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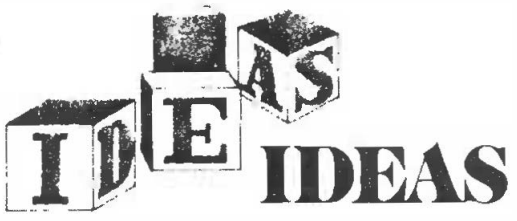
From the *Arithmetic Teacher*, January 1974



IDEAS

Activities that contribute to the student's personal understanding of key concepts in mathematics.

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Each IDEAS presents activities that are appropriate for use with students at the various levels in the elementary school. After you have chosen the activities that are most appropriate for your students, remove the activity sheets and reproduce the copies you need. After a sheet has been used, add your own comments and file the materials for future use.

IDEAS for this month utilizes a paper geoboard to provide a variety of experiences with basic geometric concepts. The paper geoboard provides an excellent model for focusing on the relation between the end points and the line segments that form polygons. Any geoboard sequence can be taught using "paper and pencil" geoboards.

For Teachers

Objective: Experience in drawing on a paper geoboard to develop the nonmetric concept of congruence.

Levels: 1, 2, or 3

Directions for teachers:

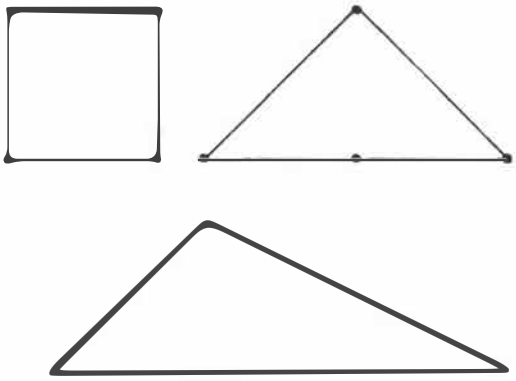
1. Remove the activity sheet and reproduce a copy for each student.
2. Give each student a straight edge but do not require that he use it.
3. Be sure that the student understands that each polygon is to be drawn on the geoboard to the right.

Comments: Other paper geoboards can be used to have the students respond to such directions as: "Draw a '3-point' triangle." "Draw the largest '3-point' triangle you can." "Draw a '4-point' square with a point inside." [•] and questions such as: "How many squares can you draw with corner points on the geoboard?" (10)

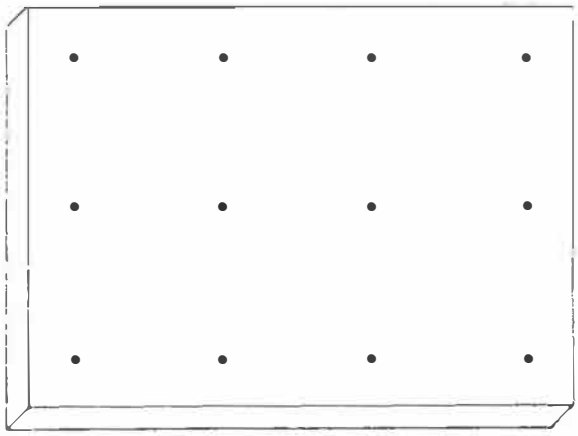
IDEAS

Name _____

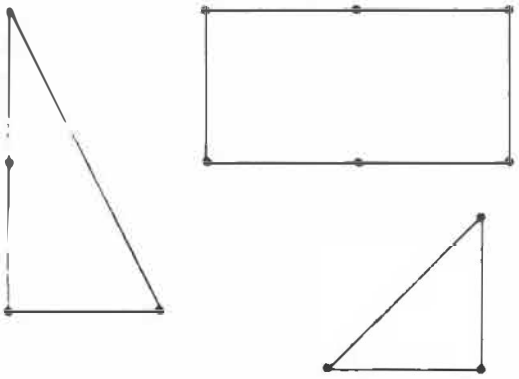
Draw these figures on the geoboards.

