

## 2009 Smart Moves Robot Missions Only

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We have compiled all the key documents for this year's challenge into one document.

**THIS IS ESSENTIAL INFORMATION AND SHOULD BE READ AND RE-READ BY EVERY MENTOR AND TEAM MEMBER. YOUR SUCCESS IS ALMOST ENTIRELY DEPENDENT ON YOUR COMPREHENSION OF THIS INFORMATION.**

**ALWAYS CHECK THE FAQ'S ON THE FIRST LEGO LEAGUE SITE. FAQ'S SUPERSEDE ALL INITIALLY PUBLISHED INFORMATION.**

Be sure to read the "Background Rules and Concepts" in the document titled **FLLRules2009SmartMoves.pdf** available at TechBrick.

<http://www.techbrick.com/resources>

Go here for the Game Q&A

<http://www.usfirst.org/roboticsprograms/fll/gameqa1.aspx>

Source documents can be found at:

<http://www.usfirst.org/roboticsprograms/fll/smartmove1.aspx>

Go here for TechBrick Worksheets and Guides

<http://www.techbrick.com/resources>



## **Robot Game Missions**

### ***2009-10 FLL Mission Details***

#### **Robot Game Overview**

The Smart Move Robot Game gives you first-hand experience in getting a sensor-equipped vehicle (your robot) to ***gain access to places and things***, while ***avoiding or surviving impacts***, all in a test environment...

Imagine if you could program a vehicle to take you places, or even go by itself...

Imagine if each vehicle knew where all the other ones were...

Imagine if vehicles could avoid each other and the things around them...

Imagine if vehicles could be programmed to avoid causing or driving into traffic jams...

Would traffic signals be needed any more?

If these vehicles did hit each other...

How might they be built to really keep passengers safe?

How might they be built to avoid getting stuck or damaged?

Have you noticed that most vehicles near where you live are only used part of the day?

How might the number of vehicles in your area be reduced?

What new technologies could sometimes eliminate your need to travel?

Now in addition to imagining and wondering... Try some of this yourself!



### MISSION: GAIN ACCESS TO PLACES (choose one)...

Required Condition: Your vehicle needs to be in one of these positions exactly as the match ends (this mission does not affect others):

**TARGET SPOT** - Required Condition: Parked with its drive wheels or treads touching the round target.

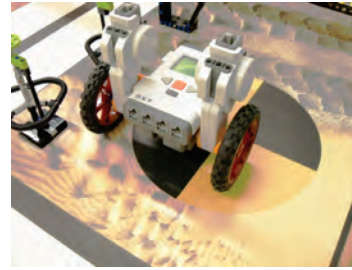
Value: 25 points.



Before



Scoring Example



Scoring Example

**YELLOW BRIDGE DECK** - Required Condition: Parked with its drive wheels or treads touching your yellow bridge decking, but not touching any red decking or the mat.

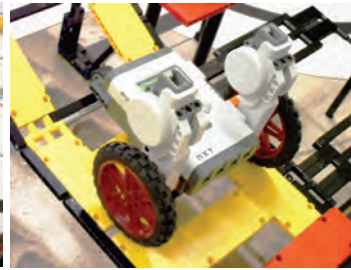
Value: 20 points.



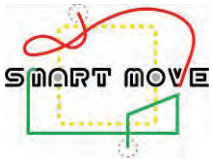
Before



Scoring Example

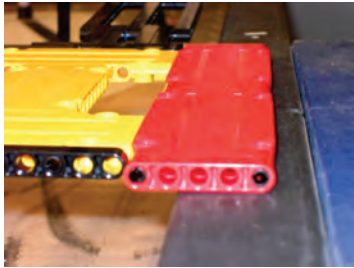


Scoring Example

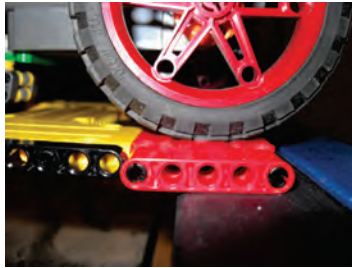


**VEHICLE SHARING** - Required Condition: Parked with its drive wheels or treads touching your red bridge decking, but not touching the mat.

Value: 25 points.



Before



Scoring Example



Scoring Example

### MISSION: GAIN ACCESS TO THINGS...

**ACCESS MARKERS** - Required Condition: Access markers need to be in their "down" position.

Value: 25 points each.



Before



Scoring Example



Scoring Example

### MISSION: GAIN ACCESS TO THINGS...

**LOOPS** - Required Condition: Loops need to be in Base.

Value: 10 points each.



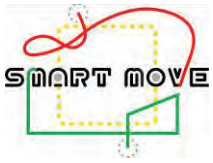
Before



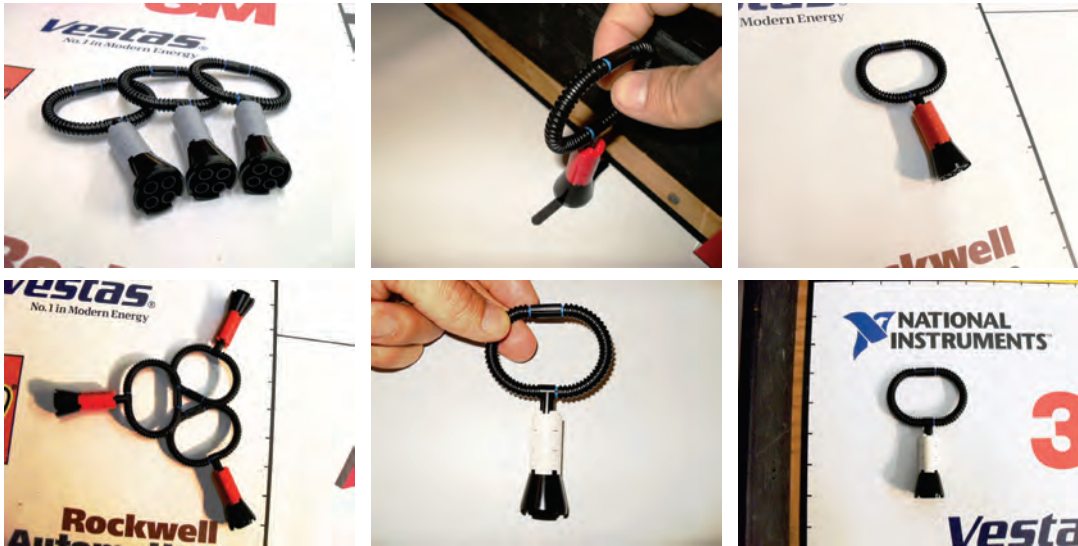
Scoring Example



Scoring Example



**BONUS:** New technologies can sometimes eliminate your need to travel. They are hard to develop, but each new one makes the next come easier... If all three gray loops have reached Base, you may take one red loop into Base by hand. Independent from that, if all three red loops have reached Base, you may take one loop of any color into Base by hand. Once earned, these hand freedoms (which are a special exception to the rules) may be used any time before the match ends.



**MISSION: AVOID IMPACTS...**

**WARNING BEACONS** - Required Condition: Warning beacons need to be upright (square to the mat).

Value: 10 points each.

ALSO: Warning beacons are the touch penalty objects for the Smart Move Robot Game. This means each time you touch your vehicle while it's completely out of Base, the referee removes one upright beacon. The beacons are removed in order from south to north, then from west to east. If there are no upright beacons at the time of the touch, there is no penalty.



Before

Scoring Example

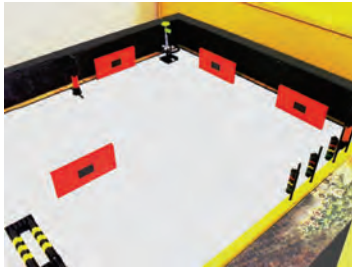
Scoring Example



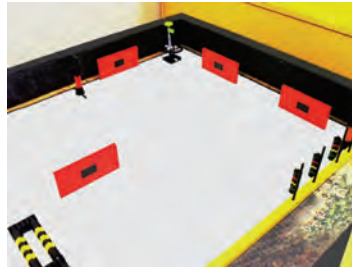
MISSION: AVOID IMPACTS...

**SENSOR WALLS (AVOIDANCE OPTION):** Required Condition: Sensor walls need to be upright (square to the mat). Any four walls can count. Only four walls can count. Each upright sensor wall also requires a "down" access marker. Example: If there are four upright walls but only three access markers down, only three walls count.

Value: 10 points each, max 40.



Before



Scoring Example

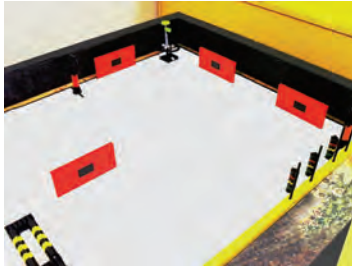


Scoring Example

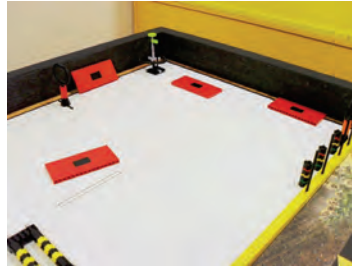
MISSION: SURVIVE IMPACTS...

**SENSOR WALLS (IMPACT OPTION):** Required Condition: No (zero) sensor walls are upright.

Value: 40 points.



Before



Scoring Example



Scoring Example



**MISSION: SURVIVE IMPACTS...**

**VEHICLE IMPACT TEST:** Required Condition: The truck needs to no longer touch the ramp's red stopper beam. Your entire vehicle needs to be completely out of Base when it produces the required condition, otherwise the referee removes two upright warning beacons (in the same manner as two touch penalties).

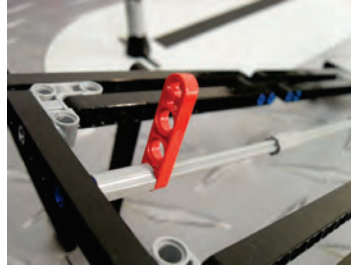
Value: 20 points.



Before



Scoring Example



Scoring Example

**MISSION: SURVIVE IMPACTS...**

**SINGLE PASSENGER RESTRAINT TEST:** Required Conditions: The crash-test figure needs to be aboard your vehicle for the entire match. The first time your vehicle is without the figure, the referee removes the figure. Any constraint system is okay as long as the figure can be separated quickly after the match.

Value: 15 points.



Before



Scoring Example



Scoring Example



**MISSION: SURVIVE IMPACTS...**

**MULTIPLE PASSENGER SAFETY TEST:** Required Condition: All four people are sitting or standing in or on a transport device of your design, and some portion of that object is in the round target area.

Value: 10 points.



Before



Scoring Example



Scoring Example