

Scratch Lesson Plan

Objective: To introduce 5/6 class Primary students to the MIT developed Scratch programming platform. Scratch allows young beginners to get results without having to learn syntactically correct writing first. It is intended to motivate for further learning through playfully experimenting and creating projects, such as interactive animations etc.

Preparations: Download the Scratch program and install from scratch.mit.edu and read the getting started guide. Register an account on the online community so that the project can be shared and embedded in the site created in the Web lesson plan.

Deliverable: The class will create a game that will be published on the class website.

Getting started: The scratch platform assumes a game environment that will be easily understood given that most of the class will have experience with Nintendos etc. The game consists of Sprites, which can be any image and the actions these sprites can perform. The Stage is where the sprites move and interact with one another. 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. Therefore it is necessary to introduce the concept of coordinates and direction.

Step1: Coordinates. Draw a box 480x360. Center is 0,0. Use a local map with Grids to draw an analogy. For example the position of the school is in D5 etc.

Step2: Direction. Draw a compass with N/S/E/W. Draw another with Up/Down/Left/Right. Draw another with 0/90/180/-90 Explain this is what Scratch needs to tell the sprite what direction to turn.

Step3: Logic. Introduce the concept of the IF and WHEN statements. Used by the program to decide what to do when something is true or false or when something happens, like When the LEFT arrow key is pressed. Draw this.

Step 4: Run sample program to show what the class will accomplish. Reinforce the concepts of coordinates, direction and logic.

Step 5: Open scratch. Show the sprite and point out the stage and blocks: Motion, Control, Looks, Sensing. We use the blocks to make the sprite do things and react to things like the ARROW keys. Let's make it move when the left-arrow key is pressed and when it hits the edge, make it bounce. Have each student repeat for up/down/left. Use space to set to 0,0



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Step 6: At this point we have a working game in the sense that the sprite can move using the arrow keys. Now we are going to share it on the Scratch site and embed in our class site. Click Share and then goto the project page, use the embed code (applet) and add to the class page.

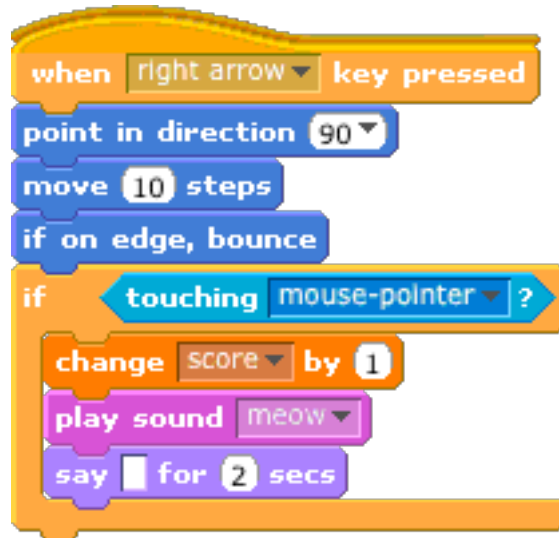
Step 7: To finish this lesson, have the students play with other statement blocks such as playing a sound or changing costume based on clicks. This should conclude the first lesson.



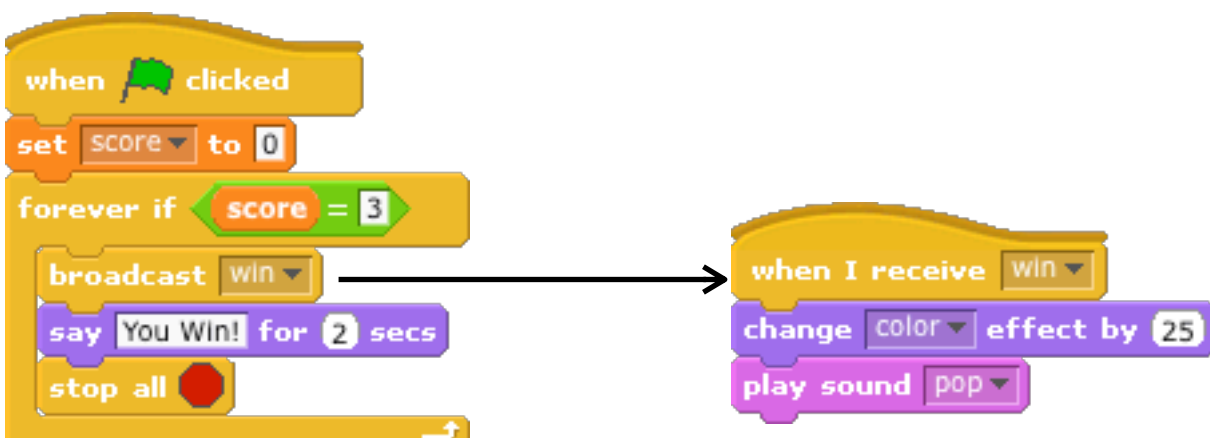
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Introducing IF, Forever, Broadcast and Variables

Step 8: Now we need to add more statements so that the class can create a more complete game that they would be used to. In this game, making the cat hit the mouse-pointer will add to the score. They will understand the concept of “score” very well and explain we do this with **Variables**. Click Variables and then Make a variable; call it ‘score’. Show how the score can be added to when the Cat touches the mouse-pointer.. Next add the **Forever If** block and then the **operators**. Then place score variable on the left operator and the score result on the right. Have the class add this to each arrow key block.



Now we need to make game react to the Score. We use the When Greenflag clicked statement to start the game. It sets the score to 0 and then enters a **Forever** loop. It checks the score using an IF statement and when it reaches the number to win, it uses the **Broadcast** statement to communicate with the stage and other sprites.



The game is ready to play. Save it to the Scratch site and embed again. Each time you share the project, it adds a version No. Add ?version=2 to the link. Now that all of the basic statements are understood, the class has a simple example to reference when creating a more complex game.