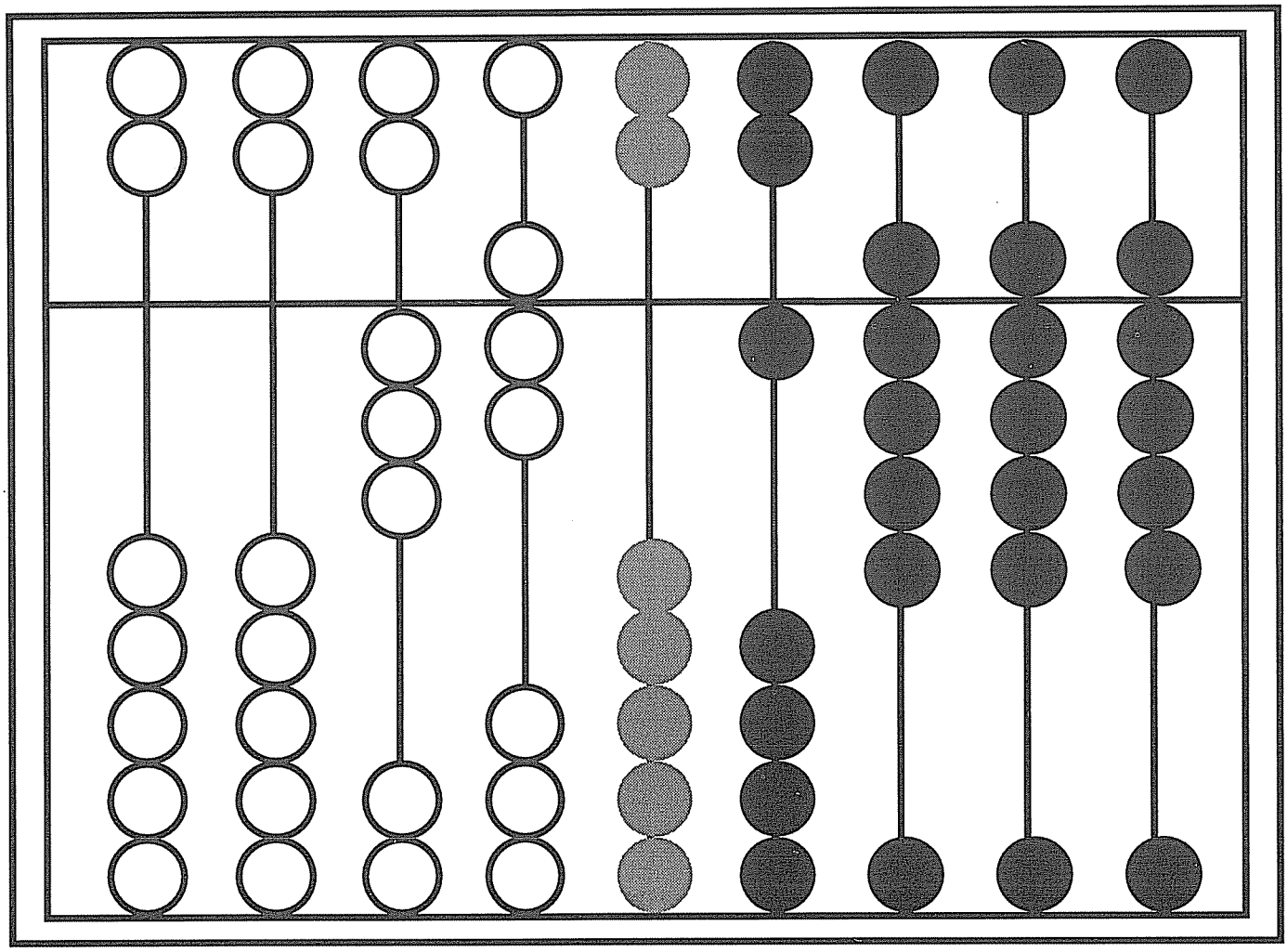
# Abacus

Volume 37 1999



ONTARIO ASSOCIATION OF MATHEMATICS EDUCATORS

• Volume 37 Number 4 • June 1999

A Publication of the OAME/AOEM

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# From the Editor's Desk

This issue contains a potpourri of activities for various grade levels , especially grades 4-8.

