SPIKE PRIME LESSONS

By the Creators of EV3Lessons

MOVING OBJECTS & STALL DETECTION

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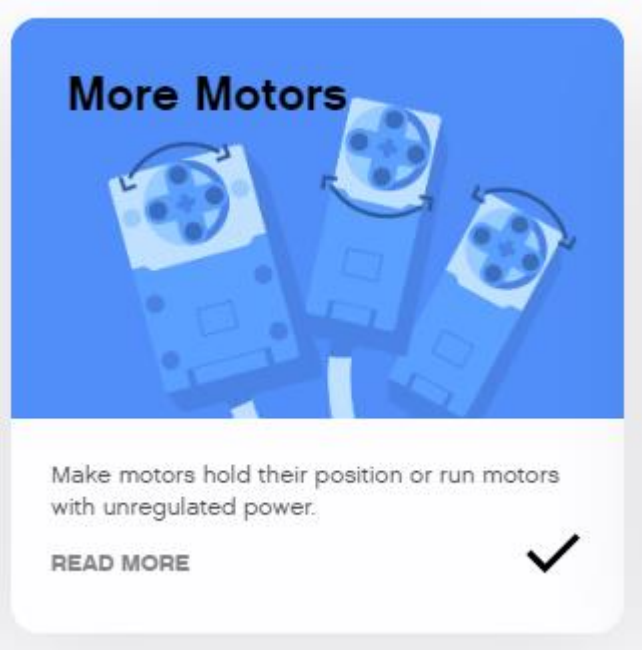
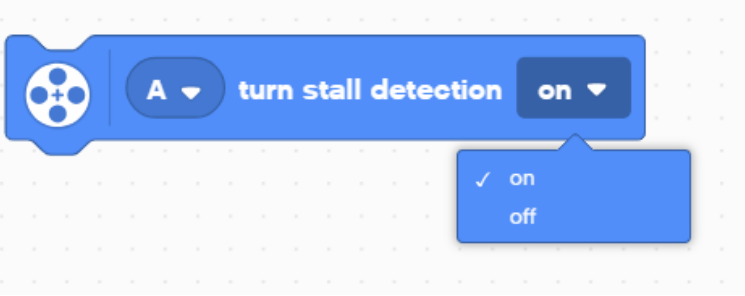
LESSON OBJECTIVES

1. Learn how to move non-drive motors
2. Learn about motor stalls
3. Learn about

STALL DETECTION

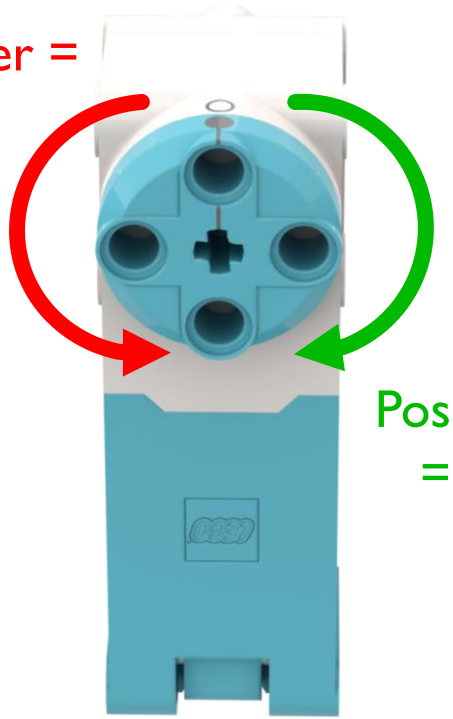
- Often times, you program the motor to move a particular amount. However, the motor gets stuck before it reaches that amount.
- Stall Detection allows your program to automatically move on to the next block in the stack when a particular motor block is stuck (unable to complete its move)
- SPIKE Prime has a built-in Stall Detection
- By default, Stall Detection is **on** for your blue motor blocks. However, you can turn this feature off using the Turn Stall Detection Block in the Motor Motors Palette (use Extensions to add the block)





NEGATIVE VALUES

Negative Power = Backwards

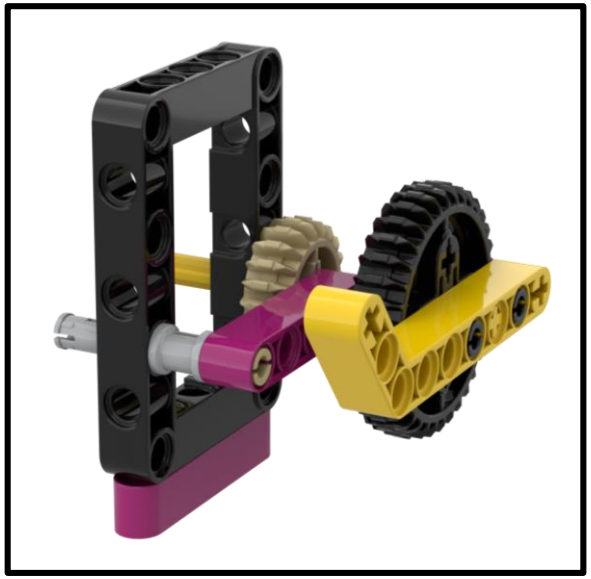


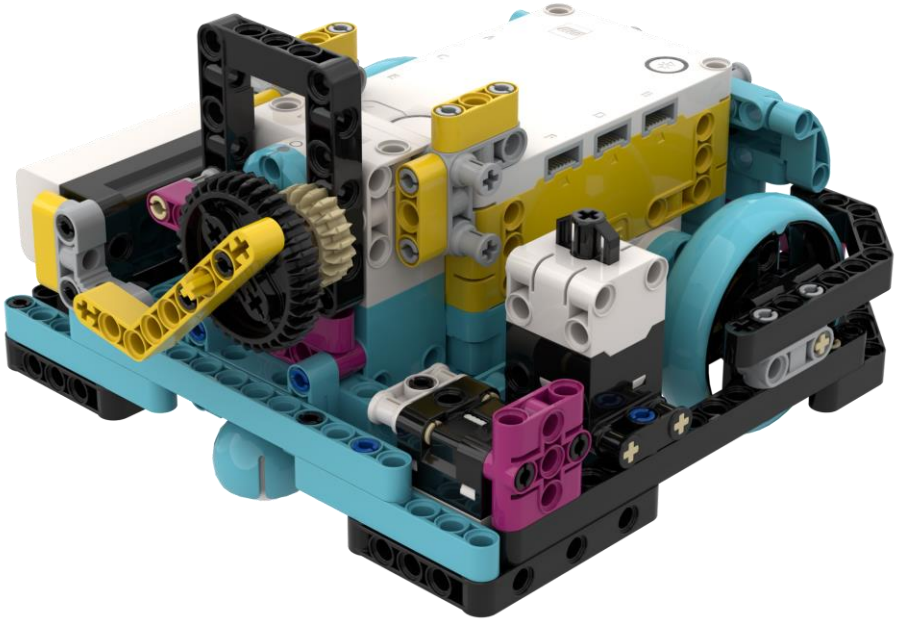
Positive Power = Forward

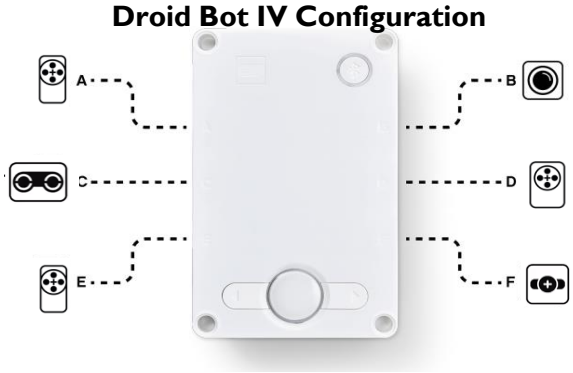
- You can enter negative values for power or distance
- This will make the robot move backwards
- If you negate two values (e.g. power and distance or distance and backwards direction), the robot will move forward.

ATTACHMENT ARM

- Create a simple attachment arm for Droid Bot IV for the Large Motor connected to Port D

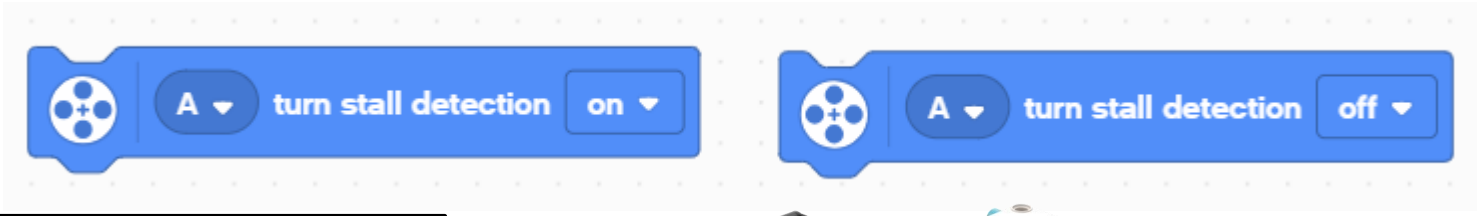




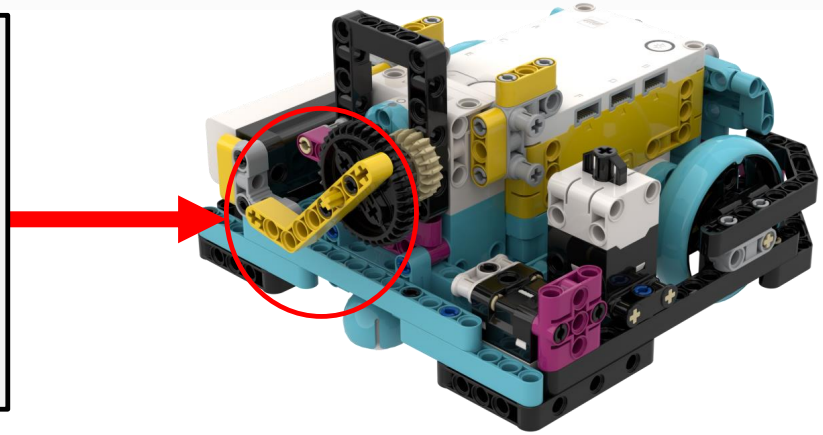


CHALLENGE 1: LEARN ABOUT STALL WITH DROID BOT IV

- Create one program with stall detection turned on and one with stall detection turned off.
- Using Droid Bot IV or similar, program the arm to turn 1000 degrees.
- Hold the arm with your hand to prevent motor from completing 1000 degrees. Hold for a couple of seconds.
- Compare what happens in each program. Will the cat meow play in both or only one program?



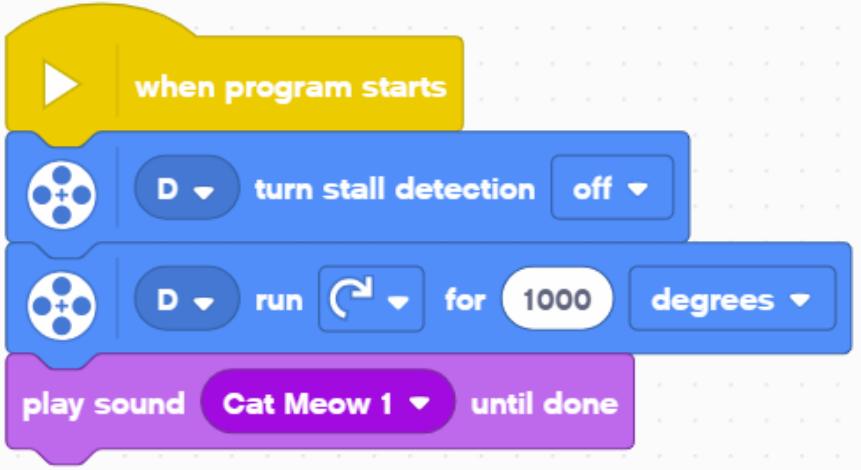
Cause a stall by holding the liftarm and preventing it from turning. Hold if for a second of two



CHALLENGE 1 SOLUTION

- Stall detection "on" allowed the code to move on to the next block even when the arm got stuck

