Professional Engineers Ontario

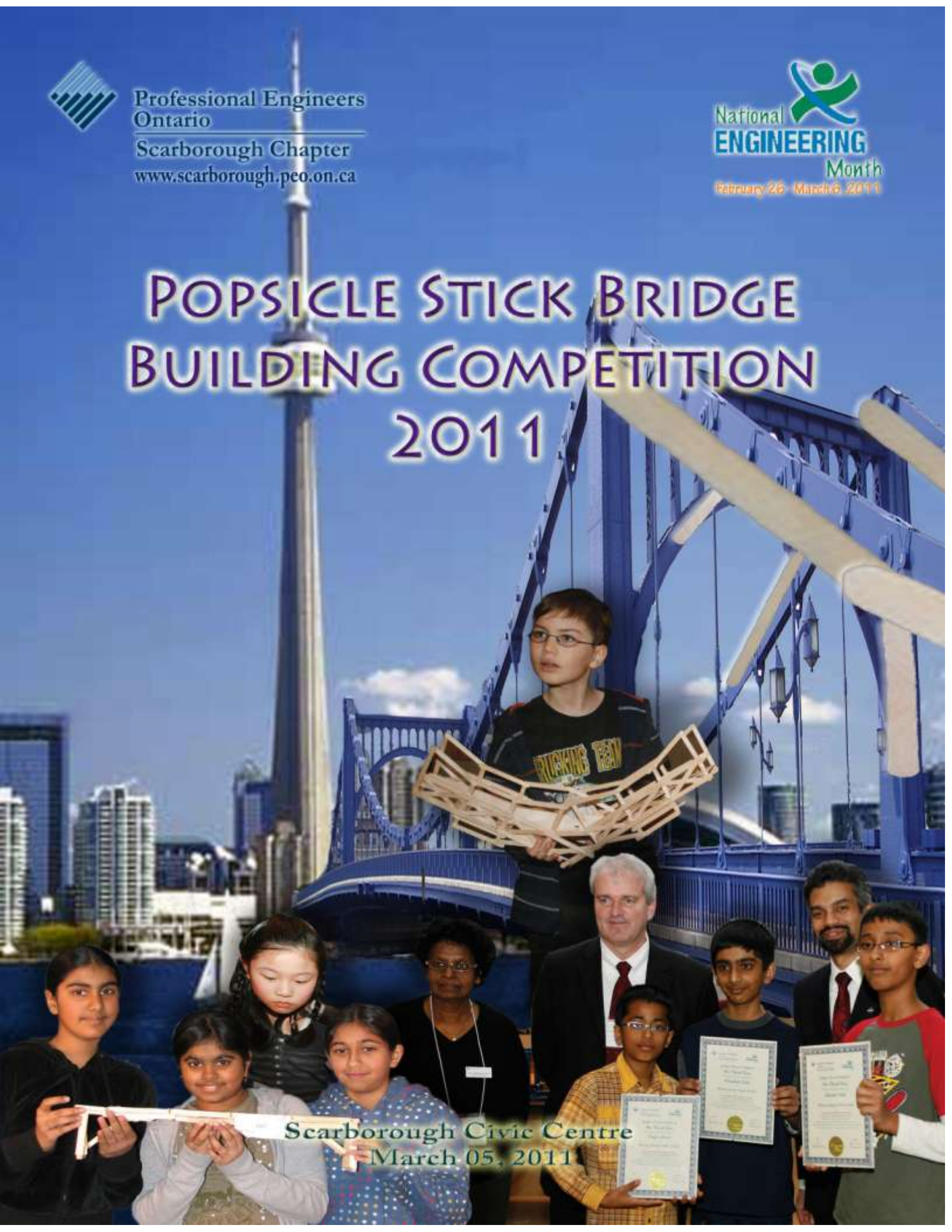
Scarborough Chapter

www.scarborough.peo.on.ca

National ENGINEERING Month

February 28 - March 6, 2011

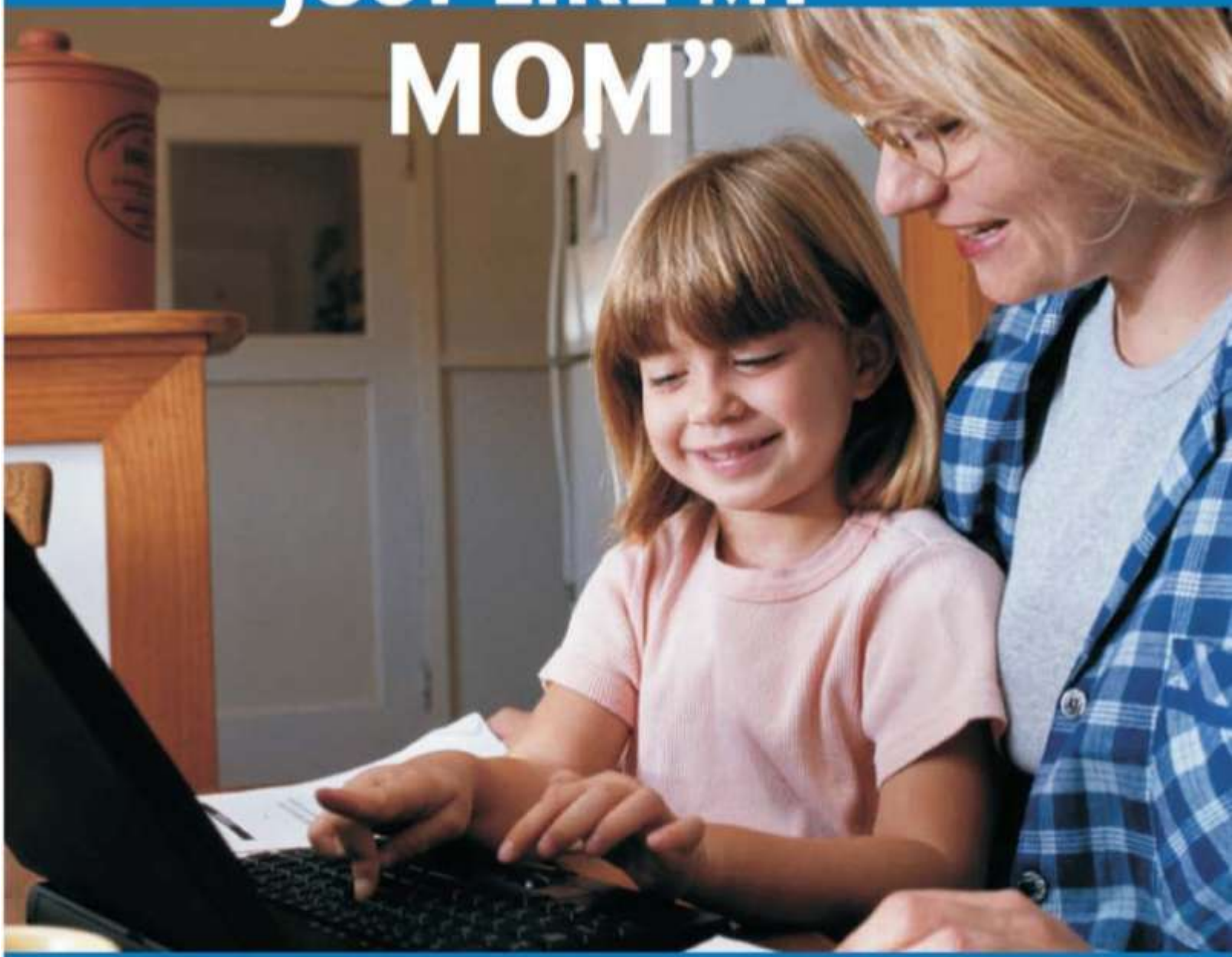
# Popsicle Stick Bridge Building Competition 2011



Scarborough Civic Centre

March 05, 2011

# "I WANT TO BE AN ENGINEER JUST LIKE MY MOM"



Professional Engineers
Ontario

For more information on Engineering, please contact us at: 416-224-1100 or 1-800-339-3716
www.peo.on.ca

# Popsicle Stick Bridge Building Competition
# Scarborough Civic Centre - March 5, 2011

## Agenda

| | |
|---|---|
| 10.30 AM: | Check-in Registration |
| 12.00 PM: | Introduction - Master of Ceremonies<br>**T. Pompilian**<br>**Lipika Saha** |
| 12.05 PM: | Welcome Address - Project Manager<br>**Uthayan Thurairajah** |
| 12.10 PM: | Breifing of Contest Procedures |
| 12.15 PM: | Competition Begins |
| 3.15 PM: | Chapter Chair's Address<br>**Asogan Narayanapillai** |
| 3.20 PM: | Message from Guests |
| 3.50 PM: | Distribution of Prizes |
| | Performance Assessment |
| 4.20 PM: | Special Prizes for Teachers |
| 4.30 PM: | Group Pictures of Winners |
| 5.00PM: | Vote of Thanks<br>**Badresh Modi** |

## Distinguished Guests

**Hon Chin Lee - Councillor**
Scarborough-Rouge River - Ward 41

**Hon. Dr. Raymond Cho – Councillor**
Scarborough-Rouge River - Ward 42

**Eric Yao, P. Eng., Senior Engineer**
Ministry of Transportation

**Maj.(Ret'd) Corneliu Chisu, M.Eng., P.Eng. FEC**
Vice President - PEO

**Thomas Chong, M.Sc., P.Eng., PMP**
Councillor, PEO

**Denis Carlos, MBA., P.Eng., FEC**
Councillor, PEO

**Dr. Santosh Gupta, PhD., P.Eng., FEC**
Councillor - Lieutenant Governor Appointee, PEO

**Ministry of Education**

Minister

Mowat Block
Queen's Park