Kurt Lewis is quoted: "If you truly want to understand something try to change it." As teachers we all have an opportunity to face the challenge of change by doing our best to understand the new initiatives in education in this province. This year the OAME Leadership conference held in February helped me in my goal of "conquering the challenge of change".

There are many external factors impacting on how we work in the classroom:

## EQAO testing

- Parent demands for teacher accountability
- New curriculum that contains new types of learning expectations
- The explosion of the knowledge base and the technology for accessing information.

These factors mean we must focus on Knowledge-In-Use rather than Knowledge-About. This issue provides some performance-based learning tasks that hopefully will be useful in your class.

**Joanne Harris, Centennial Middle School, Brampton, Ontario** has written an assignment that she used with her grade eight class. She includes the rubric that was developed to assess the assignment. She says, "the classes I have this year are very low in ability with a significant number of identified students in each of my three classes". The rubric was made with the students in the class. Joanne Harris would appreciate feedback from anyone who uses her assignment. She can be reached at Joanne_Harris@chat.haltonbe.on.ca.

"There is a new learning in math today. It isn't a fad, and it won't go away." **The Toronto District School Board** produces **Calendar Math** for the year. In this issue July-August are presented as summer projects for your students.

Starting in the year 2000 middle school students in Canada and the United States are invited to participate in the new **AMC-8** for grade 8 and below. Visit their websites at:

**http://www.math.uncc.edu/~hbreiter/.**

Update on NCTM materials available to K-9 teachers. For information about any NCTM publications please contact me. I am your representative to NCTM and OAME benefits from purchases made through your representative. Here are some titles that might interest you.

**New!** *The Wonderful World of Mathematics: A Critically Annotated List of Children's Books in Mathematics (second edition).* By Diane Thiessen, Margaret Matthias and Jacquelin Smith. This attractive book reviews more that 550 high quality books for children. NCTM 1998

*Teacher-Made Aids for Elementary School Mathematics Volume 3* contains readings from Arithmetic Teacher and Teaching Children Mathematics. This delightful volume includes a wide assortment of educational and thought-provoking exercises such as "*Cooking Up Mathematics in Kindergarten*". NCTM 1998

Mathematics for the Young Child edited by Joseph Payne is full of activities and suggestions for teacher educators and teachers in preschool through grade 4. NCTM 1990.

For more information about these books or other titles by NCTM, contact me at frances.schatz@sympatico.ca or write to the address given on title page of Abacus.

NCTM campaign urges **"Kids Do Math"**. Mathematics - we know it is at the heart of so many successful careers and quite simply, successful lives. But that message doesn't always reach parents and students. In an effort to help students and parents see the excitement in "doing math", NCTM has launched a companion Web site at www.domath.org.

**Mystery Reader Prize.** If you are OAME member number 11513 please fax, email or write to the editor for a mathematical prize valued at $25.00. If this is not your number watch future issues and your number may appear.

Frances Schatz

# ▲ CALENDAR MATH 1999

## GETTING READY FOR Y2K

The Toronto District School Board has once again printed its very popular mathematics calendar and they have given the O.A.M.E. Early/Formative Years Committee permission to bring you, the ABACUS reader, the summer section of the 1999 edition. We know that both you and your students, as well as their parents and guardians, will enjoy the problems presented here, and we hope that if you do not already have your own copy of the calendar you will want to have one on your desk soon. Congratulations to the author, Trevor Brown, and the project manager, Peter Saarimaki, on producing a wonderful mathematics resource.

## How Calendar Math Can Be Used

Questions and activities can be used at anytime, not just on the assigned day. Some activities can be used for lesson warm-ups, while others will take longer to complete and might be given as "Problem of the Week". Many of the questions and activities can be used in your daily math lessons.

Calendar Math can also be used as a home connection. Many schools districts and teachers realize that it is important to involve parents in children's education. Homework takes on a new meaning when questions and activities from the Calendar are sent home. Parents begin to experience, with their children, the joy and the challenge of a rich mathematics activity.

Along with the questions from the Calendar, the teacher might wish to send home "hints" for the parents that will assist them in modeling the problem-solving process for their child. Parent letters could also explain the role of the calculator and emphasize the importance of children reasoning, justifying their conclusions and expressing their ideas clearly.

The last few pages of the 1999 Calendar provides excellent information to include in a Home Connection Newsletter.

Have some math fun!!

## LITERATURE CONNECTION

The 1999 Calendar contains a bibliography of all the children's books referred to each month. Some of the books for July and August are:


1. Baker. S.J. 1998. *The Village of the Hundred Smiles: And Other Stories.* Toronto, ON; Annick Press ISBN 1-550-37522-9

2. Estes, E. 1994. *The Hundred Dresses.* New York, NY; Harcourt Brace. ISBN 0-152-37374-8

3. Hong, L.T. (illustrator) 1993.*Two of Everything: A Chinese Folk Tale.* Morton Grove, IL. Albert Whitman & Co. ISBN 0-8075-8157-7

4. Pinczes. E.J. 1993. *One Hundred Hungry Ants.* Boston, MA. Houghton Mifflin. ISBN 0-395-63116-5

5. Ryan, P.M. 1996. *One Hundred is a Family.* New York, NY. Hyperion Press. ISBN 0-7868-1120-X

6. Schwartz, D.M. 1998. *G is for Googol: A Math Alphabet Book.* Berkeley, CA; Tricycle Press ISBN 1-883-67258-9

7. Slate, J. 1998. *Miss Bindergarten Celebrates the 100th Day of Kindergarten.* New York, NY; Dutton Books ISBN 0-5254-6000-4

8. Ziefert, H. 1998. *A Dozen Dozens.* Toronto, ON; Penguin/Puffin Books. ISBN 0-670-87789-1

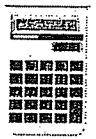
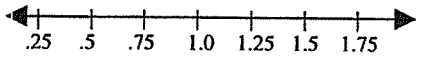
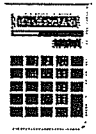

### *HOW TO ORDER CALENDARS*

THE BOOKSTORE- Toronto District School Board
155 College St, 6th Floor, Toronto, ON M5T 1P6
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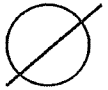
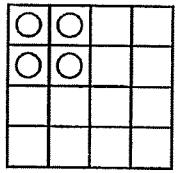
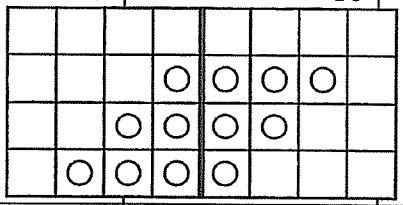
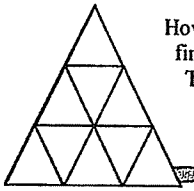
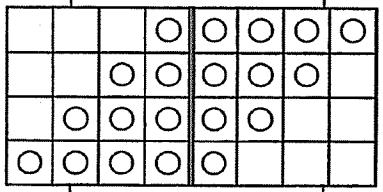
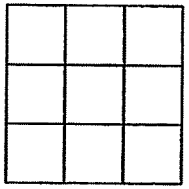
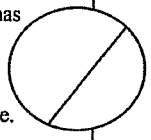
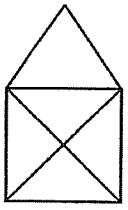
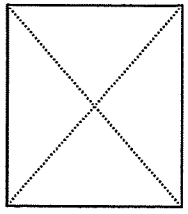
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# JULY

