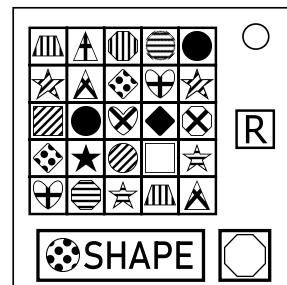


## On the Subject of Shape Fill

*Establish regularity in irregularity and familiarity in the unfamiliar.*

This module consists of a 5x5 grid filled with different shapes with different fills, a large rectangular button labelled 'SHAPE' located underneath the grid, a small button on the right side labelled 'R', and a button in the bottom-right corner with a shape on it.



To disarm the module, construct a configuration of shapes and fills that do not violate the restrictions determined in this manual, and submit the configuration by pressing the button in the bottom-right.

If an incorrect configuration of the grid is submitted, a strike will be issued, and the grid will revert to its initial state.

### Shapes and Fills

The following tables contain the different possible shapes and fills that may appear on the module:

Circle	
Diamond	
Heart	
Octagon	
Square	
Star	
Trapezoid	
Triangle	

Cross	
Diagonal	
Dots	
Empty	
Filled	
Horizontal	
Vertical	
X	

## Interacting with the Module

To change the shapes and fills of the spaces in the grid, select the desired space in the grid to toggle the shape or fill of that space. The label of the rectangular button determines whether the shapes or fills are being toggled. Select the rectangular button to switch between editing shapes and fills. The shapes and fills will scroll in the same order listed in the tables above from top-to-bottom.

If you wish to see the original grid, press the 'R' button to reset the grid to its initial state.

## Configuration Restrictions

**There must always be at least two of every shape and at least two of every fill in the grid in addition to all other restrictions.**

Use following rules to determine four more restrictions that the submitted grid must abide by.

Each set of rules for the restrictions will result in a group of four letters. Associate the first four characters of the serial number (converting letters to their alphabetic positions) with the four restrictions in order. Modulo all of the numbers by four. Take the letter in the group in the position of the resulting number as the letter to use for that restriction. The first letter in each group is indexed at 0.

If either the first two or the last two restrictions result in the same letter, shift the latter restriction's letter forward in the alphabet by three. Keep restriction 2's letter in the range of A-M (wrapping from M to A) and restriction 4's letter in the range of N-Z (wrapping from Z to N).

## Restrictions 1 & 2

In the following tables, locate the shape on the bottom-right button and the only shape missing in the original state of the grid. The resulting sets of four letters are assigned to restrictions 1 and 2 respectively.

Shape	Letters
Circle	JACD
Diamond	MHEG
Heart	IFKB
Octagon	LEMF

Shape	Letters
Square	JCGA
Star	LIBD
Trapezoid	HKMD
Triangle	BJFG

Restrictions 3 & 4

In the following tables, locate the fill on the rectangular button and the only fill missing in the original state of the grid. The resulting sets of four letters are assigned to restrictions 3 and 4 respectively.

Shape	Letters
Cross	XYPN
Diagonal	QOZS
Dots	TRVW
Empty	UTQZ

Shape	Letters
Filled	YUSV
Horizontal	WONX
Vertical	RPQW
X	ZSNY

Letter-to-Restriction

Letter	Restriction	Letter	Restriction
A	All trapezoids must be located on the outer edge of the grid.	N	At most one row may contain any shapes with the X fill.
B	Exactly four shapes must occur exactly two times.	O	No two of the same fill may be diagonally adjacent.
C	All triangles in the grid must be orthogonally adjacent to at least one other triangle.	P	There must be exactly one shape with an empty fill in each row and column.
D	The second and fourth columns must contain at least one of every shape.	Q	The four corners and the middle space must have different fills.
E	No two of the same shape may be diagonally adjacent.	R	All shapes with the cross fill must be hearts.
F	All octagons must be in either only the left half or only the right half of the grid (including the middle column).	S	Exactly four fills must occur exactly two times.

**Letter-to-Restriction (continued)**

Letter	Restriction	Letter	Restriction
G	There must be exactly one square in each row and column.	T	All shapes with vertical fills in the grid must be orthogonally adjacent to at least one other shape with a vertical fill.
H	No two diamonds may have the same fill.	U	All shapes with horizontal fills must be in either only the top half or only the bottom half of the grid (including the middle row).
I	The first two columns must not contain any hearts and the last two columns must not contain any diamonds, <u>OR:</u> the first two columns must not contain any diamonds and the last two columns must not contain any hearts.	V	The first two rows must not contain any diagonals and the last two rows must not contain any crosses, OR: the first two rows must not contain any crosses and the last two rows must not contain any diagonals.
J	The four corners and the middle space must have different shapes.	W	All shapes with dot fills must be located on the outer edge of the grid.
K	There may be no circles on the edge of the grid.	X	There may be no shapes with a filled fill on the edge of the grid.
L	All hearts must have the cross fill.	Y	No two shapes with diagonal fills may have the same shape.
M	At most one column can contain any stars.	Z	The second and fourth rows must contain at least one shape with every fill.