Malaysian Science Teachers' Needs: Towards Lifelong Learning

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Structure of Presentation

- Rational of Need Assessment
- What is Need Assessment?
- Empirical Study
- Publications
- Student's Research

Rational of Need Assessment

- Lifelong Learning

Promoting Factors of LLL

- Knowledge Revolution
  - The creation and dissemination of knowledge has speeded up. This leads to greater globalization and international competition.
  - The ability to create, access and use knowledge is becoming fundamental determinant of global competitiveness.

Promoting Factors of LLL

- Organization Reforming
  - From large & pyramidal to small & flat
  - From procedures, rules & regulations to Communications & Relations
  - From lifelong careers to multiple careers; from lifelong qualification to On-Demand, just in time learning.
  - This is resulting in frequent change of jobs, frequent change of careers, frequent change of partners…

Promoting Factors of LLL

- Implication for Education and Training
  - Drastic decrease of manual workers; challenge to occupational identity; demand for more flexible learning modes and paths; expanded need for lifelong learning.
  - Education and training are becoming increasingly important in the process of knowledge-based development and most countries like Malaysia are making policy change toward establishment of lifelong learning.

Malaysia's Situation

- Risk of knowledge divide rural and urban
- Constant need for new skills for people out of school and in labor force (including teaching)
- Higher levels of education necessary to use, adapt and create new knowledge.
- Moving towards science and technological based society

Key Elements of a lifelong Learning System

- New skills, competencies and attitude
- New pathways to learning
- Governance reform
- Financing challenges
- Private Roles

Key Challenges and Issues of Malaysia's Education System

- **Stock Challenge**-Upgrading skills of people already out of the formal school system.
- **Flow Challenge**-Expanding formal educational enrolments and increasing quality as well as quantity.
- **Dynamic Challenge**-reforming education and training to rapidly and constantly changing needs.
- Diversity in enrolment.

Current role of government in Malaysia and future reform in the knowledge economy

Policy Issues	Current Role	Role in the knowledge economy
Linkage between education and the labor market/society	Supply is institution driven, little adjustment by the public sector to changing demands, some adjustment by spontaneous rise of private providers. Major preoccupation with training and re-training laid off workers, much less focus on gigantic task of re-skilling employed workers for new skill requirement.	Demand is market-driven and learner driven. Moving towards a new trimodal system. ■Strong basic public education and core skills, including learning how to learn throughout life-time, ■Diversified public and private upper secondary and higher education institutions ■Just in time specialized learning depending on changing needs.

Current role of government in Malaysia and future reform in the knowledge economy

Policy Issues	Current Role	Role in the knowledge economy
Qualifications assurance system	National standards linked with curriculum and student assessments. Not sufficient linkage to market and social needs.	Diverse system of recognition and quality control including linkages between different levels of vocational and academic qualifications that recognize formal and informal education and training; and integrate learning, qualifications and labor market needs.

What is Need Assessment?

- Witkins (1984:35) defines **needs assessment** as "any systematic procedure for setting priorities and making decisions about allocation of educational resources."

- McKillip (1987:20) views **need assessment** as "…the process of evaluating the problems and solutions identified for a target population".

- Marti-Costa & Serrono-Garcia, 1983; Nickerns et. al, 1980, define **needs assessment** as a feedback process used by organizations to learn about and to adapt to the needs of their target population (cited in McKillip, 1987).

What is Need Assessment?

- Moore (1977; p. 145) which refer science teachers' **needs** as a conscious drive, interest, or desire on part of the science teachers which is necessary for the improvement of science teaching.
  - **The conscious drive, interest or desire results,in part, from the science teachers' interaction with students and is perceived by the science teacher as the assistance which is needed in order to do a better job of teaching science.**

What is Need Assessment?

- Educational Need Assessment involved an attempt to identify educational needs so that the instructional goals can be selected to ameliorate those needs.
- Educational Need Assessment consist of:

Desired Status of Learners	-	Current Status of Learners	=	Educational Needs

Empirical Study

- **IN-SERVICE TRAINING NEEDS ASSESSMENT FOR MALAYSIAN SECONDARY SCIENCE TEACHERS: A PREPARATION TOWARDS LIFELONG LEARNING**

Objectives Of The Study

- To identify the most prevalent needs for an in-service training as perceived by secondary science teachers in terms of:
  - Science content mastery
  - Appropriateness in instructional and pedagogical skills
  - Knowledge and skills in classroom and laboratory management
  - Usage of Integrating Computer in Teaching (ICT) and research

Objectives Of The Study

- To propose an in-service training model based on the above needs for the every science subject namely Physic, Chemistry, Biology and Science; and
- To develop self study kit for the proposed in-service course.

Methodology

- The Science Teacher Inventory Needs of Science (STIN- Zurub & Rubba, 1983) instrument was modified and administered to 1690 secondary science teachers.
- A total of 73 items was constructed to reflect the needs of science teachers in secondary schools in Malaysia.

Methodology

- The process of item development involved the following:
  - First, existing perceived needs subscales were reviewed followed by a thorough review and analysis of the needs literature.
  - Then a panel of experts in the area of science teaching representing Biology, Chemistry and Physics was asked to edit, combine, suggest and eliminate items from initial pool of items.
  - Through a factor analysis, 8 constructs of in-service needs' were identified.

