iCAC Integrating Computing Across the Curriculum

Scratch Lesson Framework - Interactive Project

Scratch makes it easy to program your own interactive stories, games, and animations and share your creations online. As you create and share projects with Scratch, you learn to think creatively, reason systematically, and work collaboratively. Scratch is a project of the Lifelong Kindergarten group at the MIT Media Lab. It is available for free download at http://scratch.mit.edu.

The goal of this lesson framework is to provide teachers with a useful outline to create a Scratch lesson for their students. You complete the framework by filling in any content standard or course objective to reinforce what you are covering in the classroom. Students will be able to create a Scratch project demonstrating their knowledge of the topic for a grade. The lesson is fun and supports learning.

The Scratch functions covered in this lesson framework:
- **Control**: When Sprite clicked
- **Looks**: Say something in a voice bubble
- **Help**: Right click on any block in Scratch gives a description and sample of the its function

The specific programming concepts covered in this lesson are[1]:
- **Sequence**: To create a program in Scratch, you need to think systematically about the order of steps
- **Event Handling**: *When key pressed* and *when Sprite clicked* are examples of event handling – responding events triggered by the user or another part of the program
- **User interface design**: You can design interactive user interfaces in Scratch – for example, using clickable sprites to create buttons.

The Alabama Course of Study Technology Education Standards Third-Fifth Grade:
- **TC1**: Use input and output devices of technology systems
- **TC2**: Use various technology applications, including word processing and multimedia software
- **TC9**: Use technology tools to organize, interpret, and display data
- **TC10**: Use digital environments to collaborate and communicate
- **TC11**: Use digital tools to analyze authentic problems (critical thinking, problem solving, and decision making)
- **TC12**: Create a product using digital tools

Lesson Framework:

Step 1) Preparation

Introduce the lesson to the students. Present the expectations of the activity:
- The students will create a Scratch project demonstrating their knowledge of your chosen topic.
- The project will include an imported background and three sprites.

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[1] Programming concepts and skills supported in Scratch, http://info.scratch.mit.edu/sites/ infoscratch.media.mit.edu/files/file/ScratchProgrammingConcepts-v14.pdf

- Each sprite will be programmed to display some information or a fact about the chosen topic when clicked.
- Inform the students that their projects will be graded, which will encourage them to complete their projects within the given time period. Another incentive for students to finish their projects is to have a presentation day. You can collect all of the student projects on the teacher ICAC jump drive.
- Before going to the computer lab to create their projects, have the students write down three facts on a piece of paper to use in project building.

Step 1) Introduction to Scratch (as needed)

A great way to introduce Scratch is to compare it to a play. Each element in Scratch corresponds to an element of a play. There are four main elements of Scratch: the stage, the sprites, the script, and the programming palette using the analogy of actors in a play.
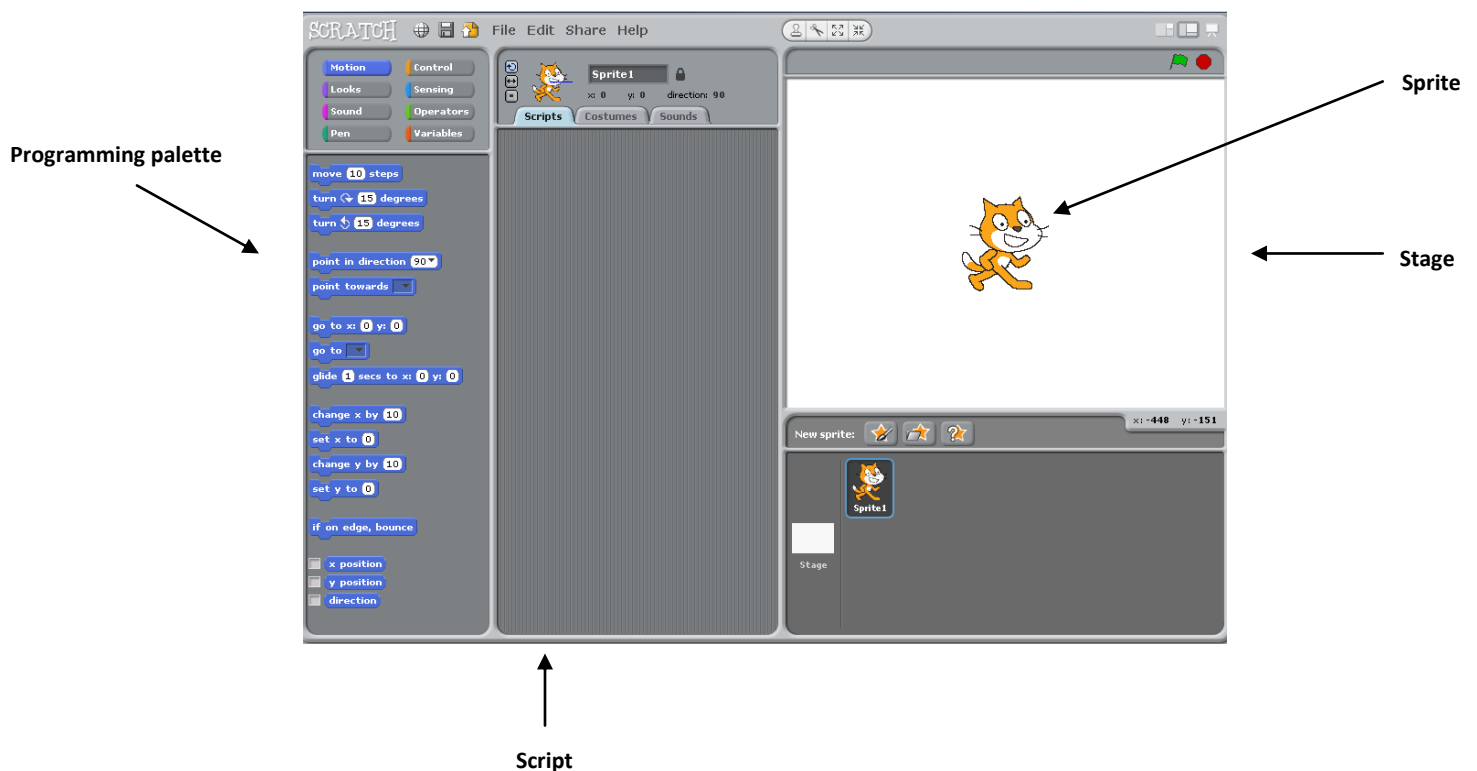
The **stage** in Scratch is similar to the stage in a play. It is where the Scratch projects come to life. Everything that is programmed in Scratch will be displayed on the stage.

The **sprites** are the actors of the play; the programmable objects of Scratch. Sprites can be programmed to create the interactive story, game, animation, music, or art for each project.

The **script** tells the actors what to do on stage. The scripts in Scratch are the code that programs the sprites, the programmable objects.

The **programmable palette** is like the literary elements used by the playwright to craft the play. In Scratch, the programming palette provides all of the code in LEGO™-like blocks to create scripts.

Step 2) Scratch Refresher

Present the chosen topic to the students. You can import the background and program the first sprite together with the students by showing them what to do on the Promethean board.

Click on the **stage thumbnail** underneath the stage. Click on the **Backgrounds** tab in the scripts tab. To import a background, click on the **Import** button option next to "New background."