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| | | | | **Canada Day** 1<br>Read *The Village of a Hundred Smiles* | 2<br>Play this game with a partner:<br>* Enter 1, 2, 3, 4 or 5 in your calculator.<br>* Give the calculator to your opponent, who adds 1, 2, 3, 4, or 5 to the total.<br>The first player to reach 21 wins! If you go over 21, you are "bust", or lose! | 3<br> |
| **Independence Day** 4<br>You were supposed to enter 39+18 into a calculator, but you entered 39+8 instead. Explain how you can correct the problem without using the clear key or starting over. | 5 | 6<br>Here are some interesting patterns:<br>-Multiply some 2-digit numbers by 99. Record your results and make a conjecture.<br>-Multiply some 3-digit numbers by 999.Record your results and make a conjecture.<br>-Multiply some 2-digit numbers by 999.Record your results and make a conjecture.<br>-Now try these – 11 x 11; 111 x 111; 1111x 1111; Predict 11111 x 11111 | 7 | 8 | 9<br>Read *One Hundred Hungry Ants* | 10<br>Make up riddles about numbers using 2, 3, or 4 clues. For example: "My number is less than 6. My number is even. My number is more than the number of legs on a bird." |
| 11<br>Read *The Hundred Dresses* | 12<br>Suppose that A = \$1, B = \$2, C = \$3, . . .<br>How much would Z be worth?<br>Figure out the value of your name.<br>How many words can you find that are worth close to 100?<br>Are any exactly \$100? | 13 | 14<br>Read *Two of Everything: A Chinese Folktale* | 15<br>Place each number on the number line below.<br>1.2, 0.50, 0.9, 0.20, 2.0, . . .<br><br> | 16 | 17 |
| 18<br>Use a calculator, where necessary, to help you find the following:<br>-the number of days in a year;<br>-the months that have 30 days;<br>-the shortest month;<br>-the number of days till your birthday | 19<br> | 20<br>Read *G is for Googol* | 21<br>On the hundreds board make a picture of an object by colouring squares. Describe it to a friend without showing it. Use clues like: 9, 16, and 25 are red; 1, 2, 3 are blue | 22<br>Read *Tic-Tac-Toe, Three in a Row* | 23<br>Imagine you have an eraser, a screw, a jam jar, a paper clip, a piece of card, a pencil, a pebble and a paper tissue. Describe several different ways of sorting these objects. | 24 |
| 25<br> | 26<br>**Fill in the missing numbers in this addition table. Is there another answer?** | 27<br>+ \| \| \| \|<br>\| \| 7 \| \| 11 \|<br>\| \| \| 13 \| \|<br>\| \| 9 \| \| 13 \|<br>\| \| \| 14 \| \| | 28 | 29<br>A calculator expression for 6 is 4+2 =. Another calculator expression for 6 is 5+2–1=. How many different expressions for 6 can you write? | Read *Monster Math Picnic* | 31<br>If you read one million words this year, about how many books is that? How did you figure that out? |

# AUGUST

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| 1<br>This cake has been cut into 2 pieces with one cut.<br> | **Simcoe Day** 2<br>Draw some cakes. Use only 2 cuts across each time to divide cakes into 3 pieces and 4 pieces. The pieces do not have to be equal. Use only 3 cuts across each time to divide cakes into 4 pieces, 5 pieces, 6 pieces, 7 pieces. | 3 | 4 | 5<br>These 4 counters make a square. Use the same 4 counters and find out how many *different sized* squares can you make on the grid? | 6<br> | 7<br>Check out *Charts and Graphs* |
| 8 | 9<br>Use squared paper and counters to make this pattern.<br> | 10 | 11<br>Move counters to make a shape with **one line of symmetry.** How many counters did you move? Can you do it by moving just two? | 12<br>Read *The True Story of the 3 ...* | 13<br> | 14<br>How many triangles can you find in this kite? The triangles may be different sizes. Outline some with different colours. |
| 15<br>Use squared paper and counters to make this pattern.<br> | 16 | 17<br>Move 4 counters to make a shape with one line of symmetry. In how many different ways can you do this? | 18<br>Read *A Fair Bear Share* | 19<br> | 20<br>These 9 squares have been made into a shape with 4 edges. Use squared paper to put the 9 squares into shapes that have: 6 edges, 8 edges, 10 edges, 12 edges, 14 edges. | 21 |
| 22 | 23<br>This circle has been divided into 2 regions that touch along an edge.<br> | 24<br>Divide a circle into 3 regions so that each region touches both the other regions along edges. Divide a circle into 4 regions so that each region touches the other three regions along edges. | 25 | 26<br>Read *A Dozen Dozens* | 27<br> | 28<br>Draw this rocket ship on a piece of paper. Now see if you can retrace it, but do not take your pencil off the paper and do not go over the same line twice. |
| 29<br>You will need a large **square**. Draw the two diagonals. Cut out the four triangles.<br> | 30<br>Use two of the triangles to make a square.<br>Use all four triangles to make one large triangle.<br>Use all four triangles to make a rectangle.<br>Use all four triangles to make a shape with **six** sides. | 31 | | <br>A box contains a plentiful supply of straight rods of different lengths: 1, 2, 3, 4 and 5 cm Join them to make triangles and classify them.<br><br>Did you make any equilateral triangles? Scalene? Isosceles? Right angled? . . . | <br>Read *What if the bus doesn't come?* | |

