



23rd INTERNATIONAL BIOLOGY OLYMPIAD

8th – 15th July 2012

OFFICIAL REPORT



INTRODUCTION

The 23rd International Biology Olympiad (IBO) was held in Singapore from 8th July to 15th July, 2012. IBO2012 was hosted by the National Institute of Education (NIE), Nanyang Technological University (NTU) and the National University of Singapore (NUS) and sponsored almost entirely by the Ministry of Education (MOE). Singapore played host to a total of 440 participants from 59 competing countries (as well as one new observing country, Costa Rica and one non-competing country, Liechtenstein). These participants comprised 234 student competitors accompanied by 207 Jury members and observers. The full participant list is provided in the IBO2012 Program Book (Appendix 1, pages 7 to 10).

Compared with previous IBOs, the 23rd IBO Organizing Committee was rather lean, with only 34 key committee members, aided by 109 helpers and 104 volunteer guides (Appendix 1, pages 14 to 16). The two Co-Chairpersons of the IBO2012 Organizing Committee were Associate Professors Shirley Lim and Tit-Meng Lim. The IBO2012 Organizing Committee, though small in size, worked together as a cohesive team to provide all participants with a wonderful experience of Singapore culture.

The student competitors stayed at the Prince George's Park Residences at the NUS while Jury members and observers were housed in the dormitories at NTU. The close proximity of the NTU dormitories to the Jury Room ensured that travel time to and from the questions-vetting venue is reduced as it is within walking distance. In addition, this is in keeping with the notion of reducing our carbon footprint.

The IBO2012 program officially kicked off with the grand Opening Ceremony on the 9th July, with His Excellency, Dr Tony Tan Keng Yam, President of the Republic of Singapore as the Guest-of-Honour. To mark the auspicious occasion, the President 'dotted the eyes' of two new Chinese dancing lions to "bring them to life". Cultural items were performed by primary school children who were part of the prize-winning dance items and bands in the annual Singapore Youth Festival. The daily program of the entire IBO for both student competitors and Jury members is given in Appendix 2.

Special efforts were made by the organizers to introduce aspects of Singapore life into the daily activities. All the meals were carefully chosen to showcase typical Singapore cuisine as Singapore is well known as a food paradise. Pages 11 to 13 in the IBO2012 Program Book (Appendix 1) provide detailed information on the daily menus such that all participants can better appreciate the local cuisine. The menus were different for every meal and varied from Chinese (from diverse dialects such as Cantonese, Teochew, etc.), Malay, Indian, Peranakan food to Western food.

In addition, student competitors and the Jury members plus observers were also given a glimpse of how Singapore solves her problem of water shortage: they visited the NEWater Plant as well as the Marina Barrage. A kite decoration competition was organized at the Marina Barrage, followed by a fun evening of night kite flying. Jury members were also introduced to the steamboat dining culture – a traditional roundtable dining experience to cultivate camaraderie by cooking your own food. There were also visits to museums, the Jurong Bird Park, the Underwater World and the Singapore Zoo. At the Bhangra Night, participants let their hair down and partied the night away encouraged by the vibrant drums of the Sikhs.

The expenditure for hosting the event totaled about USD 1.1 million. Participation fees were pegged at USD 2,000 for each team (comprising two Jury members and four student competitors) and USD 1,440 for each individual Observer – these rates were not considered as high in comparison with past IBO participation fees. A total of USD 201,894 was collected from the 440 participants with the rest of the expenditure for IBO (about USD 900,000) being funded by the MOE, Singapore.

THEORY AND PRACTICAL TESTS

The Scientific Committee, with the assistance of the international Sub-group (Table 1), worked tirelessly to ensure that a high standard of the IBO competition was maintained with quality questions and tasks. In fact, IBO2012 has the distinction of having the least number of words for the theoretical tests (7003 words) and the third lowest number of words for the Practical tests (7619 words) (Fig. 1).

Table 1. Composition of the International Sub-group for IBO2012.

	Name	Country
1	Poonpipope Kasemsap	Thailand
2	Hans Morelis	Netherlands
3	Mary Oliver	Australia
4	Alexander Rubtsov	Russia
5	Anindya Sinha (Rana)	India
6	Dennis Kappei	Germany
7	Daniel Wegmann	Switzerland
8	Olga Waksman	Germany
9	Alex Friedman	Germany

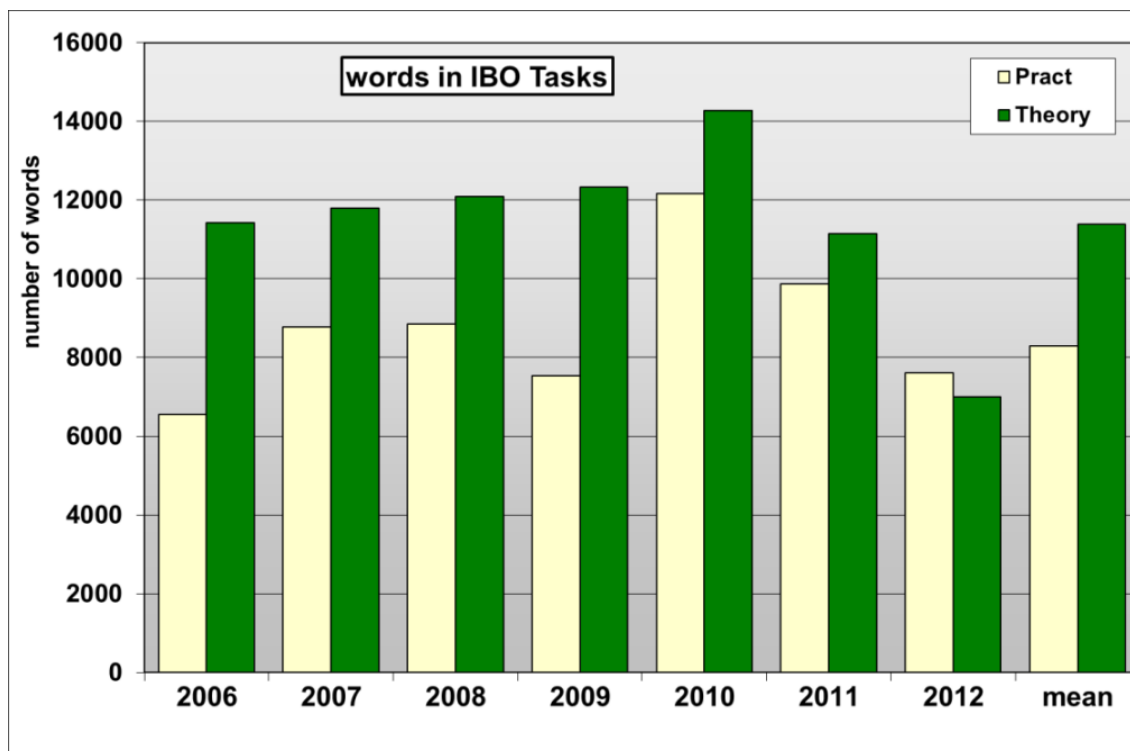


Fig. 1. Comparison of number of words in the IBOs from 2006 to 2012 (prepared by Hans Morelis).

Practical tests (each of 90 minutes' duration and worth 50 points each) were held on July 10 in the four big laboratories of the National Institute of Education (NIE), at the Nanyang Technological University campus. The four biological fields tested were: (1) Cell & Molecular Biology, (2) Microbiology & Biochemistry, (3) Plant Diversity, Anatomy & Physiology, and (4) Animal Anatomy & Ecology.

The Theoretical tests (each lasting 3 hours) were held on July 12 at the NIE Gymnasium and for the first time in the IBO competitions' history, comprised all 'Type B' questions. Paper 1 (89.30 points) and paper 2 (89.60 points) had 49 and 46 questions respectively, with no questions being skipped (i.e., only parts of a few questions were omitted after Jury discussion).

A total of 193 questions were submitted by Argentina, Australia, Bulgaria, China, Chinese Taipei, Czech Republic, Georgia, India, Indonesia, Italy, Korea, Kuwait, Latvia, Mexico, Netherlands, New Zealand, Russia, Singapore, Slovakia, Slovenia, Switzerland, Thailand, Turkey, Turkmenistan, United Arab Emirates, Ukraine, and United States of America (27 countries). The organizers selected and modified only 29 questions as most were Type A questions; the contributed questions comprised 28.88% of the total 187.2 points of the Theoretical tests.

The distribution of the various fields of biology (i.e., Cell biology, Plant anatomy and physiology, Animal anatomy and physiology, Ethology, Genetics and evolution, Ecology, and Biosystematics) conformed to the guidelines of the IBO with deviations of less than 2% in each topic (Table 2).

Table 2. The distribution of points for the various biological fields in the two theoretical tests that were prepared by the Scientific Committee prior to the Jury vetting session.

	Paper 1	Paper 2	Total	%	Exptd Weighting	Difference
Cell Biology	15.3	19.9	35.2	18.8%	20%	-1.2%
Plant Anat & Physio	14.7	10.8	25.5	13.6%	15%	-1.4%
Anim Anat & Physio	24.6	23.1	47.7	25.5%	25%	0.5%
Ethology	3.9	3.8	7.7	4.1%	5%	-0.9%
Genetics & Evolution	18.9	21.1	40	21.4%	20%	1.4%
Ecology	11.1	9.7	20.8	11.1%	10%	1.1%
Biosystematics	5.3	5	10.3	5.5%	5%	0.5%
TOTAL	93.8	93.4	187.2	100%	100%	

A complete set of the 23rd IBO questions (theoretical and practical tests), together with the answer keys and marking schemes are given in Appendix 3.

RESULTS OF THE 23rd IBO

Statistical analysis of the theory tests showed high reliability, significant correlation, with no outliers (Fig. 2A). In general, students who did well for Theoretical Test 1, also did well for Theoretical Test 2. Similarly, the performance of the students for the Theoretical tests (combined) was highly correlated with the scores for the four Practical tests (Fig. 2B). There were no outliers, indicating that there was unlikely to be any cheating.

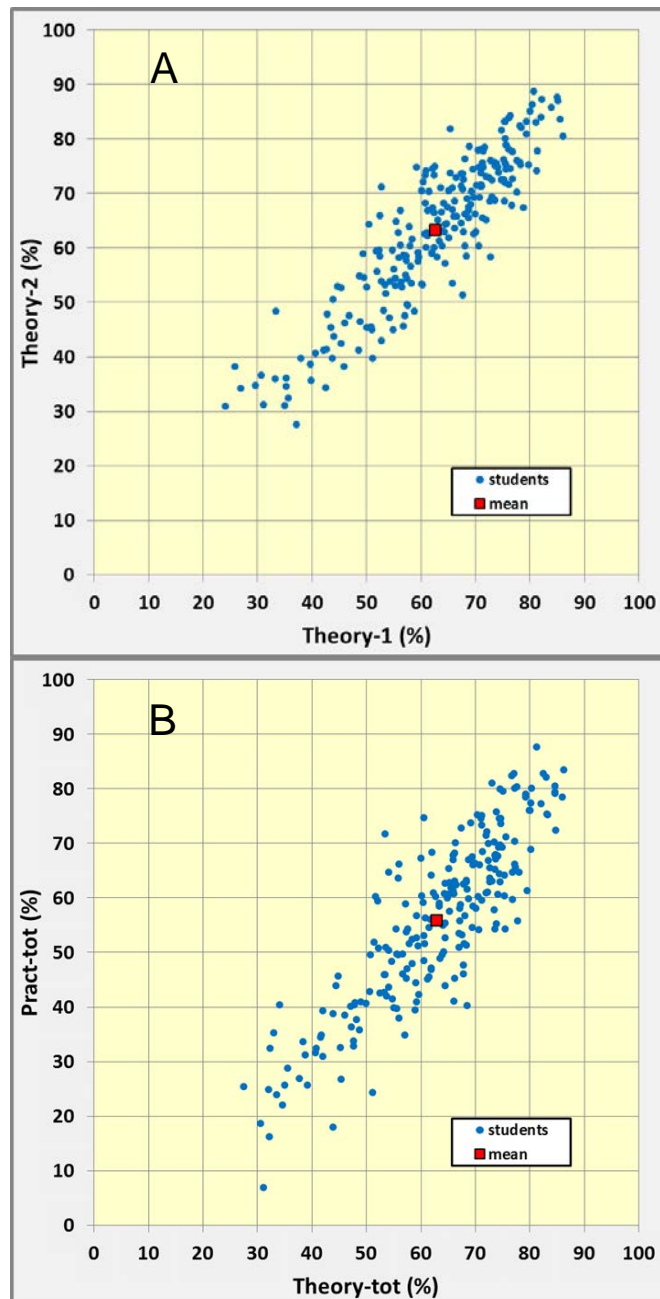


Fig. 2. Scatterplot of scores of the students in the various tests: (A) Theoretical Test 2 against Theoretical Test 1; (B) Practical Tests total score against Theoretical Tests total score.

From the scatterplots in Fig. 3 A – D, it can be seen that students did the best in Practical Test 1 (Cell & Molecular Biology), with the mean score of more than 70% and the worst in Practical Test 2 (Microbiology & Biochemistry), with low mean score of less than 40%. The mean score for Practical Test 3 (Plant Diversity, Anatomy & Physiology) and Practical Test 4 (Animal Anatomy & Ecology) were 60% and 50% respectively, indicating that the students fared better in the Plant Diversity test than in the Animal Ecology test.

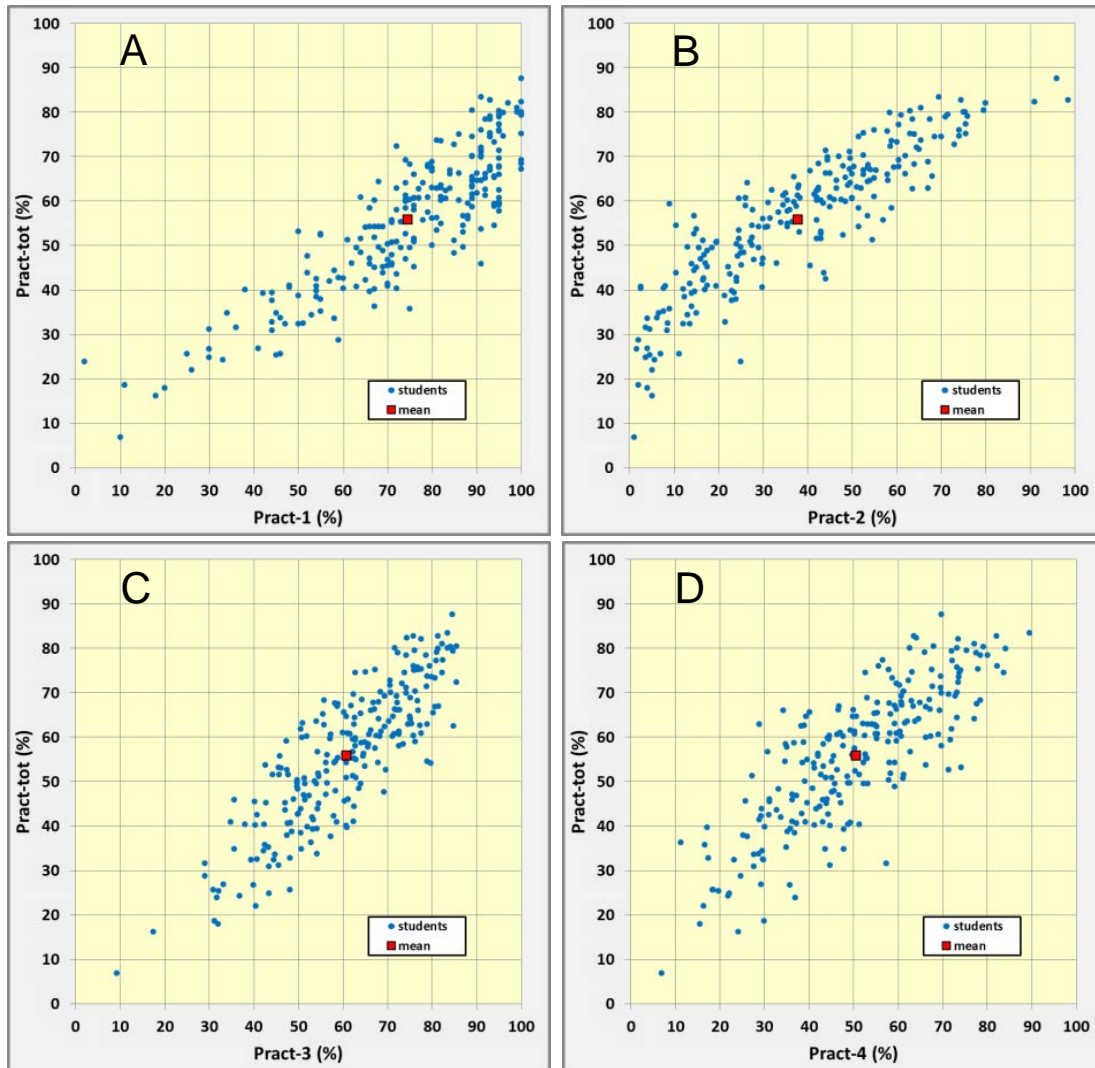


Fig. 3. Scatterplot of Total Practical scores against individual Practical tests: (A) Practical Test 1; (B) Practical Test 2; (C) Practical Test 3, and (D) Practical Test 4.

The total scores of the student competitors were converted from percentage scores to t-scores, with equal weighting for the Theoretical Tests (50%) and the Practical Tests (50%). The complete list of student t-scores is given in Appendix 4. Test papers were randomly picked for checking of translations and accuracy. The following countries' test papers were checked: Chinese Taipei, Germany, Japan, Korea, Russia, Singapore, and Thailand – and everything was in order.

In keeping with the IBO rules, about 10%, 20% and 30% of the student competitors were awarded medals: 25 gold medals, 48 silver medals and 73 bronze medals. The design of the medals featured the IBO2012 logo on one face and the official IBO logo on the flip side (Fig. 4); the photograph on the Cover of this report shows the gold, silver and bronze medals. A full description of the design of the IBO2012 logo is given in Appendix 1 (page 6).



Fig. 4. Design of the 23rd IBO medal featuring the logo (with a DNA strand, the Sunda Pangolin and the Singapore Rhododendron).

At IBO2012, the next highest ranking 25 students (after the medal winners) were awarded Merit Certificates as encouragement for their good performances. Fig. 5 shows the certificates that were given to the medal winners as well the merit certificate recipients. The certificate of participation that was given to all participants of the IBO2012 is shown in Fig. 6.



Fig. 5. Design of the 23rd IBO Certificate of Awards for medal winners: Gold, silver and bronze (left to right). The gold, silver and bronze lettering were hot-stamped with matching metallic foil onto the certificates.



Fig. 6. Design of the 23rd IBO Certificate of Merit.



Fig. 7. Design of the 23rd IBO Certificate of Participation for all participants at the IBO2012.

CLOSING CEREMONY

The Closing Ceremony was held on the 14th July and the Guest-of-Honour was Ms Chan Lai Fung, Permanent Secretary (Education Policy), MOE, Singapore. Before the results of the IBO2012 were announced, there was the traditional presentation of award to the winners of the IBO Video Competition. Team Japan's hilarious entry for the Bio Video Competition was voted by the 234 competitors to be the best entry in this competition.

Upon completion of the medal awards ceremony, the IBO Cup and Flag were officially handed over by the two Co-Chairpersons of IBO2012 to the next host of the IBO, Switzerland. Dr Daniel Wegmann and Ms Irène Steinegger-Meier received the cup and flag on behalf of Switzerland. In keeping with the tradition set by the organizers of the IBO in 2011 (Chinese Taipei), the flags of the participating countries were also handed over to the next organizers. Everyone then adjourned to the Raffles Marina where a sumptuous spread awaited them – a fitting Farewell Banquet for a week-long of competition, fun and camaraderie.

EPILOGUE

Several IBO-Firsts were achieved at IBO2012. Internet access for each country was provided in the Jury Room. Massage chairs (manufactured by a Singapore company, OSIM) were provided for the Jury members in the Jury room – these were proclaimed a big hit by all those who had weary bodies from the long hours of translation work! Reusable insulated mugs, personalized with names of the Jury members and Observers were provided so as to make the IBO2012 a 'green' IBO. Monogrammed souvenir towels were given to all participants. Wireless 'clickers' were provided to each country for electronic voting – a simple and painless way to collate votes for debated issues.

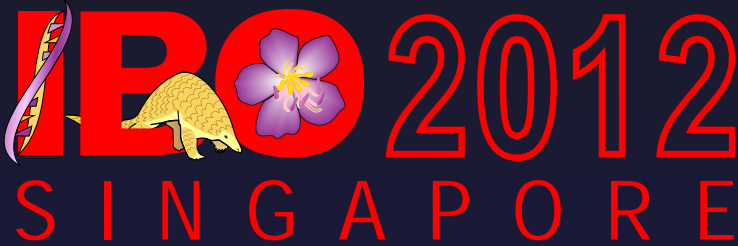
Several newspaper articles were published in the national English newspapers, *The Straits Times*, about the IBO2012 just prior to the event (May 25th 2012: Appendix 5), during the IBO itself (July 10th 2012, Opening Ceremony: Appendix 6) and at the end of the whole IBO (July 15th 2012, Closing Ceremony and Results: Appendix 7).

After the IBO2012, two articles were published in September 2012 about the event: (1) *NIE News* (Appendix 8) and, (2) *NTU Link* (Appendix 9). In March 2013, 23 members of the 23rd IBO Organizing Committee were honoured by NTU with the Nanyang Award 2013 for Teamwork (Appendix 10).



Program

23rd International
Biology Olympiad
Singapore, 8-15 July



IRO 2012
SINGAPORE



Supported by



Ministry of Education
SINGAPORE

Organised by



NANYANG
TECHNOLOGICAL
UNIVERSITY



NUS
National University
of Singapore

The 23rd International Biology Olympiad, Singapore

 IBO 2012

Program at a glance

Jury and Observers	Students
Sunday, 8 July	
Arrival & Registration (NUS & NIE/NTU)	
Monday, 9 July	
Opening Ceremony (Nanyang Auditorium/NTU)	
Vetting of Practical Tasks (Sports Hall/NIE)	Review of Lab Equipment & Visit to NTU (SBS/NTU) Ice-breakers (PGPR/NUS)
Tuesday, 10 July	
Excursion: NEWater Plant & Jurong Bird Park	Practical Tasks (Labs/NIE) Social Night (PGPR/NUS)
Wednesday, 11 July	
Vetting of Theory Questions (Sports Hall/NIE)	Excursion: Visit to NUS, Jurong Bird Park & NEWater Plant
Thursday, 12 July	
Excursion: Visit to A*Star & Underwater World (Sentosa)	Theoretical Tests (Gym/NIE)
<i>Bhangra Night (The Triangle/NIE)</i>	
Friday, 13 July	
Coordinators' Meeting (Sports Hall/NIE) Excursion: Peranakan & National Museums	Excursion: Visit to A*Star & Underwater World (Sentosa) Team Building: Kite-making Workshop
Special Activity: Kite-flying & Marina Barrage Tour	
Saturday, 14 July	
Checking & Finalisation of Marks (Sports Hall/NIE)	Excursion: Singapore Zoo
Closing Ceremony (Nanyang Auditorium/NTU) Farewell Dinner (Raffles Marina)	
Sunday, 15 July	
Farewell & Departures	

A*STAR: Agency for Science, Technology and Research
 NIE: National Institute of Education, NTU
 NTU: Nanyang Technological University
 NUS: National University of Singapore
 PGPR: Prince George's Park Residences, NUS
 UWS: Underwater World Singapore

