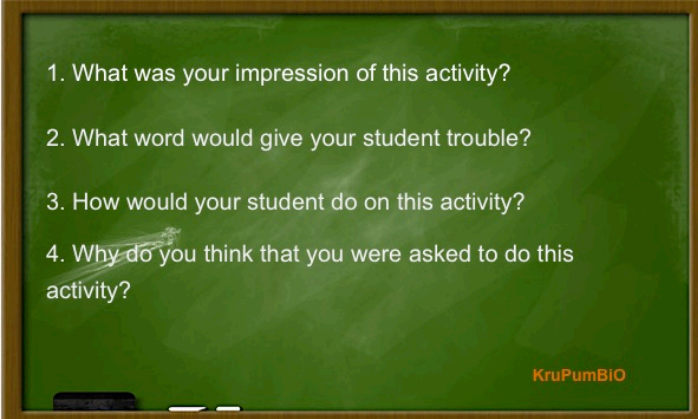
- **Devise a plan.**
- **Follow the plan and record your predictions.**
- **Explain why you made the predictions that you did.**

1.1 Everyone got 2 Sealed boxes and guess shape of something that inside per box.

1.2 I bet that something is circle shape in Number 1 box and there are two things in another box. One is triangle and one is circle.

1.3 After this discuss with friends, teacher show us the answer.

2. Answer 4 questions.



1. What was your impression of this activity?
2. What word would give your student trouble?
3. How would your student do on this activity?
4. Why do you think that you were asked to do this activity?

KruPumBIO

1. My Answer.

Black dish make me curiosity to find something that I can't see and figure out.

I try to use science skills but its not enough to prove the right answer.

2. My Answer.

How to know mystery things in box without open it?

3. My Answer.

1. Use sense to figure out something that inside black dish.

2. Connect sense with prior knowledge for answer.

4. My Answer.

Think about ways, method to find and prove something. This activity make students do like scientist when they can't find evidence to prove something. We can use discussion or argumentation to solve this problem.

Activity 2 : Formative and Summative

Teacher shows slides.

The word "Assess"


Comes from the Latin verb "assidere" meaning "to sit with"

IPST: Sec. Sci Workshop #7

How do you Assess Student Learning?

- There are two main types of assessment
FORMATIVE ASSESSMENT
SUMMATIVE ASSESSMENT
- A chef make soup and tastes it.
This formative assessment
- When the customers taste it.
This summative assessment

Assessment OF Learning (Summative)
vs.
Assessment FOR Learning (Formative)