# ▲ Create A Box Assignment

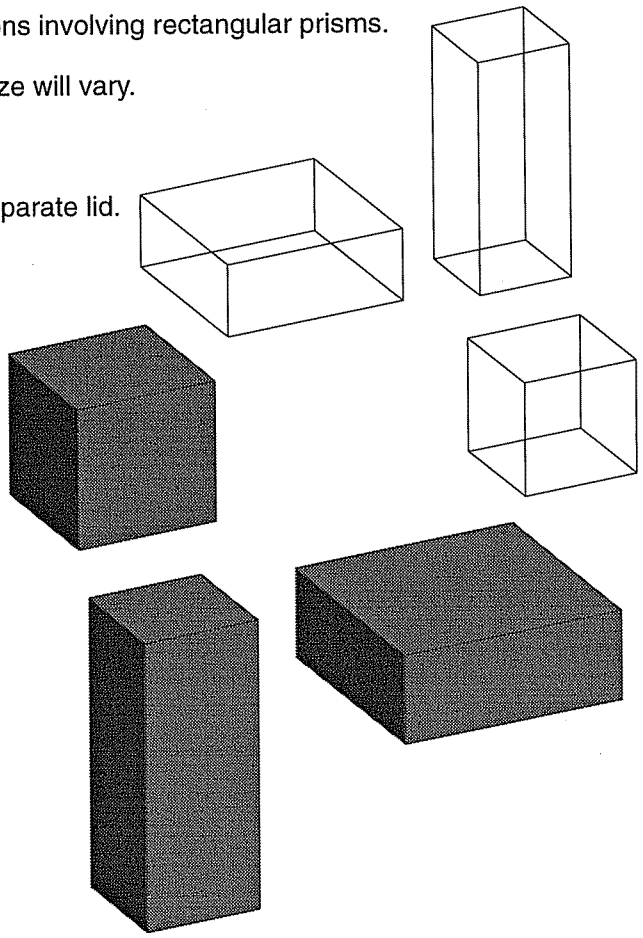
*By Joanne Harris*

**Expectations:** Measurement:

**Grade 8:** apply volume and area formulas to problem-solving situations involving triangular prisms.

**Grade 7:** apply volume formulas to problem-solving situations involving rectangular prisms.

1. Box is to hold something of value to you, therefore the size will vary.
2. This is an individual project.
3. The box is to close - this could be with a flap or with a separate lid.
4. Box may be decorated.
5. Box must be substantial enough to get to school in one piece.
6. Include the following with the box when it is handed in: name, class, dimensions, a place for a peer to verify the dimensions, a calculation of the total surface area of the box and the volume of the box.



## Extensions:

Create a box with the smallest surface area given a specific volume.

Create a box with the largest volume given the specific surface area.

## Teacher Notes

### Preparation for the Assignment

Here is the path to follow:

1. Review straight line measurement strategies and units.
2. Review how to calculate area for regular figures (square, rectangle) and the more unusual figures such as triangles and parallelograms.
3. Use unifix cubes to identify how perimeter can remain constant and area change.
4. Identify the formula for finding the volume of a rectangular prism, and then a triangular prism. (Hint: Toblerone bars are perfect for this.)
5. Use prepared nets to make an open box.
6. Make a net for an open box that would have a specific item (eg 12 unifix cubes) fit into it. Then cut out the net and test it.
7. Complete the Create A Box Assignment.

