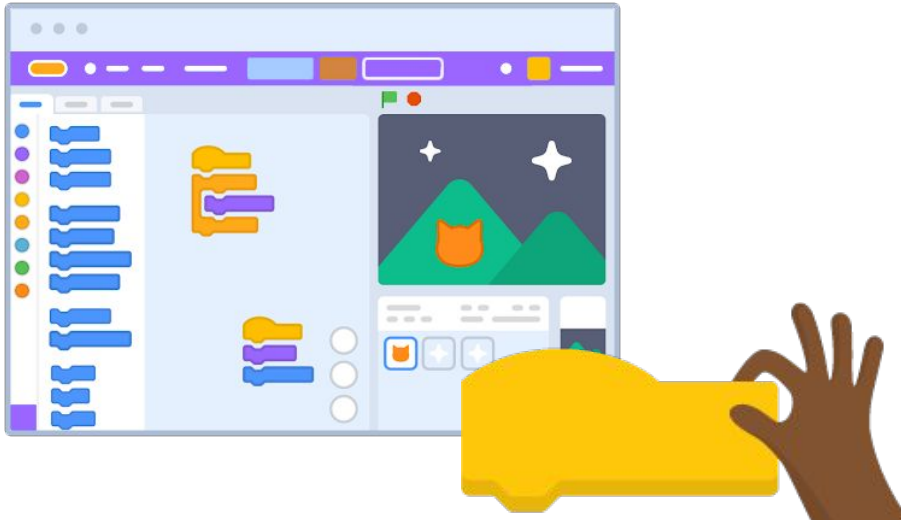
LEVEL UP WITH SCRATCH WORKSHOP SERIES

Make Some Music with Scratch

SCRATCH™

Session Overview

- Brief Introduction to Creative Learning with Scratch
- Choosing a Sound/Sound Blocks
- Looperman
- Pitch and Volume
- Sound Board
- Music Extension
- Compose or Recreate a Song
- Using My Blocks
- Tempo
- Notation and Rhythm
- Code a Digital Piano
- Alternate Pianos
- Drum Sequencer
- Loudness
- Wrap Up - Debugging and Reflection



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Scratch Learning Resource Designer
@algorithmar and @scratchlycaterton

SCRATCH™ FOUNDATION

Learning Goals

- Identify good use-cases for sound in Scratch projects
- Create projects using sound in a variety of ways
- 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

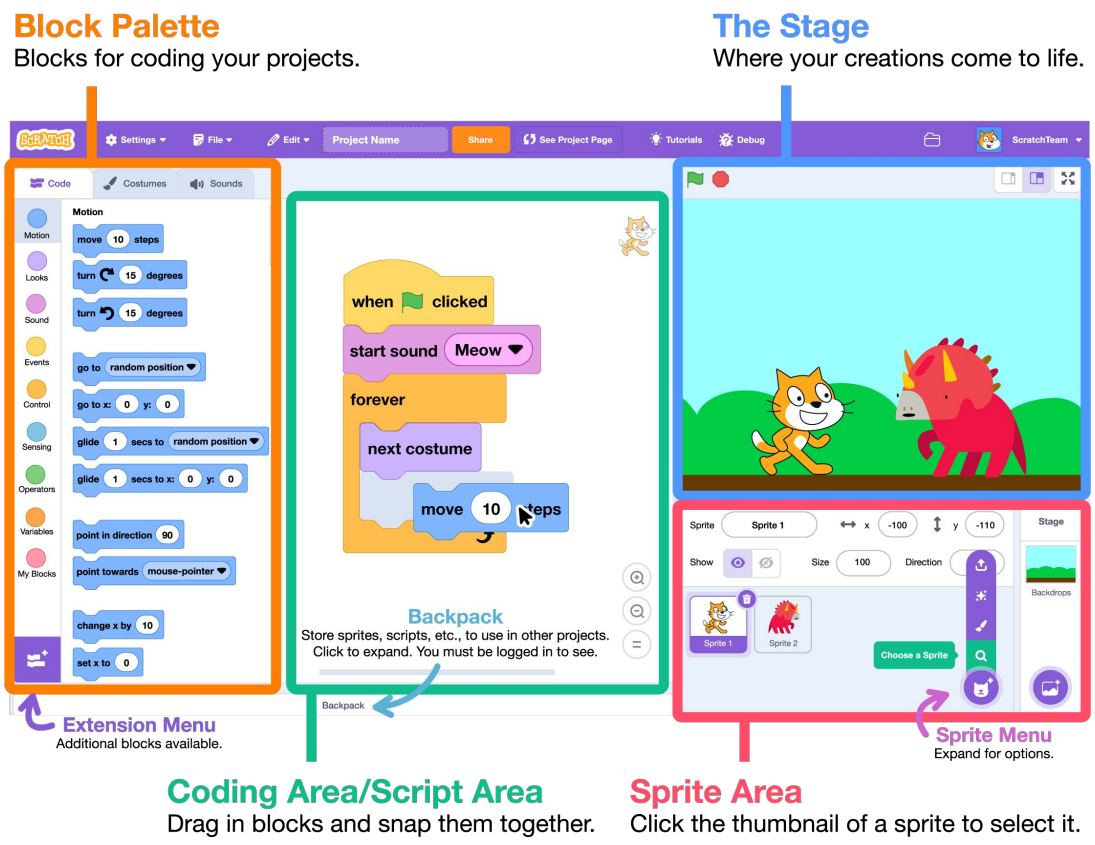
Click “Create” or log in to your free account to save projects.