- The most prevalent needs for an in service training as perceived by secondary science teachers in terms of:
  - **Generic knowledge and skills**
  - **Knowledge and skills in science subject**
  - **Managing and delivering science instruction**
  - **Diagnosing and evaluating students**
  - **Planning science instruction**
  - **Administering science instructional facilities and equipments**
  - **Application of multimedia**
  - **The use of English in science instruction.**

Methodology

- The survey instrument employs a Likert scale ranging from ‘1’-No Need, ‘2’-Moderate Need to ‘3’- Great Need.
- Frequencies and percentages are used to report a priority science teacher need.
- According to Moore and Blankeship (1978) a priority science teacher need is defined as an area for in-service help when science teachers indicate more than a moderate need.

Methodology

- In this study a priority science teacher need is identified when the percentage of 'Great Need' is 40 per cent and above. The 40 per cent cut off point was used in previous studies (Baird & Rowsey, 1989).

- Analysis of perceived science teachers' needs of each dimension according to teaching experience is through the cross tabs procedures, which later followed by Chi Square analysis of association.

Findings

- Most of the science teachers participated in this study are experienced science teachers, who have taught more than ten years (n = 918).

- The second cohort of science teachers are those who have taught within four to nine years, and there are only 309 teachers who participated in this study having teaching experiences less than three years.

Findings

Location	Gender	Teaching Experience			
		1-3 years	4-9 years	>10 years	Total
Urban	Male	30	34	131	195
	Female	95	169	350	614
	Total	**125**	**203**	**481**	**809**
Rural	Male	52	48	149	249
	Female	132	198	288	614
	Total	**184**	**246**	**437**	**867**

School Location by Gender by Teaching Experiences

Item No.	Description of Items	Percentage (%)	Dimension
72	Increasing ICT knowledge towards more interesting teaching	66.5	Application of Multimedia Technology
66	Developing communication skills in English	59.0	Use of English in Teaching
62	Be creative in science teaching	56.2	Knowledge and Generic Skills
71	Increasing teaching professionalism via short courses	53.3	Knowledge and Generic Skills
63	Developing thinking skills	51.5	Knowledge and Generic Skills
14	Motivating students to learn science	51.5	Planning science instruction
9	Selecting suitable teaching strategy	50.8	Diagnosing and Evaluating Students For Science Instruction
33	Preparing safe science laboratory for students	47.3	Managing and delivering science instruction
61	Obtaining information on innovations in science teaching	47.2	Knowledge and Generic Skills

Top Ten Common Priority Needs

Managing and Delivering Science Instruction

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	32 (10.4)	149 (48.2)	128 (41.4)	102.447	.000
	4 - 9	105 (23.4)	197 (43.9)	147 (32.7)		
	>10	357 (38.9)	316 (34.4)	245 (26.7)		

Diagnosing and Evaluating Students for Science Instruction

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	22 (7.1)	171 (55.3)	116 (37.5)	99.014	.000
	4 - 9	81 (18.0)	214 (47.7)	154 (34.3)		
	>10	304 (33.1)	377 (41.1)	237 (25.8)		

Knowledge and Generic Skills

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	12 (3.9)	149 (48.2)	148 (47.9)	59.230	.000
	4 - 9	20 (4.5)	234 (52.1)	195 (43.4)		
	>10	129 (14.1)	484 (52.7)	305 (33.2)		

Knowledge and Skills in Science Subject

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	61 (19.9)	134 (43.6)	112 (36.5)	26.86	.000
	4 - 9	103 (22.9)	202 (45.0)	144 (32.1)		
	>10	286 (31.2)	402 (43.8)	230 (25.1)		

Administering Science Instructional Facilities and Equipments

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	30 (9.7)	182 (58.9)	97 (31.4)	40.968	.000
	4 - 9	81 (18.0)	238 (53.0)	130 (29.0)		
	>10	240 (26.1)	446 (48.6)	232 (25.3)		

Planning Science Instruction

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	12 (3.9)	146 (47.2)	151 (48.9)	68.505	.000
	4 - 9	44 (9.8)	213 (47.4)	192 (42.8)		
	>10	190 (20.7)	409 (44.6)	319 (34.7)		

