Interactive Stories – Reinforcement Handout

Computer Programs:

A computer program is a series of instruction that tell a computer to perform an action. Computer programs are a defined set of algorithms or processes that are completed in order to achieve a task.

A program is created using a programming language, which allows a computer programmer to write lines of code that the computer can understand.

Everything that a computer does is achieved using a program, whether that be browsing the web with or processing a document using Microsoft Word.

What is Scratch?

Scratch is a free visual programming language developed to help simplify the process of creating and programming animations, games, music, interactive stories and more.

With Scratch, you can program your own interactive stories, games, and animations — and share your creations with others in the online community.

Scratch is designed especially for ages 8 to 16, but is used by people of all ages. Millions of people are creating Scratch projects in a wide variety of settings, including homes, schools, museums, libraries, and community centers.

Scratch is a project of the Lifelong Kindergarten Group at the MIT Media Lab. It is provided free of charge.
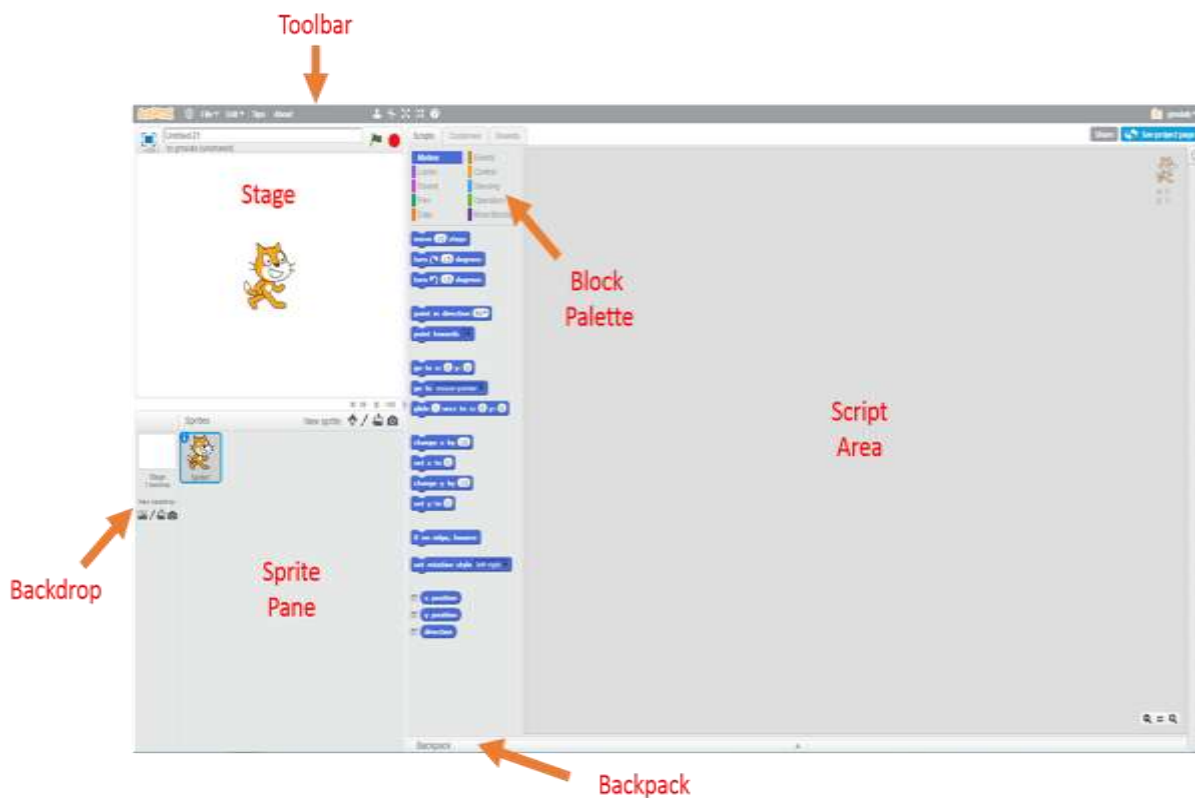
How Scratch Works:

In Scratch, we write programs called SCRIPTS. Each SCRIPT controls an object called a SPRITE. The orange cat that you see when you start up Scratch is an example of a Sprite. Here is an example of what a script looks like.

