



CHAMP is an association for Mathematics Teachers of Peel, Etobicoke, Halton and Dufferin Peel.

Carol Danbrook Wins Prestigious Math Award

“The best thing in my career” is how Carol Danbrook described her winning of the Morley McGregor Award for outstanding teaching of Mathematics. Presented to Carol recently at the Ontario Association for Mathematics Education (OAME) annual conference in London Ontario, this award recognizes Carol, the 1996 winner as best elementary school Mathematics teacher in the province.

On a recent visit to Carol’s classroom at W.G. Davis PS, I was privileged to see some of the outstanding results of Carol’s caring and enthusiastic teaching style. Her students demonstrated Carol’s philosophy of Mathematics education as an “enjoyable, co-operative, active hard work” subject. Carol’s classroom is covered with graphs, geometry assignments, tessellation art and other student-produced work. Her cupboards bulge with math games, hands on materials, visual aids and resource materials. If you visit her classroom during Wednesday lunch period, you are likely to be trampled by the over one hundred active participants in her weekly math club, avidly competing in games involving thinking skills and deductive reasoning.



Carol has come a long way from her start over twenty years ago teaching Latin in such diverse locations as Richmond Hill and New Brunswick. When she became involved full time in Mathematics teaching about fifteen years ago, several generations of students got very lucky. The author of seven books, Carol is a lifelong active learner. She continues to be involved in attending conferences as far away as Boston, and Long Island, both as a speaker as well as a learner. She has spent time as a math resource teacher in Peel, runs outstanding Mathdays involving her whole school, and was a founding member of the Peel Association for Mathematics Education, the local forerunner for our current OAME Chapter, CHAMP (Credit Humber Association for Mathematics Promotion).

When asked what her advice would be for other teachers, Carol emphasized that good teachers are life long learners. Attending conferences, remaining current and venturing into new techniques and new territory are not only challenging but necessary to continue to grow. Carol also pointed out that students need us to continually make connections for them, so Mathematics is not just a series of unrelated facts and strategies. Make sure that your Mathematics students are empowered and confident self learners.

One of Carol’s favourite anecdotes concerns a day when she gave as her grade eight assignment “Do any page from any book in this classroom”. It is a tribute to Carol that her students eagerly attacked this challenge with confidence and determination. Congratulations to Carol on provincial recognition of her outstanding accomplishments.

Jeff Irvine
CHAMP Executive
BCSS

Why Become a CHAMP Member?

By Marlene Dewey, Clarkson Secondary School, PEEL

CHAMP is a professional association for you, a MATH TEACHER. It allows for joint efforts and activities on behalf of all math teachers in PEEL, HALTON, ETOBICOKE and DUFFERIN-PEEL (SEPARATE) Boards. CHAMP's greatest undertaking is the CHAMP MATH CONTESTS for GRADES 7 to 11. Last year approximately 11 000 students across our four boards wrote these contests. What a wonderful way to involve students in math beyond the regular curriculum.

Awards for top-scoring schools and students in the CHAMP MATH CONTESTS are proudly received at the Spring MATHFEST, an event sponsored by CHAMP. The recipients, their teachers and their parents share in a sense of accomplishment.

CHAMP also supports the Grades 7 and 8 O.A.M.E. Math OLYMPICS. This is a competition in group, pair or individual problem-solving between O.A.M.E. Chapters. Our students compete for CHAMP. Competitions for this year will be held on April 8th (Halton), 9th (Peel), 10th (Dufferin-Peel) and 11th (Etobicoke), to determine the 2 teams to represent CHAMP at the finals in June, in Barrie, Ontario.

CHAMP provides these opportunities to our students, but what does it do for you directly? CHAMP organizes two Mathfests each year, one in the fall and one in the spring. These provide math teachers with an opportunity to network with other math teachers, as well as allowing for Professional Development Workshops, with math teachers sharing ideas, pedagogy and student-ready worksheets. The fall event includes a publishers' display, a bar, a dinner and prizes galore! This year's FALL MATHFEST was well attended and very successful (please see page 12 for some of its photo-moments)!

