SCRATCH 3

SCRATCH PROJECTS:

A COMPREHENSIVE COURSE

LESSON PLANS

Lesson Layout

Title

Scratch Activities

3

Playing with Color

Introduction

INTRODUCTION - REVIEW

From the Menu of "Looks", we introduce in this tutorial the block of "change effect". When we click on this block, the Sprite will change its color by the amount specified. We can also select other graphic changes, such as whirl, mosaic, etc. In this lesson we also introduce another control block to execute actions. The block "when key pressed" will execute all the actions of the blocks connected to it.

PRACTICE

Scratch Activity: Reproduce the actions in the tutorial. Experiment with the size and direction of the steps.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

Closing Assignments

EXTENSIONS

1. Experiment with different rates of changing the color.
2. Experiment with two sprites and see how they change colors.
3. Experiment with different keys to control how a sprite changes colors.
4. Experiment adding sounds when you change colors.

List of Tutorials

PRESENTATION - VIDEO TUTORIALS

Tutorial Part 1: Change Color
Tutorial Part 2: Pressing Keys

Scratch 1 - 10

Scratch 1 - 11

Additional Exercises

List of Lessons

TABLE OF CONTENTS

Class Management

TIME SCHEDULE

This course has been designed so that each lesson will occupy one meeting session with the students.

Once the tutorial has been reviewed, the activity of the student will concentrate on mastering the new concepts presented.

Practicing with Scratch and exploring all the possibilities of the new concepts learned is essential for a robust learning process.

The exercises proposed in the Extensions section are designed to reinforce the learn-by-doing approach.

SCRATCH ACTIVITIES

After studying the tutorials the students will replicate on their own Scratch environment the activities presented during the lesson.

The students are encouraged to explore, beginning with the environment presented in the tutorials, all the possibilities open by the newly learned concepts.

EXTENSIONS

The exercises presented in the Extensions section provide suggestions to develop and reinforce the knowledge and techniques learned in the tutorials.

They also provide a schedule support by allocation a variety of work assignments for each lesson.

Class Management

DVD WITH COURSE MATERIALS

Schools and institutions can reduce their internet demands for using these materials by installing them locally in their labs and computers.

To receive DVDs with these materials, send the institutions mailing address via the "Contact Us" link at learnscratch.org.

SOLUTIONS TO EXTENSIONS EXERCISES

Scratch programs with solutions to the Extension exercises can also be obtained sending a request via the "Contact Us" link at learnscratch.org.

ADDITIONAL COURSES

New courses using Scratch are being developed to be incorporated into the K-12 curriculum. Information on these courses will be available at learnscratch.org.

INTRODUCTION - REVIEW

This project includes a dialog between two friends and a final sound effect. It uses a sequence of wait blocks to synchronize the communication between them. It is a good example for an initial story telling project.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts of the project and recreate the program.

Reproduce the actions in the tutorial.

Experiment with different dialogs, different timing, and different sound effects.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional protagonist in the story: three, four, etc.

2. Experiment with the control of who speaks at which time.

3. Experiment with sequential and simultaneous dialog.

4. Experiment with different sound effects and multiple sound effects.

Going to a Party

This project includes a dialog between the two protagonists. During the story there are changes of scenery and costumes and a final section for the project credits. It uses broadcasting signals to synchronize the dialog and the changes of scenery and costumes.

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different dialogs, different timing, and different backgrounds and costumes.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional protagonist in the story: three, four, etc.

2. Experiment with additional scene changes.

3. Experiment with additional costume changes for the actors.

4. Experiment by adding sound effects.

Cheetah Animation

INTRODUCTION - REVIEW

This project includes animation effects through continuous change of consecutive costumes. It allows step by step study of motion. It is a good project to start using frame by frame costumes of sprites.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different timing for the animation and different number of sprites. Create your own animated sprites.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional animated sprites: three, four, etc.