Script   Sprite

The Scratch Interface:

- The STAGE is the background that our program runs on.
- The SPRITE PANE shows all of the sprites that are part of our program.
- The BLOCKS PALATTE contains the blocks that we can use to make our scripts. Each block represents one instruction in our program.
- We build our scripts by dragging blocks from the BLOCKS PALATTE to the SCRIPTS AREA.

File Menu:

- New — Creates a new project from a blank template.
- Save — Saves the current project in the directory from which it came from. If the project is new it opens a file browser, allowing you to save a project as a new file, except when online.
- Save as a copy — Creates a copy of the current project.

Edit Menu:

- Undelete — Undeletes a sprite, costume, sound, or script that was recently deleted.
- Small stage layout — Makes the stage shrink to a smaller size.
- Turbo Mode — Sets the player into Turbo Mode, where the code is executed very quickly.

Duplicate Button:

The duplicate button (stamp icon) duplicates anything on the screen. It duplicates sprites (in the sprites area or stage), costumes, costume selections, sounds, blocks, and scripts.

Delete Button:

The delete button (scissors icon) deletes anything on the screen. It deletes sprites (in the sprites area or stage), costumes, costume selections, sounds, blocks, and scripts.

Enlarge Button:

Clicking on a sprite in the stage, costume editor, or a selection in the costume editor will make the sprite or selection grow bigger.

Shrink Button:

Clicking on a sprite in the stage, costume editor, or a selection in the costume editor will make the sprite or selection shrink.

Help Button:

The � button opens the Tips Window. Clicking on a part of the editor or a block will give help on that section.

All Tips:
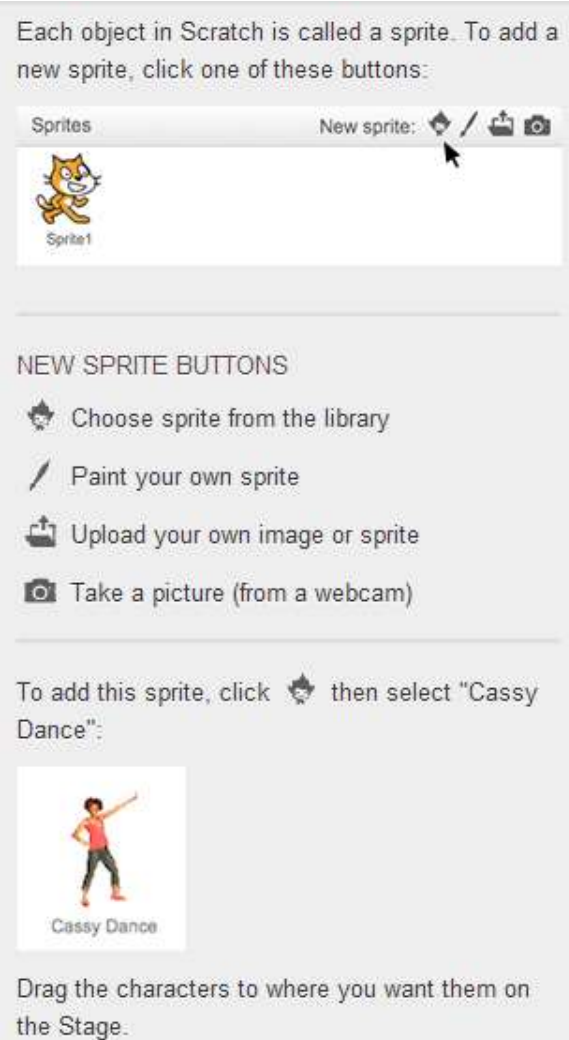
These are informational sections with helpful tutorials and information about the scratch website itself.

Sprite:

Each object in our program is a sprite. The default sprite is the orange cat, but you can pick from a library of different sprites. Let's get rid of the cat. Right click on the cat and select delete.