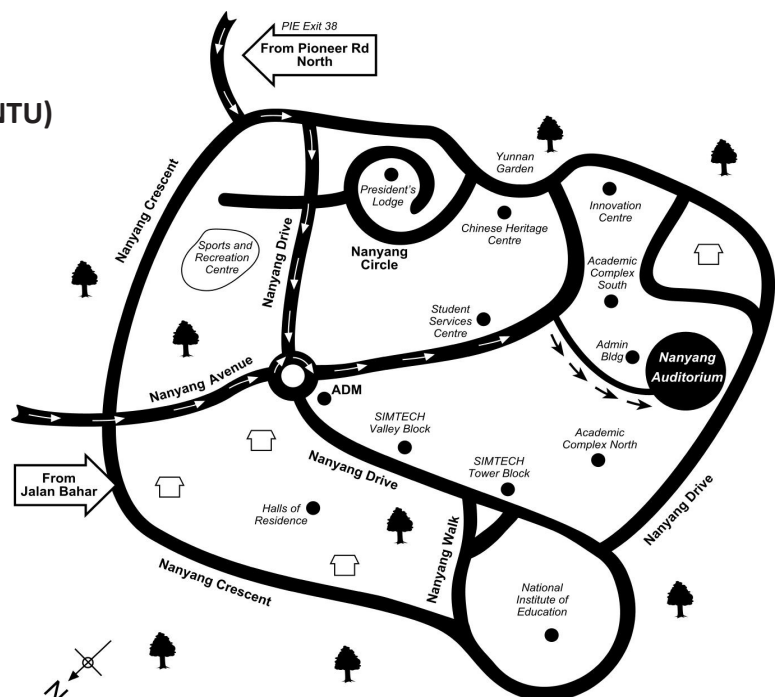


Program

23rd International Biology Olympiad Opening and Closing Ceremonies
Nanyang Auditorium, Nanyang Technological University

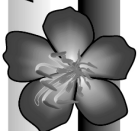
Opening Ceremony Monday, 9 July 2012, 9.45am		Closing Ceremony Saturday, 14 July 2012, 3.30pm	
9.45am	Arrival of Guest-of-Honour His Excellency Dr Tony Tan Keng Yam President of the Republic of Singapore Competitors' March-past Opening of Event Address by Chairpersons of IBO2012 Organising Committee <ul style="list-style-type: none"> • Associate Professor Shirley Lim • Associate Professor Lim Tit Meng Address by Chairman of IBO Coordinators <ul style="list-style-type: none"> • Associate Professor Poonpipope Kasemsap Oath by Competitors' Representative Oath by Representative of International Jury Cultural Performances	3.30pm	Arrival of Guest-of-Honour Ms Chan Lai Fung Permanent Secretary (Education Policy) Ministry of Education Video of IBO Highlights Closing Remark by Chairman of IBO Coordinators <ul style="list-style-type: none"> • Associate Professor Poonpipope Kasemsap Closing Address by Chairpersons of IBO2012 Organising Committee <ul style="list-style-type: none"> • Associate Professor Shirley Lim • Associate Professor Lim Tit Meng Cultural Performances Presentation of Award for Video Competition Prize Presentation for IBO2012 Competition Handing-over of IBO Cup & Flag Invitation Speech by Host of IBO2013 Closing Performance
12.00pm	End of Ceremony	6.00pm	End of Ceremony

**Location of Nanyang Auditorium,
Nanyang Technological University (NTU)**



Detailed Schedule

JURY SCHEDULE



Sunday, 8 July

All Day Arrival
11:00 - 18:00 Registration
18:30 - 20:00 Welcome Dinner

Hall
NIE Bk 5
NTU

Monday, 9 July

07:00 - 08:15 Breakfast
08:45 Bus departs
09:45 - 12:00 Opening Ceremony
12:00 - 13:00 Lunch
13:30 - Late Vetting of Practical Tests

RF Café
NIE Bk 1
NA, NTU
NA, NTU
NIE

Tuesday, 10 July

07:00 - 09:30 Extended Breakfast
10:00 Bus departs
11:00 - 12:00 Visit to NEWater Plant
13:00 - 16:30 Visit to Jurong Bird Park and Lunch
17:30 - 18:00 Meet with Competitors
18:30 - 20:00 Dinner

RF Café
NIE Bk 1
NEWater
JBP
NIE
RF Café

Wednesday, 11 July

06:30 - 08:00 Breakfast
08:30 - Late Vetting of Theoretical Tests

RF Café
NIE Bk 5

Thursday, 12 July

07:00 - 09:30 Extended Breakfast
10:00 Bus departs
10:30 - 13:00 Visit to A*STAR & Lunch
14:00 - 16:30 Visit to Underwater World
17:30 - 22:30 Dinner & Bhangra Night

RF Café
NIE Bk 1
A*STAR
UWS
NIE
NIE

Friday, 13 July

07:00 - 08:00 Breakfast
08:30 - 09:30 Checking Practical Scores
09:30 - 12:00 Coordinators' Meeting
12:00 - 13:00 Lunch
13:30 Bus departs
14:00 - 16:30 Visit to Peranakan and National Museums

RF Café
NIE Bk 5
NIE Bk 5
RF Café
NIE Bk 1
Museums

Saturday, 14 July

17:00 - 19:30 Visit to Marina Barrage and Dinner
19:30 - 22:00 Special Activity: Night Kite-flying

Marina Barrage
Marina Barrage

Sunday, 15 July

06:30 - 09:30 Breakfast
Up to 12:00 Farewells and Departure

RF Café
Bus to Airport

Monday, 9 July

06:30 - 07:30 Breakfast
Up to 13:00 Farewells and Departure

PGPR
Bus to Airport

COMPETITORS' SCHEDULE



Sunday, 8 July

All Day Arrival & Registration
18:00 - 20:00 Dinner

PGPR
PGPR

Monday, 9 July

06:30 - 07:30 Breakfast
08:00 Bus departs
09:45 - 12:00 Opening Ceremony
12:00 - 13:00 Lunch
13:30 - 16:30 Review of Lab Equipment
16:45 Bus departs
18:00 - 19:00 Dinner
19:00 - 21:00 Ice-breakers

PGPR
PGPR
PGPR
NA, NTU
NA, NTU
NTU
SBS
PGPR
PGPR

Tuesday, 10 July

06:00 - 06:45 Breakfast
07:15 Bus departs
08:30 - 10:00 Practical Test (Shift 1)
10:45 - 12:15 Practical Test (Shift 2)
12:15 - 13:15 Lunch
13:15 - 14:45 Practical Test (Shift 3)
15:30 - 17:00 Practical Test (Shift 4)
17:30 - 18:00 Meet with Jury Members
18:30 Bus departs
19:30 - 22:00 Dinner & Social Night

PGPR
PGPR
NIE
NIE
NIE
NIE
NIE
NIE
NIE
NIE
NIE
PGPR

Wednesday, 11 July

07:00 - 08:00 Breakfast
08:30 - 10:15 Visit to Faculty of Science
11:00 - 14:30 Visit to Jurong Bird Park and Lunch
15:45 - 16:45 Visit to NEWater Plant
17:00 Bus departs
18:30 - 20:00 Dinner

PGPR
PGPR
NUS
JBP
NEWater
NEWater
PGPR

Thursday, 12 July

07:00 - 07:45 Breakfast
08:15 Bus departs
09:30 - 12:30 Theoretical Test (Paper 1)
12:30 - 14:00 Lunch
14:00 - 17:00 Theoretical Test (Paper 2)
17:30 Meet with Jury Members
19:00 - 22:30 Dinner & Bhangra Night

PGPR
PGPR
NIE
NIE
NIE
NIE
NIE
NIE

Friday, 13 July

07:00 - 08:00 Breakfast
08:30 Bus departs
09:00 - 10:15 Visit to A*STAR
11:00 - 14:00 Visit to Underwater World and Lunch
15:00 - 18:00 Team-Building Activity: Kite-making Workshop, and Marina Barrage Tour
18:00 - 19:30 Dinner
19:30 - 22:00 Special Activity: Night Kite-flying

PGPR
PGPR
PGPR
A*STAR
UWS
Marina Barrage
Marina Barrage
Marina Barrage

Saturday, 14 July

06:15 - 07:00 Breakfast
07:30 Bus departs
08:30 - 12:00 Visit to Singapore Zoo
13:00 - 13:45 Lunch
14:00 Bus departs
15:30 - 18:00 Closing Ceremony
19:00 - 22:30 Farewell Dinner

PGPR
PGPR
Zoo
PGPR
PGPR
NA, NTU
R, Marina

Sunday, 15 July

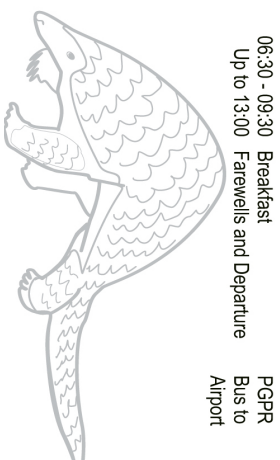
06:30 - 09:30 Breakfast
Up to 13:00 Farewells and Departure

PGPR
Bus to Airport

A*STAR, Agency for Science, Technology and Research;
NA, Nanyang Auditorium; NIE, National Institute of Education;
NTU, Nanyang Technological University; NUS, National University of Singapore; PGPR, Prince George's Park Residences; R, Marina; Raffles Marina; UWS, Underwater World Singapore.

IPO 2012 SCHEDULE

23RD INTERNATIONAL
BIOLOGY OLYMPIAD
SINGAPORE, 8-15 JULY



IBO 2012 Singapore

Patron	Dr Tony Tan Keng Yam, President of Singapore
Official Name	The 23rd International Biology Olympiad, Singapore
Abbreviated Name	IBO 2012 Singapore
Duration	Sunday, 8th July to Sunday, 15th July, 2012
Supported by	Ministry of Education, Singapore
Co-organized by	National Institute of Education Nanyang Technological University National University of Singapore

The Republic of Singapore is an island nation at the southern tip of the Malay Peninsula in South-East Asia. Its population of over five million form a diverse cross-section of cultures, with Chinese, Malay and Indian cultures representing the major groups. This brings plenty of diversity to Singapore, in terms of language, religion, heritage, and of course, our national obsession, food. A former British colony, English is the language of education, business and government, and many public areas have additional signs in Mandarin, Malay and Tamil. Although only 710 square kilometres in area and highly urbanized, Singapore has several relatively large nature reserves and other pockets of wildlife, and takes pride in infusing greenery throughout the 'Garden City'.



About the IBO

The International Biology Olympiad (IBO) is a competition for secondary school students. Their skills in tackling biological problems, and dealing with biological experiments are tested. Interest in biology, inventiveness, creativity and perseverance are necessary. In bringing together gifted students, the IBO tries to challenge and stimulate these students to expand their talents and to promote their career as scientists.

A very important point is bringing together young people from over the world in an open, friendly and peaceful mind. Every participating country sends four students, who are the winners of the respective national competitions. They are accompanied by two team leaders who represent the country.

The IBO began in 1990 with six countries participating and held in Olomouc, Czechoslovakia (now Czech Republic). Singapore started as an observer country at the 11th IBO in Turkey (2000), and has competed every year since the 12th IBO held in Belgium, Brussels (2001). Singapore is proud to be the host for the 23rd International Biology Olympiad and welcomes participants from over 60 countries to our island nation.

To learn more about the IBO, visit the website of the Coordinating Centre of the International Biology Olympiad at www.ibo-info.org. The website of IBO 2012 Singapore is at www.ibo2012.org.



Welcome Message

From Singapore, a tiny tropical island smaller than most big cities in the world, we extend to all friends, colleagues and participants of the 23rd International Biology Olympiad (IBO) a very warm and big welcome to our Garden City!

Over the period of 8th – 15th July, we shall continue the spirit of IBO in celebrating some of the world's most promising secondary biology students, through a unique event designed to encourage and challenge exceptionally gifted young talents.

IBO 2012 is organized mainly by a team of professors and support staff from the National Institute of Education (NIE) at the Nanyang Technological University (NTU), and the Department of Biological Sciences at the National University of Singapore (NUS) as well as some other academic and administrative staff members from various departments in NTU and NUS. The efforts are strongly supported by our Ministry of Education in the form of professional administrative alliance as well as financial grant.

