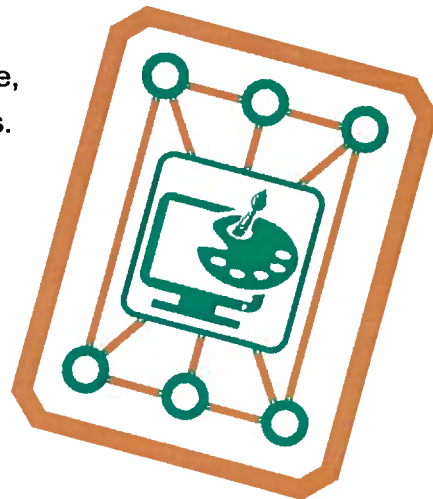# Video Game Designer Patch Program

Activity Guide

Many girls love to play video games, but not all girls have tried making their own. This **Patch Program** gives Girl Scouts the chance to make their own video games and learn about the games industry. Inspiring girls to design video games helps them foster **Science, Technology, Engineering, and Math (STEM) skills** and ensures that the world will have a strong female voice in the video games and technology of today and tomorrow.

Key Messages

- Designing games helps to develop critical thinking, systems thinking, problem solving, and STEM skills.

- Designing games is a way for girls to be creative, tell their own stories, and gain practical life skills.

- Designing games means working on a team, collaborating and cooperating, testing and sharing feedback, and inspiring each other.

- The world of games has opportunities for girl designers, artists, programmers, and more. A female voice is important and valued in video games!

This patch program is divided into the following steps:

DISCOVER
1 hour

1. An exploration of Rock-Paper-Scissors and learning about what makes up a game.

2. An introduction to the life of a game designer and what it means to be a women in the games industry.

CONNECT
1 hour

1. A group project around making a game from found objects. Girls learn how teamwork, testing, and feedback are important in the game design process.

TAKE ACTION
2 hours

1. Girls design their own digital games using Gamestar Mechanic. They present and share their work to the group.

DISCOVER

Rock-Paper-Scissors (30 min)

In this activity, you'll take apart and change the elements of the classic game Rock-Paper-Scissors to investigate how a change to a small piece of a game system is reflected in the entire game system.

What you need:

It's best to have at **least three people who have played** Rock-Paper-Scissors before.

INTRO

All games are systems designed to be played. Like any system, games have **interconnected elements** that make the system what it is. If one element of a system is changed, the entire system will adapt to reflect that change.

There are many elements in a game system, but for now we'll look at the **basic five: rules, goals, space, mechanics, and components.** Let's break down Rock-Paper-Scissors using these elements:

- **Space:** the space of Rock-Paper-Scissors is a close, but not intimate, area between two players.

- **Components (the pieces of the game):** the hand symbols for rock, paper, and scissors; two players.

- **Mechanics (what you do in the game):** a player "throws" a hand symbol into the game space.

- **Rules (the parameters of gameplay):** One hand symbol beats another and the player who threw the winning symbol gets a point. Paper beats rock. Rock beats scissors. Scissors beats paper. Players throw the hand symbols at the same time (often after counting to 3). Players cannot change a hand symbol once it's thrown, and the symbol must be in both player's lines of sight.

- **Goals:** A player wins a round by throwing a winning hand symbol. Another common goal is to win 2 out of 3 rounds.

PLAY

1. Have two people demonstrate a normal game of Rock-Paper-Scissors for the group. (Note: "normal" may mean different things to different players. Some may start the game by counting to 3, other may start it by saying "rock, paper, scissors, shoot"). **Go over the five elements of the game with the group** (as described above).

2. Then ask the demonstrators to change only one element of the game. A good place to start is by changing the space of the game by having the players stand back to back, so that they cannot see each other. Have them play a round of Rock-Paper-Scissors like this and note what happens. Now, the two players alone cannot tell who has won the round without the help from a judge who can see both of the hand symbols. So, **by changing the game space, we've also changed the components**; we need at least three players instead of two! Have any other elements changed in this version of Rock-Paper-Scissors?

