



## Science Outcomes Achieved by Students Participating in Spaghetti Bridge Building

**Grade 3 – Materials and Structures (Cluster 2)**

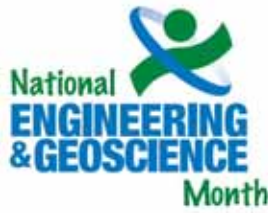
**Grade 7 – Forces and Structures (Cluster 3)**

Students design and build a bridge from only spaghetti and white glue. Bring the completed bridges to Kildonan Place Shopping Centre on Saturday March 10th, 2012 for testing to destruction to see whose bridge will hold the most weight. There will be cash prizes for the best bridge in each grade level; and, grand prizes for Grades 1-6 and 7-12. In addition to the fun of participating in the competition, students will also have the opportunity to support Winnipeg Harvest. For every pound held by the bridges in the competition, APEGM will donate a pound of pasta to Winnipeg Harvest. Help us reach our goal of donating 10,000 pounds of pasta to Winnipeg Harvest.

Register your class: enter a minimum of 10 students for the Spaghetti Bridge Competition and APEGM will donate to your class a \$100 gift certificate for a pizza party.

For full competition rules and registration information, please go to [www.apegm.mb.ca](http://www.apegm.mb.ca) and follow the link to **Provincial Engineering and Geoscience Week — March 5 - 11, 2012.**

Kildonan Place Shopping Centre — Centre Court, Saturday March 10th, 2012.



The Association of Professional Engineers and Geoscientists of Manitoba (APEGM) will be hosting a series of events and activities at Kildonan Place Shopping Centre on Saturday and Sunday March 10<sup>th</sup> and 11<sup>th</sup> to celebrate Provincial Engineering and Geoscientist Week (PEGW). The celebration is part of a National Engineering Month occurring across Canada throughout March 2012. APEGM would like to take this opportunity to make your school aware of the PEGW celebrations and invite all of your students and staff to attend with their families.

PEGW is held for the public with the goal of improving awareness of the engineering and geoscience professions and their numerous contributions to improving the lives of Manitobans. PEGW also promotes careers in engineering and the geosciences to young people of all ages. Displays and activities showcase the work of engineers and geoscientists in Manitoba; and allow attendees to get some hands-on experience with engineering and geoscience work.

Highlights of this year's PEGW activities include:

- APEGM and Winnipeg Harvest have joined forces to expand the ever popular Spaghetti Bridge Competition. In addition to the normal competition, APEGM will match the total weight supported by the spaghetti bridges tested at the Winnipeg location with a donation of pasta to Winnipeg Harvest. Last year, student's efforts resulted in a **donation of 9,377 pounds of pasta** to Winnipeg Harvest. This year, we hope your students will help us achieve our goal of donating 10,000 pounds of pasta.
- Displays and live demonstrations from the University of Manitoba showcasing engineering and geoscience technology and career prospects in these professions.
- An interactive display hosted by Manitoba Robot Games, where students can play with an assortment of "Robo-Critters".
- A children's discovery centre on Sunday afternoon where kids will have the opportunity to build gum-drop structures, test floating concrete, build straw bridges and much more.

This event offers a unique opportunity to learn more about how engineering and the geosciences affects each of our lives in a fun and interactive learning environment.

For more information on PEGW events, please see our website ([www.apegm.mb.ca](http://www.apegm.mb.ca)) or contact us by email ([apegm@apegm.mb.ca](mailto:apegm@apegm.mb.ca)).

We hope you will join us for this worthwhile and entertaining experience.

Sincerely,  
Grant Koropatnick, P.Eng.  
Executive Director

# Science Outcomes Achieved by Students Participating in Spaghetti Bridge Building

The activity of spaghetti bridge building is very rich in opportunities to achieve the skills for each grade level. This is a sample of some of the outcomes that can be reached in this activity for Grades 3 and 7. For a full list, please visit [www.apegm.mb.ca](http://www.apegm.mb.ca).

## Grade 3 – Materials and Structures (Cluster 2)

- 3-2-01:* Use appropriate vocabulary related to their investigations of materials and structures.  
Include: strength, balance, stability, structure, frame structure, natural structure, human-built structure, force.
- 3-2-03:* Explore to determine ways to strengthen a material used for building.  
Include: changing shape, bulk, and number of layers.
- 3-0-1B:* Make predictions based on observed patterns, collected data, or data provided from other sources.
- 3-0-3A:* Brainstorm, with the class, one or more methods of finding the answer to a given question and reach consensus on which method to implement.
- 3-0-4A:* Carry out a plan, and describe the steps followed.
- 3-0-5A:* Make observations that are relevant to a specific question.
- 3-0-6C:* Place materials and objects in a sequence or in groups using two or more attributes, and describe the system used.
- 3-0-7A:* Draw a simple conclusion based on their observations.

