



Coding in K-2 with Scratch Jr

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What is ScratchJr?

- Introductory programming language for ages 5-7
- Inspired by Scratch
- Free App for Androids and I pads
- New Chrome App for Chromebooks

What is ScratchJr?

ScratchJr is a collaboration between the DevTech Research Group at Tufts University, the Lifelong Kindergarten Group at the MIT Media Lab, and the Playful Invention Company.



Why ScratchJr?



As young children code with ScratchJr, they learn how **to create and express** themselves with the computer, not just to interact with it.

- In the process, children **learn to solve problems and design projects**, and they **develop sequencing skills** that are foundational for later academic success.
- They also **use math and language in a meaningful and motivating context**, supporting the development of early-childhood numeracy and literacy.

With ScratchJr, children aren't just learning to code, they are coding to learn.

(Mitchel Resnick, MIT Professor of Learning Research and head of the Media Lab's Lifelong Kindergarten group)

Differences Between Scratch and Scratch Jr.

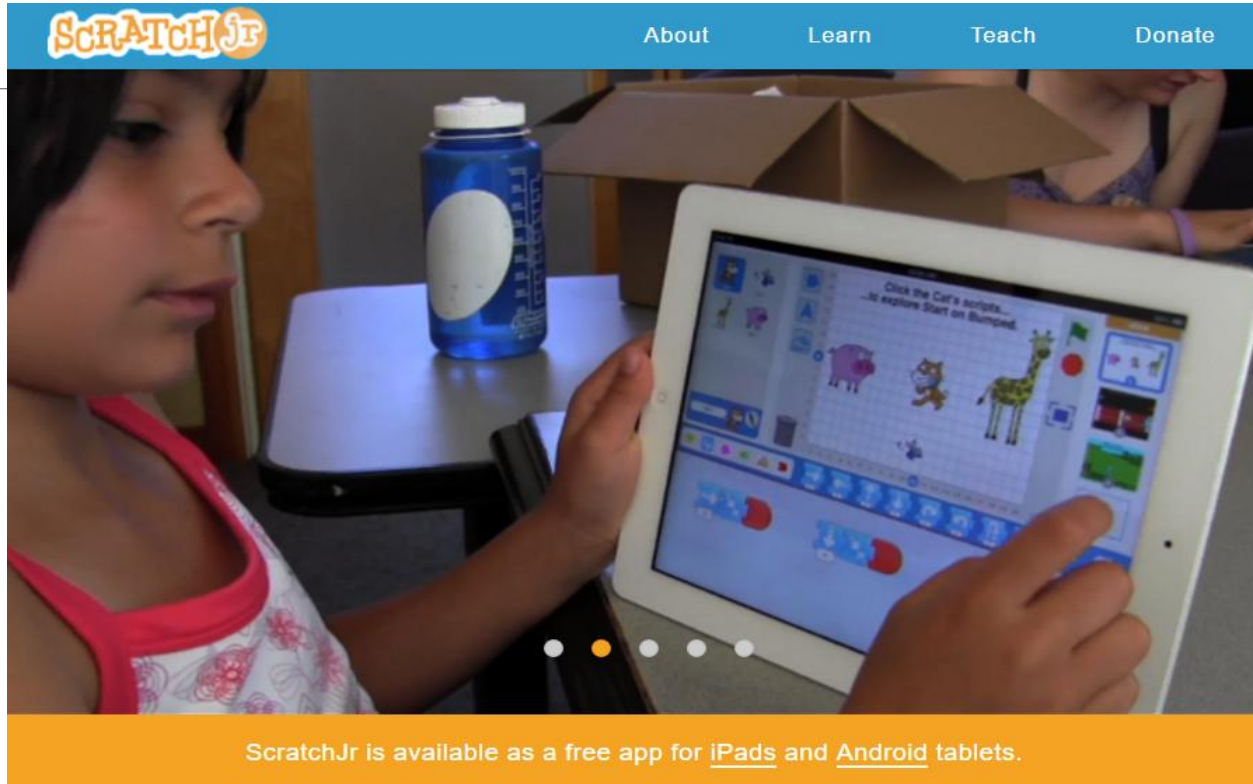
Scratch	Scratch Jr.
Web based (usually)	Tablet based
Sharing to web option	Sharing only through email
More than 40 language options	Seven language options
Online collaboration	No online collaboration
Ten categories of blocks	Six categories of blocks

Introductory Video



ScratchJr Website

<https://www.scratchjr.org/index.html>



The image shows the ScratchJr website header with the logo and navigation links: About, Learn, Teach, and Donate. Below the header is a photograph of a young girl sitting at a desk, using a white tablet. The tablet screen displays the ScratchJr interface, which includes a central workspace with a grid and various objects like a pig, a cat, and a giraffe. The text on the screen reads: "Click the Cat's scripts... to explore Start on Bumped." The girl is wearing a pink and white patterned tank top. In the background, there is a blue water bottle and a cardboard box.

ScratchJr is available as a free app for iPads and Android tablets.

ScratchJr is available as a free app for [iPads](#) and [Android](#) tablets.

ScratchJr

Coding for young children

Coding is the new literacy! With ScratchJr, young children (ages 5–7) can program their own interactive stories and games. In the process, they learn to solve problems, design projects, and express themselves creatively on the computer.



www.Scratchjr.org

News

ScratchJr is now available in Spanish for [Android](#) and [iOS](#) tablets!

No Starch Press has re-released [The Official ScratchJr Book](#) in Spanish in paperback and ebook format.

Join the Discussion

We introduced ourselves. Now it's your turn.
Drop us a line with feedback, report bugs & glitches, or just say "hi!"

[Tweet @ScratchJr](#)

ScratchJr is a collaboration between the DevTech Research Group at Tufts University, the Lifelong Kindergarten Group at the MIT Media Lab, and the Playful Invention Company.

 ScratchJr Retweeted



Lynn Spady @lynnspady

1st graders can code too @Westgate66 Sharing their @ScratchJr addition math games w/ their friends #kidscancode

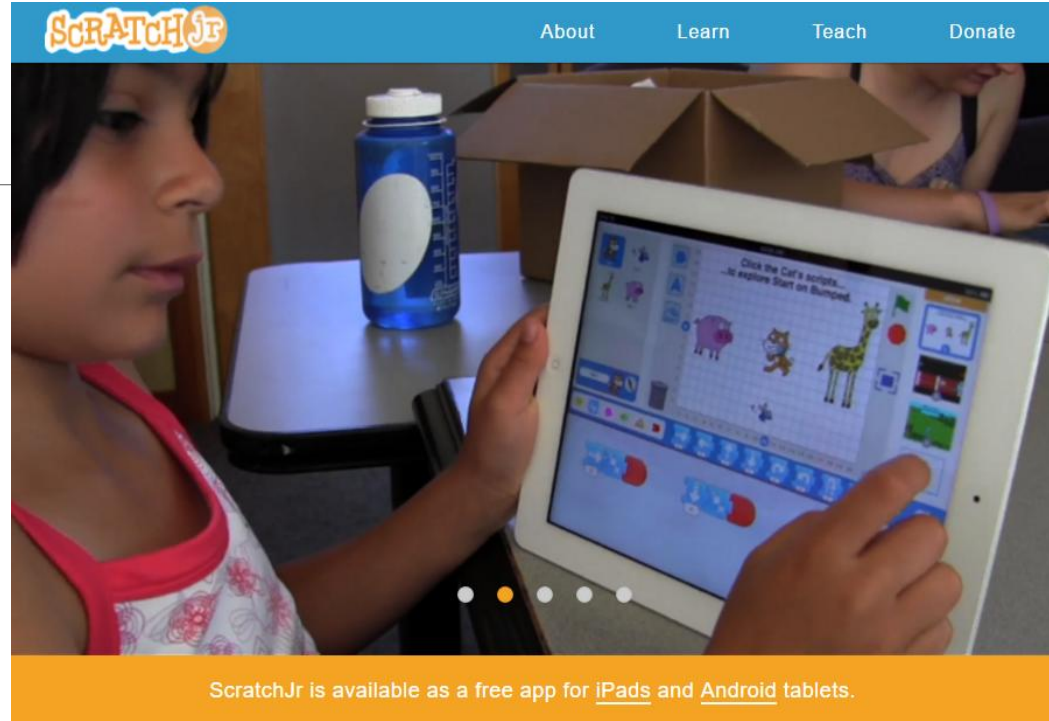


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[Contact Us](#)