3. Divide your group into small groups of 2 or 3 and assign each group an element of Rock-Paper-Scissors to change. Give them 5 minutes to change their element and then present the game in front of the group. Some example changes are:

- **Space:** players hide their hands while they play
- **Components:** add a component like fire or bear
- **Mechanics:** speak the components instead of using hand symbols
- **Goals:** try to tie/throw the same hand symbol as your partner
- **Rules:** you have 2 seconds to change your hand symbol after you throw it

After a group demonstrates its changed game, ask the group what element they changed originally and what other elements changed as a consequence of changing that first element.

CIRCLE UP

Reiterate the point that in a system, like the game system Rock-Paper-Scissors, **changing one element of a game will also change the others because a system is made up of elements that work together.** Ask participants to think about changing one element of a sport (the space of basketball is in a swimming pool) or one element of a video game (the mechanics of Mario do NOT include jumping, only walking). What else would change in those situations?

Connection to Game Design: The success of this exercise is in the transfer of the idea. A game is a system with interconnected elements. That means a game designer has to create these elements to work together in a fun and challenging way. When designing a game, a designer should playtest early and often to see how small changes to elements in the game can affect whole system . . . for better or worse!

Learn From A Pro (30 min)

INTRO

Pass out the **Roles in the World of Video Games handout** to each girl (attached at the end). They should look at the picture and write down ideas of what kinds of jobs they think exist inside a video game studio. They can then compare what they wrote with the list of Roles on the second page of the handout.

LISTEN

In this section, girls will hear from a professional who works in the video games industry. The professional will present about how she became interested in the video games industry, how she got her job, what she does at work, and what it's like to be a women in the video games industry.

DISCUSSION

Girls should then ask the professional some questions about her work. Here are some examples questions you can use to help inspire the scouts with their own questions:

1. What is the most fun part about your job?
2. What is the hardest part about your job?
3. What is your favorite video game to play?
4. What would be your dream video game to make?
5. Do you have any advice for someone my age who wants to become a game designer?

CONNECT
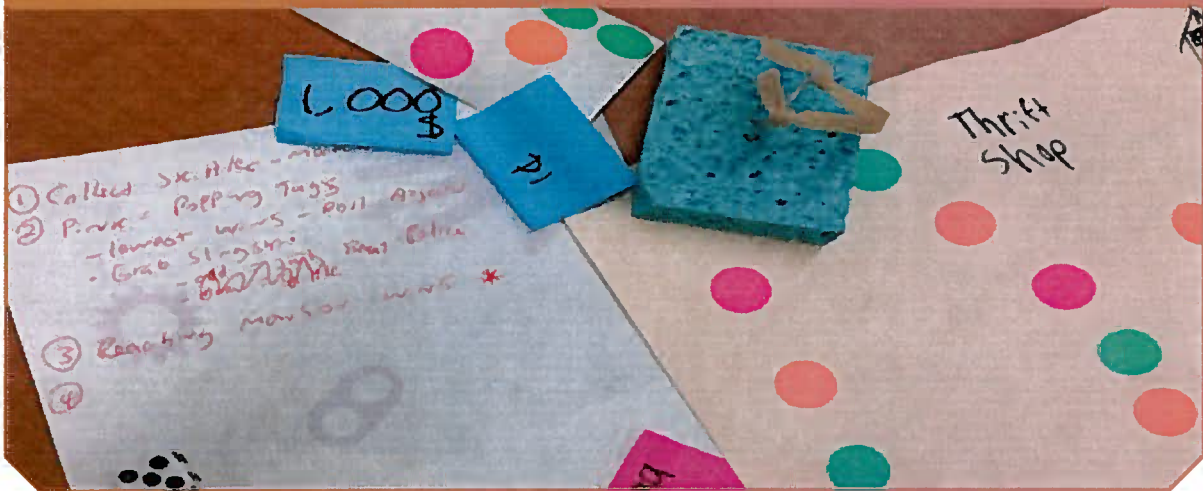
Game Kit (1 hour)

In this activity, girls will make a game from a particular set of everyday objects in order to examine the relationship between physical game pieces and other components and game design patterns.

