



## **Picking Up and Moving an Object**

By Sanjay and Arvind Seshan

# **BEGINNER PROGRAMMING LESSON**

# OBJECTIVES

1. **Learn how to program a robot to move an attachment arm – a powered attachment**
2. **Learn how to make useful attachments**

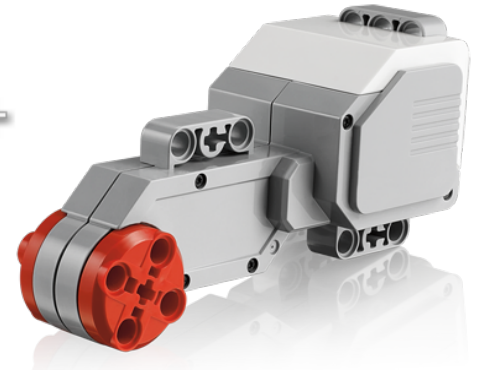
# NEW TOOL: MOTOR BLOCKS

You can use the Large EV3 Motor or the Medium EV3 Motor for attachment arms

## Move Steering vs. Motor Block

- For moving your wheels you should use a Move Steering Block that syncs both wheel motors (*see Intermediate lesson called Move Blocks to learn about sync*)
- For moving your attachment your arm, you use either a Medium Motor Block or a Large Motor Block because you don't need to sync your motors.

Large Motor Block

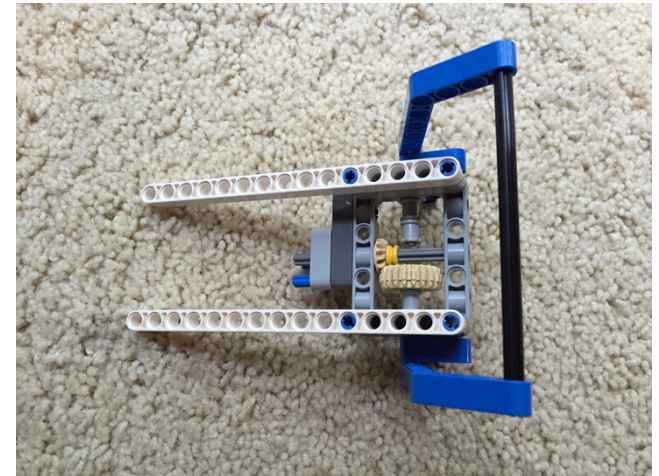
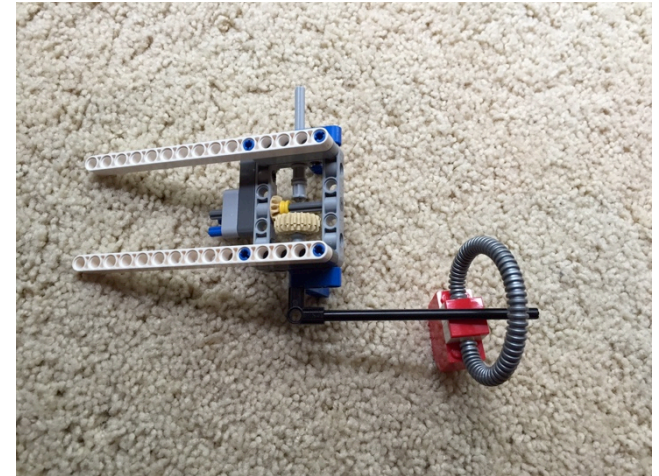


Medium Motor Block



# USING A MEDIUM MOTOR

- **Attach a medium motor to Port A or a large motor to Port D as needed**
  - This is a generic set-up for the EV3
- **Construct an attachment that can pick up or grab a hoop (object)**
  - Look at the two examples on the right. They use the DroidBot's SNAP attachment
  - DroidBot's build instructions are available on the Robot Design page of [EV3Lessons.com](http://EV3Lessons.com)



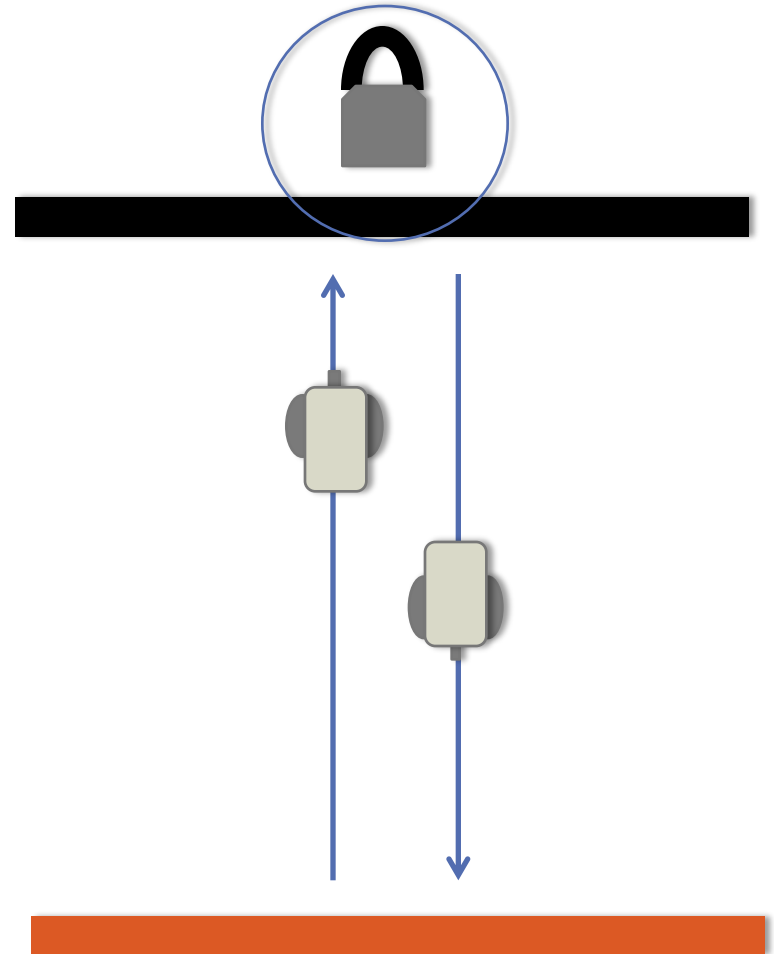
# PICK UP AND MOVE OBJECT CHALLENGE

**From the start line, move up to the black line**

**Pick up the object and bring it back to the start line**

**You can have the robot turn to come back or simply move backwards**

**You can make the object a cube to grab (as in the Core EV3 kit) or an item with a loop on top depending upon the pieces you have available.**



# CHALLENGE SOLUTION

The goal of this program is to move from the start line till a black line.  
The robot should stop at the line and pick up an object.  
The robot should return to the start line with this object.



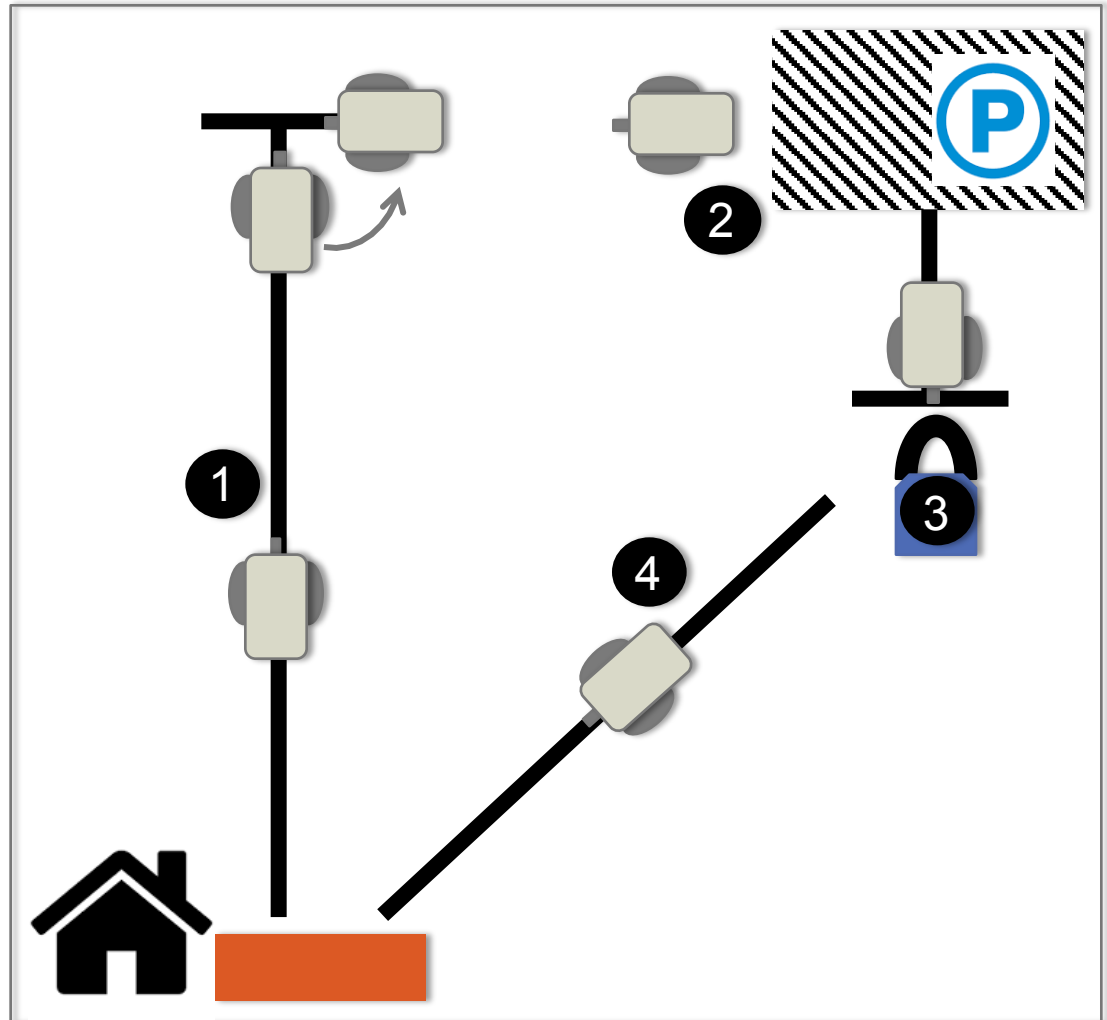
Move forward until black

Turn the medium motor the amount you need in order to pick up the object. You can measure how many degrees using Port View.

Move backward until green

# TRIP TO THE GROCERY STORE

1. Start at Home and drive to the grocery store
2. Have your robot turn and backup/reverse into the parking space
3. Stop to pick up groceries
4. Return home using the short cut



# NEXT STEPS

**Now that you know how to move an arm on a robot, can you move the arm while moving?**

- Check out the Parallel Beams lesson in Intermediate and Advanced

**Refer to the Move Blocks Lesson in Intermediate to learn more about the differences between Move Steering and Motor Blocks**



# CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan
- More lessons at [www.ev3lessons.com](http://www.ev3lessons.com)



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