CRIMSON NET

MANUAL

INTRODUCTION

CrimsonNet is a Scratch 1.4 modification. Scratch is a programming language that makes it easy to create interactive stories, games, and animations – and share your creations with others on the web.
The Reference Guide provides an overview of this modification. If you are just getting started with Scratch 1.4 itself, we encourage you to try the Getting Started Guide and look at the Help Screens first.
This introduction goes over the essentials of Scratch from the Scratch 1.4 Reference Guide. For the full guide, read the Scratch 1.4 **Reference Guide**.

SETUP

To set it up, download the .image file and set the MIME type (the thing that tells Windows/GNU/Linux/MacOS which program to open a file) to Scratch 1.4.
If you need help, go to the **MIME Type Help** on this project's GitHub page.

BASIC INGREDIENTS OF A SCRATCH PROJECT

Scratch projects are made up of objects called sprites. You can change how a sprite looks by giving it a different costume. You can make a sprite look like a person or a train or a butterfly or anything else.
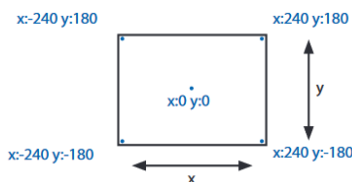You can use any image as a costume: you can draw an image in the Paint Editor, import an image from your hard disk, or drag in an image from a website.
You can give instructions to a sprite, telling it to move or play music or react to other sprites. To tell a sprite what to do, you snap together graphic blocks into stacks, called scripts. When you click on a script, Scratch runs the blocks from the top of the script to the bottom.

SCRATCH INTERFACE

SAVE
LANGUAGE
SHARE
SPRITE ROTATION STYLE
CURRENT SPRITE INFO
TABS
Edit scripts, costumes, or sounds.
TOOLBAR
VIEW MODE
Change to large or small stage view.
PRESENTATION MODE
Present your project.

BLOCKS PALETTE
Blocks for programming your sprites.

GREEN FLAG
A way to start scripts.

STOP SIGN
Stops all scripts.

STAGE
Where your Scratch creations come to life.

MOUSE X-Y DISPLAY
Shows location of cursor.

NEW SPRITE BUTTONS
Create a new character or object for your project.

SPRITE LIST
Thumbnails of all your sprites. Click to select and edit a sprite.

SCRIPTS AREA
Drag blocks in, snap them together into scripts.

STAGE

The Stage is where you see your stories, games, and animations come to life. Sprites move and interact with one another on the Stage.
The Stage is 480 units wide and 360 units tall. It is divided into an x-y grid. The middle of the Stage has an x-coordinate of 0 and a y-coordinate of 0.

x:-240 y:180   x:240 y:180
x:0 y:0
y
x:-240 y:-180   x:240 y:-180
x

To find out x-y positions on the Stage, move the mouse (cursor) around and look at the mouse x-y display just below the **Stage**.

x: 75   y: 25

Click the **Presentation Mode** button when you want to present your project. To exit **Presentation Mode**, press the Esc key.

Click the **View Mode** buttons to switch between small and large stage views. You can use a small stage view to display Scratch on small screens or to expand the **Scripts Area.**

NEW SPRITES

When you start a new Scratch project, it begins with a single default sprite.
To create new sprites, click on these buttons:

Paint your own costume for a new sprite using the Paint Editor.

Select a costume for a new sprite – or import an entire sprite.

Get a surprise sprite.

If you want to delete a sprite, select the scissors from the Toolbar and click on the sprite.
Or right-click (Mac: Ctrl+click) on the sprite and select delete from the pop-up menu.

To make a sprite that looks like part of the Stage background, right-click (Mac: Ctrl+click)
the **Stage** and select grab screen region for new sprite

The **Sprite List** displays thumbnails for all sprites in a project. The name of each sprite
appears below its thumbnail.

To see and edit a sprite's scripts, costumes, and sounds, click on the sprite's thumbnail
in the Sprite List – or double-click on the sprite itself on the Stage. (The selected sprite is
highlighted and outlined in blue in the **Sprite List**.)

