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# H<sub>2</sub>OT Engineering: STEM on the Run

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CCPC Educating for Careers Conference

February 26, 2008

# Welcome!

- [www.innovatecalifornia.net](http://www.innovatecalifornia.net)
- [www.spacetec.org](http://www.spacetec.org)
- [www.hancockcollege.edu/engineering](http://www.hancockcollege.edu/engineering)

*Funding provided by Department of Labor, Employment & Training Administration: WIRED Initiative*



# What do engineers do?

- Work in teams
- Define problems
- Design solutions with limited resources
- Build and test
- Analyze and evaluate
- Communicate
- Have fun!!!!

# Thank you!

- Questions
- Resources
- Evaluations

## **STRUCTURE TO SUPPORT WATER**

The purpose of this project/contest is to work as a team (3 people) to design and build a structure of maximum height capable of supporting a cup of water with the materials provided and within the allowed time period.

After constructing the structure, each team will be required to carry the structure, with water in the cup, a predetermined distance in the shortest possible time (*i.e.*, race it). The structure will be held at its base in the hands of one of the team members.

The following formula will be used to determine the team's score:

$$\text{Score} = \frac{H^2V}{T}$$

In the formula:

- ⇒ **H** is the *height* of the structure (cm) measured from a point on the structure visible above the hand at the bottom of the structure;
- ⇒ **V** is the *volume* (ml) of water remaining in the cup when the structure crosses the finish line and is handed to the judge, and
- ⇒ **T** is the *time* (seconds) required to carry the structure between two predetermined points.

**The height, H, is determined by measuring from the top of the cup to a reference point on the structure determined by each team, which must be visible at all times above the hand carrying the structure while the "race" is being run.**

**Each structure may be constructed only with the provided materials.**

**Each team will have a time limit of twenty (20) minutes in order to complete construction.**

**In order to qualify, each structure must be a minimum of 20 cm in height (H), as defined above.**

Each cup on each structure will be filled immediately before the race is run. Each team will decide how much water to start out with. The score is based on the final volume (ml) of water when it is handed to the judge after the race is run.

Major spills during the race will result in disqualification.

### Materials

- 30 straws
- 20 pipe cleaners
- 10 rubber bands
- 10 paperclips
- 10 toothpicks
- 1 paper bag
- 1 cup (plastic or Styrofoam)



## H<sub>2</sub>O<sub>2</sub> Engineering: STEM on the Run Score Sheet

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Team No.	<u>H</u> eight (cm)	<u>T</u> ime (sec)	<u>V</u> olume (ml)	Score = H <sup>2</sup> V/T
1				
2				
3				
4				
5				
6				
7				
8				
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## H<sub>2</sub>O<sub>2</sub> Engineering: STEM on the Run! Score Sheet

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Team No.	Height (cm)	Time (sec)	Volume (ml)	Score = H <sup>2</sup> V/T
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

**H<sub>2</sub>O<sub>2</sub> ENGINEERING: STEM ON THE RUN!**  
**EDUCATING FOR CAREERS CONFERENCE; FEB. 26, 2008**

Team No.	Height (cm)	Time (sec)	Volume (ml)	Team Score
1				#DIV/0!
2				#DIV/0!
3				#DIV/0!
4				#DIV/0!
5				#DIV/0!
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15				#DIV/0!



### WORKSHOP EVALUATION FORM

Workshop Title: H2OT Engineering: STEM on the Run!

Today's Date: 2/26/08

For each of the following areas, please indicate your reaction:

Content	Excellent	Good	Needs Improvement	Not Applicable
Covered useful material	[ ]	[ ]	[ ]	[ ]
Practical to my needs and interests	[ ]	[ ]	[ ]	[ ]
Well organized	[ ]	[ ]	[ ]	[ ]
Presented at the right level	[ ]	[ ]	[ ]	[ ]
Effective activities	[ ]	[ ]	[ ]	[ ]
Useful visual aids and handouts	[ ]	[ ]	[ ]	[ ]

Presentation	Excellent	Good	Needs Improvement	Not Applicable
Instructor's knowledge	[ ]	[ ]	[ ]	[ ]
Instructor's presentation style	[ ]	[ ]	[ ]	[ ]
Instructor covered material clearly	[ ]	[ ]	[ ]	[ ]
Instructor responded well to questions	[ ]	[ ]	[ ]	[ ]

How could this workshop be improved? \_\_\_\_\_

Any other comments or suggestions? \_\_\_\_\_

Overall, how would you evaluate this workshop training session?

Excellent	Good	Fair	Poor
[ ]	[ ]	[ ]	[ ]

Optional Information:

Name: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Organization: \_\_\_\_\_  
 Address: \_\_\_\_\_

Phone: \_\_\_\_\_  
 Email: \_\_\_\_\_

**"H<sub>2</sub>OT Engineering: STEM on the Run!" SIGN IN SHEET, Feb. 26, 2008**

***I, the undersigned, agree to permit video and photographs to be taken of me while attending this educational outreach event. I consent to Allan Hancock College (AHC) to use my photograph, including my voice and features, with or without my name, and waive any right to approve the finished photograph, audio recording, or video, without compensation, for any use or reuse in any promotional or advertising product.***

<b>PRINT NAME</b>	<b>SIGNATURE</b>	<b>AFFILIATION (Company/School)</b>	<b>E-MAIL ADDRESS</b>
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