Robo-Hatters FLL
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Sensor scramble

Believe it or not, sensors are the key to making an efficient, reliable LEGO robot. Whether you choose to use them or not, it is helpful to know how much of an advantage a sensor-based robot has over one that just drives using programmed distances.

To play Sensor Scramble, you will need:

- At least two people (one as Robot, the other as Programmer)
- Some obstacles (like tables, chairs or walls)
- A goal object (like a baseball)
- A score sheet for each scenario (3)

Set-up:

- One person must be chosen to be the Robot
- One or more people must be the Programmers
- A simple obstacle course should be created out of tables, chairs, etc. Its layout should be kept secret from the Robot
- The goal object should be placed somewhere in the course

Here's how it works:

1) Your objective is to complete 3 scenarios, each of which involves getting the Robot to the goal object, picking it up, and bringing it back to the start.
2) At the beginning of each scenario, the Robot must shut its eyes and be spun around 3 times. It should then be moved to the start of the obstacle course.
3) The Robot is not allowed to move on its own. A Programmer must tell it what to do before it does ANYTHING. However, the Robot may talk at any time.
4) If the Robot touches an obstacle with anything but its touch sensor, you must start over.
5) Each of the scenarios have certain rules that the Programmers and Robot must follow.
6) At the end of each scenario, your team must fill out a score sheet.

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Scenario One: Distance Scramble

Heads Up! The Robot only has a distance sensor (tachometer) for this scenario. This means that:

- The Robot must keep its eyes shut

- The Robot must keep its hands at its sides (unless grabbing the goal object)

- The Programmer is allowed to say:

"Walk _____ steps forward or backward"
"Turn _____ degrees to the right or left"
"Turn _____ steps to the right or left"
"Move your hand _____ inches to the right/left/up/down"

Remember! The Robot must be told a number of steps to move! Programmers can't just say "Stop!"

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Scenario Two: Touch Scramble

Nice! Your robot was just upgraded with a touch sensor. This means that:

- **The Robot must still keep its eyes shut at all times**
- **The Robot is allowed to move its hands around and feel for obstacles**
- **The Programmer is allowed to say:**
  - **Everything from last scenario**
  - **"Walk forward or backward until you hit an obstacle"**
  - **"Turn left or right until you hit an obstacle"**

Remember! Safety first! The Robot should always walk SLOWLY while in the obstacle course.

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Scenario Three: Vision Scramble

Cool! Your robot just got a vision sensor (like the ultrasonic or light sensor). This means that:

- The Robot is allowed to open its eyes at any time -

The Programmer is allowed to say:

Everything from last scenario
"Turn toward the _____"
"Walk until you reach the _____"

Remember! The Robot can't do anything until it's told by the Programmer!

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Sensor Scramble

Score sheet

Group Name: _____

Group Members: _____

Scenario: _____

Rate your experience on the scenario:

Rage Quit

Pretty Tough

OK

Smooth Sailing

Easy Peasy

Based on your rating, do you think it's a good idea to use sensors on your LEGO robot? Explain.