The [**Learn**] Tab provides information about the:

- Interface
- Paint Editor
- Blocks
- Tips & Hints



www.Scratchjr.org



Interface Guide



Paint Editor Guide

Block Descriptions



Tips & Hints

[Download guide as pdf](#)

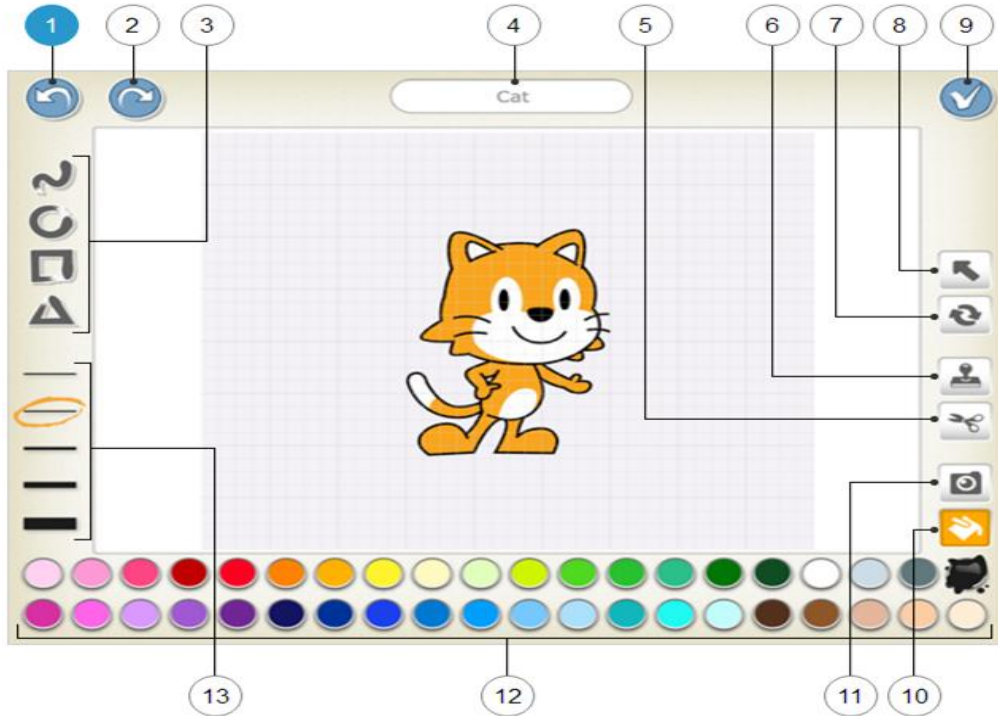
The image shows the Scratch interface with 16 numbered callouts:

- 1: Scratch logo
- 2: Home button
- 3: Stage button
- 4: Sprites button
- 5: Stage background button
- 6: Stage lighting button
- 7: Stage camera button
- 8: Stage zoom button
- 9: Stage backdrop button
- 10: Stage backdrop thumbnail
- 11: Stage backdrop thumbnail (bottom right)
- 12: Stage backdrop thumbnail (bottom middle)
- 13: Stage backdrop thumbnail (bottom left)
- 14: Stage backdrop thumbnail (bottom left)
- 15: Stage backdrop thumbnail (bottom left)
- 16: Stage backdrop thumbnail (bottom left)

1 | Save

Save the current project and exit to the list of projects.

Interface Guide

[Interface Guide](#)[Paint Editor Guide](#)[Block Descriptions](#)[Tips & Hints](#)[Download guide as pdf](#)

1 | Undo

Reverses the most recent change.

Paint Editor Guide

Blocks Descriptions - Triggering

Start on Green Flag



Starts the script when the Green Flag is tapped.

Start on Tap



Starts the script when you tap on the character.