2. Experiment creating your own multi-costume animated sprites.

3. Experiment synchronizing multiple animated sprites.

4. Experiment by adding sound effects to the animations.

4

Story Teller

INTRODUCTION - REVIEW

This project uses random selection of predefined set of phrases to automatically create stories. It illustrates the use of location on the Stage, random number generation, and the synchronized action of multiple sprites.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with new sets of text, new costumes for the stories and new backgrounds.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment adding more lines to the text.

2. Experiment adding color to each line.

3. Experiment adding sound effects with each new story.

4. Experiment with background changes.

Taking Picture

INTRODUCTION - REVIEW

This project is a good example of interactivity. The user has the ability to create random audio stories. It includes a sprite with audio for each individual represented in the painting. By clicking the sprites the user controls de dialog in the group. It is a good example of graphic and audio design.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Experiment changing the sounds and adding musical or instrumental elements to the picture.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with a new picture.

2. Experiment adding musical effects to parts of the picture.

3. Experiment with two or more sounds at the same time.

4. Experiment adding text references to the picture.

Etch-Sketch

INTRODUCTION - REVIEW

This project simulates the operation of an etch-sketch toy, allowing the user to draw by using the key arrows and special keys to select colors and the width of the marks. It is a good example for an initial drawing project.
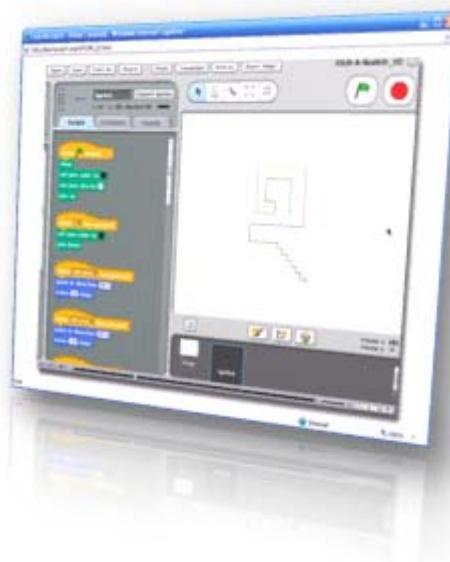
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different sizes for the drawings and width for the pen.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with size of the steps and the width of the pen.

2. Experiment with adding sounds to each color marking.

3. Experiment with new colors and shades.

4. Experiment with two simultaneous pens.

Drawing Plane

INTRODUCTION - REVIEW

This project allows the use of the arrow keys and other keys to control the forward direction, turning and color of the pen. It creates an environment where different types of drawings can be obtained by selective and combined use of the controls. It illustrates the use of simultaneous controls in computer drawing.
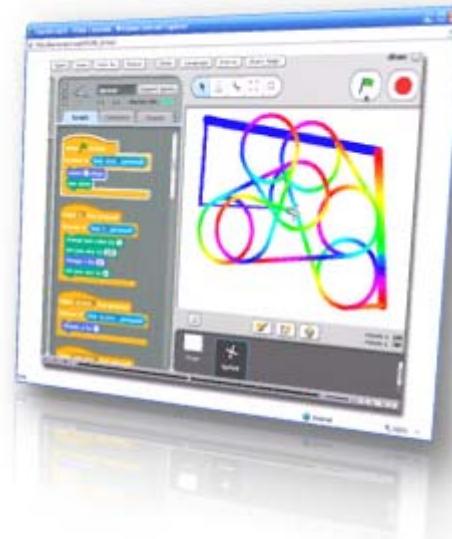
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

Practice

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different controls for the airplane: size of the pen, color change, speed of drawing.

