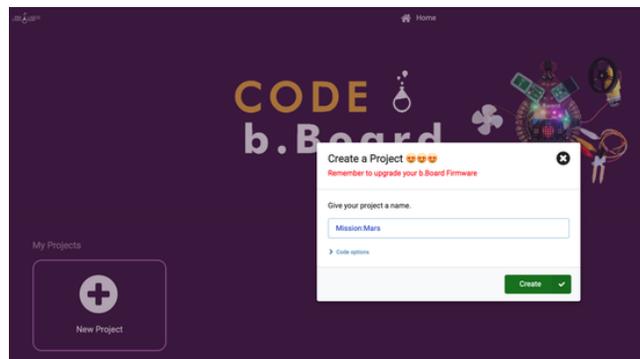## Seismic Activity on Mars

The earth is made up of 17 different pieces, like a puzzle, that we call tectonic plates. These plates are always moving, and when they bump or grind we get earthquakes. Although scientists believe that Mars does not have any tectonic plates, there have been lots of smaller earthquakes recorded that are often referred to as "Marsquakes" which can be caused by contraction from cooling, magma movement and meteorite impacts. Marsquakes, just like the ones on earth, can be recorded by very sensitive devices that detect vibration known as seismographs. Scientists can study seismic activity to have a better understanding of what the interior of the planet is like and how its formation came to be.

While we haven't provided you with a seismograph, you do have a built-in device that can measure changes in speed known as an accelerometer.

Your mission will be to detect a Marsquake and indicate when it is occurring.
If you don't know much about the b.Board, or how to power it or plug anything in, take a minute to go through our great getting started guide before you go any further! There's even a section with an example of how to use the microphone.

Getting Started Guide

Once you're ready to go, head on over to code.brilliantlabs.ca and start testing it out! Create a new project or open one that you've already created. In my case, I selected the new project + icon and gave it the name Mission: Mars.

NASA. (2018). Mars in a Minute: Are There Quakes on Mars? – NASA's InSight Mars Lander. NASA. https://mars.nasa.gov/resources/21551/mars-in-a-minute-are-there-quakes-on-mars/?site=insight.

As soon as you select "create", your new project will open. You should see something like this ➤

On the left hand side of the screen you can see the toolbox. This is where we keep all of the blocks of code you need to control your micro:bit and b.Board. We will be using the accelerometer which can be found under the inputs section of the toolbox
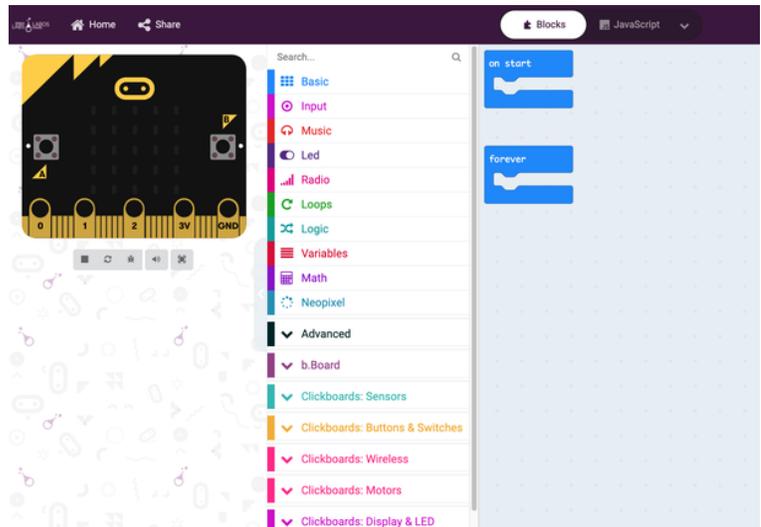
Let's experiment with vibration detection by displaying the acceleration of the b.Board on the micro:bit LED screen. To do that, grab the "show number" block as shown here:
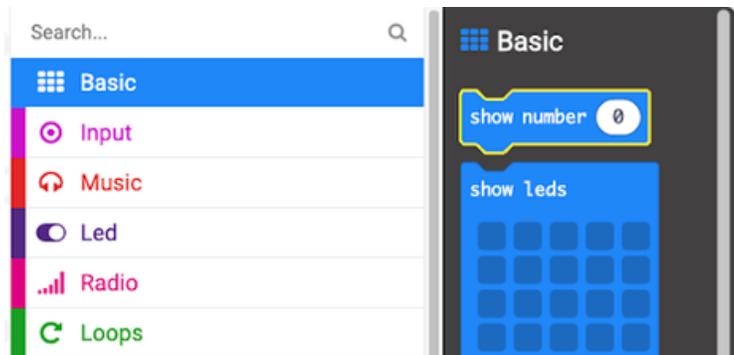
Now drop it in your forever loop and grab the acceleration block under the inputs toolbox as shown here:
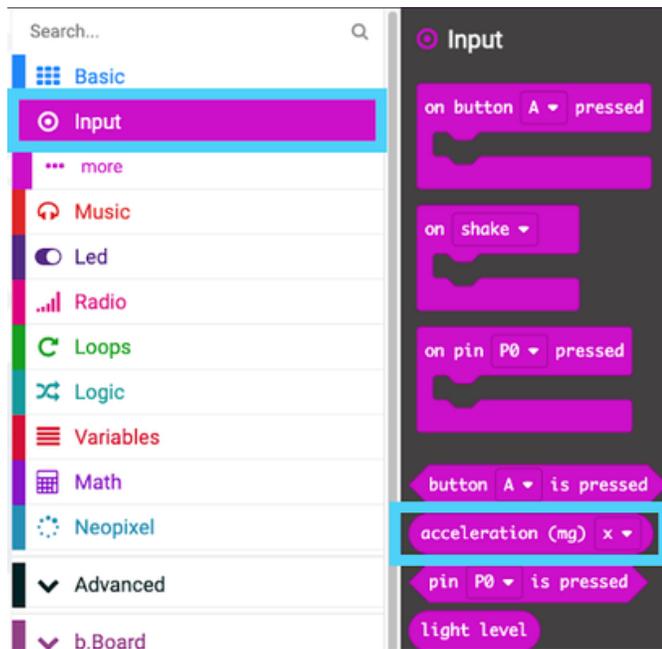
Drop the acceleration (mg) block into your show number block inside your forever loop and change the acceleration from "x" to "strength". This lets us measure the strength of the vibrations/acceleration in any direction instead of just one.
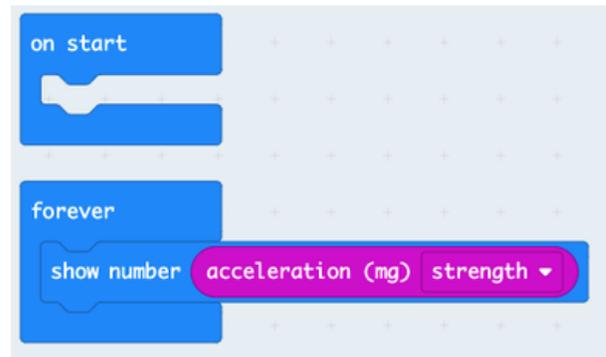
Program your micro:bit and observe how the value changes as you shake your desk or bump it a bit.

What Next?

Continue to experiment with this idea. Are the vibrations easy to measure? How often do you have to check for the vibrations? How can I tell if the vibrations are from my robot moving or from a Marsquake? When you're ready head on over to our WiFi guide to learn how you can connect your rover to our Brilliant Labs Cloud (cloud.brilliantlabs.ca) and get your rover ready to send this vibration data from "Mars" back to "Earth". :)