**Backgrounds Tab**

Import Button

Stage Thumbnail
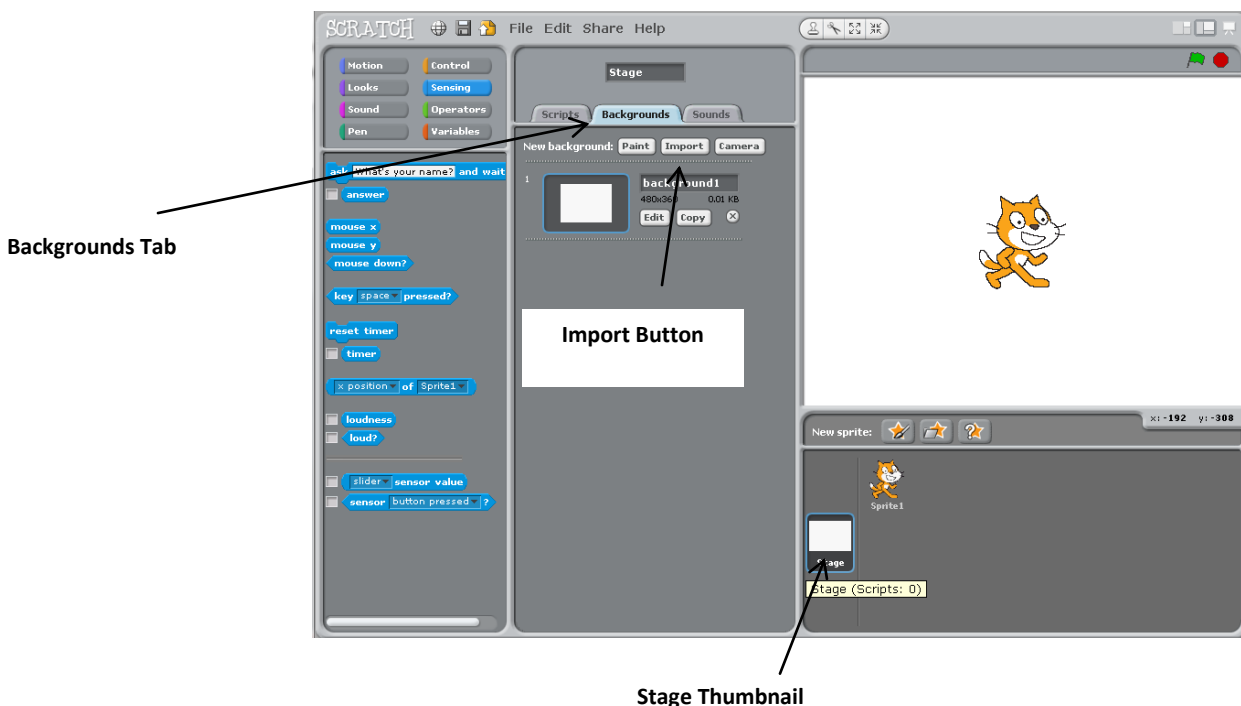
Click on one of the folders to view backgrounds in that category. Scroll through the backgrounds until you find the one that you would like to use. If you want to view backgrounds in another category, click on the **white arrow** pointing up next to the name of the background category to return to the list of all background categories.
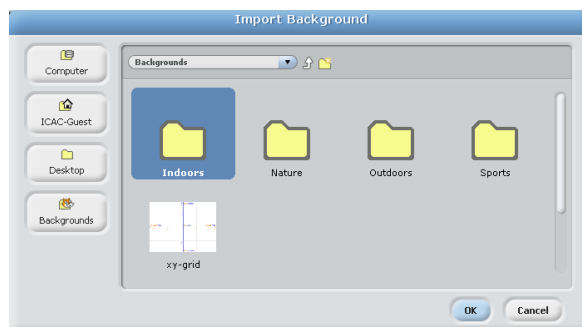
When you have found your desired background, click **OK,** and the background will be added to the stage.

