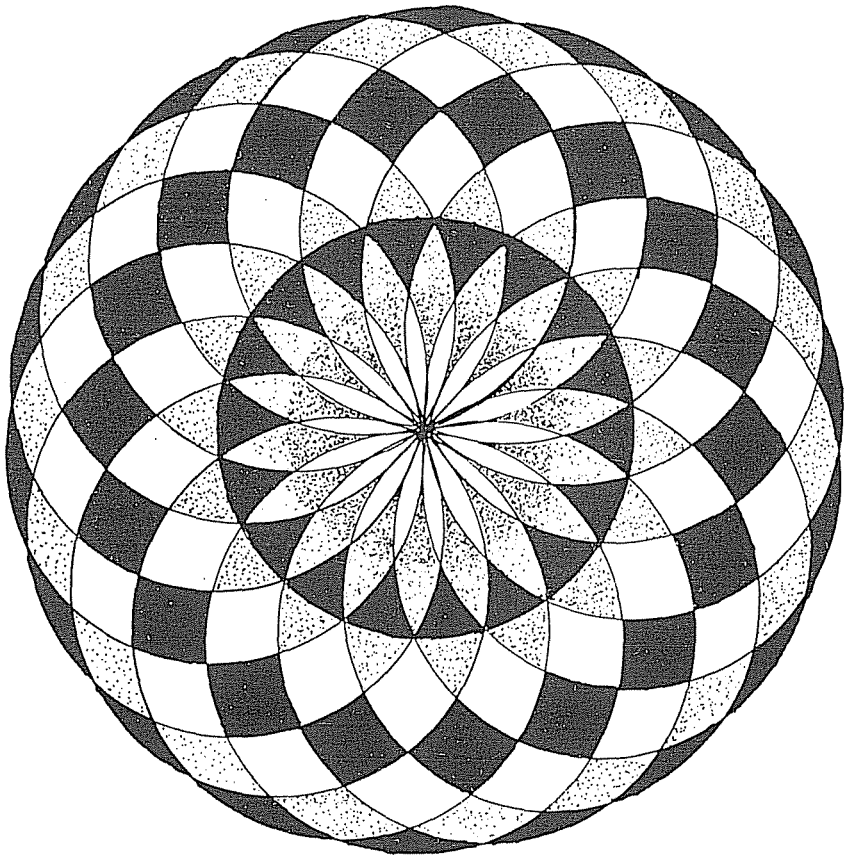
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"Before LOGO"

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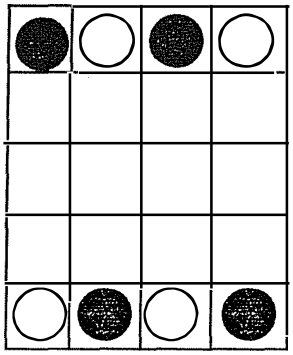
STRATEGY GAME

Two players

Materials: Game Board - a four by five grid
Two sets of 4 markers each.

Activity:

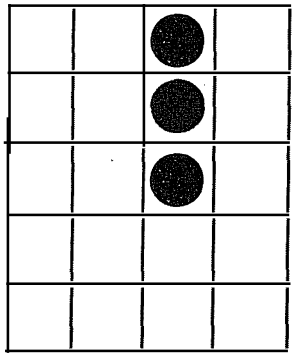
1) Place the markers on the game board as follows.

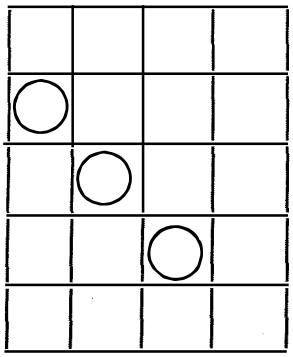


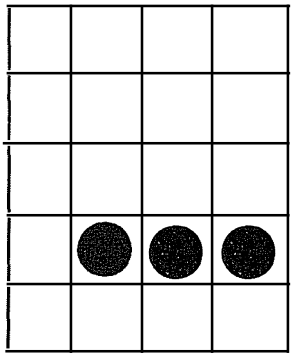
2) Rules of the game:
   a) Players take turns each moving the marker one space: diagonal moves are not permitted.
   b) Jumping and taking as in checkers is not permitted. All markers remain on the game board at all times.

