Robot Dance

Task Description

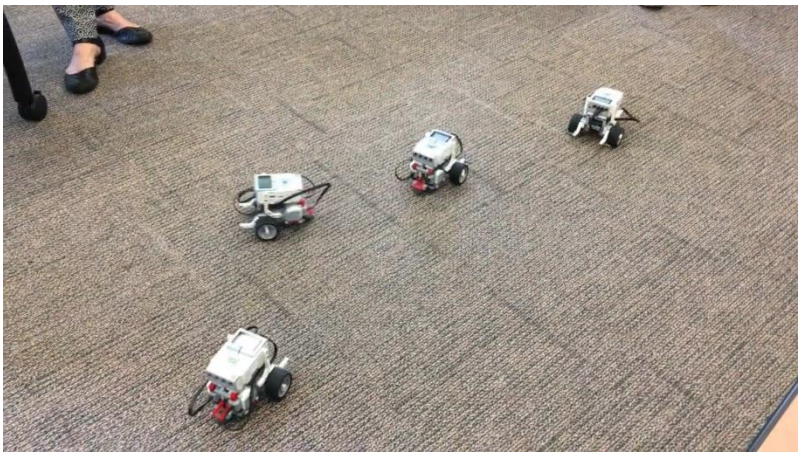
The goal for this introductory programming is to get the robot to dance. By making their robot dance, students will learn some basic programming skills such as moving forwards and backwards, turning, and using loops.

Materials needed

- *EV 3 Mindstorm Robot* in base configuration
- Lego *Mindstorms Education EV3 Classroom* software on an iPad or PC
- Music

Dancing Robots

Watch a video of a group of dancing robots here: https://vimeo.com/291510578



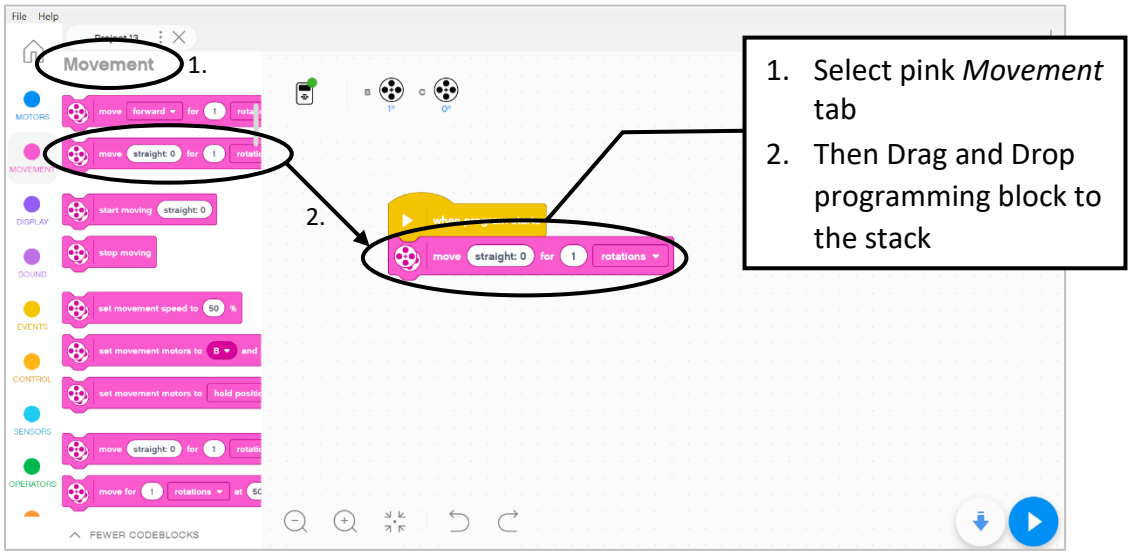
Programming to Dance

Please find a step-by-step tutorial on programming the robot to dance on the next pages, or see these video tutorials. Note: An older version of the EV3 programming software is used for the video tutorials.

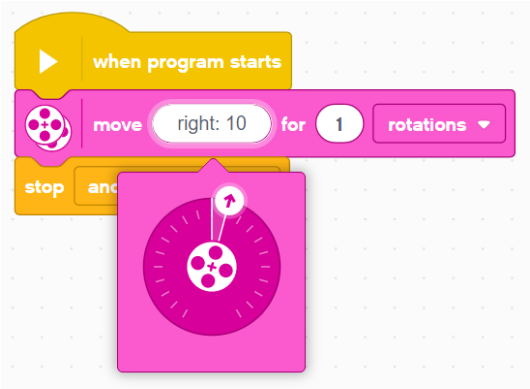
- Video 1: https://vimeo.com/148521107
- Video 2: https://vimeo.com/148521658

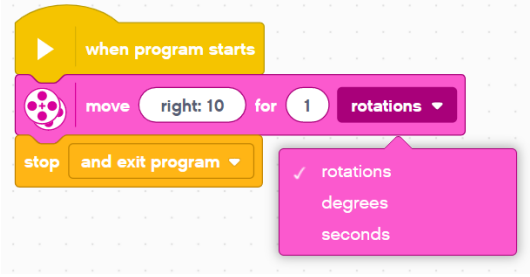
1) Moving Forwards, Backwards, and Turning

- Drag a <Move> Block from the pink *Movement* category to the programming canvas and connect it to the <Start> Block.
  Add a <Stop> Block from the orange *Control* section to your programming stack to exit out of the program.

