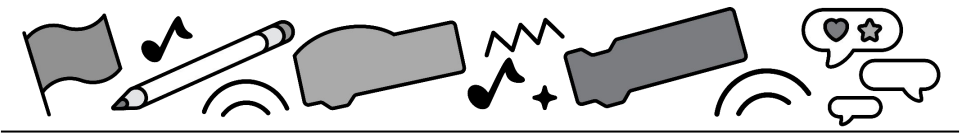
Build the Change

What design features are important to consider if you are creating a building that is good for the well-being of the environment and people in the community?

The LEGO Group X SCRATCH

Creating Sustainable Futures



Cards in This Pack

- Create Your Sprites
- Remove Image Backgrounds
- Code Your Sprite
- Add Digital Elements
- Using the Paint Editor
- Collaborate: Export or Backpack / Collaborate: Remix
- Interactive Prototype with Makey Makey

Combine with other cards like “Imagine a World,” “Animate a Character,” or “Create a Story” to learn how to animate your sprites!

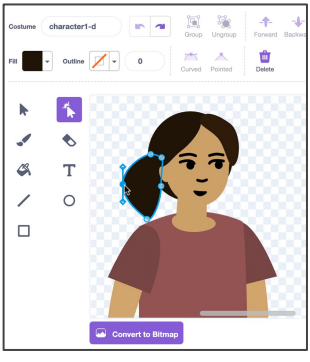
Create Your Sprites

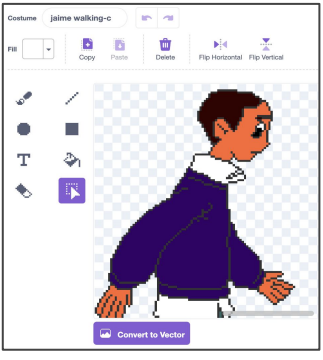
Options:

- **Upload a picture**: Take a picture of your physical prototype and upload it into Scratch as a sprite.

  You may want to take pictures of individual pieces to animate seperately.

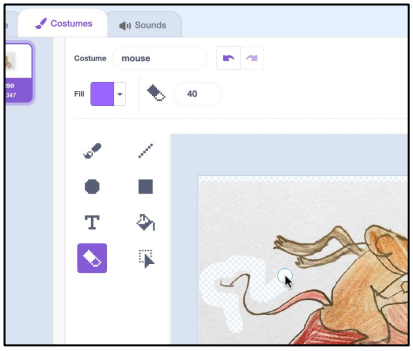
- **Create a sprite using the Scratch paint editor tools.**





- There are two modes for using the paint editor in Scratch:
    - **Vector-mode** allows you to create and edit shapes (Scratch default).
    - **Bitmap-mode** allows you to edit photos and paint with pixels.
- To upload a file as a sprite, hover over the sprite menu in the lower-right corner of the sprite area and choose “Upload.” Then, select the file you want to create a sprite from. Your image will appear on the costume tab as bitmap when it has been uploaded.

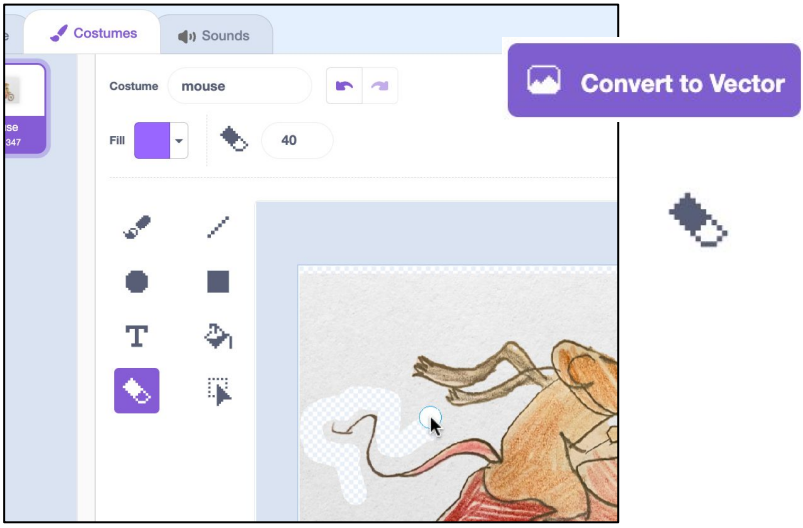
Remove Image Backgrounds



It is best if the images you chose have a transparent background, such as a PNG with transparent background or SVG file.

