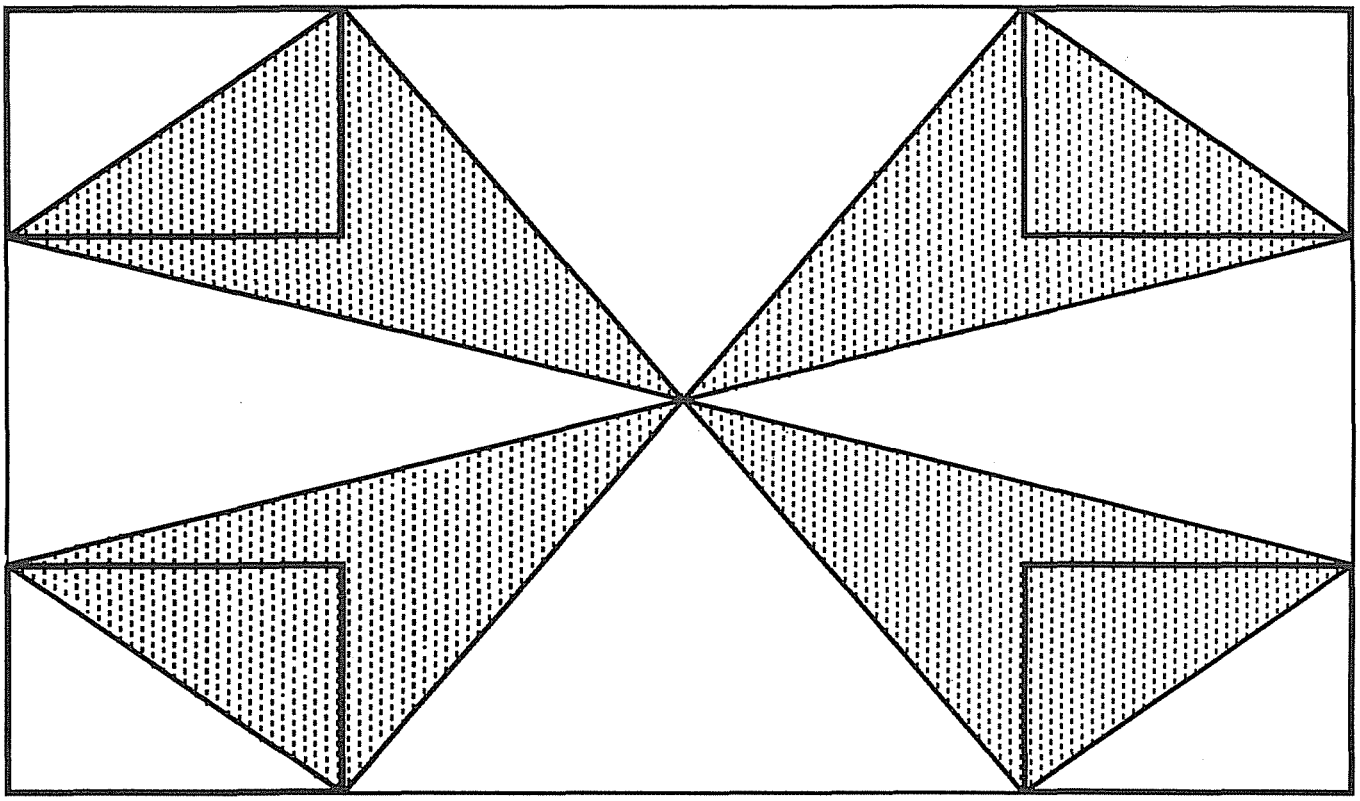
Abacus

December 1991

publication of the O. A. M. E.



Prepared By

Carol Danbrook
Program Implementation
Resource Teacher
Peel Board of Education

Amy Parker
Guelph, Ontario

The Abacus this month features the discoveries of Patti and Patrick - the Pattern Twins. For years, they have been hearing their professor father say "Mathematics is Pattern". As a result, they have searching for the 'perfect' pattern by exploring patterns that can be seen in mathematics.

Patti and Patrick are both elementary school students who are fluent in both French and English. At the beginning of this issue, they will work in English. At the end, they will work in French.

We hope that you enjoy the upcoming issue and have fun once again living the adventures of Patti and Patrick in both French and English.

Using a Calendar

One of the earliest memories for Patti and Patrick is exploring the patterns in calendars. Here is the exploration they tried.

Step 1
A blank calendar is shown on the next page. Have each student fill in the dates of the current month in the calendar. Have the students circle any dates that are special to them during this month (birthdays, weekends, end of school, etc.).

Step 2
Have the students answer the following question.

- How are the numbers in the horizontal rows alike? How are they different?

- How are the numbers in the vertical rows alike? How are they different?

