



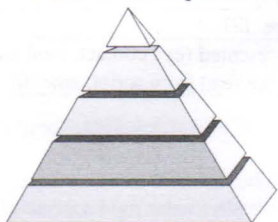
# NEWSLETTER

ONTARIO ASSOCIATION OF PHYSICS TEACHERS  
(An Affiliate of the American Association of Physics Teachers)  
Volume XXIII, Number 1  
Winter, 2002

## Physics Research Presentation

By Janice Gladstone

Although the curriculum has not changed very much from the old to the new physics courses, there are some significant new expectations regarding evaluation and assessment. Also, where some content has been removed (e.g. nuclear radiation), the STSE (science, technology, society and environment) has been added. In response to these requirements, I created an assignment for my students at the end of the course. I completed the basic curriculum (less the STSE components) a few weeks before the end and will spend the last two weeks working on projects, reviewing and, best of all, having student presentations. The presentations -- generated from STSE segments in the text -- are 10 minutes long plus 5 minutes for an interactive component. In the student handout, I make several suggestions about how to get the class involved. I will grade the students while they are presenting (saves marking time) on the quality of their presentations, visual aids and interactive component. Students know that there may be quiz or exam questions (student generated) arising from the presentations. This was designed to encourage attentiveness. So far the kids are excited about their topics and are working hard. The first presentation went well.



## Yep! It's a Physics Research Presentation The Project

Physics has to be one of the most intrinsically interesting subjects to study. What could be of more interest than how the world around you works? The first questions little children ask are almost always physics questions: Why is the sky blue? Where do rainbows come from? Why does lightning come before thunder? Where does electricity come from? Where does rain come from?

Physics is interesting because it can be used to explain so many phenomena in the world around us. You have a chance to research and present how physics relates to our daily lives. In this project you should focus on societal impacts and history of physics.

### The Expectations:

- I. You will work as individuals or in pairs and will choose a topic from a chapter we have studied.
- II. The focus of your work will be Science – Technology – Society – Environmental Interrelationships found at the end of each chapter in our text (Irwin Physics Concepts and Connections).
- III. Confirm your topic choice with the teacher.
- IV. Prepare a fabulous 10 minute information and idea packed presentation. Note: great presentations require practice. Be sure to practice your presentation beforehand so it is smooth and on time. It's better if you have an audience for practicing.
- V. Create great visual aids either on computer (we do have a projector for that—so you could use Powerpoint or whatever software – check with the teacher) or with a poster.
- VI. You will be expected to use at least one Internet web site *and* one other book for reference material.
- VII. To hand in: 1. One page of notes including the references you used, a very brief description of your topic, key points in how you will do your presentation.  
2. Three sample questions (easy, medium and challenging) on your topic including answers for the questions. These may be used on the final exam.
- VIII. Your presentation must include an interactive component for your classmates. You will know you have been successful in this if all your classmates are actively engaged in the activity or discussion related to your presentation material.

### SOME SUGGESTIONS FOR INTERACTIVE ACTIVITIES:

#### Think/pair/share

1. You pose a question.
2. Students think alone for a specified amount of time (depending on the complexity of the question – maybe up to a minute).
3. Students form pairs to discuss their ideas.
4. Pairs then share responses with the class.

## Voting or survey

Ask students to put up their hand to indicate if they agree or disagree with a statement (or if they think the answer is...or not). This works well if you think a lot of students might have a misconception about an idea. After the vote, discuss, as a class, why people voted the way they did. Tell them the correct answer.

## Brainstorm

If you want the class to solve a problem as a group, this is a great way to generate ideas. Have students put up their hands to give suggestions and write them down. Rules: 1. There is no such thing as a bad idea. All suggestions are good so no criticism allowed (until this step is finished.) 2. Ideas should lead to other ideas. Piggybacking or adding to other people's ideas is good. 3. After there is a reasonable list, you can start to criticize and eliminate impractical suggestions.

