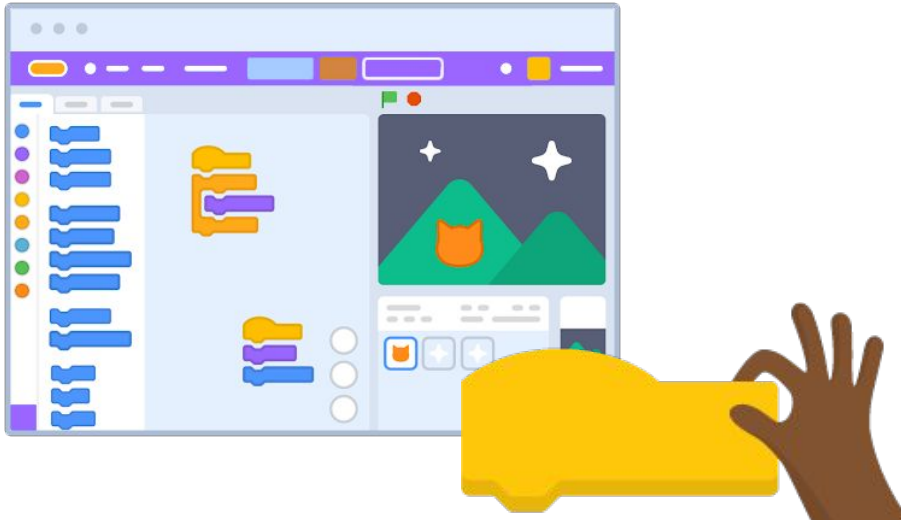
LEVEL UP WITH SCRATCH WORKSHOP SERIES

Create Interactive Art with Scratch

SCRATCH™

Session Overview

- Brief Introduction to Creative Learning with Scratch
- Stamp Art and Parts Create a Whole
- Clone Art
- Turtle Graphics and Next Level
- Sound Art with Lines
- Sound Art with Shapes
- Draw with Your Nose!
- Parallax
- Art Comes Alive!
- Draw Offline, Animate with Scratch!
- Stop Motion
- Interact with Physical Drawings
- Tilt, Acceleration, Art!
- More Art to Explore
- Wrap Up - Debugging and Reflection



Facilitator: Maren Vernon

Scratch Learning Resource Designer
@algorithmar and @scratchlycaterton

SCRATCH™ FOUNDATION

Learning Goals

- Explore different ways that art can be created (stamping, with math, digital pen drawings, etc.)
- Utilize an Interactive and expressive canvas (Scratch) to enhance/transform art pieces and engage users
- Remix our starter projects to add personalized touches and additional elements
- Reflect on finalized projects and the creative process with peers
- Communicate and share projects with your learning community and the greater Scratch online community

Getting Started

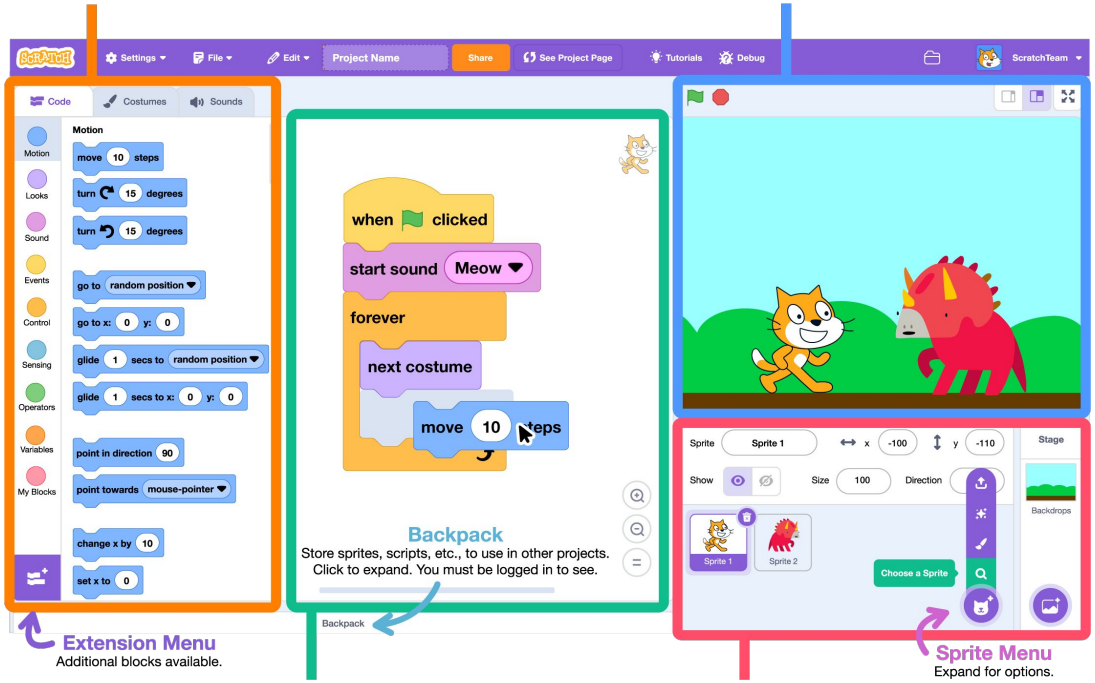
Click “Create” or log in to your free account to save projects.

go to: scratch.mit.edu

Set your language and block color mode.

Choose a sprite. Drag and drop code blocks to create a script.

scratchfoundation.org/learn/learning-library/getting-started



Creative Learning

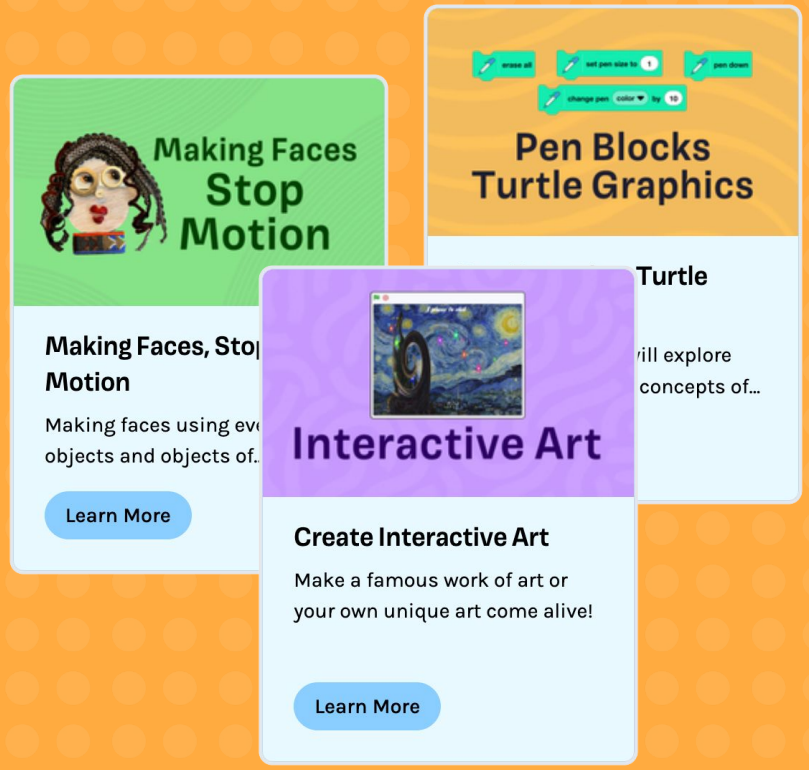
As facilitators, we want to support **playful learning and tinkering mindset values** so that participants can:

- Engage playfully in **projects** that are meaningful to them and elicit joy
- Collaborate with **peers** to experiment, share, and celebrate ideas
- Develop a mindset that is **comfortable with the discomfort** of getting stuck
- Develop a mindset that thinks critically about **strategies for getting unstuck**

scratchfoundation.org/learn/learning-library/scratch-creative-learning-philosophy

Let's Imagine...

What will you create?



