



A STEM Student's Guide: Learning to Code and Design Video Games

For many, video gaming is not only a hobby but a passion. But while playing video games is fun, you could also consider taking things a step further and becoming a game developer someday. There are a lot of different ways to get involved in game design, but one of the most useful skills in this field is the ability to code. Anyone can learn to code and create video games, and there are all sorts of free resources online that can help. The two main roles for people who create video games are designers and programmers, but often, their responsibilities will overlap. While there are many different types of video games in the world, all of them are created with the same basic process.

Brainstorming

A game designer should first come up with a basic concept for their game. It's helpful to keep a list of ideas written down somewhere, whether this is on paper or in an app. Next, you'll need to think about the different abilities and actions possible for each character, the mood and tone of the game, and the story that will hold it all together. When thinking of the game's mood, it's essential to consider visual and audio effects and the overall aesthetic you're going for. Think about color, shape, and space, and keep in mind that the look of your game should be both unique and functional. While brainstorming new games, designers should keep in mind that they will often go through many ideas that do not work out before finding one that works.

Prototyping

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Prototyping

Once you have a basic concept and look in mind, you'll need to draw up a prototype, either on a computer or just on paper. Prototyping new games helps prove the concept, demonstrate the style, and highlight potential issues. Prototyping games also helps motivate team members and set budget expectations to prevent overspending.

Sketching out the basics of how the game will look and work can help you to test out your idea to see if it will actually work. For instance, you might want to prototype a level or two to see if a core game mechanic will be fun, usable, or just cumbersome. If your prototype is promising, you may want to bring others in to give their opinions on it. Keep in mind the potential audience for your game; while the stereotype might be that video games are for young boys, most gamers are actually adults, and around half of them are women.

Design Phase

During the design phase, the game's overall look and the path players will follow are planned out, as well as the art, audio, and coding for the game. For 2D animations, a designer has two choices: You can draw out items limb-by-limb, called bone-based drawing, or frame-by-frame. If you're making a 3D game, there are many free resources online that can provide designers with 3D models to base their designs on.

Games can be built using many different technological tools, including Unity, Unreal Engine, Construct, and GameSalad. Each of these allows the user to accomplish different things within the process of designing and coding games, and each will have its weaknesses and strengths depending on the type of game you're creating.

Coding Languages for Game Development

Programming is the central component required to create video games. Although there are many different coding languages, nearly all of them can be used to make a popular video game. Some of the most common programming languages used to make games are C++, Java, Lua, and SQL. Which languages you should use will depend on which ones you're familiar with as well as what platform your game will be played on: A browser-based game, an iPhone app, and an Xbox game will all have different technical needs.

Playtesting

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When video games are ready to be played, they are often released to a small group of test players first. This allows any coding or programming issues to be found and fixed before the game is released for sale to the general public.

It's important to realize that all of the steps involved in designing games can be cyclical: Issues found in playtesting can send you back to programming or even back to the design phase again. After the playtest has been successful, the new game can then be prepared for release.

Additional Resources

[How to Start Building Video Games](#)

[What Every Game Designer Should Know About Human Psychology](#)

[Free Downloadable Game Assets](#)

[Open Game Art](#)

[Programming Languages for Game Design](#)

[CodinGame Challenge-Based Training](#)

[Game Development: First Steps](#)

[Process of Developing a Game](#)

[The Game Design Process](#)

[How to Make a Video Game](#)

[Guide to Making Your First Video Game](#)

[Learning to Code: Where to Start](#)

[How to Learn Video Game Programming While You're Still in High School](#)