As one of its new initiatives, CHAMP has introduced this exciting first issue of the CHAMP NEWSLETTER which it is sending to all math teachers in the four associated boards. Subsequent issues will go to members only, to keep them up-dated and informed. Another new initiative is CHAMP's plan to hold 2 or 3 Social Events this year, for math teachers to share and enjoy! Its third new undertaking is its involvement in THINKBOWL. CHAMP hopes to sponsor a THINKBOWL Competition at the regional level sometime between March (Board level competitions) and June (Provincial level competitions). THINKBOWL involves Group Problem-Solving at the Elementary School level, with an emphasis on logic, presentation, leadership and interpersonal skills.

ALL OF THIS IS PROVIDED FOR MATH STUDENTS AND MATH TEACHERS BY CHAMP and yet only a small percentage of math teachers in our region are members of CHAMP. We should be giving 100% support to this organization! CHAMP does CARE and hopes that you CARE enough about Math Education to support its worthwhile endeavours. With greater membership CHAMP can do even more! CHAMP does NEED and APPRECIATE its supporters. **Complete the membership form on the next page and return it today.**

CHAMP NEWS

Editors:

Marlene Dewey
Jeff Irvine

Layout & Typeset:

Brampton Centennial Secondary School (BPA 4AG)
Julie Rennox, Nila Chandrasegaram, Daryl Wright, Darryl MacDonald

Printing:

Peel Board Print Shop

Membership Form

Name In Full: _____

School: _____

Board: _____

Position: _____

Home Information

School Information

Address

Tel. No.

Fax No.

E-Mail Address

Application For Membership In:



O.A.M.E. (includes membership in your chapter affiliation, CHAMP) \$40 for one year. Make cheque payable to O.A.M.E.



CHAMP membership only \$9 for one year. Make cheque payable to CHAMP.

Signature: _____

Date: _____

Please send completed application and cheque to: Mr. Mike Simpson
Erindale Secondary School
2021 Dundas St. W.
Mississauga, ON. L5K 1R2

For new/returning CHAMP members:

Please tell us:

1. What do you personally get from your membership in CHAMP?
2. What would you LIKE to get as a member?
3. What would you like to see in our next issue of the CHAMP newsletter?
4. Would you like to make a contribution to a future issue? If so, please send your article, clearly identified with your name, address and phone number to: Mr. Jeff Irvine
Brampton Centennial S.S.
251 McMurchy Ave. S.
Brampton, ON. L6Y 1Z4
Fax No. (905) 451-4756
Phone No. (905) 451-2860 x 230

Thank you for your SUPPORT of CHAMP

Sensitive Survey Questions and the Randomized Response Technique

An Application From MFN OAO

Question One on a recent survey concerning marital stability was “Have you ever participated in an extra-marital affair?”. If you were a survey respondent, would you answer this question truthfully? Suppose the surveyor promised total anonymity? Wouldn't you still feel that there must be some way of identifying your particular response, especially if the survey was written rather than oral?

Or suppose Grade Nine boys were surveyed concerning their sexual activity. Isn't there a pretty good chance that they would “inflate” their responses? Especially if the respondent felt his survey could in some way be identified and linked to him. These are examples of *response bias*, a very real problem for companies like Angus Reid when they want accurate responses to sensitive questions.

There is a mathematical technique called *randomized response technique* which can be used to reassure respondents that their responses are totally anonymous. This increases the likelihood that the survey respondents will answer truthfully. Here's how it works: Let's go back to the extra-marital affair question, and present the respondent with these instructions:

Before answering the question below, FLIP A COIN. If it comes up “heads”, answer question A. If it comes up “tails”, answer question B. Do not in any way indicate which question you answered. Simply reply “yes” or “no” to question #1.

1. A. Have you ever participated in an extra-marital affair?
- B. Does the day you were born have a 5 in it?

Wouldn't you feel more secure that your privacy is intact? Wouldn't you be more likely to answer truthfully? [But wouldn't you feel that your response would be useless to the survey firm?]

Here's the math behind the survey company's apparent madness.

