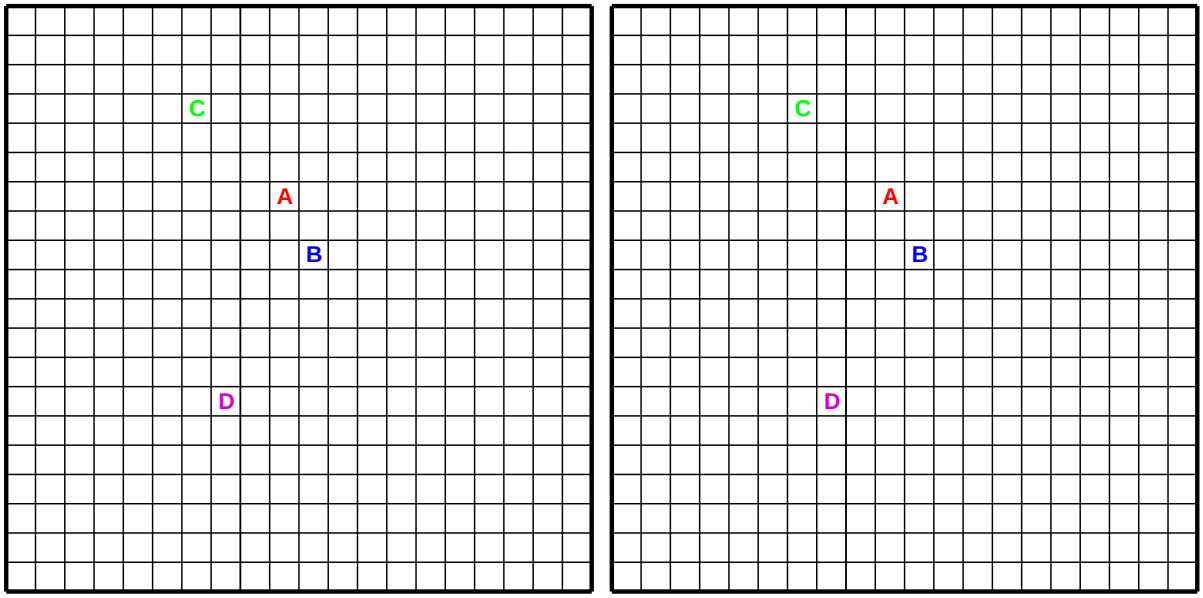
After Class Exercises-0



The purpose of this exercise is to illustrate in a simple way the ideas we will be studying in the next month.

Consider the grid above, and on the left. Start out at the location marked **A**. Roll a die and move left, right, up, down if the die reads 1, 2, 3, 4 respectively. Do nothing if you roll a 5 or 6. Trace your path out. Imagine there are hard boundaries ("cell walls") at the edge so that you can never move outside the grid. Stop after 50 steps.

- Do you ever reach the point marked **B**? How many steps does it take?
- Do you ever reach the point marked **C**? How many steps does it take?
- Do you ever reach the point marked **D**? How many steps does it take?

Suppose you only allow diagonal moves. That is, if you roll a 1 you move one square to the right and one step up. If you roll a 2, you move one step to the left and one up. If you roll a 3 you move one square to the right and one step down. If you roll a 4, you move one step to the left and one down.

- Can you ever reach **B** from **A**?
- Can you ever reach **C** from **A**?

Change the rules to be 'self-avoiding': Once you have occupied a square you are forbidden to return to it. (Reroll your die and try again.) Trace out paths on the grid above and on the right. Do you reach **B**, **C**, **D** now? How are your paths different from originally? Do you think molecules in cells do self-avoiding walks?