

Materials Needed

- Paper, pencil, crayons, or markers
- Paper
- Two players

Grade Range

- 3-5
- 6-8

Topics/Skills

- Problem solving
- Reasoning

Learning Standards

CCSS Math: [Mathematical Practices](#)

Duration

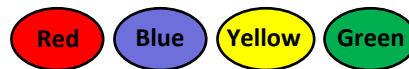
20 -45 mins

Prep Time

5 minutes

Pigs and Cows – Reviving a Decoding Game

A 2-Player Logic Game for Uncovering Secret Codes



Students apply logic to solve an opponent's secret code. This activity helps students practice reasoning and problem-solving through identifying patterns.

Activity Challenge

Create secret codes containing a series of different numbers, colors, or letters.

Preparation

1. Gather materials needed.
2. Decide whether to create codes with 3-5 colors, numbers, or letters. Each round of this game can be changed between playing with different colors, numbers, or letters. Note: Letters must spell a word.

To Do

1. Each player writes a secret code at the bottom of a piece of paper and folds the bottom over, hiding it from the opponent. Examples:
 - a. 3 to 5 different colors (e.g., red – blue – yellow – green)
 - b. 3 to 5 different numbers (e.g., 0 – 2 – 4 – 6)
 - c. A 3 to 5 letter word (e.g., house)
2. Decide who goes first (simple method such as “rock, paper, scissors”).
3. The 1st player guesses the 2nd player's secret code.
 - a. Player 2 tells Player 1 if the guesses are wrong.
 - b. If some of the items (numbers, color, letters) are correct but not in the right order, Player 2 calls each correct item a “**pig**.”
 - c. If the colors, numbers, or letters are correct *and* in the correct location, Player 2 calls them a “**cow**.” DO NOT tell the Player 1 which is the cow, and which is the pig!
 - d. See page 2 for examples of codes with “pigs” and “cows.”
4. Players take turns guessing each other's codes until one player has 4 “cows.” The code is solved.
5. Guesses can be recorded by drawing tables as shown on page 2.

Observations

- Write down your guesses and the input from the other player.
- Determine which type of code (colors, number, letters) was the most challenging to decode and think of reasons for the difficulty.

Extensions

- Create codes with longer sequences of colors, numbers, or letters
- Write a short story with the parts of a code and pigs and cows as the characters

The Content behind the Activity

This activity provides an engaging way for students to analyze patterns and relationships between elements arranged in sequences. These are important skills for students to learn as they progress through grades 3-5 towards proficiency in conducting mathematical operations and engaging in algebraic thinking and problem-solving that will be required in the middle and high school grades. The activity is best facilitated as a game to maximize engagement and can be modified to accommodate students in need of more challenging learning experiences.

EXAMPLE: Player 1's paper Player 2 code = Red, Blue, Yellow, Green

Player 1 Guesses	Player Two Responses
Orange, Purple, Yellow Red	1 pig & 1 cow (Red = pig, yellow= cow)
Orange, Yellow, Purple, Red	2 pigs
Red, Orange, Yellow, Purple	2 cows
Red, Green, Yellow, Blue	2 pigs & 2 cows
Red, Blue, Yellow, Green	4 cows

EXAMPLE: Player 1's paper Player 2 code = Walk

Player 1 Guesses	Player Two Responses
Mine	0 Correct
Name	1 cow (A in correct position)
Nail	1cows, 1 pig (A in correct position, has an l but not in correct position)
Talk	3 cows (A, L, K in correct position)
Walk	4 cows!