Closing - Assignments

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

Extensions

1. Experiment with different settings for the airplane controls.

2. Experiment adding a second drawing airplanes.

3. Experiment with changes in the colors of the background.

4. Experiment by adding sound effects to the flight of the airplane.

Colorful Ball

INTRODUCTION - REVIEW

This project combines the simple use of arrow keys to move the sprite and the effect of changing colors to obtain colorful designs. It allows for easy modification and expansion of its features.
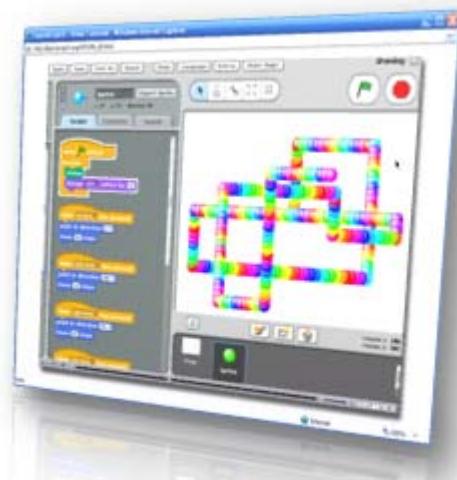
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different directions of drawing, different color changes and different speeds of drawing.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional directions of the drawing path.

2. Experiment with changes of the color of the background.

3. Experiment with two simultaneous drawing balls.

4. Experiment by adding sound effects to the drawing ball.

Lego Kit

INTRODUCTION - REVIEW

This project simulates a lego construction kit, allowing the creation of sophisticated designs with a relatively simple program. The richness of the possible designs is in part due to the large number of existing building blocks, their sizes and colors. It uses a very resourceful method to move the blocks throughout the grid and in the vertical space. It allows for easy expansion and addition of new features.
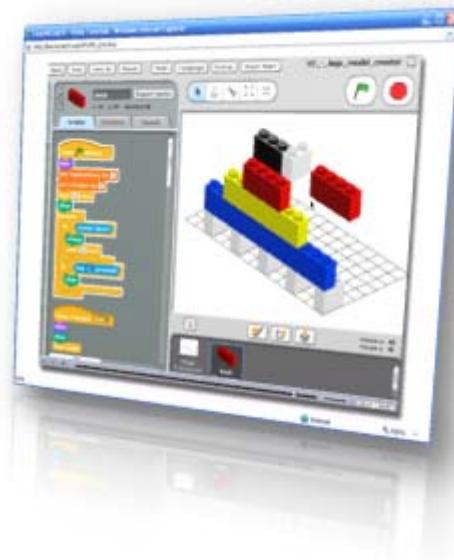
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different sizes, colors and forms for the building blocks.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional orientations for the bricks.

2. Experiment with different shapes for the bricks.

3. Experiment with additional building elements (windows, doors…)

4. Experiment by adding sounds with each building block.

INTRODUCTION - REVIEW

This project simulates the operation of a typewriter by printing on the screen the characters typed on the keyboard. It includes a simple but long program which illustrates how to use a large number of inputs to control a project. It allows for easy expansion and it is a good example of how a project can include very long, and at the same time simple, scripts.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment creating a simple typewriter with only a few keys.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional font colors.

2. Experiment with additional font sizes.

3. Experiment changing the color and theme of the paper (background.)

4. Experiment by adding sound effects as you type.

Pac Man

INTRODUCTION - REVIEW

This project implements a version of the traditional pac-man game. It provides a simple method to navigate through the maze without trespassing its limits. It is a good example for an initial game project. It allows for easy expansion and the addition of new features

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with the speed of the Pac Man, and the controls of its movement (substitute arrows by a set of four keys.)

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment adding a second Pac Man (with different sets of controls.)

2. Experiment with additional mazes (backgrounds.)

3. Experiment by adding a score counter for the targets obtained.

4. Experiment by adding sound effects according to the motion of the Pac Man.

INTRODUCTION - REVIEW

This project implements a version of the traditional pong game. It includes two moving parts: the ball, which bounces on the edges of the Stage, and the paddle, which is controlled by the player. It includes sound effects, and it is a good example of an initial interactive game project.
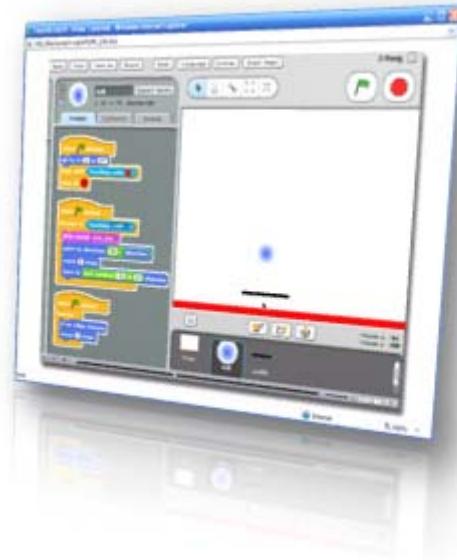
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with the speed of the ball and the width of the paddle.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with an additional ball.