Add a Sprite:

Each object in Scratch is called a sprite. To add a new sprite, click one of these buttons:

Sprites   New sprite: ◆ / ⬆ 📷

Sprite1

NEW SPRITE BUTTONS

🐾 Choose sprite from the library

/   Paint your own sprite

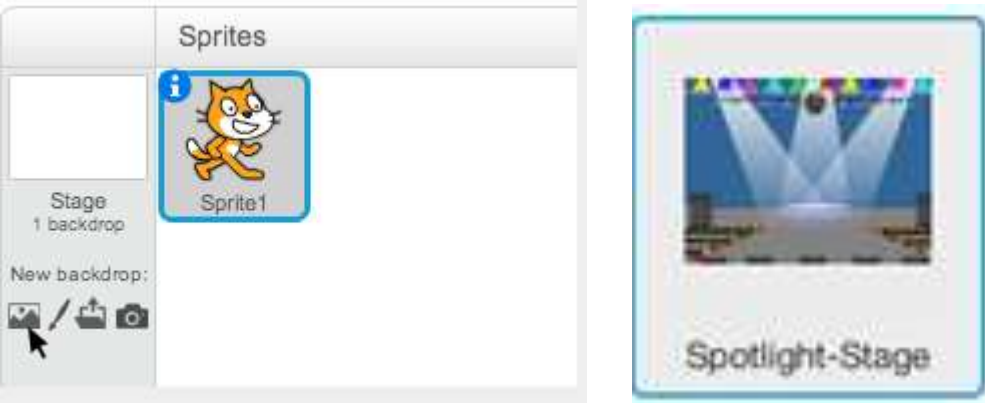⬆ Upload your own image or sprite

📷 Take a picture (from a webcam)

To add this sprite, click 🐾 then select "Cassy Dance":

Cassy Dance

Drag the characters to where you want them on the Stage.

Add a Background:

You can add new backdrops on the Stage.

Sprites

Stage
1 backdrop

Sprite1

New backdrop:
🖼 / ⬆ 📷

Spotlight-Stage

Click 🖼 to choose a New backdrop from the Library (such as "Spotlight-Stage").

Script Area:

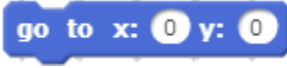In order to get our sprites to animate, move, or interact with one another on the stage, we need to create one or more scripts for each sprite. If you click on a sprite from the list, the project editor will show the existing stacks of blocks in the scripts area.

To create a game, story, or animation in Scratch, we stack blocks together to form a script that gives instructions to the project sprites.

In the middle of the project editor screen, we have categories of blocks that are grouped by the kinds of tasks they represent.

They are **Motion, Looks, Sound, Pen, Data, Events, Control, Sensing, Operators, and More Blocks.** We mix the blocks together to form our art work. Each type of block is color coded so that we can easily identify them by their type in our scripts.
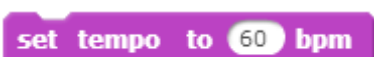
Motion (Movement Blocks):

move 10 steps	Sprite is moved by 10 steps in the current direction.
turn ↻ 15 degrees	Rotate the sprite to 15 degrees clockwise.
turn ↺ 15 degrees	Rotate the sprite to 15 degrees counterclockwise.
go to x: 0 y: 0	Move the sprite with the specified x and Y coordinates using the center of the sprite. Using this block is equal to two blocks: "Set X to" and "Set Y to" simultaneously.
point in direction 90 ▼	Rotate the sprite in the specified direction.

Looks Block:

say Hello! for 2 secs	Sprite will display the word "Hello!" Script execution will be suspended.
say Hello!	Sprite displays the word "Hello!" without stopping the script. The phrase will constantly accompany sprite until changed.
think Hmm... for 2 secs	Sprite will displays "Hmm…" Script execution will be suspended.
next costume	Sprite will change its current costume to the next costume.

