Abstract. Shape formation is one of the most thoroughly studied problems in most algorithmic models of programmable matter. However, few existing shape formation algorithms utilize similarities between an initial configuration and a desired target shape. In the hybrid model, robots with the computational capabilities of finite automata can form shapes by lifting and placing passive tiles on the triangular lattice. We study the *shape reconfiguration problem* where robots need to move all tiles in an input shape to so-called *target nodes*, which are distinguishable from other nodes by the robots. We first examine how a single robot can solve the problem under different shape assumptions. We present a worst-case optimal $O(m \cdot n)$ algorithm for simply connected input and target shapes and an $O(m^2 \cdot n)$ algorithm for input shapes with holes, where m is the initial number of non-occupied target nodes and n is the total number of tiles. Shape reconfiguration is more difficult for target shapes with holes. We propose an $O(m \cdot n^3)$ algorithm for a robot equipped with two pebbles, which it can place on any tile, and an $O(n^4)$ algorithm where a robot emulates pebbles by moving tiles from target to non-target nodes. Finally, we discuss how our algorithms can be adapted for multiple robots and empirically test a multi-robot implementation on randomly generated problem instances with different numbers of robots.