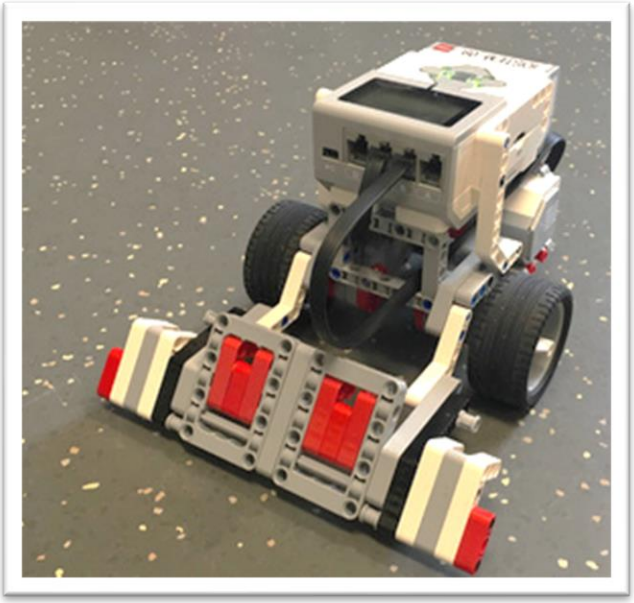
SnowBot: A Snow Shovelling Robot

Task Description



The SnowBot Challenge is to design and program a *SnowBot* that can clear all the snow from the driveway (e.g., a designated space). The robot does not require any sensors. Students are challenged to design and create their own wedge for plowing the snow.

Encourage students to show their *SnowBot* to the rest of the class and explain how the program works.

Instructions for Students

Design and program a *SnowBot* that can clear all the snow from the driveway (e.g., a designated space).

Challenge: What is the fewest programming blocks you can use to clear the space?

Materials Needed

- Cotton balls or small pompoms
- Tape for the floor to mark down a space, or turn the polygon vinyl mats upside down
- Basic *EV3 Robot* without sensors

Set up

Tape a rectangular shape on the floor, approximately 1 m x 1 m. Alternatively, use the vinyl polygon mats turned upside down.
Distribute the cotton balls or the pompoms on the mat.

Key Understandings

- Relates length (or width) of the enclosed area to robot's wheel rotations by estimating measurement and movement
- Relates the robot turns into wheel rotations by estimating measurement and movement
- Translates measurements into programming code to move a robot a specific distance and turn a specific angle
- Requires multiplicative and proportional thinking

Design Notes

On our first attempt, we noticed that the snow was getting under the wheels and putting our *SnowBot* off course (see video). We speculated that maybe the wedge needed to be wider. We modified the wedge and it worked beautifully (see the final design in action).

Also note: Different floor surfaces affect the robot's ability to turn (e.g., carpet vs. smooth flooring).

For programming, we suggest trying a loop similar to this one to have the robot drive in a zig zag pattern: