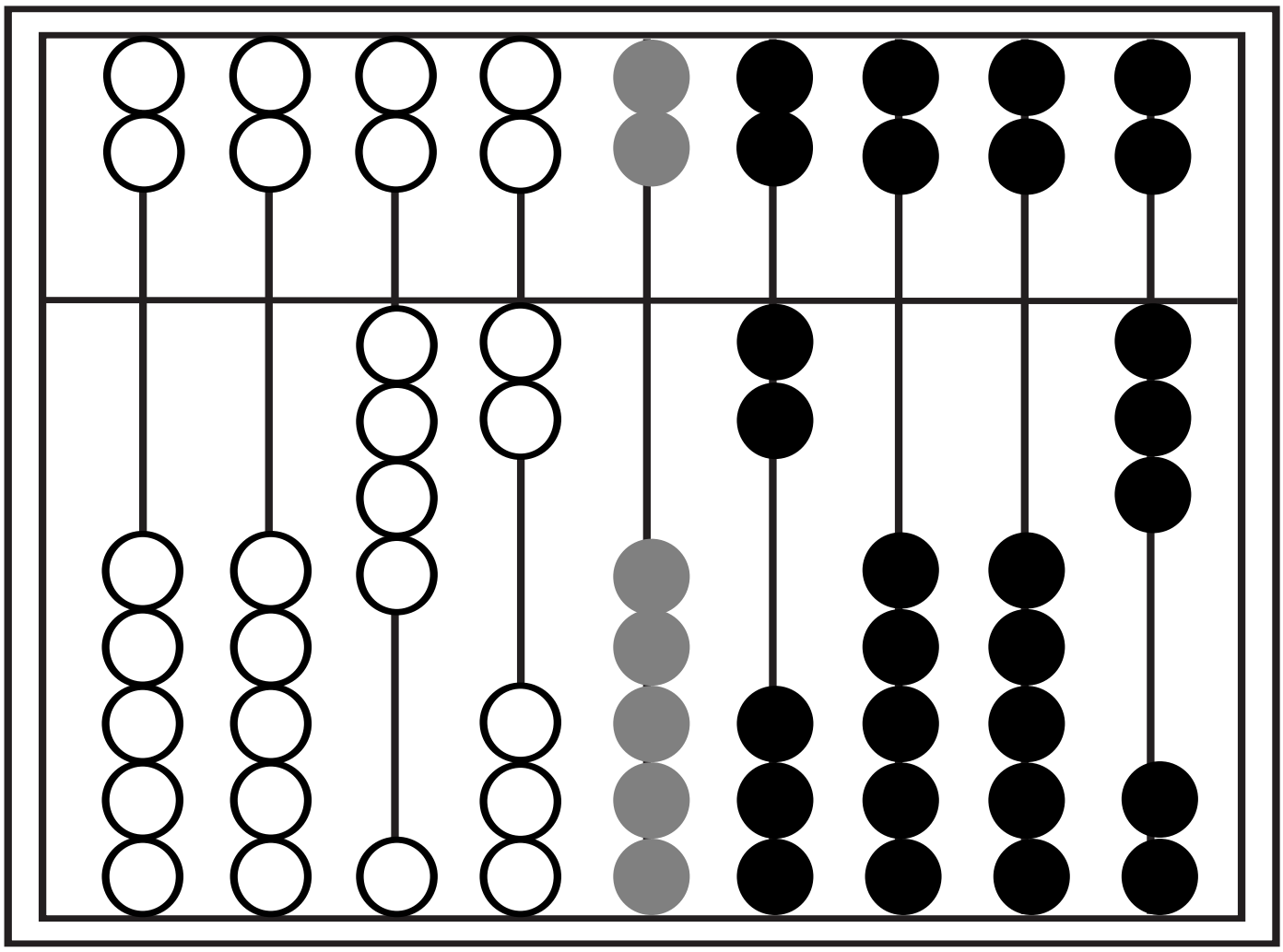
# Abacus

## Volume 42 2003



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Edited by Frances Schatz

ONTARIO ASSOCIATION FOR MATHEMATICS EDUCATORS

# ▲ From the Editor's Desk

During this past summer **Christopher Guest**, from PEP. Concepts and Design in Brampton, Ontario introduced me to the *Game of Flickers*. The basic function of this game is to "fun-challenge" both the mind, and hand/eye co-ordination. In this issue of *Abacus* I will introduce a paper version of this game. This game utilizes the 'power of colour' to spice up the learning experience; unfortunately, the sample will be black and white. To obtain the game board and related materials for your classroom, family math night, or community club, I encourage you to contact the game inventor at **PEP. Concepts and Design**, 10 Margate Place, Brampton, Ontario, L6S 2S5. Telephone (905) 458-8927 or email: Christopher Guest Harvey.Bennett@ sympatico.ca

Mathman, **Gill Dunn** is back with more entertaining toothpick puzzles. In the March 2003 issue we promised to feature some new creations.

**Tara Tasker**, an elementary teacher from the Bowmanville area, is currently studying at Queen's University and continues to write her math resource 'Math Wizards'. The entire resource can be found on her website **www.bonfieldpublicschool.com** for free downloading in PDF format. For this *Abacus* she has provided the instructions, black line masters and rubric for an activity within a grade 3 measuring resource.

Thank you to Christopher Guest, Gill Dunn, and Tara Tasker for providing lively, fun activities in this *Abacus*.

Frances Schatz

# ▲ From Mathman's Desk (Guest Editor)

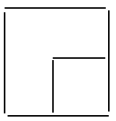
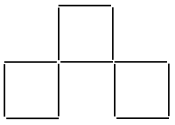
Thank you Frances for inviting me to be a guest editor for the *Abacus*.

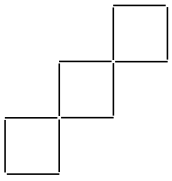
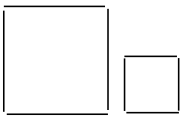
