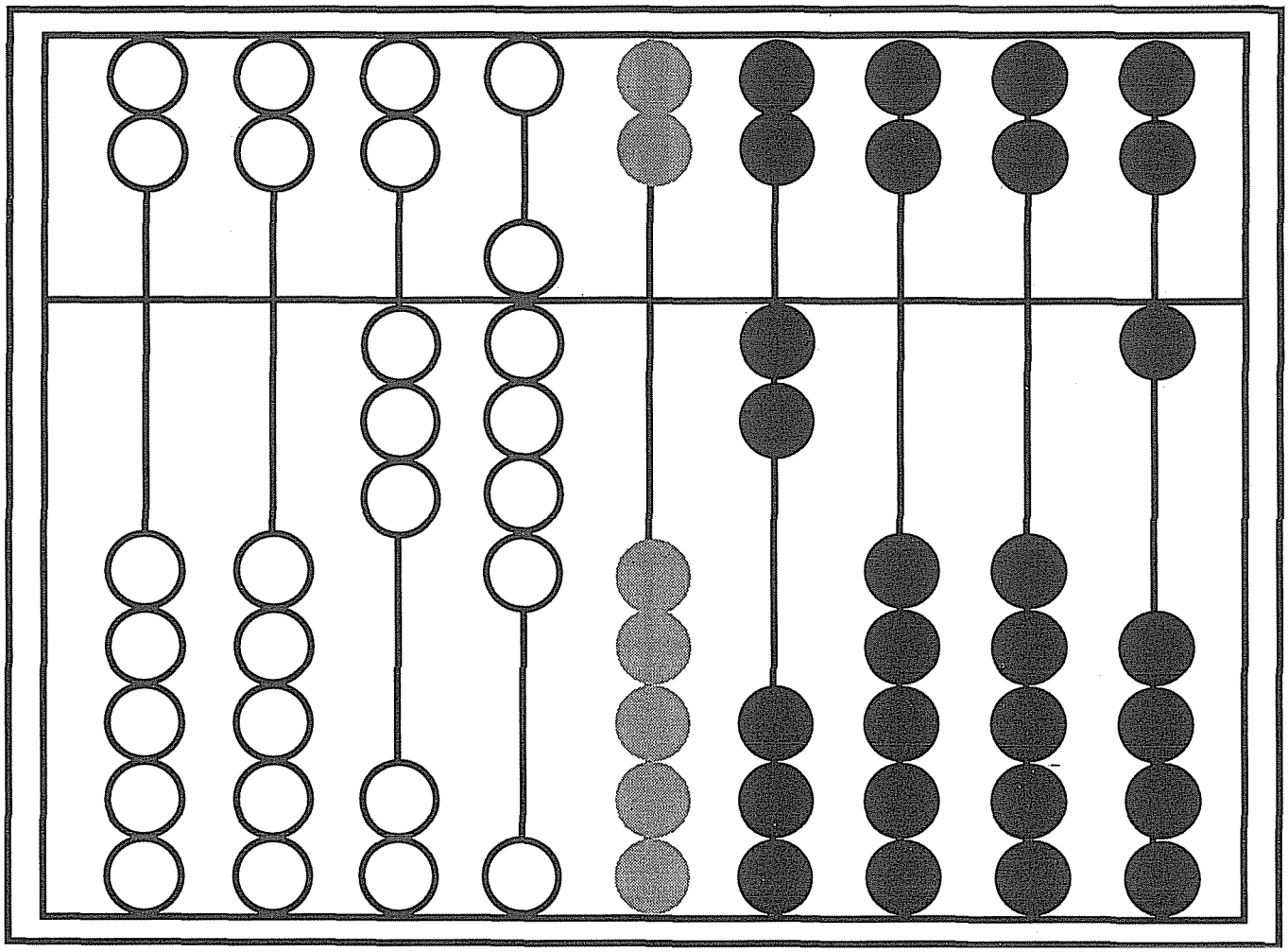
# Abacus

Volume 39 2001



ONTARIO ASSOCIATION OF MATHEMATICS EDUCATORS

**Volume 39 Number 3**
**March 2001**
**A Publication of the OAME/AOEM**
Edited by Frances Schatz

# ▲ FROM THE EDITOR'S DESK

March is the time to reflect on the school year to date, to plan to attend the spring conference, and to have some activities to welcome spring.

