



Retro Game Design

Can fulfill the GSUSA Cadette and Senior Game Design badges

This is a meeting outline, not a comprehensive meeting plan. It is an untested, brainstormed concept providing a possible sequence of activities. Leaders will need to create their own supplementary handouts and evaluate the plan to ensure the activities match the specific abilities and interests of their scouts.

Items Needed:

- Graph paper (1-inch or 1/2-inch squares work best)
- Colored pencils or markers
- Blank paper and pens
- Sticky notes (optional, for decision tree nodes)

Minutes 0–20: Pixel Art Arrays (Graphics Engine)

The Activity: Scouts learn how computer screens render images using a grid of pixels controlled by code arrays. They write a simple array and color the grid to design their character's "sprite."

Leader Instructions: Explain that screens are massive grids. Computers use arrays (lists of data, like a row of numbers) to tell each square (pixel) what color to be.

1. Assign a number to a color (e.g., 0 = Blank/White, 1 = Black outline, 2 = Red).
2. Have the scouts draw a 10x10 grid on their graph paper.
3. Beside the grid, they must write out the array code for each row (e.g., Row 1: 0, 0, 1, 1, 1, 0, 0).
 - **GSUSA Cadettes:** Design a pixel-art avatar that represents themselves.
 - **GSUSA Seniors:** Design the main character for their upcoming game.

Minutes 20–35: Character Select Screen (Character Bios)

The Activity: Scouts map out the personality, skills, and mechanics of their avatar/character.

Leader Instructions: Instruct the scouts to write a "Character Select" profile for the pixel art they just drew. They must define:

- **Name & Appearance Notes:** Expanding on the pixel art.
- **Personality Traits:** (e.g., brave, analytical, quick-tempered).
- **Special Abilities:** What can this character do in the game? (e.g., double-jump, hack terminals, translate languages).
 - **GSUSA Cadettes:** Ensure these traits reflect their own real-life strengths and personality.

Minutes 35–50: The "Positive Impact" Scenario Pitch

The Activity: Teams or individuals write out the core concept, goal, and mechanics of their game.

Leader Instructions: Explain that the game scenario must have a positive impact (e.g., cleaning up an ocean, stopping a cyberbully, rescuing endangered animals, teaching a skill).

- Scouts write a Game Design Outline detailing:
 - **The Scenario:** What is the story and the ultimate goal?
 - **The Mechanics:** How does the player interact with the world to achieve the goal? (e.g., resource management, dialogue choices, puzzle-solving, platforming).



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Minutes 50–70: Paper Programming (Decision Trees)

The Activity: Scouts map out one specific level or interaction in their game using a flowchart to understand game logic.

Leader Instructions: Explain that a decision tree is how a computer handles choices (If/Then statements). It is a flowchart showing all possible outcomes of a player's choice.

1. Scouts use blank paper (or sticky notes on a table) to build a decision tree for a scenario in their game.
2. *Example:* Node 1: "Player encounters a polluted river." -> Option A: "Use a filter net." (Leads to Node 2: "River is clean, gain 10 points.") -> Option B: "Swim across." (Leads to Node 3: "Player takes toxic damage, lose 1 heart.")
3. The tree must have at least one starting point, two choices, and distinct end results for those choices.

Minutes 70–90: Beta Testing (Playthrough & Feedback)

The Activity: Scouts pair up to "play" each other's games and provide peer feedback.

Leader Instructions: Have scouts swap their Game Design Outlines, Character Bios, and Decision Trees with a partner.

- One scout acts as the "Computer" reading the scenario and the decision tree; the other acts as the "Player" making the choices.
 - **GSUSA Cadettes:** Focus on testing the game mechanics during the playthrough. Does the mechanic (like choosing an item or answering a question) make sense? What needs to be added?
 - **GSUSA Seniors:** Focus on the peer review. After the playthrough, write down two things the game did well and one specific suggestion to improve the positive impact or the decision tree flow, and hand the feedback back to the creator.



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Decoding Pixel Art Array Instructions: A computer screen is a massive grid of tiny squares called pixels. To create an image, the computer reads an "array" (a list of data) that tells it exactly what color to make each square.

Use the array code below to reveal the hidden video game character. Read the code row by row.

- If the number is **0**, leave the square **blank**.
- If the number is **1**, **color the square in** completely.