## Numbered Heads

Students discuss your question in groups of 3 or 4. Have students in the groups number themselves 1, 2 or 3 (and 4 if there are 4 people in the group). After the students have had a few minutes to discuss and record their ideas, you select a number. That person in each group reports to the class.

## Four Corners

If you have a controversial question, you can get good debate going using this method. Place large labels in each corner of the room saying: Strongly Agree; Agree; Disagree; Strongly Disagree. Have students go to the corner that suits them. The 4 groups discuss why they chose their corner. The groups then share their ideas with the rest of the class.

## Card Quizzes

1. Students make cards or slips of paper with 1, 2, 3, and 4 written in large letters on each piece (or if you prefer the papers and answers could be A, B, C, and D). 2. You pose multiple-choice questions and have students hold up the card with what they think the answer is. 3. Make a note of how many students got the right answer. 4. Have students discuss their answer with a neighbour who has a different answer from them. After a minute or less, have students hold up their cards again. 5. Now note how many got the correct answer. Give the correct answer to the class.

## Evaluation [30 Marks Total]

Peer Involvement (5)	Hand in questions and written outline (5)	Visual Component: (8)
Presentation: (12)	Attractive (2)	Clear (3)
Obvious Effort (2)	Informative (3)	Concise (2)
On time (2)	Informative (2)	Well presented (eye contact, loud and clear voice, not read from script, smooth) (4)

## THE DEMONSTRATION CORNER

### "Demos for Fun"

by

Rolly Meisel

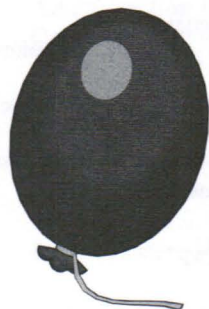
Ridgeway Crystal Beach High School

[rollym@vaxxine.com](mailto:rollym@vaxxine.com)

The three demos described here are, to the best of my knowledge, nowhere in the Ontario curriculum, although I stand to be corrected. Sometimes we need to do things because they are interesting and fun, and not solely because they are "on the course". ☺

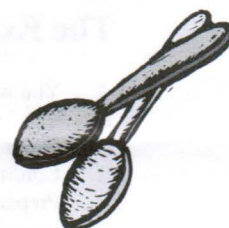
### Hang a Spoon From Your Nose:

If you try to hang a spoon from your nose, most of the time it will just fall off. We could use epoxy or other glue to hold it on, but that's a bit too permanent. It is a little-known fact that a thin layer of water will act as an adhesive, although thicker layers usually act as a lubricant. Before doing this lab, it is important to clean oils from the nose using a towelette or other cleaner. Also ensure that the spoon is clean. Breathe lightly on the spoon to fog it, place the bowl on the bridge of your nose, and press lightly to set the adhesive. If you do it right, the spoon will stick so well that you can even walk around with it. When you get really good at this, you can do it with a ladle.



### Use a Balloon as an Air Conditioner:

Rubber has a negative coefficient of thermal expansion. If you hang a weight from a rubber band, and then heat the band, you can watch it contract. On the other hand, if you stretch a



hand, if you stretch a rubber band, it heats up. You can do this with a balloon. Stretch the balloon, and then touch it to your lip. You should feel a dramatic warming effect. While it is stretched, wave it around to dissipate the heat into the air. Once it's back to room temperature, let it contract, and press it to your lip again. It should feel quite cool. No doubt you can think of a way to engineer an air conditioner using this effect. Please send me 10% of the gross as a fee for giving you the idea.

## **Make Your Face "Explode" or "Shrink":**

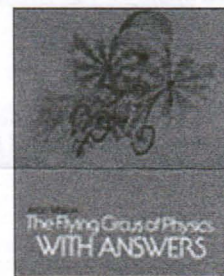
Make a spiral design as shown on this handout, and find a way to spin it, but not too fast. A few hertz will do. Watch the spinning spiral for thirty seconds, and then immediately look at someone's nose. Spin the spiral the other way, and repeat the experiment. One direction will cause an "exploding" (actually an exfoliating) effect, while the other will cause a "shrinking" effect. A computer version of this demo can be found at: <http://msr.bmr.com.au/fun.html>.