Toronto ON M7A 1L2
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Facsimile (416) 325-2608

**Ministère de l'Éducation**

Ministre

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Toronto ON M7A 1L2
Téléphone (416) 325-2600
Télécopieur (416) 325-2608

Ontario

March 5, 2011

**To the Participants at the Scarborough Chapter of Professional Engineers Ontario Eighth Annual Popsicle Stick Building Contest:**

On behalf of the Ministry of Education, I would like to extend my congratulations and very best wishes to all of you who are attending this special event.

The Scarborough Chapter of PEO is to be commended for conducting this contest to make students from grades 3 to 8 even more aware of the engineering profession. I would also like to congratulate all the students who competed in this exacting and interesting challenge, as well as those who supported them.

I offer many thanks to the organizers, sponsors, supporters and community members who have been, and continue to be instrumental in making this event a meaningful celebration.

Sincerely,

Leona Dombrowsky

Leona Dombrowsky
Minister of Education

**Ministry of Transportation**

Office of the Minister

Ferguson Block, 3rd Floor
77 Wellesley St. West
Toronto, Ontario
M7A 1Z8
(416) 327-9200
www.mto.gov.on.ca

**Ministère des Transports**

Bureau du ministre

Édifice Ferguson, 3e étage
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Toronto (Ontario)
M7A 1ZA
(416) 327-9200
www.mto.gov.on.ca

Congratulations on participating in this year's Popsicle Stick Bridge Building Competition hosted by the Scarborough Chapter of Professional Engineers Ontario. This event is a wonderful opportunity to showcase your team building skills and creativity. It is also an opportunity to have fun!

