

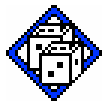
# Loops, Jumps and Forks

## For Loops

For Loops allow you to repeat part of your program for a certain number of times. This way, you don't have to rewrite the same piece of the program over and over again.

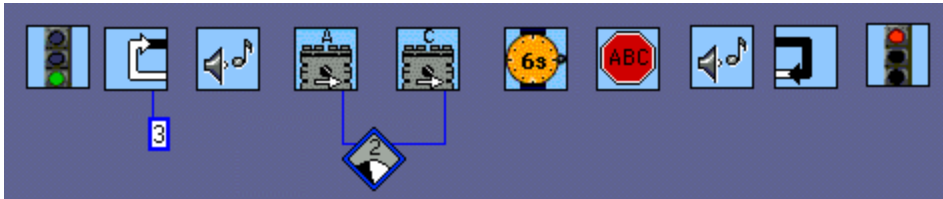


Loops are found in the structures sub-palette and require a start and an end icon. Use a text box modifier to denote how many times you want the program to execute the loop.





You can also use the random dice modifier for a random number of times. If you don't use a modifier, it will loop 2 times.

Create and download this program. Run the program on your robot. Does it repeat 3 times?





## Jumps and Lands

Jumps and lands are another set of icons that let you control the flow of your program.

When a program reaches this icon  called a jump it will immediately jump to this icon,  called a land.



There are 5 different pairs of colored jumps.  



Replace the loop in your program with a jump and land. Download and run this program on your robot. How do Jumps and lands differ from the loop icons you used previously?

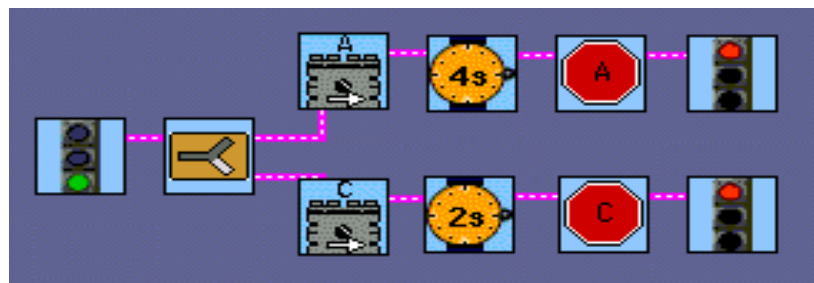
## Forks

So far the programs that you have written have only one task. Multi-tasking means your robot can appear to be doing more than one thing simultaneously in your program. You can have up to 10 separate tasks.

To create multiple tasks, you need a task fork icon. Each separate task must end with a red stoplight icon.



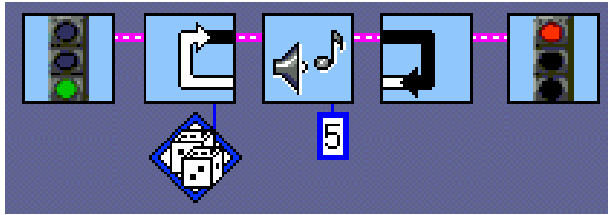
This is a simple example of a program using a task fork icon. It contains 2 tasks. One that turns on motor A and the other that turns on motor C.





## Programming Loops, Jumps and Forks Worksheet Solutions

1. Play a buzz for a random number of times



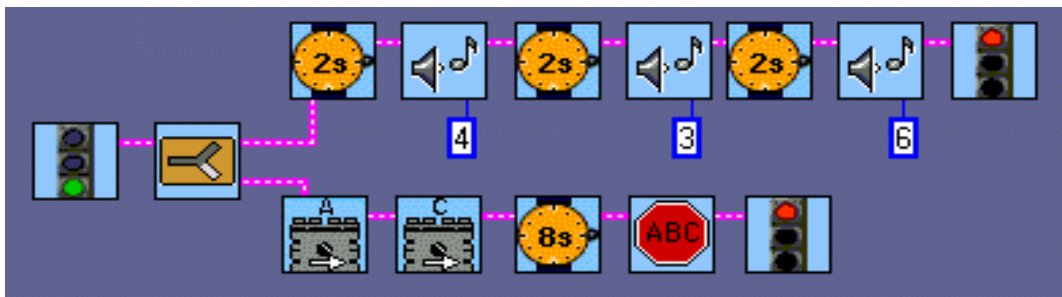
2. Have the robot go forward for 4 seconds, stop for 2 seconds, then go in reverse for 4 seconds all at power level 5 and stop for 1 second. Have the robot repeat this 5 times.



3. Turn on Motor A in the forward direction for 3 seconds, then stop the motor. Then turn on motor C in the forward direction for 3 seconds, then stop the motor. Repeat this forever.



4. Create a program with 2 tasks. The first task waits for 2 seconds, plays a rising sweep, waits for 2 seconds and plays a descending sweep, waits for 2 seconds and plays a fast rising sweep. The second task turns on motors A and C in a forward direction for 8 seconds then turns them off.






Name \_\_\_\_\_ Hour \_\_\_\_\_

## Loops, Lands and Forks Challenge

Programming Specifications:




Write a program with 3 separate tasks.

-  The first task turns on Motor A for 4.5 seconds, then turns it off.
-  The second task plays a rising sweep sound, then waits for a random amount of time. It does this 4 times.
-  The third task turns on Motor C for 1 second, then turns it off and waits for 2 seconds it does this for a random number of times.

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-  The third task turns on Motor C for 1 second, then turns it off and waits for 2 seconds it does this for a random number of times.