Sound Block:

play sound meow ▼	Play the sound "meow" chosen from the library of sounds, without stopping script execution.
stop all sounds	Silence! Stops all sounds
play drum 1 ▼ for 0.25 beats	The first drum to play one quarter of beat. In the drop-down list, select one of eighteen drums.
rest for 0.25 beats	Wait for one-quarter of a beat.
change tempo by 20	Change the beat by 20 or more beats per minute.
set tempo to 60 bpm	Set the beat at 60 or more beats per minute.
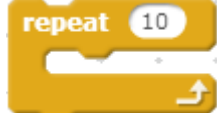
Pen Block:

clear	Clears all printed and drawn-by-a-pen blocks on the stage.
pen down	Pull down the Pen. After this command all actions with a Pen will be accompanied by a line on a stage.
pen up	Move the Pen Up. After this command an action with Pen will not leave any traces on a stage.
set pen color to ▮	Set Pen color. The color choice can be made using the cursor.
change pen color by 10	Change the pen color to 10 or any other color. The change of color is the same as "color effect".
set pen size to 1	Set Pen size to 1 or more pixel.
set pen shade to 50	Set Pen shade to 50%.

Event Block:

when [🏳] clicked	Block "begin program execution". Program executes if the green flag is pressed.
when [space ▼] key pressed	Block "keyboard control". It is executed if a key chosen from the drop-down menu is pressed.
when this sprite clicked	Block "Mouse control". It is executed if you click a sprite with the mouse.

Control Block:

wait ① secs	The script will pause for the specified number of seconds.
repeat ⑩	Block "Cyclic repeat". This block repeats execution of all the scripts it contains.
forever	Block "Constant cyclic executing". This block repeats execution of all the scripts it contains.
if ⬡ then	Condition block "if". If a condition in the block heading is "true", then the blocks which are inside will be executed.

Sample Code (Dance Move):

Sample Code (Making a square in different line colors):

```
when [flag] clicked
clear
go to x: 0 y: 0
pen down
set pen color to [orange]
move 100 steps
turn ↻ 90 degrees
set pen color to [purple]
move 100 steps
turn ↻ 90 degrees
set pen color to [white]
move 100 steps
turn ↻ 90 degrees
set pen color to [yellow]
move 100 steps
go to x: 0 y: 0
stop [all ▼]
```
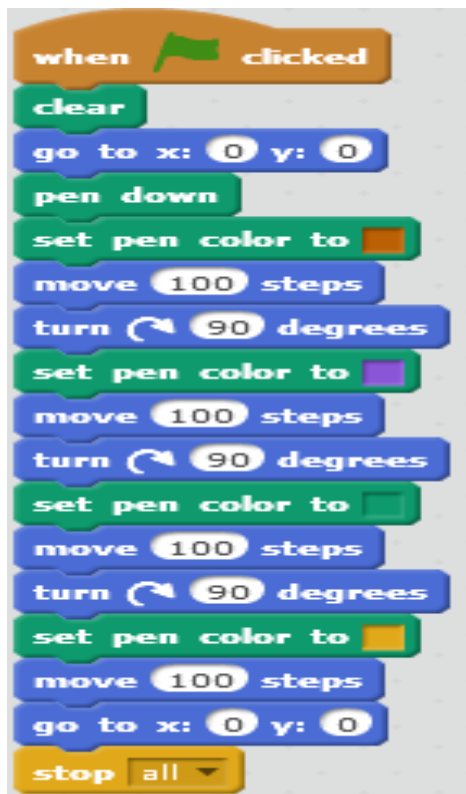
Sample Code (Make a sprite jump):

```
when this sprite clicked
forever
    go to x: -99 y: -1
    wait 0.5 secs
    go to x: -99 y: 56
    wait 0.5 secs
```
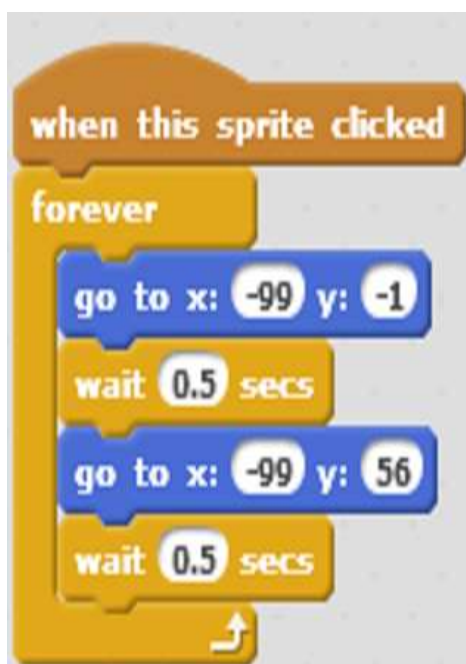
Robotics is becoming increasingly important at all levels of education and a variety of educational robots have been developed. Each robotics set comes with detailed instructions on how to set up your robot and how to program it to follow specific commands. Then you can make changes to the robot by adding or removing parts and can change the program to do whatever you like!

Edison Robot:

Edison is a programmable robot. It is suited both to learning basic concepts and to complex processes as it supports Python programming. Edison can expand its features as it is compatible with LEGO® building blocks, providing unique capabilities to create new robotic models.

Edison carries three hardware buttons. With the record button, you download a program to the robot, the play button, starts the execution of the program and by pressing the stop button, the program is stopped. It is also equipped with different sensors in order to understand its environment and interact with it.
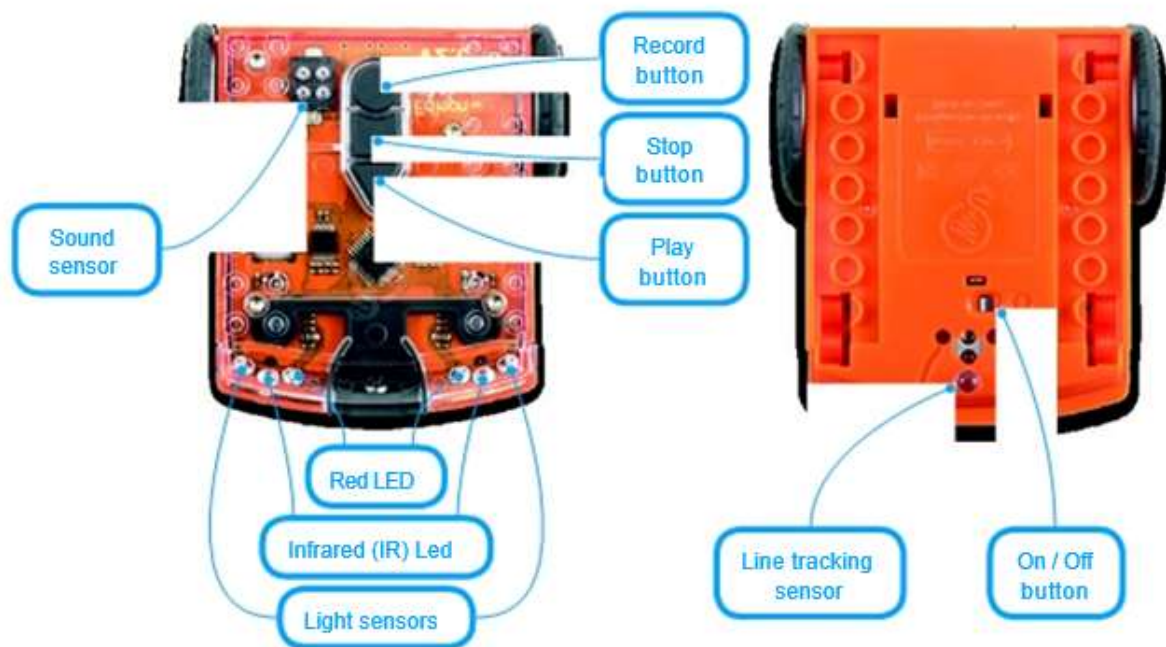
Edison Robot can be programmed by scanning the following barcodes:

Pre-set barcode programs for Edison

Clap controlled driving

Line tracking

Avoid obstacles

Light following (follow a torch/flashlight)

Bounce in borders

Sumo wrestle

Drive forwards

Drive backwards

Spin right

Spin left

Play beep

Play tune

What is EdScratch:

