Lesson Plans

LESSON PLAN

TANGRAMS

by Dennis Hamaguchi, W.L. Seaton School, Vernon

Fellow Mathgents:

Our superiors have requested a 'mission impossible' to save our country Geometrica from the invaders of Goo Gol Lee. Our people have a hint of the coming danger – a shattered clay tablet was discovered near the capital. Our task is to piece the tablet back to its original shape to avert the danger. This message will not, I repeat, will not, self-destruct in any number of seconds. Good Luck!

Plan:

1. Construct a 15 centimetre square. Label it ABCD.

2. Draw the diagonal $\overline{AC}$.

3. By construction, determine the midpoint of $\overline{AB}$ (call it T), and the midpoint of $\overline{BC}$ (call it U). Join $\overline{TU}$.

4. By construction, determine the midpoint of $\overline{TU}$. Call it V. Join $\overline{DV}$.

   OUR MISSION IS ALMOST COMPLETED.

5. Label the intersection of $\overline{DV}$ and $\overline{AC}$, W.

6. By construction, determine the midpoint of $\overline{AW}$ (call it X). Join $\overline{XT}$.

7. By construction, determine the midpoint of $\overline{CW}$ (call it Y) Join $\overline{VY}$.

8. Cut out your seven pieces. Each shape is called a *tangram*.

9. See how many shapes you can make with all seven pieces. Each time you make a tangram, draw an outline of the shape.

ADDITION SHADE IN
by Grace Dilley

Shade squares in each row so that the column numbers add to the number given at the left.

	128	64	32	16	8	4	2	1
167								
162								
226								
162								
167								

|	2048	1024	512	256	128	64	32	16	8	4	2	1
64												
160												
272												
520												
2044												
64												
1612												

THE FIVE SQUARE PUZZLE
by Grace Dilley

The following diagrams show the pieces needed for one group of five pupils and the way the pieces fit together into five squares. Make the pieces on Bristol board.

Divide the class into groups of five students. At the beginning, the pieces labeled 'A' are given to the student labeled 'A,' the 'B' pieces are given to 'B,' etc., in each group.

RULES
1. Each member must construct one square directly at his work place.
2. No member may talk, signal, or gesture in any way that would provide guidance, direction, or suggestion to any other group member. For example, no member may signal that he wants a piece from another member.
3. Any member may *give* any of his pieces to another person.
4. Each member's pieces must be in front of him at his work place except the one that he is giving to another member.
5. Only giving is allowed — no taking.
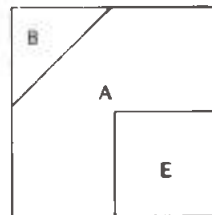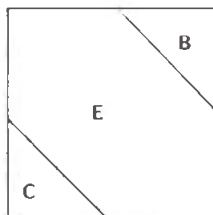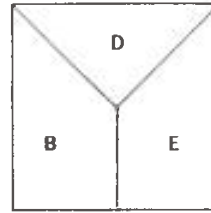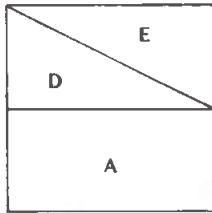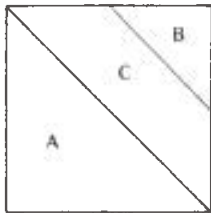
FIND A MATCH

by Dennis Hamaguchi

DIRECTIONS: Each of the two blocks below is divided into 18 boxes. Boxes in the top block contain problems, and boxes in the bottom block contain the answers. Work any problem and find your answer in the bottom block. Then write the word from the problem box into the answer box. Keep doing problems, and you will spell out a funny saying.

$\frac{5}{8} - \frac{1}{2}$	$\frac{5}{6} - \frac{1}{3}$	$\frac{3}{4} - \frac{1}{12}$	$\frac{4}{5} - \frac{2}{3}$	$\frac{13}{10} - \frac{2}{5}$	$\frac{3}{4} - \frac{1}{3}$
THE	A	TWICE	AS	IS	WHO
$\frac{7}{8} - \frac{1}{6}$	$\frac{3}{2} - \frac{5}{9}$	$\frac{3}{5} - \frac{1}{4}$	$\frac{17}{12} - \frac{5}{6}$	$\frac{13}{9} - \frac{2}{3}$	$\frac{7}{6} - \frac{5}{9}$
A	OCEAN	BATH	SAILOR	A	TAKING
$\frac{4}{3} - \frac{3}{8}$	$\frac{7}{15} - \frac{1}{6}$	$\frac{9}{10} - \frac{5}{6}$	$\frac{9}{8} - \frac{7}{12}$	$\frac{7}{9} - \frac{1}{4}$	$\frac{4}{5} - \frac{1}{6}$
KNOWN	DOUBLE	CROSSES	CROSSER	WITHOUT	DIRTY

$\frac{17}{24}$	$\frac{7}{12}$	$\frac{5}{12}$	$\frac{1}{15}$	$\frac{1}{8}$	$\frac{17}{18}$
$\frac{2}{3}$	$\frac{19}{36}$	$\frac{11}{18}$	$\frac{1}{2}$	$\frac{7}{20}$	$\frac{9}{10}$
$\frac{23}{24}$	$\frac{2}{15}$	$\frac{7}{9}$	$\frac{19}{30}$	$\frac{3}{10}$	$\frac{13}{24}$

Addition-Subtraction-Multiplication-Division

by Dennis Hamaguchi
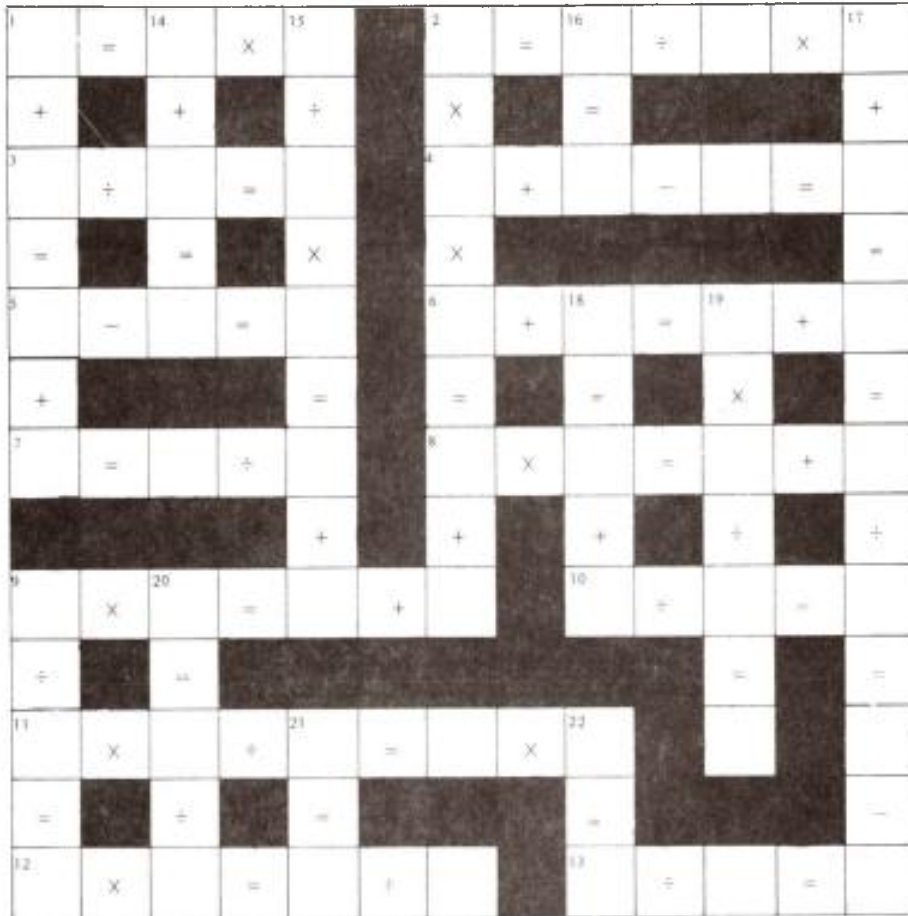
The following totals are to be achieved.

ACROSS:
1. Four
2. Two
3. Two
4. Five
5. Five
6. Thirteen
7. One
8. Nine
9. Fifteen
10. One
11. Fifteen
12. Two
13. One

DOWN
1. Ten
2. Sixteen
9. One
14. Four
15. Ten
16. Nine
17. Seven
18. Five
19. Three
20. Three
21. Two
22. Five

CHRISTMAS

Use several squares to equal 1.

1. Graph the following lines:

   $2x + y = -6$

   $2x - y = 6$

   $y = -2$

   $y = -4$

   Color the area enclosed by these lines RED.

2. Graph $y = -1$; $y = -2$; $x = -1$; $x = 1$

   Color the area enclosed by these lines BROWN.

   The graph of a circle $(x - 2)^2 + (y + 3)^2 = 25$
   center $(2 - 3)$ radius = 5

3. Graph and color the area inside the following:

   Radius = ½

YELLOW	$(x - 0)^2 + (y - 6)^2 = \frac{1}{4}$
PINK	$(x + 1)^2 + (y - 0)^2 = \frac{1}{4}$
ORANGE	$(x - 1)^2 + (y - 3)^2 = \frac{1}{4}$
LAVENDER	$(x + 2)^2 + (y - 2)^2 = \frac{1}{4}$
	$(x - 3)^2 + (y - 0)^2 = \frac{1}{4}$
BLUE	$(x - 2)^2 + (y - 1)^2 = \frac{1}{4}$
	$(x + 1)^2 + (y - 4)^2 = \frac{1}{4}$

4. Graph $2x + y = 8$; $2x - y = 8$; $y = -1$

   Color the area enclosed by these lines except for
   the area in 3 above GREEN.