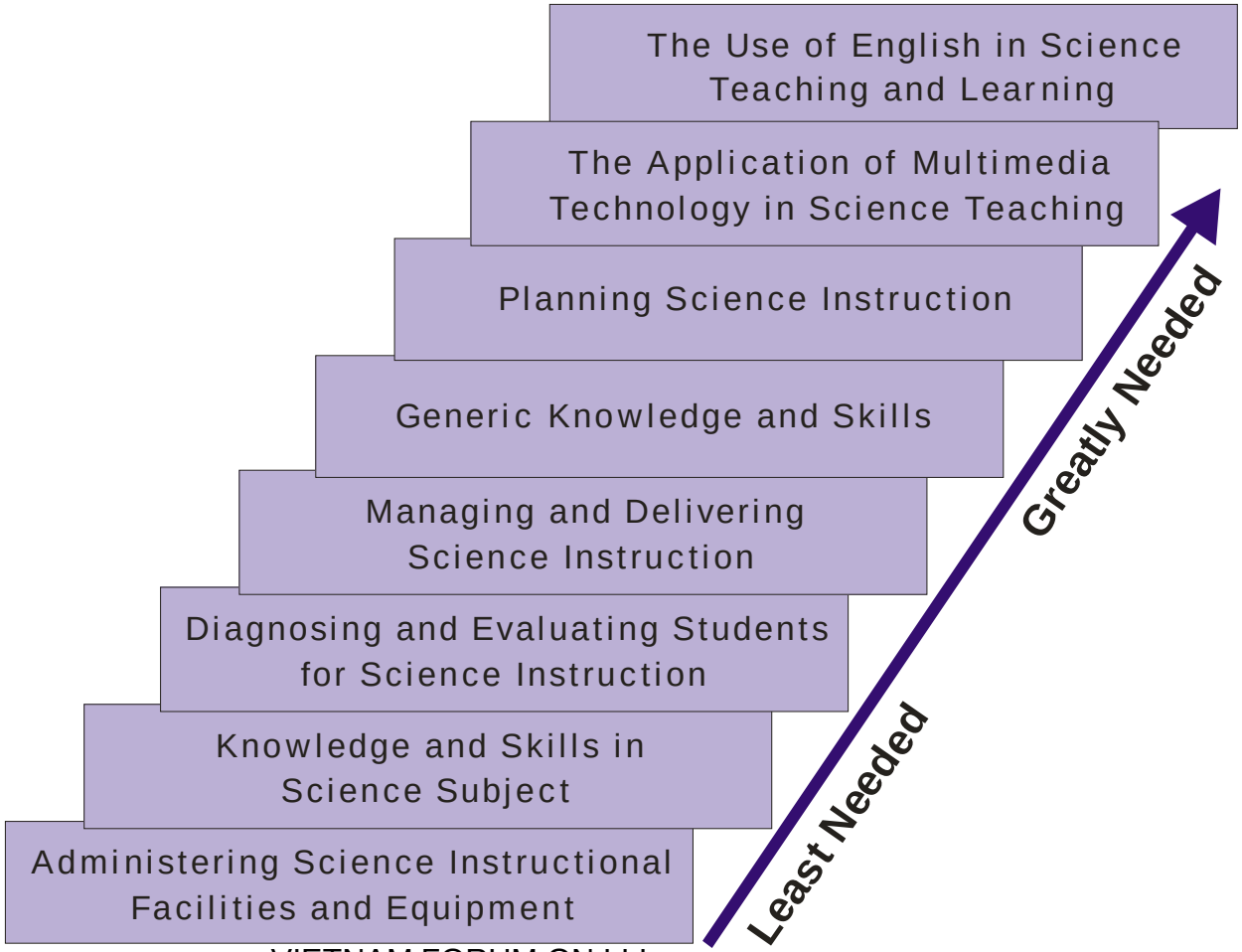
The Application of Multimedia Technology

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	11 (3.6)	126 (40.8)	172 (55.7)	15.652	.004
	4 - 9	20 (4.5)	178 (39.6)	251 (55.9)		
	>10	65 (7.1)	419 (45.6)	434 (47.3)		

The Use of English in Teaching

Need (n %) Variables		No Need	Moderate Need	Great Need	X^2	p
Teaching Experience	0 - 3	15 (4.9)	77 (24.9)	217 (70.2)	97.488	.000
	4 - 9	26 (5.8)	115 (25.6)	308 (68.6)		
	>10	194 (21.1)	255 (27.8)	469 (51.1)		

Hierarchical illustration of perceived Malaysian science teachers' perceived needs



A FRAMEWORK OF IN-SERVICE TRAINING MODEL FOR MALAYSIAN SCIENCE TEACHERS

Factors Influencing/ Forces and Demand
- Curriculum Change
- Assessment Change
- Educational Change
- Training Gap
- Professional Development Policy
- Accreditation Policy
- Employment Policy

Teacher Variables
- Gender
- Subject Taught
- Teaching Experience

School Variables
- Location
- Type of Students
- Curriculum

System Support
- Curriculum material such as self-instructed modules
- Usergroups
- Professional Development Web Based
- Action Research Seminars
- Peer Support Group

Needs Assessment

Dimension : Science Teachers Needs
- Managing and delivering science instruction
- Diagnosing and evaluating students for science instruction
- Generic knowledge and skills
- Knowledge and skills in science subject
- Administering science instructional facilities and equipment
- Planning science instruction
- Application of multimedia technology
- Use of English in science teaching and learning
- And others...

Forms of Delivery
- School based
- District based
- Central based
- Virtual mode
- Distance Learning
- Training Institution
  - o Teacher training colleges and University
- Private Institution

In-Sercice Courses/ Training

Type of Courses:
- Short Courses
- Upgrading academic qualifications school
- Professional Day

Evaluation/Monitoring

Reflection

- The first and second priority needs are obviously contextual in nature whereby these particular needs arise due to the recent Malaysian government policy on the teaching of Science and Mathematics.

- The policy emphasizes the use of multimedia in science teaching. The Malaysian government realizes the potential of ICT in improving the quality of students' learning.

Reflection

- This is evident in the building of smart school in which such schools aim to encourage students and teachers to exploit the potential of Internet in their teaching and learning process.
- The associated policy is that science is also to be taught in English since latest information and the field of science is mostly available in English.
- It appears that the orientation of the needs was to develop teachers' own competency, both in English and ICT, as response to the current development.

Reflection

- However, such needs could be seen as a conscious drive on the part of the teachers to improve science teaching through improving one-self first.
- This hypothesis is further supported by another prominent needs indicated by the science teachers, which are related to the need for self-improvement.
- The needs revolve around concerns such as ‘to improve professionalism through in-service courses’, ‘to gain knowledge on innovative science teaching’ and ‘to enhance one’s thinking skills’.

Discussion

- In all cases, it was found that there exist significant association between science teachers' need and the length of their teaching experiences.
- As highlighted by Dillon, et.al. (2000), there is a strong correlation between science teachers' level of confidence in science teaching and their length of teaching experiences.

Discussion

- Dillon et.al. (2000) survey empirically demonstrates that **only 45 percent** of teachers with less than five years teaching experience having a lot of confidence in teaching science as compared with over **60 percent** of their more experienced colleagues.

- Several suggestions can be put forward especially in filling the gaps of the science teachers needs.

Reflection

- As suggested by Appleton and Kindt (1999), in dealing with inexperienced teachers, the most helpful support is their colleagues through mentoring programmes.

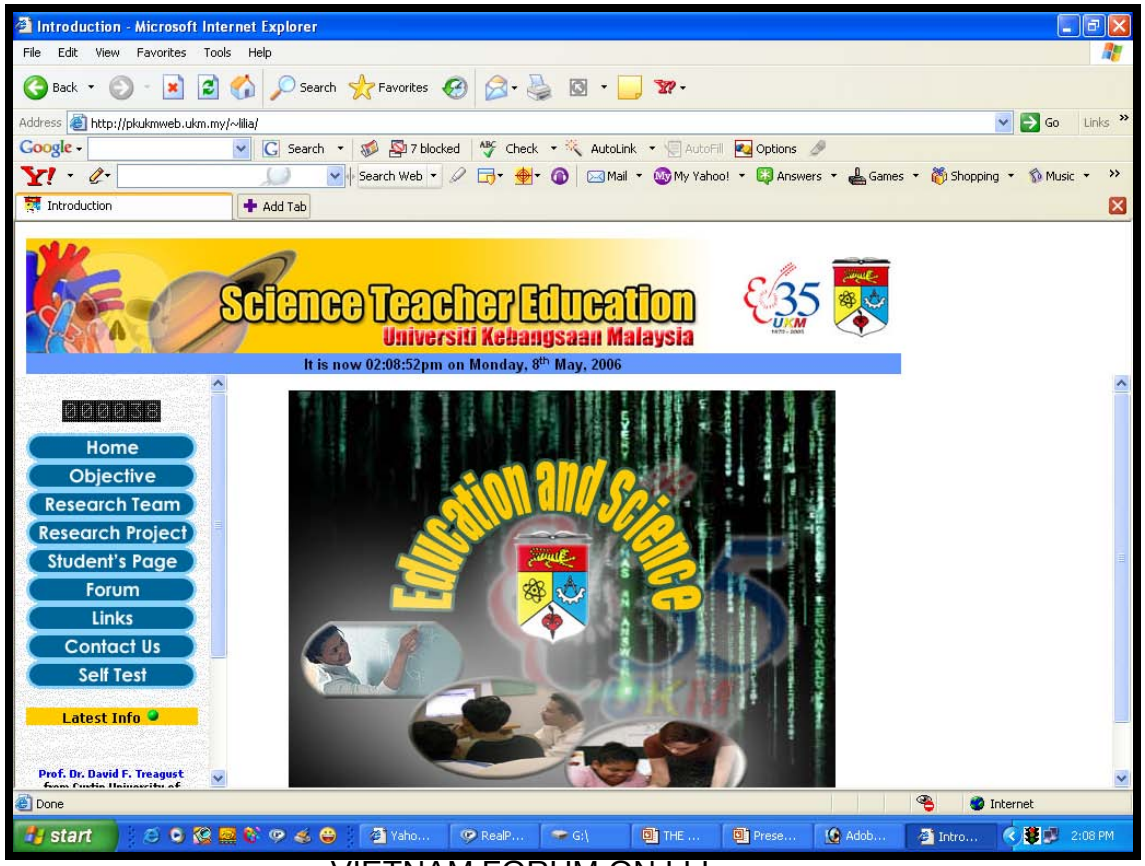
- The importance of colleagues or mentors relates to the issue of tackling questions about science content, innovative ideas pertaining to science pedagogical content knowledge, and more importantly be a general support for them (Anderson and Mitchener, 1994).

Discussion

- For a mentoring system to be put into place would require adequate resource and a commitment not only from educational systems but also school administrators.
- Besides coaching and mentoring, there are many other strategies that could be offered by the support systems such as curriculum materials, self instructed modules, action research networks, peer and study group support, partnerships with scientists and mathematicians in business, industries and universities (Brown and Smith, 1997, Loucks-Horsley, et.al., 1998).

Output - Website

http://www.ukm.my/lilia
http://www.geocities.com/science_teacher_edu/



Forum

STEForum - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://steukm.4.forumer.com/

