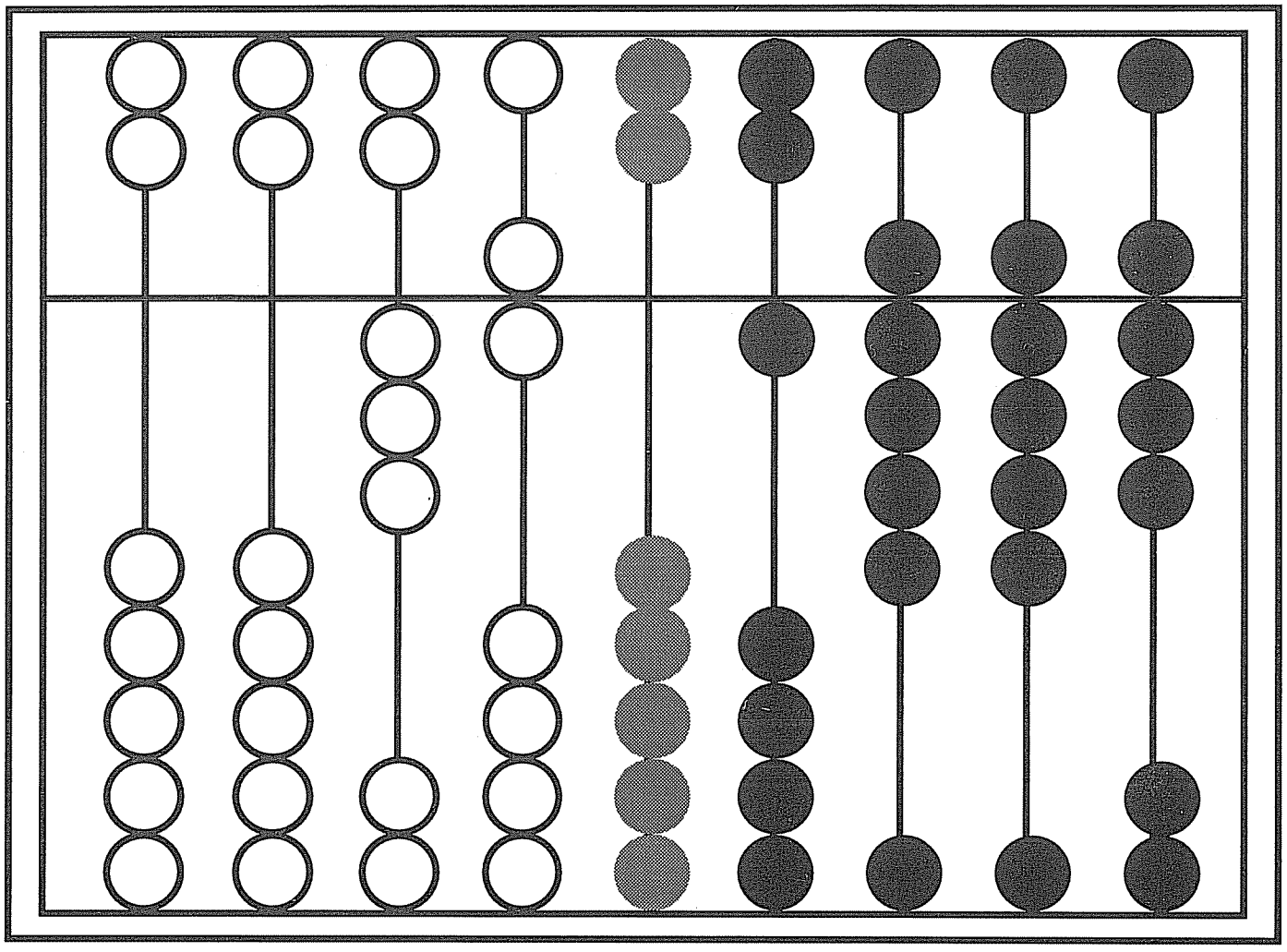
Abacus

Volume 36 1998



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New Challenges in Elementary Mathematics

When the Honourable David J. Johnson was named Minister of Education last fall the "Excellence in Education:Ontario's Plan for Reform" was promoted in the press. I wrote to Mr. Johnson and requested more information about education reform and the new mathematics curriculum. I received a personal response to my request.

The *Ontario Curriculum, Grades I-8: Mathematics 1997* emphasizes the high standard expectations related to students' problem-solving skills. Students will be expected to describe what they are doing in mathematics and to explain why they are doing it. Students should also be able to identify relationships between mathematical terminology and language in other curriculum area such as language and art. This issue features activities that address the need for connecting mathematical strands and topics.