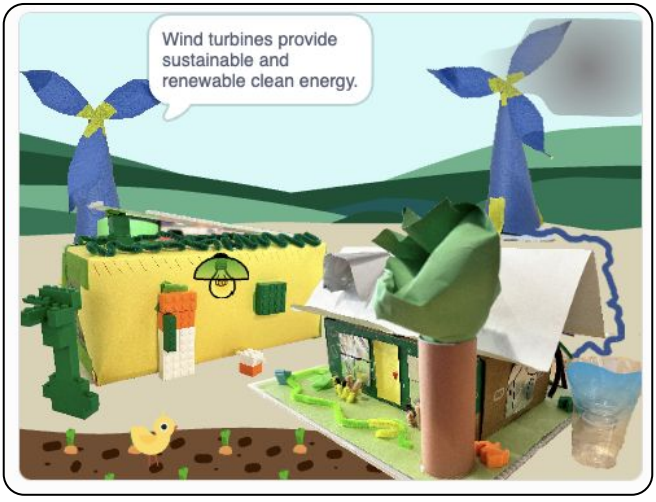
Options:

- You can remove the background using the **tools in the Scratch paint editor** after a file has been uploaded.
- Or, before you upload the file, using **online tools or software**.



- In the Scratch paint editor in bitmap-mode, use the eraser tool to remove the background or other pieces you don't want from your image.
- You'll know you are in bitmap-mode when you see the "Convert to Vector" button at the bottom of the screen.

Code Your Sprite



Options:

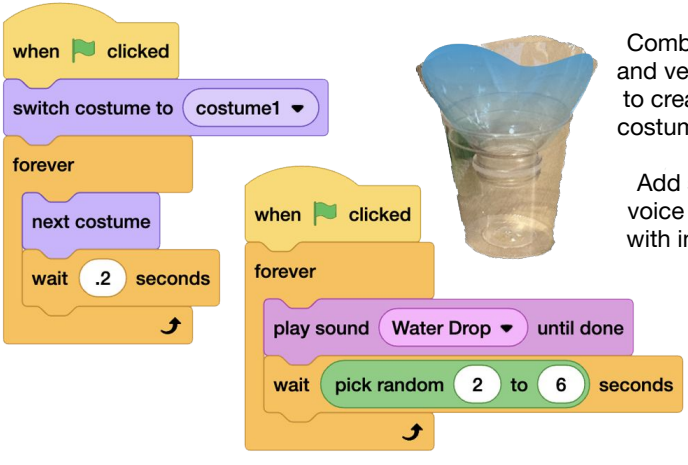
- Create an **informational project**.
- Create a **story with characters** and your prototype as a background.
- **Animate elements** or **add interactivity**.

Example project scratch.mit.edu/projects/981427021 by algorithmar

Code Your Sprite

scratch.mit.edu

IDEAS TO TRY

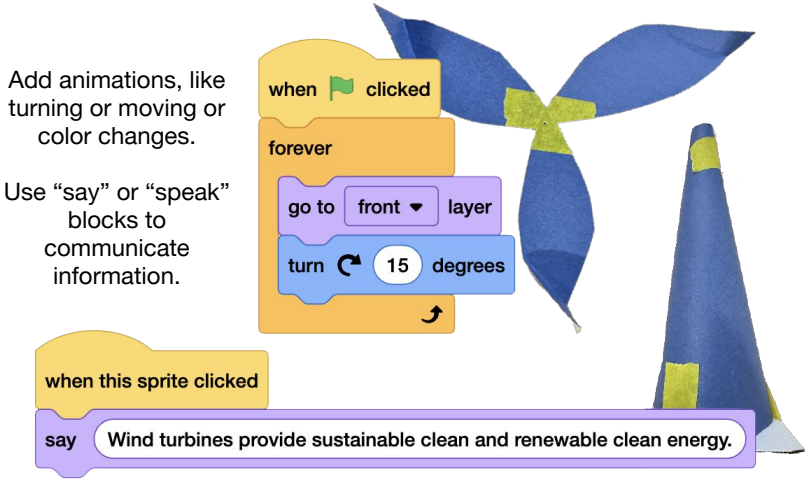


Combine photos and vector shapes to create multiple costume changes.

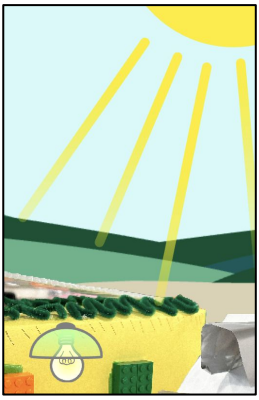
Add sounds or voice recordings with information.