STEForum

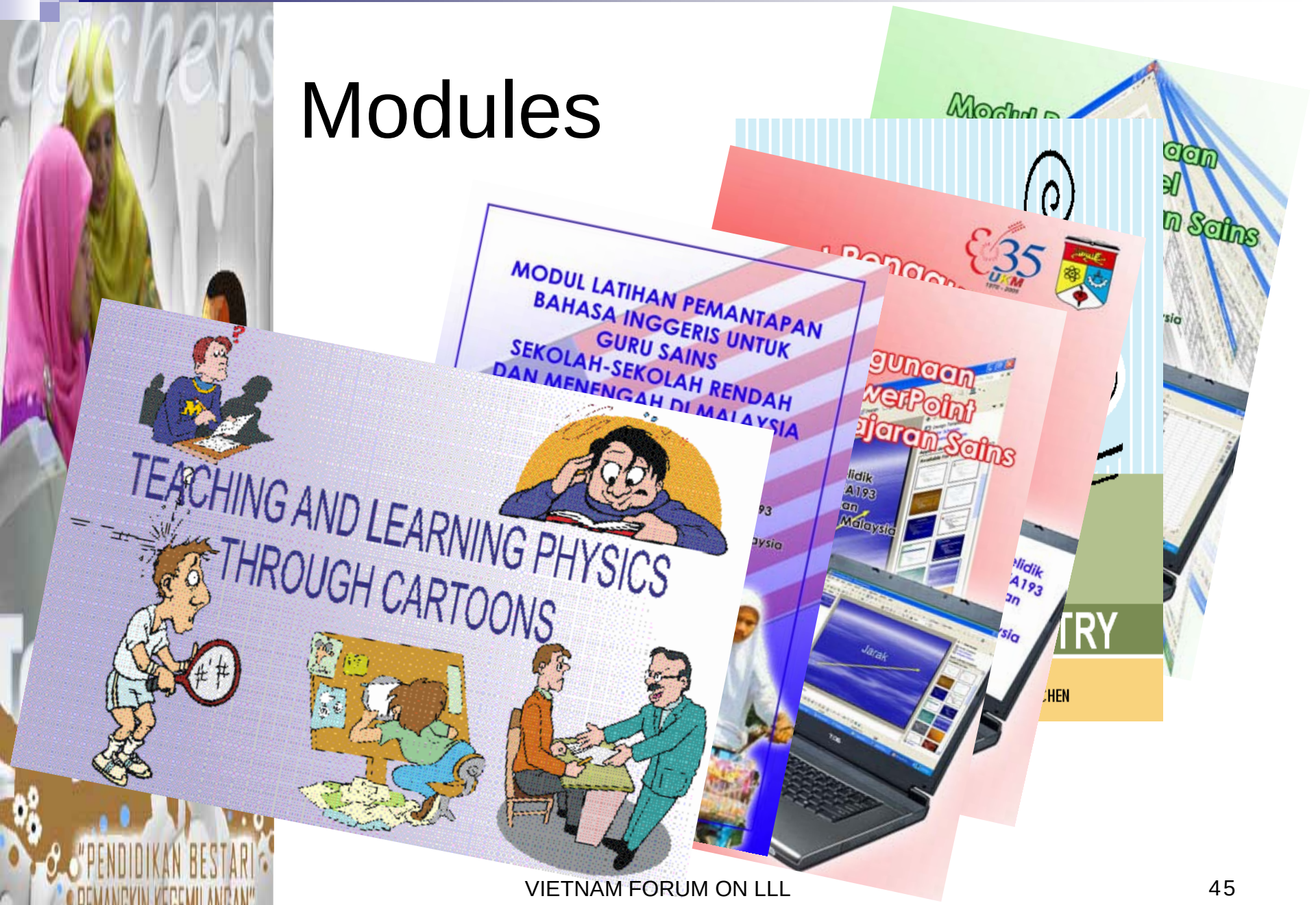
Science Teacher Education Forum

Forum	Topics	Replies	Last Post Info
Welcome Members.... Hi there Forumer! Get to know each other.... Ruangan ini khas untuk anda berkenalan antara satu sama lain.	2	0	August 31, 2005 12:45 am In: »How to register as member? By: admin