During the IBO week, participants will be housed in the NUS campus, while jury members will be staying in the NTU campus. The IBO theory and practical tasks will be conducted at the NIE. NTU and NUS are the oldest universities in Singapore and each has its own unique characteristics. NTU is situated in a rather hilly terrain at the western part of Singapore, whereas NUS is on Kent Ridge at the south-western part of the country. Both campuses enjoy lush greenery landscape befitting our Garden City image.

Singapore is well known as a favourite tourist destination with a very efficient airport that ranks among the best in the world. It is also known as a food and shoppers' paradise. Visitors can expect a very vibrant and multiracial social tapestry that makes Singapore unique. While the IBO is a platform for friendly competition, we welcome all to come and enjoy the many surprises that our tiny nation offers and befriend our people of different ethnicity, many of whom can speak at least two languages and are good at making visitors feel at home.

We shall have engaging fun amidst the tough roles as participants and jury members. We shall work hard and play hard. We shall also grow our friendship and share our love for biology!



Dr Shirley LIM and Dr LIM Tit Meng

Associate Professors

Co-chairpersons, IBO 2012 Organising Committee



Dr Shirley LIM



Dr LIM Tit Meng

About the IBO 2012 Logo

The IBO 2012 Logo was designed to represent the spirit of the International Biology Olympiad and embody a sense of the host country's unique relationship with nature. The logo's principal colour is the bold red closely associated with Singapore, affectionately known as 'the little red dot' in reference to its appearance on the world map. In the national flag, red symbolises 'universal brotherhood and equality', a sentiment in common with the IBO's aims.

The letters '**I-B-O**' have three iconic images superimposed. The DNA double-helix over the letter '**I**' symbolises the molecular and cell biology, microbiology and biochemistry disciplines. At the very core of life, DNA is the underlying unity within the diversity of all living things. These disciplines also form the core of modern Life Science industry that Singapore has made a strategic pillar of growth in its economy, investing heavily in pure and applied research, and manufacturing sectors to become a major research hub in this arena.

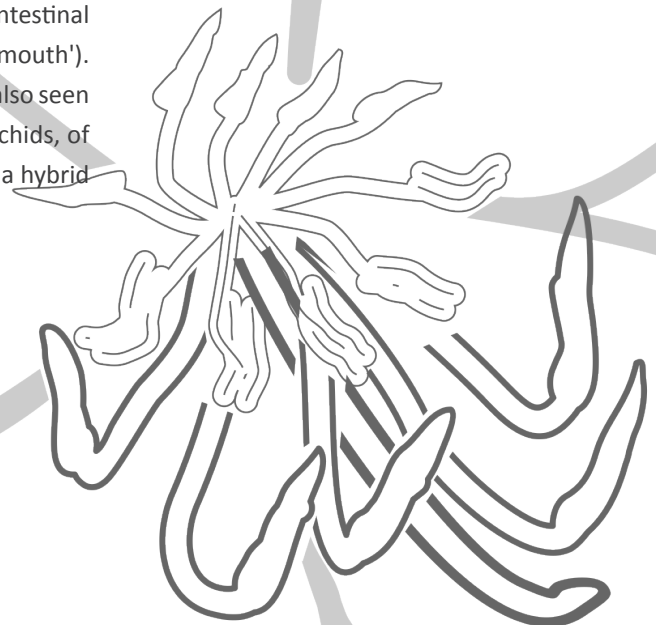
The letter '**B**' has a Sunda Pangolin or Malayan Pangolin (*Manis javanica*) ambling through, and represents the animal functional morphology and ecology aspects of the competition. Also known as the scaly anteater, this native mammal of the order Pholidota inhabits the Central Nature Reserves, Western Catchment Area and the larger offshore islands. This nocturnal animal gets its name from the Malay language word, *pengguling*, which means "something that rolls up". This it will do when sleeping or threatened. *Manis javanica* can be found widely distributed in Southeast Asia.

The letter '**O**' features the Singapore Rhododendron (*Melastoma malabathricum*), also known as the Straits Rhododendron which signifies the fields of plant diversity, anatomy, and physiology. It is not really a rhododendron but belongs to the family Melastomataceae and is distributed across tropical Asia. Known in Malay as the *Senduduk*, parts of the plant are consumed as remedies for various gastrointestinal ailments. The seeds stain the tongue black (Melastoma is Greek for 'black mouth'). Although a very common native species in Singapore's nature reserves and also seen around disused clearings or cleared land, it lacks the celebrity status of orchids, of which Singapore is a major worldwide exporter. The Vanda Miss Joaquim, a hybrid orchid cultivar, is Singapore's national flower.

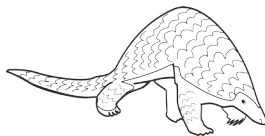


On the Cover

Featured on the cover and on the back of the IBO 2012 T-shirt is the Sunda Slow Loris (*Nycticebus coucang*), also known as the Greater Slow Loris. A nocturnal and arboreal primate native to Singapore and the region, this protected species is listed as 'Vulnerable' and threatened by habitat loss and the illegal pet trade.



Student Competitors



ARGENTINA

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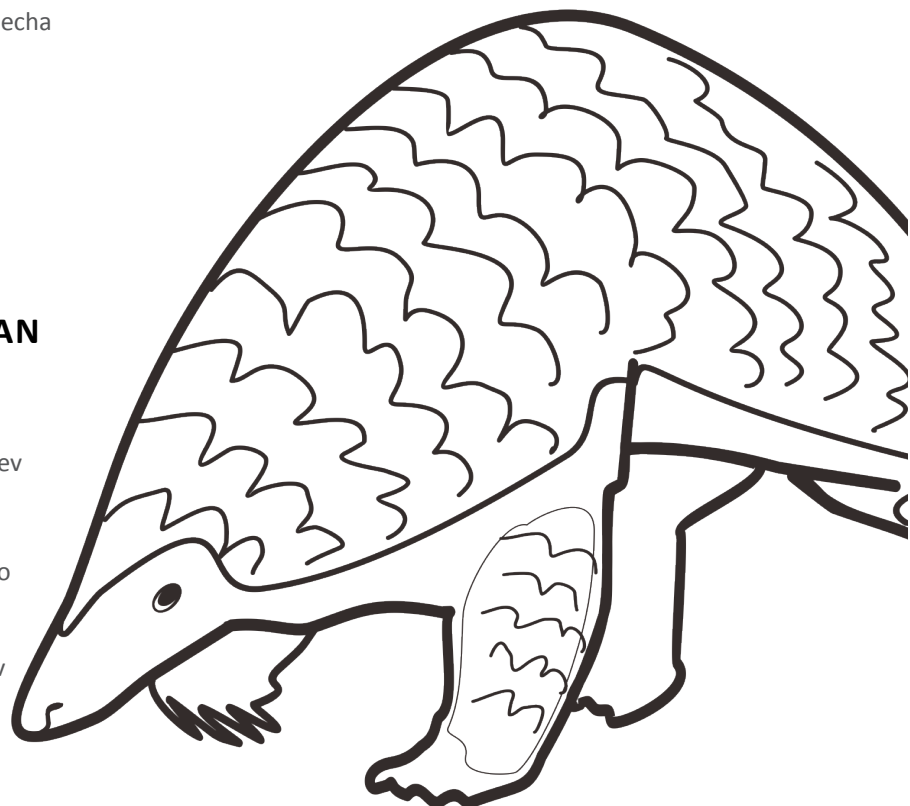
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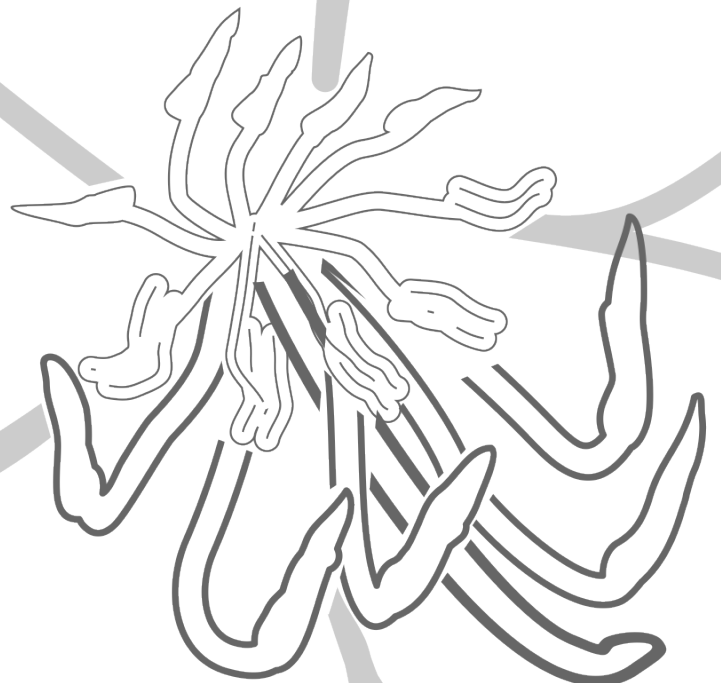
(yet to confirm at the time of printing)

BANGLADESH

(yet to confirm at the time of printing)

MALAYSIA

(yet to confirm at the time of printing)



Daily Menu for Jury and Observers (subject to change)

8 JULY 2012 SUNDAY

Meal: **Dinner** (VLS)
Style: Sit-down, Chinese Cuisine
Venue: Executive Cafe, NTU

Slice Abalone Combination Cold Dish
Fish Maw Thick Soup
Steamed Grouper in Hong Kong Style
Stewed Herbal Ginseng Chicken
Stir-fried Scallop & Celery in XO Sauce
Sautéed Black Mushroom with Spinach
Fried Rice with Prawn wrapped in Lotus Leaf
Honey Dew Sago

9 July 2012 MONDAY

Meal: **Breakfast** (H)
Style: Buffet
Venue: NIE Rainforest Cafe

Steamed Soon Kueh *(Steamed dumpling made of tapioca flour with shredded bamboo shoots, jicama, dried mushrooms)*
Assorted Fruit Cake
Cheese Donut
Assorted Finger Sandwiches
Coffee & Tea

Meal: **Lunch** (H)
Style: Buffet
Venue: NTU Nanyang Auditorium

Singapura Mee Siam with Gravy *(thin rice noodles (vermicelli) in spicy, sweet and sour light gravy)*
Mantou *(steamed bread)* with Teo Chew Braised Duck & Fish Otak *(Spicy Fish Cake)*
Chef's mixed Fruit Cocktail Salad
Potato Salad
Indonesian Butter Chicken
Ginger Crusted Fish with Lemon Mustard
Battered Oat Prawn with Curry Leaves
Traditional Chicken Cottage Pie
Broccoli, Cauliflower & Carrot in Herbs
Nonya Stewed Mixed Vegetables
Rocky Shrimp Croquette
Fragrant Olive & Mushroom Rice
Selectin of Fruit Mochi *(Melon, Pineapple, Yam and Strawberry)*
Selection of English Tea Cakes *(Mango Tango, Classic Blueberry and Fragrant Pandan)*
Selection of Pastries Melange *(Chocolate Éclair and Snowy Cream Puff)*
Tropical Fruit Punch

Meal: **Afternoon Tea** (SH)
Style: Buffet
Venue: NIE, Outside Jury Room

Chocolate Muffin
Samosa *(fried or baked pastry with a savory filling such as spiced potatoes, onion)*
Fried Bee Hoon *(rice vermicelli)*
Fruits
Brewed Coffee/Tea

Meal: **Dinner** (VH)
Style: Buffet, Malay Cuisine
Venue: NIE, Rainforest Cafe

Biryani Rice *(Basmati rice flavoured with spices)*
Roti Jala *(kirai) (crepe)*
Chicken Kurma
Biryani Masala Mutton
Sweet and Sour Fish
Mashed Potato with Cauliflower
Sautéed Mixed Vegetables
Cucumber with Pineapple Salad
Sotong Ball Sambal *(squid-meat balls in chili based sauce)*
Mixed Fruit Cocktail
Lime Cordial
Teh tarik *("Tarik" literally means "pull", pouring the tea back and forth in two vessels to create a thick frothy top)*