EdScratch is a vertical block-based visual programming language based on Scratch. EdScratch combines the ease of drag-and-drop programming with powerful functionality and versatility. The result is a robot programming language that is easy to learn and offers a robust platform for computer science education.
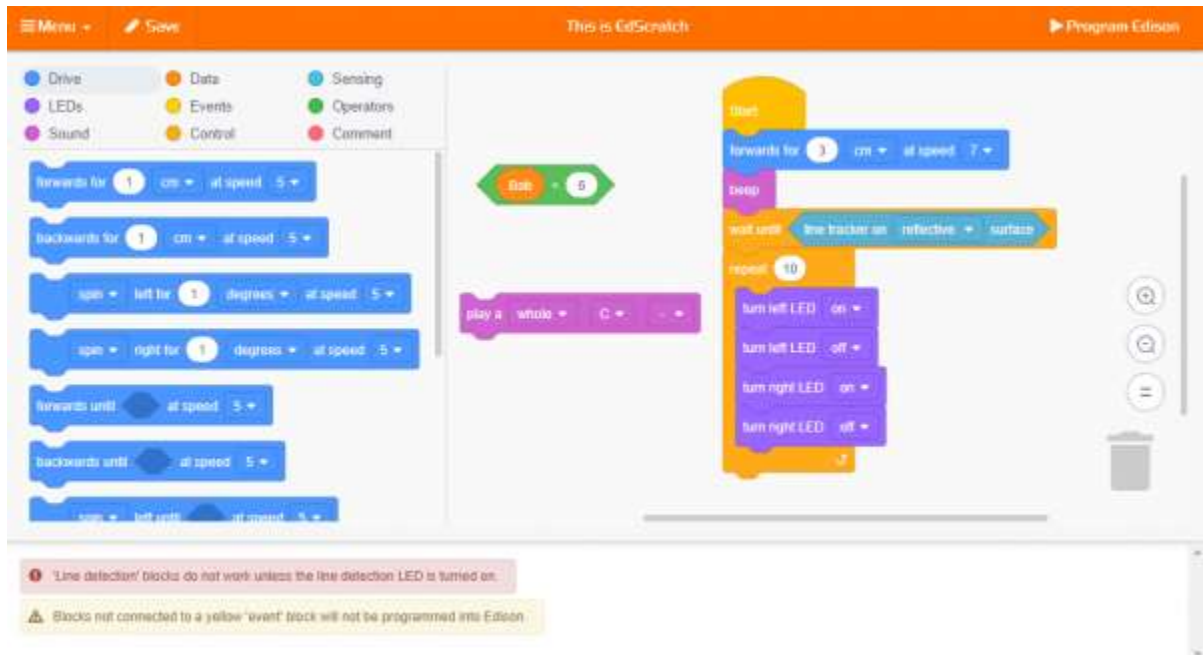
The online EdScratch programming environment is designed to deliver meaningful computer science education through an easy-to-use interface. EdScratch's intuitive layout and the simplicity of block-based coding makes EdScratch an ideal programming language for students aged 10 and up.

You can access EdScratch online at www.edscratchapp.com

Setting up your programming device for EdScratch:

The best way to set up your programming devices is to run a test program in EdScratch. Follow these six steps to test EdScratch on your device:

1. Load the EdScratch app by opening www.edscratchapp.com in a browser (we strongly recommend Google Chrome1). Launch the programming app by pushing the orange 'Launch EdScratch' button. Make sure you allow pop-ups for www.edscratchapp.com

2. Once the app opens, you will see the programming environment. Open 'Menu' from the menu bar and select 'Load Demos'. A list of demo programs will open in a pop-up window. Select the program called 'Test_program' which will load in the programming environment.

3. Adjust your device's volume to maximum or 100%. Plug the EdComm programming cable into the audio jack of your device.

    NOTE: many devices have built-in safety settings that reduce the volume when an audio device is connected to the headphone jack. Always doublecheck the volume settings after plugging in the EdComm cable to your device.

4. Turn your Edison robot on. Connect the EdComm cable to the bottom of the robot, near the power switch. Press the round (record) button one time.

5. In the EdScratch app, press the 'Program Edison' button. Follow the instructions on the pop-up and then press the 'Program Edison' button on the pop-up to download the program into Edison.

6. While the program is downloading, you will hear a whirring sound, a bit like a dial-up modem. When the download is done, you will hear one of two sounds: the 'success' sound (the same chirping beep Edison makes when you first turn the robot on) or the 'fail' sound (a descending beeping sound).