

## Lesson 1: “Scratch at the Surface”

### OVERVIEW

1. Welcome girls to fall program, icebreaker, create code of conduct and give overview of the semester.
2. Introduction to Scratch. Watch Scratch videos and complete tutorial.
3. Examine sample games and practice changing scripts.
4. Students use Scratch to make a ball bounce on the screen.
5. Students create a simple game using Scratch.
6. Trade and play simple games

### CLASSROOM PREPARATION & MATERIALS

- Nametags
- Pre-survey and permission forms
- Flip chart for code of conduct
- Scratch cards, one set per student

### TRAINER TECHNICAL PREPARATION

- Test laptops, video projector, presentation files and internet connection.
- Read the following short documents online or in curriculum binder:
  - <http://scratch.mit.edu/files/ScratchGettingStarted.pdf>
  - <http://scratch.mit.edu/faq>
  - <http://ilk.media.mit.edu/projects/scratch/help/>
- Look at the sample Scratch games and create a simple game of your own.
- Have ‘Intro to Scratch’ and ‘Image Effects’ videos ready to show on the projector.

### KEY CONCEPTS

- You use Scripting to make game objects do cool stuff
- Game Programming is FUN!

### SUGGESTED AGENDA (4 hours)

15 min.	10:00—10:15	Welcome, opening business, overview of semester
5 min.	10:15—10:20	Action Syllables Name Game
10 min.	10:20—10:30	Watch Scratch videos: “Intro to Scratch”, “Image Effects”
15 min.	10:30—10:45	“Getting Started With Scratch” tutorial
10 min.	10:45—10:55	BREAK
15 min.	10:55—11:10	Examine Scratch interface
20 min.	11:10—11:30	Dissect Pacman script
10 min.	11:30—11:40	Play sample games and experiment with changing scripts

30 min.	11:40—12:10	LUNCH AND SPEAKER
40 min.	12:10—12:50	Students make a ball bounce using Scratch
10 min.	12:50—1:00	BREAK
40 min.	1:00—1:40	Students make a game: "Don't Mess With Texas."
10 min.	1:40—1:50	Trade and play games
10 min.	1:50—2:00	Wrap-up

**Color Key:**

**Pink:** Interpersonal learning

**Green:** Audio/Visual learning

**Yellow:** Tactile/kinesthetic learning

**Gray:** Introducing and/or synthesizing information

## ACTIVITIES

### Activity #1: Action Syllables Icebreaker

**Time: 5 minutes**

With the group standing in a circle, have the participants each choose an action for every syllable of their name. Example: Elvis has 2 syllables, so he does a hip shake with "El" and snaps his fingers for "vis". Once Elvis has done his action while saying his name, the whole group repeats. After the 2<sup>nd</sup> person does his/her name, the whole group repeats, then does Elvis's again. And so on 'til everyone's done it.

### Activity #2: Scratch "How To" Videos

**Time: 10 minutes**

Watch the two short Scratch movies (included in Lesson 1 folder) on the overhead projector. The one called "Scratch Intro Movie" introduces the Scratch interface and shows how to quickly make a script and navigate through the program. The second video, "Image Effects Movie," shows easy ways to script cool changes to your images.

### Activity #3: "Getting Started with Scratch" Tutorial

**Time: 15 minutes**

Students complete Scratch tutorial on their own (included in Lesson 1).