Meal: **Supper** (SH)
Style: Buffet
Venue: NIE, Outside Jury Room

Strawberry Roll, Mini Hot Dog Bun
Red Bean Soup *(sweet dessert, served warm)*
Fruits, Brewed Coffee/Tea

10 JULY 2012 TUESDAY

Meal: **Breakfast** (H)
Style: Buffet
Venue: NIE, Rainforest Cafe

Assorted Danish Pastries
Chicken & Shrimp Siew Mai *(Cantonese-styled meat dumpling)*
Assorted Nonya Kueh *(local cakes)*
Assorted Mini Burger Sandwiches
Coffee & Tea

Meal: **Lunch** (VH)
Style: Packed
Venue: Jurong Bird Park

BENTO SET:
Pandan-flavoured (Screwpine) Rice
Breaded Fish
Broccoli and Carrot
Potato Wedges
Apple
Dessert

Meal: **Afternoon Snack** (H)
Style: Packed
Venue: Jurong Bird Park

Banana Muffin
Apple Juice
Chips

Meal: **Dinner** (H)
Style: Buffet, Chinese Cuisine
Venue: NIE, Rainforest Cafe

Cucumber, Tomato, Carrot & Green Salad with Traditional Sauce
Chicken Served With Black Pepper Sauce
Baby Kai Lan with Young Corn in Crabmeat Sauce
Fillet Fish with Asparagus & Mushroom
Squid with Homemade Chili
Steamed Tiger Prawn with Chinese Herbs
Freshly made Steam Crystal Bun
Braised Tofu with Crabmeat Sauce
Traditional Mushroom Rice
Dessert *(Double Boiled Longan, Red Date, White Fungus & Lotus Seed)*
Fruit Punch

11 JULY 2012 WEDNESDAY

Meal: **Breakfast** (H)
Style: Buffet
Venue: NIE, Rainforest Cafe

Steamed Crystal Bun *(Steamed dumpling made of tapioca flour with shredded bamboo shoots, jicama, dried mushrooms)*
Yam (Taro) Cake
Swiss Roll
Samosa
Assorted Muffin
Coffee & Tea

Meal: **Morning Tea** (SH)
Style: Buffet
Venue: NIE, Outside Jury Room

Banana Cake
Curry Puff
Sesame Glutinous Rice Ball
Fruits
Brewed Coffee/Tea

Meal: **Lunch** (VH)
Style: Buffet, Malay Cuisine
Venue: NIE, Rainforest Cafe

Sayur Lodeh *(vegetables in coconut milk soup, contains shrimps)*
Lontong *(compressed rice wrapped in banana leaf)*
Grilled Chicken Wing
Sambal Sotong *(squid in chili sauce)*
Otah Otah *(spicy fish cake)*
Telur Belada *(hard-boiled eggs in gravy)*
Mee Goreng *(fried noodles)*
Nasi Pandan *(rice cooked with screwpine leaf)*
Bundung Drink *(rose syrup cordial)*

Meal: **Afternoon Tea** (SH)
Style: Buffet
Venue: NIE, Outside Jury Room

Fried Popiah *(vegetable roll)*
Assorted Sandwiches
Fruits
Brewed Coffee/Tea

Meal: **Dinner** (H)
Style: Buffet, Indian Cuisine
Venue: NIE, Rainforest Cafe

Samosa
Chicken Curry
Fish Masala *(fish in onions & tomatoes gravy)*
Aloo Gobi *(potatoes and cauliflower)*
Chana Masala *(chick peas)*
Palak Paneer *(spinach with cottage cheese)*
Naan Bread
Saffron Rice
Raita *(yoghurt with cucumber)*
Suji Halwa *(semolina pudding)*
Lime Juice

Meal: **Supper** (SH)
Style: Buffet
Venue: NIE, Outside Jury Room

Short Cake Muffin
Donut
Green Bean Soup *(sweet dessert, served warm)*
Fruits
Brewed Coffee/Tea

KEY

- V** Vegetarian options provided
- L** Late dinner available until 2100h, limited number
- S** Snacks *(biscuits, nuts, fruits, instant beverages, instant cereals, instant noodles available upon request)*
- H** Halal meal
- N** No pork, no lard

12 JULY 2012 THURSDAY

Meal: **Breakfast (H)**
 Style: Buffet
 Venue: NIE, Rainforest Cafe

Donut
 Assorted Nonya Kueh (*local cakes*)
 Chwee Kueh (*steamed rice cakes topped with savoury radish*)
 Assorted Finger Sandwiches
 Coffee & Tea

Meal: **Lunch (H)**
 Style: Buffet
 Venue: A*Star

Meal: **Afternoon Snack (H)**
 Style: Packed
 Venue: Underwater World Sentosa

Butter Cake
 Apple Juice
 Chips

Meal: **Dinner (N)**
 Style: Buffet, BBQ Style
 Venue: NIE, Triangle

Singapore-style Satay Mee Hoon (*rice vermicelli*)
 Garlic Bread Toasts
 Honey Chicken Wings
 Black Pepper Fish Fillets
 Peranakan Chicken Satay (*meat on skewers*)
 Defu Chilli Crab Otah Otah (*spicy fish cake*)
 Teochew-style Beef Stew
 Butter Garlic Prawns
 Sambal (*chili sauce*) Stingray
 Buttered Sweet Corn
 Shitake Mushroom on Skewers
 Coleslaw
 Roti Prata (*fried flour-based pancake pancake - Plain, Egg, Cheese*)
 Mix Fruits Cocktail
 Coke
 Green Tea

13 JULY 2012 FRIDAY

Meal: **Breakfast (H)**
 Style: Buffet
 Venue: NIE, Rainforest Cafe

Fried Carrot Cakes (*fried radish cake in dark sauce*)
 Turnip Fritter
 Sesame Ball
 Éclair
 Coffee & tea

Meal: **Morning Tea (SH)**
 Style: Buffet
 Venue: NIE, Outside Jury Room

Fruit Tartlet
 Tuna Puff
 Walnut & Brownies Cake
 Fruits
 Brewed Coffee/Tea

Meal: **Lunch (VH)**
 Style: Buffet, Fusion cuisine
 Venue: NIE, Rainforest Cafe

Boneless Chicken served with Black Pepper Sauce
 Pink Dory Fish Fillet served with Mediterranean Sauce
 Squid with Homemade Chili served on a Bed Of Banana Leaf
 Baby Kai Lan with Baby Corn served with Crabmeat Sauce
 Thai Style Hot & Spicy Sautéed Prawn Ball
 Rendang Mutton (*spicy mutton*)
 Miniature Pomegranate (*fried seafood dumpling*)
 Cold Cheng Teng (*sweet dessert made from a variety of grains*)
 Peach Tea
 Fruits

Meal: **Afternoon Snack (H)**
 Style: Packed
 Venue: Museum

Apple Almond Bun
 Orange Juice
 Chips

Meal: **Dinner (V)**
 Style: Sit-down, Chinese
 Venue: Marina Barrage

Steamboat
(A simmering pot of stock at the center of the dining table. While the hot pot is kept simmering, ingredients are placed into the pot and are cooked at the table. Typical hot pot dishes include thinly sliced meat, leafy vegetables, mushrooms and seafood. The cooked food is usually eaten with a dipping sauce).

14 JULY 2012 SATURDAY

Meal: **Breakfast (H)**
 Style: Buffet
 Venue: NIE, Rainforest Cafe

Assorted Mini Bun
 Pound Cake
 Steamed Rice Cake
 Curry Puff
 Chicken Char Siew Sou (*pastry*)
 Swiss Roll
 Coffee & Tea

Meal: **Morning Tea (H)**
 Venue: NIE, Outside Jury Room

Blueberry Jam Tart
 Mini Egg Tart
 Pandan (Screwpine) Roll
 Fruit

Meal: **Lunch (HV)**
 Style: Buffet, Peranakan (Straits-Chinese) Cuisine
 Venue: NIE, Rainforest Cafe

D.I.Y Kueh Pai Ti with Condiments (*thin and crispy pastry tart shell filled with a spicy, sweet mixture of thinly sliced vegetables and prawns*)
 Signature Nonya Laksa (*rice noodles in rich coconut gravy, Nonya refers to Peranakan women*)
 Nonya Fried Rice
 Ayam Buah Kaluak (*chicken pieces with nuts from the kepayang tree to produce a rich sauce*)
 Chicken Ngoh Hiang (*five spices spring roll*)
 Nonya Chap Chye (*mixed vegetables*) with Black Mushroom
 Udang Woku (*deep-fried prawns with garlic and ginger*)
 Grilled Dory with Sambal (*chili sauce*)
 Bo Bo Cha Cha (*dessert - sweet potato and taro in coconut milk*)
 Assorted Nonya Kueh (*local cakes*)
 Freshly Squeezed Lime Juice

Meal: **Dinner (N)**
 Style: Buffet
 Venue: Raffles Marina

Assorted Western Cold Cuts
 Half Shell with Mussel
 Prawn and Mango with Cocktail Sauce
 Angular Salad with Chicken, Mango and Avocado
 Tuna Salad
 Clam Chowder Soup
 Assorted Bread with Cheese Spread
 Grilled Rosemary Chicken
 German Sausages with Onion Sauce
 Pan Fried Salmon on Ratatouille
 Black Pepper Yakimiku Beef Udon (*Japanese noodles*)
 Buttered Seasonal Spring Vegetables topped with Toasted Almonds
 Roast Herb Potatoes
 Irish Stew Lamb
 Roast Beef with Pepper Sauce
 Assorted Tropical Fresh Fruit
 Crème Brûlée
 Mini Tiramisu
 Mango with Pomelo
 Chocolate Fondue
 Ice Tea

15 JULY 2012 SUNDAY

Meal: **Breakfast (H)**
 Style: Buffet, Malay Cuisine
 Venue: NIE, Rainforest Cafe

Nasi Lemak (*coconut rice*)
 Deep Fried Groundnuts
 Ikan Bilis (*fried anchovies*)
 Egg
 Cucumber
 Coffee & Tea

KEY

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L Late dinner available until 2100h, limited number
S Snacks (*biscuits, nuts, fruits, instant beverages, instant cereals, instant noodles available upon request*)
H Halal meal
N No pork, no lard

Daily Menu for Student Competitors (subject to change)

9 JULY 2012 MONDAY

Meal: **Lunch (H)**
 Style: Buffet
 Venue: NTU Nanyang Auditorium

Singapura Mee Siam with Gravy (*thin rice noodles (vermicelli) in spicy, sweet and sour light gravy*)
 Mantou (*steamed bread*) with Teo Chew Braised Duck & Fish Otak (*Spicy Fish Cake*)
 Chef's Mixed Fruit Cocktail Salad
 Potato Salad
 Indonesian Butter Chicken
 Ginger Crusted Fish with Lemon Mustard
 Battered Oat Prawn with Curry Leaves
 Traditional Chicken Cottage Pie
 Broccoli, Cauliflower & Carrot in Herbs
 Nonya Stewed Mixed Vegetables
 Rocky Shrimp Croquette
 Fragrant Olive & Mushroom Rice
 Selection of Fruit Mochi (*Melon, Pineapple, Yam and Strawberry*)
 Selection of English Tea Cakes (*Mango Tango, Classic Blueberry and Fragrant Pandan*)
 Selection of Pastries Melange (*Chocolate Éclair and Snowy Cream Puff*)
 Tropical Fruit Punch

10 JULY 2012 TUESDAY

Meal: **Morning tea (H)**
 Style: Buffet
 Venue: Holding Room

Tuna and Egg Mayonnaise Sandwich
 Chicken Pie
 Banana Muffins
 Apple Juice
 Chocolate Milk
 Snacks