What you need:

You don't need to use this specific list of materials, but this set does work well together as a whole. Feel free to substitute some materials with something similar ... but remember that when you change the components of the kit, the challenge will 'play' very differently!

- 1 marker (such as a Sharpie)
- 3 paper cups
- 1 small sponge cube - a square cut from a larger kitchen sponge works as well
- sticky notes (a portion of a 1" small stack will do)
- 7 inches of string
- paper/board rectangle - half of one side of a manilla folder is good
- a die - polyhedral is more interesting
- 3 small binder clips
- 1 big binder clip
- 3 rubber bands

- 1 package of a small candy - recommend using a pack of Smarties because they work as a unit or are divisible

- 1 small 'better' candy - recommend using a Starburst

- 1 pointy eraserhead

- 1 sheet of color-coded label stickers - recommend using the sheets with circular stickers in four colors (usually red, yellow, green, blue) because these correspond with the paper clips (see below)

- 4-6 multicolor paper clips - recommend using a package from Staples or similar office supply store that comes with six colors because the colors often correspond to the sticker colors

- 1 gallon Ziploc or similar resealable bag

INTRO

In this challenge, girls will start a game design from a particular set of components, mostly available around the house or in an office supply store. The components in the kit are chosen for how they can work together, but a broad variety of games are possible with them.

THE CHALLENGE

Make a game that can be played by two or more people using only the materials in the kit described above under the "What you need" section. Discuss how the design springs from and depends on the components used. Playtest the game and consider how the game could be revised using 'real' materials.

SETUP

Create enough kits (put the materials inside the gallon Ziploc bag) for your whole group to each use a kit in groups of 3-5. Divide into groups and take a kit.

DESIGN

Have groups take 30 minutes to devise a game that can be played using only the materials in the kit. 15 minutes in, have groups check the time and make sure that they are making a game that will be playable at the end of the 30 minutes.

The requirements are:

1. Your game must be playable - a set of players must be able to take at least a couple of turns with the materials you have, and you must have a way to win the game.

2. You must write out an introduction to your game - the rules of the game or the framing/story.

3. You must give your game a name, even if it's a silly one, because that will call out to your players what the important parts of the game are or what the theme is.

Playtest

Groups will take 5-10 minutes and have someone else play the game. They will then take another 5-10 minutes for playtesters to give notes back to designers.

DISCUSSION

Discuss as a design team:

- Where did your game concept originate? Was it a physical property of the materials, or some relationship between them, or another element of game design?

- If you were making a paper prototype of another game, how did you have to change your design to fit the materials that were given to you?

- What mechanics did the materials encourage, or make difficult?

- What are the proper components for your game. If you weren't restricted to paper clips and rubber bands, what would you use? Would those materials be as easy to find or make, and would the game play better with them?

TAKE ACTION

Design a Game with Gamestar Mechanic (2 hours)

In this activity, girls will make their own digital games using the online tool Gamestar Mechanic.

What you need:

- One computer per girl with Internet access.
- Computers must have Flash Player 10 or newer. (If they don't, you can download it here: http://get.adobe.com/flashplayer)

SETUP

Have the girls go to the special Gamestar Mechanic URL for your specific workshop (contact educators@gamestarmechanic.com) and hit the "Get Started" button to sign up for an account. They will have to enter a username, password, and birthdate, and choose a security code.

Note: A birthdate is collected in order to determine eligibility to use certain age-restricted features of the site, specifically Social Media and Networking Features. Gamestar Mechanic will not use a participant's birthdate for any other purposes. The Gamestar Mechanic platform is secure and usernames, passwords, and birthdates will never be shared with a third party.

PLAY
30 minutes

Once they've set up their accounts, girls should start by clicking on the Quest button. In the Quest they will play the kinds of games they can design, and read comics about a fictional world where everything is powered by games. As girls move through the Quest

9

they will complete missions that give them sprites (characters and objects) that they can use when they make their own games. The more missions they complete, the more sprites they get!

DESIGN
45 minutes

After 30 minutes of playing in the Quest, have girls click on the "Workshop" button at the top of the screen, and then on the "Build a New Game" button in the upper right corner. Now they can start designing their own games. The design tool is drag-and-drop (no coding necessary!) and very intuitive for kids. For more information on how to design games with Gamestar, check out the resources at http://gamestarmechanic.com/teachers.

SHARE
30 minutes

Once all girls have made at least one level, have them stand up and switch seats with a neighbor and play each other's games. You can have them use the Playtester Feedback worksheet (attached at the end) to give feedback on each other's work.

When each girl has collected some feedback, they should move back to their original computers and make changes to the their games according to the feedback.

Finally, if you have a projector available, invite girls to log in to the computer with a projector and share their game with the entire group.

WRAP UP
15 minutes

Have girls log out of the computers and put them in small groups. Ask each group to spend a few minutes discussing these questions:

- What is one new thing you learned in this Video Game Design Patch Program?
- What do you want to do next in learning about video game design?

While groups discuss questions, walk around to make sure they are staying on task. When they are ready, ask a few volunteers to share their answers with the group. You can pass out the Game Design Tools worksheet (attached at the end) that has a list of many tools girls can use to design, program, and create art for games. Of course, they can continue using their Gamestar Mechanic accounts as well!

Alignment to It's Your Story – Tell It! Journeys:

Juniors can apply this program to their "It's Your Story—Tell It!" Journey. Suggestions are to apply this session to the awards you can potentially earn along the aMUSE Journey. Reach out to the women leading the session and the roles they play and the leadership skills they are using in this field. Speak out against stereotypes—did you know that women are in the minority in the Video Game Design field? Why is that? Also, try out the many roles you can have in the Video Game Industry. Even if none are for you, make a promise to yourself to keep trying out new roles as a leader in life!

Cadettes can apply this program to their "It's Your Story—Tell It!" Journey. Suggestions are to apply this session to Remaking Media. Tune in to what's going on in the Video Game Design world, and survey what others like. Ask questions about diversity in video games, what holes there are, and determine possibilities on how to remake the media. Examples of remaking a video game include an under-celebrated hero, morphing a stereotype, NOT having a stereotype, or remaking something to eliminate all of the above. Share your project when done to get feedback, and learn the value of educating or inspiring others to remake media as well!

Roles in the World of Video Games

Name:

Here are pictures of people working in a game studio.

What kinds of jobs do you think these people have?

Kind of Job	Tasks that person does at their job

Roles in the World of Video Games

Kind of Job	Tasks that person does at their job
Artist	Artists can make storyboard art, character designs, textures, environments, backgrounds and animations.
Programmer	Programmers write the code that makes the game work. They work on game engines, artificial intelligence (AI), and many other pieces that are needed to make the game run.
Sound and Audio Designer	Sound Designers create sound effects, music, voiceovers, and audio engineering.
Game Designer	Game Designers create the characters, story, and levels of a game. They design the overall experience of a game.
Game Producer	A producer makes sure the game gets done on time and in budget. Producers are like managers of the game creation team.
Writer	Writers create game stories, character scripts and dialogue.
Quality Assurance (QA)	These are the testers. These people play the games and record the bugs (problems) and work with the game design team to fix them. They also test servers, networks, code, and hardware.
Business Team	The business side of a game studio raises money, markets and sells the games, creates documentation for the software, and makes partnerships with other companies.

There are many more roles that could go into a game development team because each game is different and has different needs.