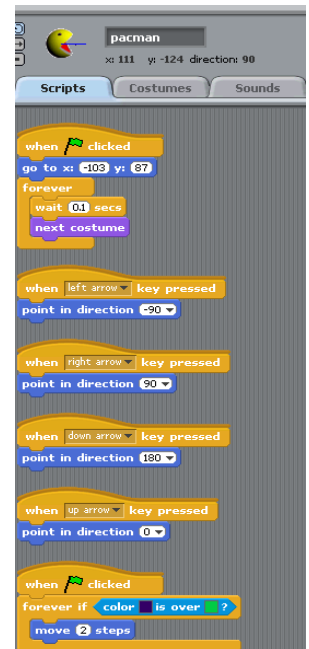
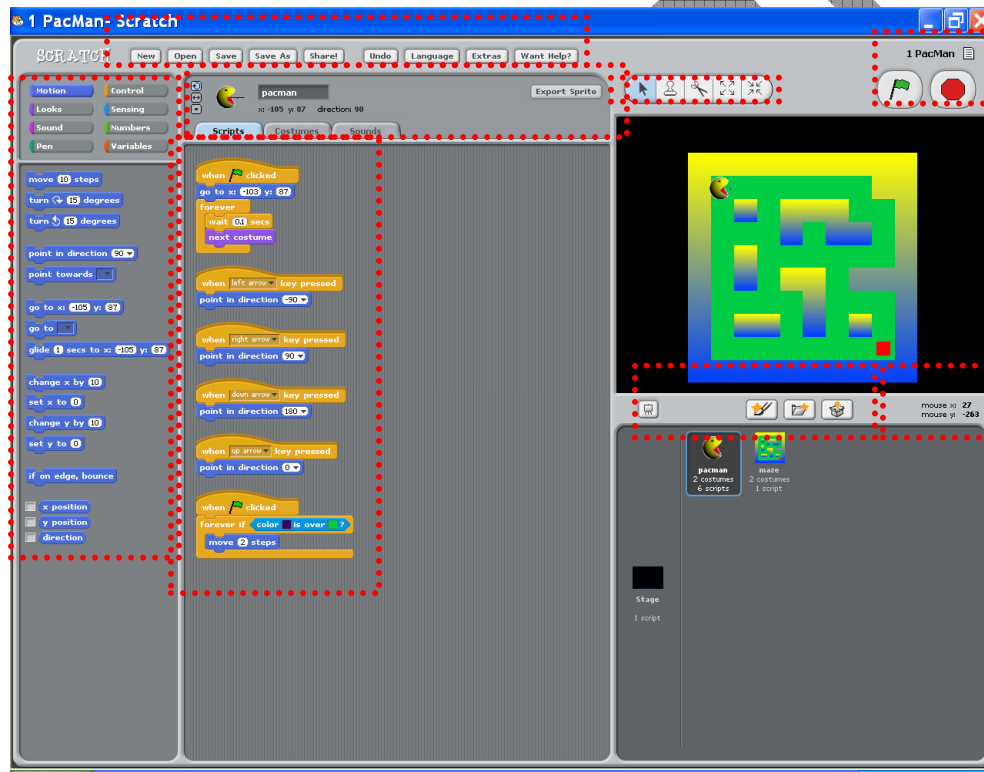
### 5 Minute BREAK

### Activity #4: Examine Scratch Interface

Time: 15 minutes

In Scratch go to OPEN and Choose the Games Folder and Click on the Pacman Sample game. Point out these important areas of the screen and ask students to share their ideas about the purpose of each feature:

- The mouse x and y coordinates on the middle right hand side of your screen
- The buttons at the top, especially the undo button
- The toolbar on the right hand top
- The green flag and stop symbols
- The motion through variable buttons on the left hand top portion and the box underneath that displays the menu options
- The scripts, costumes and sounds tabs
- The rotate and flip buttons in the middle next to the Pacman sprite
- The presentation mode, draw, open and surprise buttons in the middle of the right hand side and the box underneath.



### Activity #5: Dissect and Discuss the PacMan Script

Time: 20 minutes

Have students play PacMan for a couple of minutes. Then discuss the PacMan script:

- How many Sprites are there? Two—the PacMan Sprite and the Maze Sprite. This may be confusing at first because it appears that the Maze is a background. The Maze is actually a Sprite with two costumes.
- What is the Stage/Background? The black screen (visible behind the Maze.)
- How many costumes does PacMan have? Two. Open and closed-mouth.
- Where in the script does it tell the PacMan Sprite to change costumes? The Forever Loop at the top: wait 0.1 seconds, change costume.
- Have students run the program, and while it is running click on the Pacman Sprite, then Costumes. They can see the two costumes light up as they switch back and forth every 0.1 seconds. This gives the appearance that PacMan is opening and closing his mouth.
- Look at the PacMan script: there are a total of 6 blocks. The first block starts with: When green flag is clicked, go to x: -103 and y: 87. What does this do? Sends PacMan from the top left corner to the bottom left corner—just to start him moving.
- There are four direction blocks—one for each arrow direction.
- The final block tells the PacMan Sprite to keep moving two steps for as long as the Sprite (which has a navy undertone) is over the green part of the maze. This is another Forever Loop.
- When and how does the Maze change costumes? The Maze changes costumes whenever PacMan eats the Dot. The change is in the Maze script: there is a Forever Loop: if red over navy, change costume. Notice the Dot is red, and remember the PacMan Sprite has a navy undertone. As soon as the PacMan Sprite (navy) gets to/under the Dot (red), the Maze changes costumes.
- What is the sound for the game: A Forever Loop of pop music. Does it change? No.

