The Crane

Model Name and Number: The Crane YE.525

Topic: Use the motor as a sensor.

Accessory tools: snail transmission, 6 smoothe lines, 4 nail beams, 2 technical 9 beams, 2 gear racks, 2 cross nails, 24 Lego® bricks and Printed reference pages.

Lesson's Goals:

- Students will learn how to use the engine as a sensor.

Lesson Structure:

1. Explain the model that will be built in the class.
2. Using the motor as a sensor.
3. Explaining the Operational Algorithm.
4. Construction of the model.
5. Programming.
6. Playing with the model.
7. Dismantling and rearranging the Young Engineer kits - 10 minutes before the class is to be dismissed.

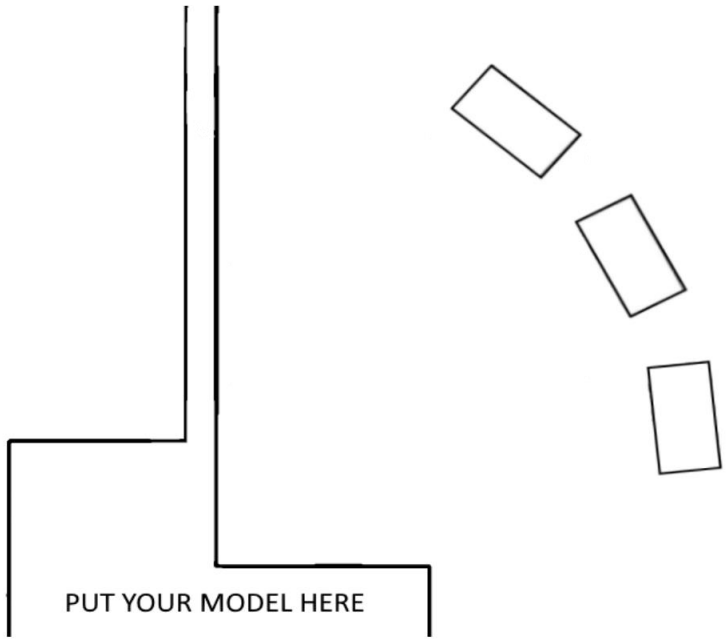
Explanation of the model to be built in class:

The model that will be built in this lesson is called "The crane". A crane has a "pliers" that can catch objects and is located at the end of a main arm that can be raised. The pliers and the main arm are operated by one motor so that they can grasp, be raised or lowered and released. It is controlled by the Smart Brick. In addition, the crane has the capability to rotate, which is carried out by a driven axle. The axle will be powered by another engine as explained below.

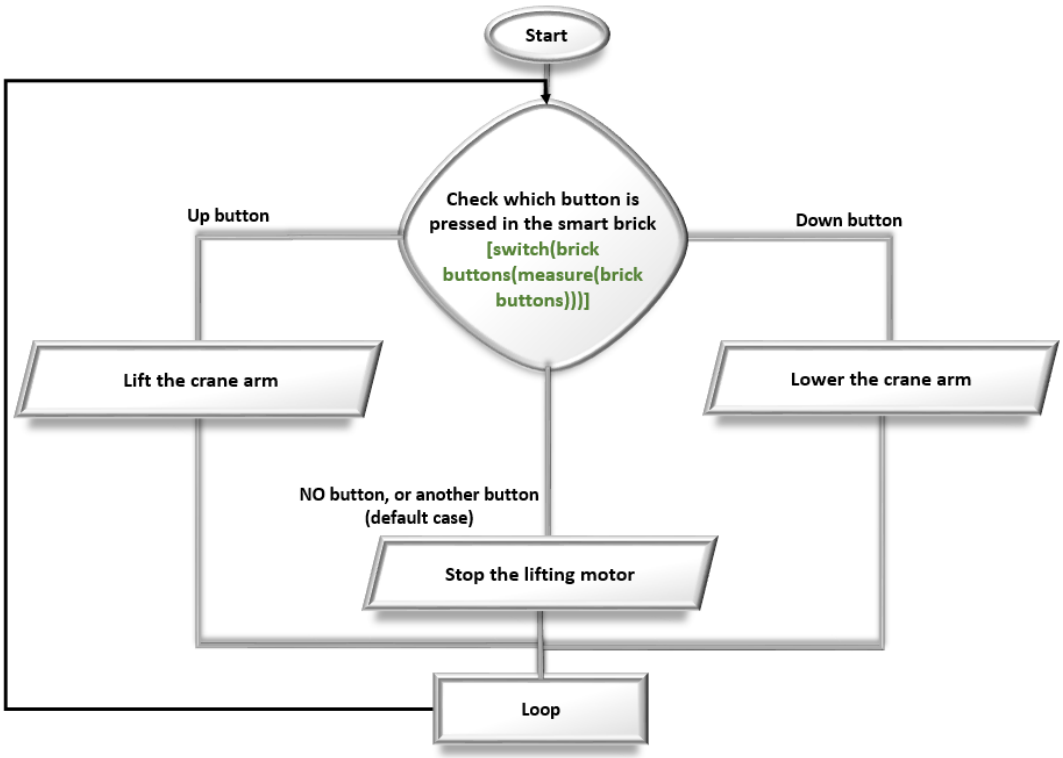
Using the motor as a sensor:

The motor which is responsible for turning the lever is operated by another motor, that is rotated by the student and not by the smart brick. It is possible to simulate this mechanism for the generator - a motor that is turned by the student and generates electricity that will pass through the cable to the engine that will turn the crane. In other words, a motor that recieves electricity rotates, a motor that will rotate will give out electrical energy. Students should

be presented with an idea based on the following picture: Rotate one of the motors and see that the other follows.



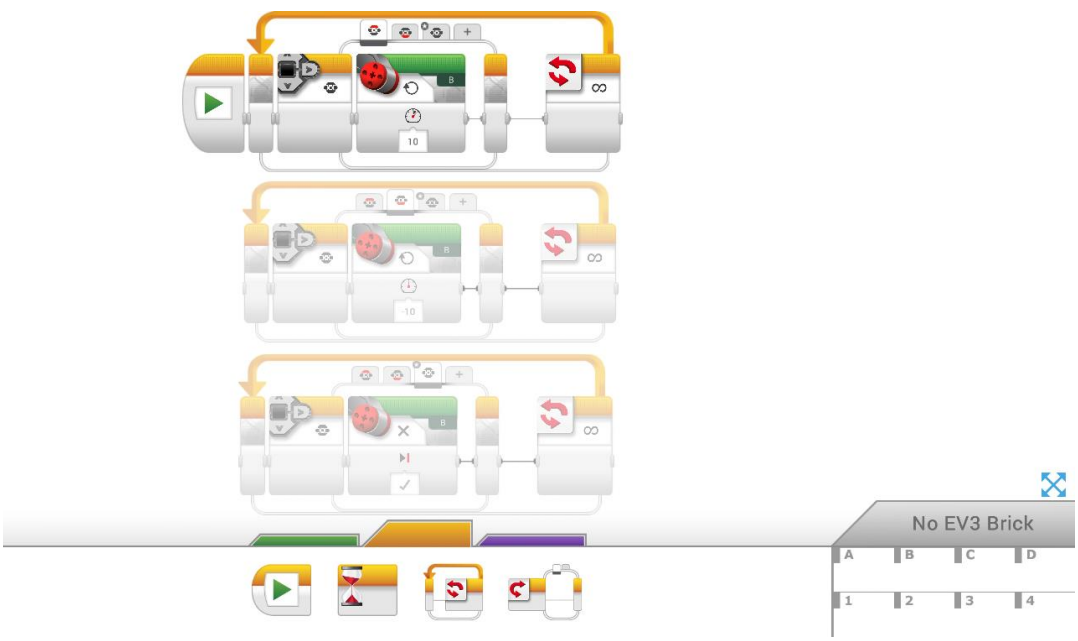
Operational Algorithm:



Playing with the Model:

This model is a game in which students must place the LEGO® constructs according to the following picture. {Missing photo]. The goal is to move all the LEGO® constructs beyond the long beam in the shortest time possible.

Programming:



Notes for the instructor:

- ✓ It is very important to correctly connect the arm system (the main arm and pliers) and therefore should assist children at this stage.
- ✓ When arranging the bricks, you should use a model layout page that can be downloaded through the site, it must be printed for each team.