Playtester Feedback Worksheet

Name:

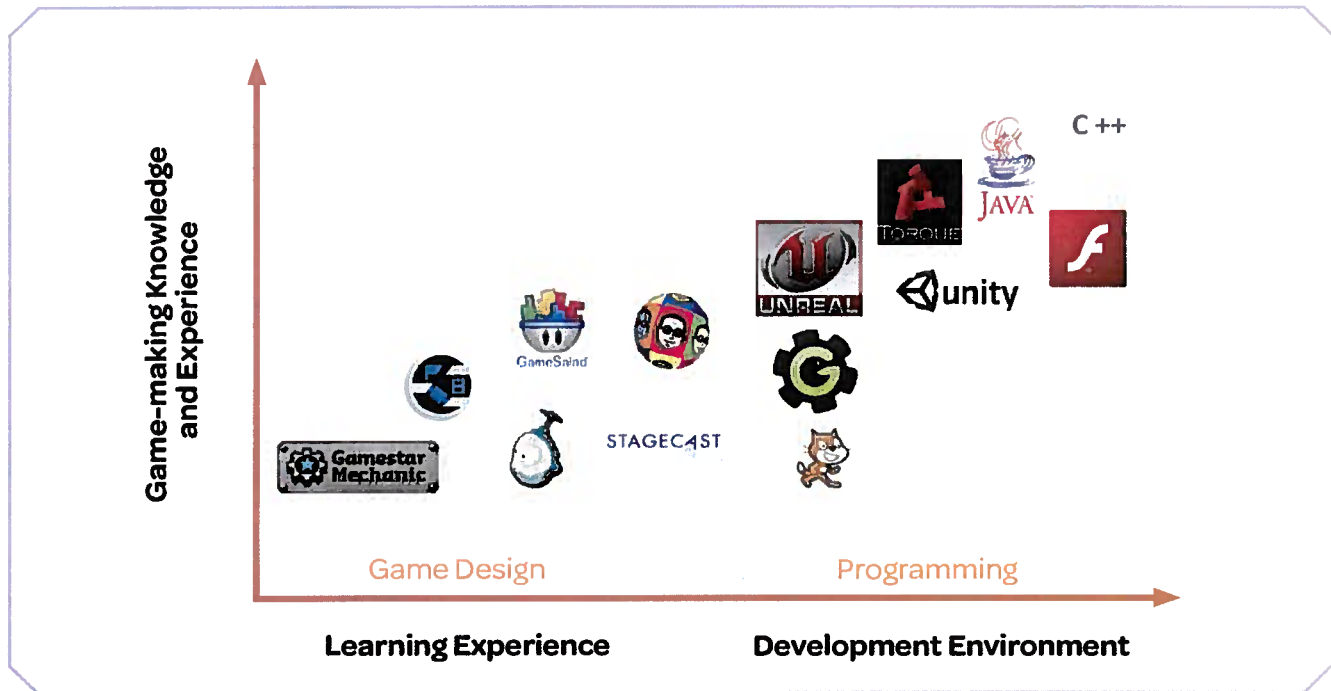**Name of Game You Are Playtesting:**

Feedback Questions

1. What was the concept of the game? Was it clear? Why?

2. What were the mechanics of the game? Did they fit well with the concept?

3. How did you feel while playing this game? Why?

4. Is this a balanced game? Why or why not?

5. What was challenging about this game?

6. What was fun about this game?

7. How could this game be improved?

Game Making Tools

Game-making Knowledge and Experience

Game Design   Programming

Learning Experience   Development Environment

Tools in the Game Design Pathway

TOOL	WEBSITE	DESCRIPTION
Gamestar Mechanic	http://gamestarmechanic.com	Focuses on design, not programming, a very good place to start at any age.
Kodu	http://research.microsoft.com/en-us/projects/kodu	Learn programming on Xbox or PC with 3D.
Stagecast Creator	http://stagecast.com	Drag-and-drop multimedia and game builder.
Agentsheets	http://agentsheets.com	Quickly build interactive simulations and games. Free trial.
Scratch	http://scratch.mit.edu	Learn programming with interactive animations/games.
GameSalad	http://gamesalad.com	A game toolkit to make iOS games
Game Maker	www.yoyogames.com/studio	2D game-making across devices.
Unreal Development Kit (UDK)	http://www.unreal.com	Free to use, pay to publish 3D game engine.
Unity	http://unity3d.com	Free to use, pay to publish 3D game engine.
Adobe Flash	http://www.adobe.com/flashplatform	Professional 2D toolkit, widely used.
Torque	http://www.torquepowered.com	Make 2D or 3D games, even for iOS.
Java	http://www.java.com	Professional programming language for more than games.
C++	http://en.wikipedia.org/wiki/C++	World standard programming language.

These are tools that we found that form a pathway to professional game and software development at whatever level of experience you have. There are dozens more, and many that are even better at specific kinds of games and tasks.
See the back for more!

More Tools for Learning Programming

Alice	http://alice.org	Learn the basics of programming with 3D tools.
Processing	http://processing.org	A simple language for interactive experiences.
Codecademy	www.codecademy.com	Learn about programming in a fun way.
Greenfoot	http://www.greenfoot.org	An environment for learning Java online.

Art Production