Start on Bump



Starts the script when the character is touched by another character.

Start on Message



Starts the script whenever a message of the specified color is sent.

Send Message



Sends a message of the specified color.

Blocks Descriptions - Motion

Move Right



Moves the character a specified number of grid squares to the right.

Move Up



Moves the character a specified number of grid squares up.

Turn Right



Rotates the character clockwise a specified amount. Turn 12 for a full rotation.

Move Left



Moves the character a specified number of grid squares to the left.

Move Down



Moves the character a specified number of grid squares down.

Turn Left



Rotates the character counterclockwise a specified amount. Turn 12 for a full rotation.

Hop



Moves the character up a specified number of grid squares and then down again.

Go Home



Resets the character's location to its starting position. (To set a new starting position, drag the character to the location.)

Blocks Descriptions - Looks

Say



Shows a specified message in a speech bubble above the character.

Shrink



Decreases the character's size.

Hide



Fades out the character until it is invisible.

Grow



Increases the character's size.

Reset Size



Returns the character to its default size.

Show



Fades in the character until it is fully visible.

Blocks Descriptions – Sound and Control

Pop



Plays a "Pop" Sound

Play Recorded Sound



Plays a sound recorded by the user.

Wait



Pauses the script for a specified amount of time (in tenths of seconds).

Stop



Stops all the characters' scripts.

Set Speed



Changes the rate at which certain blocks are run.

Repeat



Runs the blocks inside a specified number of times.

Blocks Descriptions – Ending

End



Indicates the end of the script (but does not affect the script in any way).

Repeat Forever



Runs the script over and over.

Go to Page



Changes to the specified page of the project.



Interface
Guide



Paint Editor
Guide



Block
Descriptions



Tips & Hints

Tips & Hints

Tips and hints that you might find useful as you explore ScratchJr. For answers to more general questions about ScratchJr, see the [Frequently Asked Questions](#).



[Making, Renaming, and Deleting Projects](#)

Learn how to make a new project, rename an existing project, and delete a project. [Watch video](#)



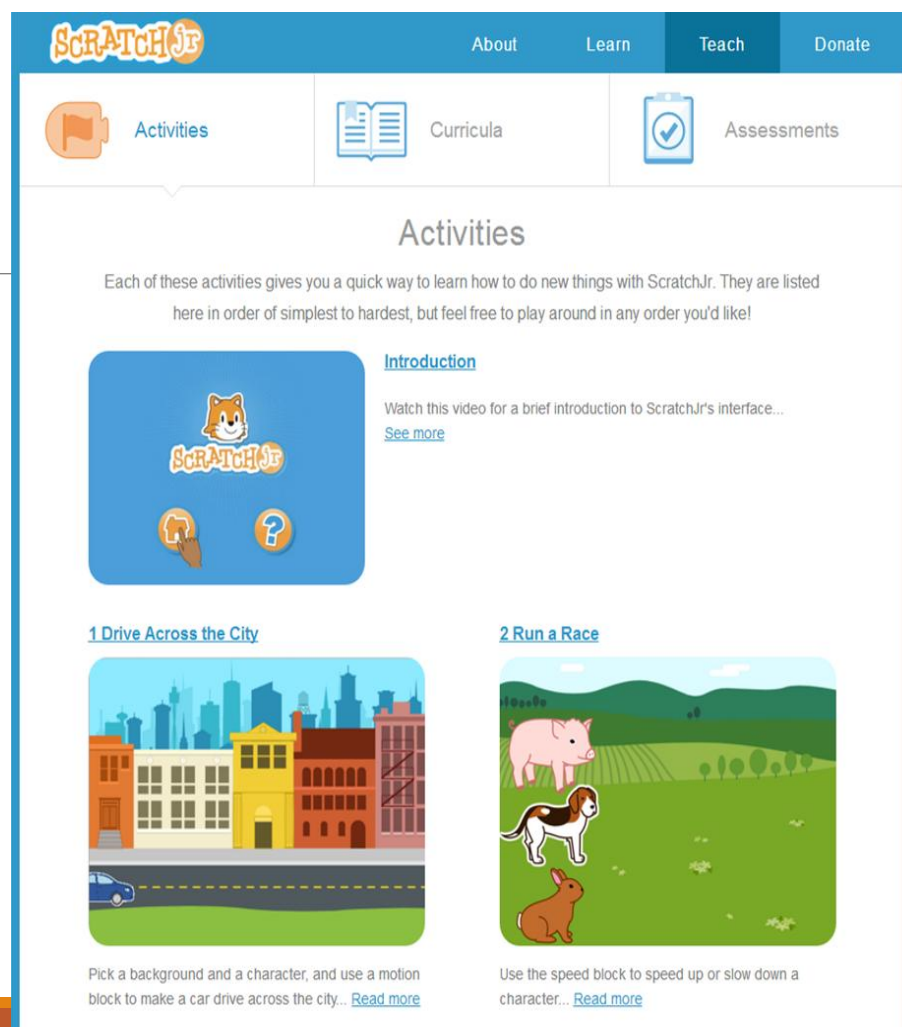
[Character Animation using the ScratchJr Blocks](#)