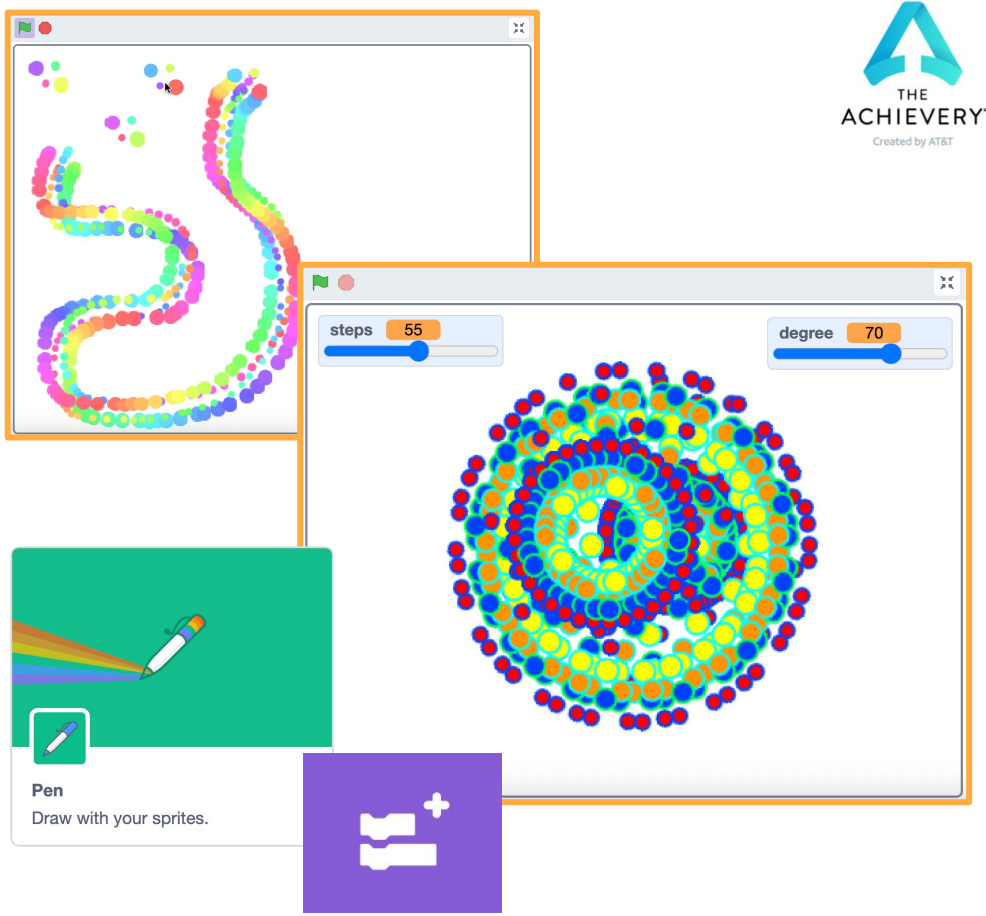
Achievery Unit

Stamp Art

Check out our Achievery Unit “Stamping an Image” and our starter projects “Stamp Studio” and “Spin Art”

Add the Pen extension to access the “stamp” and “erase all” blocks.

Because the stamp is simply an image of the sprite at the moment it was stamped, it cannot be programmed but can still be a powerful tool to create interesting patterns or movement tracks.



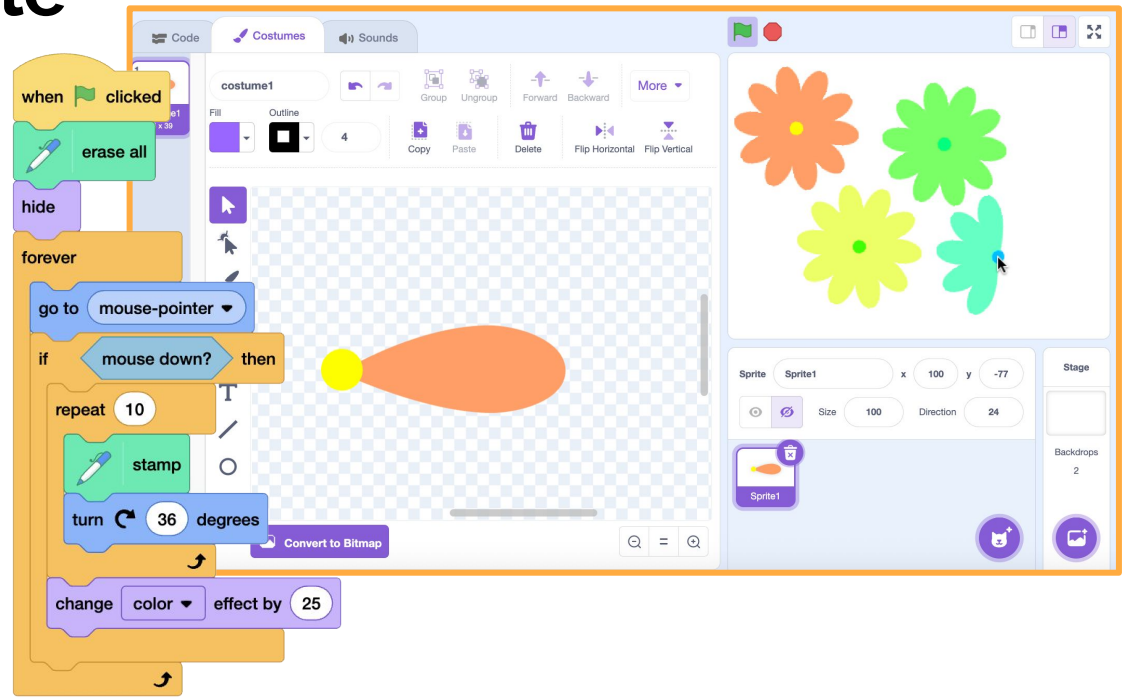
More on the Stamp block

Achievery Unit

Parts Create a Whole

For a leveled up challenge that can incorporate math, try creating a piece of an image (like a petal) that can be repeatedly stamped in a pattern to create something new (like a flower).

Check out our Achievery Unit "Create an Image with Stamps" for an example. Tinker and experiment with the costume center.



Example project: 819395727

More on the Stamp block and Costume Centering and Direction

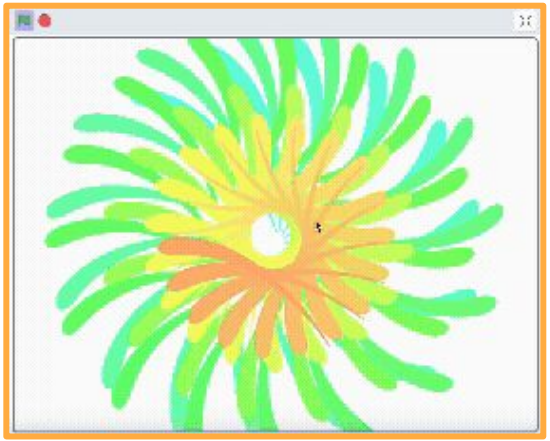
Clone Art

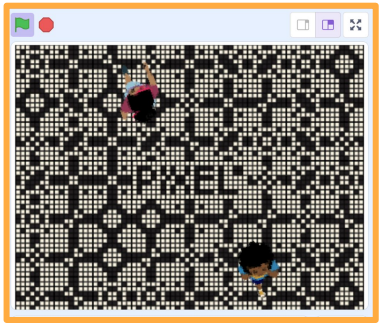
Stamped images cannot be programmed, but clones can.

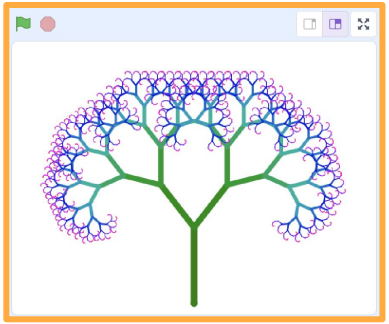
Cloning lets you create multiple copies of your sprite while your project is running. When each clone is produced, it has the same costumes, sounds, scripts, and variables as the original, but it is otherwise independent.

