

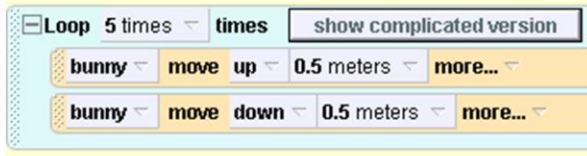
# Alice 2.2

## Repetition & Decisions

Programs run from top to bottom. If the program wasn't able to repeat or make decisions about which parts of the code to run or what to do with that code then it's going to run exactly the same every time and be more a movie than a program.

# Loops

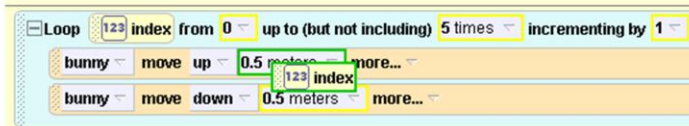
Loops allow us to repeat sections of code.



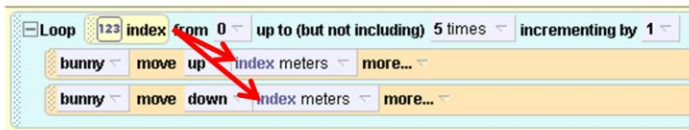
How many times is our bunny going to hop? **5**

# Loops

## index is the counter for the loop



Now what's our bunny going to do?



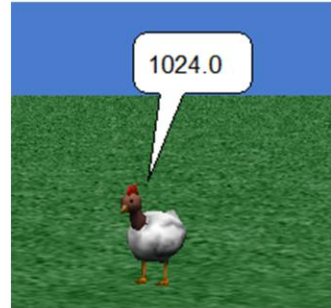
You can drag from the [123]index onto any place inside the loop that will take a number.

Our bunny will still hop 5 times. But instead of going up and down  $\frac{1}{2}$  meter each time it'll change. The first time he'll hop 0 meters, the second 1 meter, and so on up to 4 meters. Note that it doesn't actually go to 5.

# Loops & Variables

```
myVar set value to 1 more...  
Loop 10 times times show complicated version  
myVar set value to ( myVar ^ 2 ) more...  
chicken say myVar as a string more...
```

What's the  
chicken say?



# open forLoop.a2w

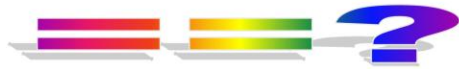


**Ifs allow us to run parts of code if something is true**



If whatever is next to the if is true then the code within that block will run.


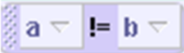


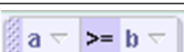
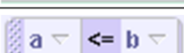
What will our bunny do? Is 1 equal to 1? He'll say "hello".



**Most programming languages use a double equals sign when you're checking equality**



# Comparisons

	True if
	a is equal to b
	a is NOT equal to b
	a is greater than b
	a is less than b
	a is greater than OR equal to b
	a is less than OR equal to b

Add stuff here

# Else

When the if comparison is false then the else section will run



What's the monkey going to do? He's going to say goodbye since 1 is not greater than 2. The `monkey.say(Hello)` gets skipped over.

# Nesting ifs & Elses

You can put if / elses within if / elses

```
if 1 > 2
  if 1 == 1
    monkey say my name is Bob more...
  else
    monkey say I like tomatatoes more...
else
  if 1 != 1
    monkey say giraffes are funny more...
  else
    monkey say my tail itches more...
```

Now what's our monkey going to say?



Because  $1 > 2$  is false we skip to the first else. We then compare to see if 1 is not equal to 1. Since that's false we go to the last else and our monkey says "my tail itches". The is 1 equal to 1 comparison never happens.

# Ifs, Elses, & Variables

```
myVar set value to 15 more...  
  
if myVar < 5  
  if myVar == 15  
    cow say The sheep frighten me more...  
  else  
    cow say I want a cheeseburger more...  
else  
  if myVar > 2  
    cow say I don't taste like chicken more...  
  else  
    cow say Milk's good for you more...
```

What's our cow going to say?



**open**  
**ifsElses.a2w**

# Built in Functions

Every object has built in functions that you can use for comparisons

```
if bunny distance to flamingo < 10
  bunny say I'm close to the flamingo
else
  bunny say I'm far away from the flamingo
```



# Loops & Lists

For All In Order loops let us loop through members of a list

```
123 jumpHeights = []
insert 1 at end of jumpHeights more...
insert 0.5 at end of jumpHeights more...
insert 3 at end of jumpHeights more...
insert 1 at end of jumpHeights more...
insert 0.5 at end of jumpHeights more...
For all jumpHeights, one item_from_jumpHeights at a time
lemur move up item_from_jumpHeights meters more...
lemur move down item_from_jumpHeights meters more...
```

How many times will the lemur jump?

# Start work on ifs & Loop Labs