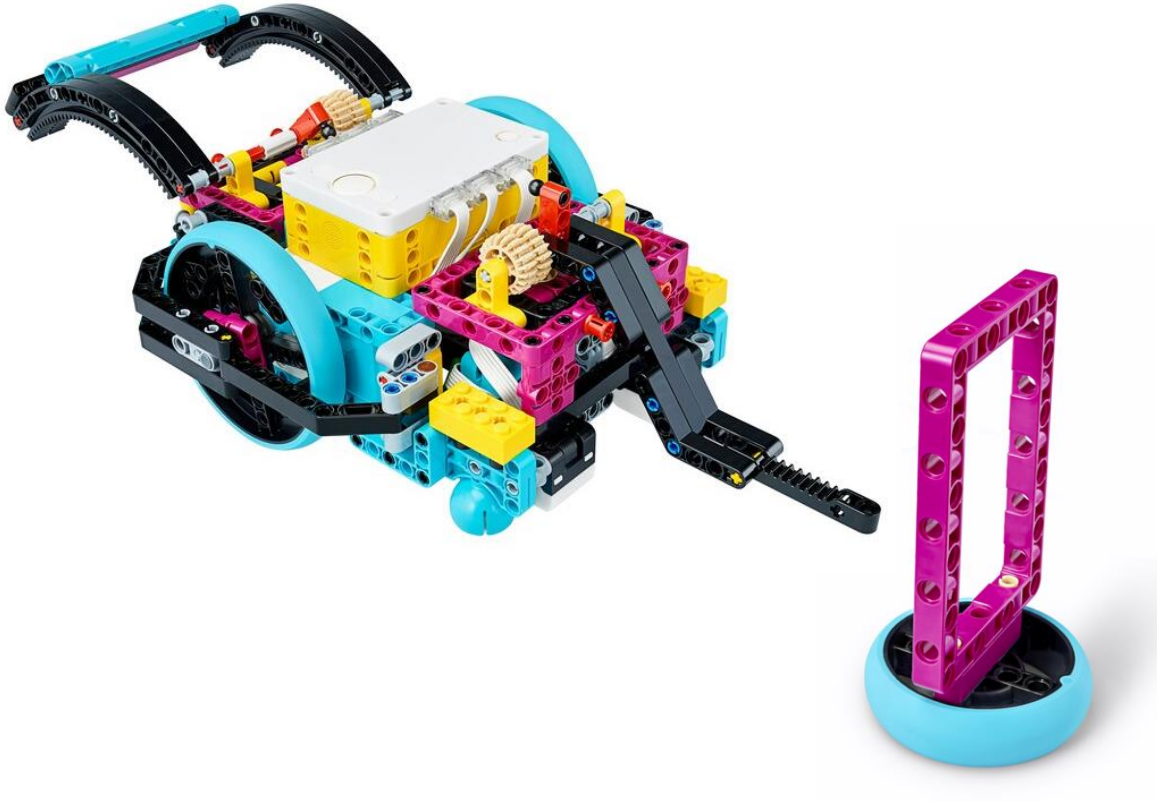
The cat meow sound plays even if you hold the arm and prevent it from moving.



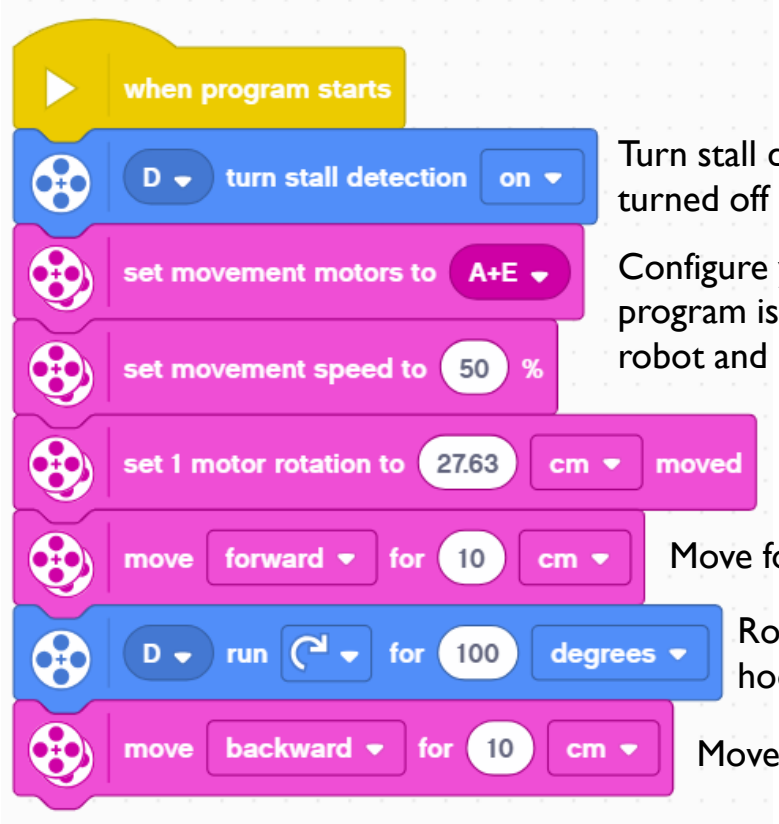
The cat meow sound will not play until you release the arm and allow the motor to complete its move

CHALLENGE 2: PICK UP OBJECT (ADB CHALLENGE)

- Drive forward, pick up a hoop and return to the start
- Make sure to use stall detection in case the motor gets stuck while trying to collect the hoop



CHALLENGE 2 SOLUTION



Turn stall detection on in case it was turned off in an earlier program

Configure your robot as needed. This program is configured for the ADB robot and large SPIKE Prime tires.

Move forward up to your object

Rotate the arm up to pick up the hoop

Move back to starting point

EXTENSIONS

- Think about situations in FIRST LEGO League when stall detection would be helpful
  - When might the robot get stuck?

CREDITS

- This lesson was created by Sanjay Seshan and Arvind Seshan for SPIKE Prime Lessons
- More lessons are available at www.primelessons.org