Problem-solvers need to exercise skill and be persistent with trial-and-error. Cryptic puzzles are for problem-solvers who like adventure with words and who want to put imagination to work. **Laura Zinn**, a mathematics teacher and computer expert, writes cryptic puzzles for a hobby. Enjoy her **How to Solve Cryptics** and her **Geometry Cryptic**. The surprises in her clues will keep you mathematically entertained.

Quilting is a topic that allows learners to explore mathematics, art design, history and language arts. It also provides opportunity to connect several strands in mathematics. The quilt presents a natural focus for studying geometric shapes, tesselations, symmetry, fractions, patterns, design, construction and measurement.

The history behind quilting, traditional quilt patterns and the mathematics inherent in the quilt designs will serve as a motivator for learning. Interesting stories have been written about quilting and these will be used to further link mathematics to the world around us and encourage cooperation and participation by all students. The literature selections and the historical study of quilts will provide opportunities to discuss life in Canada during the 1800's and explore the role of women in pioneer and modern life.

Grade 5 Expectations (Ontario Curriculum:Mathematics)

Patterning and Algebra (p57)

1. Describe patterns encountered in any context, make models of the patterns and create charts to display the patterns.
2. *Use computer applications to explore patterns.*
3. *Pose and solve problems by applying a patterning strategy.*

Geometry & Spatial Sense (p47)

4. *Construct triangles given specific measures of angles and sides.*
5. *Measure and construct angles up to 180 degrees using a protractor.*
6. *Classify triangles according to angle and side properties.*
7. *Construct congruent figures using a variety of tools.*
8. *Explore tiling patterns that cover a plane.*

Measurement (p36-7)

9. *Draw items using a variety of SI units.*
10. *Estimate and calculate the perimeter and area of squares and rectangles.*
11. *Develop methods for using grid paper to track and measure the perimeter and area of all shapes in quilt examples.*

Number Sense and Numeration (p20-1)

12. *Relate different representations of the same and equivalent fractions when designing a quilt pattern.*
13. *Multiply a decimal by a whole number to find area.*

The Quilter's Bee by **Susan Stuart** provides a rich collection of ideas for cooperative or independent studies. Page 6 lists resources and provides notes for the teacher. Page 7 is a sample student activity page.

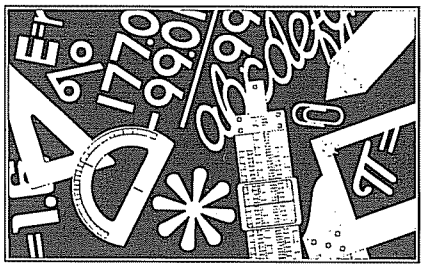
Another **READYORNOT puzzle** by **Rick Newall** is a splendid number or numeration sense activity for the primary children.

Thank you Laura, Susan and Rick for providing this set of classroom activities.

Keep forwarding ideas to me for future activity pages.

Frances Schatz

Answer Keys



Cryptic Crossword

■	H	O	U	R	■	S	H	A	P	E	■	■
■	■	P	■	A	■	E	■	N	■	Q	■	E
G	R	E	E	D	■	C	E	N	T	U	R	Y
R	■	R	■	I	■	O	■	O	■	A	■	E
O	V	A	T	I	O	N	■	Y	O	L	K	S
U	■	T	■	■	■	D	■	E	■	■	■	■
P	I	E	M	A	N	■	A	D	O	P	T	S
■	■	■	■	T	■	S	■	■	■	A	■	T
D	R	A	W	L	■	Q	U	A	R	T	E	R
I	■	N	■	A	■	U	■	P	■	E	■	A
M	A	G	E	N	T	A	■	P	O	L	L	Y
E	■	L	■	T	■	R	■	L	■	L	■	■
■	■	E	R	A	S	E	■	Y	E	A	R	■

