Below is one possible coloring of a 2 × 2 square using only red and blue.
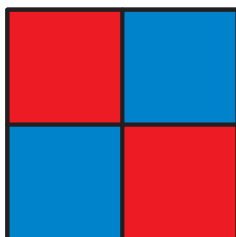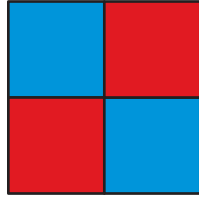

Each of the four smaller squares can be colored either red or blue, but two colorings are considered identical if one can be rotated to match the other. How many distinct colorings are there?
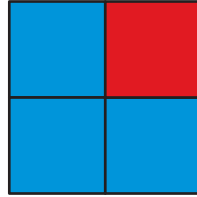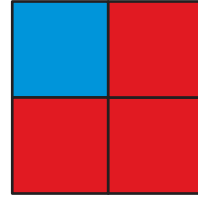
Solution: 6.

As shown below, there are six possible patterns. The number below each pattern indicates how many different colorings can be obtained by rotation. Note that the numbers add up to 16, which serves as a good check: coloring four squares using two different colors yields $2^4 = 16$ possibilities, before eliminating the duplicates that occur because of rotation.
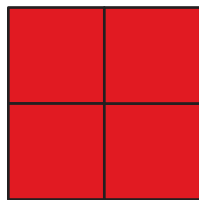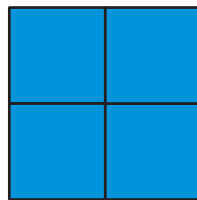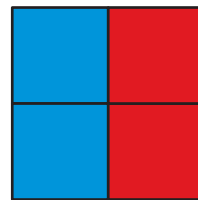

2

4

4

1

1

4