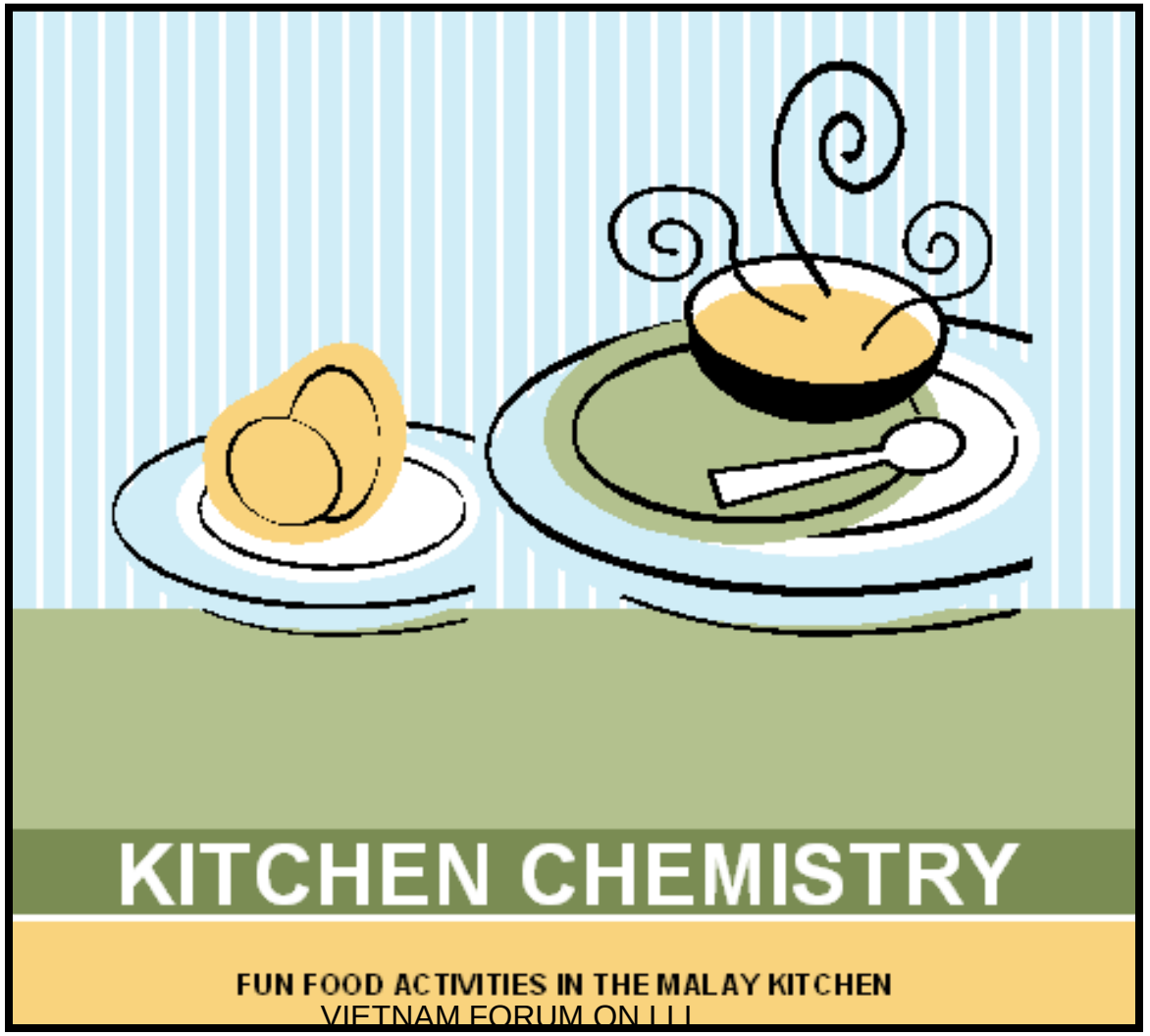
Issues in Science Education

Forum	Topics	Replies	Last Post Info
Teaching Science In English Share your ideas and suggestions to enhance teaching science in English.... Kongsi pengalaman anda mengajar matapelajaran sains dalam bahasa inggeris. Apakah pendapat anda dalam isu ini?	2	0	February 13, 2006 08:39 am In: »Teaching science in English... By: nurain
Penilaian Kerja Amali (PEKA) Write any new information or the implementation of PEKA at your school. Bincang tentang pelaksanaan PEKA di sekolah anda.	1	0	August 29, 2005 10:02 am In: »PEKA By: admin
Using ICT in Teaching Science Share your idea or experience in using ICT in teaching science. How you integrate computer in science subject. Sejauh mana guru-guru telah mengintegrasikan komputer dalam matapelajaran sains? Adakah penggunaan ICT meningkatkan pencapaian pelajar-pelajar anda?	1	0	August 29, 2005 10:03 am In: »ICT in science subject By: admin
Science Laboratory Discuss issues on science laboratory at school. Brbincang mengenai isu makmal sains di sekolah anda.	1	0	August 29, 2005 10:03 am In: »lab By: admin

Modules


MODUL LATIHAN PEMANTAPAN
BAHASA INGGERIS UNTUK
GURU SAINS
SEKOLAH-SEKOLAH RENDAH
TEACHING AND LEARNING PHYSICS
THROUGH CARTOONS
"PENDIDIKAN BESTARI
PEMANGKIN KEGEMILANGAN"

Kitchen Chemistry



Indicators work by turning a distinctive color in the presence of an acid or a base. You can make your own indicator from red cabbage

MATERIALS

- Hot plate
- 1 head red cabbage
- Knife and cutting board
- Large size saucepan
- Large jar
- 4-5 small jars
- Tea strainer or colander
- Substance to test**
- Distilled water
- Rubbing alcohol

PROCEDURE

1. *Chop red cabbage up finely. Boil a pint of water in a saucepan.
2. *Add the red cabbage carefully to the boiling water and take the saucepan off the heat. Let it stand for 30 minutes or until it is completely cool.
3. *Strain the liquid into a jar and throw away the used cabbage. The liquid should be a dark reddish-purple color. Add rubbing alcohol, or refrigerate, to reduce the spoilage of the indicator. Use a 1:5 ratio of alcohol to water.
4. The color will change as you add acids or alkalis. To test a substance, pour a small amount of your substance into a small jar. Then add a drop or two of the cabbage juice indicator. A change in color indicates its acidity or basicity.

Colors of Red Cabbage Juice and Different pH values

Color	red		rose		purple			blue		green		yellow		
pH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	ACID					**NEUTRAL**						**BASE**		

DATA AND OBSERVATIONS

SUBSTANCE	COLOR	APPROXIMATE PH	ACID OR BASE
KASTURI LEMON JUICE			
MANGO JUICE			
PRESERVATIVE PAPAYA FRUIT			
MILK			
SALT FISH			
RICE			
PURE DISTILLED WATER			
COW TAIL SOUP			
BAKING SODA			
VINEGAR			
PANDAN LEAVES			
CHICKEN CURRY			

EXTENSIONS

Soak some filter in the cabbage juice indicator. Allow the paper to dry, the cut it into strips. Conduct an "at home" pH test of other household items. Tape your strips to a piece of notebook paper and bring them back to class. Compile your results. What can you say about household cleaners? Where are most household acids found?