Before adding a new sprite, first delete the cat by clicking on the scissors, the **delete tool**, above the stage. Click on the cat with the scissor to remove him. Add a new sprite by clicking on the **choose new sprite from file** button underneath the stage.
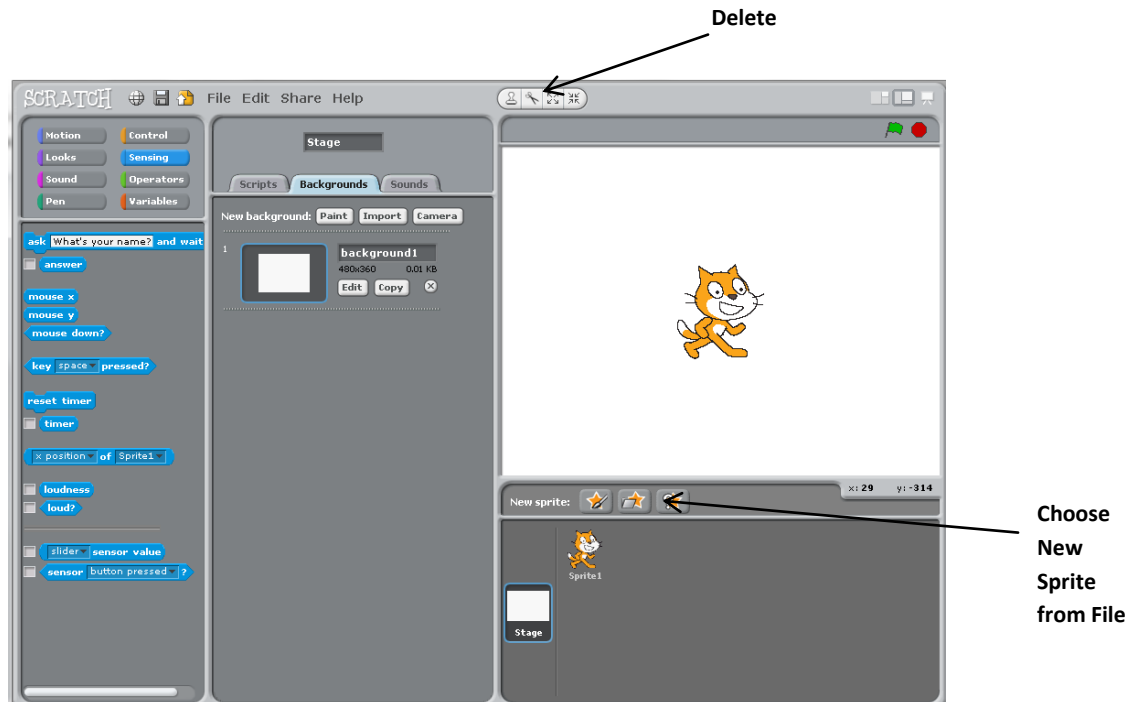
Click on one of the folders to view the sprite in that category. Scroll through the sprites until you find the one you want to use to represent or say the first fact. When you have found the sprite that you want, click on the **OK** button in the bottom right of the window to add the sprite to your stage.

Note: Give the students one minute to choose their first sprite. After a minute, move on to the next step.

Program the first sprite to say something in a cartoon word bubble when it is clicked.

Drag the orange control block, **when Sprite clicked**, from the programming palette to the scripts section.

Next, connect the purple block, **say Hello! for 2 secs**, underneath the control block.

Delete the Hello! in the say block, and tell the students to type their first fact for the chosen topic.

When the first sprite is clicked, it will display the first fact on the stage.

Step 3) Project Building

Give the students the remaining time to complete the rest of their projects. For those students who finish early, challenge them to add additional programming aspects to their projects, such as sound or editing their sprites' costumes.

Remind the students of the time limit to keep them on task.

Before the end of the session, collect the students' projects on the teacher ICAC jump drive.

- To save projects to a jump drive
    - Click **File** and select "Save As…"
    - Click on the **Computer** button on the top left of the **Save Project** window
    - Double click on the E: drive
    - Enter a New Filename at the bottom: Topic Name Student Name (for a project about butterflies, the file name could be Butterfly – Alia Carter).
    - Enter the date in the "About this project" box.
    - Click **OK** when done