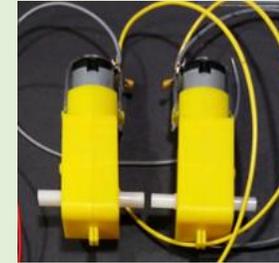


Propulsion Test #1

Objectives:

Program the rover to ??

1. Download the STEM SEALs Template from the NFC website.
2. Click edit icon to use the STEM SEALs Template.
3. Title the project: Speed Test 1
4. Follow the **what** and **how** directions.



Did You Know?

Info about 2WD drive DC motors???

What am I doing?	How will I do it?
<p>Create an On Start identifier and set the initial speed (and steer) of the rover.</p> <ul style="list-style-type: none"> • Play one or more tones in the start block. • Create an image for identification. • Set the initial speed of the rover to 10. • Set the initial steer to 0. • Use the STEM SEALs blocks to tell the rover to drive with set speed and steer variables. 	<p>Using the ON START block:</p> <ol style="list-style-type: none"> 1. Create one or more tones. 2. Create a startup image. (check mark) 3. Create a variable called "speed". 4. Set "speed" to 10. 5. Create a variable called "steer". 6. Set "steer" to 0. 7. Use the STEM SEALs block: Drive Wheels with Speed and Steer 8. Set Drive Wheels with Speed to "speed" and Steer to "steer" 9. Add a pause of 2 secs (2000 ms) 10. Add another Drive wheels with Speed and Steer 11. Set Drive Wheels with Speed to zero (0) and Steer to "steer" <div data-bbox="1318 760 1969 1279" data-label="Code-Block"> <pre> on start play scale up middle show icon [check mark] set speed to 10 set steer to 0 Drive Wheels with Speed speed and Steer steer pause (ms) 2000 Drive Wheels with Speed 0 and Steer steer </pre> </div>

Create a graphical (LED) representation of the rover's speed.

- The LEDs on the micro:bit can be programmed to be on or off based on conditions and by using their location on the (x,y) grid.
- Use the LED plot, loop, and logic blocks to create the graphical representation.
- Speed varies 0 to 100 percent, then LED count will be 0, 1, 2,...10. adding the round ensures that there will be no decimals such as 2.5.

Using the Forever block:

1. Plot the center LED using plot x 2 y 2
2. Create a variable called "LEDCount"
3. Set "LEDCount" to round of ("speed" / 10)
4. Add an index loop
5. Let "index" run from zero to "LEDCount"
6. Insert an if block
7. Set condition if "index" is not equal (≠) to zero (0)
8. Insert another if block
9. If "index" is less than or equal (≤) to 5 then plot in the y=3 row some LEDs: that is the row directly in front of the center dot
10. Else (if "index" is greater than 5) plot LEDs in the y=4 row: that is the front row of LEDs
11. Add a pause of 500 ms
12. Add a clear screen to make the LEDs blink

```

forever
  plot x 2 y 2
  set LEDcount to round speed / 10
  for index from 0 to LEDcount
    do
      if index ≠ 0 then
        if index ≤ 5 then
          plot x index - 1 y 3
        else
          plot x index - 6 y 4
      +
    +
  pause (ms) 500
  clear screen
  
```

Use the on button pressed (A) to control the speed of the rover.

- Each time the button A is pressed the speed of the rover will increase in increments of 10.
- Zero (0) equals no speed or stopped and 100 equals the top speed.

Use the on button A pressed block:

1. Change "speed" by 10
2. Add an if "speed" is greater than (>) 100 then command
3. Set speed to zero (0) if the condition is true
4. set "speed" variable to zero (0)

```

on button A pressed
  change speed by 10
  if speed > 100 then
    set speed to 0
  +
  
```

<p>Control when the rover moves.</p> <ul style="list-style-type: none"> Use the on-button B pressed block to start the rover in motion. 	<p>Use the on button B pressed block:</p> <ol style="list-style-type: none"> 1. Insert a pause of 1 second (1000 ms) 2. Add a STEM SEALS Drive Wheels block 3. Set Speed to “speed” and Steer to “steer” 4. Insert a pause of 2 seconds (2000 ms) 5. Add another STEM SEALS Drive wheels block 6. Set Speed to zero (0) and Steer to “steer” 
<p>Download to the micro:bit, insert into the rover, turn on the rover and test.</p>	<p>Can you make your rover move? (press button B) Did it move? Press button A four (4) times. Does it move now? Why? What happens if you continue to press button A then button B repeatedly? Can you make the rover move backwards?</p>
<p>Save your MakeCode for Speed Test 1. The code will be used for a later activity.</p>	<ol style="list-style-type: none"> 1. Click the share icon on the MakeCode editor page. 2. Click “Publish Project” 3. Click “copy” 4. Paste this link in a file or email to yourself. Then you will have access to use this code later to edit. <p>(Alternate: Download to a USB drive as a hex file. If you want to use again or edit, on the MakeCode Home page click on the import icon in right hand corner. Chose the save hex file from your USB drive.)</p>