To show, export, duplicate, or delete a sprite, right-click (Mac: Ctrl+click) on the sprite's
thumbnail in the **Sprite List**. To show a sprite that is off the Stage or hidden, Shift+click
on the sprite's thumbnail in the Sprite List - this will bring the sprite to the middle of the
Stage and show it.

You can rearrange the sprites in the Sprite List by dragging the thumbnails.
Just as a sprite can change its appearance by switching costumes, the Stage can change

its appearance by switching backgrounds. To see and edit the scripts, backgrounds, and sounds associated with the Stage, click on the Stage icon at the left of the Sprite List.

BLOCKS PALETTE and SCRIPTS AREA

To program a sprite, drag blocks from the **Blocks Palette** to the **Scripts Area**. To run a block, click on it.

Create scripts (programs) by snapping blocks together into stacks. Click anywhere on the stack to run the whole script, from top to bottom.

To find out what a block does, right-click (Mac: Ctrl+click) on it, then select help from the pop-up menu (DOES NOT WORK WITH THE EXTRA BLOCKS.).

When you drag a block around the **Scripts Area**, a white highlight indicates where you can drop the block and form a valid connection with another block.

To move a stack, pick it up from the top block. If you drag out a block from the middle of a stack, all of the blocks beneath it will come along with it. To copy a stack of blocks from one sprite to another, drag the stack to the thumbnail of the other sprite in the Sprite List.

Some blocks have white editable text fields inside, such as the move (10) steps block. To change the value,

click inside the white area and type in a number. You can also drop rounded blocks, like the (X Position) variable, inside these areas.
Some blocks also have pull-down menus, such as set instrument to (1). Click on the to see the Menu.

To clean up the **Scripts Area**, right-click (Mac: Ctrl+click) and select clean up from the menu. To export a screenshot of the Scripts Area, right-click and select save picture of scripts.

To add a comment to the **Scripts Area**, right-click (Mac: Ctrl+click) and select add comment. A yellow comment area will appear, and you can type in text.

To resize the width of the comment area, use the handle on the right edge. Click the triangle at the top-left to collapse or expand the comment area.

Comments can be added anywhere in the Scripts area, and you can move them around by dragging them.

To attach a comment to a block, drag the comment on top of the block. To detach the comment, drag the comment away from the block.

COSTUMES

Click the Costumes tab to see and edit the sprite's costumes.

This Sprite has two costumes. The sprite's current costume (girl1-walking) is highlighted. To switch to a different costume, simply click on the thumbnail of the costume you want.

There are four ways to create new costumes:
Click Paint to paint a new costume.
Click Import to open a picture in Scratch from your hard disk.
Click Camera to take photos from a webcam (built into or connected to your computer).

Scratch recognizes many image formats: JPG, BMP, PNG, GIF (including animated GIF).

Each costume has a costume number (displayed to its left). You can rearrange the order of the costumes by dragging the thumbnails. The costume numbers update if you change their order.

Right-click (Mac: Ctrl+click) on a costume thumbnail to convert the costume into a new sprite, or to export a copy of the costume as a separate file.

SOUNDS

Click the Sounds tab to see the sprite's sounds.

You can record new sounds or import sound files. Scratch can read MP3 files and uncompressed WAV, AIF, and AU files (encoded with 8-bits or 16-bits per sample, but not 24-bits per sample).

CURRENT SPRITE INFO

Current Sprite Info shows a sprite's name, x-y position, direction, lock state, and pen state.

You can type in a new name for the sprite.
The sprite's direction indicates which direction the sprite will move when it runs a move block (0=up, 90=right, 180=down, -90=left). The blue line on the thumbnail shows the sprite's direction.
You can drag this line to change the sprite's direction. Double-click on the thumbnail to set the direction back to its original state (direction=90).
Click the Lock to change the sprite's lock state. An unlocked sprite can be dragged in presentation
mode and the web player.
You can see the current pen color (next to the Lock) when the pen is down.
To export a sprite, right-click (Mac: Ctrl+click) the sprite on the **Stage** or in the **Sprite List**.
Exporting saves the sprite as a .sprite file, which can then be imported into another project.

ROTATION STYLE

Click the **Rotation Style** buttons to control how the costume appears as the sprite changes its direction.

Rotate: The costume rotates as the sprite changes direction.
Left-right flip: The costume faces either left or right.
No-rotate: The costume never rotates (even as the sprite changes direction).