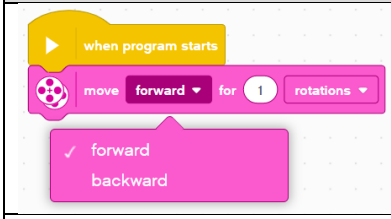
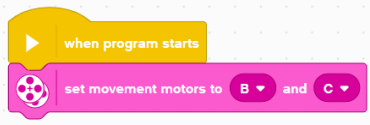
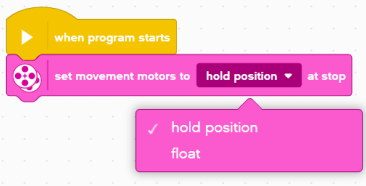


- <Move> Blocks have different functions. In the <Move> Block below, Steering and Duration can be set:

Steering Direction	
	Makes robot go straight or turn depending on the number. **Straight:** 0 **Right turns:** Any rational number >0 to 100 **Left turns:** Any rational number <0 to -100 Use arrow or enter number manually. Note: Reverse the numbers when robot goes backwards.

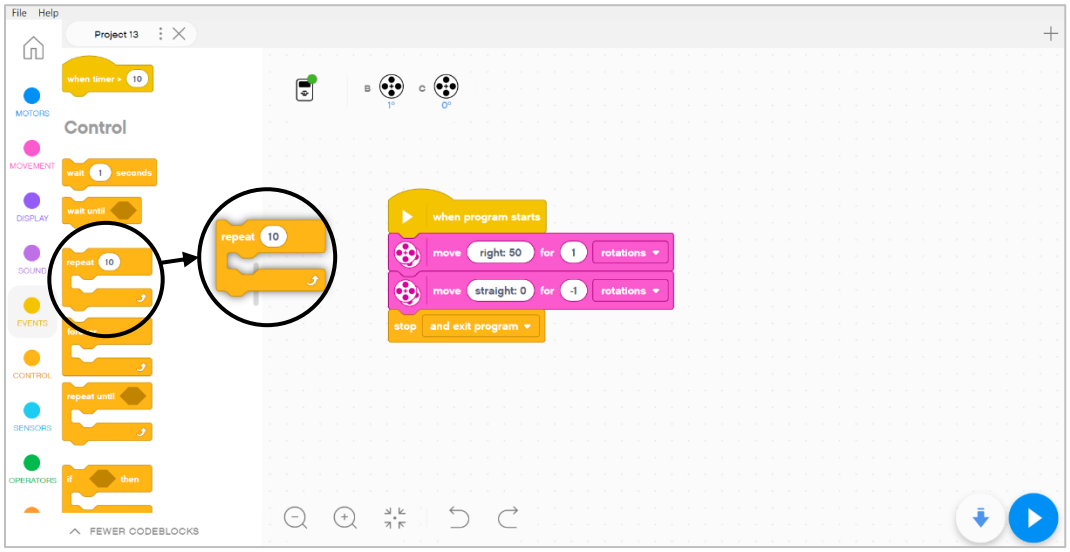
Duration Length	
	Controls wheel rotation setting. Choose between numbers, degrees, or seconds. **Negative rotations** will make the robot go backwards. Note: Many of the tasks and challenges on www.stem-education.ca use # of wheel rotations.

- Note: There are other <Move> Blocks with different controls. For example:

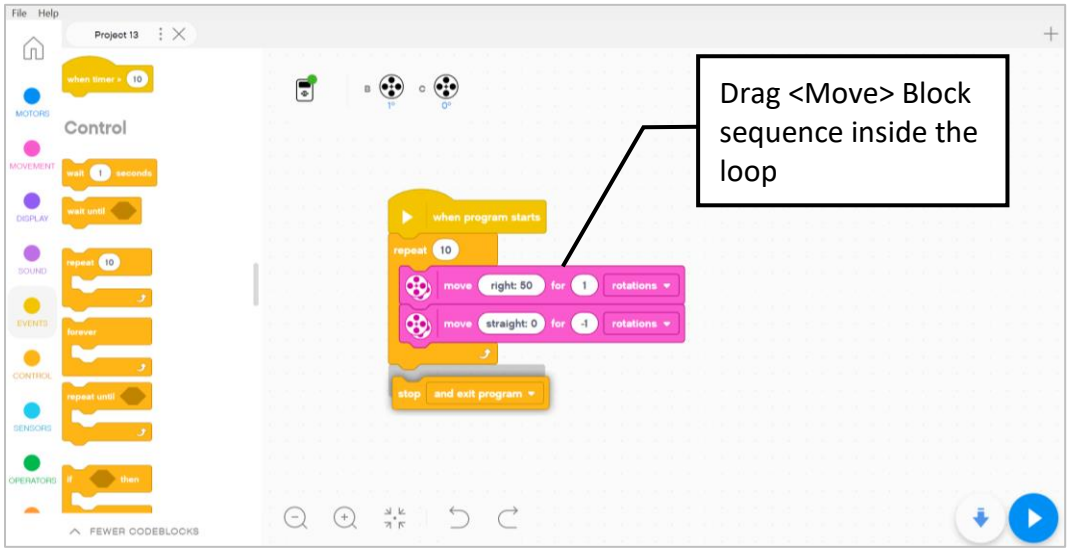
Forward and Backward	**Motor Ports**	**Hold and Float**
		
