

# Coding Maze

Sponsored by Society of Women Engineers (SWE)

Grade Level:	K-5 <sup>th</sup> Grade
Duration:	30-60 mins
Classification:	
Subject(s):	Coding
Categories (STEM):	Technology, Engineering, Math
Keywords:	Computer Science, Computer Coding

## Introduction:

Summary:	Learn the basics of computer coding.
Description:	Learn more about computer science, the study of computation and information, through this fun hands-on activity. Where we start with the basics of computer coding and help our WiSE robot get through the maze successfully.

## Online Resources:

Computer Science PD video:

[https://www.linkedin.com/feed/update/urn:li:activity:7004521616739115008?utm\\_source=share&utm\\_medium=member\\_ios](https://www.linkedin.com/feed/update/urn:li:activity:7004521616739115008?utm_source=share&utm_medium=member_ios)

## Materials:

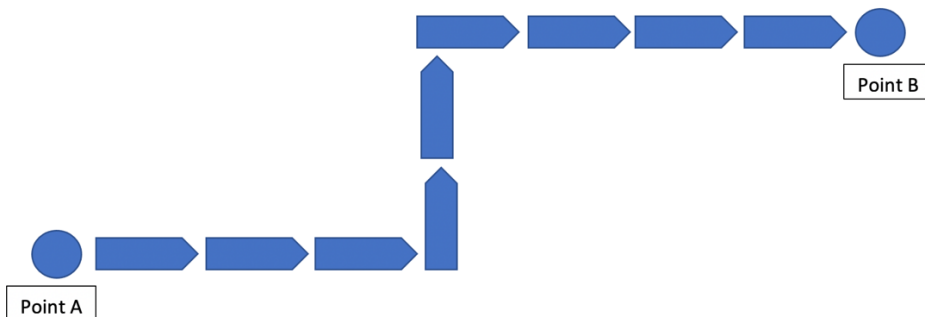
Material	Quantity	Resuable?
Painter's tape	1 full roll	No
Notecards	1/student	No
Pencils/pens	1/student	Yes
Markers	3 sets	Yes
Card stock	1/student	No

## Directions:

Take some time to set up a 'maze' using items around the room (chairs, tables, etc.). Depending on the age group consider taking the tape up and over items. Have fun creating the maze.

Once the maze is finished ask the kids what all they know about coding. Explain to them that a computer thinks in steps. Do a brief example of the board with a simple maze.

Ex:



Once they've done this on their own have them team up and tell them the codes they can use in the larger maze.

Codes for Maze could include:

- (F) – Forward
- (TL) – Turn Left
- (TR) – Turn Right
- (D) – duck
- (J) – Jump
- (C) – Crawl
- (S) – Stop
- Etc.

In their groups have them only write out the sequence of directions they think will get them through the maze. Don't let them try it out just have them work from looking at the maze at this point. With each code make sure they include how many times this code should be done. Ex: (F) 3 means forward 3 steps.

Collect all the groups code cards and have one SRM read the card while the other is the 'WiSE' robot. Play up bumping into things and try to keep your steps consistent.

Once every group has had a chance to go through their cards. Give them a second chance to change their code and do it again.

#### **Discussion Questions:**

- How did you change your thinking to be successful in this activity?
- What other areas could you use this way of thinking in STEM?

#### **What is happening?**

Computers go line by line when reading code. You can think of it this way. The computer has what is called a CPU or central processing unit (brain) that only understands something called machine code, which is a language consisting of ones and zeros.

Just like our brain intakes words, computers intake machine code and read it. This way of thinking in steps can be very helpful in other subjects as well. You too can computer code!

#### **Activity Extensions:**

If there is time have them write their names using binary code. See attached sheet. Consider upper and lowercase letters. Using the markers and larger paper have them write everything out. Ex:

K – 01001011 E – 01100101 N – 01101110 Z - 01111010

## **Applications:**

- Majors
  - Computer Science
  - Data Science
  - Computer Engineering
  - Software Engineering
  - Cybersecurity Engineering
  - IT Services
  - Management Information Systems
- Jobs
  - Game Designer
  - Web developer
  - Software developer
  - Mobile App developer
  - Cybersecurity for corporations/companies
  - Artificial Intelligence Engineer
  - Etc.
- Hobbies
  - Robotics
  - [Code.org](https://www.code.org/)
  - Raspberry pie kits