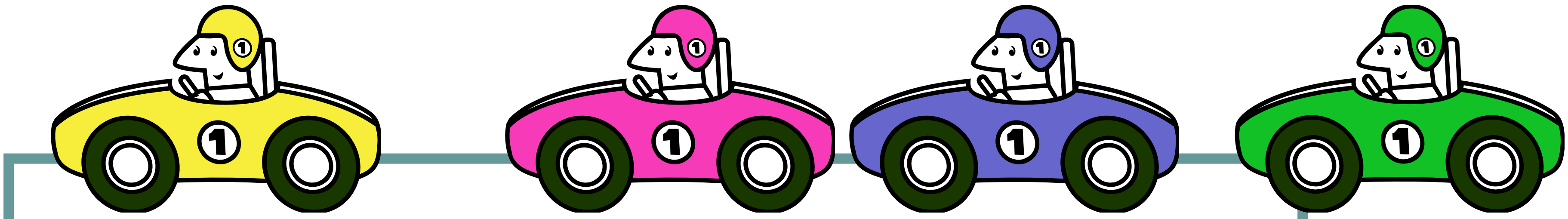


# Things That Go Bump

## Mindstorms Challenge 3:
## Using Sensors

Team Members: ___________________________________ Period: ________

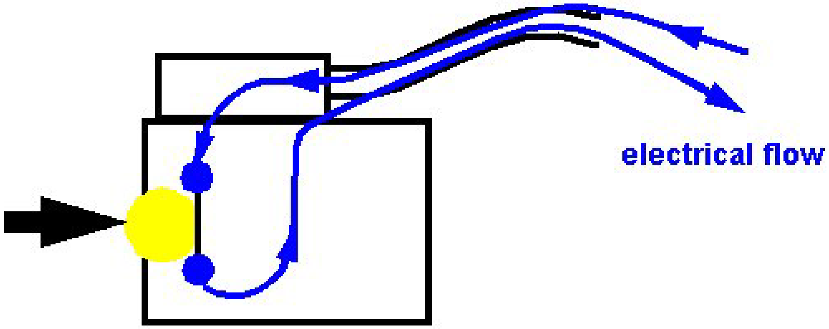
**AFTER DEMONSTRATING ALL MISSIONS, TURN THIS PACKET IN**

# Sensors

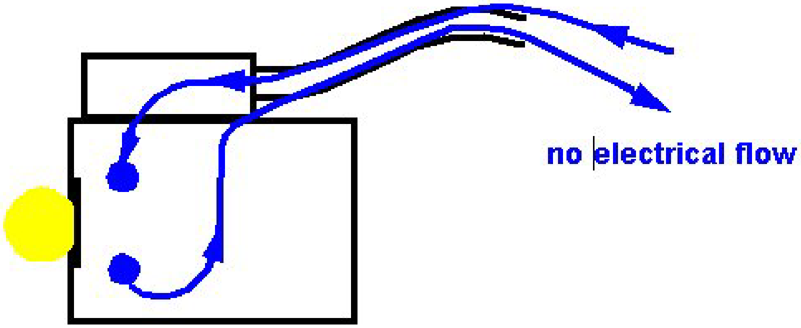
- In prior challenges, our robots have just followed our specific instructions regardless of what was around them.
- Sensors allow the robot to react to the world around them.

# Touch Sensor

- A touch sensor works like a light switch in your house. When the button is pressed, an electrical circuit is closed inside the sensor. This lets the electricity flow. When the button is released, the circuit is broken and no electricity flows. The NXT can sense this flow of electricity.

