Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch
Module 1

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

Introduction to Scratch

- What is Scratch;
- Getting familiar with the program interface;
- Working with sprites. Costumes;
- Movement commands.

Lesson Result: created the first project, got familiar with the program interface, mastered the first blocks, learned how to work with costumes and sprites.
Practical Assignment: Creating your first project in Scratch.

Day Two

Coordinate System. Event and Control Blocks

- Introduction to the coordinate system in Scratch;
- How to work with coordinates in a project;
- Event and control blocks in a project;
- Project "Labyrinth": creating sprites for the game, coding for winning.

Lesson Result: Learned how to work with coordinates, got familiar with event and control blocks.
Practical Assignment: Creating a "Labyrinth" game project.

Day Three

Loops and Sounds in Projects

- "Repeat/Until" loop;
- Using sounds in projects;
- Recording your own sounds for the game;
- Programming practice: creating the game "What Do Dinosaurs Talk About".

Lesson Result: Learned how to use ready-made and recorded sounds in projects.
Practical Assignment: Creating a game project with the use of sounds.

Day Four

Variables in Scratch Projects

- Learning the concept of a variable;
- Creating variables in a project;
- Programming practice – creating a game with variables.

Lesson Result: Learned how to use variables in projects, consolidated the acquired knowledge in practice.
Practical Assignment: Creating the "Ping-Pong" project, implementing ball-racket collision, programming the loss condition.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch Module 2

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

Creating Clones

- Creating a clone in your project;
- What are costumes and how to use them;
- Working with random numbers;
- Working on the "Space Journey" project: programming sprite movement, handling collisions.

Lesson Result: Got familiar with the concept and use of clones, learned how to move sprites to a random position.
Practical Assignment: Creating the "Space Journey" project.

Day Two

Physics in Games. Score Counter

- Introduction to movement physics;
- Creating a score counter;
- The effect of a variable on movement;
- Creating a platformer game: creating game levels, adding animation, handling collisions.

Lesson Result: Learned how to create a project with complex sprite movement.
Practical Assignment: Creating a platformer game using the studied commands.

Day Three

Time Blocks in Projects

- Falling stars: cloning - wait block, falling - repeat block;
- Adjusting falling stars: delay - appearance settings, randomness of star appearance;
- Programming practice: creating a project with clones and time blocks to manage game mechanics.

Lesson Result: Learned how to use time blocks in projects.
Practical Assignment: Creating the "Falling Stars" project with clones and time blocks.

Day Four

Applied Programs. Messages

- Creating a pencil: sprite, add-ons - Pen;
- Color button. Message;
- Working with a translator;
- Eraser. Practice with messages.

Lesson Result: Learned how to work with the pen, messages and find errors in the program.
Practical Assignment: Creating a graphic editor project using the studied Scratch add-ons.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch Module 3

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

"Quiz" Game. Lists

- Creating a list in a project and practicing working with lists;
- Creating a menu in a project;
- Programming practice – creating the "Quiz" game.

Lesson Result: Learned how to work with lists, create menus in a project, consolidated the studied skills in practice and created a new project.
Practical Assignment: Composing your own questions and answers, entering them into the game lists.

Day Two

Platformer Game. Character and Enemies

- Introduction to the platformer genre;
- Character control, jumping and falling;
- Creating an opponent for the character.

Lesson Result: Started creating a new platformer game, created a hero and his opponent.
Practical Assignment: Creating a game hero, animating his movements, creating a graphic model of an enemy.

Day Three

Platformer Game. Lives and Levels

- Managing level changes;
- Adding a character health counter;
- Creating conditions for defeating the opponent.

Lesson Result: Added level changes to the project. Set up the damage system for the opponent and hero.
Practical Assignment: Adding custom levels. Creating a health counter for the hero and opponent.

Day Four

Finishing the Game. Project Presentation

- Creating conditions for defeating the opponent;
- Game setup, refining your ideas;
- Programming win and loss effects;
- Project presentation.

Lesson Result: Completed and presented the game created during the module.
Practical Assignment: Game refinement and presentation.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch Module 4

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

"Mini-Craft". Creating the Game Landscape

- Reviewing the coordinate plane topic;
- Reviewing the clones topic;
- Programming the level building system;
- Creating a simple controlled character.

Lesson Result: Created a level building system, created a character for the game, deepened knowledge of the coordinate system.
Practical Assignment: Creating a level building system and character control.

Day Two

"Mini-Craft". New Blocks. Functions

- Introduction to functions in programming;
- Functions for creating leaves on trees;
- Creating a game world landscape using functions.

Lesson Result: Added functions to simplify landscape creation.
Practical Assignment: Creating your own landscape from blocks in Minecraft style.

Day Three

"Mini-Craft": Creating the Character, Inventory. Game Mechanics

- Gravity: introduction to the concept of gravity and its application in the game;
- Implementing gravity and sprite jumps using a variable;
- Game addition: inventory cells.

Lesson Result: Created realistic jump and fall mechanics, started work on character inventory.
Practical Assignment: Programming gravity for the character and its collision sensors.

Day Four

"Mini-Craft". Collecting and Placing Blocks

- Expanding the inventory to collect blocks;
- Creating a system for selecting blocks in the world;
- Programming block collection and placement in the world.

Lesson Result: Completed work on the "Mini-Craft" game. Created a system for collecting and placing blocks.
Practical Assignment: Game refinement. Creating a frame that allows you to select a block in the world.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch Module 5

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

"Game of Life". Creating a Living World Simulator

- Learning the simulator genre;
- Creating a wildlife sanctuary simulator;
- Reviewing the function topic through animal behavior models;
- Developing interest in ecology and respect for wildlife.

Lesson Result: Created a wildlife simulator, reviewed previously covered topics.
Practical Assignment: Creating virtual life, discussing questions about the balance of the living world.

Day Two

Tic-Tac-Toe. Lists. Function Parameters

- Creating a cell for the game;
- Learning division with remainder in Scratch;
- Developing a move system and game manager;
- Introduction to function parameters;

Lesson Result: Programmed the "Tic-Tac-Toe" game. Got familiar with division with remainder in programs.
Practical Assignment: Creating a program to check winning conditions in tic-tac-toe using functions with parameters.

Day Three

Golf. Comments. Player List

- Drawing a level using simple shapes;
- Learning boolean variables using the ball program as an example;
- Introduction to the concept of code comments;
- Creating the "Golf" game.

Lesson Result: Created the "Golf" game. Got familiar with the principle of code commenting in programming.
Practical Assignment: Programming the collision system. Creating your own virtual golf course.

Day Four

"Ice Cream Shop" Game. Lists and Strings

- Filling the product list: linking multiple lists;
- Introduction to numerical product coding;
- Programming the purchase process using lists.

Lesson Result: Created an interactive shop with the ability to purchase product sprites.
Practical Assignment: Creating product drawings, filling the product list.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch Module 6

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

Game Hero and Game World

- Discussion of open-world games;
- Using programs between projects;
- Importing the "cell" program from the "Mini-Craft" game;
- Programming hero movement in the world;
- Learning types of game characters: heroes, villains and NPCs.

Lesson Result: Created a system for loading an open world and moving through it.
Practical Assignment: Creating a drawing of your own world "cell", creating an NPC.

Day Two

Villains. Enemy AI

- Adding new "cells" to the game world;
- Creating villain AI based on the "finite state machine" principle;
- Setting up villain movement in the open world;
- Animating hero movement.

Lesson Result: Created enemy AI, expanded the game world. Got familiar with the finite state machine principle in programming.
Practical Assignment: Creating drawings of new world "cells", programming opponent behavior.

Day Three

Battles. Health Indicator

- Creating a weapon for the hero;
- Creating weapon animation and damage application;
- Creating a player health indicator.

Lesson Result: Programmed the damage system. Created a weapon for the hero capable of defeating enemies.
Practical Assignment: Creating your own weapon for the hero, creating a player health indicator drawing.

Day Four

Game Finale. Project Presentation

- Programming win and loss effects in the game;
- Creating ranged weapons;
- Adding your own ideas;
- Game presentation.

Lesson Result: Added your own ideas to the open world. Completed work on the game. Presented the game.
Practical Assignment: Implement your own ideas for the world and game tasks without teacher assistance. Present the game.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch Module 7

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

Introduction to 3D Shapes

- Creating 3D shapes;
- Getting familiar with shapes;
- Creating shapes: cube, cylinder, triangular prism, sphere;
- Practice - creating a model for the game.

