Florida Grade 8 Digital Discoveries Course

Middle School (120 Contact Hours)

Course Overview and Goals

Learning Environment

The course utilizes a blended classroom approach. The content is a mix of web-based and physical activities. Each module of the course is broken down into lessons. Lessons are composed of short video tutorials, interactive learning pages, quizzes, explorations, and free-response prompts.

Technology Requirements

To complete all activities and exercises in this course, students must have access to the 3rd party sites and tools listed here: Florida Grade 8 Digital Discoveries Course Links.

Prerequisites

The Florida Grade 8 Digital Discoveries course is designed for complete beginners with no previous background in computer science. The course is highly visual, dynamic, and interactive, making it engaging for those new to computer science.

More Information

Browse the content of this course at https://codehs.com/course/26527/overview

Course Breakdown

Module 1: Tracy's World (1 week/ 5 hours)

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37670

Objectives / Topics Covered	• What is a command? • How do we communicate with computers? • Moving Tracy • Drawing circles • History of programming languages • Why is Python such a popular language? • Tracy's coordinate system

Example Assignments / Labs	• 11 exercises total
	• Commands
	  ○ Drawing simple graphics
	  ■ Example Exercise: Caterpillar
	Combine multiple commands to write a program that has

	Tracy draw 5 circles in a row ● Programming Languages ○ Learn about characteristics of programming languages ■ Example Exercise: Programming Language Hierarchy Drag and drop programming languages into a hierarchy based on characteristics of the language

Module 2: Moving Tracy (1 week/ 5 hours)

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37671

Objectives / Topics Covered	● Testing your own Tracy programs ● Turning Tracy at right angles ● For loops ● Using coordinates and angles to move Tracy's position
Example Assignments / Labs	● 13 exercises total ● Turning Tracy at Right Angles ○ Learn how to use the left and right commands to let Tracy explore more of her world ■ Example Exercise: 4 Columns Write a program that will have Tracy split her world into 4 columns by drawing 3 vertical lines 100 pixels apart ● For Loops ○ For loops execute the code inside the loop a set number of times. ■ Example Exercise: Row of Circles In this program, Tracy should draw a row of circles across the width of the canvas using a for loop. ● Using Coordinates and Angles to Move Tracy's Position ○ Any angle can be used to have Tracy draw shapes with diagonal lines. ■ Example Exercise: Hexagon Write a program, using for loops, that has Tracy draw a hexagon on the canvas.

Module 3: Designing and Communicating Solutions (1.5 weeks/ 8 hours)

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37672

Objectives / Topics Covered	● Commenting your code ● Naming rules in Python ● Functions ● Artistic commands ● Adding text ● Top down design

Example Assignments / Labs	• 13 exercises total
	• Commenting Your Code
	  ○ Commenting is important to make sure your code is understandable to yourself and others.
	  ■ Example Exercise: Circle Pyramid with Comments
	  Take your Circle Pyramid program from earlier and add comments to explain what your program is doing.
	• Functions
	  ○ Teach Tracy new commands by grouping a set of commands that can be called with one line of code.
	  ■ Example Exercise: Shape Stack
	  Give Tracy instructions to draw a tower of squares and circles from the bottom to the top of the canvas.
	• Artistic Commands
	  ○ There are many ways to get creative with the graphics Tracy draws, such as using color, filling in shapes, and leaving trails with varying thicknesses.
	  ■ Example Exercise: Kid's Shapes Toy
	  Write a program to have Tracy draw a representation of a popular toy used to teach children shapes and colors. There should be 4 different shapes with 4 different colors.
	• Adding Text
	  ○ Text can be added to the canvas using the **`write`** command
	  ■ Example Exercise: Baseball Diagram
	  Label the parts of the baseball field.
	• Top Down Design
	  ○ Solve large Tracy problems by breaking them down into smaller, more manageable problems.
	  ■ Example Exercise: Bubble Wrap 2.0
	  In this program, Tracy will add highlights to each bubble from our Bubble Wrap example program. Use top down design to break this large problem into smaller pieces!

Module 4: Controlling Tracy with Variables (3 weeks/ 15 hours)

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37673

Objectives / Topics Covered	• Variables • Data types • Strings • User input • Parameters • Clickable interaction • Debugging • The value of i in for loops