3) Object of the game:
   To be the first player to get 3 of his markers in 3 consecutive spaces in a straight line (including the possibility of 3 on a diagnoal)

Winning Possibilities:







N.C.T.M. '88 (Make and Take)

A TOUCH OF MATH
MULTI-GRID

Topic: Multiplication Facts

Grade Level: 3 - 8

Time: 10 - 15 minutes

Number of Players: 2

Materials Needed: Gameboard Grid
100 Tiles labeled for facts of 1 x 1 through 9 x 9
with multiplication products

Object: To use up all the tiles first

Rules:

1. Each player draws 5 tiles.
2. The first player places any one of his tiles in its correct location on the gameboard grid.
3. The next player must place a tile so that it will touch a corner of a tile already on the board.
4. If a player cannot, he must draw from the pile until he can.
5. The winner is the first player to use all his tiles.

Variations: Another game is one which is played individually. The player sees how many tiles he can put in the right place in three minutes.

N.C.T.M. '88 (Make and Take)

A TOUCH OF MATH
MULTI-GRID

X	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

N.C.T.M. '88 (Make and Take)

PANCAKE DAY IDEAS FOR GRADE ONE

Annette Savage
Berner Train Jr. P.S.

Each activity was printed on a circular card with circle designs on them.

1. Do you play with any things that are round? Tell a friend and make a list of them.
2. Cut and paste different sized and coloured circles together to makdecoration for your classroom. Can you make a mobile, or a hanging design?
3. Find things that help you make a circle. Use them to make paper circles. Arrange the paper circles in order from smallest to largest.
4. Look for things in our classroom that are round. Draw pictures of them.
5. Is any part of your body round? Pretend this part is now another shape. Now draw the new you - remember to change the part!
6. Are there any foods you eat that are round? Draw them and label them. Which are your favourites?
7. Find numbers with round parts in them and use them in ten number sentences.
8. Find a math activity that has circles in it. Do the activity and mak diagram of your results.
9. Pretend you are looking through a telescope at Mars or another plan Draw a picture of what you see.
10. Which animals have round parts making them look round? Draw some and put their names on them.
11. Think about circles at home. Draw pictures of things your mother or father use that are round.
12. Think about the cartoons you watch on television. Do you see a circles in these cartoons? Show me in pictures.
13. Write a story about "The Magic Circle". How does it get from one pla to another? Does it fly or roll? Can it change into another circular object when it wants to?
14. Think of vehicles that travel on wheels. Imagine one that is very different from any you ever saw and draw it.
15. Do you know any letters that have round parts in them? Make a design using one of these letters.
16. Can you find any stories about round things? Write the titles of the stories, when you have read them.
17. Look at some things in the classroom with a hand lens. How does each object change? Draw the one you think changes the most.
18. What happens when you make two cardboard circles and fix them on each side of an empty cereal or kleenex box from your junk collection?
19. Cut strips of paper, or ask your teacher to. Glue the ends of a strip like paper chains to form circles. See what designs you can make by joining them together in different ways.

AN INTRODUCTION TO 3-D FIGURES

by Jeff Bradford, Jan Cornwall, Diane Wheler

The following two ideas are ones which we have found useful in introducing a unit on 3-D Geometry to students in the Junior and Intermediate grades. They can also be used with 2-D Geometry.

A. BRAINSTORMING FIGURES

Provide small groups with a common 3-D figure, e.g., sphere, cylinder, rectangular prism, cone, etc. Have the students brainstorm and record on chart paper everyday objects that are similar to that shape. Then have the students leave their list, marker and 3-D figure in place and visit other displays, where they add further ideas to those already recorded in the charts. Students return to their own displays to read the additions to their charts.

Extension:

Form new groups. Provide each group with a topic such as transportation, music, circus, etc., and have the students brainstorm shapes associated with that topic. They return to their original groups and add the names of objects resembling their 3-D figure to their first chart.

The students can also graph the results of both sets of charts and discuss comparisons.

Challenge them to explain the significant differences.

B. ENVIRONMENT WALK

Have the students make 'frames' from coat hangers. They bend the wire to make a rectangle and use the hook for a handle. Take the students for a walk to observe shapes in the environment. They use their frames to focus on a scene and sketch what they see. In the classroom, they outline 3-D figures with markers. Individually or in groups, students graph the 3-D figure they found. You may wish to make a large group graph for discussion and have students discuss why some shapes are more prevalent.

Find Your Number: Find Your Shape

Jan Cornwall

With the increased emphasis on language development in all subject areas, it is interesting to look at ways in which language plays an integral role in the process of conceptual development in mathematics. The following is a simple idea, successful with students in the junior and intermediate grades using 2-digit numbers, or pictures of 3-D or 2-D figures.

Make a class set of 2-digit numbers, or tape pictures of a 3-D or 2-D figures or Post-ums. Stick them to the backs of students and ask them to identify their number or shape by asking questions which require a yes or no answer, and by asking only one question of any one student. Some students may wish to use pencil and paper to record clues to a number or shape. The questions asked can provide you with data for process evaluation. They can show students' ability to apply knowledge of number before, after, between, even and odd, multiples, ones and tens place, etc.

Extension:

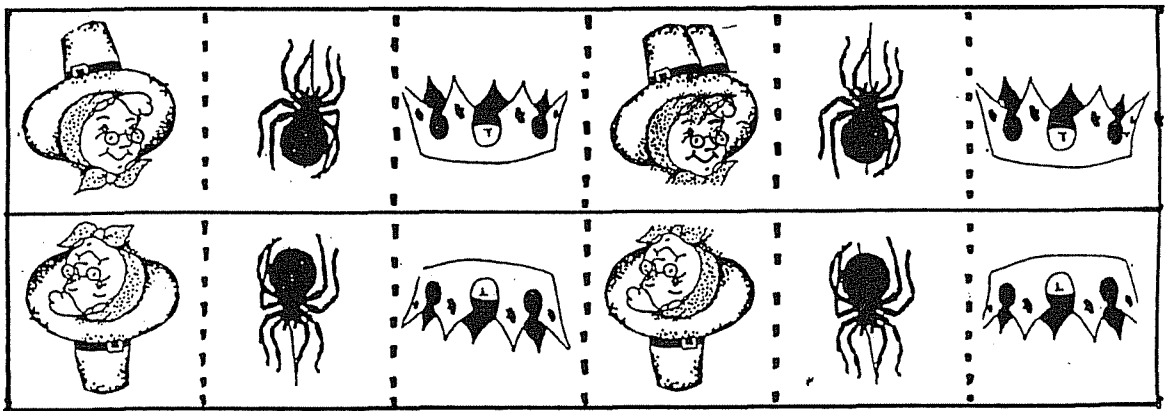
As students identify their number or shape, have them stick it to a 5 x 7 file card and write a question concerning that number or shape with the solution recorded on the back. Within a short time you have approximately 30 student-generated questions for use at a centre, or by trading in a large group. Again, the kinds of questions can help you to assess the depth of understanding of various concepts studied.

Variation:

Place a class set of numbers or pictures of 2-D or 3-D figures each in an envelope and distribute one to each student. Students exchange envelopes, look at a partner's number or shape, then answer questions posed by the partner in order to identify the number or shape. The same extension idea is useful here.

NURSERY RHYME SQUARES

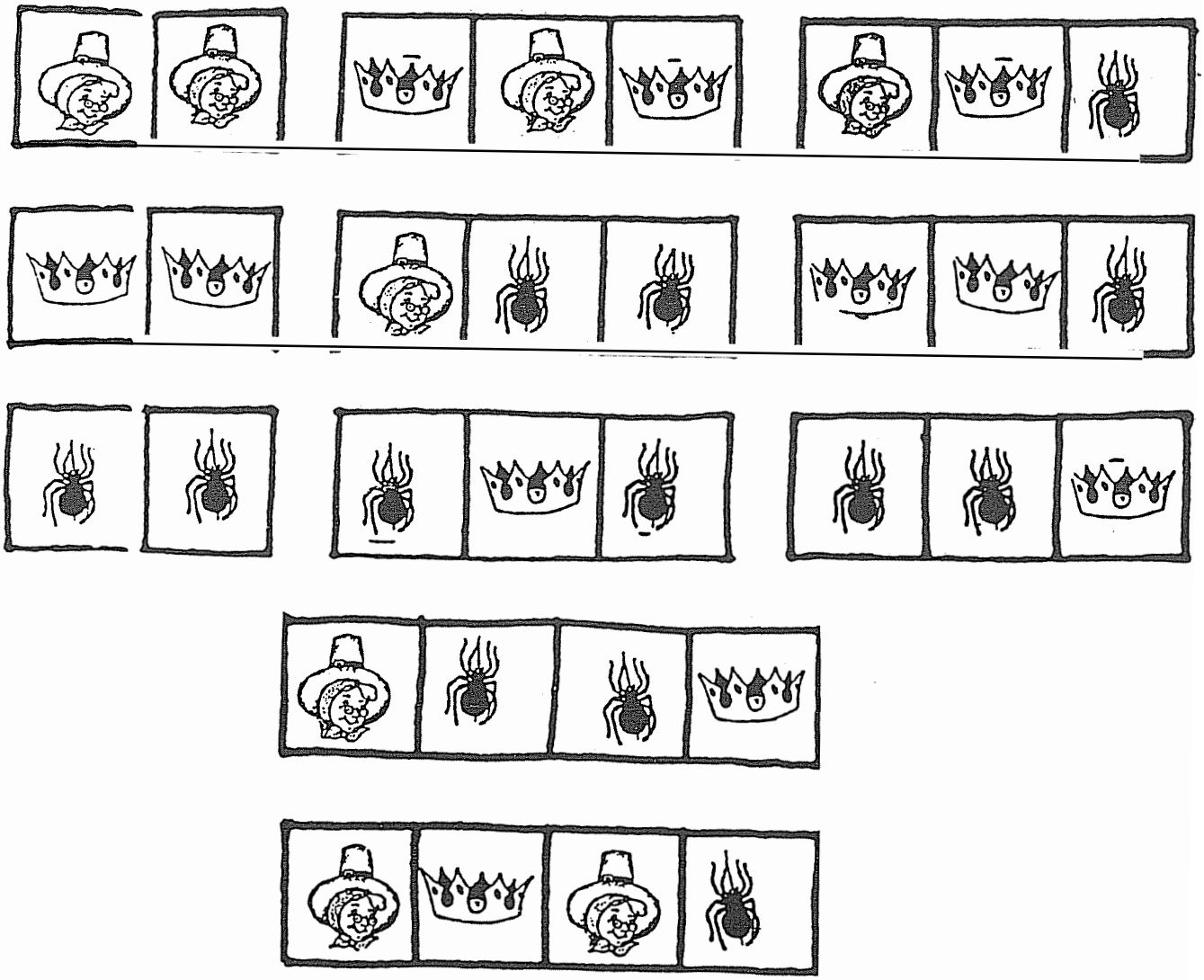
Cathy MacLennan
Enrichment Resource Teacher



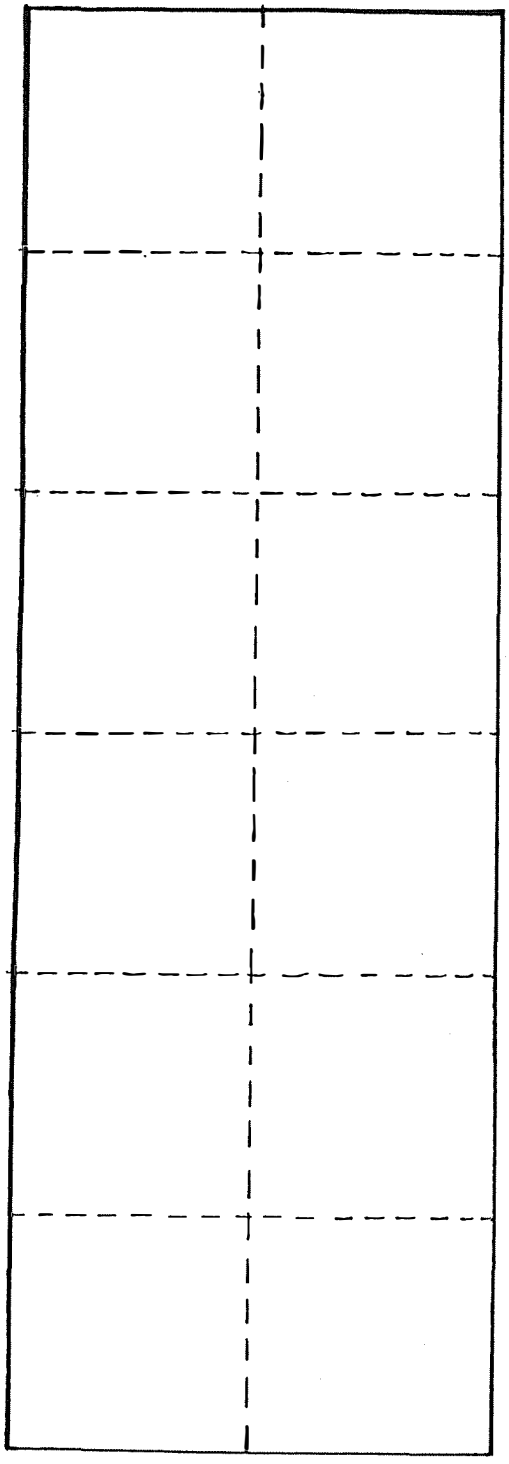
Cut out around the large rectangle.
Fold in half lengthwise. Glue corners.
Fold on the dotted lines accordian style.
Re-fold to match the patterns on the next page.

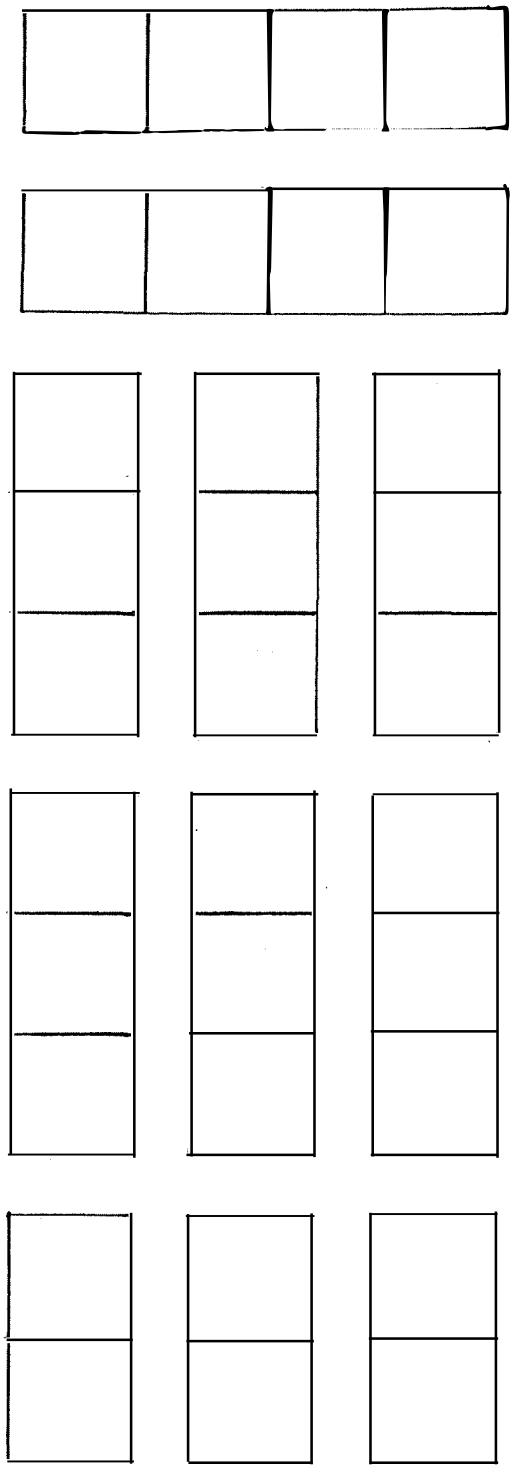
Have fun!

NURSERY RHYME SQUARES



Make Your Own Folding Squares





Other Ideas For Folding Squares

1. Themes, e.g., Dinosaurs, Story Book Characters.
2. Money
3. Colours
4. Pattern Block Shapes
5. Attribute Blocks
6. Student Photos

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needed!

EDITOR(S) FOR

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Apply to: Jack Weiner
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MATH OLYMPICS

Richard Cornwell
Sir Ernest MacMillan Sr. P.S.
Scarborough Board of Education

At the end of each term I run a mini Olympics in Mathematics involving the students in the Accelerated Math Programme at MacMillan. Over the past year we have borrowed and changed the rules from two well known T.V. game shows and have included them in our Math Olympics.

We called our games MacMillan Squares (from Hollywood Squares) and What's My Number (from To Tell the Truth). Remember that one!

In MacMillan Squares each student researches the life of a famous Mathematician.

Nine of these students are chosen as guest panelists and each must briefly relate or dramatize his or her contributions to mathematics. The guests are set up on benches, desks, chairs in three rows of three. Each has a card with an X on one side, an O on the other side.

Two contestants are selected from the class. The teacher or a student assumes the role of game show host.

In order each contestant chooses a guest panelist to answer a mathematical question which is read by the teacher/student.

The rules of the game are similar to tic-tac-toe. You must get a line of X's or O's to win.

When the guest panelist is chosen to answer a question, the guest must give a detailed answer that could be correct or incorrect. The contestant must either agree or disagree with the response. Correct responses (agree or disagree) results in an X or an O. An incorrect response results in an X or an O for the other contestant.

Three or four games can be played in the classroom at the same time.

During our Heritage Week Celebrations we have used MacMillan Squares as an activity in which all classes participate.

The more talented students may come up with excellent solutions (correct and incorrect) for questions. I also like to let the students create their own problems.

In "What's My Number" three students are chosen as guest contestants. Each contestant claims to be the same number, e.g. 25.
In order each steps forward and exclaims "I am the real number 25"

Only one student represents the real number 25 and he or she must always give real facts about the number. The other two students can give factual or false information but must give false information at least once.

Each contestant gives 3, 4 or 5 bits of information (depending on the ability of the students).

The rest of the class tries to choose the student who represents the real number.

A game might run as follows:

1. Each student contestant says "I am the real number 25."
2. Contestants in turn might say

Round 1

Contestant #1 " I am the real number 25 because I am a multiple of 5".
Contestant #2 "I am the real number 25 because I am a factor of 100".
Contestant #3 "I am the real number 25 because I am divisible by 5".

Round 2

Contestant #1 "I am a perfect square."

Contestant #2 "I am a prime number."

Contestant #3 "I am a factor of 100."

Round 3

Contestant #1 "My square is 625"

Contestant #2 "The sum of my digits is a prime number"

Contestant #3 "I have only five factors".

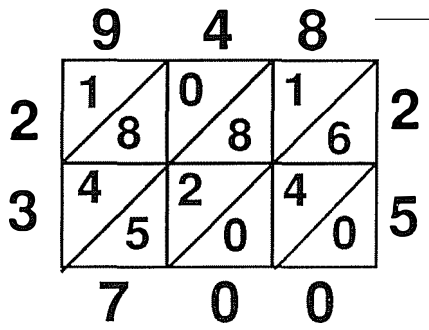
Teacher then surveys the class. Students choose from Contestants 1, 2, or 3. The real number 25 then steps forward (Contestant #1).
Contestant #1 gave correct information concerning #25 in all three rounds.

This game is an excellent way to review concepts and vocabulary development in Mathematics.

Lattice Method of Multiplication

Until the invention of printing the Lattice Method was one of the most popular methods of multiplication throughout Europe.

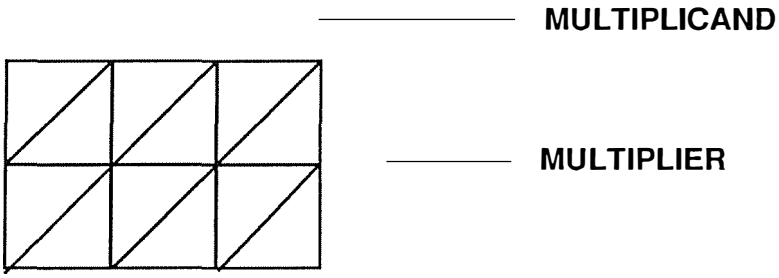
In the Lattice Method below, first construct your lattice and then place the multiplicand 948 above the multplier 25.



The answer is read from top left to bottom right 23700

Multiplying, 2 times 8 equals 16, the tens digit (1) is placed above the diagonal line. Continuing 5 times 8 equals 40. The tens digit 4 is placed above the diagonal, and the units digit 0 is placed below. Continue for each pair of digits. To find the product add the digits in the diagonals and regroup when necessary.

The Lattice - Practice Sheet



Napier's Bones or Rods

John Napier, the Scottish mathematician, created an ingenious device known as Napier's Bones or Rods using the Lattice Method of Multiplication. The original devices were actually constructed using the bones of animals and were used for many years.

Each student is given eleven popsicle sticks, tongue depressors, or strips of bristol board for this project. Have students construct the times table for each digit from zero to nine on a separate popsicle stick. On the eleventh stick list the digits from zero to nine to form a multiplier. See the Illustration #1.

To use Napier's Bones to multiply 948 by 25 choose the multiplier and the 9, 4 and 8 bones. Arrange the bones as shown in illustration #2.

Illustration #2

M	9	4	8
0	0/0	0/0	0/0
1	0/9	0/4	0/8
2	1/8	0/8	1/6
3	2/7	1/2	2/4
4	3/6	1/6	3/2
5	4/5	2/0	4/0
6	5/4	2/4	4/8
7	6/3	2/8	5/6
8	7/2	3/2	6/4
9	8/1	3/6	7/2

The product of 5 and 948 is shown in the fifth (5) row 4740. Remember to add diagona numbers.

The product of 2 and 948 is found in row #2: 1896. Since 2 times 948 is 1896, then 20 times 948 is 1896.

The product of 25 and 948 is the sum of the partial products: 4740 and 18960 = 23700.

To start students using Napier's Bones it might be best to have them first work with one digit multiplier.

Analytic Geometry TWO-POINTS EQUATION

Arnie Carefoote
Albert Campbell CI
Scarborough, Ont.

To determine the equation of a straight line, given two points $P_1(X_1,Y_1)$ and $P_2(X_2,Y_2)$ that lie on the line:
First calculate the scope using the formula $m = (Y_2-Y_1) / (X_2-X_1)$; then proceed as in the slope-point method.
Let P(x,y) be any other point on the straight line. Since the slope of a straight line is constant, $Y - Y_1 = M (X - X_1)$ is an equation of the straight line.

INSTRUCTIONS:
Determine the equation of each of the following lines and put that equation into standard form: Ax + By + C = 0. Then, find the letter that corresponds to that equation and put that letter over the numbered space.

"Unusual glee about a good golf score" (5)

| --- | --- | --- | --- | --- |
| 9 | 7 | 2 | 4 | 9 |

"So mike turns out to be a Northerner" (6)

| --- | --- | --- | --- | --- | --- |
| 9 | 5 | 1 | 8 | 3 | 6 |

1.	$P_{11}(3,0)$, $P_{12}(0,3)$	E	x - 7 = 0
2.	$P_{21}(4,6)$, $P_{22}(-1,6)$	K	x + y - 3 = 0
3.	$P_{31}(7,4)$, $P_{32}(-1,2)$	M	x - 4y + 9 = 0
4.	$P_{41}(-3,5)$, $P_{42}(2,-1)$	O	x - 5y - 12 = 0
5.	$P_{51}(0,b)$, $P_{52}(1,m + b)$	L	6x + 5y - 7 = 0
6.	$P_{61}(-3,-3)$, $P_{62}(7,-1)$	I	7x + 34y - 535 = 0
7.	$P_{71}(-C/A,0)$, $P_{72}(0,-C/B)$	A	Ax + By = C = 0
8.	$P_{81}(91,-3)$, $P_{82}(-11,18)$	S	mx - y + b = 0
9.	$P_{91}(7,11)$, $P_{92}(7,-1)$	G	y - 6 = 0

"MATH IS FUN!"

1. EAGLE 2. ESKIMO