TEACHER'S NOTE

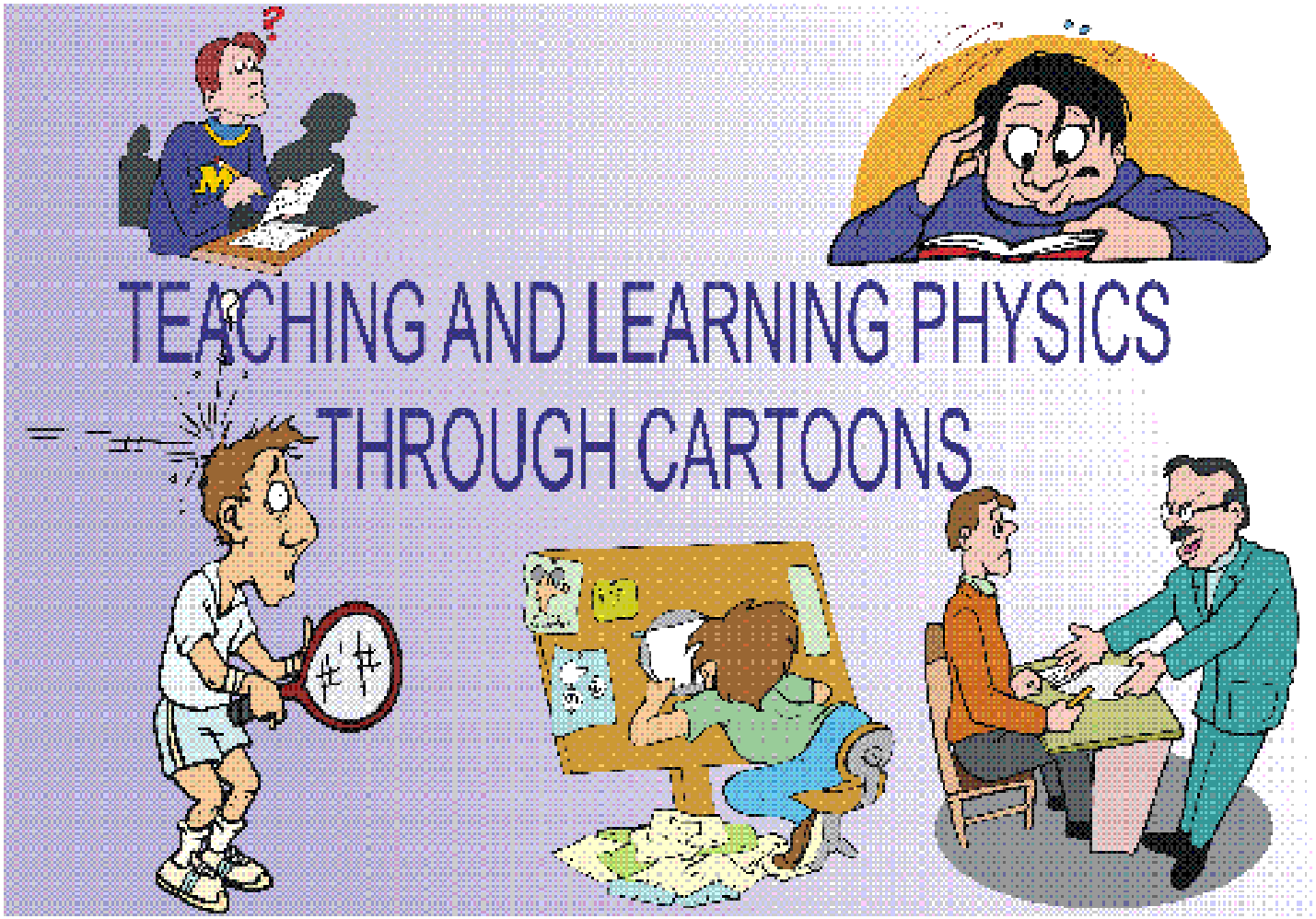
Chemists divide substances into groups. For example, there are acids, bases a neutral substances. Acids contain hydrogen, have a sour taste, react with metals such as a zinc to form hydrogen gas, react with bases to produce salts and water, and conduct electricity when they dissolve in water. Bases have a bitter taste, erect with acids to form salt and water, and conduct electricity when they dissolve in water.

A substance such as water that appears to be neither an acid nor bases is said to be neutral. Both acids and bases can change the color of certain chemicals called indicators.

DISPOSAL

All solutions can be poured down the sink. Solid bits of cabbage should be put into a solid waste container (and emptied at the end of the school days-owing to their odiferous nature).

