

Games on a Chessboard

August 12th, 2018

Warm up

- Two players play the following game. There are three coins on the table. Players take turns. Each player can take either 1 or 2 coins. The person who takes the last coin wins the game. Play this game with your partner several times. Who can win: Player I (the person who starts the game) or Player II? How?



- Play the same game starting with five coins. Who can win this game?
- Play the same game starting with six coins. Who can win this game?
- What is a strategy in a game?
- What is a winning strategy?

Rook Race

The game is played on a chessboard. Two players take turns.

- **Starting position:** Two rooks in two different rows.
- **Move:** Move *any* Rook to the right (one or more cells).
- **Goal:** To be the *last* player to reach the edge.

1. Play this game with your partner several times.

Use the following starting positions

(a) Rook I on f3, Rook II on f6

Which player can win?

Circle the answer: Player I / Player II

(b) Rook I on d3, Rook II on d6

Which player can win?

Circle the answer: Player I / Player II

(c) Rook I on d3, Rook II on d6

Which player can win?

Circle the answer: Player I / Player II

(d) In general, if both Rooks are the same distance from the right edge, which player can win? How?

2. Now use the following starting positions:

(a) Rook I on f3, Rook II on d6

Which player can win?

Circle the answer: Player I / Player II

(b) Rook I on e3, Rook II on a6

Which player can win?

Circle the answer: Player I / Player II

(c) Rook I on a3, Rook II on b6

Which player can win?

Circle the answer: Player I / Player II

(d) In general, if the rooks are different number of squares away from the right edge, which player can win?
How?

(e) If you mastered the *Rook Race* game, challenge one of the instructors to play. The instructor will set up a starting position. You will have a choice of being Player I or Player II.

GOOD LUCK!

Put the Rook Into the Corner

The game is played on a chessboard. Two players take turns.

- **Starting position:** One Rook on a chessboard.
 - **Move:** Move the Rook down or left (one or more cells).
 - **Goal:** To put the Rook into the left lower corner.
3. Play this game with your partner several times. Use the following starting positions:

(a) Rook on c3

Which player can win?

Circle the answer: Player I / Player II

(b) Rook on e5,

Which player can win?

Circle the answer: Player I / Player II

(c) Rook on g7,

Which player can win?

Circle the answer: Player I / Player II

(d) In general, if the Rook is on the diagonal connecting squares a1 and h8, which player can win? How?

4. Now use the following starting positions:

(a) Rook on b5

Which player can win? (Player I or Player II)

Circle the answer: Player I / Player II

(b) Rook on e3

Which player can win? (Player I or Player II)

Circle the answer: Player I / Player II

(c) Rook on g2

Which player can win? (Player I or Player II)

Circle the answer: Player I / Player II

(d) In general, if the rook is not on the diagonal, which player can win? How?

(e) If you mastered the *Rook Race* game, challenge one of the instructors to play. The instructor will set up a starting position. You will have a choice of being Player I or Player II.

GOOD LUCK!

Homework: Play both the *Rook Race* and *Put Rook into the corner* games at home with your family.