## **More Fun Stuff:**

There are many sources for fun demos like these. Two that I have found particularly useful are:

The Flying Circus of Physics by Jearl Walker  
Invitations to Science Inquiry by Tik Liem

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Physics Department, University of Guelph,  
Guelph, Ontario, N1G 2W1  
Email: [elm@physics.uoguelph.ca](mailto:elm@physics.uoguelph.ca)**



Submissions describing demonstrations will be gladly received by the column editor.

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## **News – News - News**

### **ASU'S SUMMER GRADUATE PROGRAM FOR TEACHERS of the PHYSICAL SCIENCES**

The Department of Physics and Astronomy at Arizona State University (ASU) offers a summer program of courses specifically designed for in-service high school physics, physical science, and chemistry teachers nationwide. Teachers may want to enroll in these courses to earn credit towards re-certification, or to pursue a Master of Natural Science degree (MNS). Take one course or many! In summer 2001, 70 teachers (3/4 of whom don't have a degree in physics) participated in 8 courses.

The ultimate target for the MNS program is not the teachers themselves but their students. Therefore each course addresses the subject at a level that prepares teachers to entice and inform their students. The teachers are engaged in activities and projects that they can set up for their students. As the standard high school curriculum does not include "contemporary physics," teachers need the material developed in a modular form that can be used for extracurricular projects and interest groups or in advanced enrichment courses for seniors.

Two summer sessions: June 10-28, July 1 - Aug. 2, 2002. Visit <http://modeling.asu.edu> for details and to apply to Arizona State University. Or reply to [Jane.Jackson@asu.edu](mailto:Jane.Jackson@asu.edu).

Its important to note in the newsletter that we (ie Canadians) are usually not eligible for the funding that they talk about. An interested teacher would need to contact Jane Jackson at ASU for more info for out of country participants. Jane Jackson, Co-Director, Modeling Instruction Program Box 871504, Dept. of Physics & Astronomy, ASU, Tempe, AZ 85287 480-965-8438/fax:965-7331 <http://modeling.asu.edu>

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## **Physics/Environmental Resource**

I would like to compile a resource for the Ontario Society for Environmental Education dealing with environmental expectations in grade 11 (this year) and 12 (next year) physics. Transportation, energy sources and transformation, noise, electrical energy, magnetic fields, radiation, nuclear energy, and technology. This resource will refer to material in the new textbooks and add more. Please send me ideas, lessons, activities - anything you would like to share. Contributors will be credited and will receive a copy. The resource is a non-profit venture by OSEE. It will be available online free or hardcopy at cost.

Example: A physics teacher/environmentalist colleague says his Mechanics lesson on tendency to disorder or entropy, technology and inefficiency always has a huge personal impact on his students decision-making around environmental issues.

**Send to:** Dave Arthur, 32 Springdale Drive, Kitchener ON, N2K1P9 or [davidarthur@rogers.com](mailto:davidarthur@rogers.com) by February 28, 2002.

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## Contests - Contests - Contests

Would some of your students like to get into the Physics Olympiad? The address to contact the Physics Olympiad Canadian Team is Professor Bailey, Coordinator of POPTOR at U. of T. [dbailey@physics.utoronto.ca](mailto:dbailey@physics.utoronto.ca)

Last year, in Turkey, the Canadian Team earned one silver and two bronze medals. This has not happened before. Names are posted on International Physics Olympiad web site.