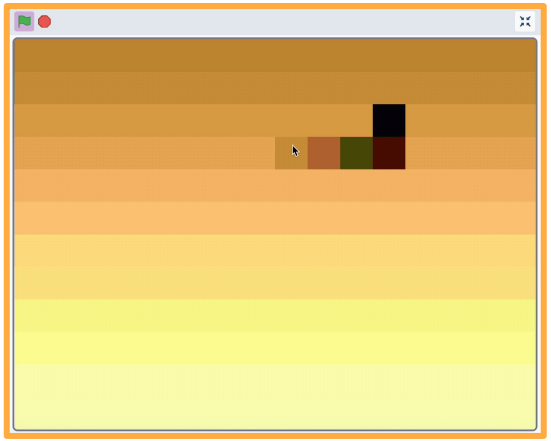
Clones can create mathematical art like fractals or mesmerizing moving patterns. Make interactive by letting the user adjust with mouse movement or variable sliders.

More on Clones. Example projects: 1145558837, 502449003, 591509840, 1171784325, and 1229472802.









Turtle Graphics

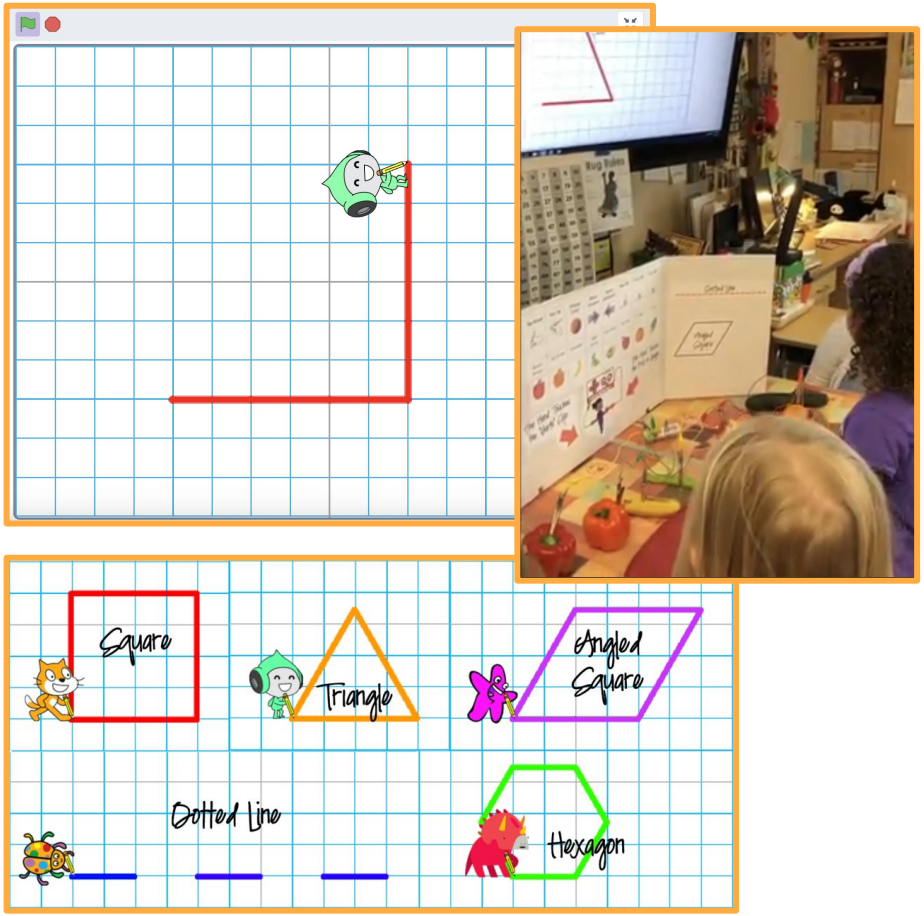
Under the Pen extension are also blocks for creating pen drawings/turtle graphics.

These digital pen drawings are created when a cursor (the "turtle") draws on a plane (like the Scratch stage).

Turtle graphics help with algorithmic thinking and debugging, and they employ geometry concepts and focus on direction, location, and repetition/looping.

Make interactive with keyboard controls, variables, or devices like Makey Makey.

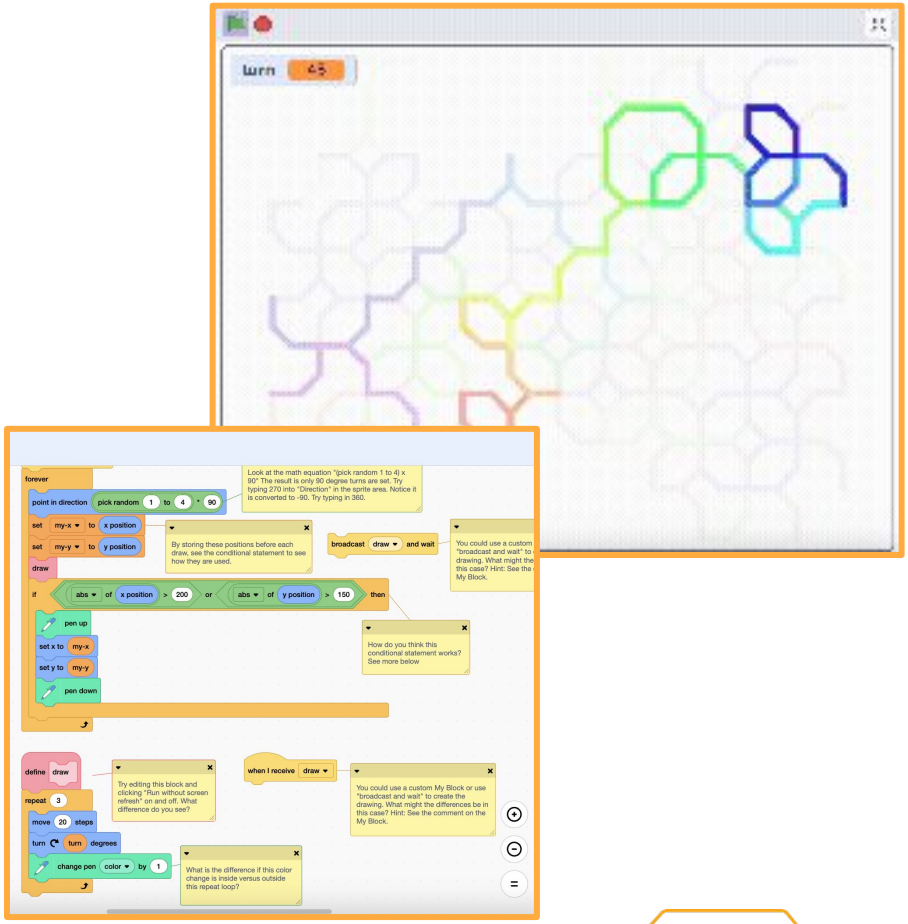
More on Pen Blocks/Turtle Graphics and Makey Makey
Example project: 301056940 or 875669721



Next Level

- Remix challenge: create repeated art by first creating half-circles, triangles, squares, or hexagons.
- Explore abstraction/modularization
- Break apart someone else's code to understand how it works. Study the visual artifact (the pen drawing). Explain findings in the form of annotated notes (using the Scratch comment feature).
- Reflect on the pros and cons of different approaches.

Example projects: 1224687962 and 10127983
More on My Blocks and Broadcasting



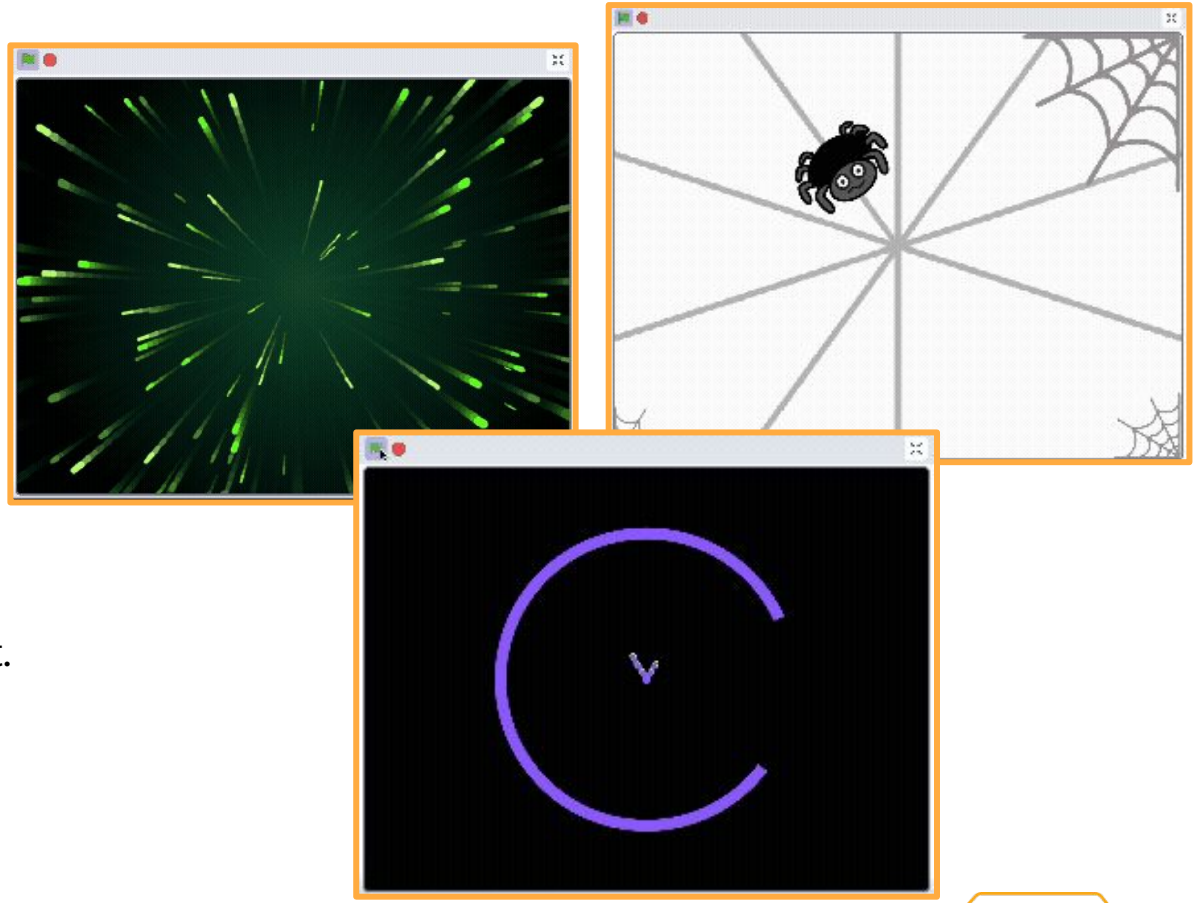
Next Level

Use turtle graphics/pen drawings, clones, and/or stamps in the service of an animation, storytelling, or informational project.

Replicate snowflakes, branching trees, spiderwebs, fireworks, raindrops, shooting stars...

Sometimes nature is imperfect. How can you introduce randomness or interactivity?

Example projects: 1224811917, 896049726, and 475866793



Achievery Unit

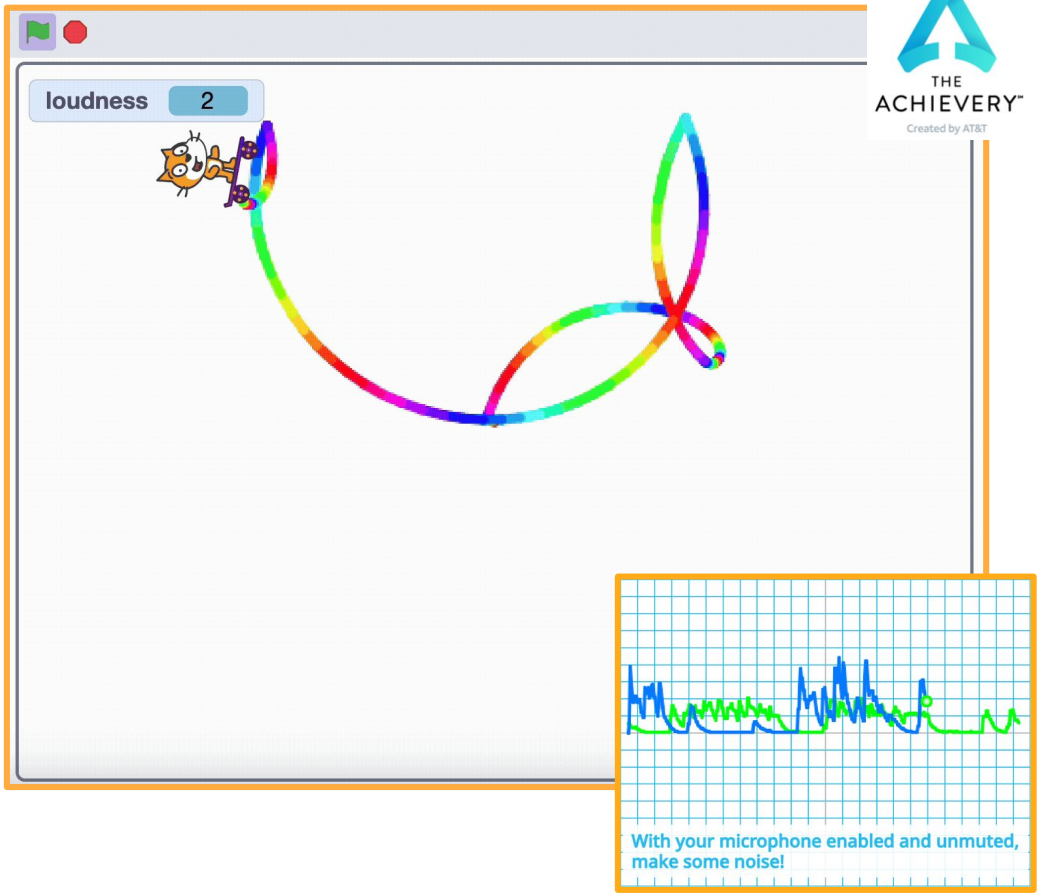
Sound Art with Lines

The “loudness” reporter block, under the Sensing category, records the “loudness” of the noise that a microphone receives.

Check out our Achievery Unit “Draw with Your Voice” and our starter project “Sound Graph.” Create your own sound wave art!

Enable your microphone in the browser (nothing is recorded or stored), and add the Pen extension!

More on the Loudness block
Example projects: 743008337 and 1213236087



THE ACHIEVERY
Created by AT&T

SCRATCH FOUNDATION

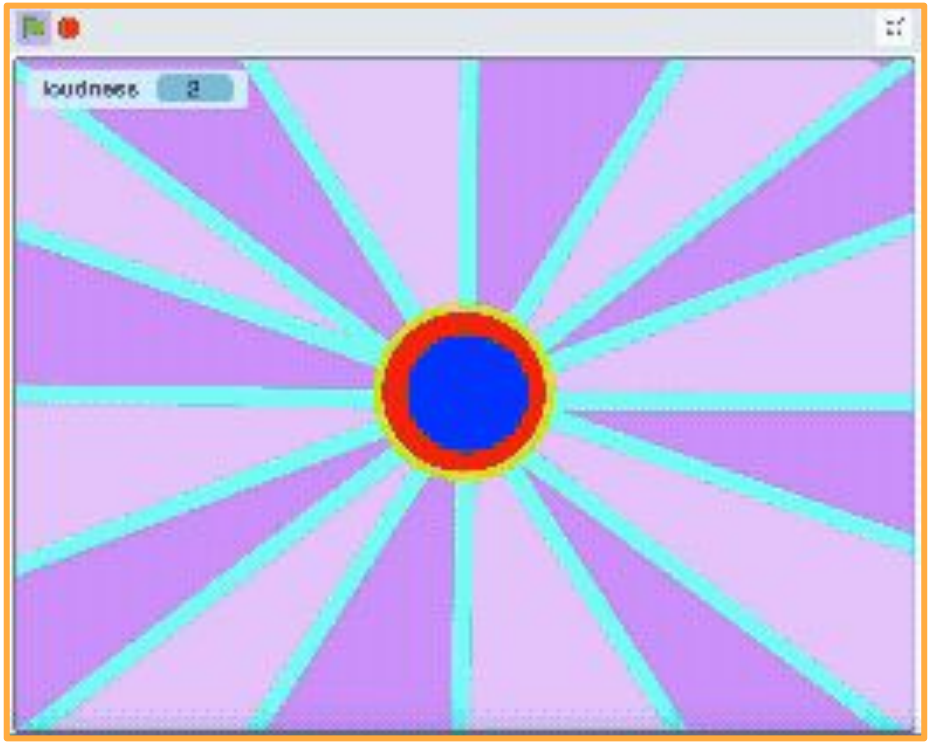
Starter Project

Sound Art with Shapes

Or check out our starter project "SoundFlower" to see a different way of making art with the loudness block, using shapes and effects.