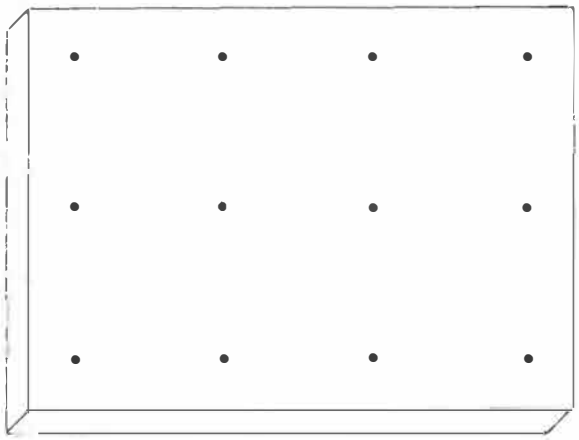


Geoboards

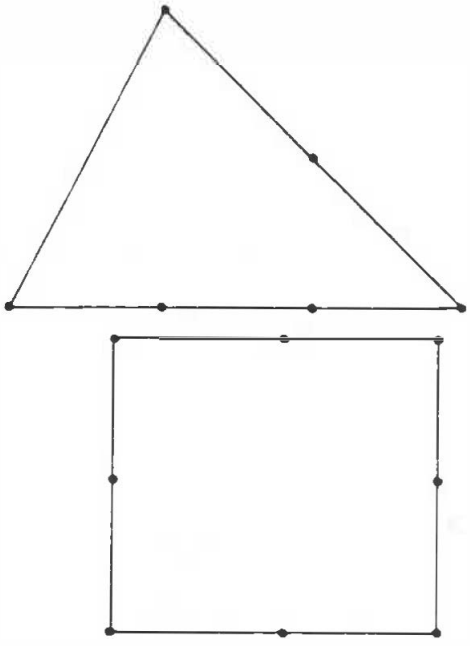


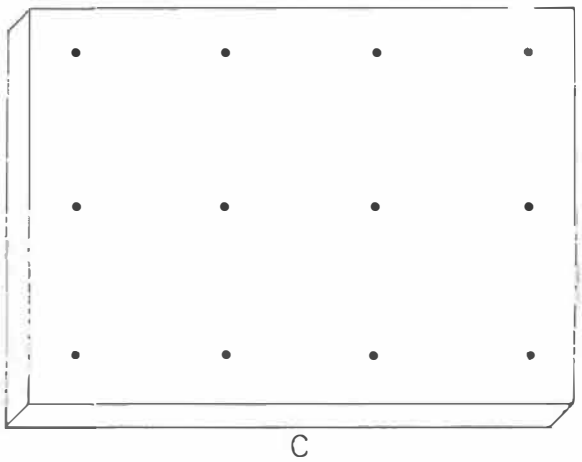
A



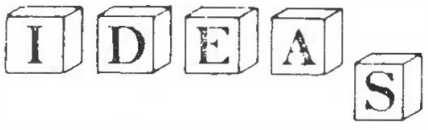


B





C



For Teachers

Objective: Experiences with basic geometric shapes and the standard technique for naming the shapes.

Levels: 3, 4, or 5

Directions for teachers:

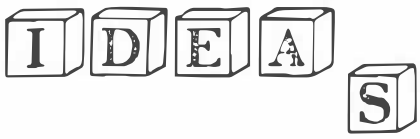
1. Remove the activity sheet and reproduce a copy for each student.
2. Encourage students to visualize the triangles without actually drawing them. (Expect that some students will have to draw the triangles before they can see them.)
3. There are many 3-letter words on geoboard A that name the corners of a triangle. Some students will list more than the number of blanks shown.
4. The letters naming the corners of a square must be in clockwise or counterclockwise order. (MOLE is a word but the square would not be properly named with the letters in that order.)
5. The student who knows that all squares are rectangles may fill the last blanks with names for squares.

Comments: You may wish to hand out 4-by-4 arrays of dots challenging the students to place letters on them to form squares, rectangles, or other polygons.

Key:

A: ROD, CAN, NOD, DUG, DOG

B: SICK, HUMP, FLAY, DAUB

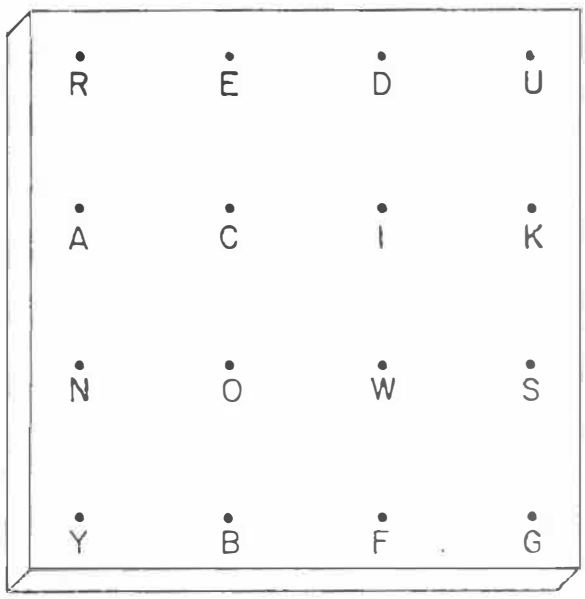


Name _____

Ring those words that name the corners of a triangle :

ROD	RED
RAN	DUG
CAN	YOU
NOD	DOG

A



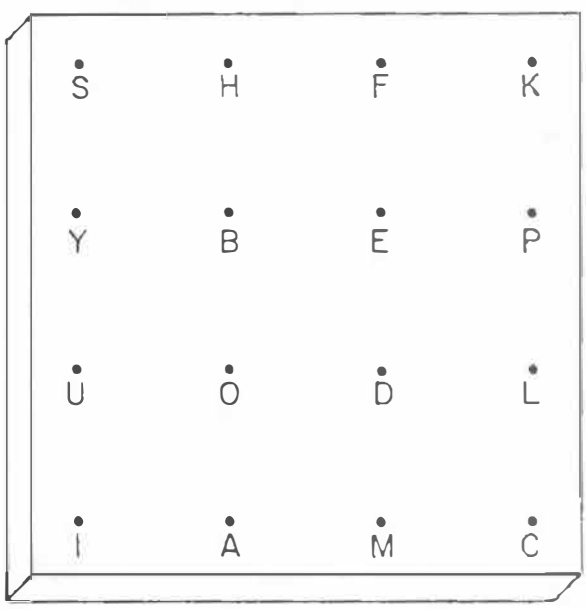
List other words that name corners of a triangle.

_____ _____ _____ _____ _____ _____ _____

B

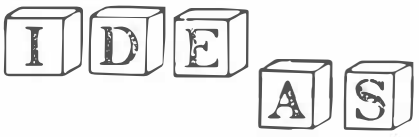
Ring those words that name the corners of a square.

SICK	FOAM
HUMP	FLAY
SULK	HACK
MODE	DAUB



List words that name corners of a rectangle.

_____ _____



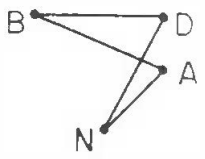
For Teachers

Objectives: Experience in visualizing special polygons

Levels: 5, 6, 7

Directions for teachers:

1. Remove the activity sheet and reproduce a copy for each student
2. Encourage students to visualize the polygons without actually drawing them.
3. Annouce that a key will be posted at a specific time.
4. Polygons are lettered clockwise or counterclockwise. (Normally BAND is not considered a polygon.)



Comments: Hand out 4-by-4 dot arrays that do not have letters. Challenge your language oriented students to make up similar sets of questions.

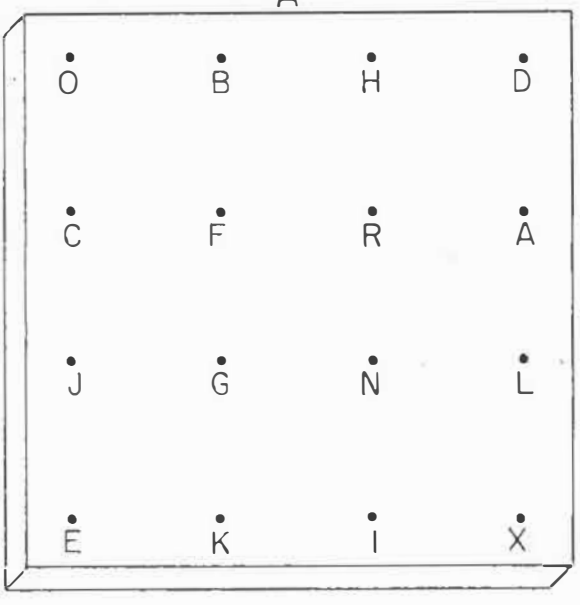
Key:

A: 1. AXE 2. DOG 3. JOHN 4. CORN
5. RAKE 6. CAKE

B: 1. BAT 2. MAT 3. SIT 4. BIT
5. MAST 6. BOAST

Name _____

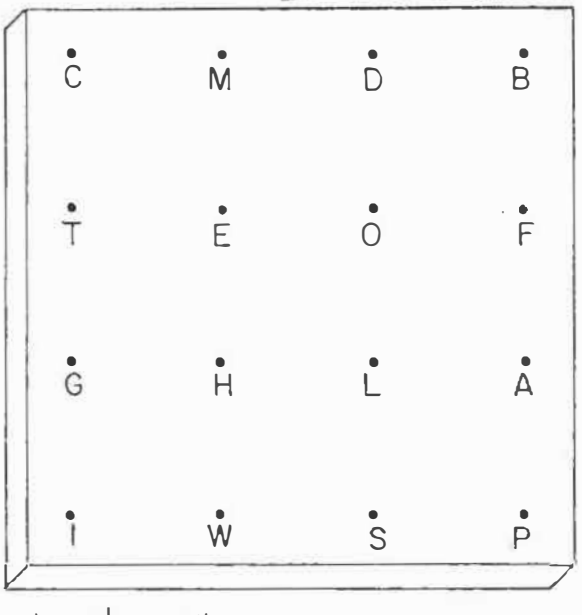
A



Find a polygon for each condition:

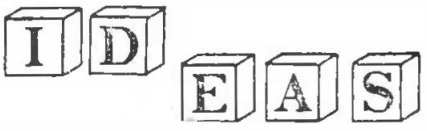
1. A right triangle that chops wood.
   ___ ___ ___
2. A triangle that names man's best friend. ___ ___ ___
3. A square that names a man.
   J___ ___ ___
4. A parallelogram that grows on ears. ___ ___ ___ ___
5. A parallelogram that is used to gather leaves. ___ ___ ___ ___
6. A trapezoid that usually has frosting. ___ ___ ___ ___

B



Find a polygon for each condition:

1. An isosceles triangle that flies at night. _____
2. A right triangle to wipe your shoes on. _____
3. An isosceles right triangle that is done on a chair.
   _____
4. An obtuse triangle that is placed in a horse's mouth. _____
5. A rectangle that holds a sail. _____
6. A concave polygon that means: to brag. _____



For Teachers

Objectives: Experience in visualizing and drawing composite polygons that requires a concept of congruence.

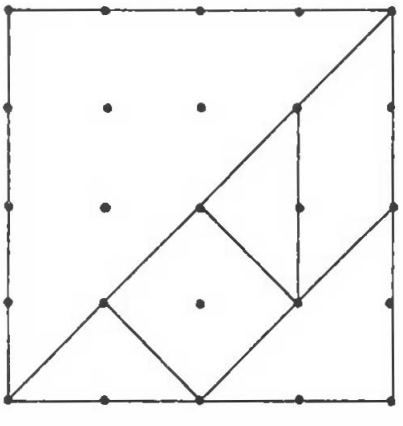
Levels: 6, 7, or 8

Directions for teachers:

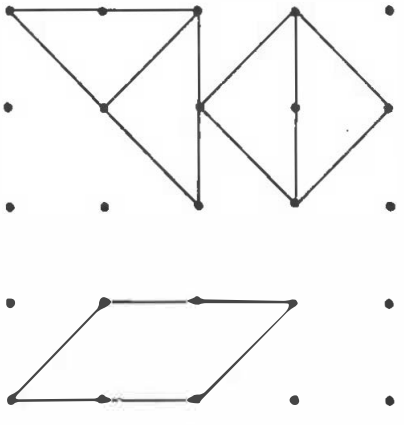
1. Remove the activity sheet and reproduce a copy for each student.
2. Be sure each student has a straight edge but do not require that he use it.
3. Present this activity as a challenge. Don't expect a high level of success.
4. Announce that all correct solutions will be posted at the end of one week.

Comments: These experiences are similar to but considerably more challenging than their counterpart using tangrams. You may wish to extend this idea into the study of different shapes with the same area.

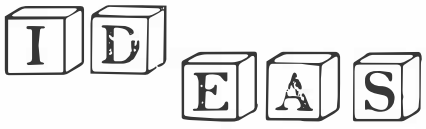
Key:



A.



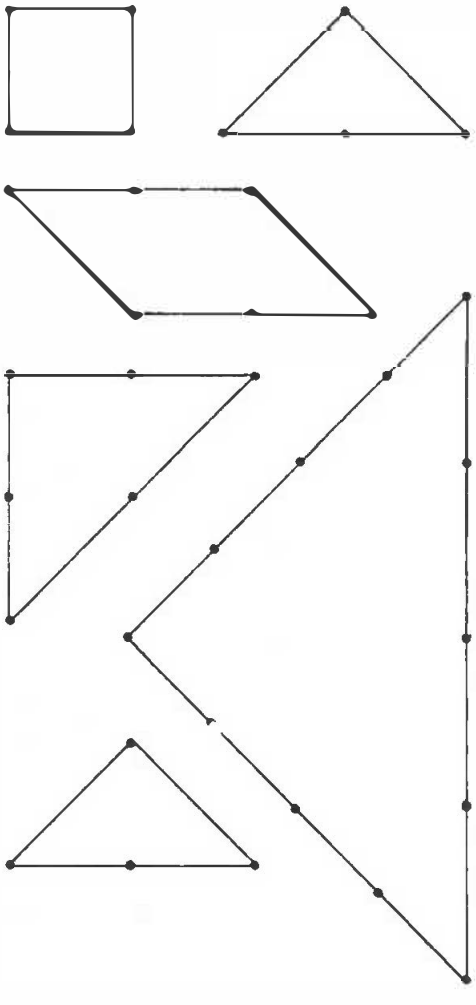
B.



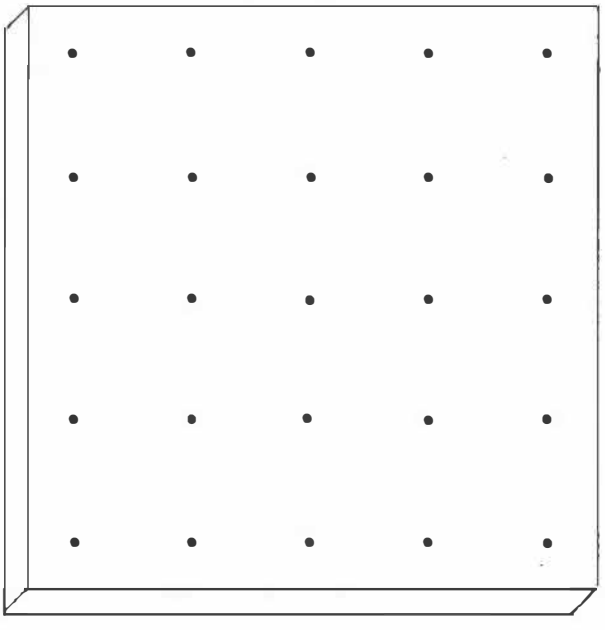
Name _____

On geoboard A :

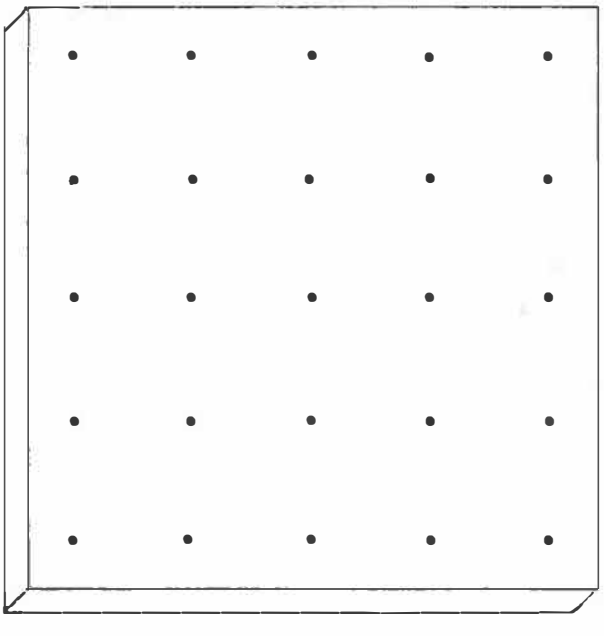
Draw all the polygons.
Use all the dots on the geoboard.



Geoboard A



Geoboard B



On geoboard B:

a) Draw one of the above polygons twice to form a right triangle.

b) Draw one of the polygons twice to form a square.

c) Draw one of the polygons twice to form a parallelogram.