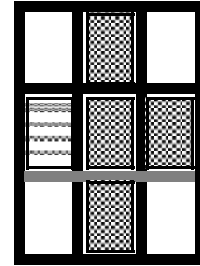
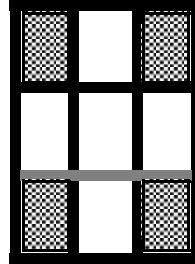
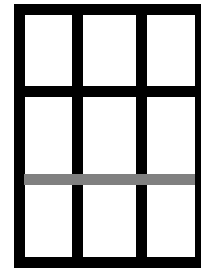


# The Magic Square

1. Only put in even numbers:



2. Only put in odd numbers:



3. Put in even numbers in sequential order first, and then odd numbers in sequential order next.

4. Fill in the two spaces in each line of addition:

$$1 + 5 + 9 = \underline{\quad} + 9 = \underline{\quad}$$

$$1 + 6 + 8 = \underline{\quad} + 8 = \underline{\quad}$$

$$2 + 4 + 9 = \underline{\quad} + 9 = \underline{\quad}$$

$$2 + 5 + 8 = \underline{\quad} + 8 = \underline{\quad}$$

$$2 + 7 + 6 = \underline{\quad} + 6 = \underline{\quad}$$

$$7 + 5 + 3 = \underline{\quad} + 3 = \underline{\quad}$$

$$8 + 3 + 4 = \underline{\quad} + 4 = \underline{\quad}$$

$$6 + 5 + 4 = \underline{\quad} + 9 = \underline{\quad}$$

2	9	4
7	5	3
6	1	8

4. Copy in the middle column:

▒		▒
▒		▒
▒		▒

5. Interchange the right and left columns

	▒	
	▒	
	▒	

6. Flip the magic square on the vertical axis.


7. Rotate top row to right column.

2	9	4
7	5	▒
6	1	▒

▒	▒	
▒	▒	
▒	▒	

8. Rotate middle row to middle column.

▒	9	4
7	5	3
▒	1	8

▒		▒
▒		▒
▒		▒

9. Rotate bottom row to left column.

▒	9	4
▒	5	3
6	1	8

	▒	▒
	▒	▒
	▒	▒

10. Rotate magic square:

2	9	4
7	5	3
6	1	8


11. Rotate 1 into 2 (same as 10).

Rotate 2 into 3.

Rotate 3 into 4.

2	9	4
7	5	3
6	1	8




1                      2                      3                      4

12. Rotate 5 into 6 .

Rotate 6 into 7.

Rotate 7 into 8.

4	9	2
3	5	7
8	1	6




5                      6                      7

Note: Square 6  
was obtained by  
flipping square 1.

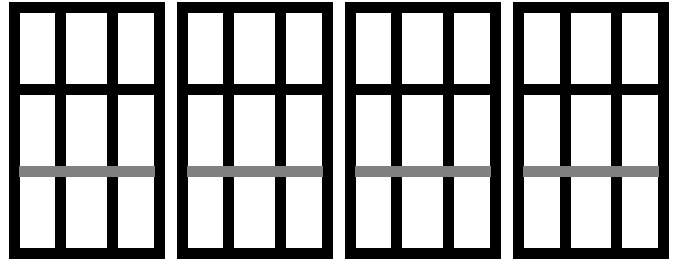
13. Finish placing numbers from 1 to 9 in column 3.  
Place the number in column 5 that makes the three numbers sum to 15.

1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3	+	1	+		=	15	5	+		+		=	15	9	+		+		=	15
3	+	2	+		=	15	5	+		+		=	15	9	+		+		=	15
3	+		+		=	15	5	+		+		=	15	9	+		+		=	15
3	+		+		=	15	5	+		+		=	15	9	+		+		=	15
3	+		+		=	15	5	+		+		=	15	9	+		+		=	15
3	+		+		=	15	5	+		+		=	15	9	+		+		=	15
3	+		+		=	15	5	+		+		=	15	9	+	7	+	-1	=	15
3	+		+		=	15	5	+		+		=	15	9	+		+		=	15
3	+		+		=	15	5	+		+		=	15	9	+		+		=	15

14. Cross out numbers where the number in column 5 is greater than 9 or less than 1 (0 or negative).
15. Cross out numbers that are repeated within a row.
16. Cross out duplicate permutations.
17. Write triplets that were not crossed out. There should be two for 3 and 9 and four for 5.

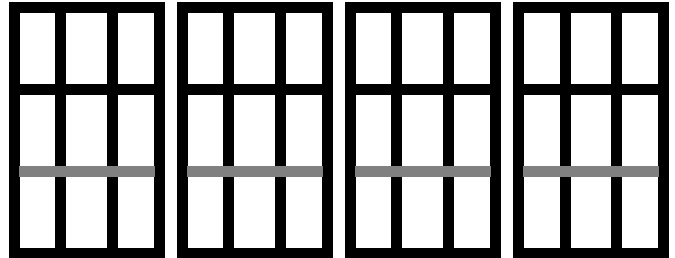
## Testing what you learned

1. Create basic magic square.



Prob. 1      3      3      3

2. Reflect the magic square.



Prob. 2      3      3      3

3. Create remaining magic squares

4. Prove 4 must be in the corner.

1	2	3	4	5	6	7
4	+	1	+		=	15
4	+	2	+		=	15
4	+		+		=	15
4	+		+		=	15
4	+		+		=	15
4	+		+		=	15
4	+		+		=	15
4	+		+		=	15
4	+		+		=	15

5. Prove that 5 must be in center.

1	2	3	4	5	6	7
5	+		+		=	15
5	+		+		=	15
5	+		+		=	15
5	+		+		=	15
5	+		+		=	15
5	+		+		=	15
5	+		+		=	15
5	+		+		=	15
5	+		+		=	15

6. Prove that each column, row, and diagonal must add to 15 by filling in the two blank positions..

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = \underline{\quad} / 3 = \underline{\quad}$$