**Reminder:** At the spring OAME conference in Scarborough, you will find NCTM K-8 materials with the NCTM display at the secondary school site. There will be information with the program book.

OAME made it possible for me to investigate a new computer tool, Coreldraw8™, and I have learned a lot about this wonderful program by reading ***Coreldraw8™, A Student Manual*** *by Mary Howe (current president of OAME)* and by trying suggested exercises **Bunny** is my first project with Coreldraw8™.

**Bunny Folds, Hops, Measures, and Counts** is a collection of activities from my miscellaneous resources. Special thanks to **Ruth Tathum, Rockledge, Florida,** for permission to use ideas from her wonderful workshop *Making Math Meaningful and Memorable* presented at the NCTM Regional in Halifax, July, 2000.

Early this year, a grade 3-4 teacher asked me to locate information about non-Arabic numeration systems (other than Roman numerals) which might be interesting in a lesson for Patterning and Algebra. At this level, the overall expectation is "identify, extend, and create linear and non-linear geometric patterns, number and measurement patterns, and patterns in their environment". Sometimes I need an idea such as this to start the searching and creative thinking process. I have collated my research in **Ancient Number Systems**.

A specific expectation for grade 1-2 Data Management and Probability is "to compare, sort, and classify concrete objects (buttons in this issue) according to specific attributes such as size, shape, and colour. **Button Person** and **Button Hunt** should be exciting for any junior grade.

A teacher friend told me there is lots of stuff on the Internet for planning lessons; however, the catch is "time is needed to collate information and develop a lesson". For this issue I have done some research and I hope you and your class enjoy the activities in this issue. You will find my research in the Teacher Notes. This issue ends with a sample worksheet from **www.aplusmath.com**, a website that allows you to make a specific exercise. I picked "add 2 digit and 1 digit numbers - 20 questions".

## Resources:


Foose, Sandra. (2000) *Simply Super Paper.* Hong Kong, Midas Printing.

Green, Marilyn. (1991) *The Button Lover's Book.* Radnor, Pennsylvania. Creative Machine Arts Publisher.

Ministry of Education. (1997). *The Ontario Curriculum Grades 1-8: Mathematics.* Ontario: Queen's Printer for Ontario

National Council of Teachers of Mathematics.(1993) Curriculum and Evaluation Standards for School Mathematics. *Addenda Patterns K-6.* Reston, Virginia, NCTM.

National Council of Teachers of Mathematics. (1990) *Mathematics for the Young Child.* J. Payne, Editor. Reston, Virginia, NCTM.

National Council of Teachers of Mathematics. (1983). *Multicultural Mathematics Materials.* M. Krause, Reston, Virginia, NCTM.

Schymkiw, Gunter. (1998) *High Interest Mathematics.*US World Teacher's Press.


## Websites:

www.lessonplanspage.com/Math

http://illuminations.nctm.org/lessonplans/

www.oame.on.ca/jk-5.html

Do you have a special request for an activity? How about Fall, Halloween, Christmas, or any other special celebration math activities to contribute to Abacus. Please contact me.

Frances Schatz

# ▲ Teacher Notes

## Websites to Visit

***What does OAME offer elementary teachers?***

Visit **www.oame.on.ca/jk-5**. OAME's JK-5 committee has begun a collection of Internet websites that it hopes will prove useful to elementary teachers. The committee welcomes feedback from users. At this website you will find links to Math Forum, Problem of the Week, Ask Dr. Math, Teacher2Teacher and one of my favourites, **http://www.lessonplanspage.com/** .

