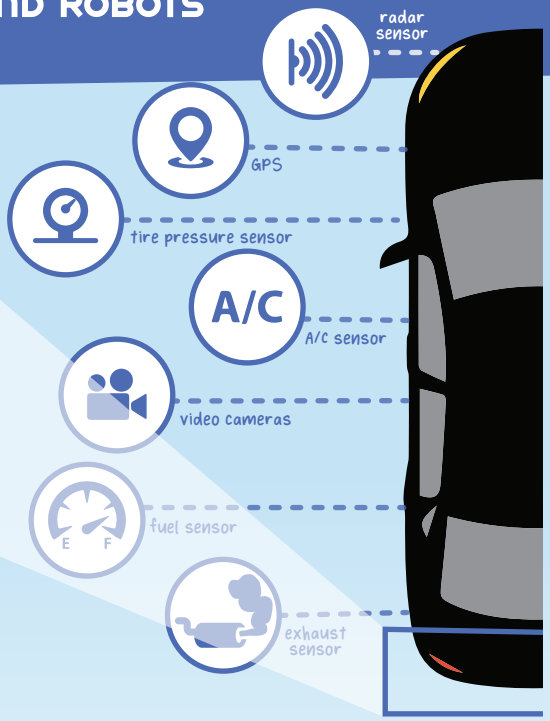
SEEING WITH SOUND

HOW ULTRASONIC SENSORS HELP STEER CARS AND ROBOTS

ELECTRIFYING THE FUTURE

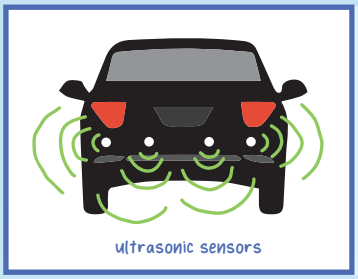
SELF-DRIVING CARS

Self-driving cars are vehicles that can navigate and operate on their own. They use various sensors to drive without the help of humans.



ULTRASONIC SENSORS

Ultrasonic sounds are high frequency sounds that are not audible to the human ear. Ultrasonic sensors act as the eyes of self-driving cars, helping to detect obstacles around them.



HOW DO THEY WORK?

1. TRANSMITTER

The transmitter sends high frequency sound waves.

2. OBSTACLE

The sound waves reflect off of the obstacle.

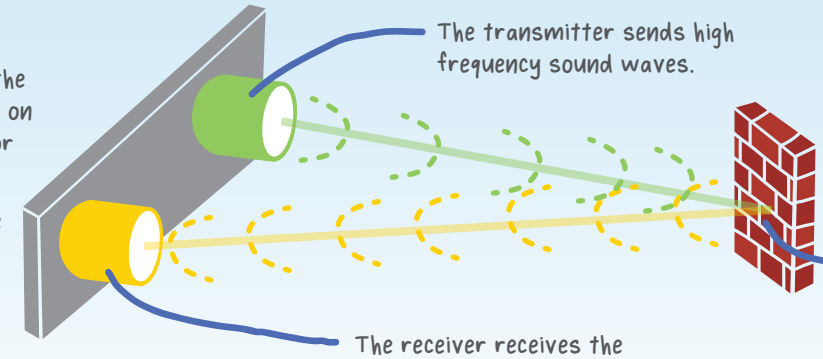
3. RECEIVER

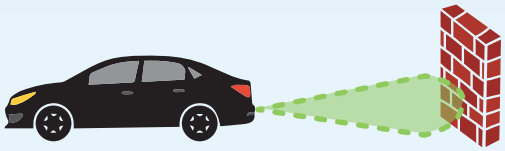
The receiver receives the reflected sound waves.

4. CONTROL CIRCUIT

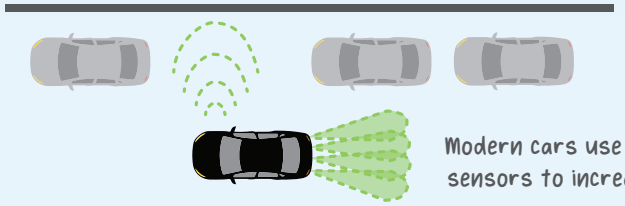
The control circuit calculates the distance of the obstacle based on the amount of time it takes for the sound waves to return.

That data is then used to take actions, such as stopping or moving to avoid the obstacle.