2. Experiment by adding a score counter for the number of contacts.

3. Experiment with adding a second paddle controlled by the key arrows (a second player.)

4. Experiment by assigning different score values to each ball hit.

Bee in a Maze

INTRODUCTION - REVIEW

This project implements a maze game where the objective is to arrive to the destination without exiting the allowed -color coded- path. It uses color overlap to control the rules of the game. The operation of the sprite is simple, and illustrates a typical implementation of maze games.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different sizes for the movement of the bee. Experiment by changing the control arrows to a set of arrows in the keyboard.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional maze layouts.

2. Experiment adding a second bee (second player, with different controls.)

3. Experiment by adding a timer to measure the time to finish.

4. Experiment by adding sound effects.

Simple Maze

INTRODUCTION - REVIEW

This project implements a maze game where the objective is to arrive to the final destination in the shortest time possible. It implements the effect of bouncing on the walls, and it includes a simple control of the motion of the sprite. It uses creative text and sound effects.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different layouts for the maze.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment by adding a second player (use a set of four keys to control it.)

2. Experiment with adding a score of the times the walls are hit.

3. Experiment with controlling the speed of the sprite.

4. Experiment by modifying and adding sound effects.

15

Kaleidoscope

INTRODUCTION - REVIEW

This project illustrates the use of simultaneous actions to create colorful designs with simple controls. It allows for easy modification of its parameters. The drawings are obtained with the stamp effect, and therefore multiple sprite costumes efficiently add to the final aspect of the drawings.
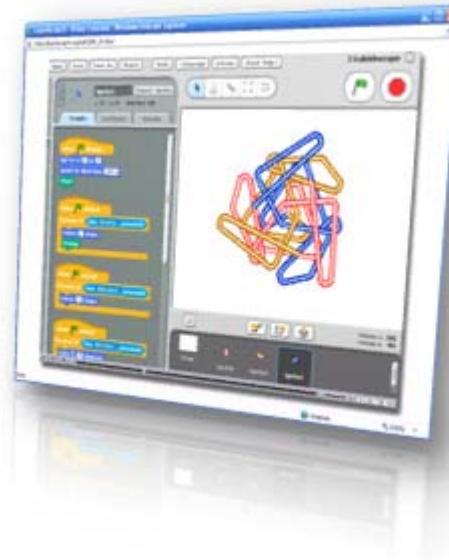
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different four sprites and changing colors.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional sprites: four, five, six…

2. Experiment with sound effects as the sprites move and turn.

3. Experiment with a second drawing set (a second player, using a separate set of controls.)

16

Fortune Teller

INTRODUCTION - REVIEW

This project combines graphic effects and a set of multiple costumes, selected randomly, to create an enjoyable experience. It illustrates the ability to apply a sequence of graphic effects with opposite parameters to return to the original image.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment by adding new messages.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with different sets of messages.