Meal: **Lunch (V)**
 Style: Packed
 Venue: Holding room

Coconut Rice
 Omelette
 Chicken Wing
 Fish Cake
 Lemonade

Meal: **Afternoon tea (H)**
 Style: Buffet
 Venue: Holding room

Butter Cake
 Apple Turnover
 Muffins
 Orange Juice
 Chocolate Milk
 Snacks

11 JULY 2012 WEDNESDAY

Meal: **Lunch (H)**
 Style: Packed
 Venue: Jurong Bird Park

Bento Set:
 Pandan-flavoured (Screwpine) Rice
 Breaded Fish
 Broccoli Carrot
 Potato Wedges
 Apple
 Dessert

Meal: **Afternoon Snack (H)**
 Style: Packed
 Venue: NEWater

Butter Cake
 Apple Juice
 Chips

12 JULY 2012 THURSDAY

Meal: **Morning Snack (VH)**
 Style: Packed
 Venue: Exam Hall

Tomato, Chicken Ham, Cheese Sandwich
 Chocolate Milk
 Chocolate Snack

Meal: **Lunch (VH)**
 Style: Buffet, Fusion Cuisine
 Venue: NIE, Rainforest Cafe

Chef's Garden Salad
 Broccoli topped with Lychee
 Boneless Chicken with Mango Puree
 Tiger Prawns & Green Apple
 Fish Fillet with Asparagus, Bamboo Shoot
 Baked Mussels in Garlic Butter
 Spaghetti with Génoise Sauce
 Stuffed Crab Pincer
 Mini Eclair & Cream Puff
 Fruit Punch

Meal: **Afternoon Snack (VH)**
 Style: Packed
 Venue: Exam Hall

Chinese Po Lo (*chicken filling*) Bun
 Apple Juice
 Chocolate Snack

Meal: **Dinner (N)**
 Style: Buffet, BBQ Style
 Venue: NIE, Triangle

Singapore-style Satay Mee Hoon (*rice vermicelli*)
 Garlic Bread Toasts
 Honey Chicken Wings
 Black Pepper Fish Fillets
 Peranakan Chicken Satay (*meat on skewers*)
 Defu Chilli Crab Otah Otah (*spicy fish cake*)
 Teochew-style Beef Stew
 Butter Garlic Prawns
 Sambal (*chili sauce*) Stingray
 Butter Sweetcorn
 Shitake Mushroom on Skewers
 Coleslaw
 Roti Prata (*Fried flour-based pancake pancake - Plain, Egg, Cheese*)
 Coke
 Green Tea
 Mix Fruits Cocktail

13 JULY 2012 FRIDAY

Meal: **Lunch (VH)**
 Style: Packed
 Venue: Underwater World Sentosa

Chicken rice

Meal: **Afternoon Snack (H)**
 Style: Packed
 Venue: Underwater World Sentosa

Apple Almond Bun
 Orange Juice
 Chips

Meal: **Dinner (VH)**
 Style: Fastfood
 Venue: Marina Barrage

14 JULY 2012 SATURDAY

Meal: **Morning Snack (VH)**
 Style: Packed
 Venue: Singapore Zoo

Chicken Ham, Cheese, Tuna Sandwich
 Blueberry Muffin
 Apple Juice
 Snacks

Meal: **Dinner (N)**
 Style: Buffet
 Venue: Raffles Marina

Assorted Western Cold Cuts
 Half Shell with Mussel
 Prawn and Mango with Cocktail Sauce
 Angular Salad with Chicken, Mango and Avocado
 Tuna Salad
 Clam Chowder Soup
 Assorted Bread with Cheese Spread
 Grilled Rosemary Chicken
 German Sausages with Onion Sauce
 Pan Fried Salmon on Ratatouille
 Black Pepper Yakimiku Beef Udon (*Japanese noodles*)
 Buttered Seasonal Spring Vegetables topped with Toasted Almonds
 Roast Herb Potatoes
 Irish Stew Lamb
 Roast Beef with Pepper Sauce
 Assorted Tropical Fresh Fruit
 Crème Brûlée
 Mini Tiramisu
 Mango with Pomelo
 Chocolate Fondue
 Ice Tea

MEALS AT PGPR

BREAKFAST (VH)

9 - 15 July 2012

Style: Canteen, variety of dishes served
 Venue: PGPR

LUNCH (VH)

14 July 2012

Style: Canteen, variety of dishes served
 Venue: PGPR

DINNER (VH)

8 - 11 July 2012

Style: Canteen, variety of dishes served
 Venue: PGPR

KEY

- V** Vegetarian options provided
- H** Halal meal
- N** No pork, no lard

Acknowledgements

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ACKNOWLEDGEMENTS

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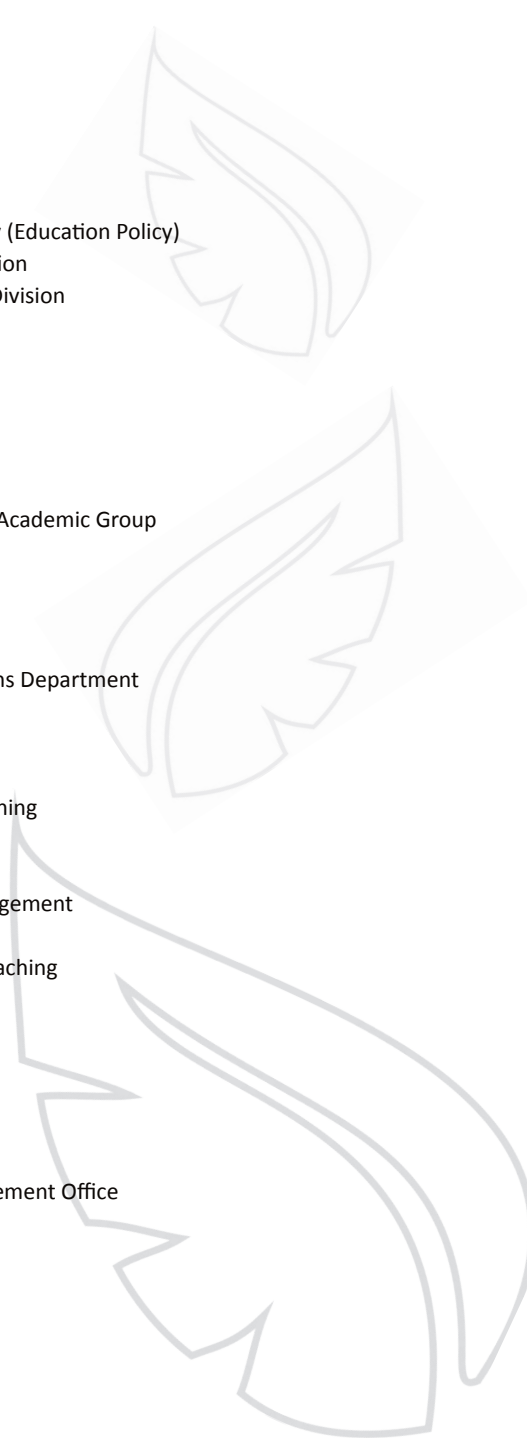
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Marina Barrage
National Museum
NEWater Visitor Centre
Peranakan Museum
Singapore Zoo
The Singapore Institute of Biology
Underwater World Singapore

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HAN Xiaoxing

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ZHANG Menglan

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ZHOU Yanjun



Notes

Notes

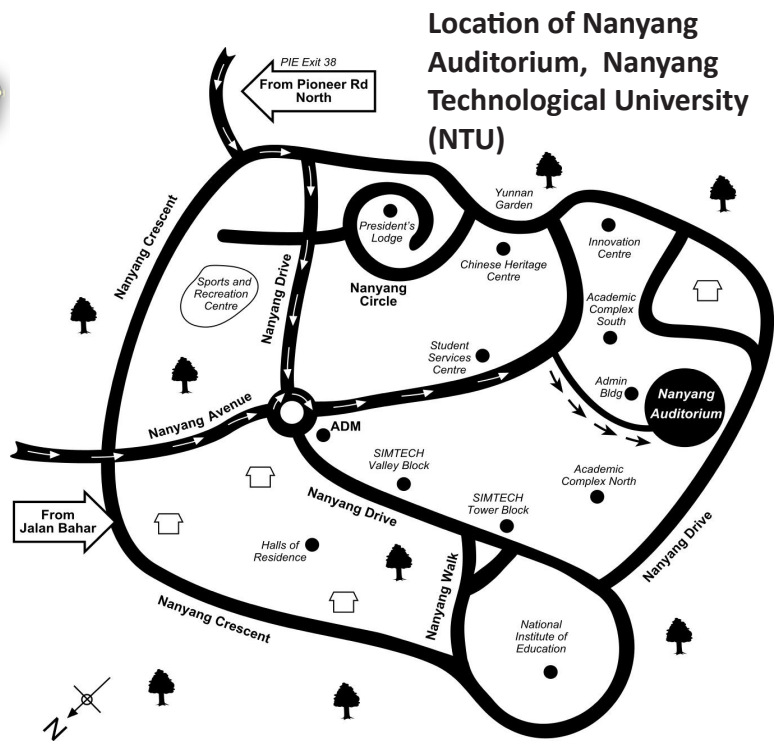
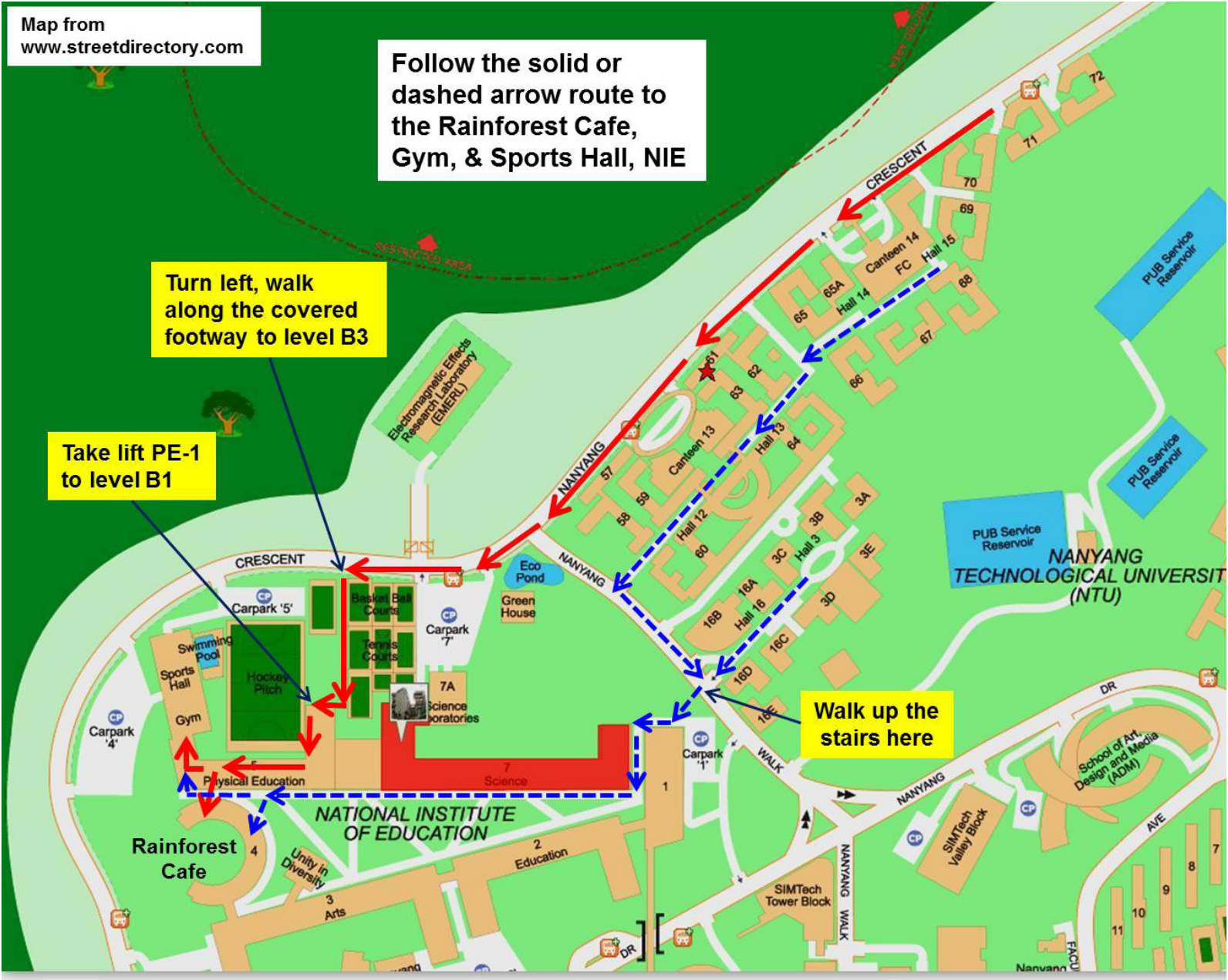
Notes

Follow the solid or dashed arrow route to the Rainforest Cafe, Gym, & Sports Hall, NIE

Turn left, walk along the covered footway to level B3

Take lift PE-1 to level B1

Walk up the stairs here



Location of Nanyang Auditorium, Nanyang Technological University (NTU)

Teams competing at the 23rd International Biology Olympiad, Singapore, 8-15 July 2012



ARGENTINA



ARMENIA



AUSTRALIA



AZERBAIJAN



BELARUS



BELGIUM



BRAZIL



BULGARIA



CANADA



CHINA



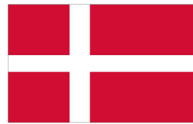
CHINESE TAIPEI



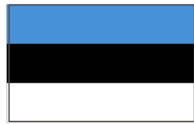
CYPRUS



CZECH REPUBLIC



DENMARK



ESTONIA



FINLAND



GEORGIA



GERMANY



GREECE



HUNGARY



INDIA



INDONESIA



IRAN



ITALY



JAPAN



KAZAKHSTAN



SOUTH KOREA



KUWAIT



KYRGYZSTAN



LATVIA



LITHUANIA



MEXICO



MOLDOVA



MONGOLIA



MONTENEGRO



NETHERLANDS



NEW ZEALAND



NIGERIA



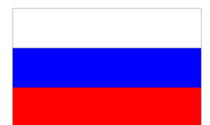
PAKISTAN



POLAND



ROMANIA



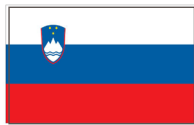
RUSSIA



SINGAPORE



SLOVAKIA



SLOVENIA



SOUTH AFRICA



SPAIN



SRI LANKA



SWEDEN



SWITZERLAND



THAILAND



TURKEY



TURKMENISTAN



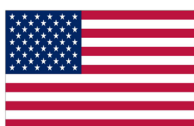
UKRAINE



UNITED ARAB EMIRATES



UNITED KINGDOM



UNITED STATES OF AMERICA

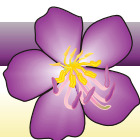


UZBEKISTAN



VIETNAM

JURY SCHEDULE



Sunday, 8 July

All Day	Arrival	Hall
11:00 - 18:00	Registration	NIE Blk 5
18:30 - 20:00	Welcome Dinner	NTU

Monday, 9 July

07:00 - 08:15	Breakfast	RF Café
08:45	Bus departs	NIE Blk 1
09:45 - 12:00	Opening Ceremony	NA, NTU
12:00 - 13:00	Lunch	NA, NTU
13:30 - Late	Vetting of Practical Tests	NIE

Tuesday, 10 July

07:00 - 09:30	Extended Breakfast	RF Café
10:00	Bus departs	NIE Blk 1
11:00 - 12:00	Visit to NEWater Plant	NEWater
13:00 - 16:30	Visit to Jurong Bird Park and Lunch	JBP
17:30 - 18:00	Meet with Competitors	NIE
18:30 - 20:00	Dinner	RF Café

Wednesday, 11 July

06:30 - 08:00	Breakfast	RF Café
08:30 - Late	Vetting of Theoretical Tests	NIE Blk 5

Thursday, 12 July

07:00 - 09:30	Extended Breakfast	RF Café
10:00	Bus departs	NIE Blk 1
10:30 - 13:00	Visit to A*STAR & Lunch	A*STAR
14:00 - 16:30	Visit to Underwater World	UWS
17:30	Meet with Competitors	NIE
17:30 - 22:30	Dinner & <i>Bhangra Night</i>	NIE

Friday, 13 July

07:00 - 08:00	Breakfast	RF Café
08:30 - 09:30	Checking Practical Scores	NIE Blk 5
09:30 - 12:00	Coordinators' Meeting	NIE Blk 5
12:00 - 13:00	Lunch	RF Café
13:30	Bus departs	NIE Blk 1
14:00 - 16:30	Visit to Peranakan and National Museums	Museums

17:00 - 19:30	Visit to Marina Barrage and Dinner	Marina Barrage
19:30 - 22:00	Special Activity: Night Kite-flying	Marina Barrage

Saturday, 14 July

07:00 - 08:00	Breakfast	RF Café
08:30 - 12:00	Checking Theoretical Test Scores & Finalisation of Medal Winners	NIE Blk 5
12:00 - 14:00	Lunch	RF Café
14:30	Bus departs	NIE Blk 1
15:30 - 18:00	Closing Ceremony	NA, NTU
19:00 - 22:30	Farewell Dinner	R. Marina

Sunday, 15 July

06:30 - 09:30	Breakfast	RF Café
Up to 12:00	Farewells and Departure	Bus to Airport

Please refer to noticeboards for announcements of any changes to the schedule. **RF Café:** Rainforest Café; for others, see overleaf.

IBO 2012 SCHEDULE

23RD INTERNATIONAL BIOLOGY OLYMPIAD SINGAPORE, 8-15 JULY



COMPETITORS' SCHEDULE



Sunday, 8 July

All Day	Arrival & Registration	PGPR
18:00 - 20:00	Dinner	PGPR

Monday, 9 July

06:30 - 07:30	Breakfast	PGPR
08:00	Bus departs	PGPR
09:45 - 12:00	Opening Ceremony	NA, NTU
12:00 - 13:00	Lunch	NA, NTU
13:30 - 16:30	Review of Lab Equipment Visit to School of Biological Sciences (SBS)	NIE NTU
16:45	Bus departs	SBS
18:00 - 19:00	Dinner	PGPR
19:00 - 21:00	Ice-breakers	PGPR

Tuesday, 10 July

06:00 - 06:45	Breakfast	PGPR
07:15	Bus departs	PGPR
08:30 - 10:00	Practical Test (Shift 1)	NIE
10:45 - 12:15	Practical Test (Shift 2)	NIE
12:15 - 13:15	Lunch	NIE
13:15 - 14:45	Practical Test (Shift 3)	NIE
15:30 - 17:00	Practical Test (Shift 4)	NIE
17:30 - 18:00	Meet with Jury Members	NIE
18:30	Bus departs	NIE
19:30 - 22:00	Dinner & <i>Social Night</i>	PGPR

Wednesday, 11 July

07:30 - 08:15	Breakfast	PGPR
08:45	Bus departs	PGPR
09:00 - 10:15	Visit to Faculty of Science	NUS
11:00 - 14:30	Visit to Jurong Bird Park and Lunch	JBP
15:45 - 16:45	Visit to NEWater Plant	NEWater
17:00	Bus departs	NEWater
18:30 - 20:00	Dinner	PGPR

Thursday, 12 July

07:00 - 07:45	Breakfast	PGPR
08:15	Bus departs	PGPR
09:30 - 12:30	Theoretical Test (Paper 1)	NIE
12:30 - 14:00	Lunch	NIE
14:00 - 17:00	Theoretical Test (Paper 2)	NIE
17:30	Meet with Jury Members	NIE
17:30 - 22:30	Dinner & <i>Bhangra Night</i>	NIE

Friday, 13 July

07:00 - 08:00	Breakfast	PGPR
08:30	Bus departs	PGPR
09:00 - 10:15	Visit to A*STAR	A*STAR
11:00 - 14:00	Visit to Underwater World and Lunch	UWS
15:00 - 18:00	Team-Building Activity: Kite-making Workshop, and Marina Barrage Tour	Marina Barrage
18:00 - 19:30	Dinner	
19:30 - 22:00	Special Activity: Night Kite-flying	Marina Barrage

Saturday, 14 July

06:15 - 07:00	Breakfast	PGPR
07:30	Bus departs	PGPR
08:30 - 12:00	Visit to Singapore Zoo	Zoo
13:00 - 13:45	Lunch	PGPR
14:00	Bus departs	PGPR
15:30 - 18:00	Closing Ceremony	NA, NTU
19:00 - 22:30	Farewell Dinner	R. Marina

Sunday, 15 July

06:30 - 09:30	Breakfast	PGPR
Up to 13:00	Farewells and Departure	Bus to Airport



A*STAR: Agency for Science, Technology and Research;
NA: Nanyang Auditorium; **NIE:** National Institute of Education;
NTU: Nanyang Technological University; **NUS:** National University of Singapore; **PGPR:** Prince George's Park Residences; **R. Marina:** Raffles Marina; **UWS:** Underwater World Singapore;

S'pore to host top biology contest

ASPIRING biologists are set to battle it out in a prestigious global contest, which is coming to Singapore for the first time.

More than 260 students from 65 countries will put their knowledge to the test by tackling problems and experiments at the International Biology Olympiad.

Held over eight days, the annual event is being organised by the National Institute of Education, the National University of Singapore and the Singapore Institute of Biology.

The last time the Republic hosted a major international science competition for secondary students was in 2006, when it organised the International Physics Olympiad.

President Tony Tan Keng Yam is patron of this year's contest, the 23rd so far. It will begin on July 8 at Nanyang Technological University.

As well as competing for the top honours, contestants and officials will also get to see the city. On the cards are visits to Marina Barrage, museums and the zoo.

Singapore has been taking part in the competition since 2001.

Its best showing was last year in Taipei, where it finished third behind the United States and Taiwan.

MATTHIAS CHEW



Shoppers walking along Orchard Road. It's d

Retailer in Gre

Trade association ch
8% to 10% increase

Biology students face off in global challenge

THE top biology students from 59 countries are gathered here this week for the 23rd International Biology Olympiad.

The competition, which Singapore is hosting for the first time, will challenge pre-university students with theoretical problems and laboratory experiments in areas such as ecology and classical biology.

President Tony Tan Keng Yam, the patron for the event, was at its official opening at the Nanyang Technological University's Nanyang Auditorium yesterday.

About 1,000 people were at the opening, which featured Chinese and Malay dances, a brass band medley and a lion dance.

The participants also took to the stage in their respective national costumes, drawing cheers and applause from the crowd.

Ever since Singapore began sending a team to this Olympiad in 2001, it has fared well, winning an average of a gold and a silver each year. Last year's team clinched three

golds and a silver.

Despite additional pressure to perform as hosts of the event, this year's team is keeping a level outlook and trying not to let the stress get to them.

Team member Zhang Hui Ting, an 18-year-old student from Raffles Institution, said: "We just want to do our best."

Singapore tops biology olympiad

Team wins four golds to tie for No. 1 spot with the US; RI student is top scorer

Sherri Lee

The 23rd International Biology Olympiad (IBO) ended on a high note for Singapore yesterday, with its students coming up tops in the prestigious competition.

The Singapore team won four gold medals, placing first in a field of 236 students from 59 economies along with the United States, which also scored four golds.

China, Taiwan and South Korea tied for second place, with three golds and one silver, and Estonia and Finland tied for third with two golds and two silvers.

Raffles Institution (RI) student Nol Swaddiwudhipong finished as the top scorer of the Olympiad.

It is the first time a Singapore team has taken the top spot, as well as the first time the Republic has won four gold medals in one year. Singapore was third last year.

Singapore was also hosting the event for the first time. Over the last week, promising pre-university biologists put their skills to the test in a series of challenging theoretical and practical tasks at the National Institute of Education.

The competition was keen, especially as the participants had all won their own countries' national biology olympiads to be selected for the international contest.