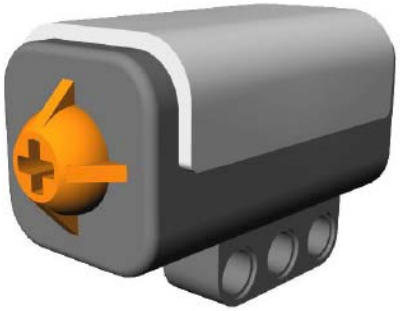


Touch sensor pressed



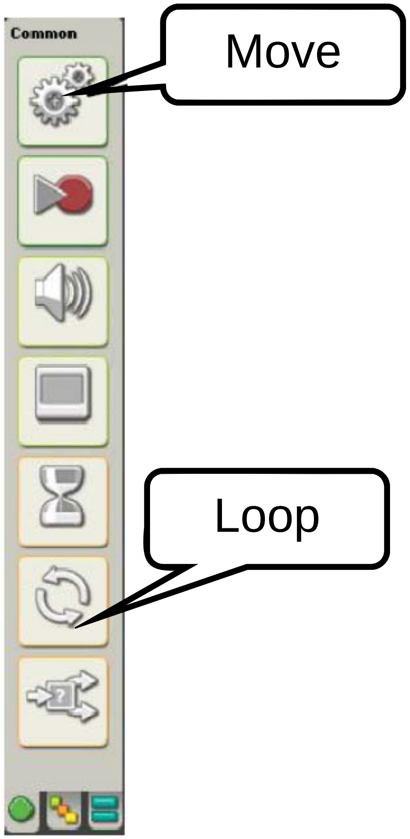
Touch sensor released

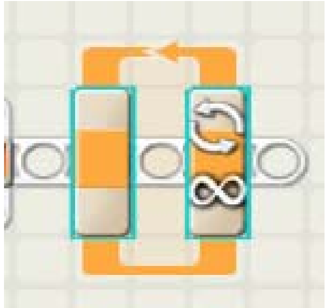
# Touch Sensor Uses



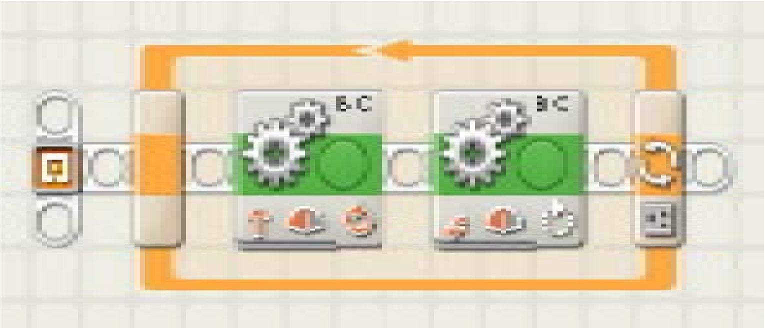
- Detect contact between the robot and external objects like the wall
- Detect contact with internal moving parts on the robot (an arm or gripper)
- Detect contact with the ground, so it doesn’t fall off a table
- Input device – push button operation or “remote” control