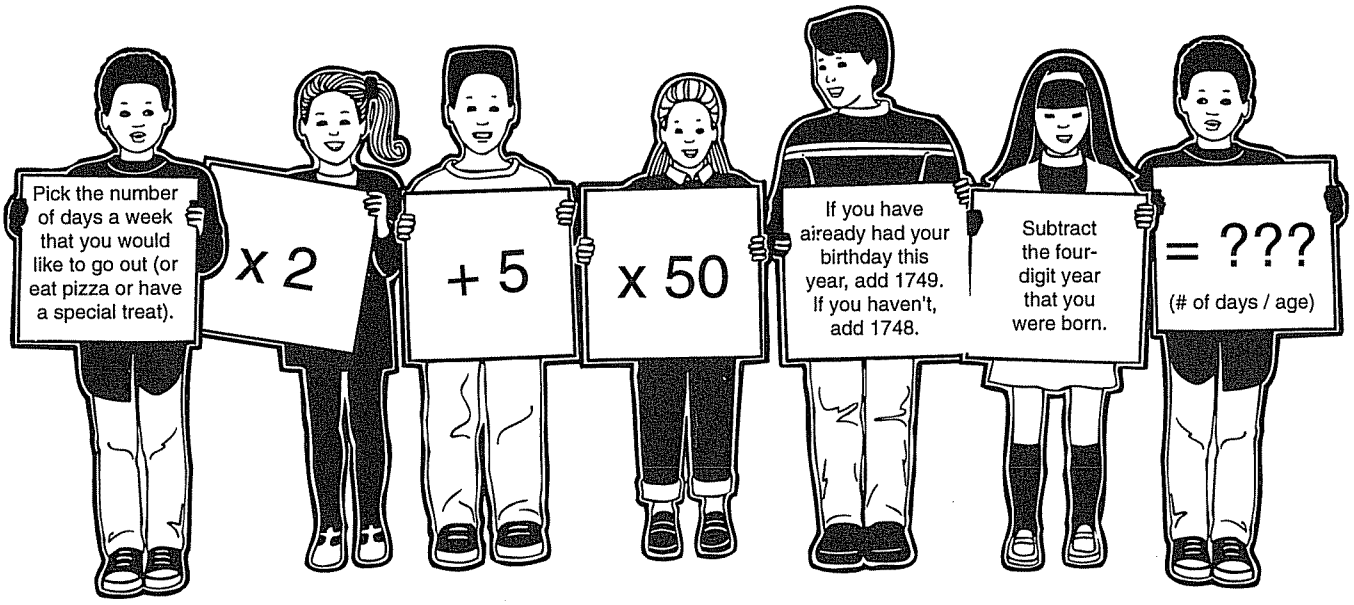
# Rubric for: Measurement-Rectangular Prisms/Triangular Prisms

| CRITERION (critical attributes) | INDICATORS: observable descriptors indicating the extent to which a criterion is met. | | | |
|---|---|---|---|---|
| | **One** | **Two** | **Three** | **Four** |
| **size** | • box way too big or way too large | • box a little too big or a little too small (snug) | • box is correct size | • box is exactly the correct dimensions |
| **construction** | • box falls apart before it gets to school | • box is strong enough to get to school in one piece | • box is substantial and stands up to use | • box is strong enough to stand repeated useage |
| **dimensions** | • at least two dimensions are incorrect | • dimensions are within one centimetre of actual dimension | • recorded accurately (length, width, and depth) | • all dimensions are accurate and include the correct units. |
| **appearance** | • little or no attempt to decorate or finish neatly | • tape or glue showing, not decorated. | • neat, attractively finished | • outstanding job of decorating, edges neatly finished. |
| **Independent Work** | • requires significant help to complete the task | • requires a little assistance to complete the task | • understands the task well enough to complete independently | • understands task well enough to help others complete work. |
| **Volume Calculation** | • unable to calculate volume (does not know formula) | • uses formula but does not arrive at correct answer | • uses formula correctly, arrives at correct answer | • uses formula correctly, arrives at correct answer, units are appropriate, correct number of places after the decimal. |

# ▲ Only In 1999, You Say

Work this out as you read-and have your students work it out as you read it aloud. Don't read the results until you have worked it out! Follow these six steps and this will amaze you...

1. Pick the number of days a week that you would like to go out (or eat pizza or have a special treat).
2. Multiply this number by 2.
3. Add 5.
4. Multiply it by 50.
5. If you have already had your birthday this year, add 1749. If you haven't, add 1748.
6. Subtract the four-digit year that you were born.




## Results:

You should now have a three-digit number:

The first digit of this was your original number (that is, the number of times you want to go out each week).

The next two digits are your age!.

This is the only year (1999) this will ever work, so spread the math fun around by sharing this with your students or a friend or two.

Reprinted with permission from *Alberta Teacher's Association Mathematics Council Newsletter* edited by Art Jorgensen, April 1999.