Make a simple script by connecting blocks together. [Watch video](#)

Tips & Hints

The [Teach] Tab provides:

- Activities
- Curricula
- Assessments



The screenshot shows the Scratch Jr website's 'Teach' tab. At the top, there are navigation links for 'About', 'Learn', 'Teach', and 'Donate'. Below these are three main categories: 'Activities' (with a megaphone icon), 'Curricula' (with a book icon), and 'Assessments' (with a clipboard icon). The 'Activities' section is active and displays a list of activities. The first activity is 'Introduction', which includes a video thumbnail with the Scratch Jr logo and a question mark icon. Below it are two more activities: '1 Drive Across the City' and '2 Run a Race', each with a corresponding illustration. The '1 Drive Across the City' illustration shows a city skyline and a car on a road. The '2 Run a Race' illustration shows a pig, a dog, and a rabbit in a field. Each activity has a 'Read more' link below it.

SCRATCHJR

About Learn **Teach** Donate

Activities Curricula Assessments

Activities

Each of these activities gives you a quick way to learn how to do new things with ScratchJr. They are listed here in order of simplest to hardest, but feel free to play around in any order you'd like!

Introduction

Watch this video for a brief introduction to ScratchJr's interface... [See more](#)

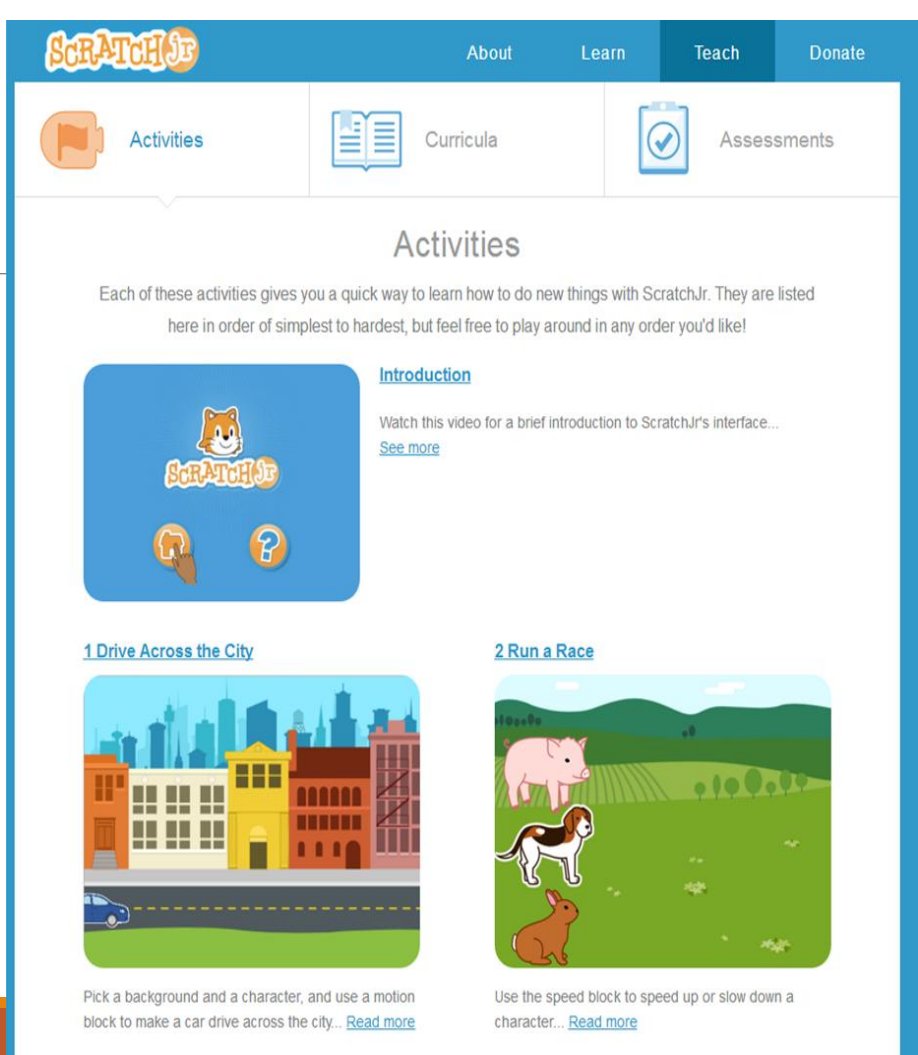
1 Drive Across the City

Pick a background and a character, and use a motion block to make a car drive across the city... [Read more](#)

2 Run a Race

Use the speed block to speed up or slow down a character... [Read more](#)

Under Activities, you'll find the ScratchJr intro video and several sample activities.



The screenshot shows the ScratchJr website interface. At the top, there is a blue navigation bar with the ScratchJr logo on the left and links for "About", "Learn", "Teach", and "Donate" on the right. Below the navigation bar, there are three main menu items: "Activities" (with a megaphone icon), "Curricula" (with a book