Recall that $P(X) = \sum P(E_i)P(X|E_i)$. Or in our case, since the item of interest is the probability of a “yes” response, given that the respondent answered question #1A, $P(Y) = P(A)P(Y|A) + P(B)P(Y|B)$. The only unknown in this relation is $P(Y|A)$ since $P(Y)$ is the relative frequency of a Yes response (total number of “yes” divided by the total number of survey respondents); $P(A) = P(B) = 0.5$ (the coin flip); and $P(Y|B) = 36/365.25$ (three dates per month contain a 5). So given the raw survey data, $P(Y|A)$ can be computed. Mathematical magic!

Randomized response questionnaires only require a randomization technique (like the coin flip) and suitable innocuous alternative questions which have known uniform probabilities. If the survey sample is sufficiently large, very good results can be obtained.

Here's a sample of a questionnaire designed and administered by a Finite Math class to a school of 1256 students. In an actual survey, 380 answered Yes to Question #1. Solving for $P(Y|A)$ gives 23% [I'll leave the math 4U2Do]. I was shocked at the size of this number

Randomized response technique is a fairly simple yet real world application of conditional probability. I have found my Finite Math classes really hooked by it and are cheerfully employed constructing and administering this technique.

JEFF IRVINE
BRAMPTON CENTENNIAL SS

DRUGS & ALCOHOL SURVEY

FOR EACH OF THE SIX QUESTIONS BELOW,

Flip a coin for each question: If it comes up HEADS, answer Part A
If it comes up TAILS, answer Part B

DO NOT INDICATE ON THIS PAGE WHICH PART OF EACH QUESTION YOU HAVE ANSWERED. Circle only the YES or NO response for each question.

1. A: Have you ever come to school under the influence of (non-prescription) drugs or alcohol?
B: Is your birthday in March?
 YES NO
2. A: Can you have a good time at a party without the use of drugs or alcohol?
B: Are you female?
 YES NO
3. A: Do you take non-prescription drugs on a daily basis (aspirin, caffeine pills, diet pills, sleeping pills etc.)
B: Does your social insurance number end in a 3?
4. A: Do you consider drugs like marijuana or hashish safe to use?
B: Does the day you were born have a 7 in it?
 YES NO
5. A: Did you ever drink and drive, or get into a car with a driver who had been drinking?
B: Are you male?
 YES NO
6. A: Do you smoke?
B: Does the month you were born have an R in it?
 YES NO

Thank you for your co-operation. MFN OAO/Irvine

OAME Current Members Only

**O.A.M.E.
Conference
1997**

**Approximate
Conference Fees:**



Full Conference	\$150.00
Thursday May 8 Only	\$ 90.00
Friday May 9 Only	\$ 90.00
Saturday May 10 Only	\$ 40.00

Non-Members Only

Full Conference	\$180.00
Thursday May 8 Only	\$105.00
Friday May 9 Only	\$105.00
Saturday May 10 Only	\$ 50.00

BE SURE TO APPLY FOR FUNDING EARLY!

Shoe Me Your Math!

Interesting projects should be a vital component of the Mathematics program. Such assignments encourage enrichment, creativity, cross curricular skills, individuality, research, self evaluation and real life applications. Students can meet many Common Curriculum goals in a broad ranging investigation.

One such project my classes did recently was in the Mathematics of Shoes and Feet. Junior and Intermediate students choose their shoes with an intense seriousness. For one month my intermediate students measured, surveyed, observed, counted and compared shoes. Math skills involved included data management, graphing, metric measurement, geometry, percent, classification, ratio, topology and problem solving. Usually an in-class survey was taken and a presentation plan was designed by each student. Outside of class time students conducted home surveys, constructed various types of graphs and completed assignments. Computer generated graphs were to be accompanied by rough notes and plans.

An early assignment was to have each student remove one shoe and classify all the shoes in the class. Students explained their classification criteria and presented their results using Venn diagrams. A subsequent assignment asked students to count all the shoes in their home and present the results in an interesting way. Other topics included: surveys of favorite shoe brands; kinds of shoes or socks in a family; shoe logos; best place to buy shoes; shoe and foot sizes. One student's mother had kept such detailed purchase records that the student was able to illustrate monthly purchases with a broken line graph.