## Grade 7 – Forces and Structures (Cluster 3)

- 7-3-01:* Use appropriate vocabulary related to their investigations of forces and structures.  
Include: frame, shell, solid, centre of gravity, stability, compression, tension, shear, torsion, internal and external forces, stress, structural fatigue, structural failure, load, magnitude, point and plane of application, efficiency.
- 7-3-04:* Identify internal forces acting on a structure, and describe them using diagrams  
Examples: compression, tension, shear, torsion
- 7-3-08:* Describe, using diagrams, how common structural shapes and components can increase the strength and stability of a structure.  
Examples: a triangle distributes the downward force of a load evenly between its two vertices
- 7-3-09:* Describe and demonstrate methods to increase the strength of materials  
Examples: corrugation of surfaces, lamination of adjacent members, alteration of the shape of components
- 7-3-10:* Determine the efficiency of a structure by comparing its mass with the mass of the load it supports.
- 7-3-11:* Evaluate a structure to determine the appropriateness of its design, using the design process.  
Examples: jacket, foot stool, local building
- 7-3-12:* Use the design process to construct a structure that will withstand the application of an external force.  
Examples: a tower that will remain standing during a simulated earthquake

# Provincial Engineering and Geoscience Week 2012

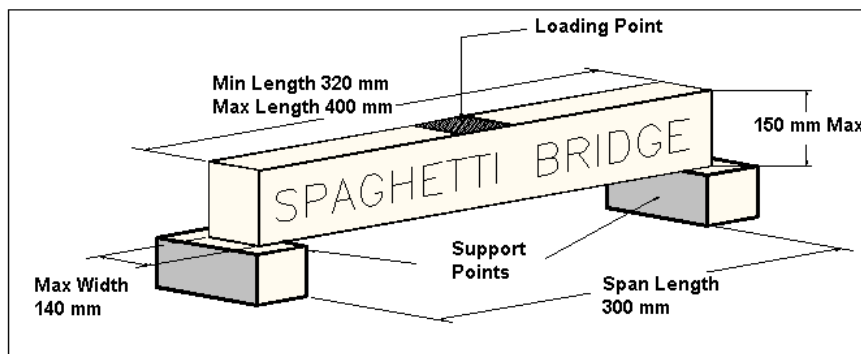
## Spaghetti Bridge Official Rules

**OBJECTIVE:** To build the strongest bridge from regular spaghetti and white glue.

**PARTICIPANTS:** Individual entries or teams, for students in grades 1 to 12.

**OFFICIAL RULES:**

1. The bridges are to span an opening of 300 mm. They must be between 320 mm and 400 mm long, no higher than 150 mm and must be no greater than 140 mm in width. (See sketch)
2. The bridges are to be constructed of **regular spaghetti** and **white glue**. No other components are to be used. (Other pasta shapes are not allowed i.e. linguini)
3. The bridges can not weigh more than **350 grams** when completed (to be eligible for prizes). The bridges will be weighed before testing.
4. The bridges will be loaded at the centre of their span (length) from the top until they break.
5. **No horizontal support** will be provided at the support points. The bridge cannot bear on the sides of the support points.
6. The bridge that holds the most load wins! If there is a tie, the lighter bridge wins!



### PRIZES

Each Grade winner - \$50.00

Grand Prize, overall winner from grades 1 to 6 - \$200.00

Grand Prize, overall winner from grades 7 to 12 - \$200.00

### LOCATION & TIME

The competitions will take place at **Kildonan Place Shopping Centre** (centre court) on Saturday, March 10th, 2012.

Competition for **Grades 1 to 6** starts at **10:00 am**. Award ceremony to follow immediately.

Competition for **Grades 7 to 12** starts at **12:30 pm**. Award ceremony to follow immediately.

If you have questions please call Don Spangelo at 360-4395 or Adèle Poulin at 360-7793.

Website: [www.apegm.mb.ca](http://www.apegm.mb.ca)

# Provincial Engineering and Geoscience Week 2012

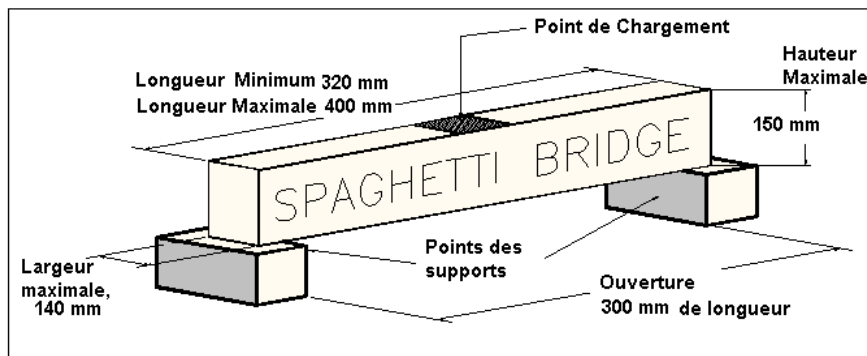
## “Spaghetti Bridge” (Pont de Spaghetti)

**OBJECTIF:** Construire le pont le plus fort, à partir de spaghetti ordinaire et de colle blanche.

**PARTICIPANTS:** Entrées individuelles ou en groupe, pour les étudiants de la première à la douzième année.

### Règles officielles:

1. Les ponts doivent étendre à travers une ouverture 300 mm de longueur. Le pont doit avoir une étendue d'une longueur située entre 320 mm et 400 mm, une largeur maximale de 140 mm, et une hauteur maximale de 150 mm. (Voir l'illustration)
2. Le pont doit être construit de **spaghetti ordinaire** et de **colle blanche**. Aucun autre matériau de construction, de colle, ou pâte alimentaire ne sera permis.
3. La masse maximale de chaque pont est **350 grammes** (pour avoir le droit des prix). Les ponts seront pesés avant la compétition.
4. Un poids sera déposé au centre du pont, par le dessus. La charge sera augmentée jusqu' à l'écrasement du pont.
5. **Aucun support horizontale sera offert** aux points des supports. Le pont ne peut pas être place entre les supports.
6. Le pont qui soutiendra la charge la plus lourde gagnera. A compte égal, le pont à la masse plus légère gagnera.



### LES PRIX :

Un gagnant par niveau : \$50.00

Un grand prix, de la première à la sixième année : \$200.00

Un grand prix, de la septième à la douzième année : \$200.00

### Date et location :

Les compétitions auront lieu au centre commercial **Kildonan Place** (dans la centre cour), le samedi, 10 Mars, 2012.

Les compétitions de la première à la sixième année commenceront à 10h00. Les prix seront distribués immédiatement après.

Les compétitions de la septième à la douzième année commenceront à 12h30. Les prix seront distribués immédiatement après.

Si vous avez des questions, appelez Adèle Poulin au 360-7793. Adresse électronique:

[www.apegm.mb.ca](http://www.apegm.mb.ca)

# PROVINCIAL ENGINEERING & GEOSCIENCE WEEK (PEGW) 2012

## Spaghetti Bridge Entry Form

[ **Formulaire d'inscription** pour la  
compétition du pont de spaghetti ]

**Kildonan Place – Centre Court, Saturday  
March 10th, 2012 [le samedi 10 mars, 2012]**

*OR you can also register online!* Visit us at:

[adresse électronique de la compétition  
du pont de spaghetti]

**<http://www.apegm.mb.ca/>**

FOR JUDGES ONLY (Espace réservé pour les juges)	
DISQUALIFIED: (if YES)	<input type="checkbox"/>
GRADE:	<input type="text"/>
Fmax (Test Load):	
BRIDGE ENTRY NO.:	<input type="text"/>
BRIDGE WEIGHT:	<input type="text"/>

and follow the Provincial Engineering and Geoscience Week (PEGW) link to the Spaghetti Bridge Competition.

[et suivez le lien interne qui s'appelle "Provincial Engineering and Geoscience Week (PEGW)" jusqu'à la compétition du pont de spaghetti ]

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●Team Captain's Name:

[Nom du capitaine de l'équipe] \_\_\_\_\_

●School Name: \_\_\_\_\_

[Nom de l'école]

●Grade [Niveau]: \_\_\_\_\_

●Team Members: \_\_\_\_\_

[Nom(s) des autres membres de l'équipe]

●Teacher's email or fax number: \_\_\_\_\_

[adresse électronique ou facsimilé de la professeur] \_\_\_\_\_

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**Fax Your Registration** to [Facsimilé]: (204) 474-5960

Or [ou]

Mail Registration to [poster à]: Spaghetti Bridge Competition  
c/o APEGM  
870 Pembina Highway  
Winnipeg, Manitoba, R3M 2M7

The **Deadline** for registration is [la date limite d'inscription] : **March 9th , 2012**

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This space is reserved for Judges' Information [Espace réservé pour les juges] :

COMMENTS: \_\_\_\_\_

\_\_\_\_\_

DISQUALIFIED (reasons): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# Spaghetti Bridge Competition

The 2012 Winnipeg Spaghetti Bridge Competition will be held at Kildonan Place on Saturday March 10, 2012. The Winnipeg competition will be in support of Winnipeg Harvest. For every pound held by the bridges in the competition, the Association of Professional Engineers and Geoscientists of Manitoba will donate a pound of pasta to Winnipeg Harvest. The goal is to donate 10,000 pounds of pasta to Winnipeg Harvest to help those in need. Participants in the competition are urged to “bring a tin for the bin” in support of Winnipeg Harvest.

Students in South-Western Manitoba will once again have the opportunity to participate in the Spaghetti Bridge Competition hosted by the APEGM Westman Chapter. This competition will be held at the 27<sup>th</sup> Annual Brandon Career Symposium, March 5<sup>th</sup> – March 7<sup>th</sup>, 2012 at the Brandon Keystone Centre.

Full competition rules and registration information is available on the APEGM website: [www.apegm.mb.ca](http://www.apegm.mb.ca)

Schools that wish to hold a Spaghetti Bridge building program, but are unable or do not wish to participate in the Winnipeg or Brandon Spaghetti Bridge Competitions, can find details on how to set up their own testing equipment on the APEGM website.

