Mad Science Workshops :
Lakeside Primary School Case Study 2012

Mad Science Workshop Topics:

3 Sep: The Scientific Method / Harnessing Heat

4 Sep: Sonic Sounds / Magnetic Magic

5 Sep: Labworks / Electricity

Conducted for: 40 High Ability P4 students

What's in Each Workshop?

Demo by Mad Scientist/Volunteers	Group Work	Individual Work
Underwater Volcano (HH)	Dragster (TSM)	Compass Magnet (MM)
Hot Paper (HH)	Build A Thermometer (HH)	Make A Levitation Tower (MM)
Hot Blocks (HH)	Sand Blast (HH)	You're In the Lab (LW)
Sound Waves(SS)	Sound Stations (SS)	How to Pipette (LW)
Traveling Sound (SS)	Mad Science Symphony (SS)	Liquid Levels (LW)
Distorted Voices (SS)	Fields of Iron (MM)	
Singing Bottle (SS)	Build A Maglev Vehicle (MM)	
Earth's Magnetic Fields (MM)	Pour Pass (LW)	
Electromagnetic Force (MM)	Salty Chips (LW)	
The Human Conductor (EL)	Conductivity Tests (EL)	
	Black Box Electricity (EL)	
	Circuit Game (EL)	
	Light Up That Bulb! (EL)	

Higher Order Process Skills Used

- Observing
- Classifying
- Comparing
- Analysing
- Inferring
- Relating to the World Around Us
- Using Apparatus & Equipment
- Applying Concepts
- Predicting
- Evaluating
- Formulating Hypothesis
- Generating Possibilities
- Investigating
- Drawing Conclusions
- Reflecting

Other Soft Skills Learned

- Communicating : Presentation by
  - Individuals
  - Groups
- Roles & Expectations Setting with rotation within Group
  - Leader
  - Scribe
  - Noise Keeper
  - Time Keeper
- Assessment of Self as a Leader to build Self Awareness on role performance
- Giving & Receiving Formative Feedback to / from Peers

The Mad Science Experience

"I would like to have more Mad Science Classes in my School", 85% Agree <u>Very Much</u>

Demonstration

Group Work

Individual Work

* Agree Very Much. Sample size N = 40

Active & Engaged Learners

- * % Agree <u>Very Much</u> ☺ -

"I was amazed by the Science demos by the Mad Scientists", 77%*

"Science is fun", 87%*

"I love to do the hands-on experiments", 92%*

"I am more interested in Science after Mad Science classes", 77%*

A Self-Evaluation ☺

- Met the design requirements
  - The Scientific Method
  - Higher Order Process Skills (HOPS)
- Met outcome of workshops
  - Hands-on activities in groups & as individuals
  - Applications of science process skills & HOPS
  - Investigations using The Scientific Method
- Provided formative feedback to each pupil at 3 levels: 1)Self 2)Peers & 3)Trainer
- Delighted pupils*
- Delivered by Quality Mad Scientists*
- Sparked interests in Science & self-discovery through fun & engaging Mad Science workshops*

*: Please refer to Survey, end of deck

The Scientific Method

"I learn more about The Scientific Method after Mad Science Workshop", 82% Agree <u>Very Much</u>





Harnessing Heat

"I learn more about Heat after Mad Science Workshop", 85% Agree <u>Very Much</u>

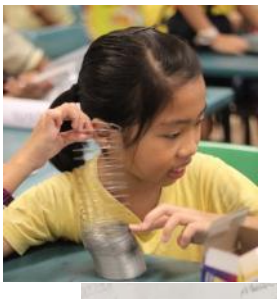





Sonic Sounds

"I learn more about Sound after Mad Science Workshop", 85% Agree <u>Very Much</u>





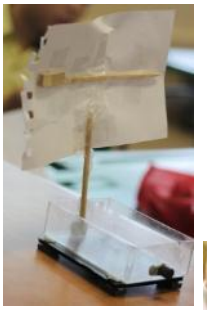

Group Presentation – Mad Science Symphony -

Magnetic Magic

"I learn more about Magnets after Mad Science Workshop", 85% Agree <u>Very Much</u>





