VISUAL PROGRAMMING – SCRATCH

Standard 9: IT-IDT-9—D, Develop, test and implement programs using visual programming.

9.1 Utilize drag and drop software to develop programs.
9.2 Understand and use objects.
9.3 Explain how sequence, selection, iteration are building blocks of algorithms.
9.4 Explore mobile devices/emulators to design develop and implement mobile computing applications.
9.5 Use various debugging and testing methods to ensure program correctness.
9.6 Describe a variety of programming languages used to solve problems.
9.7 Incorporate music and art to enhance creativity in projects.

Preview Video – Scratch Overview (1:37)
https://vimeo.com/scratchedteam/scratch20

- Brief introduction of new standard / concepts

Introduction

You are learning to write – write code. Due to a surge of interest in learning to code, it is easy to understand why the number of jobs for programmers and computer scientists is growing rapidly.

When learning to code, people learn many things (not just coding). They are coding to learn. Mathematical and computational ideas are learned, such as variables and conditionals. Strategies for solving problems, designing projects, and communicating ideas are also learned. These skills are useful to everyone, not just computer scientists.

(Source: Mitchel Resnick)

What is Scratch?

Scratch is a programming language that is perfect for making games, animations, interactive stories, and other visually rich programs. It provides a great introduction to programming for people of all ages. It's widely used in schools and colleges.

Scratch is easier to use than most other programming languages for a number of reasons.

- You don't have to remember or type any commands—it uses a drag and drop method.
- Commands fit together like jigsaw pieces.
- Error messages are rare. Scratch commands lock together—programs always make some kind of sense. It is possible to still write programs with logical errors.
- Commands are color-coded and categorized.

Which version of Scratch?

Scratch 2.0 – You don't need to install any software to use; it runs inside your browser, using an Internet connection. It will need a computer that can run the Adobe Flash Player.

Using the Scratch screen

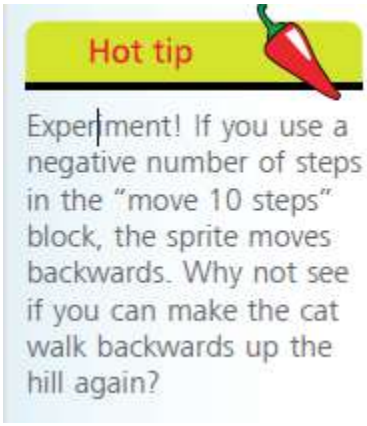
The main parts of the screen are:

1. **Stage** – see your animation and games in action
2. **Sprite List** – the cat is a "sprite", which is like a character or object in a game. In the Sprite List, you can see all the sprites that are in your project.
3. **Blocks Palette** – give the computer commands by using blocks, which are instructions that fit together like jigsaw pieces.
4. **Scripts Area** – this is where you make your programs in Scratch by assembling blocks.
5. **Backpack** – Click it to open it. It works a bit like a clipboard. You can copy scripts or sprites to it by dragging them there and dropping them. If you want to use them, just drag them from the Backpack back into your project.
6. **Costumes** – different pictures a sprite can have (showing different positions)
7. **Backdrop** – the background of the Stage can be changed.

Experiment – Practice and Explore

To create your first program, follow steps below:

1. Change background – In the **Nature** folder, select **Hill**
2. Create the following script:



Saving Your Projects

A **Scratch** project includes all the sprites, scripts and backgrounds that are used in it. It's a good idea to save your projects so you can come back to them later to reuse them or modify them.

Your project is saved with the name Untitle plus a number. You can choose a more useful name by editing the box above the Stage.

Use the File menu for additional options for saving your work.

- **Save as a copy** – this makes a copy of your project with a new name
- **Download to your computer** – this enables you to save your project as a file on your computer.
- **Upload from your computer** – if you previously downloaded a Scratch project to the computer, use this option to upload it.

- **Revert** – this throws away all the changes you've made to the project since you oepned it this time.

Opening Projects

You open projects through the **File** menu at the top of the screen. To find your projects using the website version, click your username in the top-right of the screen and then click **My Stuff**. The **My Stuff** section shows all your projects, with those you most recently edited nearer the top. To open a project, click its **See inside** button.

To tidy up unwanted projects name "Untitled", click the **Delete** links on the right. If you delete a project by mistake, click the Trash folder on the left, and then click the **Put back** button to recover the project.

Opening shared projects

You can open the projects that other people have shared on the Scratch website too. Use the options on the left to choose a category.

Click a project to go to its page. The instructions on the right tell you how to use the project, and you click the green flag button in the middle of the player to run it. If you like what you see, and you want to know how it was done, click the **See inside** button in the top right to go into the editor and see the scripts, sprites, and backgrounds that make it work.

Assignment I

Instruction / Resource Card PowerPoint

Follow the steps indicated on each slide.

1. Open PowerPoint – Instruction / Resource Card PowerPoint
2. The PowerPoint contain slides showing images and directions on how to create scripts for the action stated.
3. For example, if you want to know how to create and modify a sprite to appear to have an animation, this slide will give you suggestions.
4. The entire PowerPoint shows you the image and then gives you a sample direction guide.
5. To learn the different concepts, you will have to work through each resource card
6. Remember, to always be patient but have fun!!!

Assignment II

Guide Me Scratch Tutorial Assignment

Follow the steps indicated below to create a Scratch project.

1. Open the Scratch program.

2. Use the current sprite or delete the default sprite and select one new sprite.

3. Click on the Motion option from the Blocks Palette and drag a Move block into the Scripts area. Adjust the steps to a number other than 10. Do not indicate a negative number or a number above 40.

4. Click on the Sounds option from the Blocks Palette and select the "play drum ___ for ____ beats" block snap it onto the Move block. Change the drum option and number of beats from the default sound if you desire. (Note: Your speakers will need to be on in order to hear the sound.)

5. Click on the Motion option from the Blocks Palette and snap the Move block under play drums block. Use the same number selected in Item 3 and add a minus sign in front of the number. Add a second instance of the same Play Sound block that was used in Item 4 and snap it onto the second instance of the Move block.

6. Click on the Control option from the Blocks Palette and select the Repeat option and drop it on top of the script stack you have created. The mouth of the Repeat command should wrap around the entire script. Do not adjust the number setting for the Repeat command.

7. Click on the Looks option from the Blocks Palette and drag out a "say ___for _ secs" block. Update the text in the "say ___for _ secs" block to reflect "Watch me party". Attach the block to the top of the script.

8. Click on the Events option from the Blocks Palette and drag the "when green flag" block and attach it to the top of the script.

9. Change the color of your sprite by clicking on the Looks option from the Blocks Palette and drag the "change_____effect by _____" block below the script. Do not attach the block to the current script.

10. Click on the Events option from the Blocks Palette and drag the "when _____key pressed" command to the scripts area. Change the space default option to a different option. Attach the block to top of the second script.
11. Select a back drop for the stage and click OK. After doing so, make sure the Scripts tab is selected.

12. Click on the green flag to make sure your sprite performs as commanded. If so, click on the File option from the menu and select the Save as option to name your file tutorial. Upload

13. Congratulations! You have created a Scratch program that involves movement, sound, a dancing sprite, a talking sprite, command to change the sprite's color, addition of a backdrop, and application of commands to repeat, interact based on keyboard command, and repeat.

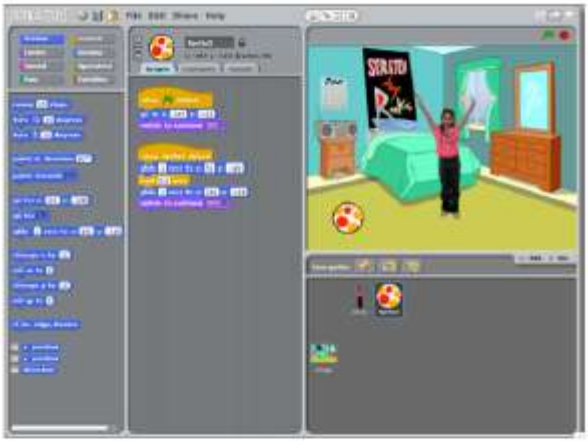
Assignment III

About Me Tutorial Assignment

Follow the steps indicated below to create a Scratch project.

The information provided below gives you a few examples of blocks used to create an interactive collage about yourself. Use the image below as a guide to assist in creating a project about you.

ABOUT ME



How can you combine interesting images and sounds to make an interactive collage about yourself?

STEP BY STEP...

1. Add a sprite

paint your own sprite

choose a downloaded or library sprite

get a surprise sprite

2. Make it interactive

make your sprite interactive by adding scripts that have the sprite respond to clicks, key presses, and more

3. Repeat!

BLOCKS TO PLAY WITH...

Assignment IV

Dance Party Tutorial Assignment

Follow the steps indicated below to create a Scratch project.

The information provided below gives you a few examples of blocks used to create an interactive dance party where sprites get down with cool costumes and funky beats. Use the image below as a guide to assist in creating this project.

DANCE PARTY

Create your own interactive dance party where sprites get down with cool costumes and funky beats.

STEP BY STEP...

1. Add a sprite

2. Make it interactive

snap blocks together to make your sprite dance

make your sprite interactive by adding scripts that have the sprite respond to clicks, key presses, and more

3. Repeat!

BLOCKS TO PLAY WITH...

Assignment V

Create a Simple Game PowerPoint

Follow the steps indicated on each slide.

1. Open PowerPoint – Create a Simple Game (Witch Game – the witch sprite is used but you can substitute any using any sprite of choice)
2. The PowerPoint contain slides showing images and directions on how to create scripts for the action stated.
3. The goals of this assignment is to learn the following concepts:
   - event handling
   - simple sequential execution
   - loops
   - variables
   - conditionals
   - parallel execution
   - message passing
4. The PowerPoint shows you images / screen shots
5. If you are not able to locate a sprite, change it to something else
6. Also, if a command is given and it has changed since the PowerPoint was created, locate the correct block.
7. To learn the different concepts, you will have to work through each slide until you have created the game
8. Remember, to always be patient but have fun!!!