



ROBOT TURTLES

INTRODUCTION

Are you a hand-on learner? In this simple board game, students will experience the fundamental elements of coding by stringing commands together to create an actual program that moves a robot turtle across a game board to an end goal. It is a tactile way to teach anyone how to code without an actual computer. Let's take a look at Robot Turtles and have some fun with coding!



MATERIALS

- Robot Turtles Game
- Flat Surface
- 2 to 5 Players

Optional:

- Adventure Quests
- Mazes
- Galapagos Rules



INSTRUCTIONS

Step 1 - Choose a Turtle Mover (instructor or experienced student who has played before). The Turtle Mover should be well-versed in the rules of the game.

Step 2 - Set up the Game Board. Sort each card deck into piles according to the symbol at the bottom of each card. You should have five piles. For the 1st game, set the Laser & Function Frog piles off to the side and only use Turn Left, Turn Right, and Step Forward Command Cards.

Step 3 - Have each player choose a turtle and place the Turtle card in a corner of the game board. Place one Robot Jewel for each turtle in the center.

Step 4 - The object of the game is to step on a Robot Jewel so you can pick it up. Everyone who gets a jewel wins!

Step 5 - Using the Instruction Cards, pick one and place it in front of you in line with any other cards you have already placed. The Turtle Mover will follow your instruction cards. If you change your mind, say "Bug!", tap your Bug Card, and put your instruction card back. The Turtle Mover will undo your last move and allow you to go again.

Advanced Skill - Add Obstacles, Use Mazes or Adventure Quests!



TECHNOLOGY

Concepts:

- Creativity, Innovation, Logical Thinking, Problem Solving, Coding

TEKS: TAC §126.6(b)(1)(A-E)

- Creativity & Innovation. The student uses creative thinking and innovative processes to construct knowledge.

TXPOST Standards:

- 3.1.C, 3.1.E, 6.2.C, 7.2.C



ENGAGE

Check out these ideas to get kids engaged in Robot Turtles and more importantly - coding:

- Let's break down the process of making a PB&J Sandwich. What are the steps?
- Let's play Simon Says. Compare Simon to the Turtle Mover and then to a Computer. Similar? Different?
- What does it mean to be a coder?



EXPLORE

- 1 Play Robot Turtles
- 2 Add in Mazes to Robot Turtles
- 3 Create a Maze for Robot Turtles



EXPLAIN

All computer programs break down into a series of commands or steps that must be executed. Computers, tablets, phones, and other devices do not just magically work! Each device runs on various computer programs

that outline a specific purpose. The Robot Turtles Game is a tangible example of a programming language called Logo, designed in 1967 by Wally Feurzeig, Seymour Papert, and Cynthia Solomon. Logo was a primary influence on the Smalltalk programming language that led to the development of object-oriented programming (i.e. Java, C++, Python, PHP, Ruby, Perl, Swift, Object-C, etc...)



In Logo and Robot Turtles, participants use simple commands to move a turtle across a game board. As participants get more advanced, additional resources are given which expand the commands one can give to the Robot Turtle. Participants begin thinking about the Robot Turtles actions as strings of commands and eventually start looking for simplified ways to move the turtle. The Bug Card is used when participants feel that they might have made an error. This teaches one to "debug" their programming sequence. At the end of several games, participants have a basic grasp of computer programming.



EXPAND

Here are some ideas you can implement to expand your Robot Turtles Experience:

- Have students make their own Robot Turtle Mazes.
- Buy some Adventure Quests and implement.
- Use the Galapagos Rules found on the website.
- Introduce the Code Master Logic Game (Amazon)
- Play the Circuit Maze Board Game (Amazon)
- Introduce KIBO from Kinder Lab Robotics.
- Play Move The Turtle (movetheturtle.com)
- Implement activities from CS Unplugged.
- Begin classes in Scratch, Alice, or Tynker.
- Delve into robots like Sphero, Dot & Dash, or Drones.



EVALUATE

3 2 1 REFLECTION

What three things did you learn from playing Robot Turtles?

Name two things that you would like to learn more about.

Record one question that you still have about the Robot Turtles project.