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

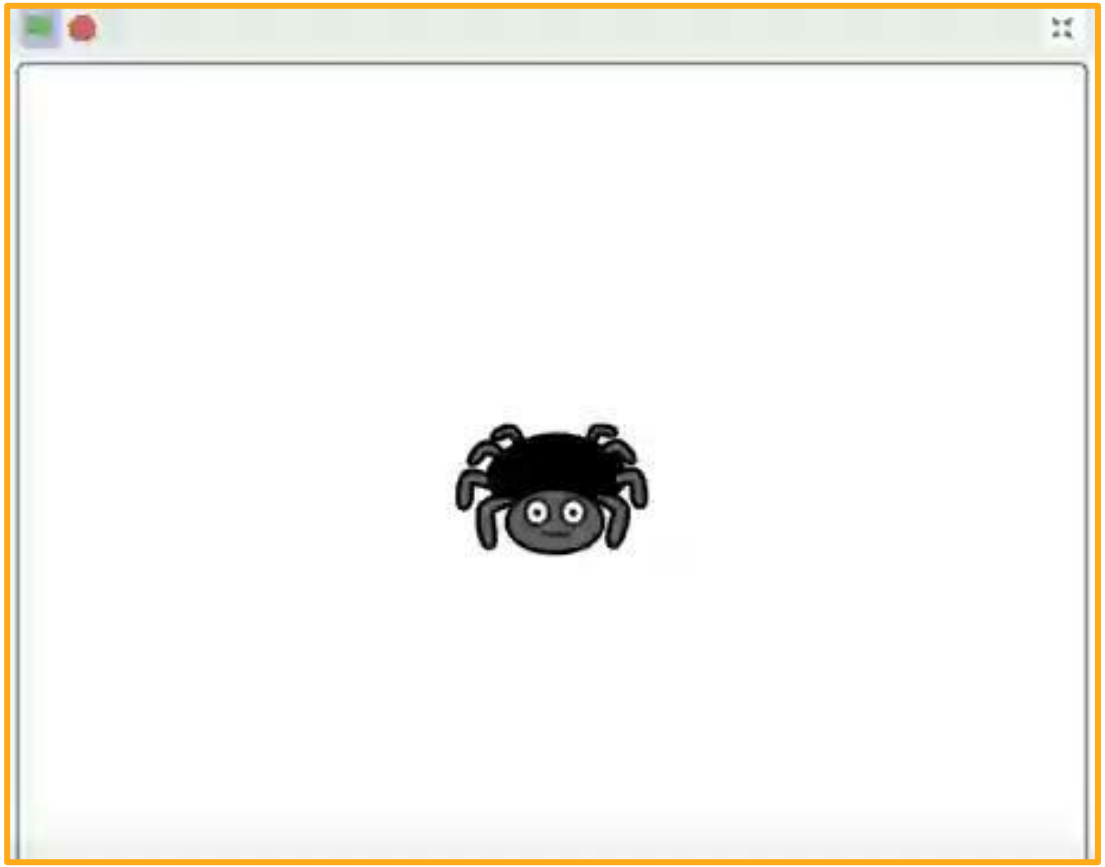
Let's Imagine...

What will you create?

Different Sounds, Different Feelings

Using sound in a game, animation, story, or interactive project can add depth and emotion.

For instance, here is the same animation for the spider, but see if it feels different with different sounds underneath.

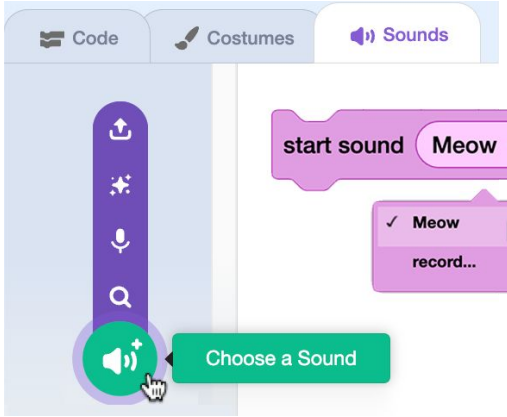


Choosing a Sound

Music and sound in Scratch can be approached in multiple ways. First, let's explore using a sound from the sound library and ways to change/manipulate it.

1. "Choose a Sound."
2. Try placing the sound block at a point in your script.
3. Explore the difference between "start sound" and "play sound until done."

Use the sound editor tools to make edits to the sound files.



Achievery Unit

Looperman

How might you use sounds in a project? One way is to trigger sounds to play with keyboard keys or mouse clicks.

Check out our Achievery Unit "Looperman." Think about how to pair sounds or layer sounds to create something new.

Explore and remix our starter project "DJ Scratch Cat," or create your own unique project.

THE ACHIEVERY™
Created by AT&T

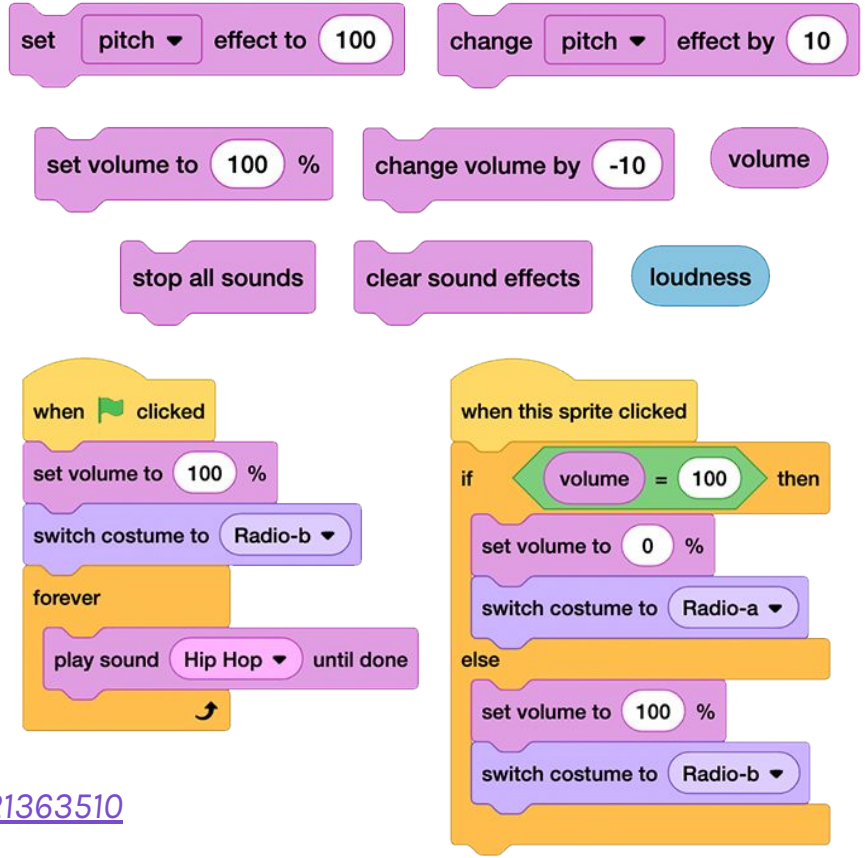
SCRATCH FOUNDATION

Pitch and Volume

Manipulate sound in Scratch via code blocks.