As Patti and Patrick got older, they began to use calendars to compare patterns in all the months of the year. Sometimes, they even used calendars for many different months to compare. Remember: They were always asking themselves the following questions. You should too.

- How are the numbers alike?
- How are the numbers different?

On page 5, you will find another exploration that Patti and Patrick did to explore the patterns in calendars. For that exploration, each student will need at least one copy of the calendar shown on the next page.

Month _____

Sun	Mon	Tue	Wed	Thur	Fri	Sat

Another Activity

Here is another exploration that Patti and Patrick tried.

Step 1
Give each student one copy of the calendar shown on the previous page. (Your students can work in groups or individually to complete this exploration.)

Step 2
Have each student choose 2 days of the week from their calendar. Have them write the dates that appear under each day that they choose. An eaxample is shown below.

Tuesday	Saturday
1	5
8	12
15	19
22	26

Look at the numbers in each row and in each diagonal.
- How are the numbers alike?
- How are the numbers different?

Step 3
Now draw a square around any 9 numbers from the calendar. There is to be 3 numbers in each row and 3 numbers in each column. An example is shown below.

8	9	10
15	16	17
22	23	24

1. Use the numbers in your square.
(a) Find the sum of the middle row.
(b) Find the sum of the middle column.
(c) Find the sum of the diagonals.
(d) What do you notice about your answers in parts (a), (b) and (c).

2. Repeat Question 1 for other calendars of your own.
(a) What do you notice?
(b) Compare your results to others in the class. How are the results alike? How are they different?

Which Child are You?

Monday's Child is fair of face;
Tuesday's child is full of grace;
Wednesday's child is full of woe;
Thursday's child has far to go;
Friday's child is loving and giving;
Saturday's child works hard for a living;
But the child that is born on the Sabbath day
Is both happy and bonny and good and gay.

1. Write your birthdate as shown below. The value of A is the last two digits of the year in which you were born.

Month	Day	Year	
8	28	1958	A = 58

2. Write the last two digits of the year and divide by 4.
The value of B is the whole number part in the quotient.

$58 \div 4 = 14.5$ B = 14

3. Use the chart to find the value of C. Its value is the number assigned to the month in which you were born.

Jan	1	Apr	0	July	0	Oct	1
Feb	4	May	2	Aug	3	Nov	4
Mar	4	June	5	Sept	6	Dec	6

C = 3

4. The value of D is the number of the month in which you were born. In the above, D = 8

5. Calculate. $E = A + B + C + D$
$= 83$ E = 83

6. Calculate. $E \div 7 = 83 \div 7$
$= 11$ with 6 as a remainder

Use the chart below, and the remainder in Step 6, to find which child you are in the rhyme above.

Sun	1	Mon	2	Tue	3	Wed	4
Thur	5	Fri	6	Sat	0		

Thus, the person born of August 28, 1958 is Friday's child.

Discovering Someone Else's Birthday

To discover the birth date of a friend, have your friend mentally answer the following questions. You are interested only in the final sum that your friend will give. From this final sum, you can determine the birth date of your friend.

1. Have them think of the number that represents the month. For example, the numeral 3 represents the month of March.

2. Have them multiply the number by 5. (3 x 5 = 15)

3. Add 7 to the number in step 2. (15 + 7 = 22)

4. Multiply the answer in step 3 by 4. (22 x 4 = 88)

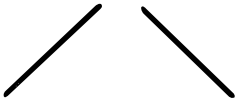
5. Add 13 to the number in step 4. (88 + 13 = 101)

6. Multiply the number in step 5 by 5. (101 x 5 = 505)

7. Add the day number of the birth date to the number in step 6. For example, if the birth date is the nineteenth, then add 19 to the number in step 5. (505 + 19 = 524)

Now ask your friend for the final number. You must subtract 205 from the number that you are given.

524 - 205 = 319



The third month.

The nineteenth day.

Thus, the birth date of your friend is March 19.

Four Square Magic

Have you ever wondered how many "mind readers" are able to tell you the sum of numbers before you have even selected the numbers? Patti and Patrick did and they set up the following exploration. Try the following exploration. It will show you how you can also be a 'mind reader'.

Step 1
Have a friend draw a square around any 16 numbers in a calendar. The numbers must be four numbers across and four numbers down as shown below.

6	7	8	9
13	14	15	16
20	21	22	23
27	28	29	30

Step 2
You, as a mind reader, will find the sum of the four numbers in the corner of the square. In this case, 6 + 9 + 27 + 30 = 72. Write the sum on a piece of paper, fold the paper and put it into your pocket.

Step 3
Now have your friend circle a number in the square and draw a line through all columns of numbers and all rows of numbers in which the circled number appears.

Step 4
Have your friend select another number and cirlce it. The number must be one that has not, as yet, had a line srawn through it. Repeat this process until all the numbers in the square have been a line through them.