***What does NCTM offer elementary teachers?***

Go to **www.nctm.org/affiliates/resource/**, then click on *Teachers corner*. Go to *teaching resources* and click on *Illuminations*. Another path is

**http://illuminations.nctm.org/imath/index.html** and choose the *grade level* you wish to research.

The **NCTM Illuminations** site has grade bands PreK-2, 3-5, 6-8, and across the grades. Each grade band contains five sections:

1. I-Math Investigations - ready-to-use, online, interactive, multimedia math lessons.
2. Reflections on teaching - based on video vignettes of teaching and learning.
3. Selected Web Resources
4. Internet-based lesson plans - lessons developed by expert teachers for your classroom.
5. Principles and Standards -searchable interactive version of the new NCTM math standards.

The site I visited was **'Understanding a Child's Development of Number Sense'**. Number sense refers to a person's general understanding of number and operations along with the ability to use this understanding in flexible ways. In K-3 children move from developing basic counting techniques to understanding number size and relationships. Students develop this understanding at different rates. How can one work with number facts if the basic number sense has not developed. In this issue you will find some button activities that will help with the development of number sense. In my work as a tutor to some elementary children, I have put aside the texts, worksheets, and any other written math to spend several hours with a large container of buttons. Children use counting as a means of assimilating and developing the concept of quantity.

I have provided a sample activity from the preK-2 band. **The Button Person** ties into activities using buttons. In this activity students will organize data into categories by sorting and classifying objects, then represent the data in a picture and/or a graph. The National Centre for Education Statistics has a site that allows the user to illustrate data on a colourful bar, pie, or line graph. See

**http://nces.ed.gov/nceskids/graphing/index.asp**.

To start this activity introduce a tub of buttons and share the different kinds contained in the tub. This will introduce the children to the various attributes: colour, shape, size, number of holes, smooth, or patterned.

Next, divide students into groups of two or three. Give each group a button basket (see A Button Basket Made from a Lunch Bag) containing a variety of buttons. Each group should sort the buttons according to an attribute of their choice.

Hand out white construction paper to each group. Each group should arrange the buttons according to one specific attribute of their choice. This is the beginning of representing data with concrete objects. Have the groups

share their results with the entire class and explain how they sorted their bag of buttons.

Tell a story. Have students select their favourite button and talk about it.

Clear the white construction paper. Use the buttons to construct Button Person.

Have students talk about the completed 'Button Person' to determine the characteristics the creators had in mind.

### Some Reflections on the Lesson

1. Did students achieve the expectations I had for this lesson?
2. What additional experiences do my students need to be successful with this activity?
3. Were the students able to explain their reasoning in a clear and logical manner?
4. What are the indicators that students were able to work together and share responsibilities?
5. Were students able to quantify, organize, and/or record information?

Another website I found really interesting is **www.aplusmath.com** and it is a great tutorial centre for students at home. At this site you can produce a variety of drill worksheets. You pick from the options provided. This site also offers flashcards and exercises with all arithmetic operations including fractions and decimals.

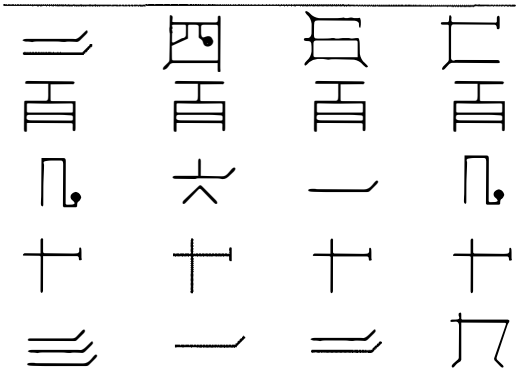
# Answer Keys:

***Aplusmath worksheet:***

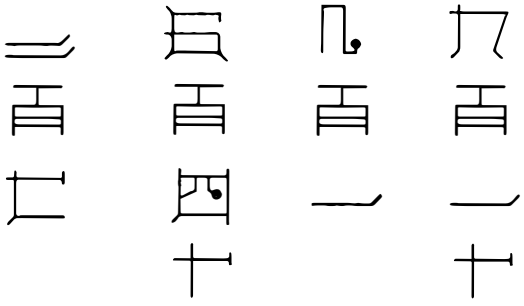
| | | | |
|---|---|---|---|
| 1. | 36 | 11. | 4 |
| 2. | 79 | 12. | 95 |
| 3. | 7 | 13. | 49 |
| 4. | 19 | 14. | 21 |
| 5. | 31 | 15. | 76 |
| 6. | 102 | 16. | 76 |
| 7. | 6 | 17. | 95 |
| 8. | 94 | 18. | 104 |
| 9. | 5 | 19. | 52 |
| 10. | 69 | 20. | 78 |

***Chinese Numbers***

283 461 512 789



207 540 801 910



# ▲ Bunny Folds, Hops, Measures, and Counts

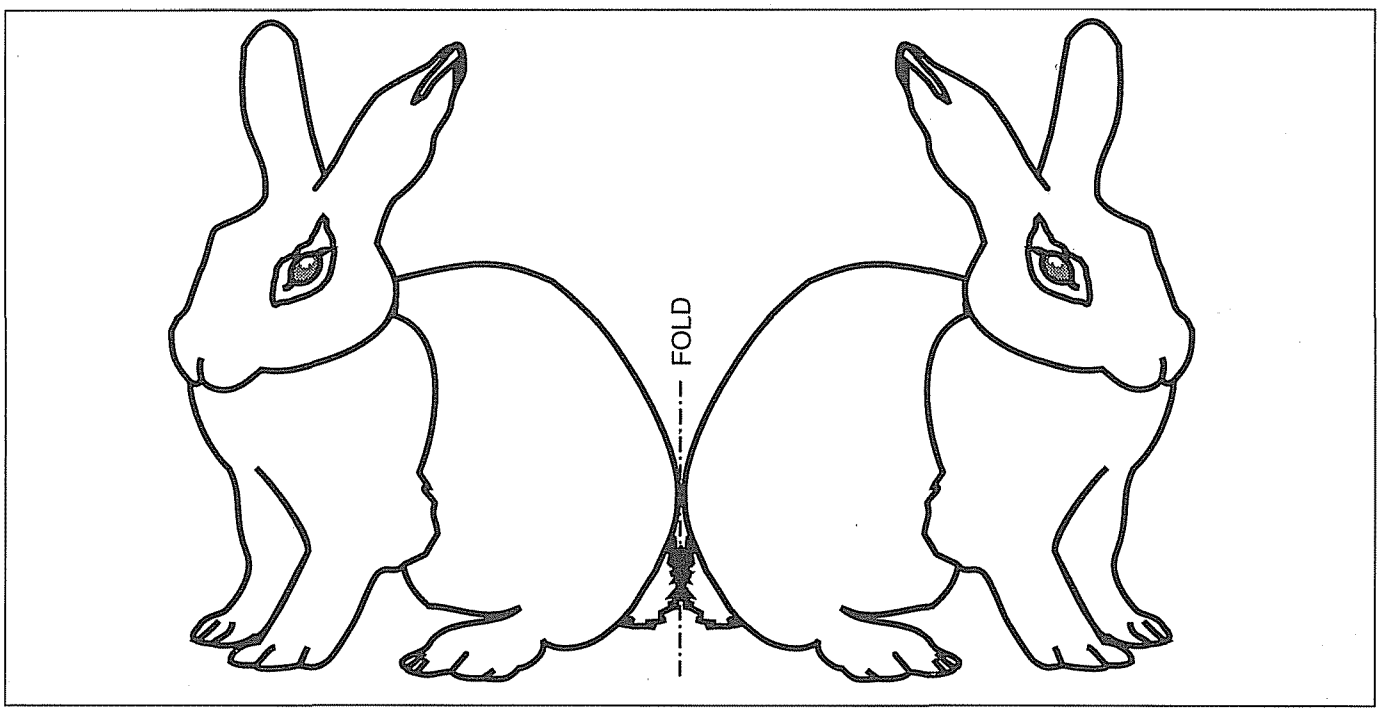



*Figure 1*

## Materials and Instructions

1. Photocopy Figure 1 onto stiff paper, and cut out. Do not cut on fold line. Use paper punch to cut out eye.
2. Fold on the line shown.

## Memory Note for Home

1. Colour the bunny on the front.
2. Write a math fact that you want to remember from today.

## Bunny Hops and Measures

1. Open up the card made.
2. Lay your opened card beside your friend's opened card so that the bunny noses meet.
3. A bunny measure can be made using any number of opened cards.
4. An open bunny card is the length of one bunny hop; that is

   Length of one bunny hop = Length of two bunnies.
5. Small pieces of tape can be used to fasten the bunny noses together to make a bunny measuring garland.
6. Measure items in the classroom.

My desk is _____ bunnies long.

My desk is _____ bunny hops long.

This classroom is _____ bunnies long.

This classroom is _____ bunny hops long.

Choose other items to measure with bunnies and bunny hops.

# Bunny 'I Have, Who Has' Game

The 'I Have' number goes on the front of the bunny card. The 'Who Has' goes on the inside of the bunny card. There is one for each card. There are 20 cards here.

I have 1. Who has four more than this number?

I have 5. Who has the value of two times this number?

I have 10. Who has the value of ten of these?

I have 100. Who has the number before this one?

I have 99. Who has 9+9?

I have 18. Who has the number of days in a week?

I have 7. Who has the number that Saturday would be if Sunday is this number?

I have 6. Who has this number doubled?

I have 12. Who has how many of this number in 36?

I have 3. Who has this plus 5?

I have 8. Who has this plus 1?

I have 9. Who has the value of this number in nickels?

I have 45. Who has this number subtracted from 60?

I have 15. Who has 5 times this number?

I have 75. Who has this value less 5 dimes?

I have 25. Who has the number of days in April?

I have 30. Who has the number of minutes in one hour?

I have 60. Who has the number of days in 4 weeks?

I have 28. Who has this number divided by 7?

I have 4. Who has one more than this number?

# ▲ Button Person

***Materials:***

- a button basket of miscellaneous buttons for each group of two to three children.
- A sheet of white construction paper for each group.

***Instructions:***

Use the buttons to outline and dress your person on the white construction paper.

***Discussion:***

1. How did you decide which buttons to use for your person? Eg small red buttons for the hat, large brown buttons for the shoes. Describe each type of button.
2. Count the buttons you used for each part of the person.
3. Make a list of the buttons you used.

## Button Hunt

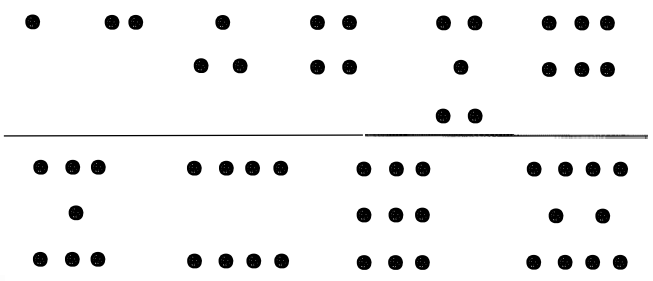
***Materials:***

- a **button basket** of miscellaneous buttons for each child or group.
- A sheet of white construction paper for each child.

***Instructions:***

1. Make number sets starting at 1, 2, 3, so that each number has a different kind of button. 1 might be one big brown, smooth button. 2 is two green buttons which are the same.
2. The goal is to have as many sets as possible.
3. In order to have the same buttons for each number, you will need to trade buttons with others in your class.
4. Make dot patterns with your buttons.

(This is an example: other patterns are possible.)