ACROSS

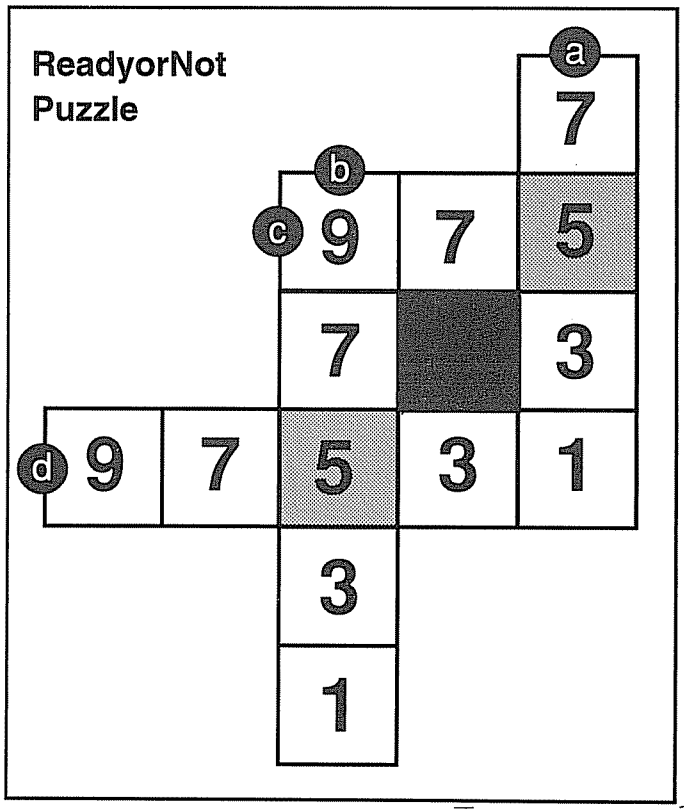
1. HOUR (our homophone)
4. SH + APE
8. aGREED
9. CENTURY (curt yen anagram)
10. O + VacATION
11. YOLKS (F replaced with Y)
12. PIEMAN (me pain anagram)
14. ADOPTS (p.s. toad anagram)
18. harD RAW Lentils
20. QUARTER (two meanings)
22. MAGENTA (magnet anagram)
23. POLL + Y
24. hE RASEd
25. YEARning



DOWN

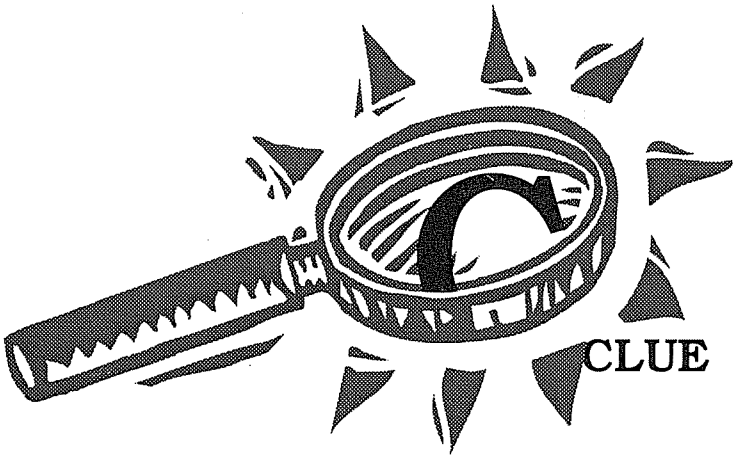
2. OPERATE (ere a pot anagram)
3. RADII (first letters of rocking and dancing, isn't it)
4. SECOND (two meanings)
5. ANNOYED (done any anagram)
6. EQUAL (pLAQUE anagram)
7. coursE! YES
8. GROUP (or pug anagram)
13. ATLANTic + A
15. grandPA, TELL About
16. ST(R)AY
17. SQUARE (two meanings)
18. DIM Eggplant
19. ANGLE (angel with last two letters swapped)
21. trAP PLYing

ReadyorNot Puzzle



How to Solve Cryptic Clues

by Laura Zinn



The secret to solving cryptic clues is to realize that there are two clues for every answer. The two clues are run together, sometimes with misleading punctuation, so you have to figure out where to break them apart. One of the clues will always be a definition, but the other one will usually be something sneaky. The number in brackets after the clue tells you how long the answer is.

Let's look at some examples.

Example 1: *More frozen digit. (6)*

The two definitions in this clue are "more frozen" and "digit". The answer is NUMBER. A digit is a number, and when something gets more frozen, it gets number (more numb). Clues like this are called DOUBLE DEFINITIONS.

Example 2: *Telecom passes around a device to draw circles. (7)*

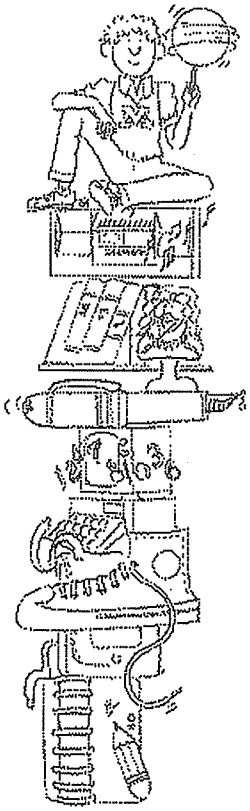
The answer to this clue is COMPASS. The definition part of the clue is "a device to draw circles". The answer is hidden in the sneaky part of the clue: teleCOM PASSes. Clues like this are called HIDDEN WORDS. When you see words like "around", "hides", "surrounding", or "in", you may be dealing with a hidden word clue.



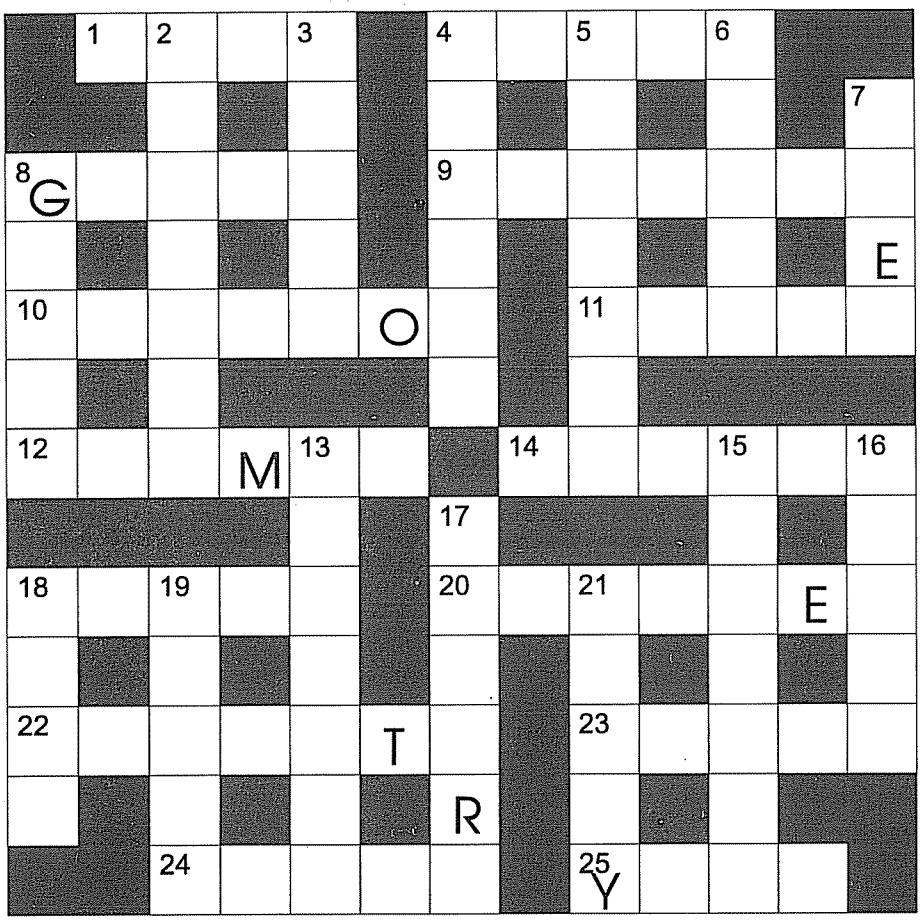
Example 3: *Quantity of a climb. (6)*

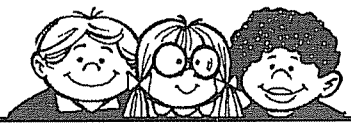
The answer to this clue is AMOUNT. The definition part of the clue is "quantity". The sneaky part to this question is that you have to build the answer from little clues: "a" stays the same: A; "climb" is a clue for MOUNT. Put them together and you get AMOUNT. Clues in which you have to build the answer like this are called CHARADES. Sometimes you are given a piece of the word directly (as with "a") and sometimes you are given a clue (as with "climb"). Some things to look for in charade clues: "north" for the letter N; "river" for the letter R; "northeast" or "any" for the letters NE; "icy" for the letters IC.

Example 4: *Ion craft swimming around, making part of a whole. (8)*



The answer to this clue is FRACTION. The definition part of the clue is "part of a whole". The sneaky part is at the beginning. The letters in "Ion craft" have been rearranged (are "swimming around"). Clues like this are called ANAGRAMS. Anagram clues will always have a hint to tell you that you need to do some rearranging. Look for words and phrases like "scrambled", "mixed up", or "confused".



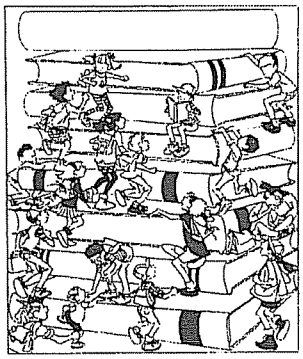


Cryptic Crossword

by Laura Zinn

To help you get started, the word "GEOMETRY" has been entered in the diagram.

The answer to 15 down is a toughie. You might need to go to the library and read up on bones in an encyclopedia or anatomy book.



ACROSS

1. 60 minutes belonging to us, I hear. (4)
4. Form of quiet monkey. (5)
8. Wanting everything is in. Agreed? (5)
9. 100 years of confused, curt yen. (7)
10. Add zero to vacation, subtract air conditioning, and get standing applause at end of show. (7)
11. Folks change "false" to "yes" and get yellow part of eggs. (5)
12. The person Simple Simon met confused me. Pain! (6)
14. P.S. Toad changes, gets a baby. (6)
18. The way some Southern people speak is surrounded by hard, raw, lentils. (5)
20. One fourth of coin. (7)
22. A magnet moves around and becomes a pinkish colour used on computers (along with cyan and yellow). (7)
23. She put the kettle on for poll, yes? (5)
24. He rased centre to get rid of it.(5)
25. Half yearning to be 12 months. (4)

DOWN

2. What a surgeon will do ere a pot runs wild. (7)
3. More than one radius is initially rocking and dancing, isn't it? (5)
4. Amount of time between first and third. (6)
5. Pestered or irritated? Done any moving around? (7)
6. Plaque loses head, dances around, and comes out the same. (5)
7. Of course! Yes! Takes in peepers. (4)
8. Scrambled or pug collection. (5)
13. Atlantic not icy, a place for 1996 Olympics. (7)
15. Grandpa, tell about hiding knee-cap. (7)
16. Stay around, right? Like a puppy who follows you home. (5)
17. Red place in Russia is not round. (6)
18. Dim eggplant has 10 cents. (4)
19. Acute or obtuse angel tangles its tail. (5)
21. Try to get a job in trap plying. (5)

The Quilter's Bee - Teacher Notes

by Susan Stuart

Learning Environment

For a fully integrated unit students can use research time to investigate the role of quilting bees in the life of the early settler.Have students analyse the work and talents of hand-crafted quilts, then develop an appreciation for the contributions of women to Canadian history. Have visiting artists, read information about quilts, try computer programs or take a class trip to an quilt display.

Suggested Resources: The Quilter's Album of Blocks and Borders Patchwork Patterns ... other quilt books.

The Patchwork Quilt (V. Flournoy)
Eight Hands Round (V. Flournoy)
Patchwork Tales (S. L. Roth & R. Phnag)
The Keeping Quilt (P. Polacco)
Sweet Clara and the Freedom Quilt (D Hopkinson)
Sam johnson and the Blue Ribbon Quilt (L Ernst)
Sunshine and Shadow: The Amish and Their Quilts (D Hopkinson)
The Quilt (A. Jonas)
The Rag Coat (L. Mills)
Software: *IBM Math & More 2 - Geometry in Design Unit Superstamper, Geometry Mart and Tesselmania*

Material:

geoboard, elastics, pattern blocks, coloured tiles,geometry tools, leftovers of sewing material, wallpaper,giftwrap, different sizes in grid paper, colouring tools,scissors, glue.

Assessment and Evaluation

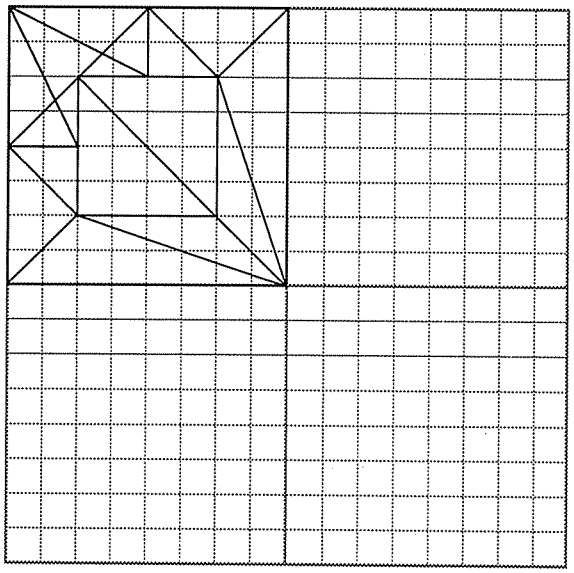
Establish the criteria for evaluation before the students begin the project. Students should keep a portfolio of their collections and story or art creations. Students' journal records can be evaluated for clarity, precision and appropriate use of mathematical language.

Quilter's Bee Activity A. Nine Patch Samplers

1. You will find **Nine Patch** samplers on the next page of this *ABACUS*. For each one determine how many of each shape is used for the design. Reproduce the design on grid paper.
2. Recreate the design on your geoboard using elastics.
3. Using wallpaper or giftwrap cut out the shapes and make your own design that uses the pattern of one of the samplers.
4. Read about quilt designs that are related to the samplers provided here. What is the history behind these designs? Record your information in your journal.
5. Experiment with your computer geometry and find out what new patterns you could design with the shapes seen in the Nine Patch designs.

Atlantic Jewel

1. In the diagram identify the triangles by name. Find strategies to complete the other four squares for this Four Patch design.
2. What other shapes are formed as the four quilting squares are completed?
3. Reproduce this design on grid paper. Investigate the effects of rotating, translating or reflecting the original square in various ways. In your journal, describe the results, using mathematical language, and choose with reasons the quilting square you like best.

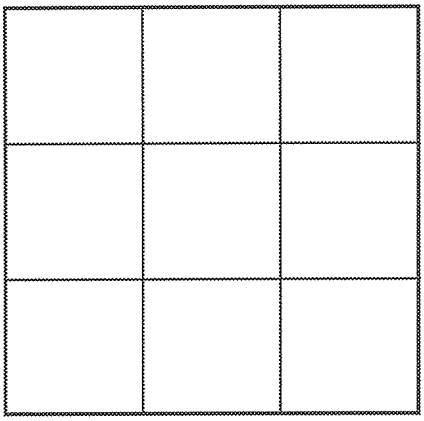


Create a Quilt Design

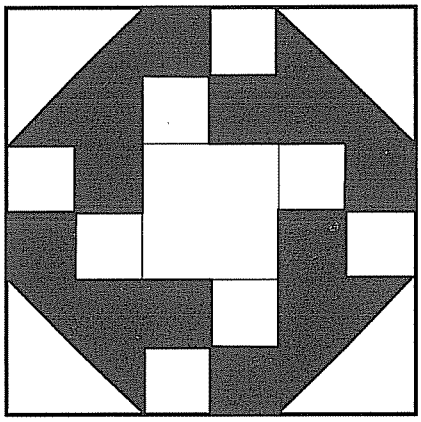
1. Using any size of grid paper, geometrically create a design on a 10 x10 grid. You have four colours representing light to dark shades. Use suitable cut-out shapes (eg. squares and triangles) to cover your 10 x10 grid.

2. In your journal name and describe your design. What problems did you have while making the design.

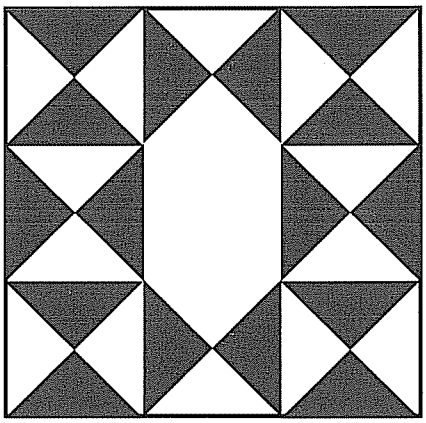
Put your design and story on a 8.5"x11" sheet and have your teacher mail it to ABACUS editor. *A selection of the designs will be published in a future issue.*



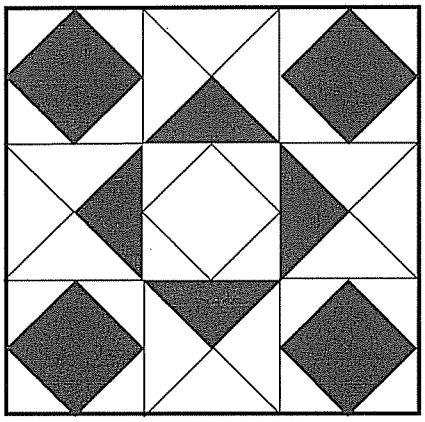
Nine Patch Grid



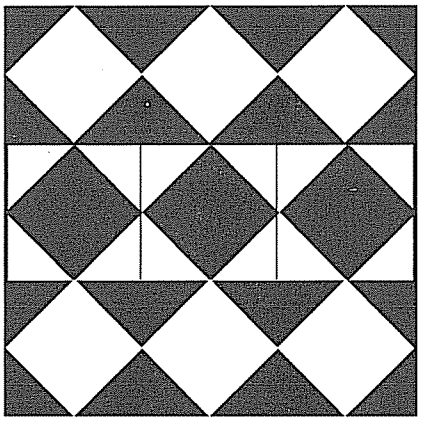
Prairie Queen



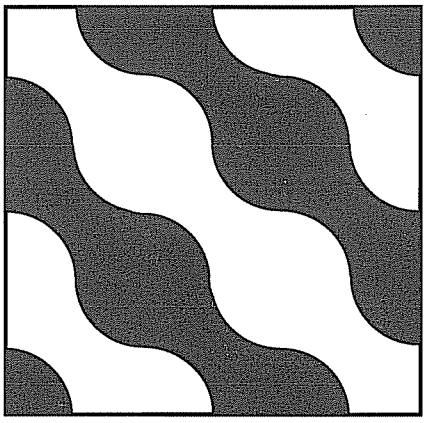
Window Pane



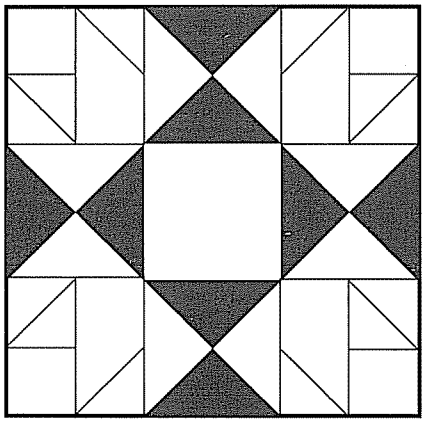
Blocks and Stars



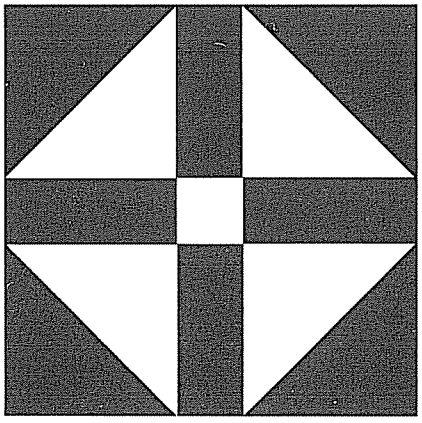
Paving Pattern



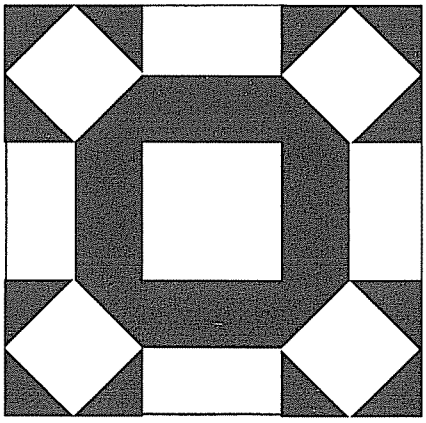
Ripples (Quarter Circles)



Union Squares



Weather Vane



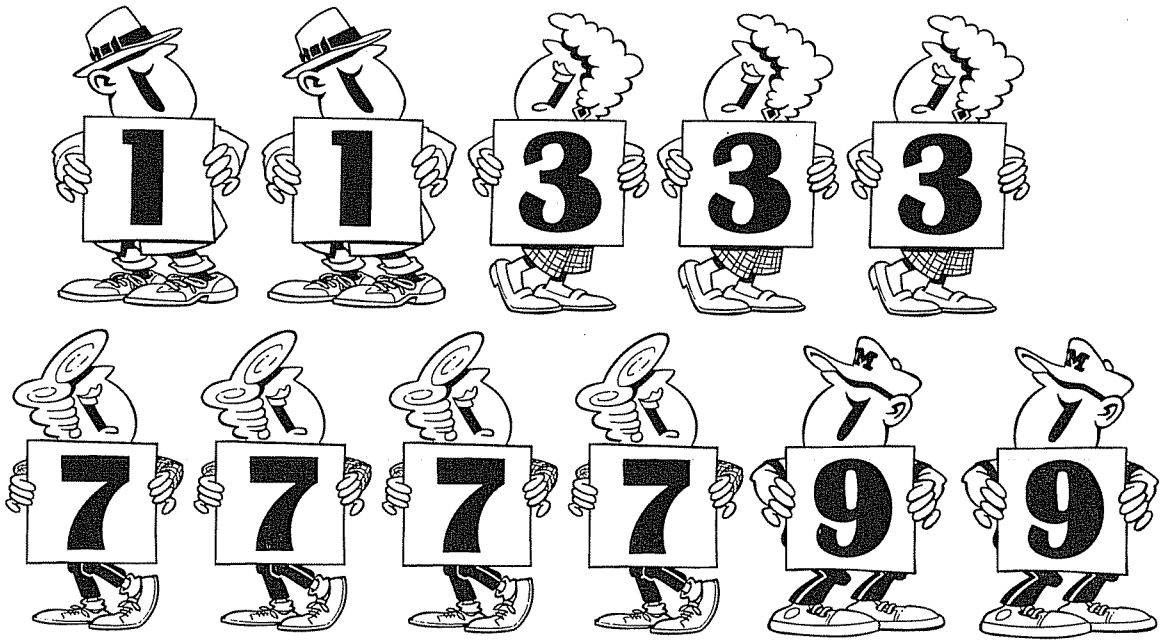
Rolling Stone

READYORNOT PUZZLE

Skills: addition and subtraction to ten, number patterns

Level: primary

Equipment: Number tiles cutout from the following:



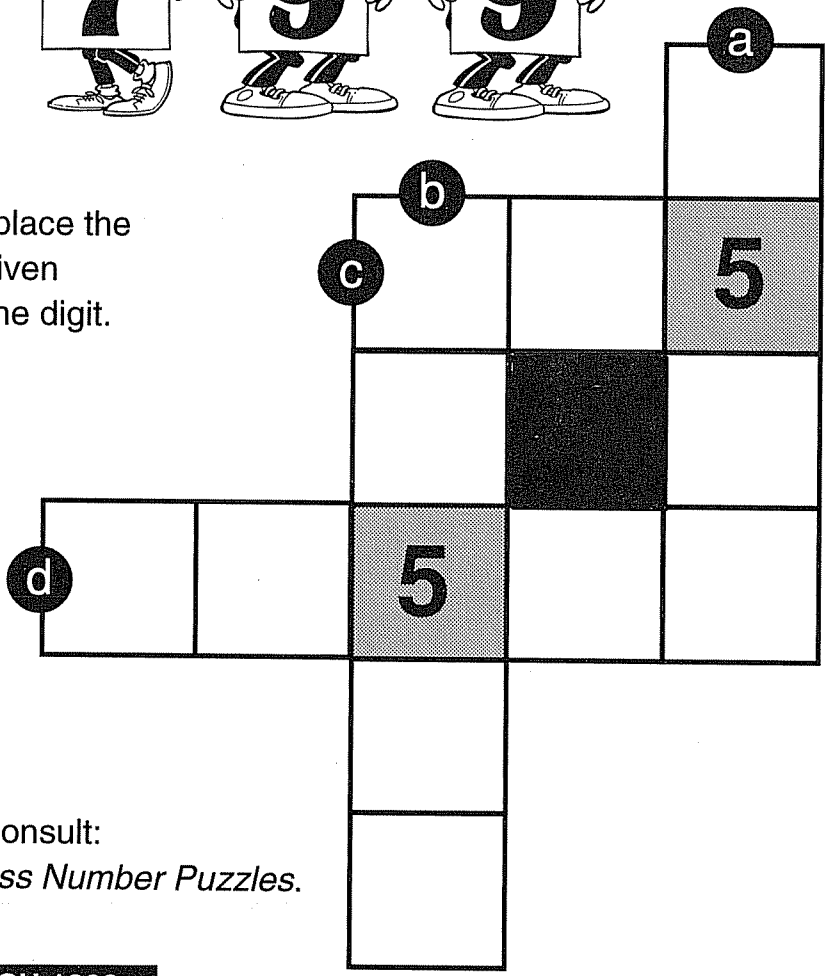
Start: On the grid given to the right, place the above number tiles so that the rule given is followed.Each box contains only one digit.

Down: a) Skip Counting; -2

b) Skip Counting; -2

Across: c) Skip Counting; -2

d) Skip Counting; -2



For other blackline master puzzles, consult:
Newell, Rick. *Pattern Puzzle 30 Cross Number Puzzles.* Cottage Games Canada Ltd. 1997.