I am very proud of everyone for participating today. Regardless of the outcome, you should all be commended for your efforts and dedication. In addition, I want to thank the event organizers for all of their hard work and the teachers and parents for their support.

As Minister of Transportation, I wish you the best of luck in today's competition and in your studies.

Sincerely,

Kathleen Wynne
Minister

Professional Engineers
Ontario
Scarborough Chapter

DEAR YOUNG BRIDGE BUILDERS OF THE FUTURE,

During the National Engineering Month, the purpose of which is to create awareness of Engineering among school children, the Scarborough Chapter of Professional Engineers Ontario organizes and conducts a contest among school children of Grades 3 to 8, to design and build a bridge using Popsicle Sticks and White Glue.

Over the years of this annual contest, the present one being the 8th, we have seen the imagination and creativity of you all children advancing forward by making stronger bridges every time. Many of you are participating repeatedly which shows that you enjoy playing with Popsicle Sticks and White Glue to put your creative ideas together and use the lessons learnt at previous occasions to improve and construct more efficient bridge and present for evaluation by experts.

In the process of designing and building this model bridge, the children are getting a hands on feel to understand various factors required to create a real three dimensional object as opposed to sketching or drawing only.

Big thanks goes to the Teachers and Parents to have encouraged the children to spend time in constructing an object out of simple material and present to this event, which in turn creates a passion for "Engineering" – a hidden factor in everything we use daily.

On behalf of Professional Engineers Ontario, I wish to congratulate all those who participated in this 8th Bridge Building Contest, thereby proving your potential to become "Great Engineers of Canada" in the future.

N. Asogan, P.Eng.
Chair – Scarborough Chapter - PEO

# Another Bridge to Cross

*Khushbu Ketan Purohit*

A bridge is a structure built to reach one point to another; usually to cross obstacles like a body of water, valley or road. Designs of bridges differ depending on the function of the bridge; the environment of the land where the bridge is made, the material and the resources available to build it. There are six main types of bridges: Beam bridges (The Lake Pontchartrain Causeway in United States), cantilever bridges (The Forth Bridge in the east of Scotland), arch bridges (The Dom Luís Bridge, or Ponte Dom Luís or Ponte Dom Luís, Portugal), Suspension bridges (Rainbow Bridge in Tokyo), cable-stayed bridges (The Millau Viaduct , France) and truss bridges (The Bridge over the River Kwai , Thailand). Beam bridges are mainly used for smaller spans. The strongest type of bridge for short distances is an arch bridge. For medium sized obstacles it is a cable stayed bridge. And for the longest span it is the suspension bridge.

These bridges can be classified by how the forces of tension, compression, bending, torsion and shear are distributed . A bridge's success can be measured by the amount of load carried. A bridge's success will be location and traffic dependent. The life-time cost is composed of materials, labor, machinery, engineering, cost of money, insurance, maintenance, refurbishment, demolition, recycling, replacement, and the rate of remains and reuse of components.

There are also moveable bridges. Movable bridges are generally built over waterways. They build them because it would be impossible or unreasonable to build a fixed bridge high enough for water to pass under it. The most common types of movable bridges are the lifting, bascule, and swing bridges. The Lifting Bridge (famous aerial lift bridge in Duluth, Minnesota) is made of a stiff structure carrying the road. The bascule bridge (The Galata Bridge in Istanbul, Turkey) can be in one length or in two halves meeting at the center. It is made of a stiff structure mounted at the abutment on a straight beam, about which it swings in an upright arc. The swing bridge (famous swing bridge in Belize City) is usually mounted on a pillar in midstream and swung parallel to the stream to allow water passage.

In this essay we learned that:

Bridges are made to reach one point to another. There are six main types of bridges. That each bridge is made to cross a certain distance. These types of bridges can be classified by how they use the five forces. There are also moveable bridges which are built mostly over waterways so that the water can pass underneath the bridges. A bridge's success is its saving compared to the cost of building it

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**MMM GROUP is pleased to support** the Scarborough Chapter of PEO and its Bridge Building Competition 2011. Congratulations to all of the participants for their efforts.

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# The Contest

- **Daphne Yang**

Last year's bridge building contest was — Something…

Teams were made. Bridges were built. Troubles were had, and along with those troubles came an amazing experience with friends and competitors.

For me, it started as a science project. I designed an arch bridge with some friends and our teacher, Mr. Johnson, thought it was a great idea. But a problem arose when we realized that creating an arch bridge out of popsicle sticks would be difficult.

We had a slow start, this happened, then that happened, and the next thing we knew, we had a badly made half of the bridge. Apparently, my teammates had faith that the bridge would hold, because I sure didn't. We all figured that entering the contest would be fun. But, of course, if you know my friends and me at all- which you don't- we couldn't enter the same way everyone else did.

The three of us chose the longest name ever- *The Bridge at the Centre of the Universe*. At the contest, they expanded the title margins just for our bridge. We always had this need to be *different*, and to be seen. The name was the backup means for that, if we didn't.

We made the other half of the bridge as badly as the first half; if we didn't, the bridge would be unbalanced. Then we managed to fix both halves of the bridge on the day before contest, put the halves together, and not realize that our bridge had gone over the weight limit until the next day at the contest.

You can probably guess what happened next. We were told that our bridge was too heavy and that we had to cut off material. This took away from part of our design, but the judges believed that our bridge could potentially surpass the first weights. The first thing we did when we were told? We laughed and told everyone that we 'broke the machine'. Or, that we *would* break it, according to the judges.