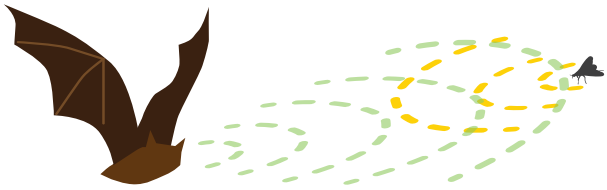
Ultrasonic sensors are mainly used when backing up.



Modern cars use four ultrasonic sensors to increase their range.

FUN FACT

Ultrasonic sensors were inspired by bats! Bats use ultrasonic sound to navigate and hunt in the dark, called echolocation.



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UNDERSTANDING MBLOCK

ELECTRIFYING THE FUTURE

BLOCK SHAPE MEANINGS

STARTER BLOCK

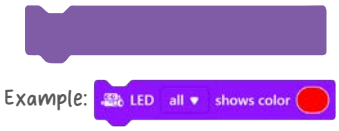
Blocks that instruct the program when to start the logic.

END BLOCK

Blocks that instruct the program when to end the logic.

INTERMEDIATE BLOCK

Blocks that contain instructions which form the core logic of the program.



CONDITIONAL BLOCK

Blocks that define a condition which can be either true or false.

NESTING BLOCK

Blocks that allow other blocks to be inserted within them.

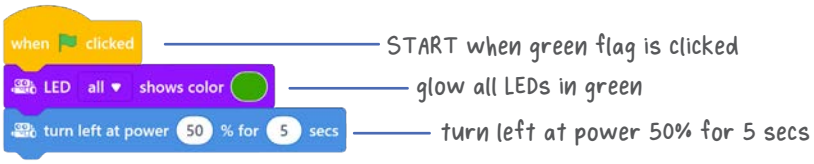
VALUE BLOCK

Blocks that hold values, which can be either numbers or words.

CODING BLOCK STRUCTURES

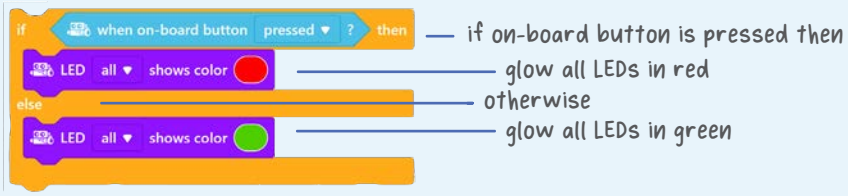
SEQUENTIAL BLOCK STRUCTURE

Blocks are connected in a straight line, one after the other, just like a list of steps.



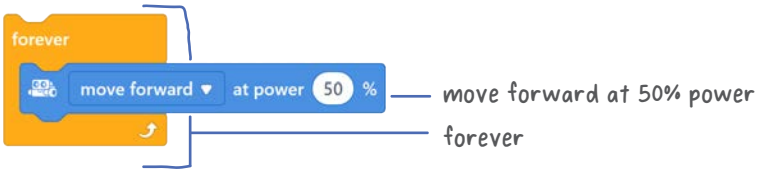
CONDITIONAL BLOCK STRUCTURE

Blocks are arranged in a way that allows the computer to make a decision based on a condition. Depending on whether the condition is true or false, the computer will choose one path of blocks to follow.



LOOP/CYCLIC BLOCK STRUCTURE

Blocks are arranged so the computer repeats certain actions multiple times, either forever or until a specific condition is met.

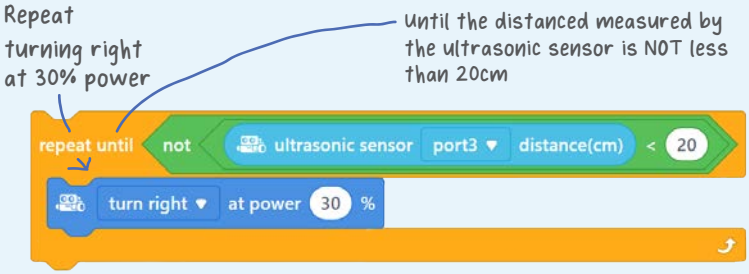


IMPORTANT LOGICS

The mBot will use the ultrasonic sensor to check whether:

the distance is less than 20cm

the distance is NOT less than 20cm



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