Example Assignments / Labs	• 33 exercises total
	• Variables
	  ○ Variables are used to store and manipulate values in our programs.
	  ■ Example Exercise: Dart Board
	  Write a program that uses variables to draw a dart board which consists of 4 concentric circles that each increase in radius by 25 pixels.
	• Data Types
	  ○ In this course, we will look at 4 data types: Strings, Integers, Floating Point Numbers, and Booleans
	  ■ Example Exercise: Categorizing Variables
	  Write variable values in their correct data type category.
	• Strings
	  ○ Strings can be manipulated using string methods.
	  ■ Example Exercise: Text Messaging
	  Edit the contents of a text conversation between you and a friend using string methods.
	• User Input
	  ○ We can use input from a user to control certain commands in our code and make our programs more personalized.
	  ■ Example Exercise: Four Corners
	  User input will dictate the length of the sides of a square. Squares of the indicated size will be drawn in each corner of the canvas.
	• Parameters
	  ○ Parameters can be used to customize functions to make them more reusable.
	  ■ Example Exercise: Colorful Caterpillar
	  Use parameters to draw a caterpillar with 8 body circles of 4 different colors.
	• Clickable Interaction
	  ○ Users can interact with Tracy programs using their mouse.
	  ■ Example Exercise: Click Counter
	  Each time the user clicks the canvas, update and display the number of times the screen has been clicked.
	• The Value of i in For Loops
	  ○ The value of i in a for loop is actually a variable! It can be altered and used to control commands in our code.
	  ■ Example Exercise: Dart Board Using i
	  Alter your previous Dart Board program to use the value of i to control the circle's radius instead of a separate variable.

Module 5: Making Decisions (1.5 weeks/ 8 hours)

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37674

Objectives / Topics Covered	• If statements • If/else statements • Returning values from functions • While loops

Example Assignments / Labs	• 18 exercises total
	• If Statements
	  ○ If statements will execute code only if certain conditions are met
	  ■ Example Exercise: Happy Face
	  Write a program that will draw a happy face on the screen if the user answers that they are happy.
	• If/Else Statements
	  ○ The if/else statement executes a block of code if a specified condition is true. If the condition is false, another block of code can be executed.
	  ■ Example Exercise: Rating
	  Write a program that shows a graphical representation of a user's rating value. If the value is between 1 and 4, draw a red X. If it is between 5 and 7, draw a yellow horizontal line. If it is an 8 or above, draw a green checkmark.
	• Returning Values from Functions
	  ○ Functions can return values back to the main program using the **`return`** keyword.
	  ■ Example Exercise: Apple Watch Messages
	  Display a message to the user based on the random time of day that is generated.
	• While Loops
	  ○ A while loop allows code to be executed repeatedly based on a given Boolean condition.
	  ■ Example Exercise: Increasing Squares
	  Write a program that has Tracy draw concentric squares form the center of the canvas until the length variable reaches 400 pixels.

Module 6: Putting It All Together (0.5 weeks/ 2 hours)

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37675

Objectives / Topics Covered	• Control Structures • Commands • Defining versus Calling Functions • Control flow • Looping • Conditionals • Commenting code • Top Down Design

Example Assignments / Labs	• Challenges
	  ○ Students use all of the skills learned in the course to solve complex puzzles and challenges.
	  ■ Example Exercise: Guess a Number 2.0
	  Write a program that allows the user to guess a secret number. If their number is too high, draw a down arrow. If their number is too low, draw an up arrow. If they guess the number, draw a checkmark and end the program.

Module 7: [Project] On-Screen Calculator (2.5 weeks/ 17 hours)

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37676

Objectives / Topics Covered	• Review all concepts through this point
Example Assignments / Labs	• 4 exercises total • On-Screen Calculator ○ Design a calculator that can be used to perform simple mathematical expressions.

Module 8: Exploring Computing (1 week/10 hours)

Students explore different technologies and the impact they have on our world.

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37677

Topics Covered	• History of Computing • Software • Hardware • Operating Systems • Cloud Computing • Ethics and Legal Considerations • The Future of Computing

Example Assignments	• History of Computing
	  ○ *Jigsaw: Computer Interaction Over the Decades:* In this activity, students are going to work in small groups to research what it was like to interact with computers over the various decades. For each section, students will want to consider what was typical for most computers. For example, GUI interfaces were first used in the 1970s, but they were not typical until the 1980s.
	• Cloud Computing
	  ○ *Case Study: Cloud Computing vs. Physical Computing:* Is cloud computing more efficient? Is physical computing the way to go? Students will read through a case study for a middle school that needs to decide between implementing a cloud computing solution

	or a physical computing solution. What are the pros and cons of each? Which way would you ultimately choose to implement? ● Hardware ○ *Brainstorm: New Computer Components:* In this activity, students are going to work with a partner to brainstorm 3 new components for a computer. It can be an entirely new idea or an improvement of an existing component. For each idea, answer the following questions: What is it? Does it replace something, or is it an additional item? If it replaces something, what is it replacing? How will this be helpful in the future?

Module 9: Exploring the Internet (1 week/10 hours)

Students are introduced to network protocols and different strategies used to protect online information.

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37678

Objectives / Topics Covered	● What is the Internet? ● Need for Protocols ● Impact of the Internet ● Cybersecurity ● CIA Triad ● Encryption ● Steganography
Example Assignments	● Network Simulation ○ In this simulation, there are six devices in a network. Click the green RUN button to start the simulation. Clicking on a device will prepare it to send a message. Clicking on a second device will send the message to that device. ● Internet in My Daily Life ○ Envision a normal day, from the time you wake up to the time you go to sleep. In what ways do you use the Internet during your day? For what purposes do you use the Internet? As you go through a normal day in your mind, write down all the ways you use the Internet. Include the device you use and the purpose. ● Cybersecurity ○ Students will learn what is meant by *cybersecurity* and explore a few news worthy cyber attacks. They will also discuss the *Internet of Things* and the increase in connected devices. ● Project: Steganography ○ In the following activity, you will see a picture and the corresponding color codes associated with the pixels. There is a message hidden in the first 12 pixels! Below is the method used to hide the message. Your mission will be to reverse the process and find the secret

	message!

Module 10: Exploring Digital Citizenship (1 week/10 hours)

Students learn about Internet etiquette and how to stay safe on the world wide web.

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37679

Objectives / Topics Covered	• Digital Footprint • Cyberbullying • Internet Safety • Privacy & Security • Information Literacy • Copyright • Hacking Ethics • Cyber Hygiene

Example Assignments	• Digital Footprint and Reputation
	  ○ *Building a Positive Digital Footprint:* Spend some time reflecting on you and your friends' social media activity. Give an example of a social media post that builds a positive digital footprint. How does the post build a positive digital footprint? Give an example of a social media post that builds a negative digital footprint. How does the post build a negative digital footprint? Thinking about your digital footprint, are you going to make any changes in what you post on social media? How about what you write to share in a group message? Why or why not?
	• Internet Safety
	  ○ *Scenario: School Stranger:* You begin to receive direct messages on Instagram from a person you don't recognize. They claim to go to your school, and they know a lot of information about your classes and teachers. They also follow a lot of your classmates, so you believe them. After a bit, they start asking questions about you and your friends. What steps should you take to respond to this situation?
	• Information Literacy
	  ○ *Evaluate the Source 1:* Take a look at this resource, and consider the following questions: What evidence do you see that this source is credible? What evidence do you see that makes you question the source's credibility? Is this a credible source?

Module 11: Exploring Data and Spreadsheets (1 week/10 hours)

Students synthesize all they've learned in this course to complete a project where they use a device to collect and analyze data to find an answer to a question they have.

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37680

Topics Covered	• Data as a Resource • Using Databases • Introduction to Spreadsheets • Sort and Filter • Statistical Measures • Models • Visualizing Data

Example Assignments	• Sort and Filter
	  ○ *Influential Women:* In this exercise, students will learn about remarkable women who have made significant contributions in fields like Science, Literature, and Environmentalism, while having the opportunity to sort and filter data to uncover interesting facts and connections about these inspiring figures.
	• Statistical Measures
	  ○ *Mammal Statistics:* In this exercise, students will explore data on common mammals while calculating the mean, median, and mode of various data points to derive meaningful insights.
	• Visualizing Data
	  ○ *Create a Dashboard:* In this exercise, students will explore running analytics data and create an engaging running dashboard, a powerful tool that consolidates essential information and data visualizations in one place.
	• Project: Tell Your Story
	  ○ *Draft a Design:* For this activity, students will take time to explore data storytelling designs and draft their own story. They can create their infographic directly in the spreadsheet or sketch their design on paper, in PowerPoint, or using a program of their choice.

Module 12: Emerging Technology & AI (2 weeks/20 hours)

Students explore the rapidly evolving world of artificial intelligence and robotics, learning how these technologies are shaping our future. They experiment with AI tools that can generate text, images, and translations; train their own machine learning models; investigate AI's role in accessibility; and explore real-world robotics applications in healthcare, delivery, and companionship. The module emphasizes both the exciting possibilities and ethical considerations of AI.

Browse the full content of this unit at https://codehs.com/course/26527/explore/module/37681

Topics Covered	• What is AI? • AI-generated text and images

	• Communicating with AI and training models • AI and accessibility • Real-world robotics and their applications • Ethical considerations and bias in AI

Example Assignments	• AI Generated Text: AI Characters
	  ○ Have a conversation with an AI that takes on the personality of a chosen character or object, then reflect on its responses.
	• AI Generated Images: Identification
	  ○ Play *Quick, Draw!* to see how AI guesses your drawings and analyze how it learns to recognize shapes.
	• Write Your Own Alt Text!
	  ○ Practice writing descriptive alt text for images, then compare with AI-generated descriptions.
	• Virtual Robot Explorer
	  ○ Guide a simulated robot through challenges, using scanning and planning to complete tasks efficiently.