How might you create an interactive art piece to accompany a musical performance?

How can operators like multiple and divide help you have more control over the effect of loudness?



Example project: 1213246188
More on the Loudness block

Draw with Your Nose!

Want a challenge that gets your body moving? Try using our Face Sensing blocks and your face to draw!

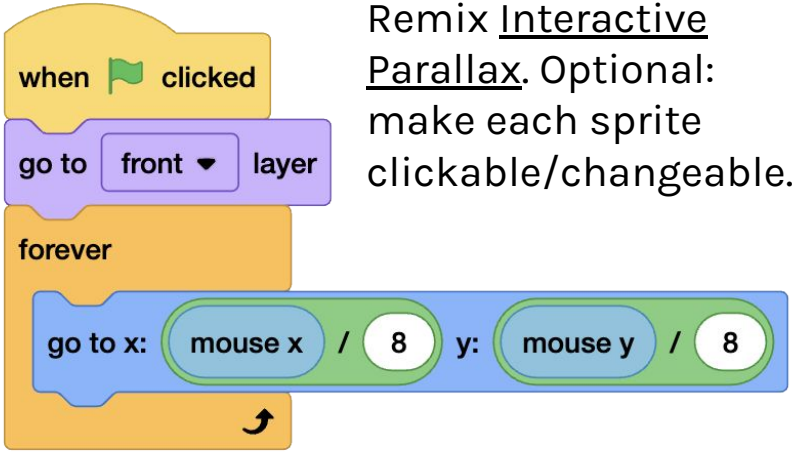
These AI-powered blocks use a machine learning model to detect if they see a face and where a nose, eyes, ears, mouth, etc., are. When you use Face Sensing blocks, **only your computer can sense your face. None of your data is stored or sent to Scratch** or any other site, making it a safe, fun, and creative way to explore the possibilities of AI.

More on Face Sensing, including coding cards.
Example projects: 1216969593, 1232868895, and studio: 50854499

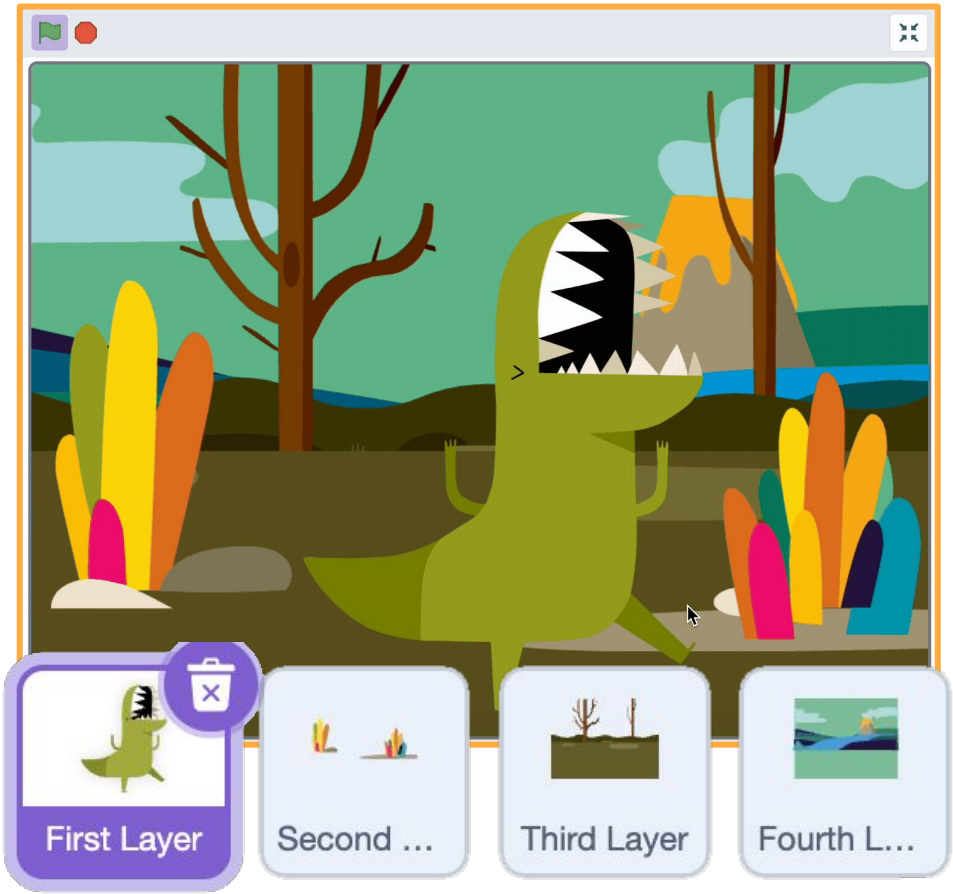
Starter Project

Parallax

A parallax is where the movement of the mouse (or other controller) adjusts the viewer's perspective. Create backgrounds as sprites to use Motion.



Remix Interactive Parallax. Optional: make each sprite clickable/changeable.



Starter Project

Art Comes Alive!

Choose a painting or art piece. Upload to a Scratch project.* Use the Paint Editor tools to make copies of sections, and animate them with code blocks to bring them to life! See our starter project "Make Art Come Alive."

Optional: Add a narrator sprite that tells more about the art or artist.

*Great opportunity to talk about copyright and licenses. Also giving credit.

Example projects: 360288983 and 786228623 (and its remixes)
More on Interactive Art

Draw Offline, Animate with Scratch!

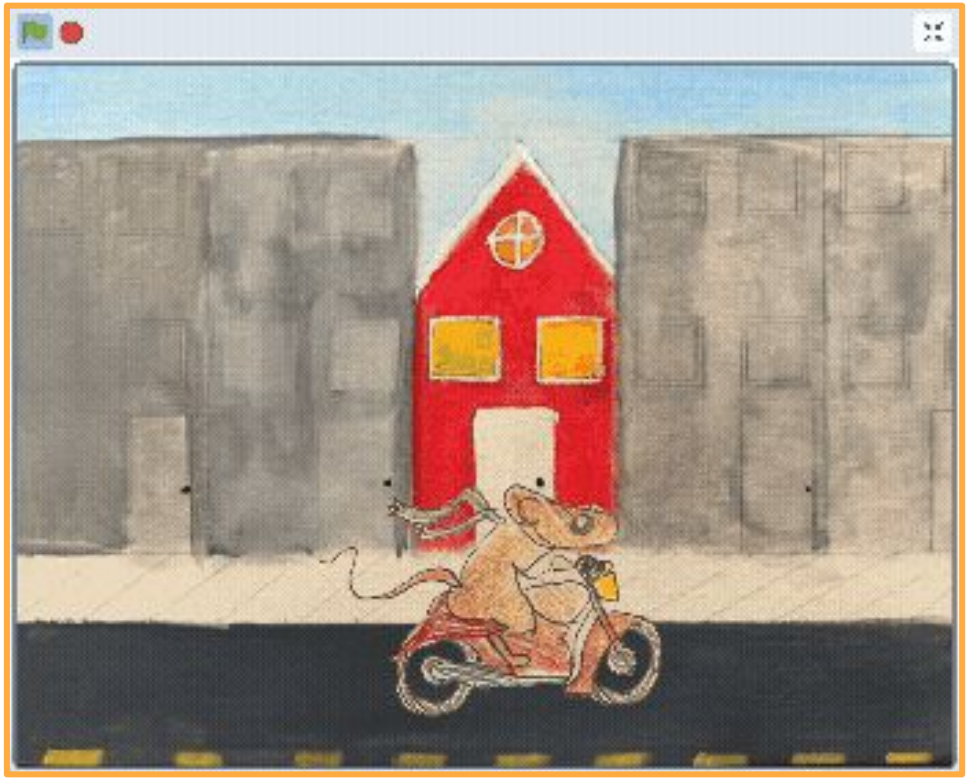
Create a hand-drawn character or your own painted art to scan/photograph and upload into Scratch to animate.

