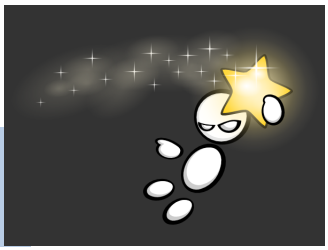
Black Out Times



Be the first person to cover your board using your knowledge of factors and multiples in this game for 2 or 3 players.

Strands:

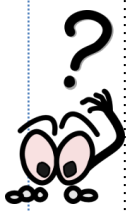
Number & Quantity	X
Algebra	
Functions	
Geometry	
Statistics & Probability	

Materials:

- *Black Out Times* game board
- 25–30 chips per player (bingo chips, pennies, etc.)
- 2 six-sided dice

Where:

Outside	
Inside	X
On-line	
On-site	



Set-Up:

- Each player chooses a game board and 25 chips.
- Place 2 dice in the center of the playing surface.
- Familiarize yourself with the numbers on your game board.
- Oldest player goes first.

Object of the Activity: Use your knowledge of factorization to decompose numbers.

On Your Turn:

1. Roll 2 dice. Create a 2-digit number from the numbers rolled and say the number aloud. For example, if you roll a 1 and a 2, you can create either 12 or 21.
2. List the factors of this number. Choose factors whose product is your number. Say these factors out loud.
3. Cover the chosen factors on your game board. For example, the factors of 12 are 2, 3, 4, 6, and 12. Because 12 = 2•2•3 = 2•6 = 3•4 = 1•12, you can cover two 2s and a 3, 3 and 4, 2 and 6, or 12. Cover only one set of factors; their product must be your number.
4. Additional rules:
   a. As long as you can cover at least one number on your game board, you can play.
   b. If no factors of your number are uncovered, you forfeit your turn.
   c. If you roll a number that has a prime factor not on the board, put one marker in the bonus box to the right of the game board.
   d. If you roll doubles, roll again until you do not roll doubles. Create a number as in Step 1. Remove one set of factors of this number from an opponent's game board.
5. Your turn is over. Play continues to the left.
6. At the end of the game, use the bonus chips to cover your board once a player goes out. You can steal the win if you have more bonus chips than you need to cover your board.

To Win:

Be the first player to cover all the numbers on your game board to win.

Think About It:

7. What number should you create after you roll the dice?
8. How many factors does your number have?
9. How easy is it to roll a prime number? Explain.
10. Study the numbers on your game board. Why do you think these numbers were chosen to be on the game board?
11. Which number appears most on the game board? Why do you think it appears so often?
12. Should the game board include the numbers 0 and 1? Why or why not?
13. What strategies did you develop as you played the game play?

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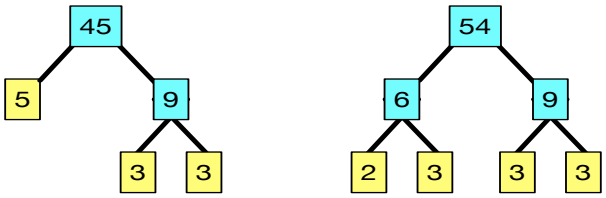
Variations:

Cover All: Cover as many factors of a number as you can on each turn. You must be able to cover at least one factor to play.

Double Trouble: If you roll doubles you have the choice of covering factors on your own game board or removing factors from another player's board as in Step 4d above.

Helpful Hint:

- Use factor trees to find factors for *Black Out Times* numbers. For example, if you roll a 4 and a 5 for Step 1, decide which number to create by examining the factor trees for both numbers, 45 and 54:



Notice that the numbers highlighted in blue are composite, the product of two or more factors other than the number and 1. The numbers highlighted in yellow are prime factors. The only factors of a prime number are 1 and the number itself.

Which number has the most factors, 45 or 54? List the factors for each number. Which number helps you cover the most numbers on your game board?

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