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.