

## Introduction

Hello, my name is Stephanie and I am a computer science major at Kean University.

Today, my team and I will be presenting you with a fun new game we created called the “Hidden Image Game”. Data and information can be represented in many different ways and **STILL** have the same meaning. The different representations are used for different purposes (**ex.** To be fast, shorter, more visual, more hidden, or more secretive.

### **Visual Example:**

To help you guys better understand this, let’s take a look at the word: **House**

- What does **House** mean in English?
- What does it mean in Spanish → **Casa**

Ok, **House** is **Casa** in Spanish. They both mean the same thing, but are represented or shown in a different way.

Now, let’s take a look at another way to represent this.

**ASCII** is a computer language used to represent data (like letters, numbers and such).

In **ASCII**, **Casa** would look like this → 43 61 74 61



And here is an image of the same thing:

Sketch on the board

### **Match Up Activity:**

Now, lets do a warm up matching game.

You will all have a piece of paper with encodings or numbers written on them, your job is to match your encoding with one of the images in the middle of the table.

*For Example, (grab answer B)*

Here is my encoding (show to class), I am going to put it next to each image and see if they match, looking one line at a time and starting from the first row. (place near images)

\*Let's look at the my row first, I have \_\_\_\_ **the same**, and \_\_\_\_ **different**.

Which image matches that so far?

Ok, how about the next row, I have \_\_\_\_ **the same**, and \_\_\_\_ **different**.

Which image matches that so far?

Now it is your turn. The winning table will be the first team to match all of your encodings to the images on the table.

### **Level One of Game:**

Now, let's start playing the first level of the Hidden Image game.

How many of you are familiar with or have ever played Battleship? How about Bingo?

Well, this game is going to be similar to those.

- 1) Hand out materials,                      2) Go over rules                      3) Demo

We are going to give each of you two pieces of paper, and some markers/pens.

One paper is going to be an empty grid, and the second is going to be a grid filled with 0's and 1's. Keep the empty grid on top to hide the grid with the numbers.

### **Level 1 - Rules for Playing**

1. The goal of the game is to reveal all of your opponent's black pixels (squares) by guessing their locations on a grid sheet (similar to Battleships, for those who are familiar).

2. You will be split into pairs of two, across from each other, and alternate taking turns. To take a turn, one of you calls out a row number and a column letter that corresponds to a square on your opponent's grid (like Bingo, for those who are familiar).

3. Your opponent (across the table) will then peek under her blank grid and take a look at that square you called out on her hidden grid (the one with the 0's and 1's).

- If the square with the row number and column letter has not already been called and revealed, your opponent will check to see:
  - If there is a 0, then your opponent will place a dot in the middle of that grid space on her blank grid paper.
  - If there is a 1, then your opponent will fill in the grid square on her blank paper. When it is a 1, meaning a black square, you also get 1 extra turn. So you get to call out another row number and column letter to check another grid space. After your move, the next player goes. (Regardless if the extra turn reveals another black space).
- If the square at the row number and column letter have already been called and revealed,

- Your opponent must look to see if there is a **run**. A **RUN** would be true if the grid space(s) directly to its right contain the SAME data number as the space called again (the 0's or 1's).
  - If there is a run, all of the spaces directly to the right of the space that contain the SAME data will be either filled in or given a dot (depending if it's a 0 or 1) up until the data CHANGES. Runs must be consecutive.
  - If the first grid space to the right is different, then nothing is revealed.

4. **The winner** is the player who reveals all of her opponents' black pixel squares first.

Strategy – Finding runs of black cells or runs of white cells are important to locate, for the success of the player, to shorten the number of turns to win the game.

### Example of a turn:

Facilitator draws on the board:

Suppose the turn comes to you and your

opponent's revealed image grid looks like this

	A	B	C	D	E
1					
2					
3	*	*	*		

And her hidden binary data looks like this

	A	B	C	D	E
1	0	0	1	1	1
2	0	1	1	1	0
3	0	0	0	1	1

Suppose you guess B2

Then your opponent would see a 1 and would color the square black.

	A	B	C	D	E
1					
2					
3	*	*	*		

Because this is a Black square you get a bonus guess.

Suppose you ask for B2 again. Are there any more 1's to the right of square B2?

Your opponent says yes. There are 2 more 1's which your opponent reveals as black.

	A	B	C	D	E
1					
2					
3	*	*	*		

Your turn is over, and it becomes your opponent's turn.

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When a table is finished with the game, ask them what the pictures are. They will not know. Point out that some actual images are a combination of smaller images. Then have them try to determine if the pictures mean something when they are put together. Then show them the finished combined picture.