

Robotics Badges: *Programming Robots 1*

Tic Tac Toe Robot Instructions

THINGS TO KNOW:

- **Artificial intelligence** or **AI** is a type of computer program that acts as if it can think like a human. AI can make robots with computer brains seem more lifelike and make it easier for humans to communicate with them.
- One of the ways scientists test how smart their computers are is to have them play a game against a human expert. In 1997, the IBM Deep Blue computer won a game of chess against world champion Garry Kasparov. In 2011, the IBM Watson computer won a game of Jeopardy! against champions Ken Jennings and Brad Rutter.
- To play a game, you need to learn the rules. To win, you also need to know the best moves to make. These instructions can be written in the form of an **algorithm**. An algorithm tells you what steps to take and in what order.
- A computer program is a type of algorithm.

HOW TO PLAY:

1. One person will play the part of the robot, and the other will represent humankind. The robots must follow the **Robot Instructions** in this handout for playing the game. The humans can make any move they choose.
2. Draw a tic tac toe board. The robots will be X, and they always get to go first. The human players always play as O and go second.
3. Play one round. How well did the robot play? Was the human able to beat them?
4. Switch roles and play again. Do the humans ever win? Or do they always lose or end in a tie?
5. Play as many rounds as you have time for.

Want More Challenge? Try this! Write an algorithm, a set of step-by-step instructions, that would let the robot win, even if it goes second.

ROBOT INSTRUCTIONS:

For each move, go down the list and do the first action that is possible. In other words, if you can't do the first action, do the second action. If you can't do the first or second action, do the third action.

Move 1:

Go in any corner.

Move 2:

Go in the corner opposite Move 1.

Go in any free corner.

Move 3:

Go in any space that will make three Xs in a row. (You win!)

Go in any space that will prevent O from having three in a row.

Go in any free corner.

Move 4:

Same as Move 3.

Move 5:

Go in any free space.