TOOLBAR
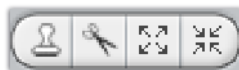
Click on the **Toolbar** to select a tool, then click on other objects to perform an action.
Duplicate: Duplicate sprites, costumes, sounds, blocks, or scripts. (Shift+click for multiple.)
Delete: Delete sprites, costumes, sounds, blocks, and scripts. (Shift+click for multiple.)

Grow: Make sprites bigger. (Shift+click for larger size steps.)
Shrink: Make sprites smaller. (Shift+click for larger size steps.)
To return to the arrow cursor , click on any blank area of the screen.

MENU
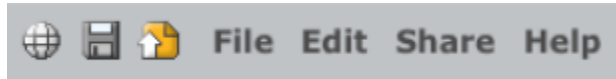
Click the **Language** icon to change the language for the Scratch user interface (NOTE: The custom blocks only work in English).

Click the **Save** icon to save your project.

Click the **Share** icon to upload your project to the Scratch website if it ***does not*** have any of CrimsonNet's custom blocks. If it does, you can share it on a file sharing site.

From the **File** menu you can create a new project, open an existing project, and save projects to the Scratch Projects folder or to other locations.
Import Project brings all of the sprites and backgrounds from another project into the current project. This feature is useful for combining sprites from multiple projects.
Export Sprite saves the current sprite as a .sprite file, which can then be imported into another project.
Project Notes allows you to write and save notes about your project, such as instructions on how to use it.
Quit exits the Scratch program.

The **Edit** menu provides several features for editing the current project.
Undelete allows you to retrieve the last block, script, sprite, costume, or sound you deleted.
Start Single Stepping allows you to watch Scratch programs run one step at a time. Each block is highlighted as it runs. This feature can be useful for finding bugs in programs, and for helping new programmers understand the flow of a program.
Set Single Stepping allows you to choose the speed of single stepping (from slow to turbo speed).
Compress Sounds or **Compress Images** to reduce the overall project file size. Compressing may reduce the quality of the sounds or images.
Show Motor Blocks adds motor blocks to the Motion category. You can use the motor blocks to program a motor connected to your computer. The motor blocks work with LEGO® Education WeDo™ 1.0 .

From the **Share** menu you can upload your project to the Scratch website if it ***does not*** have any of CrimsonNet's custom blocks. If it does, you can share it on a file sharing site.

Shift+Clicking the **Share** Menu gives you Mesh options and will reveal two items: **Host Mesh** and **Join Mesh**.
Mesh allows users to interact over a local computer network by making projects share variables and broadcasts.

Host Mesh begins a Mesh session and shows the user's local IP address. (This address is useful *only* for connecting over a local area network or LAN.)

Join Mesh joins a Mesh session given an IP address.
(If you forget the IP address of your computer, Shift-click **Share** and go to Show IP Address.)

Many devices can be connected to a single Mesh session if your network bandwidth allows so. Otherwise, the number of devices can vary.

From the **Help** menu you can access a Help page with links to Scratch 1.4's reference materials, tutorials, and frequently asked questions. You can also access a page with all the Scratch help screens.
If you need help with the custom blocks, go to the **Help Screens** on this project's GitHub page.

GREEN FLAG

The **Green Flag** provides a convenient way to start many scripts at the same time.

Click the Green Flag 🚩 (at the top-right corner of the stage) to start all scripts that have

when 🚩 clicked at the top.
The Green Flag remains highlighted while scripts are running.
In **Presentation Mode**, pressing the Enter key has the same effect as clicking the Green Flag.

