

# TURTLES

## Some Useful Commands for Turtle Geometry within NetLogo

Obs	clear-all	ca	ca	Observer <i>clears the world</i>
Obs	create-turtles	crt	crt 7	Observer <i>creates 7 new turtles</i>
Turtle	forward	fd	fd 10	Turtle <i>moves 10 steps forward</i>
Turtle	back	bk	bk 10	Turtle <i>moves 10 steps backward</i>
Turtle	right	rt	rt 90	Turtle <i>turns 90 degrees to the right</i>
Turtle	left	lt	lt 90	Turtle <i>turns 90 degrees to the left</i>
Turtle	pen-down	pd	pd	Turtle <i>puts its pen down (starts drawing)</i>
Turtle	pen-up	pu	pu	Turtle <i>takes its pen up (stops drawing)</i>
Any	random		random 10	Returns a number between 0 and 9
<b>Example:</b> using right and random together...			rt random 30	Turtle <i>turns to the right</i> by an angle that is a random number between 0 and 29 degrees.

## Built-In Turtle Variables

Turtle	heading	Number between 0 and 360	set heading 0	<i>Faces north/up (heading 0)</i>
Turtle	xcor	Number	set xcor 4	<i>Changes its xcor to 4</i>
Turtle	ycor	Number	set ycor 11	<i>Changes its ycor to 11</i>
Turtle		[combined x and y cords]	setxy 33 27	<i>Moves to the point (33, 27)</i>
Turtle	color	Number between 0 and 140, also constants for all basic colors	set color red	<i>Turns red</i> (see Tools>Color Swatches for color mapping)
Turtle	shape	String: name of a shape in the shapes editor	set shape "butterfly"	<i>Changes its shape</i> (See Tools>Turtle Shapes Editor)

## New Turtles from patches!

Patch	sprout	Create a turtle here	sprout 1 [ set color pcolor ]	The patch <i>creates a new turtle</i> on that patch. Note that the commands in the block after sprout let you 'setup' the new turtle.
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## Some other fundamental NetLogo Phrases

repeat _ [ ]	repeat 4 [ forward 10 right 90 ]	Turtle <i>repeats (forward 10, right 90) four times</i> . [What shape do you think this makes?]
wait _	wait .5	Observer <i>pauses</i> the running of the model for ½ second. (Good for animations and performances!)
ifelse _____ [ ] [ ]	ifelse color = 15 [ set size 5 ] [ set size 1 ]	Turtle <i>thinks</i> , "If I am red (color = 15), I must <i>become size 5</i> ; otherwise (else) I must <i>become size 1</i> ."
while [ ] [ ]	while [ pcolor = red ] [ forward 1 ]	Turtle <i>thinks</i> , "As long as the patch underneath me is red, I <i>go forward one</i> . Each time I go forward one, I check again to see if the patch <i>now</i> under me is red. (Once I'm <i>not</i> on a red patch, I stop moving.)
one-of _____	ask one-of turtles [ die ]	Observer <i>asks</i> one of the turtles, " <i>die</i> "
n-of _____	ask n-of 10 turtles [ die ]	Observer <i>asks</i> 10 of the turtles, " <i>die</i> "
with [ ]	ask turtles with [shape = "car"] [ set color red ]	Observer <i>asks</i> the turtles with the car-shape, " <i>turn red</i> ."

To "create a new command" (like a new block in Snap), add to the Code tab, using the paired keywords "to <new command>" and "end"