Maya	http://usa.autodesk.com	Professional 3D art tool.
Adobe Photoshop, Illustrator	http://www.adobe.com	Professional 2D art tool.
3D Studio Max	http://usa.autodesk.com	Professional 3D art tool.
Blender	http://blender.org	Open-source 3D art software.
Gimp	http://gimp.org	Open-source 2D art software.
Aviary Tools	http://advanced.aviary.com	Free suite of creative applications.
Google SketchUp	http://sketchup.google.com	Easily edit 3D models, big online library.
KerPoof	http://kerpoof.com	Create 2D art & storyboards online.

Other Game Engines and Frameworks *(Tools that start you off with a lot of game basics)*

Source	http://source.valvesoftware.com	The 3D engine behind Half-Life, Portal, TF2.
Cocos2D	http://www.cocos2d-iphone.org	2D framework for iOS.
Panda3D	http://www.panda3d.org	An open source 3D game engine.
Ogre3D	www.ogre3d.org	An open source 3D graphics engine.

Other Game Toolkits *(Focused but flexible tools for making certain kinds of games.)*

Roblox	http://www.roblox.com	Build a 3D world and devices with a marketplace.
Sandbox Game Maker	http://sandboxgamemaker.com	Open-source 3d game maker.
Multimedia Fusion	www.clickteam.com/multimedia-fusion-2	2D application and game creation tool.
Tululoo	http://www.tululoo.com	Free tool to create browser games.
The Game Creators	http://www.thegamecreators.com	PC game creation toolkit.
Pygame	http://www.pygame.org/	A set of python (language) modules to create games.

Tools for Specific Genres of Games

RPG Maker	http://www.rpgmakerweb.com	Role-Playing games.
3D Adventure Studio	http://3das.noeska.com	Adventure games.
Adventure Maker	http://www.adventuremaker.com	Point-and-click adventure games.
Vassal	http://www.vassalengine.org	Open source boardgame engine.
The GameCrafter	http://thegamecrafter.com	Publish-on-demand boardgames.
Sploder	http://www.sploder.com	Online game creation in three genres.

Popular Modding Tools *(Games that you can change and redesign.)*

Little Big Planet	http://www.littlebigplanet.com	Play and make platformer games.
Garry's Mod	http://www.garrysmod.com	Edit an FPS game from inside the game.
Cube2: Sauerbraten	http://sauerbraten.org	Edit an FPS world from inside the game.
Civillization	http://www.civilization.com	Commercial history simulation you can edit.
Forge	*Within Halo 2 & 3 on Xbox 360*	Edit an FPS game from inside the console game.