

Factor Game (grades 5+)

The Factor Game is played by two players, on a 5x6 board numbered 1-30:

- Player A selects a number from the Factor Game Board and circles it with his/her color. Player B then finds all of the factors of that number and circles them with a different color.
- Next, Player B selects and circles a number from the game board. Player A then finds all of the available factors of this number and circles them.
- Play continues until there are no more numbers which have available factors left on the board.
- Illegal Move: If a player chooses a number that has no available factors, this is an illegal move. While the player gains those points, the next turn is lost. As a result, the opponent selects the starting number, two turns in a row. Electing to make an illegal move could be considered a winning strategy move. If only illegal moves are possible, this signals the end of the game and no more points are awarded.
- Each player should total all of the numbers that are circled in their respective color. The player with the highest total is declared the winner.

Some Mathematical Questions:

- What is the best possible first move? Why?
- What is the worst possible first move? Why?
- Is there a way to finish the game with all the numbers circled on the game board?

References:

- Lesson Plan: <https://illuminations.nctm.org/Lesson.aspx?id=2069>
- Online app: <https://illuminations.nctm.org/Activity.aspx?id=4134>
- Also described here: <http://nrich.maths.org/5468/note>
- This game also appears in (at least some editions of) *Connected Mathematics* and *Everyday Mathematics*

Content Areas:

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Practices:

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