

# The Factor Game

## Rules:

This is a game for 2 people. One person, called Blue, has a blue pen, and the other, called Red, has a red pen (they can choose another pair of colours). The standard game is played on a 30-Board.

Red chooses a number and circles it.  
Blue circles all of the proper factors of that number.

If Blue misses any of the proper factors, then Red can circle them and earn the points.

Blue chooses a number (one that hasn't been circled) and circles it.  
Red circles all of its proper factors.

If Red misses any of the proper factors, then Blue can circle them and earn the points.

Note: No number may be circled more than once.

The players alternate turns.

A chosen number must have at least one proper factor that has not been circled. If not, the chosen number is circled by the other player, and the player who made the error gets no points for that turn.

The game ends when there are no legal moves left. At that point, Red and Blue add up the total of the numbers they've circled. The player with the bigger total wins.

The players take turns going first.

Variation: The person with the smallest total wins.

Variation: Use a 100 Board rather than a 30 Board

## Example Game (using a 12 Board)

Red starts by circling 10. Blue circles 10's proper factors – 5, 2 and 1.	1	2	3	4
	5	6	7	8
	9	10	11	12

Blue now circles 12. Red circles 3, 4 and 6, the proper factors of 12 that are not circled.	1	2	3	4
	5	6	7	8
	9	10	11	12

Red circles 11. Oh no! Because there are no factors of 11 that are not circled, she loses her turn, and Blue claims the 11 points. There are no proper factors of 7, 8 or 9 left, so the game is over. Score: Red: 23 Blue: 31	1	2	3	4
	5	6	7	8
	9	10	11	12

## Notes

The normal game is played on a 30 Board. Once students have become proficient on this board, challenge them to use the 100 Board.

After the students have become proficient, change the rules so the SMALLEST total wins. Give the students overnight to think about their strategy, and then play the game the next day.

One benefit of the game is the practice that students get in finding factors. Equally beneficial is the mathematical thinking needed to find the best strategy.

This game would make a good assignment, where the students choose and describe a strategy and justify why they believe it is the best.

# The Factor Game

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

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7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

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1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100