Lesson Result: Learned how to create 3D shapes images in Scratch for further use in projects.
Practical Assignment: Created a complex car model using the acquired drawing skills.

Day Two

Creating a Game from 3D Shapes

- Creating game objects from 3D shapes and their setup;
- Principles of creating animation in projects;
- Creating the "Jump Over Obstacle" game from 3D shapes.

Lesson Result: Studied methods of creating animation for game objects.
Practical Assignment: Writing scripts for a 3D figure game.

Day Three

Perspective in Games. Beginning of Creating an Airplane Game

- Introduction to "Perspective" and "Vanishing Point" concepts;
- Perspective properties. Applying perspective in various games;
- Creating a corridor with a distance effect;
- Creating an obstacle sprite.

Lesson Result: Got familiar with the concepts of "perspective" and "vanishing point" and their application in games. Completed figure construction considering perspective.
Practical Assignment: Creating space for the "Airplane in Corridor" game.

Day Four

Completing the Creation of the Airplane Game

- Creating 3D figures in perspective;
- Placing obstacle figures in the corridor;
- Programming airplane control.

Lesson Result: Learned how to create 3D figures and work with perspective for game development.
Practical Assignment: Completing work on the "Airplane in Corridor" game.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch Module 8

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

Creating 3D Models Using the Principle of a 3D Printer

- Principles of layer-by-layer model construction;
- Creating a 3D asset model using 3D printer principles;
- Working with the "Pen" add-on: tea party simulator game;
- Programming model movement.

Lesson Result: Got familiar with the principles of layer-by-layer 3D model construction, learned how to write scripts for layer-by-layer model creation.
Practical Assignment: Writing scripts for creating 3D models for your project.

Day Two

Creating a Shooter Game. Mini-Map

- Analyzing shooter game construction theory;
- Creating a mini-map for the game using perspective knowledge;
- Writing scripts for game character and object movement;

Lesson Result: Got familiar with the principles of creating a shooter game, started creating a game map and added heroes to it.
Practical Assignment: Writing scripts for characters and game objects, creating a game map.

Day Three

Launching the Enemy in the Shooter

- Adding and setting up character sprites;
- Implementing an opponent character in the game;
- Character control: understanding percentages, rotation angle, viewing angle.

Lesson Result: Learned how to use percentages and degree grid for game calculations. Implemented an opponent character in the game.
Practical Assignment: Creating scripts for adding characters using the acquired skills.

Day Four

Designing the Shooter Game

- Win and loss conditions: game score, variables;
- 3D animation: crosshair, throw, external attributes;
- Refining game logic.

Lesson Result: Completed the creation of the 3D shooter project.
Practical Assignment: Game refinement and improvement.

Your Course Syllabus

CODDY - International Coding and Design School for Teens and Kids

Creative Programming and Game Development in Scratch
Module 8

Course Objective: learn the fundamentals of programming, 3D game development basics, develop analytical skills, and foster an interest in programming, modeling, and game design using Scratch.

Course Syllabus:

Day One

Final Creative Project. Part 1

- XYZ space: orientation in three-dimensional space;
- Neural networks: generating game ideas using AI;
- Creating the project foundation.

Lesson Result: Learned how to design a program project based on your own ideas. Got familiar with the basics of using online services based on neural networks and AI.
Practical Assignment: Create the foundation of the "My Room" simulator game using AI-generated scenario ideas.

Day Two

Final Creative Project. Part 2

- Simulator games: turning a room into a game;
- AI artist: generating illustrations;
- Practice: expanding the project.

Lesson Result: Learned how to design a game based on your own ideas, got familiar with the basics of using neural networks for image generation.
Practical Assignment: Continue programming the "My Room" game project, add simulator game elements and AI images.

Day Three

Final Creative Project. Part 3

- "Magic Scratch" Quiz;
- Practice: completing the project and testing;
- Warm-up game "Find in the Room!";
- Project testing.

Lesson Result: Reviewed the basics of Scratch, completed and tested the final course project.
Practical Assignment: Complete the creation of the "My Room" simulator game.

Day Four

Final Lesson. Project Presentations

- Project refinement: game creation;
- Preparing for project presentations;
- Presentations and project defense;
- Course summary.

Lesson Result: Refined and presented the final course project, summarized the course and received recommendations for further learning and development in game development.
Practical Assignment: Project refinement and presentation.