girl scouts of central indiana

Junior – Digital Game Design

Material list:

Step 1:

- **Marble Roller Coaster** pdf
- Tape
- Scissors
- Ruler
- Pencil
- Marbles – if you don't have marbles any small round ball should work
- Household items – you can really use whatever you can find around the house
    - Paper
        - **Tip:** Thicker paper like construction or cardstock works better.
    - Cardboard tubes
    - Paper cups

Step 2:

- **Camp Emergency Kit Maze** pdf
- Paper
- Pen/pencil

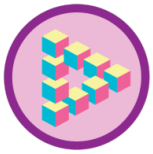
Step 3:

- **You Can Be a Game Designer** pdf
- Paper or index cards
- Something to write with – a pen, pencil, crayons or markers

Step 4 & 5:

- In these steps you will build a 3D version of your own maze game to test. The supplies you need depends on your design. It could be as simple as just using pencil and paper, blocks, or you could use something bigger. Search your house and let your imagination go! Just remember if you are using something that belongs to another person in your family, get permission first.
    - Consider taking it outside and use sidewalk chalk or items you find in nature to create your maze.

Usually the first thing you think about when you think about your favorite video game is how much fun it is to play. What is it that makes it so fun? Does the character go on an exciting adventure and face many challenges along the way? Have you ever thought about how game designers include those challenges in the games? They use



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algorithms and conditionals to create the code for these types of games. In this badge you'll get to use what you know about coding to create your own maze game.

Step 1: Discover how games can be used "for good"

Playing video games is something many people do for fun. Often when we play games, we want to be entertained. But, did you know video games can be for more than entertainment? What are some other reasons games are made?

Games can teach us new things and even help us see things we may never experience. We can find out about places, people, and situations we might not otherwise know about!

Here are some examples of games for good:

- **Games that were created for a cause:** Games can help share an idea that helps others and the world.
- **Games that help us learn:** Games can make learning even more fun!
- **Games that help our health:** Some games can help us be healthier. These games may encourage players to get out and walk their neighborhood to interact with different characters in the game. Or they track your activity and allow you to compete with friends and family.

Think about the different digital games you play. These could either be on a phone, tablet, computer or gaming console. Do any of the games you play fit into one of the games for good categories listed above? Are you inspired to help other people when you play these games? What kind of game would you create to teach someone a new skill?

For this activity use the Marble Roller Coaster handout to practice a skill game designers often use when they're creating new games. This skill is **perseverance,** which is the ability to work through challenges to solve problems.

Step 2: Explore tools used to develop digital games

Think about your favorite game, it could be a board game or a video game. What are some of the reasons you enjoy it? Often there are characters that must face different challenges to reach a goal. In this badge, you're going to get to create your own maze game. Let's start by taking a closer look at a maze game and see if we can figure out some of the important things a game designer needs to think about long before they start writing the digital code.

For this activity, use the Camp Emergency Kit Maze to start looking at a maze game like a game designer.

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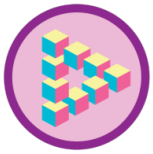

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Step 3: Plan a maze game

When game designers start working on a new game, they can't just jump into building the game. They start by brainstorming and making a plan for what they'd like the game to look like. In the next steps, you will build and test your own 3D maze game. Before you start building, it's important for you to brainstorm some ideas for your game. Use the You Can Be a Game Designer to begin making your plans.

Step 4: Build and test your maze game

Now it's time to start building a 3D version of your maze. Gather supplies from around the house to create a grid on the floor or outside on the ground.

Anytime you create something new it usually involves lots of trial and error. You may find that some of the ideas you have on paper just won't work when you try to build your 3D version, or you may have a brand-new idea. That's all part of the design process. In fact, anytime game designers repeat a step in the design process it is call an **iteration**.

Once you've built your maze, it's time to create the algorithm for your character to follow. It's important to try out your algorithm and make sure your character will reach the goal. Practice your perseverance as you work to find the right algorithm. Take a second look at your design, was it too easy or too hard? Do you need rearrange your maze?

If you need some practice looking over algorithms and spotting bugs (errors) in the code, use this activity from Girls Who Code called Debug the Maze.

Step 5: Share and improve your maze game

The best part about creating a game is sharing it with other people. Share your finished game with your family or with a friend. Ask them for feedback, or what their thoughts are on the game. Are there things they would like to see added or changed?

Game designers also often get feedback from players on their games. They use this information to look for ways to improve their game. Once game designers have improvements, they will release a new version or upgrade. Now that you've share your game with others, are there any upgrades you'd like to make to your game?

Now that you've earned this badge, you could give service by:

- Sharing with others how games can be used for good.
- Teaching others how to use the game design process.
- Encouraging others to stick with it when they are learning something new.

What are you inspired to do with your new knowledge?