SYLLABUS

SCRATCH LEVEL 1 - PREVIEW

Course Description

This course introduces core programming basics—including variables, conditional statements, loops, debugging, and functions—via the Scratch programming language. In this course, students will explore and develop familiarity and fluency with computational concepts. At the completion of this course, students will be able to create a variety of Scratch projects that include sprites, sounds, math operations, variables, and logic.

Scratch games have been prepared for you through step by step instructions. Teachers please review the scratch code prior to the lessons and replicate them with students.

Course Breakdown

During each lesson, students will be assisted and guided to complete a project to ensure that they can apply the concepts that they learn.

Lesson 1:

- We will discuss:
    - What code is and what programmers do.
    - The benefits students can gain from learning computer programming.
    - The types of projects can be created with Scratch.
    - How is Scratch the same and/or different from coding?
- Learn about sequences and the importance of having correct order
    - “Find the Animal” class activity
- Google slide activities:
    - Story Sequencing
        i. With answer Key
    - Find the mystery Animal
        i. With answer Key
- Sequences online game (to be played for the remainder of class or at the start of next class)

Lesson 2:

- Introduce the basics of scratch
- Discuss basic terminology and all the different code block categories within Scratch.
- Learn about the Scratch interface
- Scratch live demo
- Google slides activity: Help Olaf!
- Students will have the opportunity to explore Scratch on their own

Lesson 3:

- This lesson focuses on teaching students all about coordinates and the 4 quadrant coordinate plane.
- Video to be watched
- Google Slides Activity - coordinates activity
    - Answer Key provided
- Scratch live demo
- Games for students to play at the end of class

Lesson 4:

- In this lesson students will watch a demo and then create an interactive collage about themselves.
- Live demo
- Students will learn how to:
    - Add movement to a sprite.
    - Add sound to a sprite.
    - Change the colors of a sprite.

Lesson 5:

- Students will learn more about animations and continue exploring the different code blocks.
- Live demo of this Scratch Project
- Independent project: Animate your name
- Students will learn how to...
    - Link sounds to a sprite.
    - Play Scratch's sounds.
    - Adding and changing costumes.
    - Changing the size of a sprite.
    - Working with multiple sprites.

Lesson 6:

- Introduction to variables
    - Simple Basketball Clicking Game to reinforce the concept of variables - Scratch code provided
    - Variable scratch demo
- Introduction to the 2 different types of conditional statements
    - Conditional statements game (class activity)
    - Individual Activity for Students

Lesson 7:

- In this lesson, the concept of input and output will be introduced to students
- Students will create a game called “Guess the number activity”
    - Reinforcing the concept of if-statements and input through a guessing game
- Link to Scratch code
- Students have the rest of the class to work on individual projects.
    - Link to example code

Lesson 8:

- The focus of this lesson is broadcast and lists
    - A broadcast is a message that is sent through the entire Scratch program
    - Lists are similar to variables, but lists store multiple pieces of information in an order.
- First project
    - This is a very simple project however, students will gain an understanding of the purpose of broadcast blocks
- You will then discuss what lists are and some examples
- Getting ready for school project

Lesson 9:

- This lesson requires students to create their own project related to lists. After ~30 minutes, students will take turns presenting.

Lesson 10:

- Students will learn about the concept of loops
- Using loops, students will investigate how animations are created in Scratch

- Live demo Scratch Project
- Students will be tasked to create their own animation near the end of class.

Lesson 11:

- This lesson further involves exploring animations.
- Live demo Scratch Project

Lesson 12:

- In this lesson, students will learn about sensing blocks.
- Live demo Scratch Project Fetch

Lesson 13:

- Space Jump
- Focus of this lesson:
    - If-statements
    - Moving sprites left and right based on keyboard input

Lesson 14:

- Students will create a game. They will learn how to:
    - Create a timer
    - Further learn how to use loops
    - Create a score variable
    - Make a sprite follow the mouse
- Catch the donuts game

Lesson 15:

- Students will learn about mathematical concepts in Scratch and then create a Robot Calculator:
    - The four operations.
    - Random numbers.
    - Comparing numbers.
- Robot Calculator

Lesson 16:

- In this lesson, students will work independently on creating a Dino Addition Quiz game

    - Reinforces the mathematical concepts learned in the last lesson

Lesson 17:

- This lesson introduces students to extensions in Scratch which are extra categories of Code Blocks.
- Students will explore the music extension
- Music Band game

Lesson 18:

- This lesson teaches students about the Pen extension which allows one to draw on the stage with the pen.
- Drawing game
    - Tutorial used

Lesson 19:

- This lesson teaches students about the Video Sensing Extension which is an extension that allows webcams to interact with Projects through Video Sensing.
- Pet the cat demo
- Playing Instruments game

Lesson 20:

- In this lesson, students will learn how to create a game that uses video sensings and if-statements.
- Balloon Pop game

Lesson 21:

- Students will learn about direction in video sensing by creating 2 games
- Bouncy Ball game
- Bouncy Crab game

Lessons 22:

- This lesson will focus on learning about the clone feature in scratch
- Snake game

Lesson 23-25:

- These next couple lessons will focus on Artificial Intelligence
- Topics to be discussed:
    - What can computers do better than people?
    - What can people do better than computers?
    - What does it mean to be smart/intelligent?
    - What is smarter? Computers or Humans?
    - Examples of real life artificial intelligence
- Guess the animal class activity
- Google slides activity: Artificial intelligence
    - Answer Key included
- Machine learning for kids:
    - Car or cup activity
    - Make me happy activity