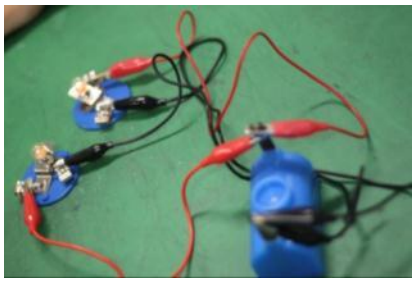

* Agree Very Much. Sample size N = 37

Lab Works

"I learnt more about Labworks after Mad Science Workshop", 87% Agree <u>Very Much</u>

Electricity

"I learnt more about Electricity after Mad Science Workshop", 90% Agree <u>Very Much</u>



*Agree Very Much Sample size N = 40

Why Mad Science?

- ✔ Designed to win
  - Inquiry based
  - 100% fit with MOE Science Syllabus
  - Hands-on activities in groups & as individuals
  - Applications of science process skills & HOPS
  - Leadership training
- ✔ Delighted Pupils with Mad Science
  - Experiential Learning, Top 2 boxes 90%. Mean, 4.6*
  - Science Topic Learning, T2B 93%. Mean, 4.7
  - Attitude Towards Science, T2B 87%. Mean 4.6
  - Mad Science Teaching, T2B 92%. Mean 4.7
- ✔ Provided formative feedback to each pupil by :1)Self 2)Peers
- ✔ Delivered by Dynamic & Quality Mad Scientists
- ✔ Sparked interests in Science & self-discovery through fun & engaging Mad Science workshops

On a 5-point scale. Sample size N = 40

P4 Survey Results

Science Topic Learning	Agree Very Much (%)	Agree (%)	Mean Score
I learned more about The Scientific Method from this workshop	82	15	4.8
I learned more about Heat from this workshop	85	13	4.8
I learned more about Sound after Sound from this workshop	85	13	4.8
I learned more about Magnets from this workshop	85	13	4.8
I learned more about Labworks from this workshop	87	10	4.8
I learned more about Electricity from this workshop	90	8	4.8
I can relate better to the Science topics I learned today to my daily life	77	15	4.7
I can relate better to the Science topics I learned today to the world around me	69	23	4.6
I will search for more information about the topics learned on the internet / in books after this lesson	49	18	4.1
Sub-total – Science Topic Learning	**79**	**14**	**4.7**

Sample size N = 40

P4 Survey Results

Experiential Learning	Agree Very Much (%)	Agree (%)	Mean Score
I was amazed by the Science Demo(s) by the Mad Scientists	77	21	4.7
I enjoyed learning through Story-telling, Dance, Movement	67	21	4.5
I loved to do the Hands-on Experiments	92	3	4.8
I enjoyed asking the Mad Scientists questions	51	31	4.2
Sub-total – Experiential Learning	**72**	**19**	**4.6**
Interactive Group Learning			
I was able to cooperate with my Group-mates	51	28	4.2
I was able to learn from my Group-mates	49	26	4.1
I was able to help my Group-mates learn from me	49	18	3.9
I enjoyed learning as a Group	67	15	4.4
Sub-total – Interactive Group Learning	**54**	**22**	**4.2**

Attitude Toward Science	Agree Very Much (%)	Agree (%)	Mean Score
Science is Fun	87	10	4.8
I am more interested in Science after my Mad Science classes	77	13	4.6
I am inspired to be a Scientist after my Mad Science classes	56	18	4.2
Sub-total – Attitude Toward Science	**74**	**14**	**4.6**
Mad Science Teaching			
The Mad Scientists are clear in their explanations of Science to me	92	5	4.9
I like Krypton Karen	78	13	4.6
I like Kinetic Keng	75	13	4.6
I Like Acidic Ally	88	8	4.8
I like Flash Cotton Woo	77	15	4.6
I would like to have more Mad Science classes in my school	85	8	4.7
Sub-total – Mad Science Teaching	**82**	**10**	**4.7**

Sample size N = 37