Enter for how many wheel rotations the robot moves forwards/backwards	Set which motor ports are used. Ports are labelled A – D at robot's front	Hold or float at the end of block

2) Loops

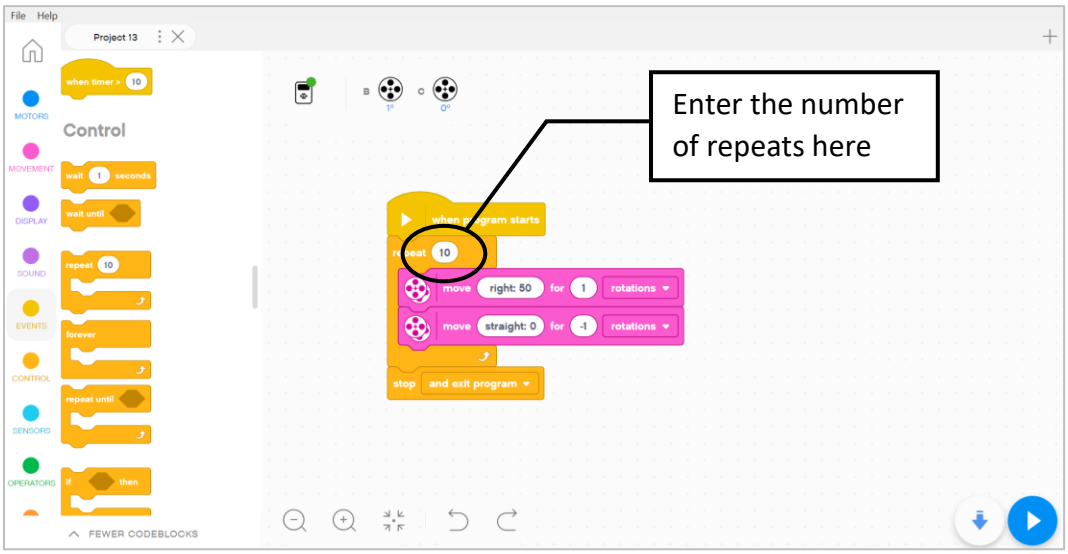
- Loops are useful for repeating a sequence of steps, such as dance moves. To create a loop, go to the orange *Control* tab on the left menu bar. Then drag the <Loop> Block onto the programming canvas.
  Note: <Loop> Blocks are C-shaped.



- Then drag your sequence of blocks into the loop. Make sure they are attached to the stack and in the correct order.
  The <Stop> Block at end the program should be outside the loop.

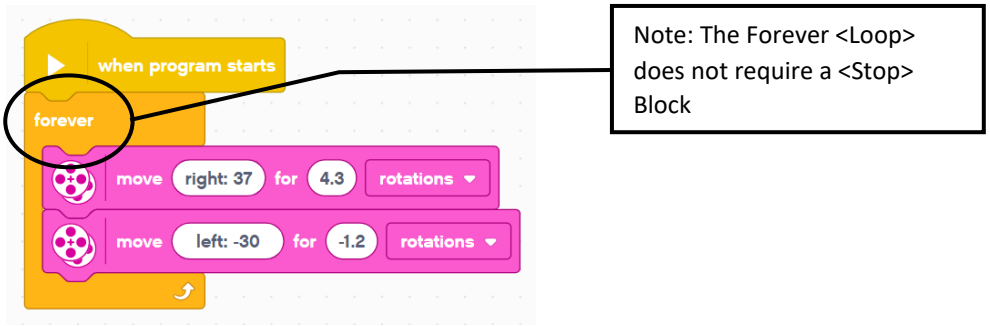


- There are many options for how long the loop repeats.
  You can enter a number at the top of the <Loop> Block.



- Note: Forever <Loop> and Repeat Until <Loop>

  If you want to repeat indefinitely, use the Forever <Loop> from the menu tab on the left.



  Another option is the Repeat Until <Loop>, where you can add a Sensor input or other conditions in the field at the top.