Boy, were the judges wrong. Our bridge only held about two hundred Newtons. The first machine went to a thousand; the second went higher. Were we humiliated? Not a bit. Okay, I lied. We were, but we laughed through it. We had a great design; we just didn't build it right. We made it to the bottom six of the rulings list.

Still, even though our bridge hadn't done as well as we- well, *they*, being my teammates and teachers- expected- I wasn't expecting to come near winning- we still had an awesome time. We're doing it again this year, and this time, we're going to do it right. The same three of us. This time, we're going to do better than bottom six.

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*Making Connections*

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# Bridge for Tourism

*Narayanapillai Asogan, P.Eng*

The term "Bridge" gives the immediate reaction as a piece of engineering for crossing a river, a valley etc. mainly connected with transport.

In Canada, at the Western Province – British Columbia, there is a bridge called "Capilano Bridge and is big tourist attraction, and money earner. There are toll bridges where one has to pay to cross by a vehicle. However at this bridge one has to pay to enter a park where the bridge is constructed and the fee includes walking across this bridge.

The original bridge – a suspension bridge was constructed in about 1889 by a Scottish Civil Engineer George Grant Mackay. The bridge was made of Hemp which is a plant fiber. Later it was replaced with a steel wire rope bridge in around 1903.

*Capilano Bridge*

It spans 136 meters across Capilano River and 70 meters above. The present bridge is made of steel wire ropes, wooden deck with non slippery covering and guarded with wire mesh protection at the sides. Over 800,000 tourists visit the park and the bridge annually.

In addition to this suspension bridge, there are other bridges of wooden construction covering the tree top areas – called "Tree Top Adventure"

It is interesting to see the anchoring system of the Capilano Suspension Bridge and construction of tree top adventure bridges.

*Tree Top Adventure*

*Anchoring of Capilano Bridge*

# Howrah Bridge

Popularly known as the Rabindra Setu, Howrah Bridge is an engineering marvel and is counted amongst the busiest cantilever bridge in the World. Observing a daily traffic of about 60,000 vehicles and innumerable pedestrians, Howrah Bridge has equaled its position to Sydney Harbor Bridge. But the later can never dream of such traffic. The bridge spans the Hooghly River in West Bengal, India. The bridge connects Kolkata and Howrah and is the lifeline of the city.

*History:*

The Old Howrah Bridge, Floating Pontoon Bridge was constructed in 1874. Essentially, it had two portions. For the convenient plying of man and traffic, the pool was connected as a whole. However, the bridge was unfastened every day, particularly during night for steamers, boats and other aquatic vehicles to ply. From 19th August, 1879, the bridge was illuminated by fixing electric poles at the center. This was done by using the electricity rendered from the dynamo at the Mallick Ghat Pumping Station. The Bridge was then 1528 ft. long and 62 ft. wide. On both sides were pavements 7 ft. wide for the sake of pedestrians. The 48 ft. road in between, was for plying of traffic.

The new Howrah Bridge was constructed in 1939 and was opened to traffic in 1943. It was constructed at an approximate cost of Rupees 25 million (INR) (CAN$545000), and was built from 26,500 tons of steel. It is a Steel Truss Cantilever bridge. Its cantilevers project from piers and are connected by girders. The bridge was erected during World War II to give Allied troops access to the Burmese front, replacing an earlier pontoon bridge that opened to let river traffic through.

*Today's Scenario:*

The eight-lane bridge carries a steady flow of more than 100 thousand vehicles and 2 million commuters every day. The best way to enjoy its stately beauty is to view it from the middle of the river, a rare stunning beauty; which you have to copy in your mind since photography is strictly prohibited due to security reasons. The ferries running from below Howrah Station are a more convenient way to cross the river and give a good view of the bridge.

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Prize Winners BBC 2010

# BBC 2010 Results - Juniors

## Bridge Performance

| RANK | BRIDGE | SCHOOL | TEAM | SELF WEIGHT (grams) | BREAKING LOAD (N) | PERFORM-ANCE FAC-TOR N/gm |
|---|---|---|---|---|---|---|
| 1 | McKinnon Bridge | McKinnon Public School | Dhyey Bhavsar | 259 | 1490 | 5.75 |
| 2 | Olympic Spirit Bridge | North Bridlewood Jr Public School | Thomas Lamanna | 258 | 1280 | 4.96 |
| 3 | Mighty Bridge | Churchill Heights Public School | Khushbu Ketan Purohit<br>Veena Samuganthan | 291 | 1220 | 4.19 |

## Judged for Bridge Building

| RANK | BRIDGE | SCHOOL | TEAM | JUDGES MARKS |
|---|---|---|---|---|
| 1 | McKinnon Bridge | McKinnon Public School | Dhyey Bhavsar | 89 |
| 2 | Shiv's Bridge | Bellmere Public School | Shiv Patel | 87 |
| 3 | Olympic Spirit Bridge | North Bridlewood Jr Public School | Thomas Lamanna | 84 |
| 3 | Elite Bridge | Woburn Junior Public School | Ashutosh Patel<br>Harshil Modi<br>Srijav Shah | 84 |

# BBC 2010 Results - Seniors

## Bridge Performance

| RANK | BRIDGE | SCHOOL | TEAM | SELF WEIGHT (grams) | BREAKING LOAD (N) | PERFORM-ANCE FAC-TOR N/gm |
|---|---|---|---|---|---|---|
| 1 | Bridge to Nowhere | Gordon A.Brown Middle School | Saeyon Mylvaganam<br>Stuart Craddock<br>Alejandro Schugurensky | 215 | 1190 | 5.53 |
| 2 | MDK Bridge | J B.Tyrrell Senior Public School | Mitch Rondolph Sulte<br>Karthik Sunderraju<br>Daneil Micheal Best | 247 | 1120 | 4.53 |
| 3 | Quadruple Way | J.B.Tyrrell Senior Public School | Edward Lu<br>Richard Du | 250 | 1110 | 4.44 |

