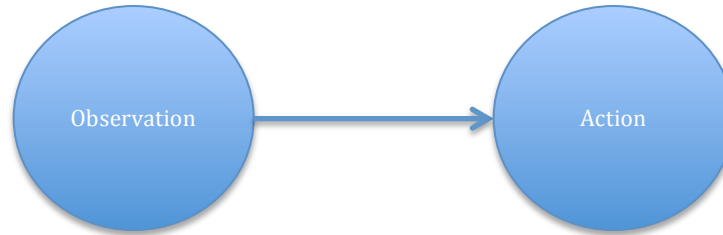# Behaviors

Definition

A **behavior** is when a robot takes one action based on one observation it makes. One observation is linked to one action, so the robot does the same exact thing every time it makes the same observation.

Examples

Robot Moving to the End of the Black Region

In the video we first looked at a robot that drives straight when it senses the color black and stops driving when it no longer senses black. When the robot observes the <u>black</u> using its sensor, the action it takes is <u>drive straight</u>. When the robot observes <u>another color</u> (in this case, white), the action it takes it takes is <u>stop</u>.

Observation	Action
Black	Drive
Other Color	Stop

Crossing the Street

Next we considered the crossing the street example. If you observe a <u>car</u>, the action you take is <u>don't cross the street</u>. If you observe <u>no car</u>, the action you take is <u>cross the street</u>.

Observation	Action
Car	Don't Cross the Street
No Car	Cross the Street

Your Turn!
Now we'll consider a new example. See if you can fill in the blanks and the table!

Alarm Clock
If the alarm clock is going off, you should wake up. If the alarm clock is not going off, you should continue sleeping. When you observe the _____, the action you take is _____.
When you observe _____, the action you take is _____.

Alarm Clock ⟶ Wake Up   No Alarm Clock ⟶ Sleep

Observation	Action

Lego Mindstorms Example
Now we'll look at a behavior the Lego Mindstorms robot has, following the black line on the left. You can watch a video of the robot with this behavior here: http://www.youtube.com/watch?v=K8i4tFLuWHs

Based on whether the robot observes black or white using its color sensor, it either moves the left tread using the left motor or it moves the right tread using the right motor. While one motor is moving, the other is stopped.

When the robot observes _____, the action it takes is _____.

When the robot observes _____, the action it takes is _____.

Observation	Action

Now make your robot perform this behavior using NXT-G. How can you translate the actions into code?

Hint: Use move blocks and a loop block to accomplish this task. When adding the loop block, remember that you will be using the color sensor to determine which action the motors should take. Also remember that only one motor should be moving at a time.

Now see if you can switch it up! Can you make the robot follow the line on the right side instead of on the left side? What changes need to be made in order to make this happen? You can see the video of the robot following the line on the right here: http://www.youtube.com/watch?v=5c5EHYA21r8

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