**BCB / BB 1030 Simulation in Biology**

**Some Netlogo hints**

1) If you don’t understand a command, place the cursor on the command and type F1. You will be taken to the Netlogo Dictionary. This is part of the Netlogo User Manual, which is downloaded with Netlogo, so you can do this even if not connected to the internet. The Programming Guide is another extremely useful part of the User Manual (see contents column on left side of User Manual).

2) Always create a ‘Step’ button when you create your ‘Go’ button. Just have it execute ‘go’ without checking the ‘forever’ box. This will just execute ‘to go’ once when you push the button – very useful for debugging.

3) To format your code consistently, select a piece of code and then type the ‘Tab’ key. This will make all your indents line up nicely, and make your code much more readable. See Code Tab Guide in the Netlogo User’s Manual.

4) Using agent monitors is very helpful for debugging. Right-click any agent (when the program is stopped is easiest), hover over the desired agent number, and then click on ‘inspect’ for that agent in the menu that appears. This will allow you to look at all the variables for that agent as you run the program.

5) The ‘show’ command is very useful for debugging.

In your code,

show variable-name

will print the value of that variable name in the Command Center at the bottom of the interface when you run your program, along with the agent number that is executing the command.

6) Comments are very helpful. Use them frequently.

7) Save a new version of your code when you have made a significant change. If your program is called ‘Bees-and-flowers’, call the second version ‘Bees-and-flowers-v2’ . At the top of the ‘code’ page, make a comment stating what new features are in this version. For example,

; v1 has bees moving randomly, and flowers do nothing

; v2 has bees choosing flowers using in-cone, and flowers are refilling

8) Be very structured in your coding – using procedures with informative names makes your code easier to understand.

to go

bees-behave

flowers-refill

end

to bees-behave

ask bees [

….

]

end

Remember that you have to ask agents to do things; you have to get into ‘agent mode’.

9) For ideas on how to code things, look in the Netlogo Model Library. To get there, click on File, then Model Library. Within the library, Code Examples is especially useful.

10) For a quick view of whether a variable is doing what you want it to, you can make your agent take on a size that is related to your variable. For example

set size 1 + (nectar \* 0.1)

This code shows you quickly the nectar levels of your flowers, because the flowers increase in size in proportion to the amount of nectar they have. Remember to leave spaces on either side of math operations (like + and – signs); otherwise Netlogo will think you are trying to name a variable.

11) The label command is also helpful.

set label int nectar

This will show the integer part of the nectar level for each flower agent on the interface, if you put it in some part of the flower’s code that is called each tick. If you leave out the ‘int’ part, the labels get very long if nectar is a floating point number. Try it and see!

12) The sprout command allows you to place each new agent at the center of its own patch.