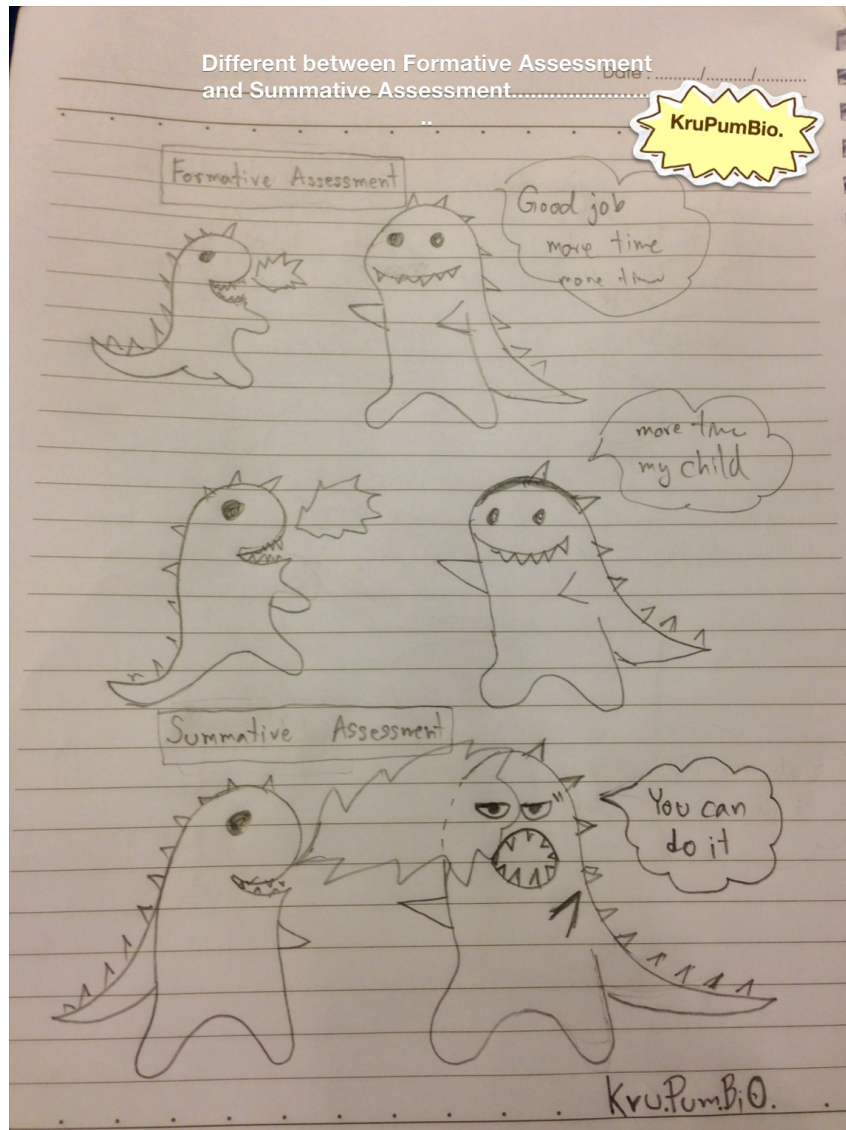
Formative – focused on improvement

- improved learning by students
- improved teaching by instructor

Summative – focused on judgment

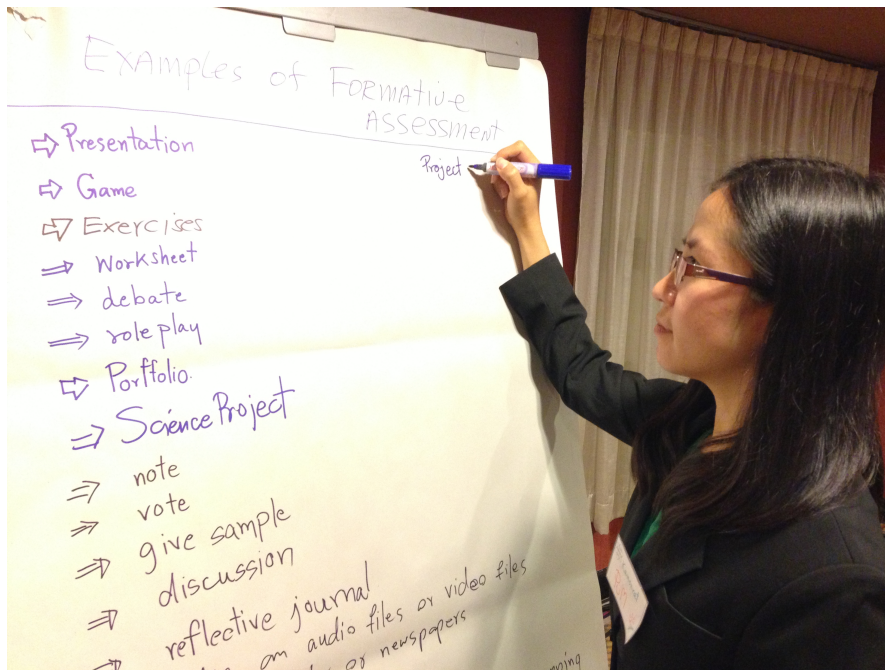
- course grades
- final exams
- surveys

My cartoon drawing of Formative and Summative



เทคนิคการให้นักเรียนสรุปความรู้ในรูปแบบการ์ตูนสั้นๆ

List of summative.



IPST: Sec. Sci Workshop #7

Writing a good Assessment

- ❖ When should great teachers write the unit assessment?

Write the assessment BEFORE you teach the topic.

- ❖ Should you tell the students what is on the test?

YES - of course!

- ❖ Should you show them the format?

YES

Sunday 12 March at Peony Room

Activity 1 : Different liquid make different moving?

IPST: Sec. Sci Workshop #8

Getting Starting Activity

- **Task :** Is there a relationship between the time taken for the air bubble to rise and the molecular structure of the molecules of each liquid?
- You are given sealed tubes containing:
(#1) 1-propanol, (#2) cyclohexane, and
(#3) propane-1,2,3-triol
- Look up for the formulas for each.
- Based on your observations, what is the answer to the task?