TEACHING AND LEARNING PHYSICS THROUGH CARTOONS

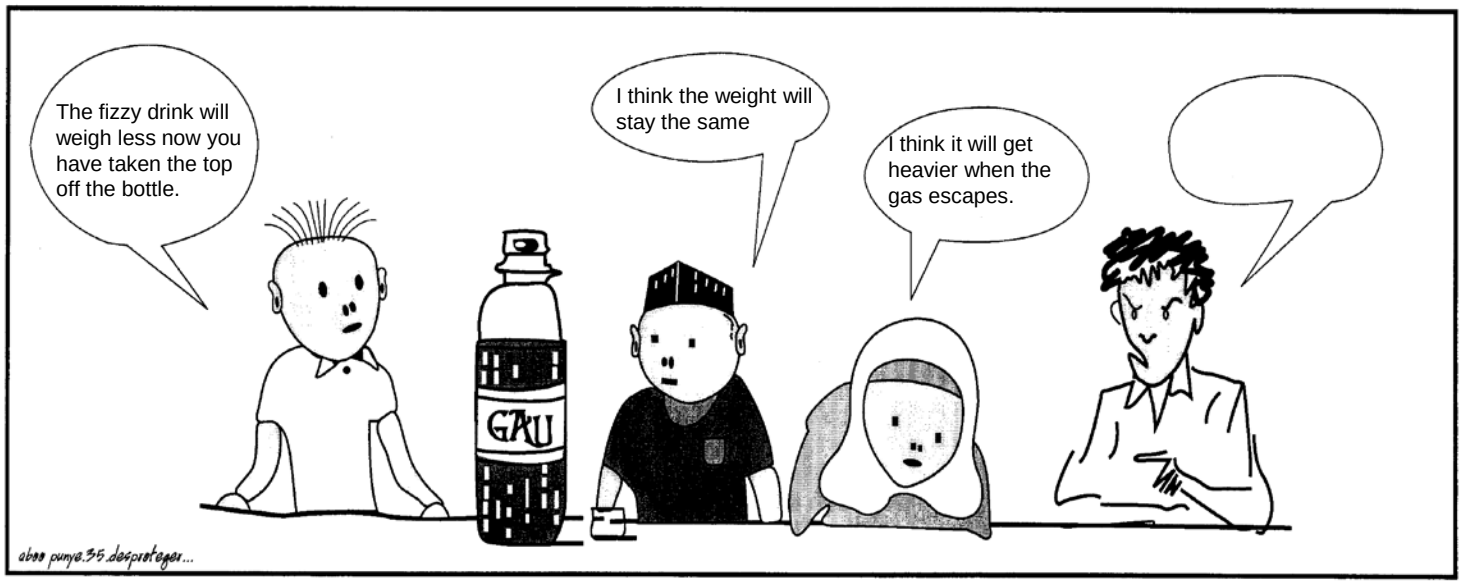


ACTIVITY 2: CONCEPT CARTOONS

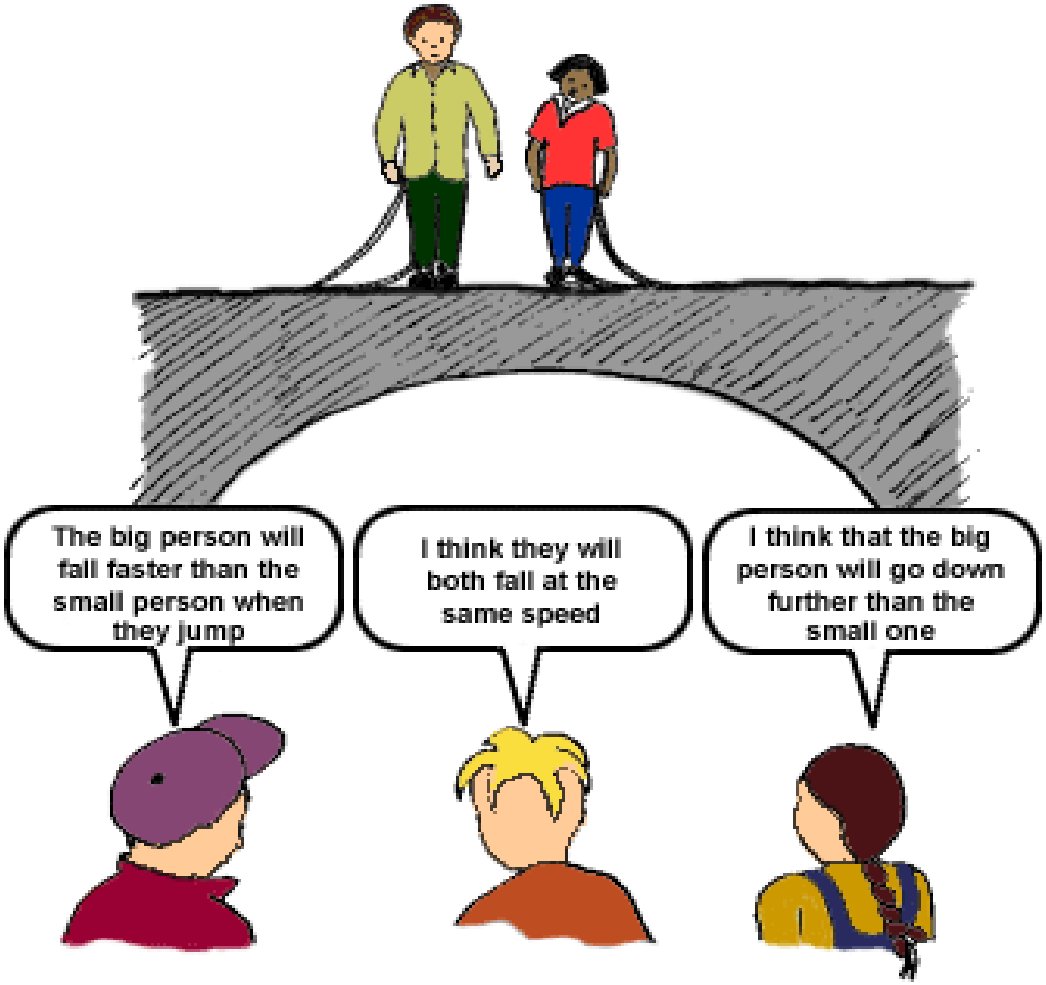
GUIDELINES TO ACTIVITY ON CONCEPT CARTOONS

1. Work in group
2. Discuss views about the concept cartoon
3. Each person comments on each character's statement in the concept cartoon
4. Indicate which character the person agree with and why
5. Debate and vote on which cartoon character the group agree with or fill in the blank speech bubble with what the group think.
6. Appoint a presenter to present the group's views about the concept cartoon.

CONCEPT CARTOONS



CONCEPT CARTOONS



CDs

Click!

Click!

Thank You

Terima Kasih…

1970-2010
40 UKM
Mengilham Harapan
Mencipta Masa Depan