# NUMBER JUNCTIONS

Number Junction puzzles are comprised of rows and columns of circles and diamonds, as illustrated in the sample below. Each diamond is surrounded by four adjacent circles. In addition, each diamond contains a number. This number is the sum of the numbers to be placed in the four adjacent circles. At the start of a puzzle, a circle may or may not contain a number. The object of the puzzle is to fill in each empty circle so each diamond is the sum of the four adjacent circles.

In order to solve a Number Junctions puzzles, you need to place a number in each empty circle following these four simple rules:

1. The number in each diamond is the sum of the numbers in the four adjacent circles.
2. There is one and only one of each number in each row of circles.
3. There is one and only one of each number in each column of circles.
4. The numbers placed in the circles are between 1 and the number of rows (so for a 4x4 puzzle, the numbers 1–4 are used).

Number Junctions come in 4x4, 5x5, 6x6, 7x7, 8x8, and 9x9 grids. Here's an example of a 4x4 puzzle and its solution:
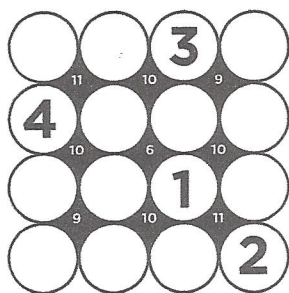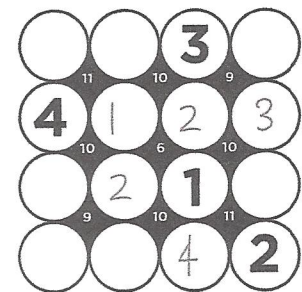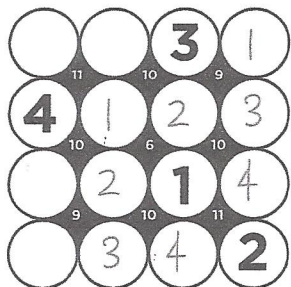

Example Puzzle
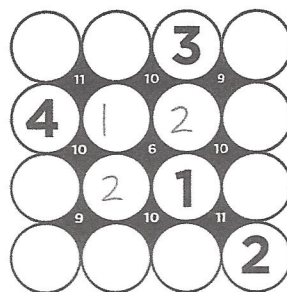
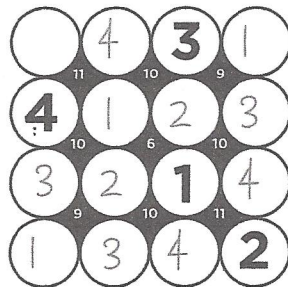**Step 1:** There is only one way to sum the numbers up to 6 in the middle:
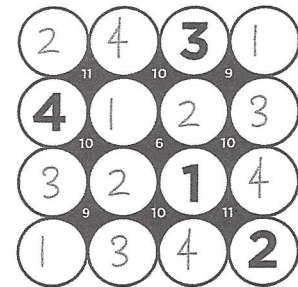1 + 1 + 1 + 2 + 2 = 6

Step 2: Complete the third column with a 4 and the second row with a 3, as only one number is missing in each.

Step 3: Once three of the four circles adjacent to a diamond are known, the fourth can be easily filled.
(example 9 = 3 + 3 + 2 + 1)

Step 4: Complete the third and fourth rows and the second column as only one number is missing in each.

Solution: Only one circle left! It must be 2! That's the number missing from the first row and column since
11 = 4 + 4 + 1 + 2

Remember:
1. The numbers must occur only once in each row or column of circles.
2. When a row or column has only one empty circle it has to be the number missing from that row or column.
3. When a diamond has only one adjacent circle that is empty, then the fourth number can easily be determined knowing the sum of four.
4. Some numbers can be made with a limited number of combinations. For example, 6 can only be made with 1 + 1 + 2 + 2.