2. Experiment with different image effects

3. Experiment by adding sound effects as the messages appear and disappear.

17

Hand Drawing

INTRODUCTION - REVIEW

This project is an example on the use of multiple costumes to illustrate a sequence of events in the process of accomplishing a complex task, in this case a hand drawing. It is a good example on how to illustrate a sequence of steps.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with your own drawings.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with your own drawings

2. Experiment with downloaded drawings.

3. Experiment adding graphic effects.

A Thousand Arrows

INTRODUCTION - REVIEW

This project illustrates the combined use of multiple copies of the same sprite to produce a complex result. In this case it uses a sprite with an arrow shape and a simple script, which in combination with many copies of itself produces remarkable results.
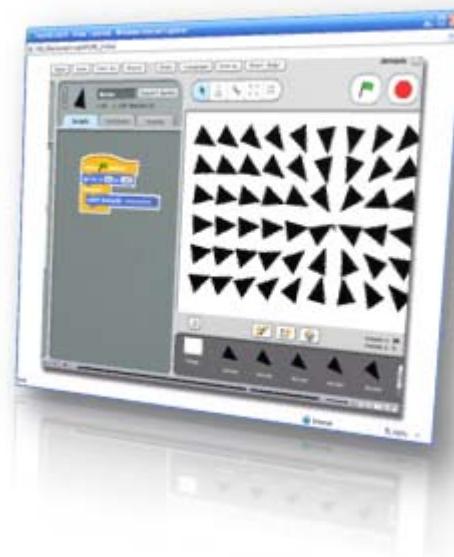
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with a small group of arrows or sprites (4, 5 or 6.)

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with different shapes of sprites.

2. Experiment with additional background changes.

3. Experiment by adding sound effects when the arrows turn.

Linear Patterns

INTRODUCTION - REVIEW

This project illustrates the use of variables and external input from the user to control the size and shape of the final design. It is a good example on how to control a program by selecting the values of its variables.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment different settings for steps, degrees and increment.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment by slowing down the drawing process.

2. Experiment with color and sizes of the pen.

3. Experiment by adding sound effects as the pen draws and turns.

Math Calculator

INTRODUCTION - REVIEW

This project illustrates an interactive application where random addition problems are created. The user enters the expected solution and later is able to check its accuracy. It illustrates how to create multiple problems randomly, how to get input from the user, how to display this input on the screen and how to check the correctness of the input. It can be expanded to implement other operations and extend the range of final results.
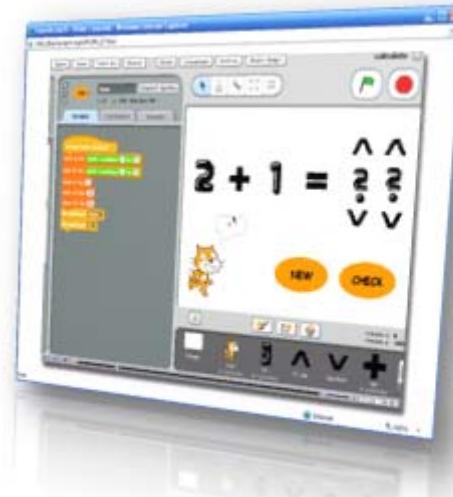
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment by adding a third number to be added.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with the addition and subtraction.

2. Experiment with one digit multiplication.

3. Experiment by adding sound effects according to the responses.

Sierpinski Fractal

INTRODUCTION - REVIEW

This project illustrates the graphical representation of a fractal algorithm. It creates an attractive design by repeatedly adding points to the drawing. The consecutive points seem unrelated at first. As the program continues execution the fractal design becomes apparent. It includes three controls for the operation of the program and an additional control to position the sprites in the corners of the design.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with the location of the three targets.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with color, shade and size of the pen.

2. Experiment with the speed of the drawing.

3. Experiment by adding sound effects as the spider moves and turns.

22 Graphing Equations

INTRODUCTION - REVIEW

This project illustrates the graphical representation of mathematical equations, in this case linear equations. It allows the user to enter the two parameters of the equation, and changes colors as a new curve is plotted. It allows easy expansion to represent more complex curves - parabolas, hyperbolas, ellipses, other polynomials, etc.
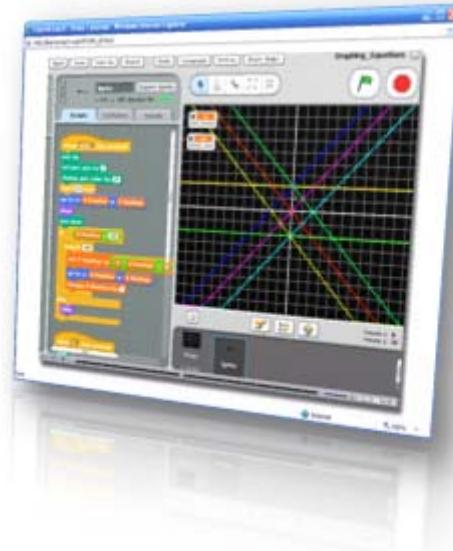
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with angles and zero crossing for the lines.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment drawing parallel lines at the same time.

