⬡ CHAPTER CHALLENGE

Search and Rescue Challenge

In this Challenge, you will use everything you've learned to create a rescue robot that will enter a 4-room building. The robot must perform 4 unique actions for 4 unique rooms, that will be randomized in order to simulate a hazardous area where you can never know what will be encountered. The robot must complete all 4 rooms, and return to the starting point.

Final Challenge Board Setup

- The rooms' basic shapes are all identical.
- The building walls do not need to move when the rooms are randomized!
- Each room either contains one of three props or contains nothing at all.
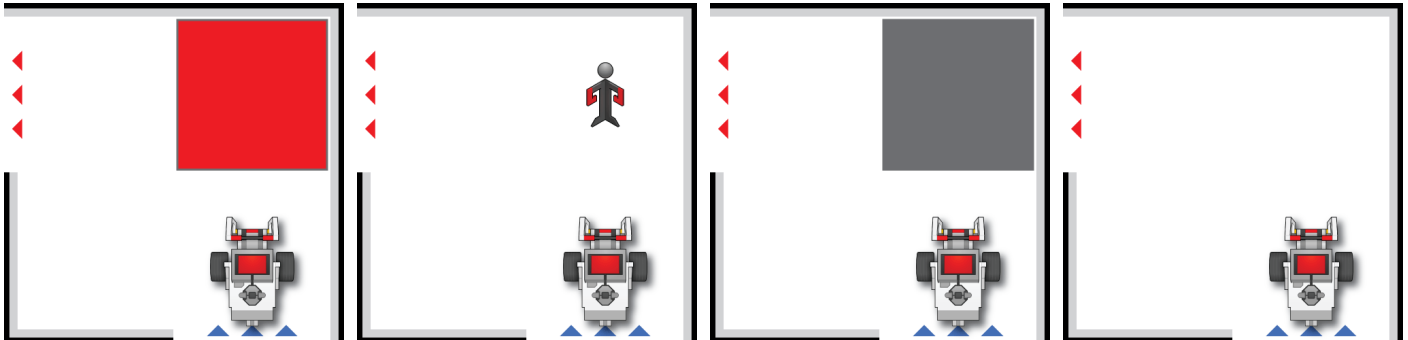
|			
Room 1: Fire	**Room 2: Rescue**	**Room 3: Walled**	**Room 4: Clear**
A sizeable square of red electrical tape on the ground. For easier portability, you can attach most of the tape to an index card or paperboard, and only attach/detach the edges from the table	A piece of PVC pipe, toilet paper tube, or small tower constructed of LEGO elements. A hook on the side of this object should be suspended about 3 cm above the table surface so that the robot's arm can lift the person off the table.	Any piece that blocks the robot's travel. It can be a piece of tape, if nothing else is available. The robot must be able to get around the obstacle, so make sure that there is enough space for the robot to go around it.	One room will not contain any props for this challenge.

PHASE 1

Before you build a robot that can complete objectives of all 4 rooms at once, demonstrate that your robot can complete each rooms, one at a time.
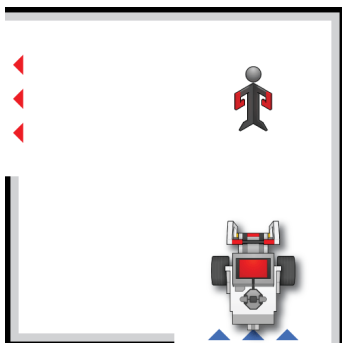
- Write 4 seperate programs for each room
- Robot can enter either entrance of the room
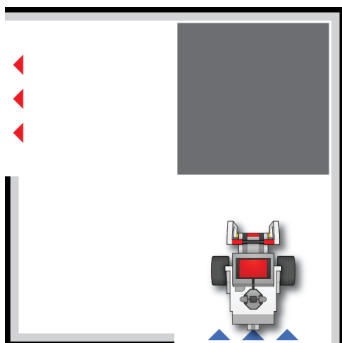- Robot must exit the room completing the objective

Room Objectives
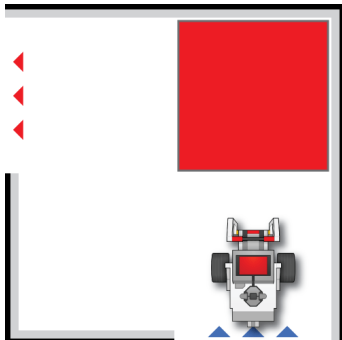
PROGRAM 1: Fire Room

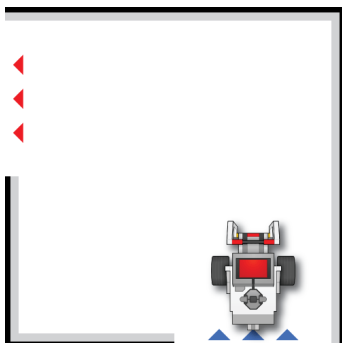Run over 'Fire' area with the rear end of the robot

PROGRAM 2: Rescue Room

Pick up the survivor

PROGRAM 3: Walled Room

Avoid the walled area and exit

PROGRAM 4: Clear Room

Play sound 'Analyze' before exiting the room

PHASE 2

Combine your robot's capabilities in Phase 1, and build a robot that can distinguish and complete all 4 rooms in one run.

- Write 1 program that will travel all 4 rooms
- The location of the rooms will be randomized each run
- The robot may start at any room's entrance
- The robot's trip can be either clockwise or counter-clockwise
- The robot must return to where it started

Final Challenge Objective