Skills involved included constructing various types of graphs, histograms, double stem and leaf diagrams, computing mean, median, mode and range. The lacing of shoes provided an exploration of topology and routes, including the mobius strip. Shoe treads were the foundation for explorations in geometry and symmetry. Assignments included making a rubbing of an interesting tread and then constructing a "flip" of the tread. An optional assignment was to design a different shoe tread.

The culmination of these exercises was an exciting contest challenge to "build a better shoe box". Designs were to be kept secret until the designated date. Construction was done at home using wood, metal, cardboard, cloth, wire and plastic. Students presented their designs in interesting and entertaining ways. Amazing boxes became jewelry boxes, doll houses, fancy decoration and display cases. Every student had to write an argument for their box to be most improved.

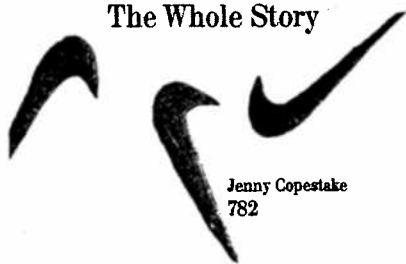
The project was evaluated by the students themselves and by the teacher according to organization, graphing skills, creativity and interpretation of data. An atmosphere of investigation, co-operation and creativity permeated the classroom during the "shoe math" project. It was highly successful way to develop important skills in Mathematics.

Student Work



So Shoe Me!

The Whole Story



Jenny Copestake
782

Rank Order

What type of sock is the most comfortable in a shoe?

thick ☹	4	3	2	1	4	3	4	3	2	5	4	2	1	2	1	4	3	1	5	3	2
thin ☹	3	2	3	5	3	4	1	4	4	4	3	3	2	4	4	3	2	4	3	2	3
soft ☹	2	1	1	2	2	1	2	1	3	3	1	1	3	1	2	2	4	2	4	1	1
clean ☹	5	4	4	4	5	2	3	2	5	2	2	4	5	3	3	5	5	3	2	4	4
dirty ☹	1	5	5	3	1	5	5	5	1	1	5	5	4	5	5	1	1	5	1	5	5

dirty 74 thick 59 thin 66 soft 40 clean 76

WHAT SHOE COMPANY HAS THE BEST LOGO?

MEADOWS
806

RANK	LOGO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
1		1	1	5	1	1	1	1	2	1	1	1	2	4	1	2	2					26
2		3	4	1	3	2	2	1	3	3	2	1	1	2	1	1						30
3		2	2	3	2	3	3	3	2	2	5	4	2	4	3	3						43
(tie) 4		4	3	4	4	5	4	5	5	5	4	3	3	5	4	5						63
(tie) 4		5	5	2	5	4	5	4	4	4	3	5	5	3	5	4						63

Conclusion:
Most students in the class liked NIKE's Logo the best.

The Socks in my House

Dad
Mom
Me
My brother, David



In my house, we have 47 pairs of socks.



THE HEIGHTS OF 806 & 782

BY: Natalie Meadows

Males (cm) Females (cm) 806

	2	14	5, 6, 6, 7, 7
8, 5, 7, 6, 4, 0	15	4, 5, 6, 7, 8, 9	
9, 6, 5, 4, 4, 3, 2	16	0, 0, 1, 1, 2, 2, 3, 4, 7, 8, 9	
6, 3, 2, 0, 0	17	6	

mode - 164, 170 cm.
median - 164 cm.
mean - 163 cm.
range - 142 - 176 cm.

mode - 146, 147, 160, 161, 162 cm.
median - 160 cm.
mean - 158 cm.
range - 145 - 176 cm.