Explore blocks in the Sounds category that can set or change the pitch or the volume. How might you use such blocks in a project?

Changing pitch can add dramatic effect. Or you could give users control over hearing or muting continuous background sound in a project. There are a number of solutions.



Some example projects: 1124781375 (remix 1216952432), 821363510
More on Conditional Statements and Variables

Starter Project

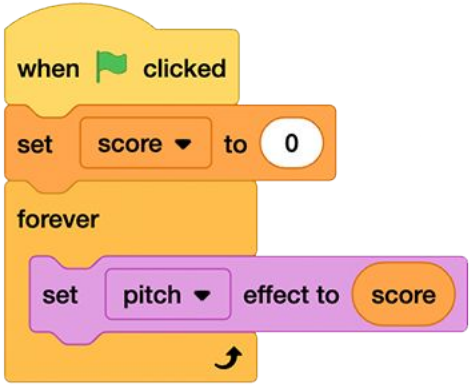
Add Emotion and Excitement with Pitch

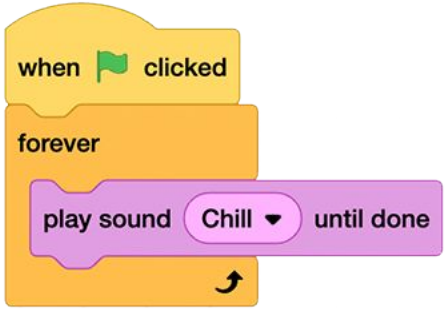
Check out our starter project "Catch the Fish, Increase the Pitch." Explore and remix this project.

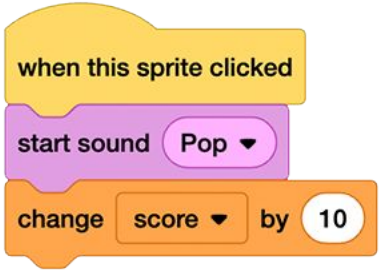
Notice as you click on all 30 fish that the music gets higher in pitch creating a feeling of urgency.

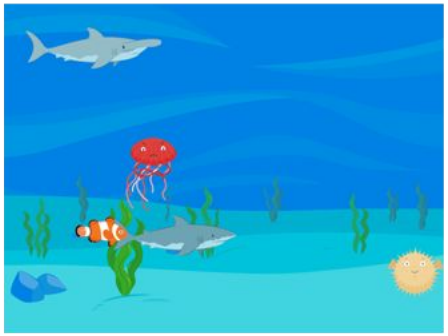
How can sound add an emotional component to a project?

Some example projects: 537008383, 530991328, 1111534003









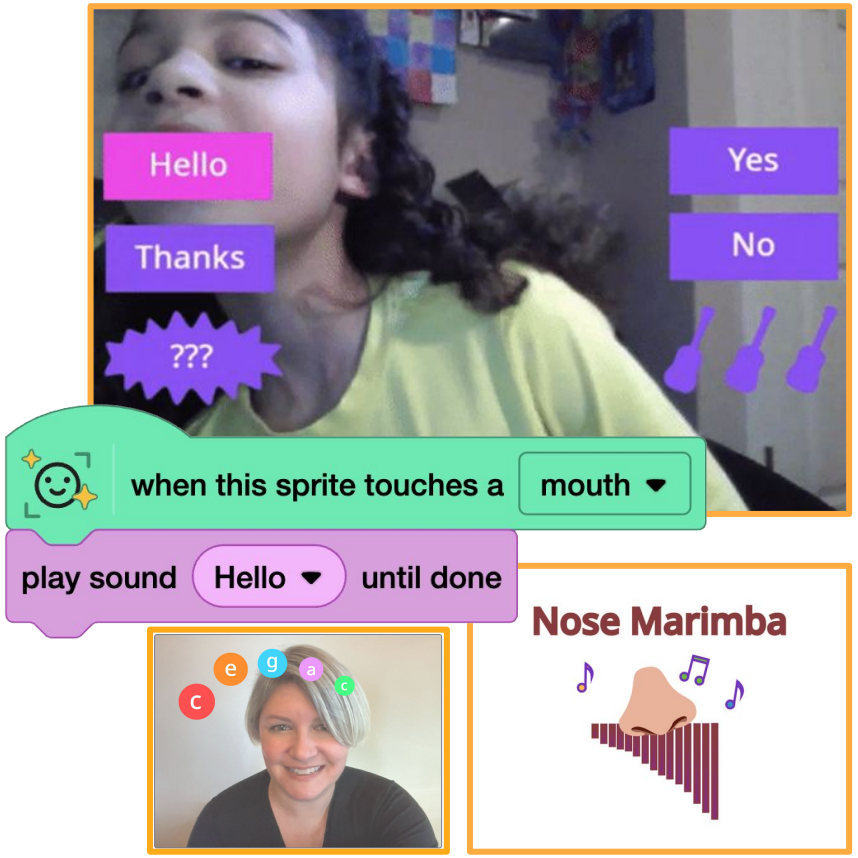
Starter Project

Sound Board

Build a soundboard in Scratch using keyboard keys or the mouse to activate sounds. Or use our AI-powered Face Sensing blocks to create a soundboard or a musical instrument that can be played with the features of your face, like your nose.