# Programming a Loop





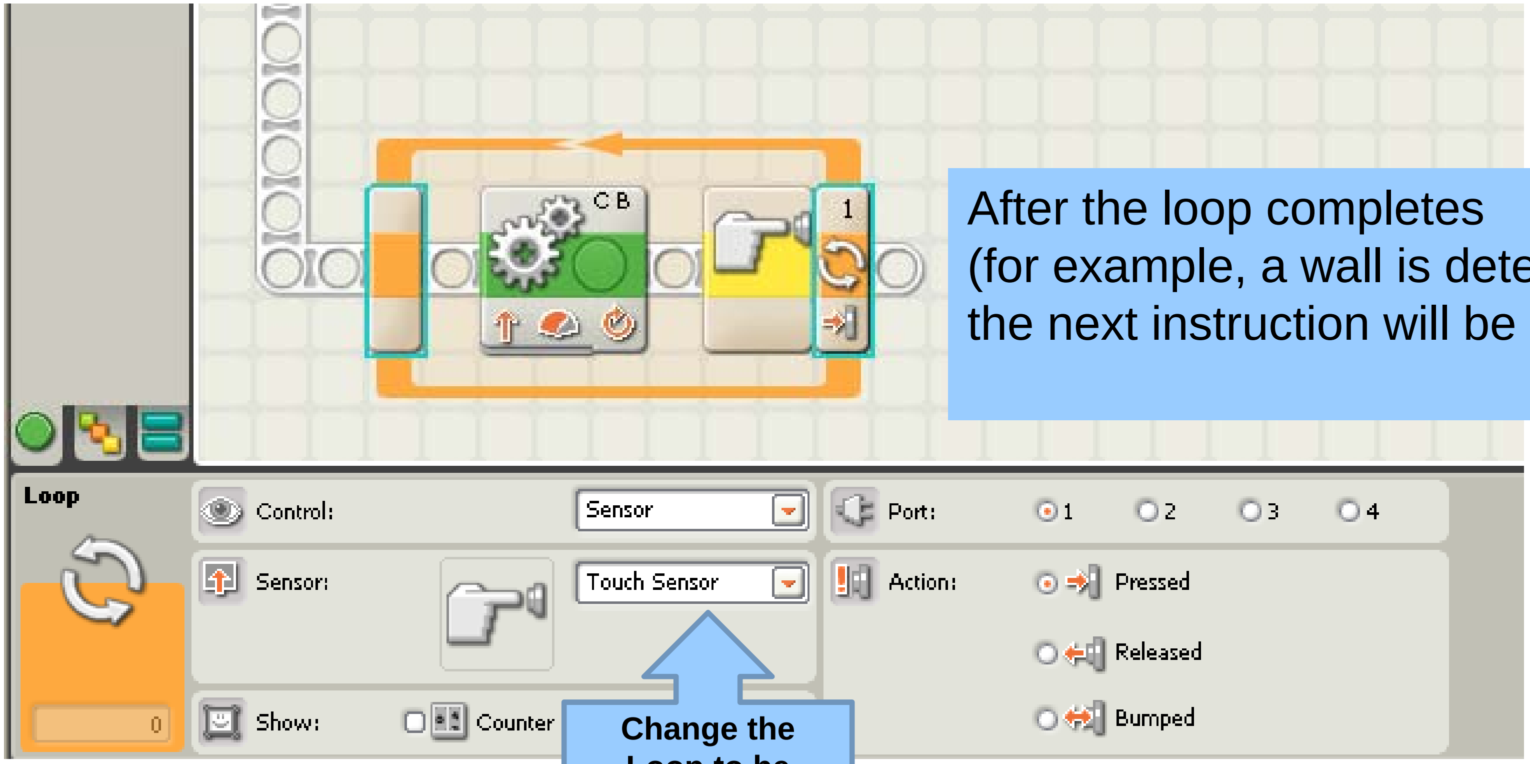
- Select loop



- Add the move blocks inside the loop.

*It will execute the loop until it reaches whatever condition you have set. More on this later.*

# Programming a Touch Sensor Block



Loop

0

Control: Sensor

Port: ● 1 ○ 2 ○ 3 ○ 4

Sensor: Touch Sensor

Action:
● Pressed
○ Released
○ Bumped

Show: □ Counter

After the loop completes (for example, a wall is detected), the next instruction will be ran.

**Change the Loop to be controlled by the sensor**

# Challenge 3 Mission 1: Wall Turn

- Design & construct a car and program it to travel in a straight line until it hits a wall.
- Once it hits the wall, program the car to turn 90 degrees (you may need to reverse first) and continue forward until it hits another wall. Repeat forever.

**AFTER DEMONSTRATING, TURN THIS MISSION IN**

Team Members: ________________________________ Period: _______

# Challenge 3 Mission 2: Ultrasonic it

- Use the ultrasonic sensor to sense when the robot is close to a wall. If within 6 inches, have the robot turn 90 degrees and continue forward until it gets close to another wall. Repeat forever.

**AFTER DEMONSTRATING, TURN THIS MISSION IN**

Team Members: ________________________________ Period: _______