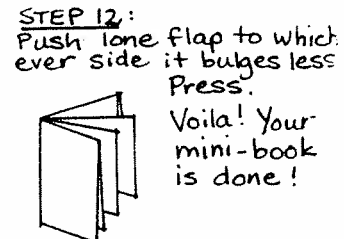
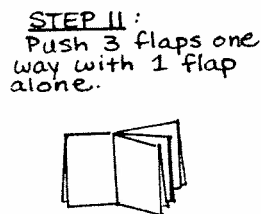
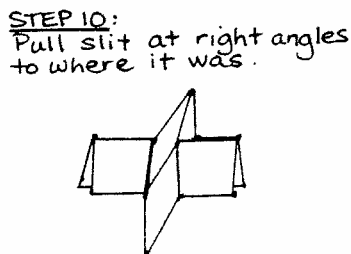
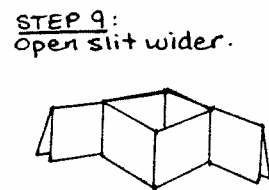
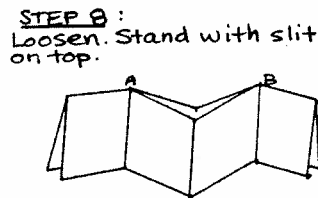
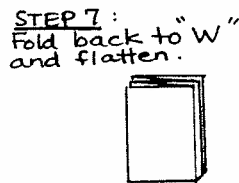
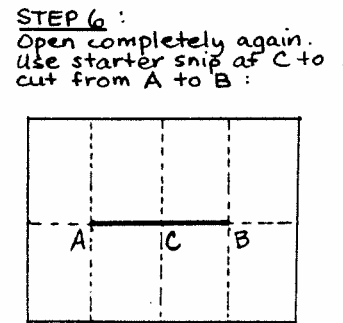
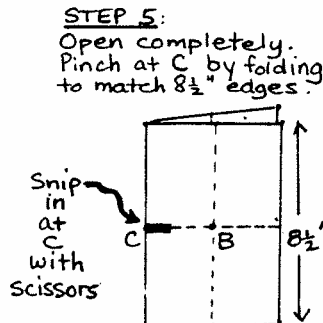
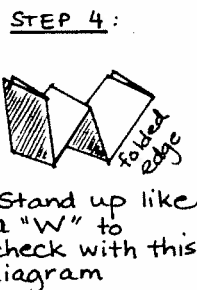
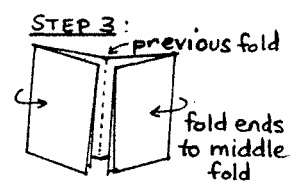
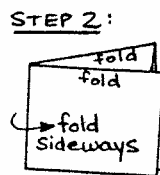
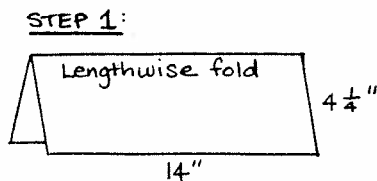
MATHEMATICS WITH A TWIST ... AND A FOLD!

by Marlene Dewey

Each issue of the CHAMP Newsletter will include a page of paper - folding. You and your students can discover the GEOMETRIC power in these simple yet amazing projects. Each can be adopted and used in many grade levels, for many purposes ... including the discovery of mathematical pasterns. In this issue, you can learn how to make a small 8 - page book, with no need for staples, glue or tape. Here we go!

A MINI - BOOK WITH MINI USES!

Start with an 8 1/2" by 14" sheet of paper.
(Or an 8 1/2" by 11" sheet will do.)





Evan Stratford - special award for performance on Grade 9 CHAMP contest while a grade 4 student at Tecumseh PS

Math Contest Winners - 1996



Islington PS Grade 8 Team



Glenforest S S Grade 10 Team



St. Jeromes Grade 7 Paris



Martingrove CI Grade 9 Team



Loue Park S S Grade 11 Team



Homelands PS Grade 7 Individual

Have your students' pictures in this page next year!