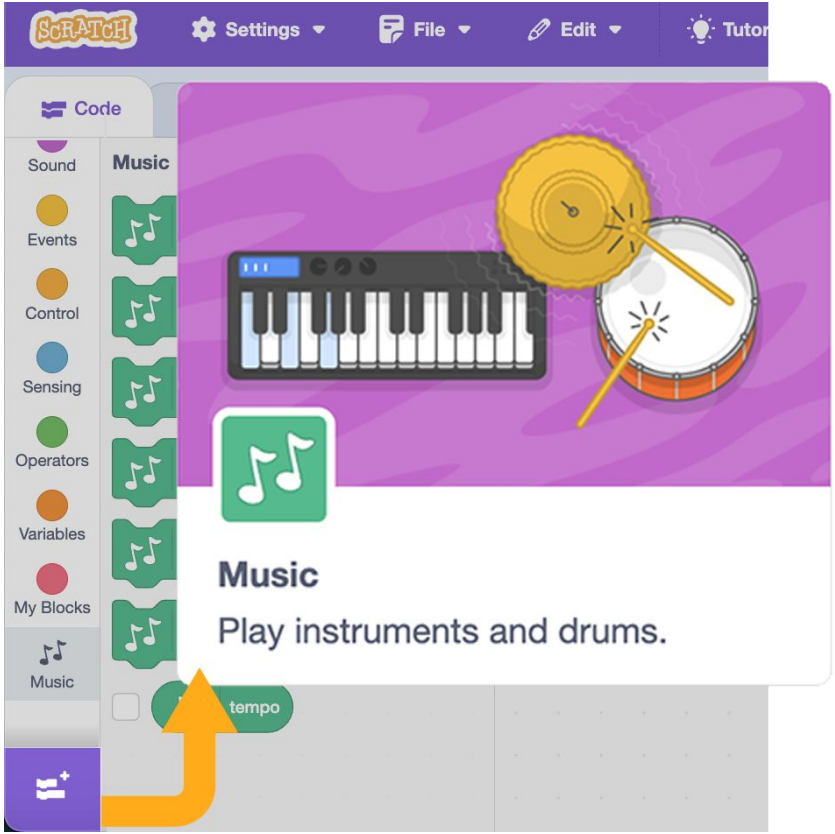
When you use Face Sensing blocks, **only your computer can sense your face. None of your data is stored or sent to Scratch** or any other site, making it a safe, fun, and creative way to explore the possibilities of AI.

Example projects: 1210064249, 1220564391, and 1241881842, and studio: 50854499



Add the Music Extension

Add the Music extension by clicking on the extension menu in the lower-left corner of the project editor and choosing “Music.”



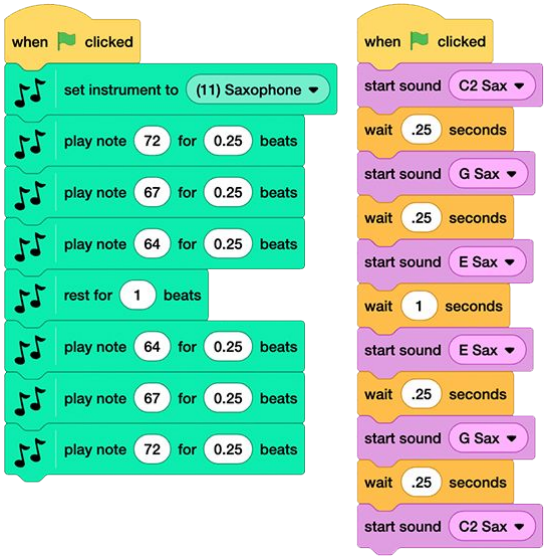
Compose or Recreate a Song

Use the music blocks to compose your own original composition or recreate a song! Identify the correct notes and any repeating parts.

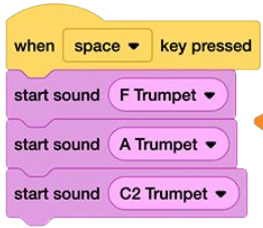
Are you creating a song with a simple melody, or are you creating chords and layering sounds or notes to play at the same time? There are different approaches you can try. Experiment!

See our coding cards for more

Example of two different ways to create a melody.



Example of two different ways to create a chord.



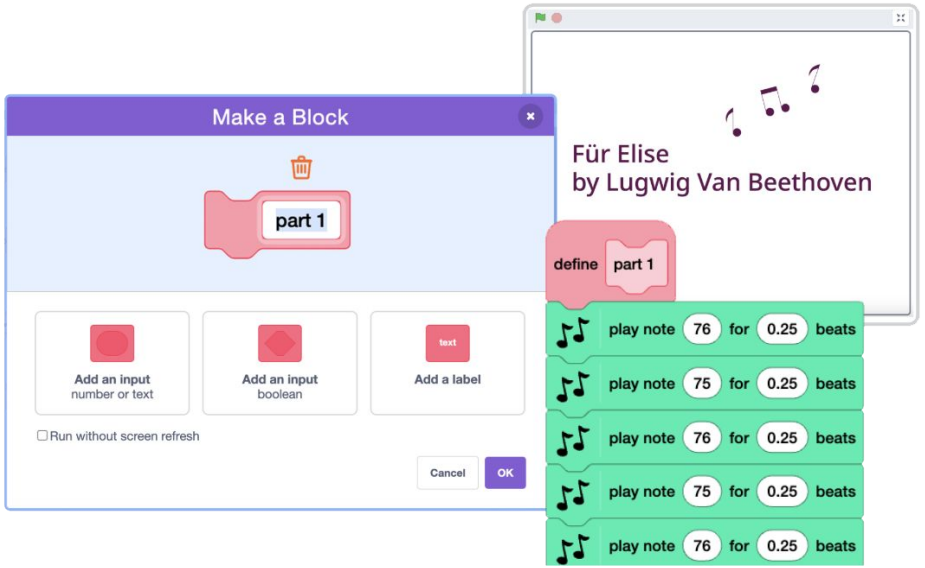
Starter Project

Using My Blocks

For repeating parts, rather than write the same sequence of notes over and over whenever they appear in your song, you can place those notes in a custom My Block and simply call that block each time you need it.

For an example, check out our starter project “Fur Elise with Music and My Blocks.” You can create multiple My Blocks for different sections/parts. My Blocks can also be placed within other My Blocks to further simplify the code.

More on My Blocks custom blocks

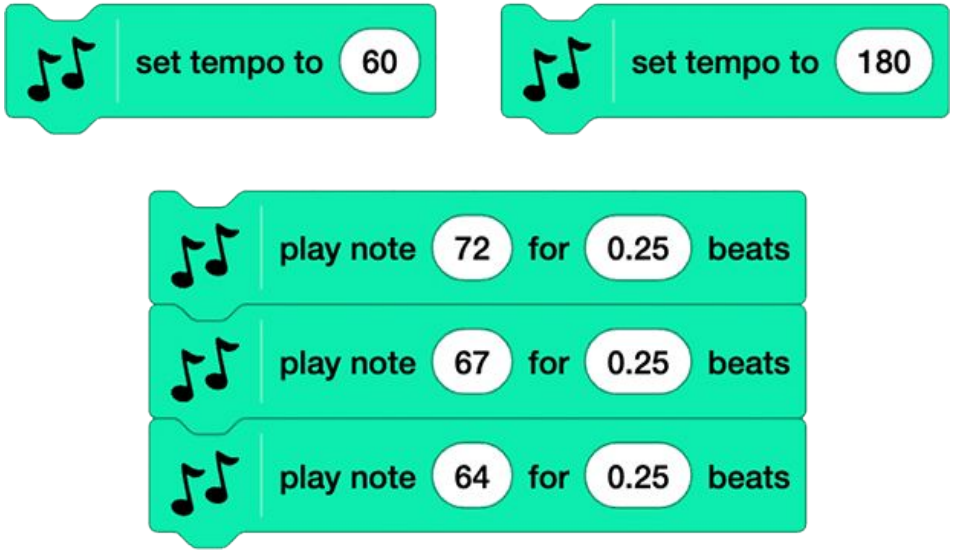


Tempo

Experiment with the tempo block, which controls how fast or slow music extension blocks play notes and drum beats.

A standard tempo is 60 BPM, which means one beat will be played each second.

What happens if you create a sequence of “play note” blocks and use the same beat but change the tempo?



Achievery Unit

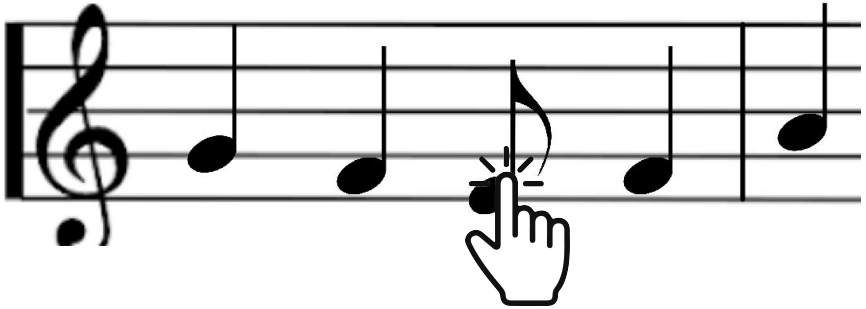
Notation and Rhythm

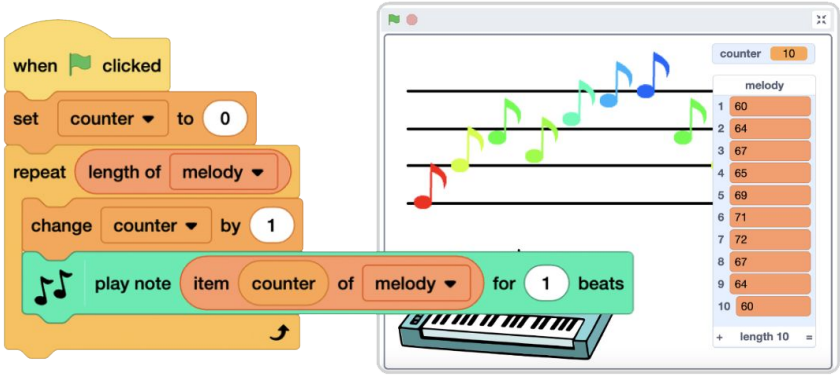
How do you think technology and computers have affected music creation? Use Scratch for interactive musical notation.

Check out our Achievery Unit "Notation and Rhythm" and bring your music notation to life!

See our example project "Notation and Rhythm," or create your own unique project.

Level up by storing song notes in a list that creates a musical score that can be played.





Example project 962308051 and more on Variables

Achievery Unit

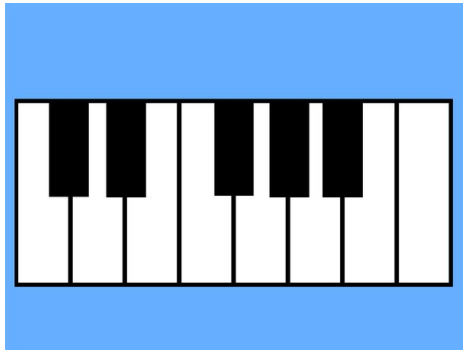
Code a Digital Piano

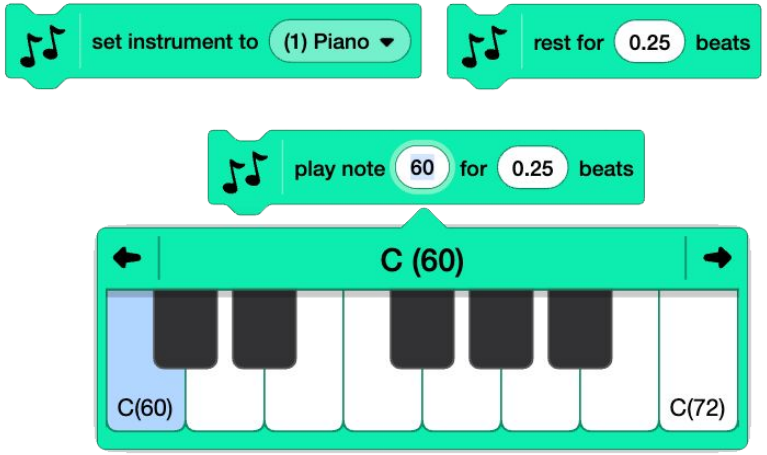
Create a digital piano! Draw a piano key sprite. Then, attach a note to it using the music extension blocks.

Check out our Achievery Unit "Code a Digital Piano." Explore and remix our starter project "Piano," or create your own unique project.

The beat or BPM (beats per minute) is a basic rhythmic unit of a measure. Try adjust using different numbers.

Try changing the instrument, either via a slider or by changing the script.





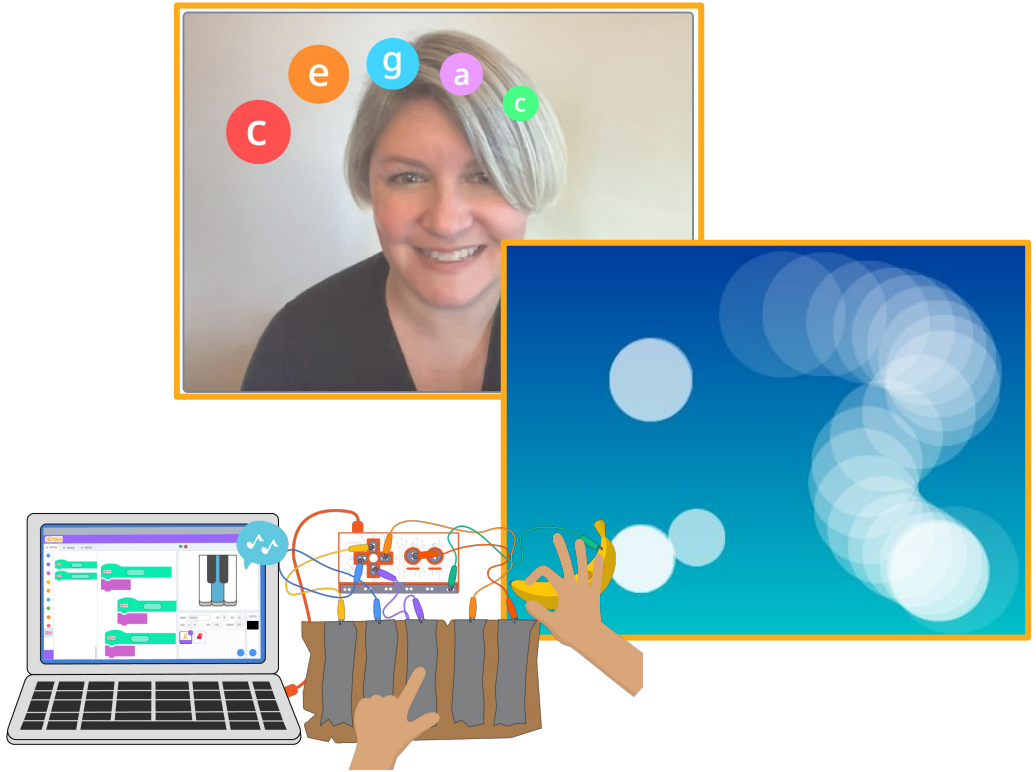
Starter Project

Alternate Pianos

Check out our starter projects “Musical Buttons using Video” or “Musical Droplets” as examples of using video motion or the position of the mouse to play notes.

Another way to extend this lesson is to use a Makey Makey to turn your digital keyboard into a physical one using conductive materials like bananas, foil, etc., as the physical keys.

More on Makey Makey and Video Sensing, or see our coding cards

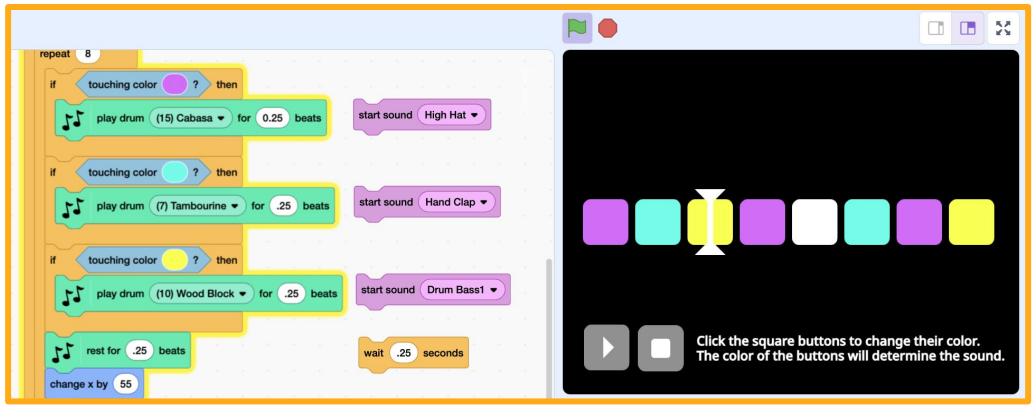


Starter Project

Drum Sequencer

Check out our starter project "Drum Sequencer," an interactive project where the user creates the beat.

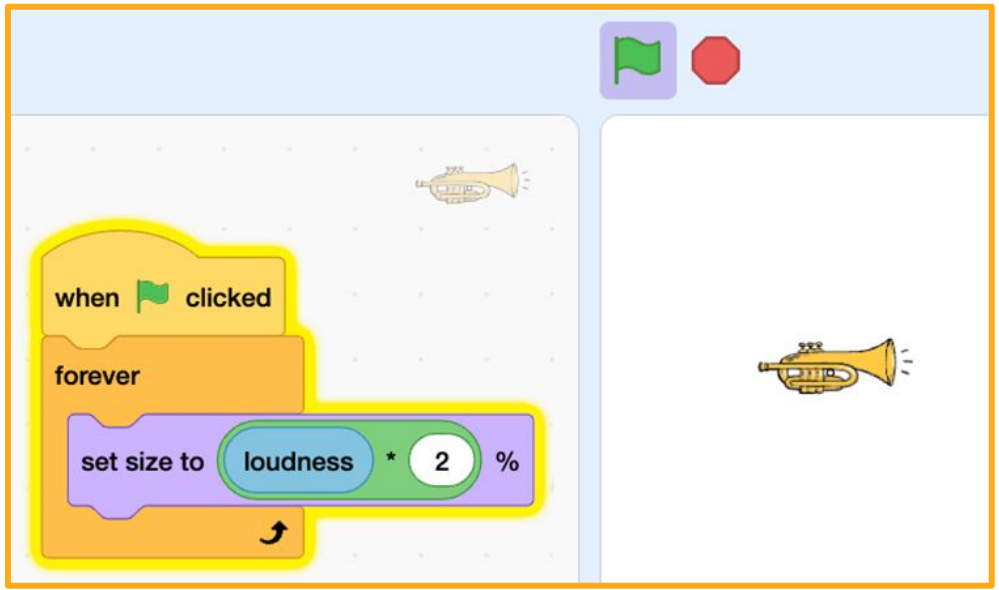
The starter project uses sounds from the library, but you could experiment with additional drum sounds by using the "play drum _ for _ beats" block from the music extension.

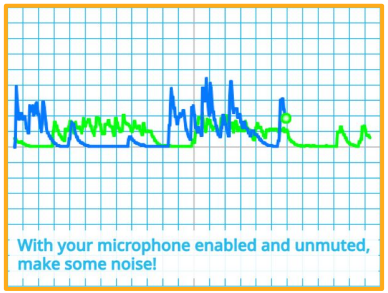


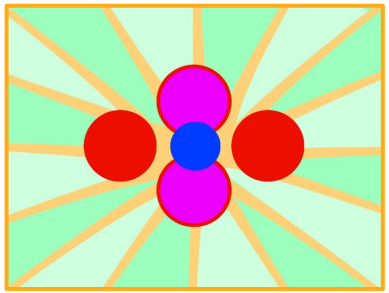
Loudness

Did you know there is also a “loudness” reporter block under the Sensing category that records the “loudness” of the noise that a microphone receives, on a scale of 0 to 100, to control things in Scratch?

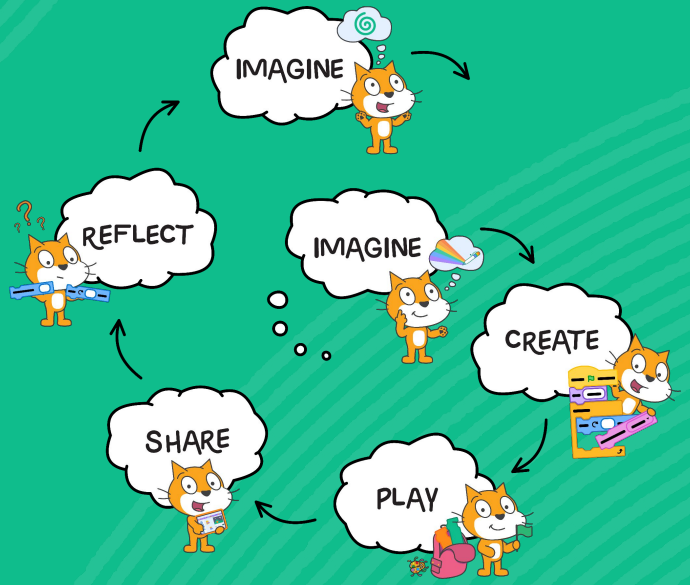
How could you use this in a project? Try using it in the “set size” block inside a “forever” loop. Then, make some noise!







More on the Loudness block
Starter projects Sound Graph and SoundFlower



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.

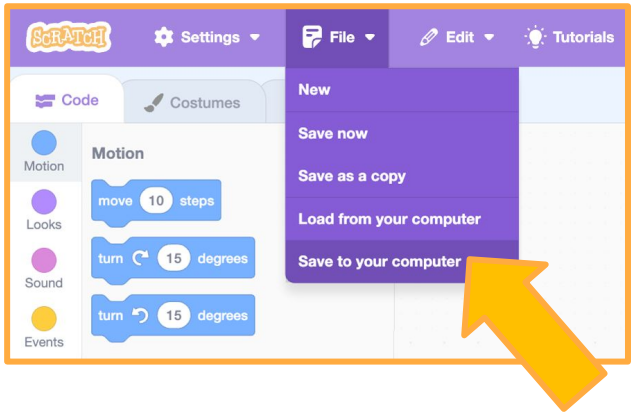
For a music project, pairing up users who are interested in the work of foley artists (a sound effects professional who creates sounds for media) with users who have more experience coding, for example, can create rich and dynamic projects in addition to opportunities for them to teach and learn from each other.

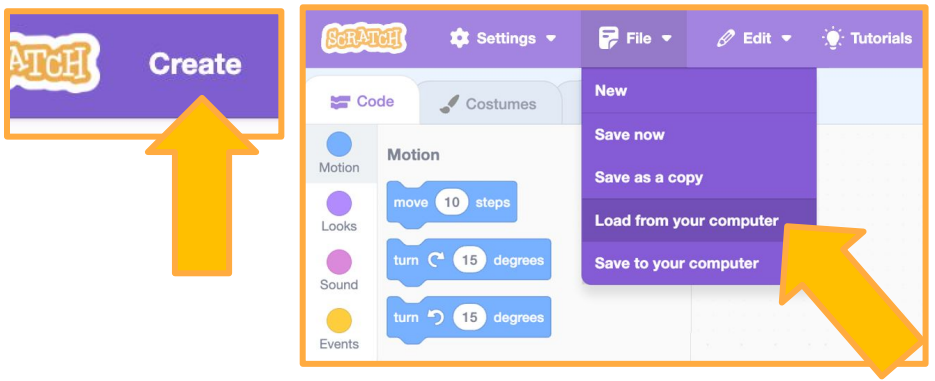
Saving

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.