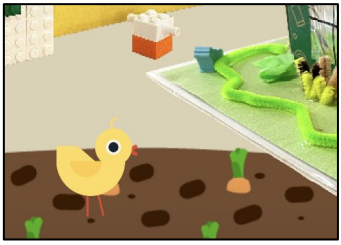
Add animations, like turning or moving or color changes.

Use “say” or “speak” blocks to communicate information.



Add Digital Elements

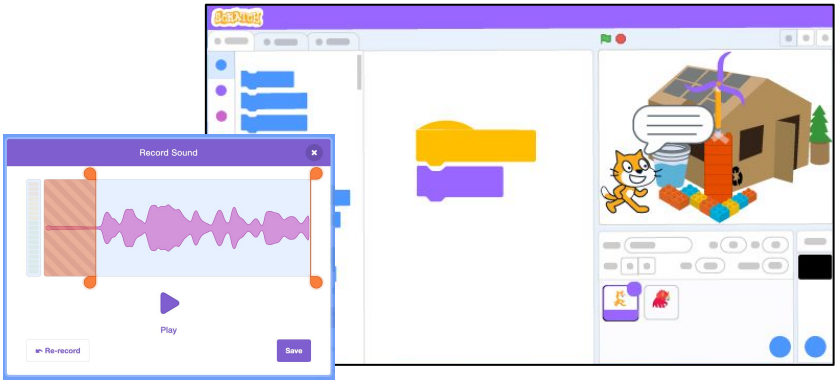




Options:

- Add a narrator sprite(s) to share information.
- Create a background (or two!) to represent how your prototype would fare in different seasons
- What additional elements did you want to represent (like animals or plants) that you could add and animate digitally?

Add Digital Elements



- What environmental sounds could you add or create that represent the area where your prototype resides? (Birds or other animals, water, electricity…)
- Have others created relevant sprites that you can remix and use in your project to add additional elements? (Just make sure to give credit to the original creator on your project page.)

Using the Paint Editor

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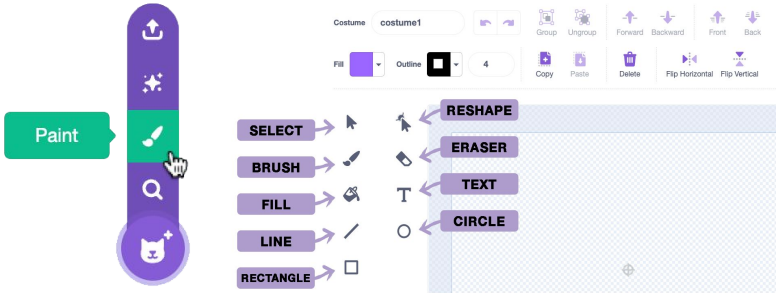
TOOLS TO TRY



	Click and drag with the Line, Circle, or Rectangle tools to **create a shape**. Hold down the Shift key while dragging to create equal sides, or 45 and 90 degree angles with lines.
	Using the Select tool, select a shape and click and drag one of the corner points to **resize** it.
	To **rotate** a shape once you've made it, use the Select tool to grab the anchor under the shape and drag it. Hold down the Shift key while dragging to rotate at 45 degree angles.
	Using the Reshape tool, click on one of the points of a shape and **move the point** around to alter the shape. Click + Shift key to select and move multiple points at once.
	Using the Reshape tool, click on a part of the shape that doesn't have a point to **add a new point**, or click on a point and press "Delete" to **remove a point**.

