

## 2020 Minor Challenge Set #1

**STEM Field:** Software Engineering/IT

**Level:** Intermediate

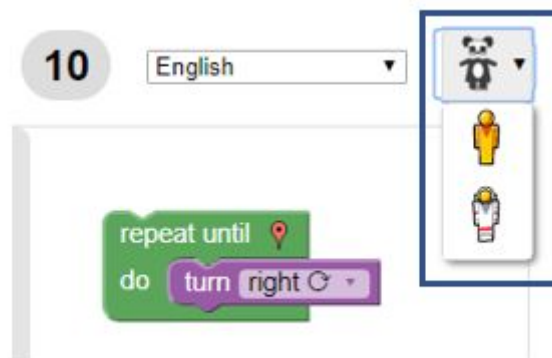
**Challenge Name:** Blockly: Maze Puzzle Game

**Materials required:**

- Internet access (preferably laptop/computer)

## Introduction:

Using programming you are tasked with helping a lost soul around a maze. Alternatively you can change the level's appearance to be guiding an astronaut across a space station or a panda across bamboo by clicking on the following:



While this game may seem short at 10 levels, the last few levels becomes very hard and your logical thinking skills will be tested very quickly.

When you click the Run Program button, the blocks will run from top to bottom. Also you'll notice certain blocks will glow orange/yellow when that block is being run. Watch your person/astronaut/panda when blocks glow and they'll follow your exact instruction!



## Instructions:

Click or type in the following link into your browser, Google Chrome is recommended as the browser of choice:

<https://www.brainpop.com/games/blocklymaze/>

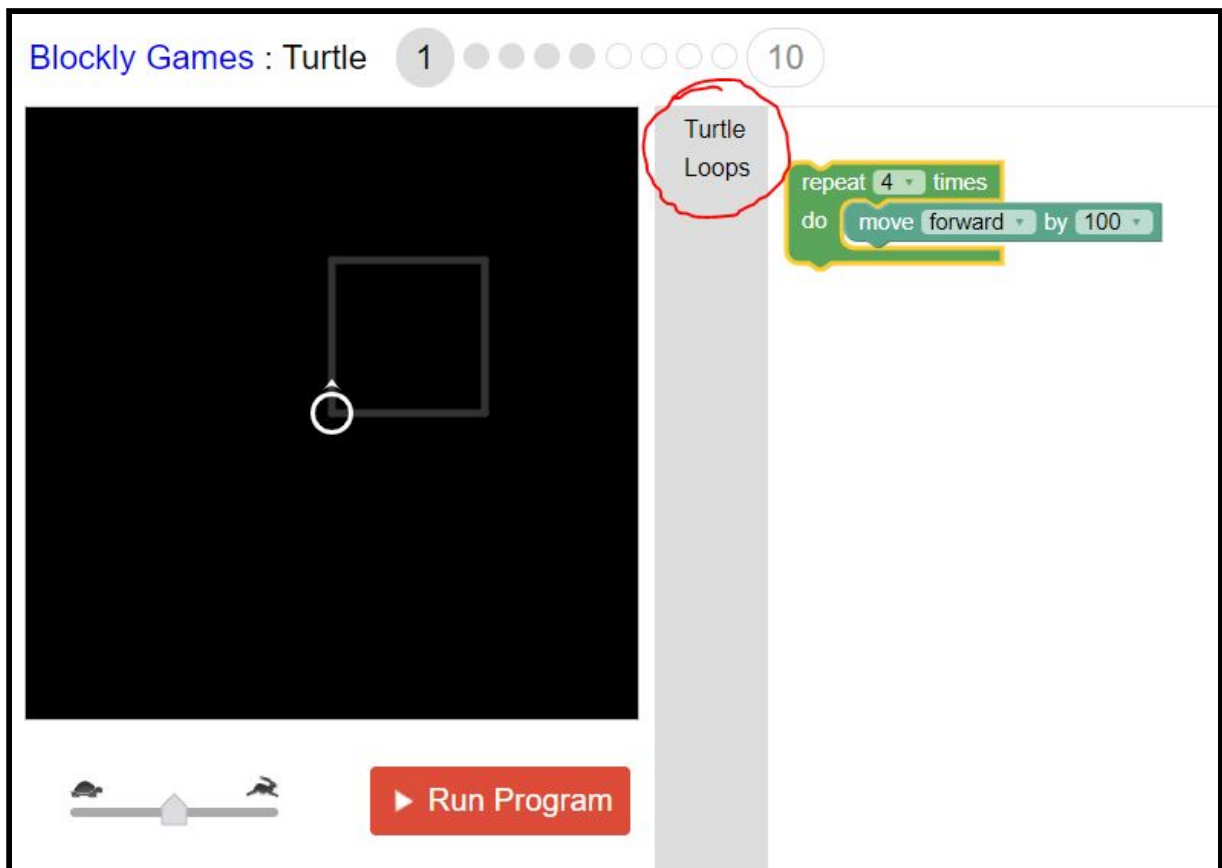
Try to beat all 10 levels! Make sure you've read the Introduction and Tips section of this document carefully. You can go back to previous levels at any time. Levels 9 & 10 are way harder than the rest of the levels which help introduce you to some of the blocks. But that's where the puzzle in puzzle game comes in, so think carefully in those levels and don't be too discouraged if it takes awhile.

### Extension - Turtle Game

Using the same Blockly structure, play the Turtle game found here:

<https://blockly.games/turtle>

This game is MUCH harder than the previous one but uses the same knowledge, it's just a bigger challenge! If you're feeling stuck remember you can always test things out by trying different blocks until it just works all at once. After completing each level, you'll see the Javascript code equivalent of the blocks you just created, which is real code and is used in many programs! Each level builds from the previous.



Click where the Red circle is to bring up Blockly blocks.

## Tips:

- Infinite loops:
  - Using the repeat blocks it is possible for blocks to run forever because we forgot something to stop it when we want it to stop. You can see this when blocks keep blinking orange/yellow or your character/astronaut/panda keeps repeating the same steps without hitting the boundary.
  - Simply press the Reset button to stop this.
- Keep trying even if it you get stuck! Sometimes it takes a lot of tries, tweaking around blocks until it works (this is true for professional programmers as well!)
- As you get into the later stages, take the time to really think logically how your blocks work step by step.

- There is more than 1 right answer to complete some of the later stages, but as long as your character/astronaut/panda reaches the end it doesn't matter how complicated your block of code ends up looking. But for a challenge try to use the least amount of blocks possible!
- You can delete blocks by right clicking on them and pressing 'Delete Block'.
- When you drag a block it will get all the blocks underneath it. Say you wanted to delete the top block, the easiest way is to select the block 2nd from the top, put it somewhere else then delete the top block.
- [Extension] The moon in the 8th level should be coloured white

## Reflection Questions:

- Address problems that may be associated with the challenge and mention the improvements you can make
- What real world application you can apply the challenge to?
- What are the key concepts of science and engineering that relate to this challenge?
  
- Did you find this puzzle game easier or more difficult than you expected?
- What was your strategy to solve the last level? Try to explain your solution to the best of your ability.

## Submission Guidelines:

- In 2020 we have changed our submission guidelines compared to 2019. To submit fill out the form here:  
<https://forms.gle/ChrCXLud97E4x3AT9>

- Submit a screenshot or photo of the completed game, which should look like the below image. Include a short summary that addresses some of the Reflection Questions.



## Learn More! Resources:

- Video on Computer Programming by Brainpop:  
<https://www.brainpop.com/math/dataanalysis/computerprogramming/>
- Blockly Games  
<https://blockly-games.appspot.com/>
- Tynker Sketch Racer  
<https://www.brainpop.com/games/tynkersketchracer/>
- Tynker Puppy Adventure  
<https://www.brainpop.com/games/tynkerpuppyadventure/>

## Sources:

Brainpop.com. (2019). Blockly: Maze - GameUp - BrainPOP.. [online] Available at: <https://www.brainpop.com/games/blocklymaze/> [Accessed 23 Feb. 2019].