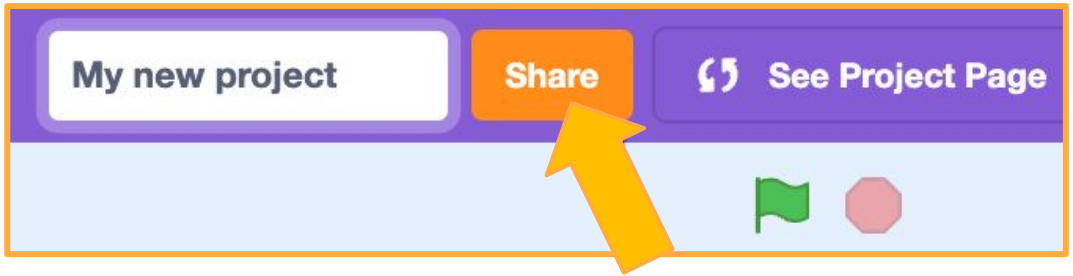
Share Your Project

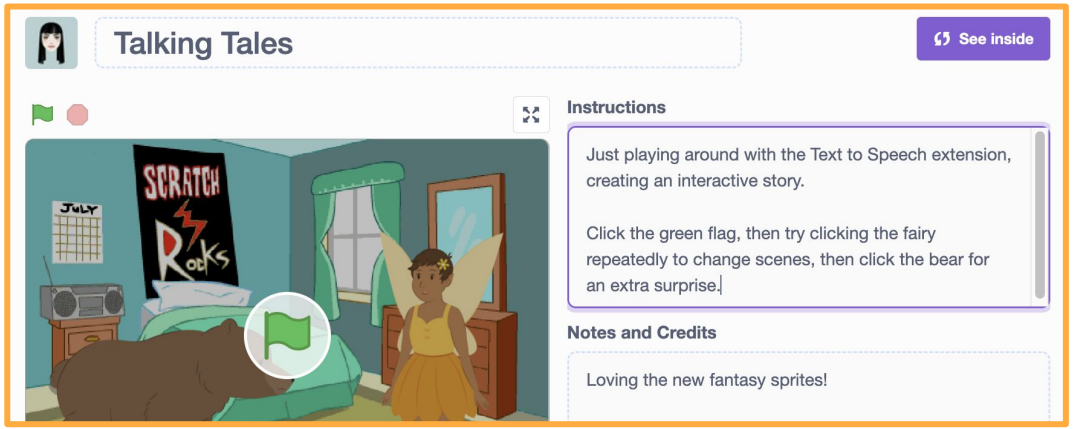
If you have a Scratch account, you can share your project and add it to studios.

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.

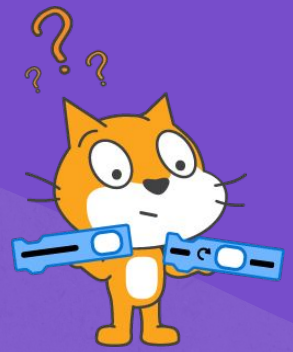
Share Option #2: Gallery Walk

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, our Lesson Plan | Make Some Noise: Exploring Sounds and Music in Scratch and Coding Cards | Sound and Music 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

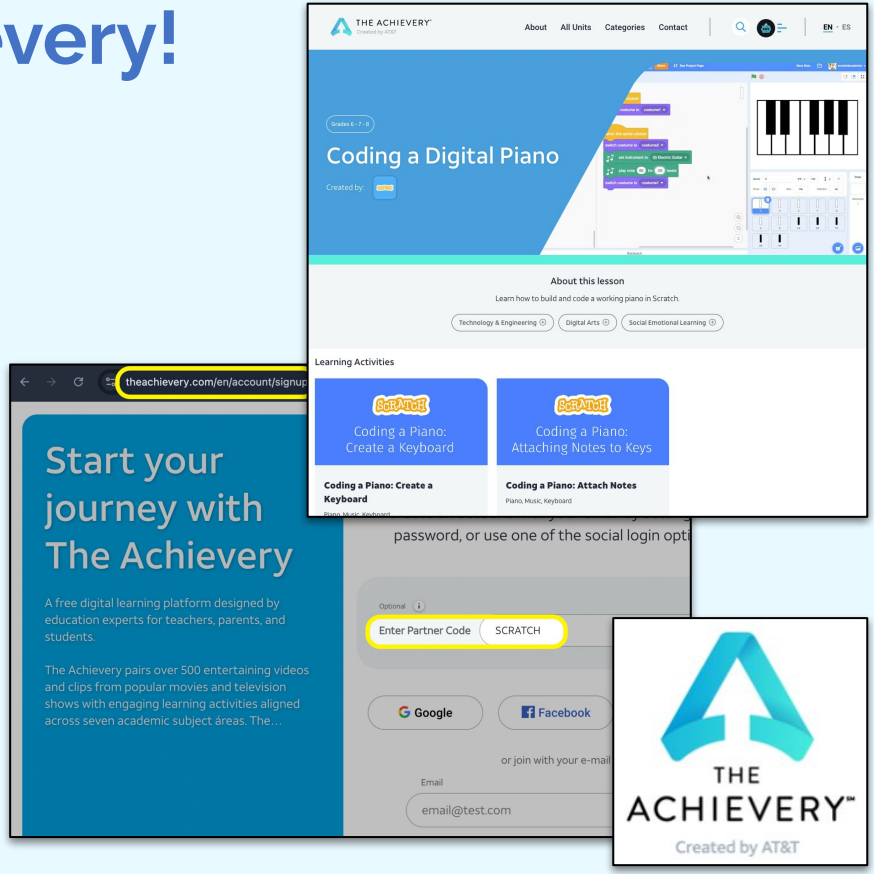
Find Scratch on The Achievery!

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