This activity teaches the idea of abstraction with loops using a maze.

Supplies:

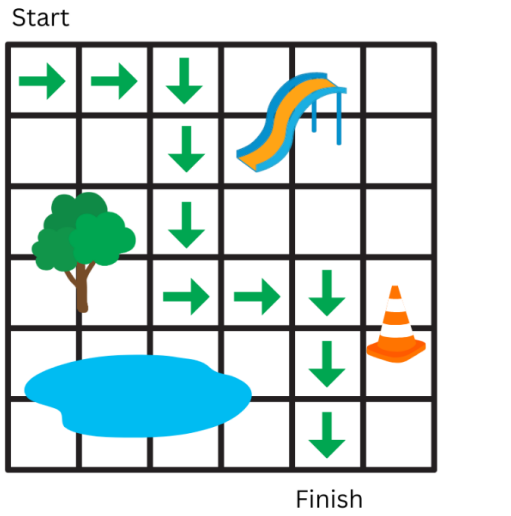
- Printouts
    - Maze sheets
    - Arrows and repeat signs (cut outs)
    - Car (cut outs or toys)

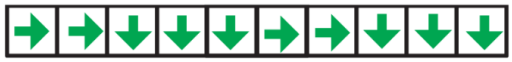
Each student will get a printout of a maze. This will take the form of a grid with some squares as free space and some as obstacles like trees, lakes, etc. There is also a start square and a finish square. The goal of the game is to get the car from the start to the finish using the arrows as instructions. Cars are not allowed to move over obstacles or outside the maze.

Phase 1:
The first time students will use just the arrows to make their solutions and it will be fairly simple. Have students count how many instructions they are using.

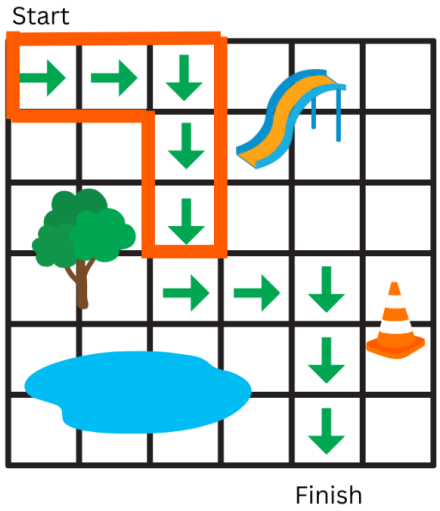
Phase 2:
Ask how we might be able to write instructions without having to use so many arrows. Help the students come up with the idea of repeating a section of the instructions multiple times. Then, hand out the repeat signs and show how to indicate a repeated part of the instructions. Then let the students try again and make a better solution. Note: there are possible solutions to phase 1 that don't repeat, so they may have to change the path the car takes in order for repeats to work.

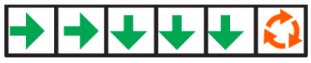
Phase 1 - example solution





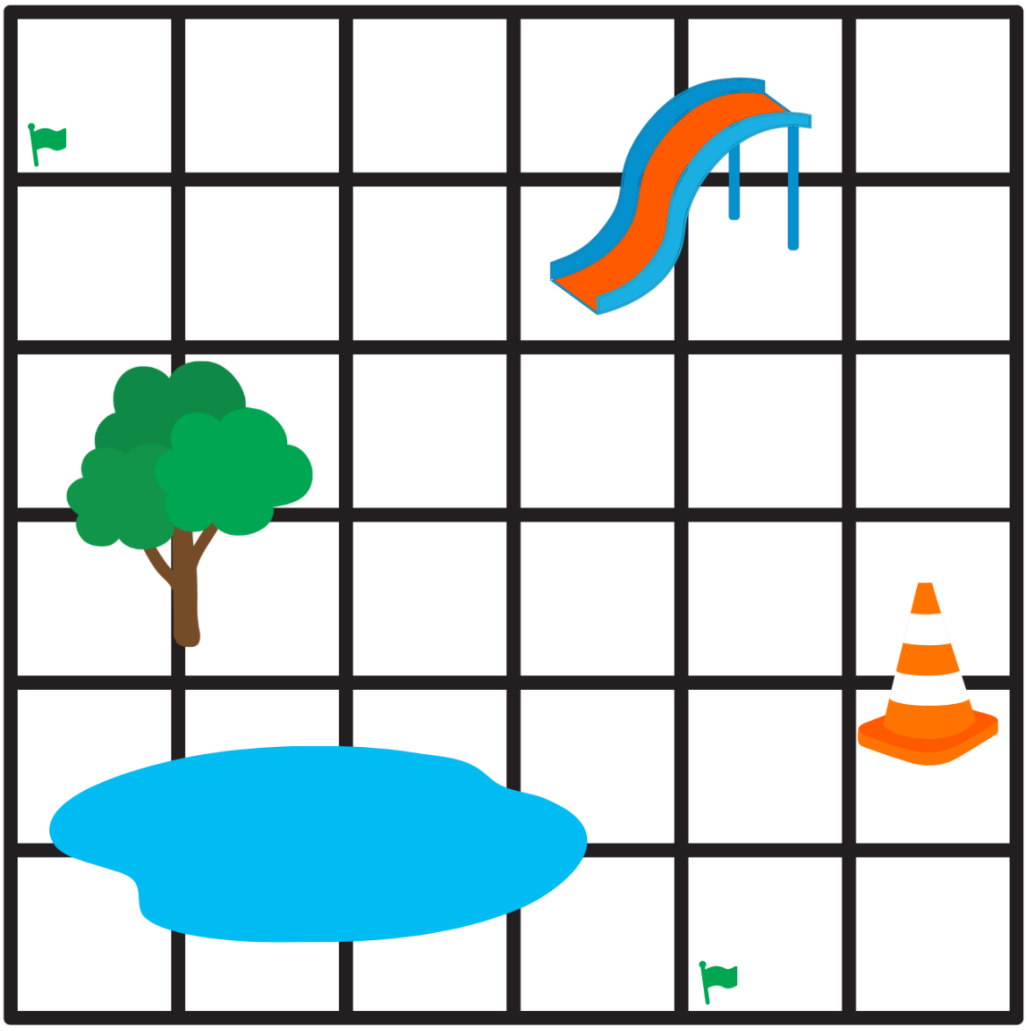
Phase 2 - example solution





Printouts:

Start



Finish