## Judged for Bridge Building

| RANK | BRIDGE | SCHOOL | TEAM | JUDGES MARKS |
|---|---|---|---|---|
| 1 | Quadruple Way | J.B.Tyrrell Senior Public School | Edward Lu<br>Richard Du | 93 |
| 2 | Can-India Bridge | Churchill Heights Public School | Vanshil Shah | 90 |
| 3 | SMCS Spartan Sigma | St Michael's Choir School | Andrew Di Santo<br>Tim Aure | 89 |

Best Wishes

# Young Bridge Builders

# 2011

**Dr Pon Sivaji MD FRCPC ABIM**

Specialist – Internal Medicine & Critical Care

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Scarborough, Ontario, M1W 2R5
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Fax: 416 298 4533

1366 Yonge Street # 306
Toronto, Ontario, M4T 3A7
Tel: 416 962 5545
Fax: 416 962 6676

# Contestants Juniors

## BELLMER JUNIOR PUBLIC SCHOOL

**Het**
- Het

**CE Bridge**
- Dvij Patel
- Rushi Patel
- Parmin Patel

**Om Bridge**
- Shiv Patel

## BERNER TRAIL JR PUBLIC SCHOOL

**KST Armour Bridge**
- Kirushan Yoganathan
- Saheb Hussein
- Thulasihan Sivarajah

## BEVERLY GLEN JR PUBLIC SCHOOL

**Kodiak 1**
- Sara Ensan
- Katherine Ching

## BRIDLEWOOD JR. PUBLIC SCHOOL

**8 Bit Bridge**
- Nirujan Gnanendran
- Andrew Wang
- Tom Duan

## CEDARWOOD PUBLIC SCHOOL

**Rainbow Bridge**
- Shrijav Shah

## CHARLOTTETTOWN JPS & CENTENNIAL ROAD JPS

**R.E.D. Bridge**
- Rashad Baksh
- David Moffett
- Evan Cromien

## CHURCHILL HEIGHT PUBLIC SCHOOL

**Nisa**
- Saiyam Patel

**Ancient Bridge**
- Druv Patel

**The Golden Bridge**
- Parth

## CORNELL JR. P. SCHOOL

**Dragon Bridge**
- Sarjak Thakkar

## CRESTVIEW PUBLIC SCHOOL

**Ontario Bridge**
- Vishwa Patel
- Zeal Patel

## CUMMER VALLEY MIDDLE SCHOOL

**Wooden Magic**
- Nikola Damjanovic
- Stefan Damjanovic

## DAVID LEWIS PUBLIC SCHOOL

**TBB**
- Janet Wei
- Lan Jing Li

**Wonder Bridge**
- Eva Xie

**Destiny**
- Jolie Wong

**Fantacy Flame**
- Jolie Wong
- Michelle Kong

**Flying Water Bridge**
- Michelle Jie Yu Kong

**Garden Galaxy**
- Marley Baker-Wright
- Maia Knight

**David Lewis Bridge**
- Jessica Jeng
- Lydia Lai

## Jr. BELLMERE PUBLIC SCHOOL

**Ellisbridge**
- Zeal

## MCKINNON PUBLIC SCHOOL

**McKinnon Returns**
- Dhyey Bhavsar

## NORMAN INGRAM PUBLIC SCHOOL

**Bridge Makamoo**
- Devan Srinivasan
- Lucas Rodrigues
- Daniel Wong

## NORTH BENDALE JR. PUBLIC SCHOOL

**Bendale Bond Bridge**
- Dhruv Upadhyah

# Contestants Juniors

## SATHYA SAI SCHOOL OF CANADA

**Master Bridge**
- Rishi Narevetla
- Sathursan Santhirakumar
- Sagaanan Ganeshathasan

**Quick Silver Bridge**
- Sai Gayathri Metla
- Raman Jain
- Anushri Mahadeo

**Rainbow Magic Bridge**
- Shaayini Shanawaz
- Krishani Kirubakaran

**Starlight Bridge**
- Lushaa Sarwal
- Lakshana Kukanesan

**Startrek 2000 Bridge**
- Keya Patel
- Ria Choksi
- Sricka Rasathurai

**The Dream Team Bridge**
- Keshava Shaiskandan
- Jeshman Sethukavalar
- Ajeyram Sricamalan

**The Enchanted Bridge**
- Saiayishwin Suresh
- Ashvinie Paraparan
- Abirami Sivakanthan

## ST. BERNADETTE CATHOLIC SCHOOL

**Tremble**
- Luke Tremble

**The Connector**
- Ivan Makkar
- Mark Gendi

**JMA2011**
- John-Marc Annibale

**Super Bridge**
- Marissa Chanderpaul

**Ajax-Ontario**
- Jessica Zabana

## ST. VICTOR

**Thunder Bridge**
- Clairrine Jeganathan
- Cassie Antony
- Ruuth Antony