PAINT EDITOR

You can use the **Paint Editor** to create or edit costumes and backgrounds.
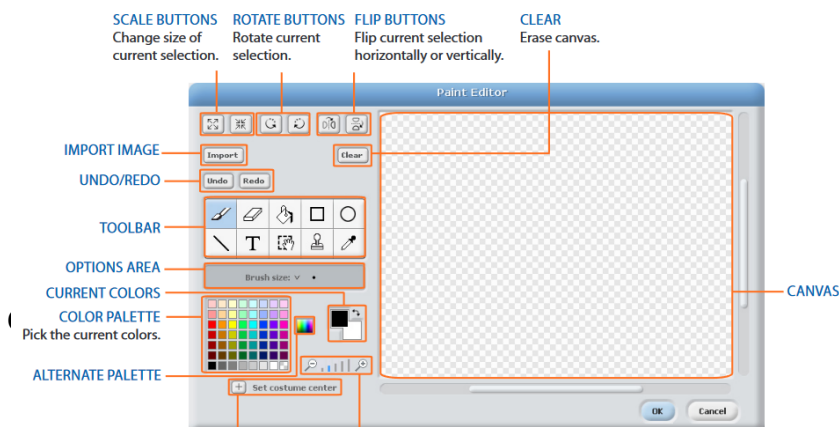
The Paint Editor **Toolbar** has the following tools:

Paintbrush: Paint freehand using the current foreground color. When you click on this tool, the Options Area shows the brush size. Click to pick a different brush size.

Eraser: Erase with freehand strokes. The areas that you erase become transparent. When you click on this tool, the Options Area shows the eraser size. Click to pick a different eraser size.

Fill: Fill connected areas with a solid color or gradient. When you click this tool, the Options Area shows the fill style (solid color, horizontal gradient, vertical gradient, or radial gradient). Gradients blend from the selected foreground color to the selected background color.

Rectangle: Draw a filled or outlined rectangle (Shift+drag for a square) using the current foreground color. When you click this tool, the Options Area shows the fill style (solid or outlined). The outline thickness is determined by the paintbrush size.

Ellipse: Draw a filled or outlined ellipse (Shift+drag for a circle) using the current foreground color. When you click this tool, the Options Area shows the fill style (solid or outlined). The outline thickness is determined by the paintbrush size.

Line: Draw a straight line (Shift+drag for a horizontal or vertical line) using the current foreground color. When you click on this tool, the Options Area shows the brush size. Click to pick a different brush size.

Text: Add text to the drawing. When you click on this tool, the Options Area allows you to change the font face and font size. Each costume can only have one block of text.

Selection: Select a rectangular region, then move it to a new location (press delete to remove the selection, Shift+delete or Shift+backspace to crop).

Stamp: Select a rectangular region, then copy it to new locations (Shift+click+drag for repeated stamping).

Eyedropper: Use the tip of the eyedropper to choose the foreground color (click on the Canvas and drag the eyedropper to pick a color from outside the Canvas).

The **Current Colors** (foreground and background) are shown below the Options Area. You can click the color swap arrow to exchange the foreground and background colors. Click in the Color Palette to pick a new foreground color (Shift+click to select a background color). To switch

between the default palette and the continuous color palette, click the **Alternate Palette**.

Click the **Set Costume Center** button to select the location within the drawing that will be used as the center of rotation when the Costume is rotated on the Stage.

Click the **Zoom** buttons (in or out) to increase or decrease the view magnification of the Canvas. When the zoom is greater than 100%, scroll bars are used to pan around the Canvas. Zoom does not change the size of the image.

To change the size of the Canvas content, or just the current selection, click on the **Scale** buttons (grow or shrink). You can Shift+click on the buttons to enter a precise value. Shrinking decreases the size and resolution of the image.

To rotate the Canvas content, or just the current selection, click on the **Rotate** buttons (counter-clockwise or clockwise). You can Shift+click on the buttons to enter a precise value.
To flip the Canvas content, or just the current selection, click on the Flip buttons (horizontal or vertical).

Click on the **Import** button to open an image from file and add it to the Canvas.

Click the **Clear** button to remove all content from the Canvas.

If you make a mistake, you can click the **Undo** button repeatedly to undo the last several actions.

If you change your mind, you can click the **Redo** button to restore the undone actions.

SCRATCH BLOCKS

TYPES OF BLOCKS

There are three main types of blocks in the **Blocks Palette**:
Stack Blocks: These blocks have bumps on the bottom and/or notches on the top, such as . You can snap these blocks together into stacks. Some stack blocks have an input area inside them, where you can type a number (such as 10 in the block) or choose an item from a pull-down menu (such as pop in the block). Some stack blocks, such as , have a C-shaped "mouth" where you can insert other stack blocks.

