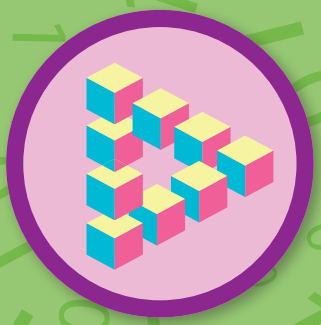


Badge 2: Digital Game Design

What makes your favorite video game fun? Have you ever wondered how the creators included all the different challenges and choices? They used algorithms and conditionals to tell the computer what to do. Use what you've learned about coding to create a game that is fun and helps solve a problem!

Steps

1. **Discover how game design can be used "for good"**
2. **Explore tools used to develop digital games**
3. **Plan a maze game**
4. **Build and test your maze game**
5. **Share and improve your maze game**

Purpose

When I've earned this badge, I'll know how video games are developed and how to plan, build, and improve a game by iteration.

STEP

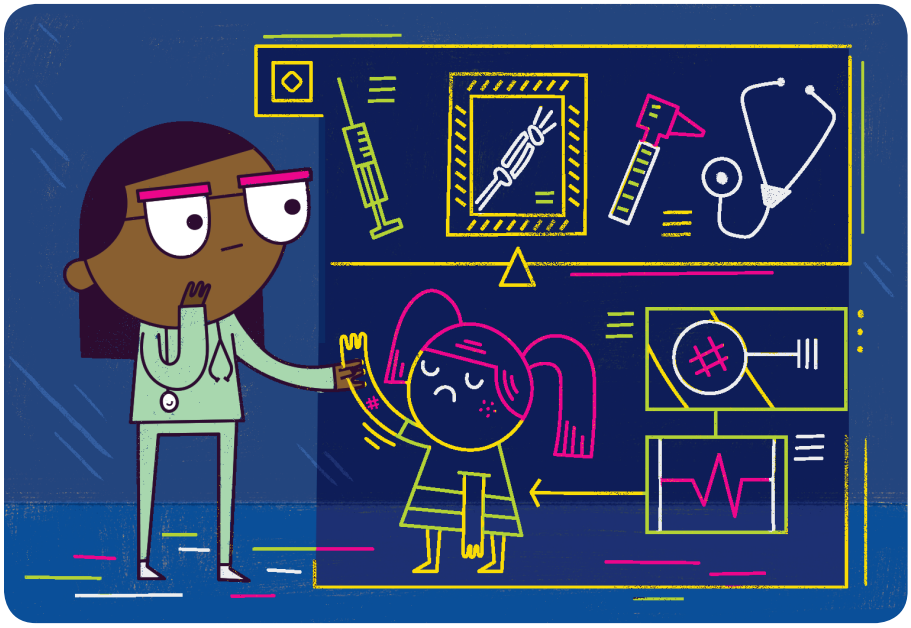
1 Discover how game design can be used “for good”

You’ve learned how computers helped astronauts land on the moon. Did you know that video games can help people, too?

Some jobs use video games to teach people new skills. Doctors and nurses use computer programs that show virtual medical situations to improve their skills. Pilots do the same thing using a simulated cockpit of an airplane.

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! Through video games, you can visit the International Space Station, dive to the deepest parts of the ocean, or visit ancient cities.

What kind of game could you create to teach someone a new skill?



Play Yourself Healthy

Is playing computer games good for you? It can be!

Some video games were created to help people with illnesses like cancer, diabetes, or asthma. A therapeutic video game was created to help kids with cancer feel more confident during treatment.

Other games get people to be more active. “Exergames” help patients do physical therapy by making them move in fun ways, like bowling or dance competitions.

Game developers have found that when patients enjoy a game, they feel more positive about getting well.

Words to Know

Digital games
These are games you can play on your phone, computer, TV, tablet, or digital gaming machine. They're also called video games.

Game design process
Video games are developed by programmers who imagine, plan, build, and test their designs. They iterate, or go through the steps many times, to improve their video game.

Iteration
This is when you do something many times to make it better. Think about drawing a picture of a flower. You may draw it once, then decide to add leaves. You may draw the flower many times. Each time you draw it, you'll make it a little better.

Perseverance
This is when something is challenging, but you don't give up. You keep trying. Learning to ride a bicycle is hard. You lose your balance a lot. You might fall down. When you keep trying to learn, even if it is hard, you have perseverance.

STEP 2 Explore tools used to develop digital games

What do you need to know to make a video game?
Computer programmers use the same ideas in every kind of program, including video games. You already know how to write **algorithms** with **sequence** and **loops**. Loops let players practice skills and get better.

You also know how conditionals create choices in the program. Game makers also use **conditionals** to make the game more exciting. Conditionals in games let players experience different things.

Think about where there are conditionals and loops in your favorite video game. Then, brainstorm how you can add or adapt them for your own game.

STEP 3 Plan a maze game

When you create a video game, you first need to decide what kind of game you want to make. Then, you plan, build, test, and improve it. When you're happy with the game you've created, you share it with others. These steps are parts of the game design process. You can use this process to create a level of a video game or to work on any big project.

BRAINSTORM

STEP

4 Build and test your maze game

Making anything new usually involves lots of trial and error. That means that the first version (or second, or third) probably won't work the way you want it to. You have to repeat the design process, practicing **perseverance**. Perseverance is when you keep working on a project, even though it's difficult.

Each time you repeat steps in the design process is an **iteration**. If you're trying to improve a cookie recipe, every time you make a batch, taste test, and change the recipe is an iteration.

Making a great video game also requires iteration and perseverance. As you test your game, you might find a mistake in your code that you need to fix. You might also think of a new feature you can add to make the game more fun.

Remember, if at first you don't succeed, try, try again!

CREATING COOL CHARACTERS

Do you have a favorite video game character? What do you like about her? Lots of things make a character special: her creativity and problem-solving skills, her ability to work with others, her leadership skills, her attitude, her history, and her look.

Video game designers have to make lots of decisions to develop and code their game characters.

☐ DESIGN CHOICES

Game designers make visual, audio (sound), and design choices about their characters. They have to make many decisions about their character: her body type, height, hair color and length, eye color and shape, clothing, facial expressions, the way she moves, the way she talks, and so much more. How a character looks, sounds, and moves all tell players about her personality.

☐ BACK STORY

A character's back story tells players the character's history and gives clues to how she behaves now. The back story is often told in dialogue or in text that can be read.

☐ CHARACTER INTERACTION

How other characters interact with a main character is important, too. Do other characters respect her? Is she a leader, or does she become one in the course of the game?

☐ DECISION MAKING

Conditionals like IF/ELSE statements create choices and consequences for a character. The choices she can make showcase her creativity, problem-solving skills, leadership, independence, and ability to work with others—or not.

STEP

5 Share and improve your maze game

The best part of finishing a big project is sharing it with other people. When you share your game with others, you get to see how it works and how other people enjoy it.

They might also give you ideas about how to make your game better.

Even after game makers share their game with the public, they might still find mistakes or ways to make the game better. They'll send an update to game users to correct or improve the computer program. Game makers are always learning what works, what their players like, and making improvements.

Brain Power

Your brain is the most powerful computer ever! Scientists are learning more and more about the brain, but there's still so much to discover.

To learn about the brain, scientists created a game called EyeWire. Ordinary people can play the game and solve 3D puzzles based on the shape of brain cells. Every time someone solves a puzzle by mapping the given cell data, the scientists learn more about the brain cells and how they interact.

Having lots of people working on the puzzles gives the scientists new information faster than if they had to map all of the cells by themselves. Since 2012, more than 200,000 people from 150 countries have played the game. Players have even charted new brain circuits and discovered six new kinds of brain cells by playing EyeWire!

Now that I've earned this badge, I can give service by:

- Sharing with friends and family how they can play games to help advance scientific or health research.
- Teaching others how to use the game design process.
- Encourage friends to practice perseverance when they're struggling with learning something new.

I'm inspired to: