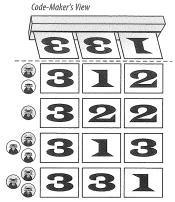
In the example here, the **Code-Breaker** took 4 rounds to successfully break the code.

Players then switch roles, with the **Code-Breaker** becoming the **Code-Maker** and vice versa, alternating through 5 rounds of play. The winner of the game is the player with the *fewest* overall code-breaking guesses after 5 rounds. In the example below, "Joey" is the winner of the game, with fewer total guesses than "Kevin."



Code-Breaker's View - Fourth Guess

ROUND	1	2	3 4	5	TOTAL
Joey	4 -	5 –	3 – 5	-6=	: 23
Kevin	6 -	- 5 -	4 – 6	- 4 =	: 25

<u>Playing the Game – 4-Number Format:</u> The game play is the same as described above, but utilizes all 4 numbers. A 4-number code is more difficult to solve than a 3-number code.

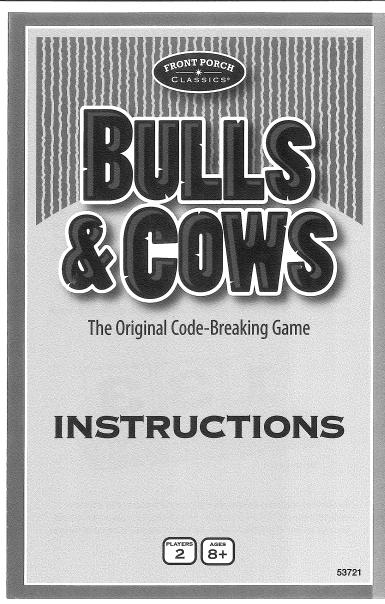
More than 2 Players: If playing with more than 2 people, the youngest player starts as Code-Maker, with all other players as Code-Breakers, playing against each other. The oldest player is the first Code-Breaker and after his/her turn play rotates to the left with the next player assuming the position of Code-Breaker. In a multi-player game, the round winner is the player who breaks the code first. We recommend that a game with more than 2 players lasts 2 rounds per player. For example, if there are 4 players, there should be 8 rounds played in total.

Bulls & Cows is also a great game when played in teams, where teammates can strategize together on each turn as  ${\bf Code}\text{-}{\bf Breaker.}$ 



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## **Bulls & Cows Rules of Play**

Bulls & Cows is a code-breaking game which dates back over 100 years. While this game is most often played between 2 opponents, it can also be played by more players, as well as in teams, as described below. The components for this game include:

- (1) Wood Code-Maker Rack (to hold code cards)
- (60) Code cards, 15 of each numbered 1-4
- (25) "Cow" code chips (with tan background)
- (15) "Bull" code chips (with red background)





Bull Chip

**<u>Objective:</u>** The winner is the player who, after 5 rounds of play, has the *fewest* total code-breaking guesses.

<u>Set Up:</u> Place the wood <u>Code Maker Rack</u> in front of the youngest player, place the code cards in one pile face down, and keep the "Cow" and "Bull" code chips in their own separate piles. <u>Before a game of Bulls & Cows starts</u>, players should first decide if they will play a 3- or 4-number code game. It is easier and quicker to learn Bulls & Cows if initially played with 3 code numbers.

<u>Playing the Game – 3-Number Format:</u> In Round #1, the youngest player becomes the Code-Maker and creates a secret number code by choosing 3 specific numbered cards from the pile. The Code-Maker places these cards with the number side facing him/herself into the Code-Maker Rack in any sequence they wish.



The secret code may be any sequence of numbers and may include a repeat of the same number (for example: 1-1-3; 3-1-2; 3-2-2, etc). Note, however, that during a 3-number code game, ALL number "4" cards should be removed from the deck prior to the start of the game.

The **Code-Breaker** then makes his/her first code "guess" by laying numbers in front of the rack (see diagram below).

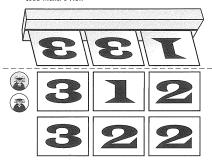
Code-Maker's View



Code-Breaker's View - First Guess

The **Code-Maker** then lets the **Code-Breaker** know how close this guess is to breaking the code by placing "Bull" and "Cow" chips to the right side (Code-Breaker's left) of the code guessed. For example, referring to the diagram below, the one "Bull" chip indicates one correct number is in the correct position (as the "3" sits directly across from the "3" card in the rack) and one "Cow" chip indicates one correct number, but in the wrong position (as the "1" is part of the code but is not positioned directly across from a "1" card on the rack). The **Code-Breaker** will, therefore, not know which specific card guesses are correct.

Code-Maker's View



Code-Breaker's View - Second Guess

Per the example above, the **Code-Breaker** has not successfully broken the code and they will then place a *second* number code guess behind the first series, knowing that so far they have identified one correct number in the correct position and a second correct number, but in the wrong position. The **Code-Breaker** strategy is to use the feedback received after each guess to eventually solve the code in as few guesses as possible.