Since a Saturday morning conversation at a breakfast table with Frances in May 2002 I am pleased that three *Mathman* articles have been published in *Abacus*. The first was in September 2002. I described the **SIX TRIX** puzzle that was contained in one of the eight stations of my Mathman's Manipulatives Kit workshop "Using Manipulatives To Build Self-Esteem". (This Kit has been to more than 70 classrooms to date.) The second article was in the December 2002 issue and it extended the SIX TRIX (Magic Squares) puzzle to investigate **Magic Triangles**. The third article was my signature **Toothpick Puzzle** presented in the March 2003 issue as another of the eight stations of my Manipulatives Kit.

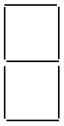
Once students have been exposed to the Magic Triangle and Toothpick Stations and are allowed to 'free play', they end up creating their own puzzles!

For this issue I've collected a variety of different types of toothpick puzzles with the hope that teachers will encourage their students to try them and then create and submit some of their own puzzles, that may be published in future issues of *Abacus*. For solutions or comments re the Activity page, please contact me: Gill Dunn gd.mathman@rogers.com

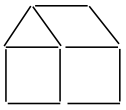
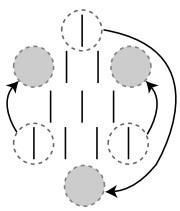
***Suggested Solutions:***

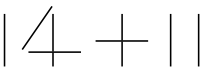
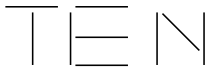
1. a)  b) 

c)  d) 

e) 

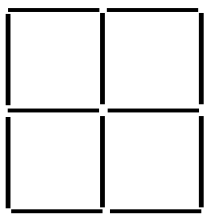
2. 

3.  4. 

5.  6. 

# ▲ Mathman Activity: Toothpick Puzzles

1. Use twelve toothpicks to make this figure



   a) Remove two toothpicks so that there are only two squares remaining.

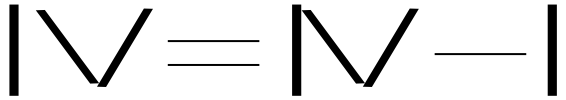
   b) Move three toothpicks so that there are only three squares left.

   c) Move four toothpicks so that there are only three equal squares remaining.

   d) Move four toothpicks so that there are only two squares left.

