The Factor Game

NAME _____

The Factor Game can be played on a 49-board, which contains the whole numbers 1-49.

1. Extend your table for analyzing first moves on a 30-factor game board to include all the numbers on a 49-board. Draw your table on a separate piece of paper.

THE FACTOR GAME 49-BOARD

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

2. What new primes do you find? _____

3. What is the best first move on a 49-board? What is the worst first move? Why?

_____

Long ago, people observed the sun rising and setting over and over at about equal intervals. They decided to use the amount of time between two sunrises as the length of a day. They divided the day into 24 hours. Use what you know about factors to answer these questions:

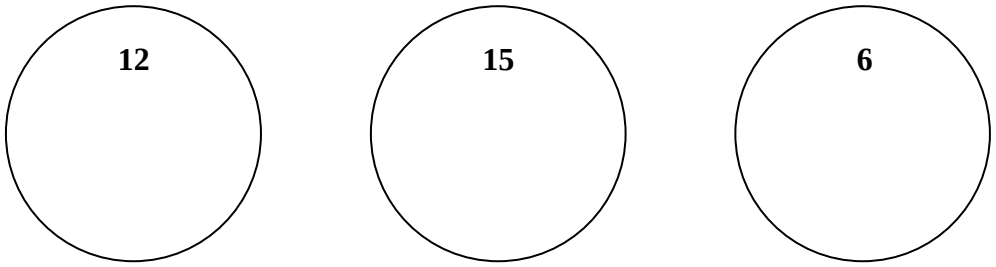
4. Why is 24 a more convenient choice than 23 or 25? _____

5. If you were to select a number different from 24 to represent the hours in a day, what number would you choose? Why?

_____

The sum of the proper factors of a number may be greater than, less than, or equal to the number. Ancient mathematicians used this idea to classify numbers as *abundant*, *deficient*, and *perfect*. Each whole number greater than 1 falls into one of these three categories.

6. Draw and label three large circles as shown below. The numbers 12, 15, and 6 have been placed in the appropriate circles. Use your factor list to figure out what each label means. Then, write each whole number 2-30 in the correct circle.



Abundant *Deficient* *Perfect*

7. Do the labels seem appropriate? Why or why not? _____

8. In which circle would 36 belong? _____

9. In which circle would 55 belong? _____

Looking back at the games you played in class and the previous three problems, answer the following questions:

10. If you choose 16 as a first move in the Factor Game, how many points will your opponent get? How does your opponent's score for this turn compare to yours?

_____

11. If you choose 4 as a first move, how many points will your opponent get? How does your opponent's score for this turn compare to yours?

_____

12. Find some other numbers that have the same pattern of scoring as 4 and 16. These numbers might be called *near-perfect numbers*. Why do you think this name fits?

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