12 May 2013

different liquid

propanol

cyclohexane

propane-1,2,3-triol

ketone

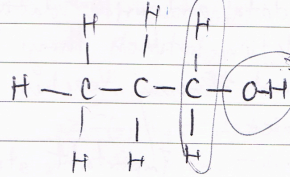
viscosity

Task: Is there a relationship between the time taken for the air bubble to rise and molecular structure of the molecules of each liquid?

1	2	3
12.4 s	14.9 s	> 1 minute
11.4 s	17.8 s	
15.2 s	11.6 s	
13.07 (s)	13.1 (s)	

Date:/...../.....

1. Propanal

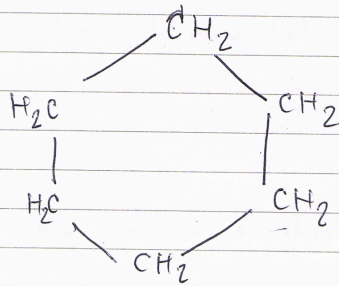


Functional group
aldehyde

Aldehyde
alcohol

different -OH

2. cyclohexane

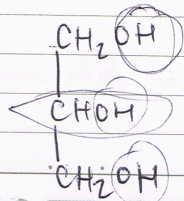


- look data
- make sense
- ask questions

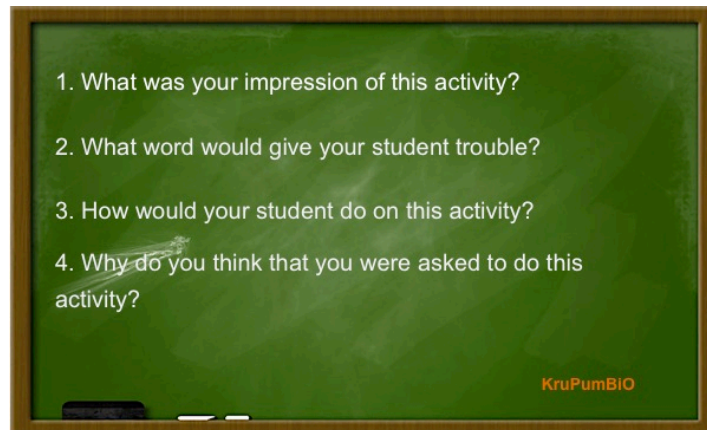
more
2 > 3

- functional group
- amount of C
- amount of e-bond

3. propane - 1,2,3 - triol



Answer 4 questions.



1. My Answer.

Learn from authentic material: 3 tube which difference liquid. I search data and write data after that I look for relation between result of experiment and data. Teacher ask essential question that make me find the answer. Good question make students find answers.

2. My Answer.

What is the factor that makes the 3 liquids moving different?

3. My Answer.

3.1 look and observe 3 liquid tubes.
 3.2 timing 3 liquid tubes.
 3.3 compare data.
 3.4 Search for molecule structure of 3 sustains.
 3.5 find relation between your data and your information

4. My Answer.

4.1 Start class with something that makes students think.
 4.2 Planning for student gather data.

Activity 2 : Summative assessment

IPST: Sec. Sci Workshop #8

End-of-Workshop Assessment

- ▶ Your task is to make a 90 second video commercial.
 - ▶ The reason to make this commercial is to tell other teachers about this workshop series,
 - ▶ how it can help them, and to encourage them to sign-up to take it.
- ▶ You will need a partner to video you. Then you can video him/her.
 - ▶ Be creative! Have fun! You do not have to be perfect!



You can watch my video at http://www.youtube.com/watch?v=XDU_-wuCyUA

Reflective Journal

I'm so proud that I registered for a part of this workshop because I learn more things from workshop for instance inquiry-based teaching, Creative activity, How to integrate English and How to use technology in my Biology classroom. I try to connect all activity with my subject: Biology for stimulating student engage in Biology. I heard about inquiry as I became teacher but I don't deep understand it. This workshop make me get it. This's my best experience to learn how to teach science and I try to use all of this in my classroom. Thank you IPST for supporting this workshop and all experts who help me to develop my science teaching.