2. Experiment with the speed, color and size of the drawings.

3. Experiment by adding sound effects when elements of the grid are crossed.

Random Test

This project implements a simulation of the random process of tossing a coin. It keeps records of the number of flips and their outcomes: tails and heads. It is a good project to experience the nature of random numbers.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and reproduce the actions in the tutorial. Experiment with different values for the random numbers generated.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with objects with 3, 4 or more outcomes (e.g. 6 sided dice).

2. Experiment with graphic effects for each possible outcome.

3. Experiment by adding sound effects for each possible outcome.

Music Boxes

INTRODUCTION - REVIEW

This project illustrates the combined effect of sounds and graphics by drawing boxes and ringing bells as the user clicks the mouse pointer on the screen. The color and the shade of the boxes and the pitch of the sounds are a function of the location of the click. It is a good example of a combination of expected and random effects.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and reproduce the actions in the tutorial. Experiment with different sounds and shade changes.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with changing rectangles by other shapes.

2. Experiment with simultaneous sounds for each shape.

3. Experiment with changing the sounds according to the colors.

Simple Piano

This project implements a piano keyboard that the user can control with the mouse or with the keys of the computer. It simulates the operation of and electronic piano. It also includes pre-programmed melodies that can be automatically be played by the piano. It is a good example of a musical project.

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and reproduce the actions in the tutorial. Experiment changing the sounds of the keys and playing the keys.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment writing additional melodies.

2. Experiment modifying the instrument's sounds.

3. Experiment playing the keys while there piano plays a background melody.

26

Rock Band

INTRODUCTION - REVIEW

This project presents a rock band performing one of their songs. It includes graphic motion of the sprites by changing their costumes. It is a good starting project combining image and sound coordination.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and reproduce the actions in the tutorial. Experiment redrawing the costumes of one of the sprites.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional melodies.

2. Experiment with additional members of the band.

3. Experiment with new members of the audience.

4. Experiment by adding sound effects.

27

Sound Maker

INTRODUCTION - REVIEW

This project illustrates the use of variables to control musical instruments. The user controls with the mouse the choice of instrument, the note played, and the speed or length of the notes. It uses long variable names to allow good control of the sliders.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and reproduce the actions in the tutorial. Experiment with different preset notes.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with multiple present notes.

2. Experiment with present sprites that play a short melody.

3. Experiment by adding graphic effects (add a color changing sprite.)

Music Travel

This project presents the action of land and air travel accompanied by music. It uses the combined effect of several sprites. It is a good example of the use of motion and change of size to simulate movement, and a good integration of music.

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and reproduce the actions in the tutorial. Experiment with different melodies and speed of the animation.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with additional flying objects.

2. Experiment with animated objects (trees, road, cars, etc.)

3. Experiment with additional background changes (day, night, etc.)

4. Experiment by adding sound effects (as the trees pop-up from the horizon, etc.)

Merry Christmas

This project illustrates the use of broadcasting signals to control sprites as they play their instruments. The sprites are pre-programmed to play several types of notes. They actually play them, in a synchronized form, when the director, in this case the script of the background, sends the corresponding signals.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and reproduce the actions in the tutorial. Experiment by selecting different sequences of players.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment by adding new players to the band.

