



Proximity Sensor

Robotics Curriculum
IT Adventures

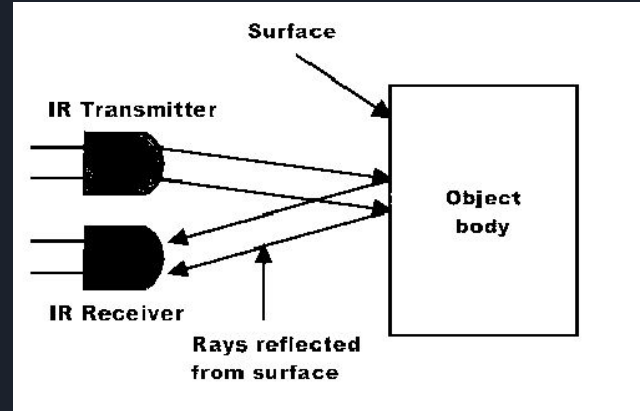


Lesson Overview

- Learn what sensors can do and the value of a proximity sensor
- Learn how to use the proximity sensor included in the littleBits kit
- Create a series of programs where the RVR autonomously runs and reacts to outside factors

Proximity Sensor

Have you ever heard a car beep when it gets too close to another car? Or seen robots in factories drive around each other? In order to do those things, proximity sensors are used. The littleBits kit comes with two of these sensors because they are so powerful and useful. The sensors we will be using send out a light beam that we can't see and then output an analog signal based on how close the thing the light bounced back from is.



Code Example

Let's see this sensor in action, hook up the sensor to a power supply and connect a wire to its right side and an input port.

Implement the code on the top right and see how the value on the LEDs updates as you move your hand closer and further away from the sensor. Connect the servo after the sensor (in turn mode) and see how you can control the motor's position based on the distance from the sensor. Implement the code on the bottom and move the power source, this is how you can reduce the number of power sources you need.



```
forever
  set Value to analog read pin P0
  show number Value
  pause (ms) 1000
```

With power source directly attached to the sensor

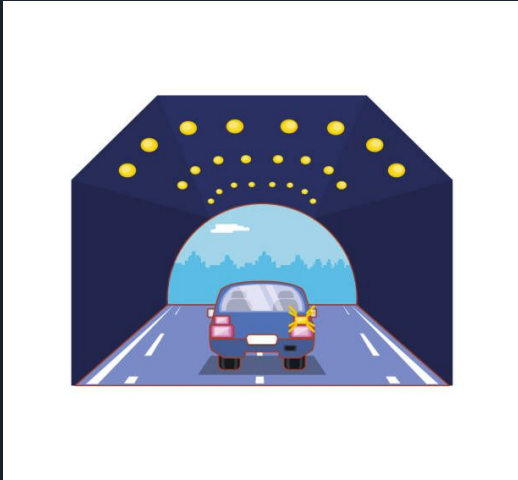


```
on start
  digital write pin P13 to 1

forever
  set Value to analog read pin P0
  show number Value
  pause (ms) 1000
```

With power source attached to topper

Primary Learning Challenge: Self-driving car



Create a program to run the robot so that if it senses a wall/object 10 cm away, it will stop and turn 90 degrees and keep driving. Make a maze out of cardboard or notebooks for the RVR to drive through!

What if the RVR gets into a dead end? Can you make it turn until it finds a way to go?

Secondary Learning Challenge: Self-parking car

Create an automatic back-up system. Using the proximity sensor, when the robot sees a wall it should back up relative to the distance (at 20 CM go at speed 100, at 10 CM go at speed 50, etc). When less than 1 cm from the wall, stop completely. Also attach a button to the same side as the proximity sensor - if the button hits the wall first, have the buzzer go off / sound an alarm. Display the distance on the micro:bit as this is all happening so that you can track how accurate it is.