Hats: These blocks have rounded tops, such as . These blocks are placed

at the tops of stacks. They wait for an event to happen, such as a key being pressed, then run the blocks underneath them.

Reporters: These blocks, such as and [x position], are designed to fit in the input area of other blocks.

Reporters with rounded ends (such as [x position] or [variable]) report numbers or strings, and fit in blocks with rounded or rectangular holes (such as [set size to 100 %] or [say]).

Reporters with pointed ends (such as [mouse down?]) report **boolean** values (true or false) and fit inside

blocks with pointed or rectangular holes (such as [wait until]).
Click on any reporter block to see its current value.

Some reporter blocks have a check box next to them, such as [☐ x position]. If you click in the check box, a **monitor** appears on the stage, displaying the current value of the reporter. As the value of the reporter changes, the monitor updates automatically. A monitor can display the value of the reporter in several different formats:

a small readout with the name of the reporter
a large readout without any name
a slider that allows you to manipulate the value
of the reporter (available only for variables)

Double-click or right-click (Mac: Ctrl+click) on a monitor to change from one format to another. The slider format is available only for user-created variables. Right-click (Mac: Ctrl+click) on the monitor in slider format to adjust its minimum and maximum values.

LISTS

You can create and manipulate lists in Scratch. Lists can store numbers as well as strings of letters and other characters.

To create a list, go to the Variables blocks category and click **Make a list**. Once you make a list, several list blocks will appear. The list blocks are described in the **Block Descriptions** section In the Scratch 1.4 **Reference Guide**.

When you create a list, a list monitor will appear on the stage. A list monitor shows all the items in a given list. You can type items directly into a list monitor.
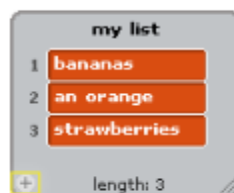
At first the list will be empty, with length 0. To add to the list, click the + button on the bottom left of the list monitor. The length will increase by 1. Alternatively, you can add to the list using the list blocks (e.g).

You can resize the list monitor from the bottom right-hand corner.

Note: You can right-click (Mac: Ctrl+click) on a list monitor to export a list to a plain .txt file. You can also import any saved plain .txt files with values on separate lines.

STRINGS

Strings are made of letters, words, or other characters (e.g., apple; October 2009; You win!).

Strings can be stored in variables or lists (such as or).

You can join together strings using . You can compare strings using the following blocks: , , or .

Strings are evaluated as 0 in mathematical operation blocks (such as:) and in blocks that expect a number (such as and).

KEYBOARD INPUT

You can use to prompt a user to type in a response on the keyboard. The response is stored in . The question appears on the screen and the program waits until the Enter key is pressed or the check mark is clicked.

The question appears in a voice balloon when used in a sprite.

The question appears at the bottom of the screen when used in the Stage.

 is shared by all sprites (global) and is changed each time it runs. If you want to save the current answer, you can store it in a variable or list, such as:

BLOCK DESCRIPTIONS

The Scratch blocks are organized into eight color-coded categories: Motion, Looks, Sound, Pen, Control, Sensing, Operators, and Variables. To look at these, Open the Scratch 1.4 **Reference Guide**.

For the custom blocks, go to the **Help Screens** section of this project's [GitHub site](#).

SYSTEM REQUIREMENTS FOR SCRATCH VERSION 1.4

Computer OS:

Windows XP, Windows 2000, Windows Vista, 7, 8, 8.1, 10, 11
Mac OS X 10.4 or later

Display:

800x480 or larger, thousands or millions of colors (16-bit color or greater).

Disk:

At least 120 megabytes of free space to install Scratch
Note: Scratch comes with a large media library and a collection of Sample projects. If you have
very limited disk space, you can delete the Media and Projects folders from the Scratch folder.

Memory:

Most computers have enough memory to run Scratch. Older computers may run
Scratch slowly.

Sound:

To take advantage of sound output and input, you need speakers (or headphones) and a
microphone. Many laptops have speakers and microphones built in.

THANKS

This is a modification of Scratch 1.4. Scratch is developed by and is the copyright of the Lifelong
Kindergarten group at the MIT Media Lab. See https://scratch.mit.edu.

This manual contains text from the **Scratch 1.4 Reference Guide** and the **Scratch Wiki**.