## T.L.WELLS P.S.

**Galaxy Rock**
- Hareis
- Rodrigo

**Not yet**
- Rishi
- Rakshan
- Nathushan

**New York Bridge**
- Hareis
- Rodrigo

## WILLIAM G. DAVIS

**Inferno Bridge**
- Ramesh Murugananthan
- Esa Shafi

**United Bridge**
- Thivya Murugananthan
- Melody Puri
- Arathie Muraleetharan

## WOBURN JUNIOR PUBLIC SCHOOL

**Express Bridge**
- Pearl Kotwal
- Karishma Shan

**Testing**
- Harshil Modi

**PEO Awesome Bridge**
- Nirusha Shanmuganathan
- Abhinash Shanmuganathan
- Omgaran Uthayakaren

## BEVERLY GLEN JR PUBLIC SCHOOL

**Kodiak 2**
- Jack Wang, Jonathan Chan

**Kodiak 3**
- Nicholas Woodrow

**Kodiak 4**
- Tony Luo, Allen Clark, Andy Zhang.

# Contestants - Seniors

## BOLTON. C. FALBY

**Invincible**
Rajeev Patel

## BROOKSIDE PUBLIC SCHOOL

**Super Duper Dynamic**
Aathithan Sivaloganathan
Varunan Sripathybalamuraleetharan

## CHURCHILL HEIGHTS SCHOOL

**The Maruthi Bridge**
Khushbu Ketan Purohit

**Hope Bridge**
Vanshil Shah

## DAVID LEWIS

**To be decided**
Sunil Sreekanth
Suhas Sreekanth

## Dr. Marion Hilliard Senior Public School

**Bridge of Hope**
Amanee Abid

## HENRY HUDSON PUBLIC SCHOOL

**Golden Gate Bridge**
Ashutosh Patel

**Trappers**
Mitul Patel
Dhruv Patel

**Tran Canadian Bridge**
Kunj Patel

**Lakkodio Bridge**
Vinit Soni

**Infinity Power Bridge**
Guhaveri Kaneshwaran, Arun Nagarantan

**Journey to Crystal Paradise World**
Vinit Patel

## J.S. WORDSWORTH

**Arjun Bridge**
Sunny Patel

## J.B. TYRRELL SENIOR PUBLIC SCHOOL

**Da Bridge**
Abeeshan Selvabaskaran
Kevin Wang

**B.O.S.S. (Bridge of Superior Strength)**
Anojan Gnanendran

**Bridge to Tyrrell 2**
Fei Wang
Raeesa Hajee

**Destiny Awaits**
Archsanan Srimurugathasan
Thomas Lamanna
Abilash Perinparasa

**Hope**
Edward Liu

**MHT Bridge**
Majd Al-Hallak
Henry Xu
Tony Kim

**The End of the Rainbow**
Nilah Ahimsadasan
Anittha Tharaparan
Rosalai Isernia

**The Other Bridge at the Center of the Universe**
Daphne Yang
Jennifer Chen
Rosie Chen

**The Dark Sausage**
Tony Wang
Caitlin Gag
Justin Hui

**The Stronghold**
Jacky Ha

## ROUGE VALLEY PUBLIC SCHOOL

**Rouge Bridge**
Daenan Gyimah
Jason Moore

# Contestants - Seniors

**SIR ERNEST MACMILLAN SENIOR PUBLIC SCHOOL**

**Everlasting**
Lakshman Thayaparam,
Mayuren Thuraisinganathan

**ST. VICTOR**

**The Mighty Bridge**
Markus Jaganathan

**ZION HTS JHS**

**Ironic**
Hermes Hui
Yiqun Zhang

**ST. MICHAEL'S CHOIR SCHOOL**

**Spartans Bolt**
Jacob Brozyna
Levi Morrissy
Gerard Mannella

**Spartans Fire**
Connor Flannery
David Snowdon
Paul Picotte

**Spartans United**
Ian Cheong
Michael Avila
Martin Halek

**Spartans Wave**
Branden Li
Martin Gomes
Adrian Velasco

# Review

## Anojan Gnanendran

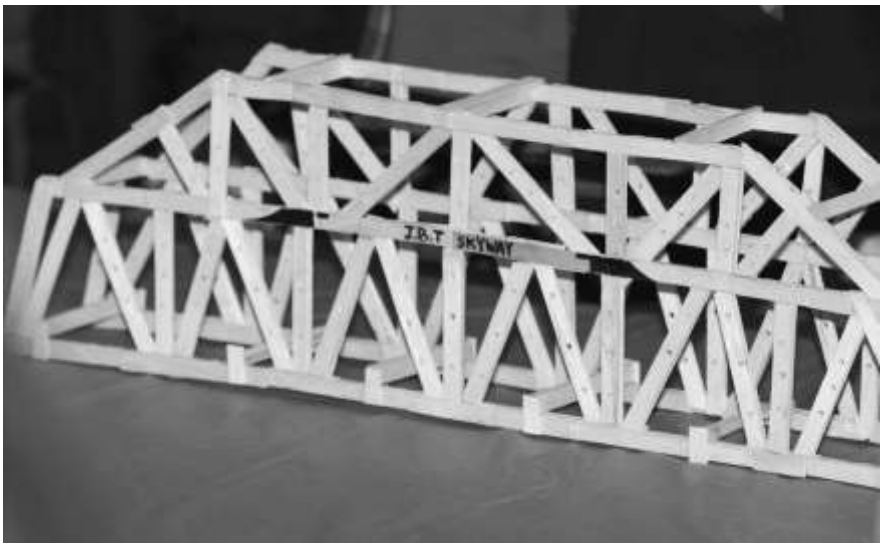
On March 6th 2010, many students and teachers traveled a journey. This journey was to hopefully create our future engineers. The task, create a bridge to impress our present engineer judges with a unique and outstanding bridge, while having a strong performance as well. Students worked day and night in hopes of making one of the best bridges. At the Scarborough Civic Centre that beautiful March morning, students woke up to the succession of their bridges, while nerves were still stirring up in their stomach.