icon), and "Assessments" (with a clipboard icon). The "Activities" section is currently selected and expanded. It features a heading "Activities" and a paragraph explaining that activities are listed from simplest to hardest. Below this, there is a large blue box with the ScratchJr logo and two circular icons: one with a hand pointing to a screen and another with a question mark. To the right of this box is a link for "Introduction" and a short description: "Watch this video for a brief introduction to ScratchJr's interface..." with a "See more" link. Below the introduction, there are two activity cards. The first is titled "1 Drive Across the City" and shows a cityscape with a car on a road. The second is titled "2 Run a Race" and shows a pig, a dog, and a rabbit in a field. Each activity card has a "Read more" link below it.

ScratchJr

About Learn Teach Donate

Activities Curricula Assessments

Activities

Each of these activities gives you a quick way to learn how to do new things with ScratchJr. They are listed here in order of simplest to hardest, but feel free to play around in any order you'd like!

Introduction

Watch this video for a brief introduction to ScratchJr's interface...
[See more](#)

1 Drive Across the City

Pick a background and a character, and use a motion block to make a car drive across the city... [Read more](#)

2 Run a Race




Use the speed block to speed up or slow down a character... [Read more](#)

1. Choose Background





New Background

2. Choose Character



New Character



Cat

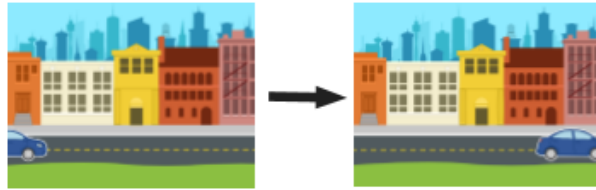
Delete the cat (press and hold)

3. Resize Character and Move to Start Place








Shrink

Drag the car from the center of the screen to the bottom corner.




4. Make Programs



Grid On/Off

Use the grid to calculate how many blocks the car should move.



- How would you make the car go only half way across the screen?
- What would happen if a wizard, or a dragon, or an elephant appeared on the sidewalk?

Each activity has a downloadable instruction card.



Activities



Curricula



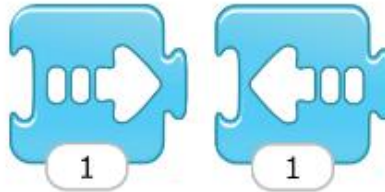
Assessments

Curricula

These curricula introduce powerful ideas from computer science that are not usually highlighted in early childhood education. We use the term "powerful idea" to mean a concept that children can learn and that will serve their critical thinking and problem solving abilities beyond the lifetime of a specific classroom technology. While these curricula were designed as tools for teaching ScratchJr, the ultimate goal is to equip students with skills that can be applied outside of the app. Abilities like programming, expressing through technology, and user-centered design are just a few of the powerful ideas covered in our lessons.

Under Curricula, you will find block images, and downloadable curriculum guides for:

- Animated Genre
- Playground Games
- Literacy and Math



Printable Block Images

You can print high quality images of the ScratchJr blocks for classroom instruction... [Download PDF](#)



Animated Genres Curriculum

This curriculum provides students with the opportunity to learn all of the concepts in ScratchJr and apply these concepts in their own personal creations. At the heart of the curriculum are three types of interactive projects that can be made with ScratchJr... [Read more](#)



Lesson 1: Instructions, Sequencing, and an Introduction to ScratchJr

Summary

In this lesson, children will be introduced to two concepts that will create a foundation for understanding programming: instructions and sequencing. Through various interactive activities, students will acquire a basic understanding of these two concepts. The lesson will conclude with an introduction to the ScratchJr interface.

<i>Objectives</i> <i>Students will learn...</i>	<i>Objectives</i> <i>Students will be able to...</i>
<ul style="list-style-type: none">• Appropriate iPad use• The concept of programming• The concept of instructions• The concept of sequencing• The basic features of the ScratchJr interface	<p>General</p> <ul style="list-style-type: none">• Give specific instructions• Sequence instructions to achieve simple objectives <p>ScratchJr</p> <ul style="list-style-type: none">• Move blocks into the scripting area• Use blocks in scripting area as buttons• Select a block category• Save a project

Programming Blocks Introduced in this Lesson	
<ul style="list-style-type: none">• Right• Left• Up• Down• Bigger• Smaller• Visible• Invisible	<p>The image shows eight Scratch Jr programming blocks arranged in two rows of four. The top row contains four blue blocks: 'Right' (arrow pointing right), 'Left' (arrow pointing left), 'Up' (arrow pointing up), and 'Down' (arrow pointing down). Each of these blue blocks has a white circle with the number '1' at the bottom. The bottom row contains four pink blocks: 'Bigger' (person icon with a plus sign), 'Smaller' (person icon with a minus sign), 'Visible' (person icon with a checkmark), and 'Invisible' (person icon with an 'x'). Each of these pink blocks has a white circle with the number '2' at the bottom.</p>

Additional Materials: Rule board

Each guide contains detailed instructions, including:

- Objectives
- Resources
- Schedule



Activities



Curricula



Assessments

Assessments

These assessments provide two different ways to help determine the depth of students' understanding of the relationship between the programming blocks and their associated behaviors. Both assessments use the same basic ScratchJr examples.

Under Assessments, you'll find two types of student assessments.

Name: _____



Circle-the-Blocks Assessment

In this basic assessment, students identify which programming blocks were used in a given ScratchJr project, but the students do not sequence the blocks... [Read more](#)



Reverse-Engineering Assessment

In this more in-depth assessment, students view a ScratchJr project and then reconstruct the scripts of the project using pre-printed blocks... [Read more](#)

Demonstration



Resources

- [ScratchJr Website](#) – Guides and discussions
- [Code.org](#) – Computational thinking
- [PBS Kids ScratchJr](#) – PBS kids characters
- [YouTube videos](#) – Playlist of examples and tutorials



PBS Kids ScratchJr

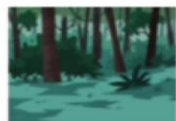
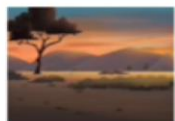
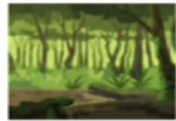
<http://pbskids.org/apps/pbs-kids-scratchjr.html>

[https://play.google.com/store/apps/details?id=org.pbskids.scratchjr](https://play.google.com/store/apps/details?id=org.pbskids.scratchjr&rdid=org.pbskids.scratchjr)



Blurr







Scratch Jr



Quick Intro to PBS KIDS Scratch Jr



Story Starters



Under the Sea



Showtime!



Cheetah Race



Tag!



Polar Bear Quest



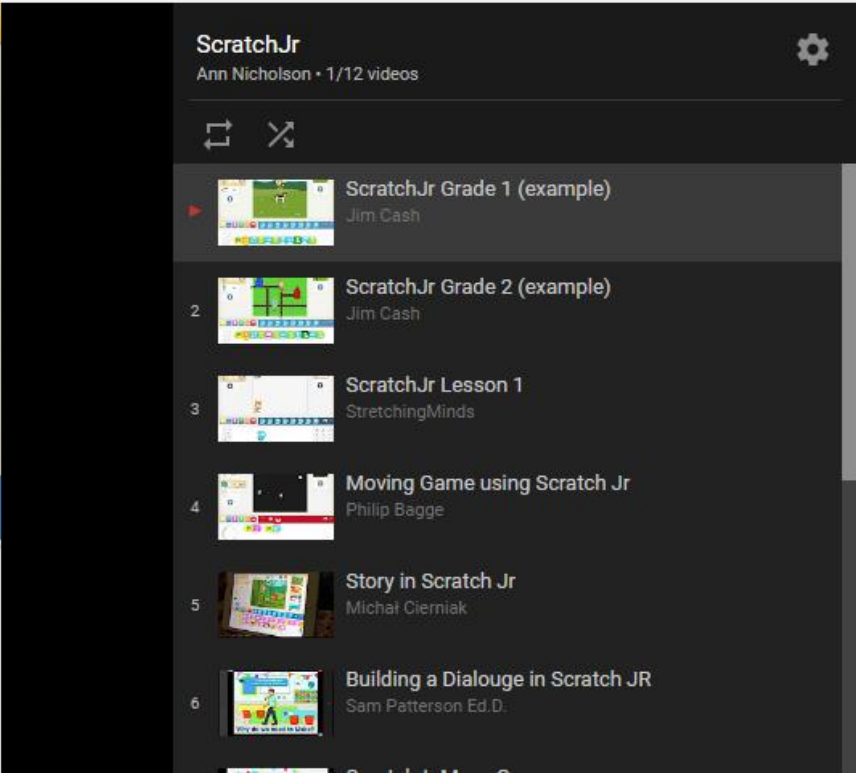
Becky's Dilemma



Creature Rescue



Nature Adventure



YOUTUBE VIDEOS: [SCRATCHJR PLAYLIST](#)

Resources

The Official ScratchJr Book
from NoStarchPress
<https://www.nostarch.com>



Research



- Kalogiannakis, M. & Papadakis, St. (2017). Pre-service kindergarten teachers acceptance of “ScratchJr” as a tool for learning and teaching computational thinking and Science education. In proceedings of the 12th Conference of the European Science Education Research Association (ESERA), «Research, practice and collaboration in science education». Dublin City University and the University of Limerick, Dublin, Ireland, 21-25 August 2017.
- Kalogiannakis, M. & Papadakis, St. (2017). A proposal for teaching ScratchJr programming environment in preservice kindergarten teachers. In proceedings of the 12th Conference of the European Science Education Research Association (ESERA), «Research, practice and collaboration in science education». Dublin City University and the University of Limerick, Dublin, Ireland, 21-25 August 2017.
- Papadakis, S., Kalogiannakis, M., & Zaranis, N. (2016). Developing fundamental programming concepts and computational thinking with ScratchJr in preschool education: a case study. International Journal of Mobile Learning and Organisation, 10(3), 187-202.

Questions or Comments?



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- Google scholar: <https://scholar.google.gr/citations?user=e3vLZegAAAAJ&hl=el>
- Research gate: https://www.researchgate.net/profile/Stamatios_Papadakis
- Academia: <https://independent.academia.edu/PapadakisStamatis>
- ORCID: orcid.org/0000-0003-3184-1147