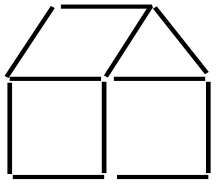
   e) Remove five toothpicks and leave eight!

2. Use ten toothpicks to form the equation below:

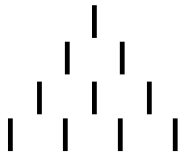


   Move one toothpick to get a true equation.

3. Use eleven toothpicks to form the house below. By moving only one toothpick, can you turn the house to face west instead of east?



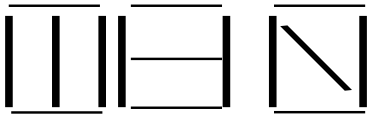
4. Use ten toothpicks to form the figure below: Move three toothpicks so that the figure is upside-down.



5. Make the figure 140 from eight toothpicks as shown. Move two toothpicks to change 140 into 25.



6. Make the following figure with 15 toothpicks. Remove six toothpicks to make ten.



**Please use the submission form included below to send me your own puzzle creation.**

***Ontario Mathematics* Gazette *and* Abacus**

***Release form for student's own puzzle. This form is kept on file with the editor.***

Student's name: _____ Grade level:_____

Teacher's name:_____ Class:_____

School's name:_____

School's address:_____

School's telephone:(  ) _____Principal's name:_____

# ▲ Teacher Notes: Flickers Game

*by Christopher Guest*

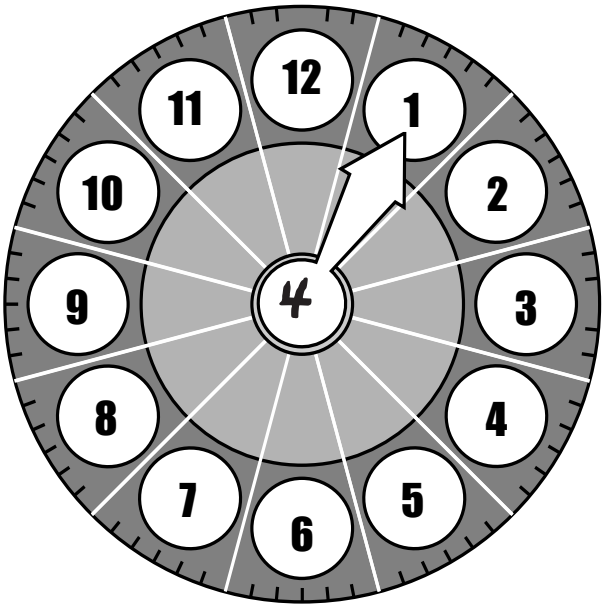
*Flickers* provides competition for all ages. Its main focus is toward education, fun, and hand/eye coordination. Its random style playing applications provide multiple numbers of combinations making it a game of choice. For mathematics the game teaches addition, subtraction, multiplication, division, per cents and combinations of these skills. [The magnetic Flickers that come with the real version of the game meet all health and safety standards.] Flickers fly like darts. For the Abacus version we will suggest a spinner; the magnetic board and flickers are described first to help you understand the scope of the game.

Flickers Math Game

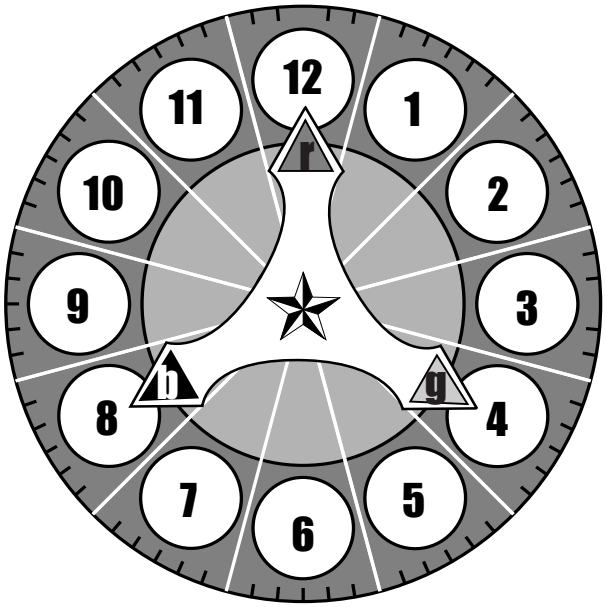
The actual 'flicker' has three points, red , blue , and green . Pick which colour you wish to use to add, subtract, multiply or divide. Each colour can change from play to play. This game can start in Kindergarten with a question such as "when the flicker lands, what is red pointing to?" Continue with counting to adding two numbers; perhaps red is add 1, blue is add 2 and green is add 3 to the number pointed to on the board. (*Abacus* activity will use a spinner on which the number on the point can be changed.) Note: All plays in Flickers are random because the real flickers spin in the air before they land on the board. The colours on the flickers are the 'power' of each play.

The actual game board and magnetic flickers give much more flexibility. Your *Abacus* editor is only providing a sample paper version. Watch for workshops on *Flickers* in your area.

On page 5 you will find a game circle that looks like a clock. You can photocopy the page to put on a stiff cardboard. Then use a paper fastener to put the spinner on the centre. The spinner will work best if it is bristol board or similar weight of paper. You will find a 'flicker-like' spinner or an arrow with a number in the centre. Here are some examples of what you could do for skills practice. The actual game board and magnetic flickers give much more flexibility. Your Abacus editor is only providing a sample paper version. Watch for workshops on 'Flickers' in your area.

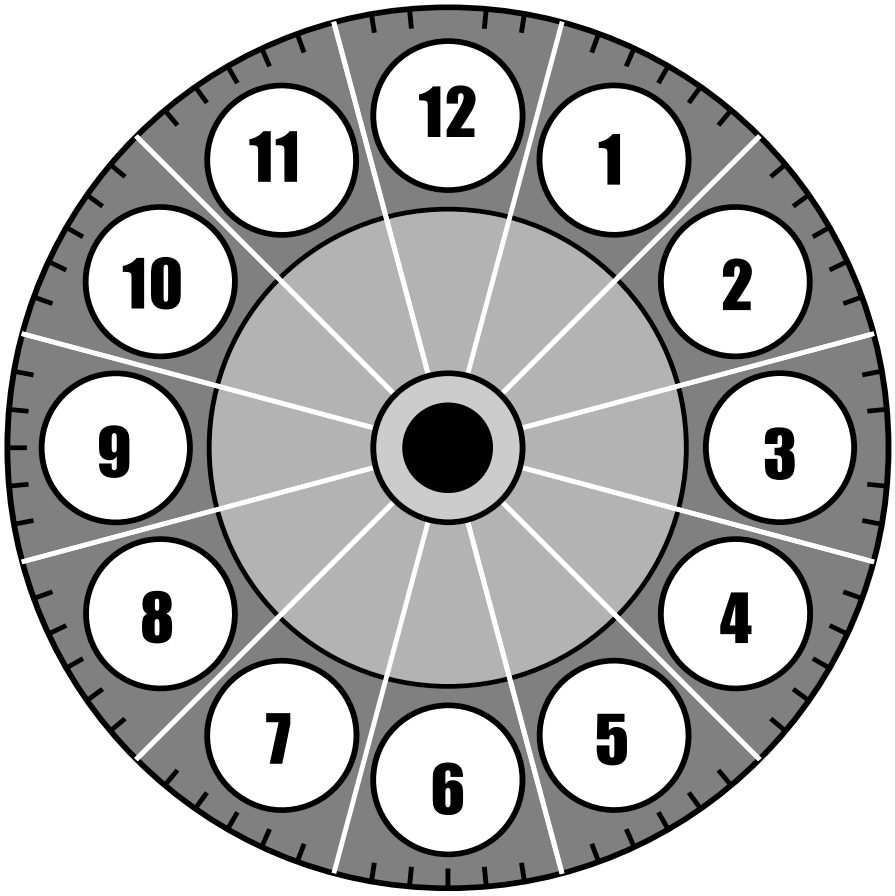


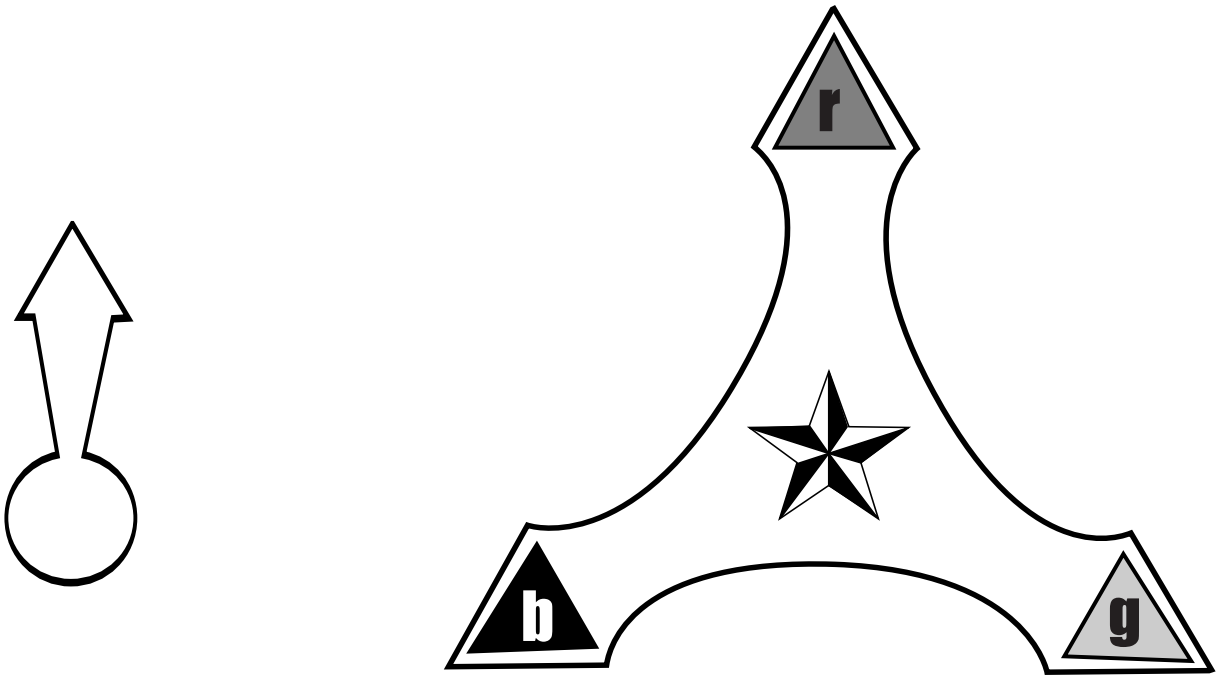

***Arrow can indicate 4 + 1, 4 x 1. Spin for arithmetic + or x facts.***




***Add ▲ + ▲ – ▲. Make up your own math question.***

# Activity: Spin the Flicker




*Arrow and 3 points to cut out for spinner*

# ▲ Teacher Notes A Measuring Picture Book

*by Tara Tasker*

As a class read the book *Measuring Penny* by Loreen Leedy (ISBN 0-439-08328-1). While reading the story, discuss the various measuring tools and units used to measure Penny. After reading the book, explain to your students that they will be writing their own measuring books and will need to bring in a stuffed animal (please see a sample letter to parents below).

Dear Parent or Guardian,

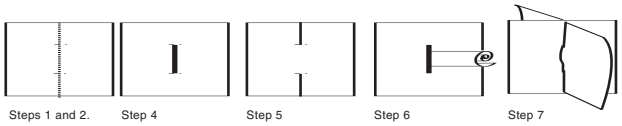
Today we read *Measuring Penny* by Loreen Leedy in class. The book is about a girl who measures every aspect of her dog, Penny. Next week, we will be creating our own measuring books. To complete this in-class assignment, every student is required to bring in a stuffed animal. Over the weekend, you may want to look up any interesting mathematical facts about your chosen animal, using the internet, library etc.