The bridge I decided to make was a typical truss bridge but a double truss with one on top of the other to make it have more strength. It took me days, weeks and months to achieve a bridge like this. As a student, I have always wanted to create a bridge that was able to sustain weight, but soon did I find out that I would be up to the challenge when the PEO bridge building contest came into my life. For my bridge, I used few materials, as it was very difficult to only use white glue, Popsicle sticks, and construction paper. Having this option made it difficult to find strong and force related methods to create my bridge. I found a good method, and that was to create a frame at first. This was a very simple method that created my bridge, the JBT Skyway.

On the day of the contest, I was up against many little engineers. It was quite scary but I was very confident in front of all my competitors. As I competed in the competition, it was outstanding to see how many marks I achieved by the judges. My performance was 370 Newtons, not exactly what I was hoping for but it made me become a better engineer and bridge builder for following years to come.

As a bridge engineer, I learned many things. The first thing I learned is you definitely have to be patient and take your time. Procrastinating in the last week or day does not help your bridge at all. Research many types of strong bridges and then chose what best suits you as an engineer and builder. The last thing is, glue takes time to dry, so be patient!

This is what I learned as a little bridge engineer. I have built the bridge as best as I could last year, but this year, I have come back with a stronger and more unique bridge to win and take home the grand prize.




# My Word Search about Bridges

*By Vanshil Shah*

| S | T | B | E | A | M | A | F | G | H | G | M | I | S | N | O | A | H | R | G | L | I | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | O | D | E | F | D | G | C | H | B | I | H | J | G | U | Z | O | X | L | Y | C | P | Y |
| D | W | A | K | A | S | H | I | K | A | I | K | Y | O | H | S | W | D | Q | Z | E | V | M |
| N | E | E | I | C | G | C | C | G | S | U | V | W | L | U | T | P | N | B | U | A | K | F |
| E | R | C | B | H | A | I | A | R | C | H | T | R | D | M | L | U | E | T | B | F | C | I |
| Y | B | L | A | F | J | N | N | F | U | S | C | B | E | B | I | X | F | N | M | S | H | K |
| H | R | I | J | K | K | Y | T | T | L | A | U | Q | N | E | K | L | P | W | S | G | E | J |
| A | I | F | D | E | Z | C | I | I | E | E | D | K | G | R | V | Q | L | T | W | I | J | P |
| R | D | T | M | B | D | L | L | D | L | X | A | W | A | R | L | S | M | E | I | U | O | Y |
| B | G | O | A | E | L | C | E | C | Y | E | I | V | T | Y | N | E | H | K | N | L | V | N |
| O | E | N | G | N | B | M | V | P | U | Z | V | T | E | J | U | Q | S | N | G | I | M | W |
| U | H | A | C | A | B | L | E | V | N | W | O | E | B | T | P | R | Z | O | O | N | U | X |
| R | U | I | P | Z | V | Y | R | S | X | O | Y | T | R | S | A | R | Q | P | R | W | X | M |

**Words:**

AKASHI KAIKYO
ARCH
BASCULE
BEAM
CABLE
CANTILEVER
CLIFTON
GOLDEN GATE
HUMBER
MILLENIUM
SUSPENSION
SWING
SYDNEY HARBOUR
TOWER BRIDGE
TYNE
VIADUCT

Answers see page - 27

# Bridging the Gap

*Amanee Abid*

A bridge is a structure built to overcome physical obstacles. Engineers build bridges spanning across valleys, rivers and seas. But for our CNN hero it's much more.

Harmon Parker was a bricklayer who became a master mason early in his life. An average man until his life took an unexpected turn when he visited the African continent.

As an active Christian Development Worker, Harmon Parker understood the needs of the people of Kenya. This led him to build bridges for the poorest of communities.

To Parker bridges meant that children could attend school and have a brighter future. His most notable contribution was when he saw the dangerous river crossings Kenyans used to attend markets, healthcare clinics and to visit families in other villages .Many people lost their lives before Parkers efforts. With his decision made, he built a stable bridge to meet all their needs.

As the demand for more bridges grew .he founded a non-profit organization called "Bridging the Gap" in 2003 to construct footbridges to keep these people, especially children and women, out of the treacherous rivers. In 2010 he was acknowledged for his efforts by being selected as a CNN hero.

Aside from that Harmon Parker has shown a truly remarkable quality, the ability to give and ask for nothing in return. Harmon Parker is a husband and a father and balances his role with his family and the Kenyans with ease. Rome wasn't built in a day, so wasn't any one of Harmon Parker's bridges. He worked tirelessly day after day along with his fellow neighboring Kenyans. now …its up to you to bridge your gap !

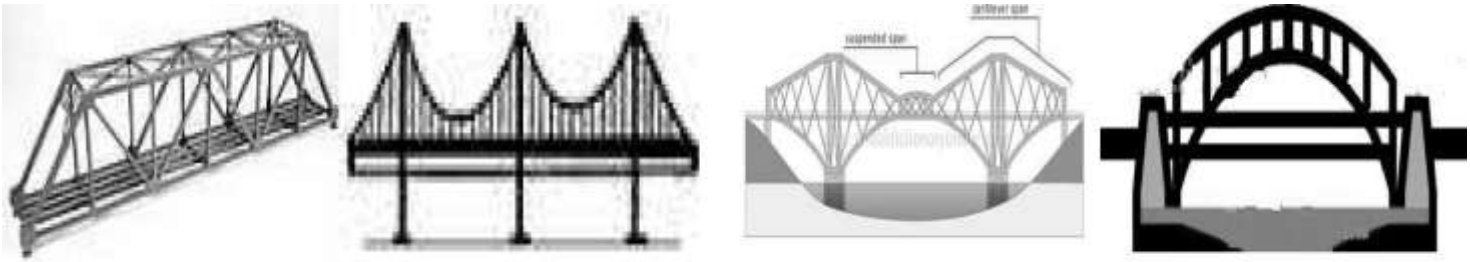
*Harmon Parker*

*One of Harmon's bridges*

# Bridges


*Vanshil Shah*

Did you know that triangles are the strongest shapes in the world! Many bridges across the world are built to resemble triangles. What is a bridge? Why are they crucial to us? Well to begin, a bridge is anything that fills a gap from one area to another. Bridges are crucial to us because they help us adapt and conquer terrain difficulties that we cross when building roads or paths. All bridges include a deck. The "deck" of the bridge is the part that people walk/ drive on. *There are four major types of bridges:*



