

Rolling marbles

Anna has a new toy. It consists of four red marbles next to four blue marbles in a U-shaped track. Anna can pick up any two **consecutive** marbles and place them, in the same order, at the left or at the right end of the track. Then gravity brings them all together again.

Can Anna put the marbles in order red, blue, red, blue, etc..., using the move described above? If so, what is the smallest number of moves that it requires?

Suppose the balls in the track **alternate** in colour, starting with red on the left.

Can Anna find a **sequence** of moves that will put them back into their original positions, i.e., four red marbles followed by four blue marbles?

If so, what is the smallest number of moves that she can make to do this?