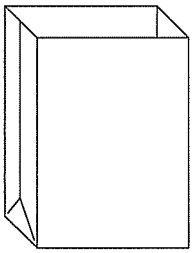
# ▲ Button Basket

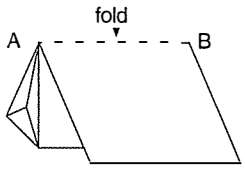
***Materials Needed:***

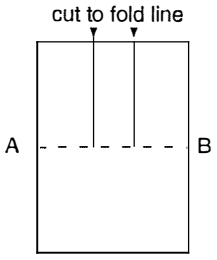
- 1 lunch bag for each student
- scissors
- Tape
- Crayons or markers (optional)

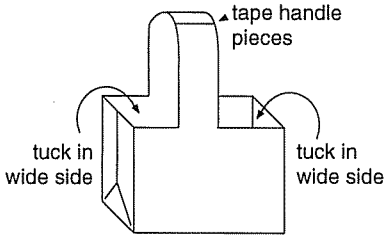
***Method:***

1. Fold the closed bag in half from top to bottom.
2. Note the fold line (draw over it with a crayon to see it).
3. Determine the centre top of the unopened bag.
4. Measure and mark 1.5 cm at both sides of the centre mark.
5. Draw lines straight to fold line.
6. Cut on the lines to make handle.
7. Open the bag and tuck in the wide sides.
8. Tape the handle pieces at the top.
9. Decorate with crayons or stickers.






# ▲ Aplusmath.com Worksheet

| | |
|---|---|
| 1. 31+5 = | 11. 4+0 = |
| 2. 70+9 = | 12. 94+1 = |
| 3. 7+0 = | 13. 44+5 = |
| 4. 12+7 = | 14. 15+6 = |
| 5. 24+7 = | 15. 72+4 = |
| 6. 95+7= | 16. 76+0 = |
| 7. 2+4 = | 17. 91+4 = |
| 8. 87+7 = | 18. 95+9 = |
| 9. 5+0 = | 19. 52+0 = |
| 10. 61+8 = | 20. 71+7 = |

# ▲ Ancient Number Systems

The Egyptians used picture symbols. There was no symbol for zero.

| 1 | 10 | 100 |
|---|---|---|
| stroke or stick | oxen yoke or heelbone | coil of rope |
| / or \| | ∩ | ୨ or ୧ |

25 = ∩ ∩ ///// or ///// ∩ ∩ (10+10+1+1+1+1+1)

102 = ୨ // or ୧ // or // ୨ or // ୧ (100+1+1)

**Exercise:**

1. Write the Egyptian symbols for the numbers 1 to 30. Continue the pattern.

1 | 2 || 3 ||| 4 |||| 5 ||||| 6 |||| 7 |||| 8 |||| 9 ||||| 10 ∩
|| ||| |||| ||||

2. Write the Egyptian symbols for 35, 40, 45, 50 to 150.

The system of writing numerals in ancient Greece was more efficient than that of Egypt because the Greek system had a symbol for 5.

1 = |

3 = |||

5 = Γ

9 = Γ||||

10 = Δ

25 = ΔΓΓ

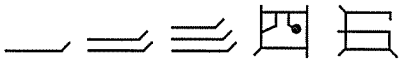
100 = H

**Exercise:**

Write the Greek symbols for 2, 6, 7, 11, 12, 16, 17, 18, 19,20, 110, 150, 200.

Old Chinese numerals had symbols for all digits and the order was vertical for our left to right numbers. Below you will find the symbols, several examples, and several for you to try. (Answers on page 4.)

***Figure 3***



1 2 3 4 5



6 7 8 9 10



100

| 642 | 283 | 461 | 512 | 789 |
|---|---|---|---|---|
| 6 x 100 + 4 x 10 + 2 | | | | |

| 350 | 208 | 207 | 540 | 801 | 910 |
|---|---|---|---|---|---|
| 3 x 100 + 5 x 10 | 2 x 100 + 8 | | | | |