Truss Bridge | Suspension Bridge | Cantilever Bridge | Arch Bridge

One of the most common and simplest types of bridge is the **truss bridge**. As seen in the image this bridge is basically made up of triangles with cross sections that connect it together. Truss bridges are made of straight elements that take tension, the shape that the straight elements are arranged in are vital and this is where the triangle becomes a part.

Another type of bridge is the **suspension bridge**. Suspension bridges get there name from the design of the bridge. A suspension bridge is made up of a series of poles that have long cables hanging in between them. Hanging from these cables are more cables from which the bridge deck is suspended. Any weight or strain put on the bridge relies on the cables thus the name of the bridge: suspension bridge.

The third most common type of bridge is the **cantilever bridge**. The principle behind the cantilever bridge is to balance weight with counter balances. The image left shows how the man in the middle is balanced with the use of counter weights. The image resembles a cantilever bridge and how it works.

Finally there are **arch bridges**. An arch bridge takes the load put upon it and transfers it to the sides of the bridge. Arch bridges were used in ancient history by the Romans. Arch bridges have great structural efficiency which is probably why people in ancient history used them. A bridge with good structural efficiency is good because it means it weights less but is still quite powerful.

Bridges have been used in our generation in the past and will continue to be a part of our lives in the future. So help mankind preserve these wonderful creations by entering the **P.E.O. Bridge Building Competition** annually!

# Volunteers - BBC 2011

### Project Manager

Uthayan Thurairajah

### Registration

Bhadresh Modi

Augustine D'Souza

Murad Hussain

William. A. Dale

### Judging

Raji Puthurath

Peter Hulley

### Souvenir, Media Communication

Maria D'Souza

Abid Syed

Curtis Cheam

Pompillian Tofilescu

Rakesh Shah

### Computer Networking

Vyjayanthi Chander

Chhaya Vijay Arabastani

David Dias

Jonathan D'Souza

### Inspection/Testing

Jega Jeganathan

Arul Thiagarajah

Maha Mahalingam

Raju Chander

### Photo/Video

Madu Suthanan

Naren-Mylavaganam

Rakesh Shah

### General

Parvez Akhtar

Kiran Patel

Ashishkumar Patel

Gayathri Kunaratnam

Bala Balasingam

### Master of ceremony

Lipika Saha

Pompillian Tofilescu

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My Word Search about Bridges - Solution

Answers for word search:

# PEO Scarborough Chapter

## Thanks...

### Judges - BBC 2011

Karan Singh, P.Eng.
Muslim Pardhan, P.Eng.
Ayvun Jeganathan, P.Eng.
Subohi Obaid, P.Eng.
Raju Chander, P.Eng.
Clifford Lam, Ph.D., P.Eng.
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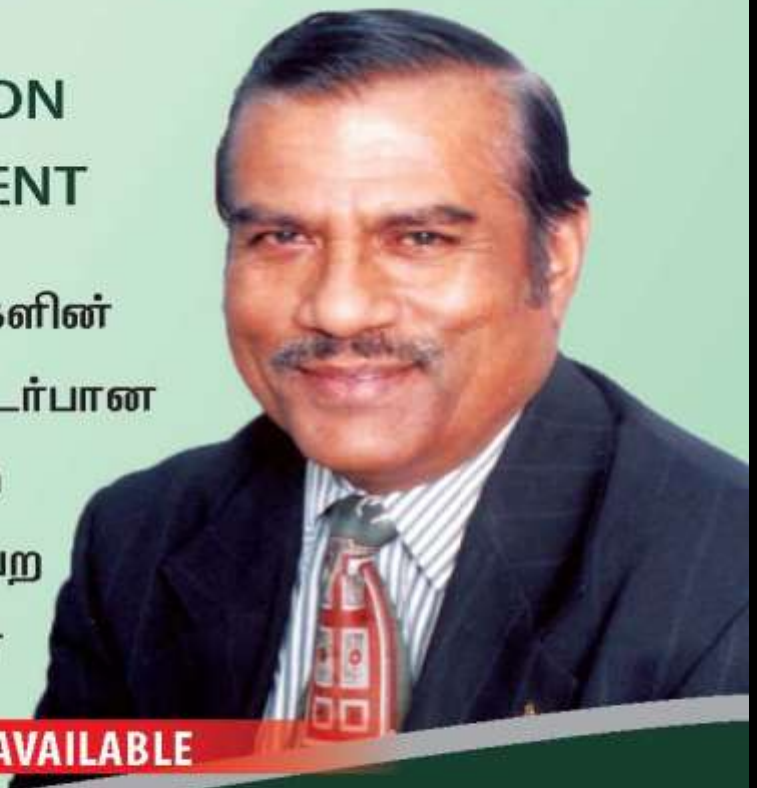

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சிறந்த சேவைகளையும்
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