Using the Paint Editor

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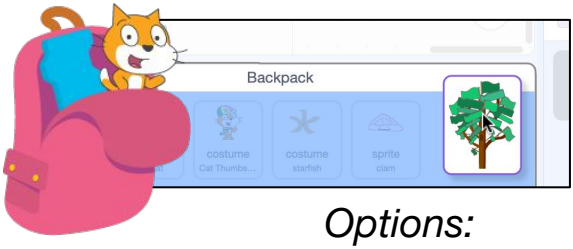
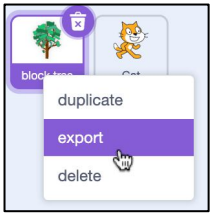
	Using the Reshape tool, click on a point and choose whether it is **curved or pointed**. Click on a point and drag rotate the handles attached to the point to **alter the shape of a curve**.
	Using the Select tool, select a shape and click the buttons on the top menu to **copy and paste** a duplicate.
	Using the Select tool, select a shape and click the flip horizontal or flip vertical buttons on the top menu to **flip** a shape.
	Using the Select tool, select a shape and click the Forward, Backward, Front, or Back buttons to change the **layer order.**
 	Select the fill from the dropdown and use the fill (paint bucket) tool to adjust a shape's color. Or using the Select tool, select a shape and then use the Fill and Outline dropdowns to adjust the **color, saturation, brightness, and outline**. You can also choose to use a **gradient**. Use the eyedropper to select a color from another shape. Use the red strikethrough to fill with no color.
	Using the select tool and holding down the "Shift" key, select multiple shapes to **group** them (helpful to move several shapes together).
	Use the brush tool for **freehand line drawing**. The example to the right shows hand drawn whiskers.
	Use the **eraser** tool to remove parts of the drawing from *all* shapes and layers it comes into contact with when clicking and dragging. You can use the reshape tool to then adjust the new points created.
	The **text** tool comes with a dropdown list of font options to choose from, and Fill and Outline dropdowns to change text color and outline.

Collaborate: Export or Backpack

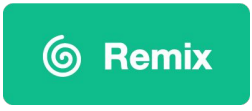




Options:

- **Export a sprite, costume, or sound:** Right-click the asset. Choose “export.” To add the asset to a project, choose the **upload** option in the sprite, costume, or sound menu to upload from your files.
- **Backpack a sprite, costume, or sound:** You must be logged in to access the backpack at the bottom of the editor screen. Click it to open the backpack and drag-and-drop a sprite, costume, or sound inside. To add the asset to a different project, open the backpack and drag-and-drop the asset into the sprite, costume, or sound area.

Collaborate: Remix



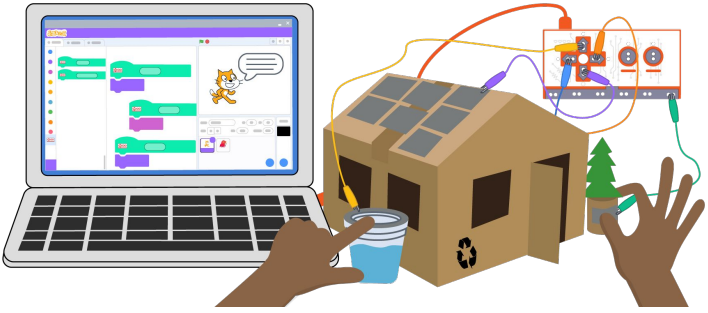
Scratch embraces remix culture. Remixing is when you build upon someone else's projects, code, ideas, images, or anything else shared on Scratch to make your own unique creation.

When remixing an asset, **make changes** like:

- adding code to animate the asset
- placing it in a new scene with other assets or add related sounds
- using the tools in the paint or sound editor to make adjustments to it
- adding additional elements you felt were missing

Just make sure that you **give credit** to whomever created the original asset in the Notes and Credits section.

Interactive Prototype with Makey Makey



1. Plug the Makey Makey Board into a computer using the provided cable.

2. Add conductive materials (conductive paint or tape, foil, Play-doh, scrap metal, etc.) to points on your prototype, and attach alligator clips connected to keyboard inputs on the Makey Makey.

3. Open Scratch. Create a new project where sprites provide additional information or are animated when participants interact with your work.

Interactive Prototype

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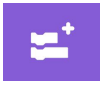
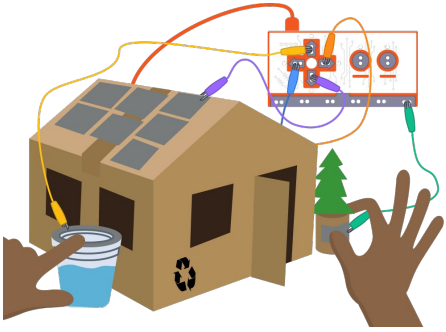
GET READY

Choose any sprite.



Optional: Add the Makey Makey Extension, or use the "when [space] key pressed" block under the Events category.

ADD CODE AND TEST



Connect the conductive points on your prototype to alligator clips. Don't forget to establish EARTH.

Close the circuit to register each keyboard press by touching EARTH and each spot on the prototype.

Add code to play a sound (like a recording of your voice) or have your sprite say something when different pieces of the prototype are touched.