Scratch - Free programming software for children

Scratch 3 Offline Editor - or simply the Scratch 3 app - is a free educational program that allows you to easily code and develop your own software.

What is Scratch?

Scratch is a program aimed at helping children develop coding and programming skills. It can be used to create stories, games and animations.

Did you know that this is the largest programming community for children in the world? That's right, this great educational tool is aimed at students between 8 and 16 years old. Users on the site call themselves 'Scratchers' and they make awesome projects on the site using a block-like interface. Their work can then be exported to programming languages, such as HTML5, JavaScript and EXE files.

Here are the main features of Scratch:

1. Teach children how to code visually.
2. Provides block-based coding, allowing learners to sequence pre-written instructions to create actions.
3. Helps users work together, think imaginatively, and analyze methodically.
4. Allow them to create animations and graphics that can be shared once the project is complete.
5. Allows users to convert completed projects to HTML5 files, Android applications, Bundles (macOS) or EXE using external tools.
6. Allows students to combine animation, computer games, and other projects using sound and images.
7. There is an online community that allows children to develop and exchange interactive multimedia such as fairy tales, puzzles and animations with others around the globe.
8. Giving teachers the option to assign and exchange assignments with students makes this a great teaching platform, especially when learning remotely.
9. Great way to introduce kids to computer science and programming.
10. Accessible in 70 languages ??worldwide.
11. As of December 2022, more than 67 million projects have been contributed to Scratch by more than 64 million users. With 38 million monthly users, Scratch is extremely popular today. However, it requires basic reading ability so it is not suitable for children under 8 years old. Scratch developers quickly realized this and launched ScratchJr in 2014.

ScratchJr provides a simpler approach to programming at a relatively young age, without the ability to read or calculate. Used by more than 10 million individuals globally, ScratchJr is for children ages 5 to 7 and is available for free on iOS, Android, and Chromebook.

History of Scratch

MIT Media Lab, a research laboratory, began developing visual programming languages ??in the early 2000s to help children learn to code and program. The group conducting this study is the Lifelong Kindergarten group (LLK). They were given a grant to develop an environment for children where they could practice coding. Together with the team at UCLA and Computer Clubhouses in Boston and Los Angeles, LLK designed a basic programming language simple enough for children to learn and use. The group's slogan "Imagine, Program, Share" influenced Scratch's philosophy.

In May 2013 Scratch 2.0 was released and 5 years later, in 2018, Scratch 3.0 was released. The main difference between the two versions is that Scratch 3.0 can be used on most browsers, except Internet Explorer.

The name "Scratch" comes from a technique used by DJs. With Scratch programming, the idea is to allow users to combine different media assets, such as graphics and sounds, together to create projects.

Scratch 3.0

If you plan to teach your child how to program using Scratch, the version you will use is Scratch 3.0. So what can you expect with this release?

It's important to know that the Scratch interface is divided into 3 parts: The stage area, the block panel, and the code area. In the code area, "blocks" can be placed and arranged to form scripts, which will run after the user presses the green flag. Advanced users can create their own code blocks and use those code blocks to create scripts. Users will be able to see the results of their scripts, such as animations, in the stage area.

Why should children be taught Scratch programming?

Now, you know what Scratch programming is. You can teach your students how to use this app. But what are the benefits of using Scratch in the classroom?

Teaching children to write Scratch code will bring the following benefits:

1. Encourage computational thinking
2. Helps students develop problem-solving skills
3. Promote creative learning
4. Give children real-life experiences
5. Supports self-expression of individual and collaborative skills

With Scratch, children will develop problem-solving strategies, gain the ability to design projects, and gain skills in communicating their ideas.

What is Scratch programming?

Scratch programming is the process of writing and running programs using Scratch, a free programming language and code editor that helps young learners understand coding logic using blocks and visual aids.

How does Scratch programming work?

The Scratch User Panel is the area on the screen that displays the Scratch application. The screen is divided into sections or cells. Each box serves a distinct purpose, such as selecting a block to write on, writing code, and viewing the results of your work.

Scratch UI is comparable to an integrated development environment or IDE. Additionally, users can create custom code blocks, which will display in 'My Blocks'. Scratch programming is a very simple form of coding that focuses on teaching coding procedures based on events rather than directly in language. It integrates with many larger projects, such as LEGO Mindstorms EV3, BBC micro:bit, through various extensions, bringing many interesting additional results from the programming platform.

Scratch extension

There are many Scratch extensions that can be attached to the block area. One can select the blue icon on the right side of the regular block sections to select the extension. Commonly used Scratch programming extensions include:

1. Music: This extension allows users to play MIDI notes on many different instruments.
2. Video sensing: Projects can communicate with cameras using this extension.
3. Translate: Using the Translate plugin, text can be translated into many different languages.
4. Pen: Pen Extension allows users to sketch on the stage with a pen.
5. Text to speech: This allows text to be read aloud.
6. LEGO MINDSTORM EV3: It allows Scratch projects to connect to LEGO MINDSTORM EV3 devices.
7. Micro:bit: It allows Scratch projects to communicate with micro:bit projects.

Start programming Scratch

To start coding with Scratch, visit the MIT website for Scratch and follow the steps below:

1. Click the 'Create' button to start a new project.
2. Coding units are located on the left side of the screen.
3. To start writing code, click and drag sections into the large area in the middle.
4. The letters and objects in Scratch are called 'sprites'. You can add or remove an unlimited number of sprites.
5. Tap on a sprite to generate code for that sprite.
6. There are several entertaining sprites to choose from.
7. To write code, you can connect pieces of code by dragging them from left to right.
8. In addition to the backdrop, each sprite will be given its own code.

9. These blocks can move, make noises and change the color of the patterns. And when combined, they create a chain of events that you can use to create games, anime, and other projects.
10. After coding your app, you can select the green flag to run it on Stage.
11. Make sure your project is stored in your account if you want to save or share it.
12. Scratch allows you to upload projects created by Scratch on its virtual live studio, CODE. You can also view projects posted by other programmers here and leave your comments.

Benefits of Scratch programming

The main purpose of Scratch is to help children learn basic coding concepts without delving into the complexities of object-oriented programming or text coding. Here are some benefits of coding with Scratch.

1. Improve analytical and problem-solving skills

As children tackle and overcome different challenges while coding, Scratch helps them develop logical reasoning and problem-solving skills.

2. Simplify the learning process in the coding world

One of the most challenging elements of programming is that it requires a lot of effort to fully grasp. However, this is not the case with Scratch. Because the language is created for children, it is easy to understand. Children don't need complicated books, instructions, or lessons to understand how language works.

3. Bring entertainment and engagement during the learning process

Scratch programming helps children think creatively and express themselves freely. Furthermore, the tasks developed are very engaging, making learning fun.

4. Provides attractive user interface

Thanks to its visually appealing interface, Scratch programming sparks your child's love of programming. It helps children visualize their code, making the experience more enjoyable.

5. Teach how hardware extensions can be compatible with code

Scratch programming is great for kids who enjoy hands-on activities. Many companies sell Scratch-compatible hardware kits that can be used to build cool projects. For example, Makey-Makey or micro:bit allows children to design and build their own game controllers.

6. Reduce barriers to coding

Programming using Scratch is accessible to the majority of Internet users. So, you can give your kids coding lessons from the comfort of your own home with Scratch for Kids. It helps them have a successful career in software development without making the learning process difficult.

7. Explain programming logic visually

Children can continuously see what they are creating and check the results of their performance. This helps them understand the rationale behind computer programs. Scratch's logic expands on basic ideas like variable parameters, data types, collections, matrices, loops, and operators. As students move from popular block-based programming to text-based programming, these abilities carry over to other languages ??as well.

8. Ignore the syntax rules surrounding traditional programming languages

Many programming languages ??require children to learn text commands and impose strict constraints on their use. Programming with Scratch allows kids to focus on the fun parts of programming, such as creating concepts for new programs, figuring out how to build them, creating them, and discussing them with others. .

To ensure that Scratch programming meets all of these needs, the software development team follows a set of principles called the 4Ps when learning to code – project, passion, colleagues, and play.

1. People learn most effectively when they actively engage in project-based activities, such as generating ideas, developing models, making improvements, and creating finished products.
2. When individuals focus on topics they are passionate about, they work harder and longer, persevere despite obstacles, and gain more knowledge in the process.
3. With the socialization process, learning flourishes as individuals exchange ideas, collaborate on initiatives, and extend the work of their peers.
4. Learning requires playful exploration – trying new things, experimenting with material, pushing boundaries, taking risks, and iterating over and over again.

Advantage

1. Easy and intuitive interface
2. Graphical code blocks are great for beginners
3. Can be shared with others online
4. No Internet connection required

Defect

1. Adobe AIR needs to be installed first
2. Online community features cannot be accessed on the app