Another option: Draw multiple frames to create your own GIF-like animation (hint: use next costume).

PNG and JPG will upload as Bitmap. Tip: Convert to vector to easily resize to the stage.

Example projects: 1221466959, 1065666031, and 1097267602

More on Sprite Creation



Stop Motion

Making faces using everyday objects and objects of significance to make portraits is an idea that comes from the artist Hanoch Piven.

Try bringing them to life in Scratch using stop motion techniques. Moving from unplugged to digital provides the opportunity to expand your creative expression and transform your original creation.

See our Making Faces, Stop Motion resources and our starter project.

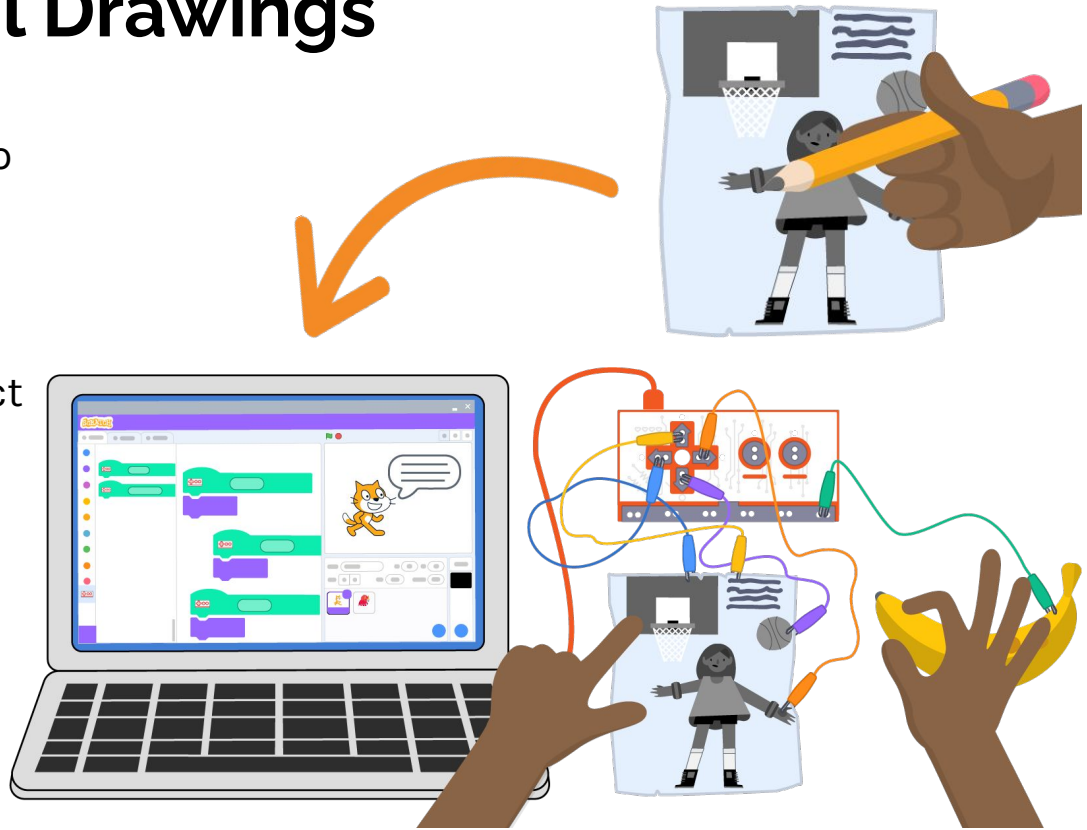
Example projects: 1053301507, 053636533, and 1056532831; or studios like 30687004

Interact with Physical Drawings

Create a drawing, informational sheet, poem, or poster you want to connect to the digital space.

Use a graphite pencil, foil, conductive tape, or conductive paint to create connection points with pieces. Connect a Makey Makey. Then, create a Scratch project to provide additional information (by playing recordings or displaying information on the stage) when participants interact with your work.

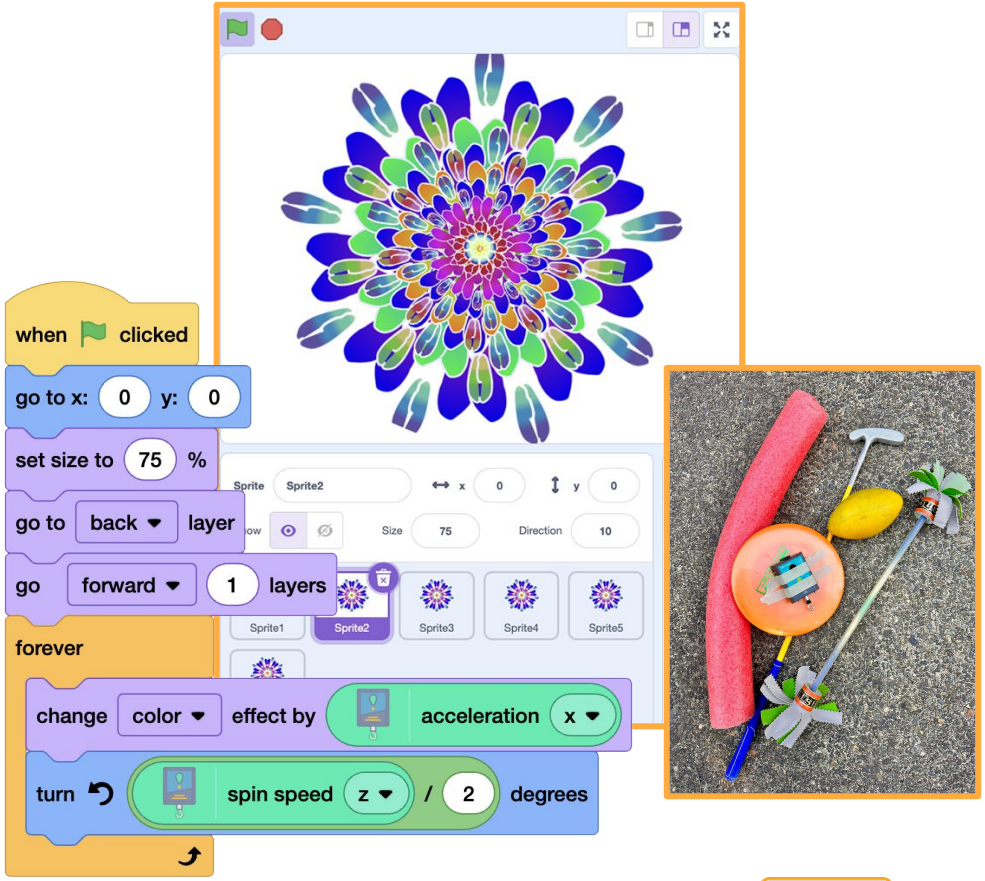
More on Makey Makey
Example project: 302098912



Tilt, Acceleration, Art!

Attach a device like a Vernier Go Direct Force & Acceleration sensor or a micro:bit to various objects like a golf club, juggling stick, pool noodle, or a frisbee.

Code animation when the object is thrown, swung, or moved. For example, this project uses a mandala with multiple layers that spin, make a sound, or change color depending on device readings like tilt or acceleration.



More on Vernier Go Direct and micro:bit
Example projects: 1161842271 and 736187682

More Art to Explore

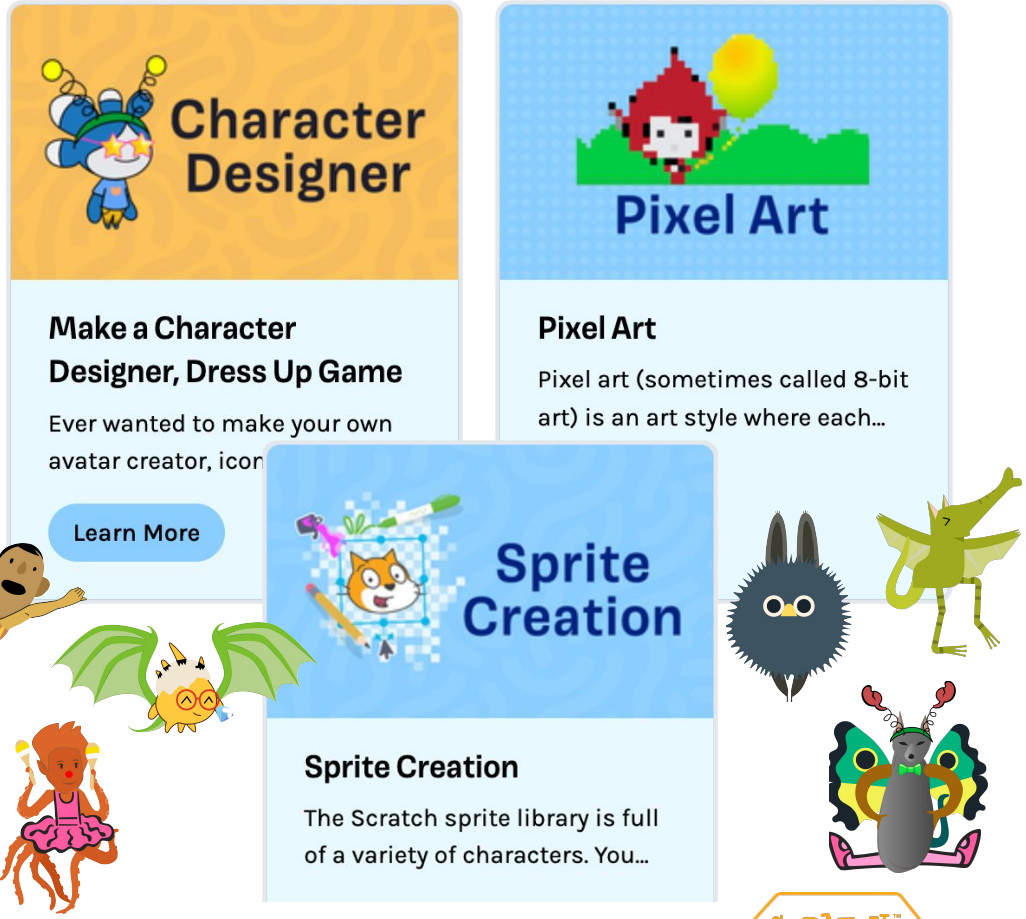
Our resources on Sprite Creation (like coding cards and videos) contain helpful details on using the Paint Editor tools to create original sprites or remixing sprites.

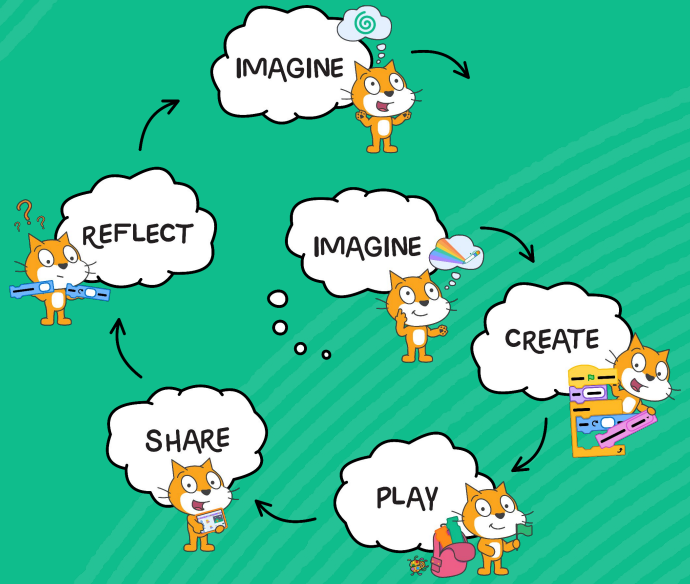
Want more? You might also check out these Learning Library resources:

- Make a Character Designer, Dress Up Game
- Pixel Art
- Unplugged Pixel Programming

Example projects: 1105678528 and 1171950611,

Thank you to Scratch users or remixed sprite examples. Can you tell which sprite pieces were used?





Debug, Share, and Reflect

Continue Along the Creative Learning Spiral

Debugging

Debugging strategies to suggest include:

- Read Aloud/Explain the Code Step-By-Step
- Break Long Sequences Apart
- Add Temporary Waits to Slow Action
- Tinker with the Block Order
- Is There a Similar but Different Block Option?
- Check the Values/Inputs

See our Debugging resources for more

Prompts to Try

- “Ask Three Before Me,” ask three peers before asking a facilitator.
- I don’t know, but let’s see if anyone else in the room might know/find out together.
- Which category do you think would be helpful?
- Can you say more about that?
- Let’s test it out. What do you observe?
- Walk me through your code. What does it say?

Pair Programming

Have groups of different experience levels? Try pair programming! One person serves as “**driver**” (creating scripts), while the other is a “**navigator**” (reviewing, advising, etc.) and roles are switched frequently.

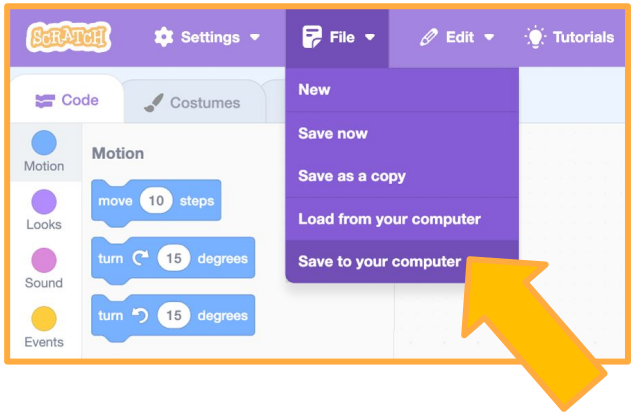
For interactive art, try pairing up users who are interested in drawing with users who have more experience coding, for example. Together, they can create rich and dynamic projects in addition to opportunities for them to teach and learn from each other.

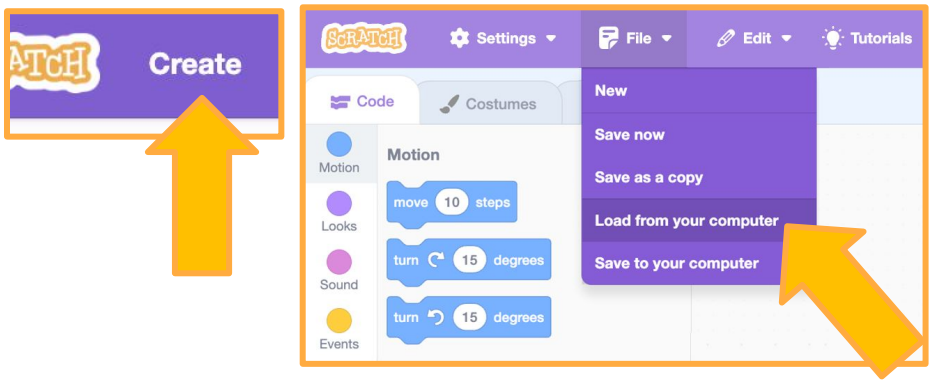
Saving

If you have a Scratch account, your project will save automatically.

If you don't have a Scratch account yet, you can save your project to your computer. Click "**File**," then choose "**Save to your computer**."

Next time you want to work on your project, go to scratch.mit.edu and click "Create." Then click "**File**," choose "**Load from your computer**," and upload your project.





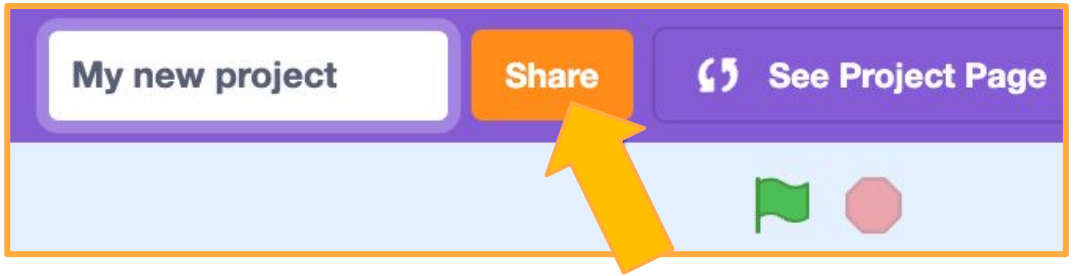
Share Your Project

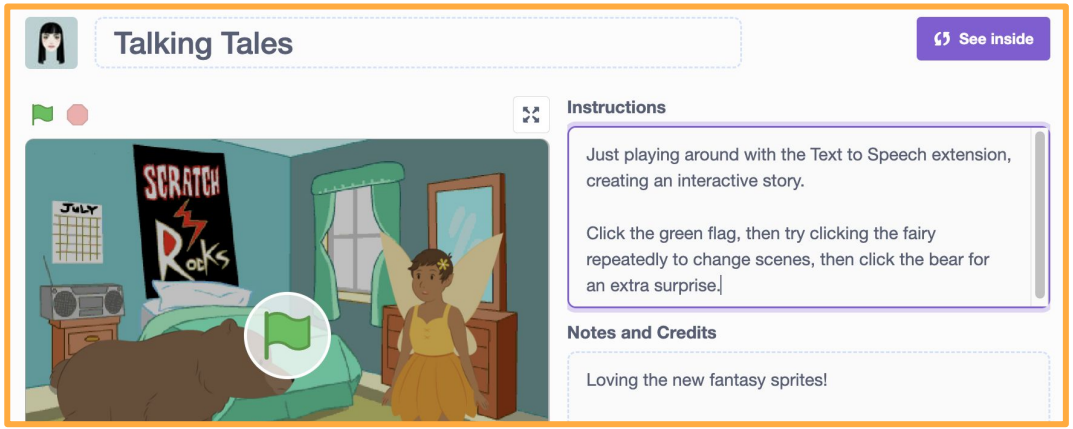
If you have a Scratch account, you can share your project and add it to studios.

Click the orange “**Share**” button at the top of the Scratch editor to share your project with the Scratch community.

Click the “See Project Page” button to go to the project page. This is where you can **add instructions and notes** about your project.

Now other Scratchers can see and interact with your project!





Reflection

- What was fun about this activity?
- What struggles or frustrations did you have during this activity?
- Many pathways, many solutions: Compare your code with other solutions. Was your solution similar or different? Why did you choose the blocks you did?
- If you had more time what would you add or change?

See our Reflection and Sharing resources for more

Prompts to Try

- I love it! What is it?
- What are your next steps for this project? What do you want to do in the future?

"Turn & Talk" is one technique to reflect and share in a physical environment.

Breakout rooms are an option for small group reflection in virtual spaces.

Record reflections using Scratch's sound editor. Then, add to a reflection project.

After-Activity Reflection

Share Option #1: Create a Class Studio to Gather Shared Projects

Studios are a space on Scratch where users can come together to make, share, and collect projects related to a particular theme, idea, or prompt.

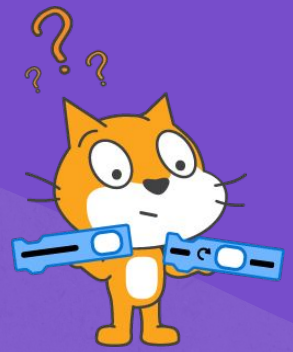
Share Option #2: Gallery Walk

Have your project open on your computer. Walk around the room (or take turns sharing your screen in a virtual space) to experience each other's creations. Take time to look at projects and read/listen/interact with them to learn more about your peers.

More on Teacher Accounts, Studios, and our Reflection and Sharing resources

Wrapping Up

Reflecting on Our Session, Resources, Next Steps



Get a copy of our Creative Learning Materials!

In addition to the resources shared throughout these slides:

- See our Learning Library at scratchfoundation.org/learn/learning-library to find lesson plans, coding cards, tutorial videos, and more! For this session, Stamp block, Pen Blocks/Turtle Graphics, Clones, Loudness block, Interactive Art, and Stop Motion would be perfect to explore.
- Getting Started with Scratch
- Scratch Creative Learning Philosophy

Find help, inspiration, and information:

- Visit scratch.mit.edu/ideas and scratch.mit.edu/starter-projects
- Click “Tutorials” to see in-editor guides
- Watch tutorial videos on our channel youtube.com/c/ScratchTeam

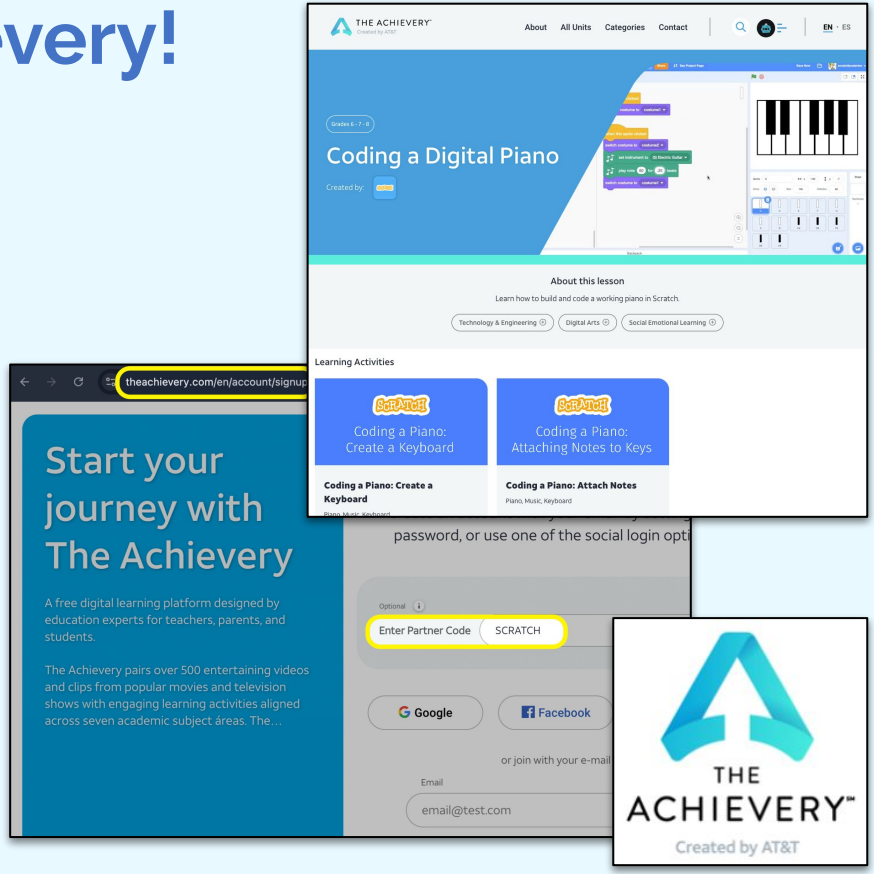
Find Scratch on The Achievery!

The Achievery platform connects K-12 students to a new world of digital learning.

Scratch Foundation has teamed up with The Achievery to provide free beginner and intermediate creative coding lesson plans on a variety of topics for educators, caregivers, and learners.

Sign up (for free!) by using our custom code “SCRATCH” when you register to support our work!

theachievery.com/account/signup



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Thank you!

Be sure to subscribe to our Scratch Foundation YouTube channel for Educators (@scratchfoundation).

Keep an eye on our Event page for additional opportunities: scratchfoundation.org/get-involved/events

Helpful Links:

- Scratch Application: scratch.mit.edu
- Learning Library: scratchfoundation.org/learn/learning-library
- Email Signup: scratch.mit.edu/connect
- Follow us on Instagram and Facebook @ScratchTeam
- Also see our YouTube channel @scratchteam for tutorials