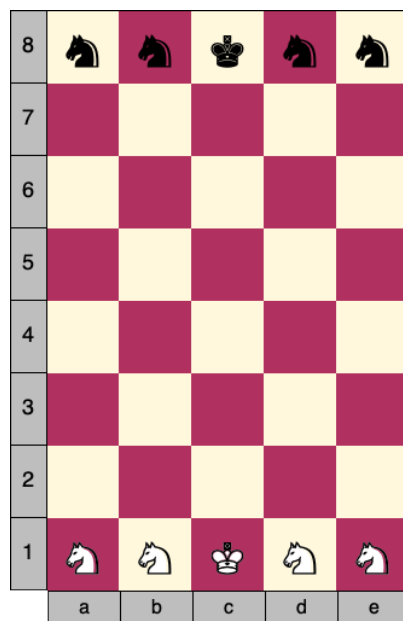


Knight Shift: Rules of the Game

Adam Shaw, May 2025

Knight shift is an original chess-like game designed to be played with an ordinary chess set. Knight shift is played on a 5×8 section of the board with a restricted set of pieces. Files are labeled **a** through **e** and ranks are labeled 1 through 8. White starts on rank 1, while black starts on rank 8.¹

Each player starts with four knights² and one *royal guard* on the board, and two *fortresses* in reserve. Kings are used for royal guards, and rooks for fortresses. Note that although knights follow standard chess rules, royal guards are not kings and fortresses are not rooks. Each player starts with the royal guard in the center of their back rank, with four knights surrounding it as shown.



On each turn, a player takes one action: either a *move* or a *fortification*.

Knights in knight shift move like knights in chess. A knight captures an opponent's knight by entering its square, as long as that knight is not *protected* (see below).

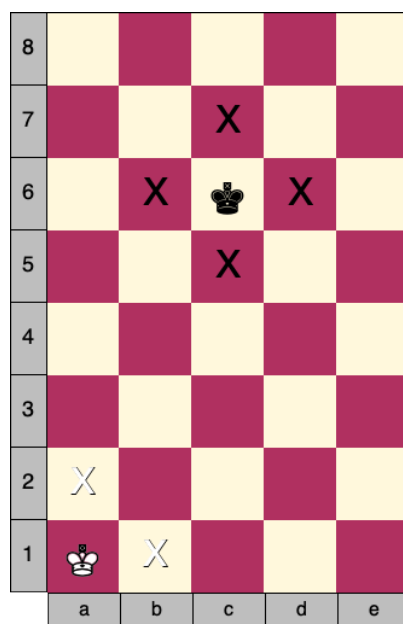
Royal guards cannot be captured. Furthermore, the royal guard carries a *zone of protection* around it: any knight that is orthogonally adjacent to its own

¹If playing on an ordinary chess board, treat files **f–h** as out of bounds.

²If playing with one chess set and four knights of each color are not available, pawns can be used as substitute knights.

royal guard is protected and cannot be captured. A royal guard moves one square in any direction, like a king, but it is not allowed to enter another royal guard's zone of protection. Note that per these rules two royal guards may stand adjacent to one another diagonally but not orthogonally. Royal guards capture pieces — necessarily, unprotected knights — by entering their square, in the usual chess way.

The figure shows black and white zones of protection with Xs. In the figure, note that the white royal guard only has two squares in its zone of protection since it is near the boundary of the board.



A knight in the opponent's back rank can be *fortified*.³ When a knight is fortified, it is replaced by a rook piece and becomes a fortress. A fortress is a permanent structure; it can be neither moved nor captured. The idea is, a knight's having scouted and secured a particular site, it is now possible to build there. As stated above, it takes a turn to fortify a knight, unlike pawn promotion in chess. Because it costs a turn, a knight must pass at least one turn in the opponent's back rank safely (without being captured) before it can be fortified.

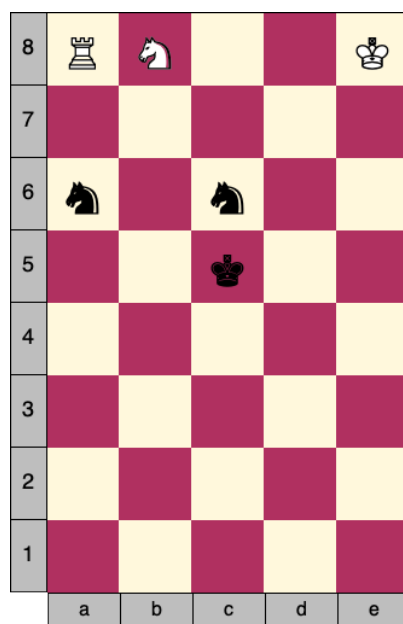
The object of the game is to fortify two knights, or, correspondingly, to make it impossible for the opponent to do so.

³The opponent's back rank is 8 for white and 1 for black.

The game is won immediately when either

- a player has made their second fortification, or
- a player has captured three of their opponent's four knights, thus making their opponent's victory impossible.

In the following scenario, it is white's turn. White has two ways to win. What are they?



1. White can fortify the knight at **b8**. Because this is white's second fortification, white wins immediately.
2. White can capture the black knight at **a6**. Because black has no fortifications and only one remaining knight (*i.e.*, it is white's third capture), it has become impossible for black to fortify twice, and white wins.

Note that even though white's knight at **b8** is a knight's move away from the black knight at **c6**, the knight at **c6** is protected by its royal guard and so not subject to capture.

This game was designed as the basis of a programming project in CMSC 14300 at the University of Chicago in the spring quarter of 2025. This is version 1 of this document, May 31, 2025. Graphics made with DrRacket.