



First Lego League Curriculum - Ontario

Activity Sheet	
Gr 7 - Lesson #7	Switch Block – Movement Towards Knowledge
Date:	Name(s):

Check That I'm Done <input checked="" type="checkbox"/>		
<input type="checkbox"/> Commented on my code	<input type="checkbox"/> Modify it task	<input type="checkbox"/> Coding Challenge

Learn
<p>Below are important definitions concerning interactions in the environment. If you're not already familiar with these definitions, use your favorite memorization method (such as quizzing you partner) to get (at least mostly) familiar with each of them. The activity will help solidify them in our mind.</p> <p>Biotic Element: Any living thing found in the environment Organism: a living thing Micro-Organism: a living thing that is small enough that it must be viewed with a microscope Species: a group of similar organisms that can mate and reproduce more of the same type of organism Population: a group of organisms of the same species in a given area Community: a group of populations of a different species in a given area Individual: a single organism Abiotic Element: a non-living component of the environment Ecosystem: the network of interactions that link the living and non-living parts of the environment Ecology: the study of relationships between organisms and their environment (ology means the study of) Habitat: the environment where an organism lives</p>



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Nutrient: a substance that an organism needs to grow and maintain its body

Competition: occurs when more than one organism tries to obtain the same basic resources in the same habitat

Predator: an organism that hunts other living things for food

Prey: an animal that is hunted by a predator

Mutualism: an interaction between individuals that benefits both individuals

Predict and Plan

Which definition do you find the hardest to understand? Why? _____

Which definition do you find the hardest to remember? Write it once here.

Demonstrate/Design/Discover

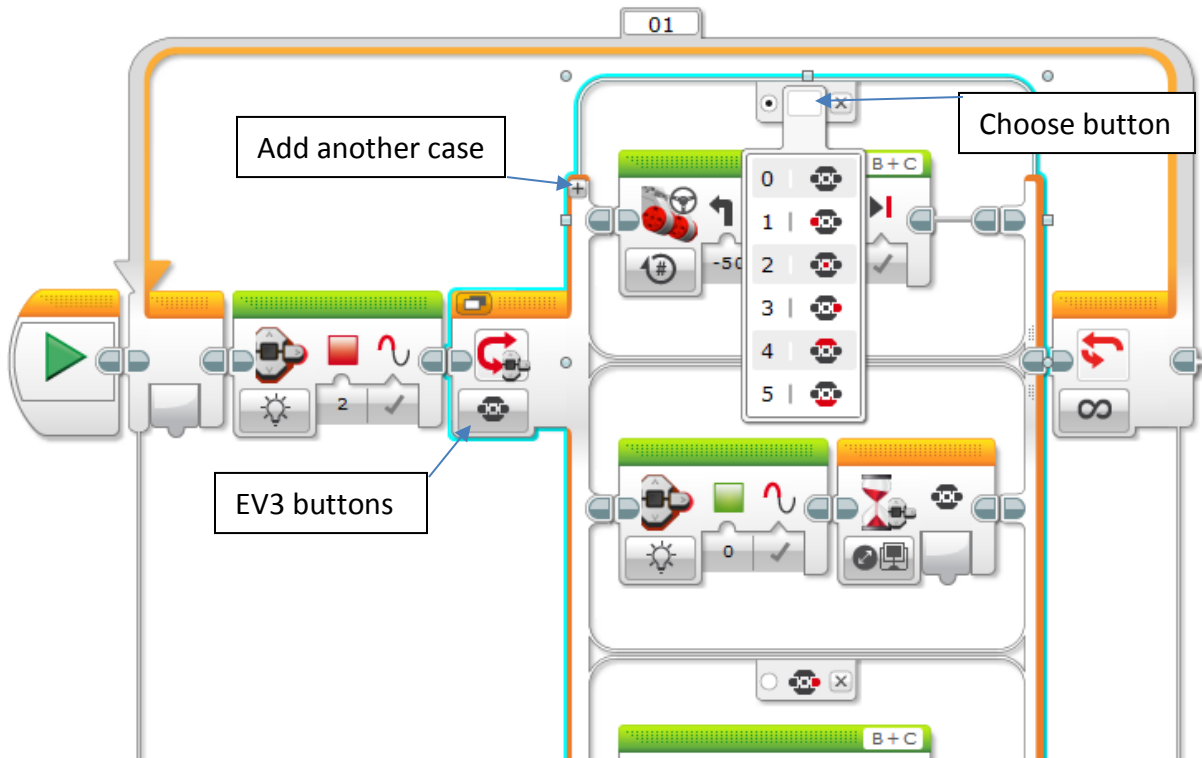
- ✓ Using the switch block and the buttons on the EV3 robot you will be creating a remote control program that allows you to quickly drive to different locations on the floor.

- ✓ You will be using your remote-control program in a fun competition to show your groups knowledge of the various definitions. Your robot will need to drive to the correct definition on the floor, and signify you've made a selection.

- ✓ Your program must:
 - Be in an infinite loop (to keep the switch block check active)

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- Turn your light to red (to signify you haven't locked in your answer)
- Have a switch block that you have expanded to include cases for all 5 buttons. Shown below is where to add more cases to your switch block (on the PC).



- The left button will make your robot turn left 90°
- The right button will make your robot turn right 90°
- The up button will make your robot go forwards some amount of rotations (too large and you'll have trouble getting where you need to, too small and it'll slow you down)
- The down button will make you go backwards some rotations
- The center button will indicate you've made your final choice, turn your light green and wait for a change in the button

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presses before exiting that section (see example above for a hint).

- ✓ The game will work something like this.
 - Your teacher will put a definition on the board.
 - You will have a limited time (~10sec) to get from wherever you were last to the new location where the correct word is located. The ground will look something like this.

Biotic Element	Population	Ecosystem	Competition
Organism	Community	Ecology	Predator
Micro-Organism	Individual	Habitat	Prey
Species	Abiotic Element	Nutrient	Mutualism

- This will be both a test of your comfort with the definitions, your ability to program/operate your robot, and to a lesser degree the faith you have in your classmates (as you see them operate their robots).
- As time goes on you will become more confident with the definitions.

Tips: Using trial and error (or some math) to find out the number of rotations it takes to move from one definition to another.

Record

Think back to the definitions you were having the most difficulty with. Record whether or not it is still your most difficult definition, or if it's changed. _____



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Empty rectangular box for student information.

Questions

Question 1 Science Is your robot biotic or abiotic?

The robot is non-living and thus is abiotic

Question 2 Science In what ways did this activity demonstrate mutualism, and in what ways did it demonstrate competition? Use the words resource(s) and benefit(s) in your answer.

It was mutualism because we benefit from the direction of the other groups in a definition we were less sure of, but we were all competing for the resource of space and a limited time resource as well. We were all competition to get their first.

Question 3 Science How did the classroom habitat need to change in order to make this game work?

The tables and chairs needed to be moved so we had space on the floor. This made the habitat more open.

Question 4 Robotics Given more time, how you improve the interface of your robot so that was easier to use?

I would like to hold the button down as long as I need in order to reach the exact horizontal and vertical distance I need.

Extension Coding and Science Instead of only moving a pre-defined distance with each button press, use a clever combination of wait blocks to have your robot go continuously in the direction of your choice while holding down the buttons (and have it stop when you release).