



## Iron Ore on Mars:

### What materials are on Mars that we can use?

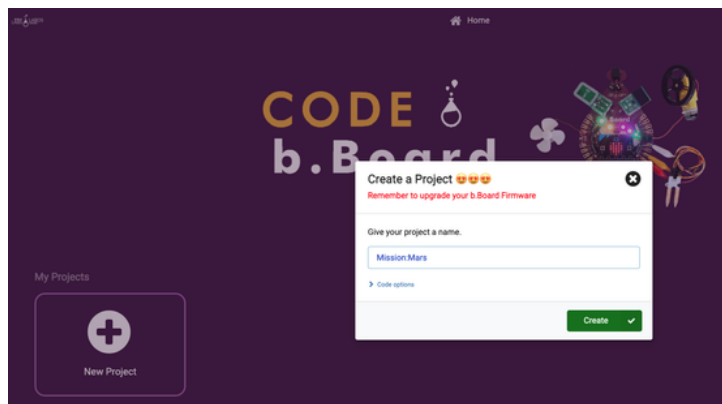
Have you ever wondered where the gold that expensive jewelry is made out of came from? Or what about the copper that is inside all the electronics you own? Well, they came from the earth! Metals like gold and copper are often mixed together with other minerals and found in deposits deep within the earth known as ore. Some types of ore contain iron, which is a critical component in steel, the metal we use to build things like cars, appliances and use for construction on Earth. Iron is really strong, and it loves magnets! It will stick to magnets as hard as it can.

There are a lot of metals on Mars, particularly iron. Mars is known as the Red Planet because iron minerals in the Martian soil oxidize, or rust, causing the soil and atmosphere to look red. Using spectrometers, which measures chemicals elements, scientists have determined many different minerals on Mars. Unlike Earth however, Mars has a more limited magnetic field, so these ions are likely to behave differently than those on Earth's atmosphere.

Your mission will be to use the micro:bit to determine which Martian rocks, if any, have iron ore inside them and send this information back to earth. 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!

[Get started guide !](#)

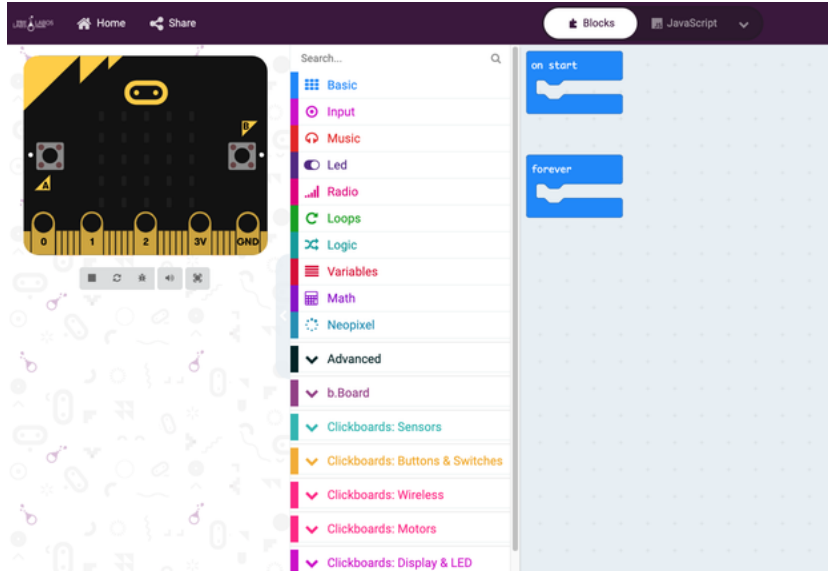
Now that we have it plugged in, let's go to [code.brilliantlabs.ca](https://code.brilliantlabs.ca) and start testing it out! Create a new project or open one that you've already created. In my case, I selected the new project + icon and gave it the name Mission:Mars.



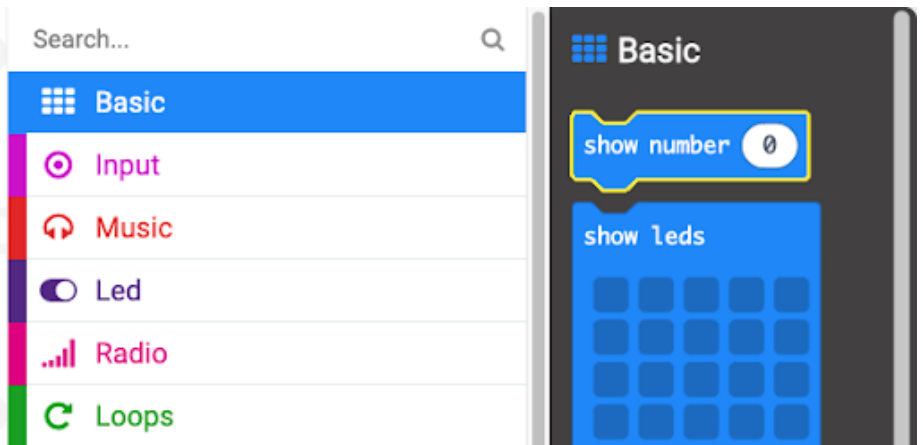
As soon as you select “create”, your new project will open. You should see something like this



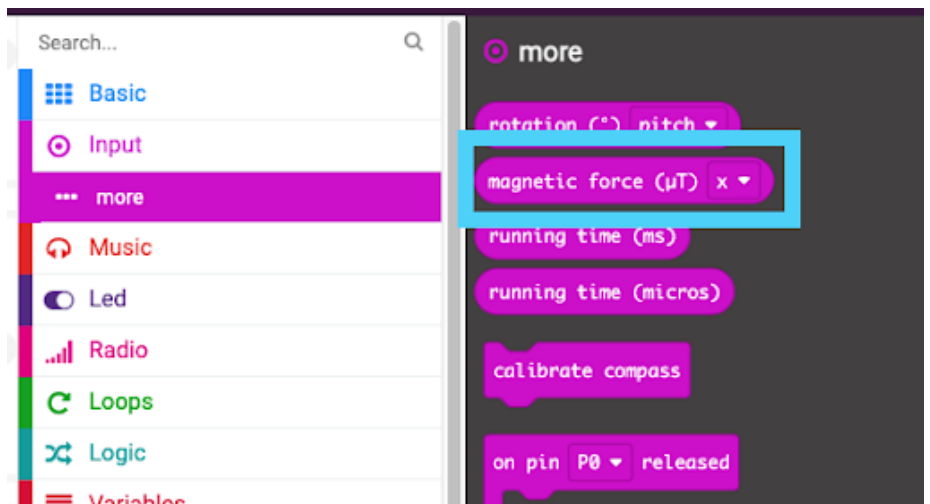
On the left-hand side of the screen, you can see the toolbox. This is where we keep all of the blocks of code you need to control your micro:bit and b.Board.



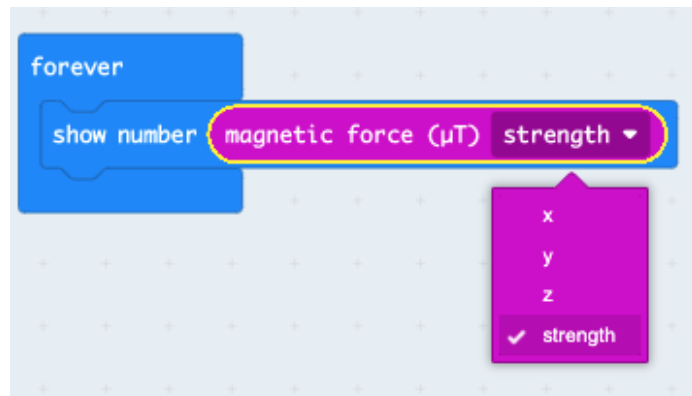
Let’s experiment by displaying the detected magnetic field strength near your rover on the micro:bit LED screen. To do that, grab the “show number” block as shown here:



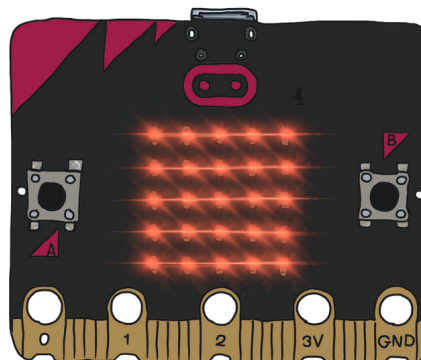
Now drop it in your forever loop and grab the magnetic force (uT) block under the inputs->more toolbox as shown here:



Drop the 'magnetic force ( $\mu\text{T}$ )' block into your 'show number' block inside your 'forever loop' and change the dropdown to 'strength' as shown below.



If this is the first time you've programmed your micro:bit with this block, follow the calibration procedure by tilting the micro:bit in all directions to fill all the LEDs on the display with a dot. Once that's done, observe how the value changes as you near any large metal or magnets.



## What next?

Continue to experiment with this idea. What value does it return when you are not near any metal or magnets? Does some metal work better than others? If so, why? How could you use this information to "detect" if a rock is magnetic or contains iron? Once you've got it all sorted out, head on over to our WiFi guide to learn how you can connect your rover to our Brilliant Labs Cloud ([cloud.brilliantlabs.ca](http://cloud.brilliantlabs.ca)) and get your rover ready to send your iron detection data from "Mars" back to "Earth". :)

### Join the Mission: Mars Challenge!

Are you on track to complete your Mission: Mars Rover by early May? If so, Brilliant Labs welcomes you to visit or mail your rover to 1 of 5 in-person Provincial School Maker Faires or the Atlantic Virtual Mission: Mars Challenge (June 2nd). This is your chance to showcase your work and participate in up to 10 mission challenges. Each challenge, when completed successfully, will earn points and badges. The Mission: Mars student engineers with the most points will win the Mission: Mars Challenge Showcase!

### Download, Register & Book Today!

Get the Mission: Mars Challenge Guide to learn more about what to expect and how the points will be awarded. Plus, don't forget to register and book your Mission Challenge(s) at [Brilliantlabs.ca/mission-mars](http://Brilliantlabs.ca/mission-mars) (winners will be announced at the June 9th Atlantic Virtual School Maker Faire). Join the challenge and explore Maker Mars!