Sincerely,

The students will then complete a story planner, a rough draft and an editor's checklist. The final copy will be done in a roll and slide book (directions below).

## Roll and Slide Book Directions:

1. Fold an 8.5" x 11" paper in half (hamburger style).
2. Along the fold, measure 5 cm in from either side.
3. Repeat steps 1 and 2 with several more pieces of paper.
4. Take **one** and cut **in between the 5 cm markings**, removing a sliver of the fold creating a slit in the middle of the paper.
5. Take the rest of the papers and cut slits **up to the 5 cm markings** (creating two slits one on top and one on bottom) .
6. Roll the two slit papers lengthwise and slide them through the paper with the slit in the middle.
7. Unroll the two slit papers when the middles meet to complete your roll and slide book.



Steps 1 and 2. Step 4 Step 5 Step 6 Step 7

### *Measurement Story Planner*

I will be measuring: _____

Some interesting facts about this animal: _____

_____

| DIMENSIONS | VOLUME | MASS |
|---|---|---|
| length: _____ | notes: _____ | mass: _____ |
| heights: _____ | _____ | |
| width: _____ | _____ | notes: _____ |
| | _____ | _____ |
| notes: _____ | _____ | _____ |
| _____ | _____ | _____ |
| **TEMPERATURE** | **TIME** | **MONEY** |
| preferrred _____ | notes: _____ | notes: _____ |
| climate: _____ | _____ | _____ |
| notes: _____ | _____ | _____ |
| _____ | _____ | _____ |
| **BEGINNING** | **MIDDLE** | **END** |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

### *Measurement Story Rough Fraft*

| | |
|---|---|
| page 1 - picture | text: _____ _____ _____ _____ |
| page 2 - picture | text: _____ _____ _____ _____ |
| page 3 - picture | text: _____ _____ _____ _____ |
| page 4 - picture | text: _____ _____ _____ _____ |
| page 5 - picture | text: _____ _____ _____ _____ |

# ▲ Measuring Book Rubric

| | Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|---|
| Understanding of measurement concepts in written story | • Limited understanding of concepts through partially complete and unclear explanations in the story. | • Understanding of concepts is incomplete based on appropriate but inaccurate explanations in the story. | • Solid understanding of concepts through complete and appropriate explanations and procedures in the story. | • Complex and/or thorough understanding of concepts explained throughout the story. |
| Communication of measurement knowledge through the written story | • Mathematical language is imprecise or inappropriate.<br>• Measurement tools used were inappropriate. | • some mathematical language and symbols are used appropriately, but are compromised by errors or vagueness<br>• Measurement tools used were at at times inappropriate | • Mathematical language and symbols are used appropriately, no errors of terms.<br>• Measurement tools were appropriate. | • Mathematical language and symbols are used pruposefully and with elaboration to enhance the story.<br>• everal measurement tools are used and the most appropriate tool highlighted. |
| Communication of measurement procedures in illustrations | • Illustrations are not used to communicate the measurement procedures. | • Measurement procedures are often correct in illustrations but include minor flaws or errors. | • Measurement procedures are accurate in illustrations with only a ffew monor errors.<br>• Details of how things were measured is included. | • Measurement procedures are accurate in illustrations. Additional information of measurement procedures and details of steps are included. |
| During the production of the story the student | Required assistance | Required some assistance | Was independent | Was independent |
| The overall presentation of the story | Needs improvement | Is satisfactory | Is good | Is excellent |

# ▲ Activity ~ Measurement:

Does your story have

- ☐ A beginning
- ☐ A middle
- ☐ An ending
- ☐ A pattern

Does your story include a variety of measurements?_____

Are your ideas

- ☐ In order
- ☐ Clear
- ☐ Interesting

I checked my capitals

- ☐ At the beginning of sentences
- ☐ In names
- ☐ In dates

I checked my punctuation for

- ☐ Periods (.)
- ☐ Question marks (?)
- ☐ Exclamation marks (!)

- ☐ I checked my story for spelling.
- ☐ I reread my WHOLE story after editing it.
- ☐ My pictures give clues to the words and the story.

Now you may write your final copy.