2. Experiment with new sounds for all players.

3. Experiment by adding image effects when a player plays.

INTRODUCTION - REVIEW

This project uses a very short and simple script to implement a spinning wheel. The operation of the turning sprite is controlled by a random number generator. It allows for easy modification of its parameters. A change in the background can add meaning to the final position of the turning arrow.
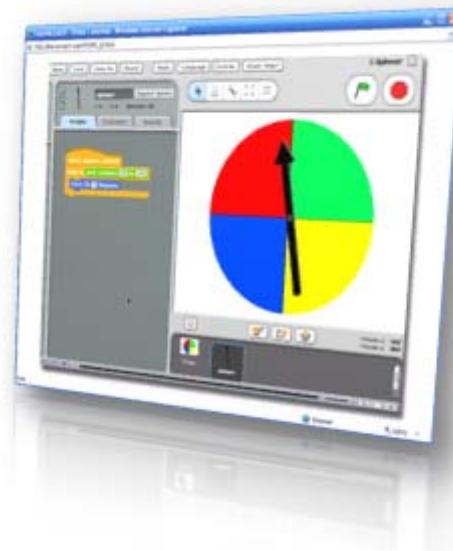
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with two arrows turning in different directions.

2. Experiment with different backgrounds.

3. Experiment by adding sound effects as the arrow turns and stops.

31

Gravity

INTRODUCTION - REVIEW

This project illustrates the interaction of multiple sprites simulating the effect of gravity in falling bodies. The interaction between the sprites is controlled by overlapping colors. In addition, the audio signal from the microphone randomly affects the position of the sprites.
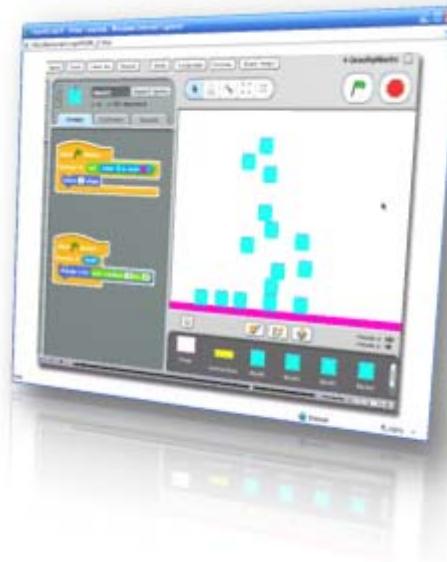
PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment with different falling speed for the blocks.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment with different types of blocks (size, color, rules for stopping.)

2. Experiment with blocks moving up and down, and bouncing off the walls.

3. Experiment by adding sound effects as the blocks move, fall, collide, etc.

32

Web Design

INTRODUCTION - REVIEW

This project illustrates in great detail the process of a web construction with the combined and synchronized motion of two sprites. It uses broadcast signals to activate the different parts of the process. It is a good example of the use of broadcasting and modular scripts to illustrate long and complex processes.

PRESENTATION - VIDEO TUTORIALS

View and study the tutorial. Take notes of the new features introduced in this project. Stop and rewind if necessary. Use the print out of the main script as you take notes.

PRACTICE

Study the scripts and recreate the program. Reproduce the actions in the tutorial. Experiment executing the individual segments of the program.

CLOSING - ASSIGNMENTS

Review the main topics introduced in this lesson and discuss the assignments proposed in the Extensions section.

EXTENSIONS

1. Experiment adding new segments with new broadcast signals.

2. Experiment adding a second spider with similar scripts.

3. Experiment by adding sound effects as the spider does the work.

Scratch Courses

SCRATCH 1
GETTING STARTED:
AN INTRODUCTORY
COURSE

LESSON PLANS

learnscratch.org

SCRATCH 2
STEP BY STEP:
A COURSE IN SCRATCH
PROGRAMMING

LESSON PLANS

learnscratch.org

SCRATCH 3
SCRATCH PROJECTS:
A COMPREHENSIVE
COURSE

LESSON PLANS

learnscratch.org

This guide and materials were prepared by Juan Carlos Olabe and other members of the LearnScratch Team.

Christian Brothers University
650 E. Parkway South
Memphis, TN 38104

learnscratch.org