How about the OAPT Physics Contest? Get in touch with Terry Price. **Find the Ontario Association Of Physics Teachers WEB SITE at: <http://www.physics.uoguelph.ca/OAPT>**

## Copy, Copy, Copy

We are looking for articles and items for the newsletter – no matter how small or large. Have you got an interesting demo, a unique project development, a fascinating web site, an off the wall summative, or informative piece. Send them to: **Glenn Wagner or John Caranci** [GWAGNER@cwdhs.ugdsb.on.ca](mailto:GWAGNER@cwdhs.ugdsb.on.ca), [physix@iprimus.ca](mailto:physix@iprimus.ca), or demos to **Ernie McFarland**, Physics Department, University of Guelph, Guelph, Ontario, N1G 2W1 Email: [elm@physics.uoguelph.ca](mailto:elm@physics.uoguelph.ca)

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## Membership

### Join the Ontario Association of Physics Teachers

Members receive a Newsletter and **reduced registration rates at the annual conference.**

As well, from time to time, the Association makes available special resources; examples have included reprints of "**Demonstration Corner**" articles from the **Newsletter**, and the videotape, "**The Physics of Dance**," from a presentation at one of the annual conferences.

To become a member of the OAPT, send a cheque for \$8 (or a multiple thereof) payable to OAPT to:

**Ernie McFarland**  
OAPT Membership Secretary  
Department of Physics  
University of Guelph  
Guelph, Ontario  
N1G 2W1

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## THE EXECUTIVE

**President** - John Beattie

**Vice-President** - Kevin Soltes

**AAPT Section Representative** - Diana Hall

Conference Coordinator

**Contest Authors** - Rolly Meisel, Vida Ghaem-Maghani

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**Past President** - Terry Price

**Newsletter Editors** - Glenn Wagner and John Caranci [GWAGNER@cwdhs.ugdsb.on.ca](mailto:GWAGNER@cwdhs.ugdsb.on.ca), [physix@iprimus.ca](mailto:physix@iprimus.ca)

**Membership Secretary** - Ernie McFarland

**Member at Large** - John Petri

**Past Newsletter Editor** - Paul Laxon



Ontario Association of  
Physics Teachers



**2002 Annual Meeting**

**Thursday May 23 – Saturday May 25**

**Hosted by**

**Department of Physics (Erindale College )**

**University of Toronto at Mississauga**

**Meeting Highlights**

- Informative Hands on Workshops
  - Interesting Tours
  - Excellent Speakers on Current Topics
  - Fellowship with Other Teachers
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ONTARIO ASSOCIATION OF PHYSICS TEACHERS

Annual Meeting

May 23-25, 2002

University of Toronto at Mississauga, Erindale College



## CALL FOR PAPERS

Do you wish to share an idea or technique of interest with your fellow teachers? Have you a special demonstration, computer program, culminating activity or teaching concept? Do you have interesting ideas related to the new curriculum, or connecting the grade 9,10 Science courses to the Grade 11 Physics? Have you used your computer or the web in an innovative way in your classroom? Please consider sharing these with your colleagues by making a contributed presentation at the conference.

If you wish to make a presentation at the 2002 OAPT Conference, please return this form to:

John Beattie  
Conference Coordinator  
Blenheim District High School  
163 Chatham Street  
Blenheim, Ontario  
N0P1A0

Or FAX to 519-676-4919  
Or E-mail to: jbeat123@aol.com

Name: \_\_\_\_\_

School or Institution: \_\_\_\_\_

E-mail address: (I need this) \_\_\_\_\_

Phone: (home) \_\_\_\_\_ (school) \_\_\_\_\_ (fax) \_\_\_\_\_

**TITLE OF PRESENTATION:** \_\_\_\_\_

Time Required:      10 min: \_\_\_\_\_      15 min: \_\_\_\_\_      20 min: \_\_\_\_\_      30 min: \_\_\_\_\_

### SPECIAL NEEDS:

Do you require any audio-visual or special equipment besides an overhead projector? yes \_\_\_ no \_\_\_

If yes, please describe your needs \_\_\_\_\_

Will you be bringing any equipment yourself? yes \_\_\_ no \_\_\_

If yes, describe what you will be bringing: \_\_\_\_\_

**ABSTRACT:** Please include a brief summary of the specifics of your presentation on the back of this form. (\*If faxing, be sure to fax both sides)