MATH OLYMPICS



Queen Elizabeth Park PS Teams



Teams of 4

Grade 7 - 1 boy, 1 girl

Grade 8 - 1 boy, 1 girl

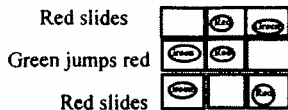
2 PERSON EVENT

Ontario Mathematics Olympics

Scarborough Campus
University of Toronto
Saturday June 1, 1997



A frog can either slide onto an adjacent square, or jump over one other frog to the vacant square immediately beyond it. Use red and green bingo chips to represent the frogs. (A sample is provided below.)



Equal numbers of squares are added to each end of the arrangement with red and green frogs separated from each other by the empty middle square. Find the minimum number of moves to switch the frogs from one end to the other for

- 4 frogs at each end
- n frogs at each end

Write your answers on the next page.

Sample Questions

TEAM OF 4 EVENT

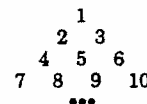
Place 19 trees in an arrangement that has 8 rows with five trees along each row.

INDIVIDUAL EVENT

- Eighty-five unit cubes are placed in a line such that they are joined face to face. Find the number of square units in the surface area of the resulting solid.



- Suppose the number 1, 2, 3, ... are written in a pyramid as shown. In what row does the number 100 first appear?



- Find the most probable total when two regular octahedral dice are rolled.

Math Olympic "Time Trials"

April 8, 1997 -

Halton

April 9, 1997 -

Peel

April 10, 1997 -

Dufferin Peel

April 11, 1997 -

Etobicoke

Problems Corner Richard Dewey

1. Find the missing numbers

$$\begin{array}{r}
 \square \square 7 \\
 \times 3 \square \square \\
 \hline
 \square 0 \square \square \\
 \square \square \square \\
 \square 5 \square \\
 \hline
 \square 7 \square \square 3
 \end{array}$$

2. In Klingon money 1 zilch is worth 13 milches and 1 milch is worth 23 pilches. How many pilches would you have to give for 26 zilches?
3. If it takes 30 seconds to go up an escalator without walking and it takes 45 seconds to walk up the escalator stairs if it is not moving, how many seconds will it take to get to the top if you walked up while it was moving?
4. What is the highest power of 2 in 1000?
5. (A tough one) Solve for a
If $\sqrt{4+2\sqrt{3}} - \sqrt{28+a\sqrt{3}} = -4$
6. Extra-for fun. Albert Einstein who stimulated a new interest in Riemannian geometry through his theory of relativity was born on March 14, 1879. If you looked at his month and day of birth with a decimal between them, what equally famous number do you find.

Answers in next issue of CHAMP News

In the next issue of CHAMP news
only for CHAMP members

...At least one ready-to-use article for elementary Math teachers

...At least one stimulating article for secondary Math teachers

...More on Thinkbowl and the Math Olympics

...More paper folding

...Answers to the problems corner

...More challenging problems

...A new column, Book and Software Reviews

A N D L O T S M O R E !

MATHFEST



MATHFEST '96

by Sue Trew

The CHAMP executive felt they were gambling this year when they chose an earlier date, October 3rd, for Mathfest '96. Fortunately, the gamble paid off! More than 150 teachers from Peel, Dufferin-Peel, Halton and Etobicoke Boards, gathered at North Peel Secondary School in Brampton for this annual social/professional development event, now famous for its great food, wine, beer, pop, great company, and excellent workshops.

On arrival, registrants, having collected a pile of free materials were able to browse the extensive publishers' displays while meeting old friends or making new acquaintances. Following the first session of workshops, the Hospitality Services students of North Peel served up a sumptuous meal of sweet basil chicken, home glazed virginia ham, pasta, salads and breads, with cakes, tarts and patties for dessert. During the meal, 20-30 prizes were won as the raffle was drawn. The publishers present were extremely generous with their prize donations, which included calculators, manipulatives, binders, books, marker's etc. One lucky person was able to walk off to the second session of workshops with a T1-82 graphics calculator!

The twelve workshops, which catered to all divisions, covered Portfolio Assessment, Problem-solving with Calculators and Computer software, integrated units, the Geometers' Sketchpad, Articulation, Learning Partners, Recreational Math, and a CBL/light sensor demonstration. At \$15 for members (\$20 for non-members) this was definitely the best PD opportunity around!