### Activity #6: Play and Change Sample Games

Time: 10 minutes

Students play with the another sample game for 3-5 minutes and examine the script. Then have students find a partner, and ask them to describe one part of the script to their partner. What does the block of code say, and what does it do within the game?

Handout one set of Scratch cards per student. Students now work alone to experiment and make changes to the game of their choice. Encourage students to push and play with all of the features. Remind them that there is no way to break the programs. Students should **not** save the changes they have made to the sample games.

### 30 Minutes LUNCH

#### Activity #7: Make a Piece of Trash or a Ball Bounce in Scratch Time: 40 minutes

Using Scratch, have students create a simple graphic of a piece of trash and a script to make the trash bounce continuously against the walls of the game screen. Allow students time to try many combinations of scripts. The basic steps should be:

- 1. Import a background.** Click on Stage, then click on Background. Students can Import the bluebonnet-background from the Images folder on their Desktop. Or they can choose a background from the Scratch library.
- 2. Create a Sprite that looks like a piece of trash.** Click on Sprite1, then click on Costumes. Students should then click on Paint to enter the Scratch Paint feature. Students draw and color a wadded piece of paper. If students are having problems with Paint, they can Import a Sprite of a ball from the Scratch library.
- 3. Write a Script for the Sprite's Movement.** While still working on Sprite1, click on Scripts. Students use the command tools to write blocks of code that bounce the trash/ball on the screen. Hint: begin with "When green flag is clicked." Students can refer to Scratch cards.

If students experience major difficulty, allow them to look at a sample trash/ball bounce script.

Sample script:           When green flag is clicked  
                                  Forever Loop: Move 40 steps; If on edge, bounce; turn 5 degrees

### 5 minute BREAK

#### Activity #8: Creating Your First Game Time: 40 minutes

At this time, the students begin to create their first game. Ask them to start making a "Don't Mess with Texas"/ Pack your Trash game. The object of the "Don't Mess with Texas" game is for the player to collect trash for points. They should base this game on the script from the Fish Chomp sample game.

Each student game should look different. Encourage students to be creative while staying within the pick up trash for points theme. They should create sprites for the trash and the character picking up the trash, as well as choose costumes, backgrounds, and sounds for their game. Encourage them not to spend too much time making all of the graphics.

After they finish making the graphics, have them start scripting their characters. They can use the scratch cards, each other, and the sample Fish Chomp game as reference. If they need further guidance or want to take their games to the next level they can go to the Scratch webpage and check out this link: <http://llk.media.mit.edu/projects/scratch/help/>

Allow the students to experiment with Scratch, but keep them focused on completing the creation of a playable, simple, fun educational game.

### **Activity #9: Trade and Play the games**

**Time: 10 minutes**

Leave time at the end for students to trade games with at least one other person. (Have them switch computers and play their neighbor's game.)

To view sample student games visit: [www.scratch.mit.edu/users/girlstart](http://www.scratch.mit.edu/users/girlstart)

### **Activity #10: Closing Discussion**

**Time: 10 minutes**

Closing discussion about student games:

- How successful were students in scripting their games?
- What were the easiest and the most difficult parts of the process?
- How fun and educational were the student games?

## **SUPPLEMENT MATERIALS**

- Scratch Videos
- Scratch Flash Cards
- Sample Trash Bounce Scratch project
- Sample Don't Mess with Texas Scratch project

## **REFERENCES**

- Scratch: [www.scratch.mit.edu](http://www.scratch.mit.edu)
- Scratch Videos: <http://www.scratch.mit.edu/videos>
- Scratch Tutorial: <http://www.scratch.mit.edu/files/ScratchGettingStarted.pdf>
- Scratch Flash Cards: <http://www.scratch.mit.edu/cards>