The other members of the Singapore team were Zhang Hui Ting and Mao Haitong, also from RI, and Lim Yuan Wei from Hwa Chong Institution. They are all 18 years old, and in JC 2.

The four were selected from more than 300 students who took part in the Singapore Biology Olympiad (SBO) last year.

Emotions ran high at the awards ceremony, as participants waited to

hear the results. "It was agonising," groaned Nol, who waited over 1½ hours to find out he had won.

The others in the team placed sixth, 11th and 23rd individually.

The tests required teams to apply their thinking skills to original data from research papers.

Competition regulations disallow more than two weeks of intensive preparation, so they had been studying hard since late June.

Nol said they were mentored by professors from the National University of Singapore, Nanyang Technological University and the National Institute of Education; SBO and IBO alumni, and their own schoolteachers.

Even though the olympiad has finally come to a close, there will be no rest for the weary – the team's next challenge will be the looming preliminary examinations and the dreaded A-levels.

At least for now, though, the team will take a well-deserved break before hitting the books again. "We will just revel in the moment first," said Hui Ting. Haitong laughed, adding: "I think it will sink in tomorrow... Because school starts again next week!"

✉ ljsherri@sph.com.sg



Team members (from left) Zhang Hui Ting, Mao Haitong, Nol Swaddiwudhipong and Lim Yuan Wei with their medals. It is the first time a Singapore team has taken the top spot, as well as the first time the Republic has won four gold medals in one year. Raffles Institution student Nol was also the Olympiad's top scorer.

ST PHOTO: CHEW SENG KIM

PHOTO:
PATHLIGHT
SCHOOL

Acting Minister for Community Development, Youth and Sports Chan Chun Sing signing a "VVIP Wall" at Pathlight School yesterday, with Autism Resource Centre president Denise Phua looking on.



\$480,000 for the autistic

More than \$480,000 has been raised for autistic people in the seventh annual fund-raising drive led by the Autism Resource Centre and Pathlight School. The amount targeted was \$300,000.

Mr Chan Chun Sing, Acting Minister for Community Development, Youth and Sports, and Senior Parliamentary Secretary (Community Development, Youth and Sports, and Foreign Affairs) Sam Tan were present at yesterday's event, called A Very Special Walk 2012.

It drew more than 800 participants. Rain meant the planned

walk to Bishan Park was cancelled, and replaced with game stalls and performances at autism-focused Pathlight School in Ang Mo Kio.

The money raised will fund the centre's Employability and Employment Centre, which was launched in March and aims to equip autistic youth and adults with employable skills.

"People with autism and other special needs want to be independent, just like us," said Moulmein-Kallang GRC MP Denise Phua, who is the autism centre's president.

Walter Sim

NIE hosts the 23rd International Biology Olympiad

By Mr Timothy Tan, Natural Sciences and Science Education Academic Group

Having hosted the International Physics Olympiad in 2006, the National Institute of Education (NIE), Singapore played host to the world for the 23rd International Biology Olympiad (IBO 2012), from 8 to 15 July 2012.

In partnership with the Ministry of Education (MOE), Singapore, the event was co-organised by a dedicated team of professors and staff from NIE/Nanyang Technological University, Singapore and the National University of Singapore (NUS). The team led by Co-Chairs, Associate Professor Shirley Lim from NIE and Associate Professor Lim Tit Meng from NUS saw the global participants delight in a myriad of exhilarating activities. The students were accompanied by adult delegates, mostly high-school educators and professors, who formed the international jury panel that vetted and translated the test papers into their students' native language. All participants were hosted on excursions of interest, particularly biological ones, with a mix of cultural indulgence throughout their stay.

IBO 2012 saw 234 student competitors from 59 countries taking part in a gruelling series of practical tasks and theoretical tests that assessed their knowledge and skills across various disciplines of in the biological sciences, grouped into four key areas: Cell and Molecular Biology; Microbiology and Biochemistry; Plant Diversity, Anatomy and Physiology; and Animal Anatomy and Ecology. Concluding on a high-note, participants are looking forward to the next Olympiad to come.

Kudos to Teams Singapore and USA, who each garnered the maximum of four gold medals, with Singapore's Mr Nol Swaddiwudhipong securing the Top Gold Medal.

For more information, visit www.ibo2012.org



Above: The Theoretical Tests were conducted en masse in the Gymnasium



Above: Team-building workshop for student competitors to construct kites culminating in Night-kite flying at the Marina Barrage.



Above: Practical Tasks conducted in the Natural Sciences and Science Education AG's science laboratories. The laboratories were set up with individual partitions for each student in each of the four tasks



Above: Student Competitors assembled and waiting to enter the Nanyang Auditorium for the "Competitors' March-past"



Above: Members of the International Jury in deliberation at the NIE Sports Hall, transformed for the purpose with networked ICT facilities, with wireless classroom participation 'Clickers' used for voting, and a range of refreshment and relaxation amenities for the long sessions lasting through the night



Above: Student competitors (and quite a few Jury members) letting their hair down during Bhanga Night at the NIE Triangle after completing all the tests



Above: Singapore's Mr Nol Swaddiwudhipong receiving his Gold Medal from Ms Chan Lai Fung, Permanent Secretary (Education Policy), MOE, Guest-of-Honour at the Closing Ceremony



Above: Co-chairs of the IBO 2012 Organising Committee, Associate Professor Shirley Lim from NIE (right); and Associate Professor Lim Tit Meng from NUS giving their Welcome Address

Below: Team Singapore. From L-R: Mao Haitong, Nol Swaddiwudhipong, Lim Yuan Wei, and Zhang Hui Ting



Teamwork

To give the highest recognition to teams whose outstanding teamwork in a major University project or event brought success and honour to the University.



The Nanyang Awards are given in recognition and celebration of the outstanding achievements and contributions of faculty, staff and students. The prestigious Awards were launched in 2005.

The design of the Trophy is inspired by the outspread wings of an eagle in flight. The majesty, grace and power of the soaring eagle represent our desire to fulfill our mission in a borderless domain.

The award symbolizes a deep sense of passion and a single-minded resolve to overcome obstacles and achieve excellence.



23rd International Biology Olympiad Organizing Committee

The 23rd International Biology Olympiad (IBO) was hosted by Singapore from 8 - 15 July 2012. This event was jointly organized by NIE, NTU and NUS with support from MOE. Participants from 59 countries (a total of 440 participants) attended IBO 2012, which had an extremely complex scientific and social programme that required elaborate co-ordination and detailed planning. There were 34 Committee Members, 23 of whom were NTU colleagues, in the IBO Organising Committee, inclusive of the Scientific Committee. The Organizing Committee made it their mission to ensure that student competitors were challenged with good quality biological science practical tasks and gruelling theoretical questions so that Singapore is recognized for her excellence in biology education. Countless hours were spent to ensure that all equipment worked; creative media and publicity materials were produced to publicise the event and participants brought back memorable souvenirs. All

these contributed positively to their experience

with NTU. The participants not only experienced the well-planned physical infrastructure NTU provides, they were warmly welcomed by the University's community. The dedication and spirit of excellence exhibited by the members of the Organising Committee are highly commendable. Their self-sacrificial attitude has inspired many colleagues and demonstrated clearly what it means to give one's best in every project.



Battle of the Biologists

Aspiring biologists gathered at the National Institute of Education to compete in the 23rd International Biology Olympiad, hosted by Singapore for the first time.

Young budding biologists from the world over gathered in Singapore for the first time during the prestigious International Biology Olympiad (IBO) held from 8 to 15 July. A total of 234 of the world's most promising pre-university/senior high school biology students and 203 officials from 59 countries made Singapore their home during this period.

The student participants were housed in NUS dormitories, whilst the jury members and officials resided in NTU hostels during IBO 2012 Singapore. The eight-day event with rigorous practical and theoretical tests, social and cultural programmes and business meetings, was organised by a committee co-chaired by Associate Professor Shirley Lim from

the National Institute of Education (NIE), and Associate Professor Lim Tit Meng from the National University of Singapore (NUS). Members of the Organising Committee comprised professors and staff from NIE, and the Department of Biological Sciences at NUS, as well as other staff members from various departments in NTU and NUS.

The opening ceremony held on 9 July at NTU's Nanyang Auditorium, was graced by His Excellency, President Tony Tan Keng Yam, who was also the Patron of the 23rd IBO.

IBO 2012 Singapore ended on a high note with the Singapore team garnering four gold medals for the first time, ranking

first of the 59 countries that competed. In addition, the top gold medal was awarded to Singapore competitor, Mr Nol Swaddiwudhipong – this is the third time since Singapore's first venture into the IBOs in 2001 that it has won the top medal. The competition was closely fought as all the participants were winners at their respective countries' National Biology Olympiads. The Singapore delegation was led by Dr Beverly Goh from Natural Sciences and Science Education, NIE, and Dr Ng Ngan Kee from the Department of Biological Sciences, NUS. The team was also mentored by a team of professors from NIE and NUS, and alumni from previous IBOs.

ABOUT THE IBO

The International Olympiads for Science gather the brightest students from around the world, as they compete in stimulating challenges. Students demonstrate their proficiency of scientific concepts through rigorous theoretical tests whilst their experimental skills are also tested through practical tests.

The International Biology Olympiad (IBO) is a competition for secondary school students where they tackle biological problems and conduct biological experiments. It is necessary for the students to be interested in biology and to have traits of inventiveness, creativity and perseverance. IBO tries to challenge and stimulate these students to expand their talents and to promote their career as scientists.

The IBO aims to bring together young people from over the world in an open, friendly and peaceful mind. Four students from each participating country are sent for the competition. These participants, who are winners of the countries' respective national competitions, are accompanied by two team leaders.



Biology students from around the world participated in IBO 2012 Singapore.

DID YOU KNOW THAT...?

- Singapore participated in the IBO for the first time, as an observer country, in the year 2000. A year later, Singapore competed for the first time, winning two gold and two silver medals and ranking third out of 38 countries.
- The recruitment of IBO volunteers began in February 2012 with information sessions being held at NTU and NUS. Close to 200 students applied as volunteers, including foreign students studying in Singapore. A total of 106 volunteers were finally selected.
- The youngest volunteer was 16 years old, whilst the oldest was 30.
- A total of 83 female and 151 male students participated in IBO 2012 Singapore, with 24 of them celebrating their birthdays in July. Of these, four had birthdays that fell within the IBO period!
- The youngest competitor was Emmanuel Oludowole, a 13-year-old, from Nigeria. Another young competitor was 14-year-old Elmar Mammadli from Azerbaijan.
- A pair of twins, Marko and Mirko Pejatovic from Montenegro, participated in the IBO.
- Competition regulations state that participants are not allowed more than two weeks of intensive preparation, so they had been studying hard only from late June.
- Student participants had to surrender their electronic devices to the officials, and only received them at the end of the Olympiads.
- Team Spain brought their own footballs and posed with them in photographs.
- Four challenging and innovative Practical tests in the fields of Cell and Molecular Biology, Microbiology and Biochemistry, Plant Diversity, Anatomy and Physiology, and Animal Anatomy and Ecology were designed to test the students' practical skills.
- Students wore multi-coloured laboratory coats which categorised them into different groups. Each team in each group had a representative who rotated through each practical test in four shifts, which lasted one whole day.
- In the Plant Diversity part of the practical test, students had to answer questions on a durian seedling of which many of them were unfamiliar with. Whilst many may have seen a durian fruit, probably none had ever seen a durian seedling! The seedlings used for the practical task were germinated by NIE's Dr Shawn Lum, a few months before the Olympiad.
- In the ecology section of the Animal Anatomy and Ecology practical task, students had to figure out the structure of the simulated benthic communities by counting *mahjong* chips in different samples. One student even submitted his/her *mahjong* chips together with the answer sheet!
- The Theoretical Tests were held at NIE's gymnasium which was converted into an examination hall to accommodate all the students. The tests consisted of two three-hour long papers. Given the lengthy duration, students were provided with snacks and drinks.
- IBO 2013 will be held in the city of Bern, Switzerland.