Step 5
Have your friend find the sum of the circled numbers. Then, remove the piece of paper from your pocket.

- What do you notice?
- How can you explain what you notice?

Repeat the steps above for other numbers of any calendar. Are your friends amazed at how good a mind reader you are?

Number Designs

1. Patti and Patrick made the designs below using numbers.
(a) Extend each pattern 4 more rows.
(b) What patterns do you see in each horizontal row?
(c) What patterns do you see in each vertical row?
(d) Create a similar design of your own using numbers.

1									
2	4								
3	6	9							
4	8	12							
5	10	15	20	25					
6	12	18	24	30	36				
7	14	21	28	35	42	49			
8	16	24	32	40	48	56	64		
9	18	27	36	45	54	63	72	81	
10	20	30	40	50	60	70	80	90	100

									1
								2	4
							3	6	9
						4	8	12	16
					5	10	15	20	25
				6	12	18	24	32	36
			7	14	21	28	35	42	49
		8	16	24	32	40	48	56	64
	9	18	27	36	45	54	63	72	81
10	20	30	40	50	60	70	80	90	100

2. Patti and Patrick also made the design below from numbers.
(a) Extend the pattern 4 more rows.
(b) What patterns do you see in each horizontal row?
(c) What patterns do you see in each diagonal row?
(d) Create a similar design of your own using numbers.

			1			
		2		4		
	3		6		9	
4		8		12		16
	5		10		15	
6		12		18		

Pattern Power

Patti and Patrick have also expressed an interest in looking for patterns in the '100 Chart' and its many variations. Shown on the next page is a regular '100 Chart'. They used the following Pattern Power exploration to explore the '100 Chart'.

Pattern Power

When you look at a number to explore a pattern, you have a special power. For example, use the number 39 and explore the patterns as shown.

$39 = 30 + 9$	(Place Value)
$3 + 9 = 12$	(Add the digits of the numeral.)
$1 + 2 = 3$	

The final numeral, 3, is a factor of 39.

Try the process above for other numbers in the '100 Chart.' Then, try the exploration that follows. Your should work in groups to complete the exploration.

Step 1
Use a blank '100 Chart' and some counters. Put a counter on each number that is a multiple of 2 and a composte number.

Step 2
Put a counter on each multiple of 3 that is also a composite number.

Step 3
Repeat Step 1 for the numbers 5 and 7. What do you notice about the numbers that are not covered?

The steps above simulate the Sieve of Eratosthenes. Use your library and summarize the Sieve Eratosthenes. How are the processes alike? How are they different?

Step 4
Repeat the steps above for a '200 Board' that you create. How many numbers do you need to check before you have only prime numbers left?

A Short Story

Patti and Patrick are both wrestling fans. As an English assignment, they decided to write about their favourite wrestler - Hulk Hogan. The following is the essay that they wrote.

Unfortunately, on their way to school, it began to rain. Patrick did not protect the essay as well as he should and all the numerals and fractions in the essay were washed away. Help Patti and Patrick submit their assignment on time. Rewrite the essay below in your journal. Fill the blanks in the essay with an appropriate numeral or an appropriate decimal fraction so that the essay makes sense. Exchange your essay with others in the class and give each other's assignment a mark out of 10.

The Main Event

"The following contest is scheduled for ____ with a duration of ___ h. Already in the ring, with a mass of ____ kg, is the "The Bad Dream". Now entering the ring, with a mass of ____ kg, everyone's hero "Hulk Hogaaaaan". " Hogan entered the ring to the cheers of the _____ of fans in attendance.

The action ws fast and furious during the _____ moments as both men went looking for an opening. After _____ minutes a suplex brought Hogan to the mat and he was pinned for a count of ___ before he kicked out. The crowd was going wild and all the Little Hulkamaniacs were feeling that their hero, the Hulkster, was going to be beaten.

Suddenly, after being on the defensive for _____ minutes, Hulk Hogan came back to life. As he was drawing strength from the _____ fans in the audience, he began to go on the offensive. This was it. It was all or nothing time for Hogan. As the blood rushed through his body, his _____ muscles began to tighten and without warning, Hogan was up and battling. As the crowd stood and cheered on their hero, Hogan hit "The Bad Dream, not ____, not ____, but _____ times. "The Bad Dream" began to stagger and fell to the mat. Hulk Hogan dropped his mighty leg onto "The Bad Dream" and it was all over. The referee counted ____, ____, ____ and Hulk Hogan became the wrestling champion of the world _____ again.

La Magie du Mira ou d'un miroir

1. Dessine une foret.

2. Dessine un beau grand chateau.

3. Draw un prince monye sur un cheval noir et une princesse montee sur un cheval brun.

4. Avec le Mira, permets le prince et la princesse d'arriver au chateau.