The Code (Array Data)

- **Row 1:** 0, 0, 1, 0, 0, 0, 0, 1, 0, 0
- **Row 2:** 0, 0, 0, 1, 0, 0, 1, 0, 0, 0
- **Row 3:** 0, 0, 1, 1, 1, 1, 1, 1, 0, 0
- **Row 4:** 0, 1, 1, 0, 1, 1, 0, 1, 1, 0
- **Row 5:** 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
- **Row 6:** 1, 0, 1, 1, 1, 1, 1, 1, 0, 1
- **Row 7:** 1, 0, 1, 0, 0, 0, 0, 1, 0, 1
- **Row 8:** 0, 0, 0, 1, 1, 1, 1, 0, 0, 0
- **Row 9:** 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
- **Row 10:** 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

The Grid

	1	2	3	4	5	6	7	8	9	10
R1										
R2										
R3										
R4										
R5										
R6										
R7										
R8										
R9										
R10										



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Create Your Own Avatar Array

Now that you know how a computer renders an image from an array, it is time to write your own code.

1. Use a blank 10x10 grid to draw a pixel-art avatar that represents you.
2. Once your image is colored in, write the array code for your avatar row by row.
3. **Challenge:** If you want to use multiple colors, assign a different number to each color (e.g., 0 = Blank, 1 = Black outline, 2 = Red, 3 = Blue).



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Character Select Bio

Character Stats

Character Name:

Appearance Notes (Sprite Details):

Personality Traits: (e.g., brave, analytical, quick-tempered)

Sketch your pixel art avatar or tape your grid array here

Special Abilities: (What can this character do in the game? e.g., double-jump, hack terminals, translate languages)

GSUSA Cadettes: These traits should reflect your real-life strengths/personality for badge requirement.

How does this character represent you?



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Scenario Pitch

Game Concept Outline: *Every classic adventure needs a mission. Outline the core concept, goal, and mechanics of the game you want to make below.*

Game Title: _____

The Scenario (Story & Goal): What is the story of your game, and what is the goal?

- **GSUSA Cadettes & Seniors:** The scenario must have a positive impact (e.g., cleaning up an ocean, stopping cyberbullying, rescuing endangered animals, teaching a skill).

The Mechanics (Gameplay): How does the player interact with the world to achieve the goal? (*e.g., resource management, dialogue choices, puzzle-solving, platforming*)



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Decision Tree Workspace

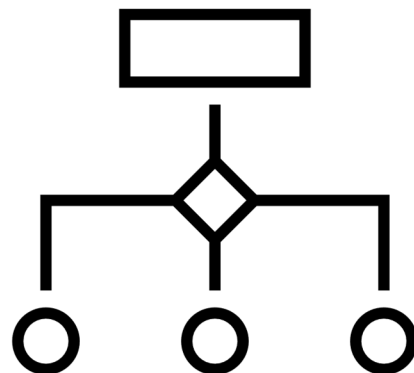
How to map game logic? A decision tree is how a computer handles choices using If/Then statements. It is a flowchart showing all possible outcomes of a player's choice. Your tree must have at least one starting point, two choices, and distinct end results for those choices. It can have more than two, but always at least two options for each point that allows a choice.

Example map

- **Start node:** Player encounters a polluted river.
- **Choice A:** Use a filter net.
- **Result A:** River is clean, gain 10 points.
- **Choice B:** Swim across.
- **Result B:** Player takes toxic damage, lose 1 heart.

(Note: You can draw boxes around your nodes or use sticky notes on a table to build your tree.)

Build Your Decision Tree





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Beta Testing Feedback Form

Swap your game design outline, character bio, and decision tree with a partner. Choose a role:

- **The Computer:** Reads the scenario and the decision tree out loud.
- **The Player:** Makes the choices to navigate through the game.

System Diagnostic: Peer Review

Game Title Reviewed: _____

Reviewed By: _____

- **GSUSA Cadette:** *Focus on Game Mechanics for badge requirement.* Does the gameplay mechanic (like choosing an item or answering a question) make sense during the playthrough? What needs to be added to make it work better?
- **Senior Focus:** *Focus on Constructive Feedback for badge requirement.* After the playthrough, write down two things the game did well.

Write down one specific suggestion to improve the positive impact or the decision tree flow:

Write down two things you liked about the game: