

Lab 5. In this lab, you will work in groups of 3 or 4 (rather than in pairs.) You will *not* be writing any NetLogo code today. Instead, you will be exploring several existing NetLogo models in the models library, which you can access from the NetLogo **files** menu. Some will be relatively simple, and some will be more complex. Most will have a “things to notice” section and/or a “things to try” section. There are seven models to explore, and then you may pick an 8th on your own. Plan accordingly the amount of time to spend on each.

Take turns leading the discussion and taking notes for a model, using the questions and suggestions below. (That is, one person leads discussion and takes notes on the first model, a second person on the second model, etc., cycling back to the first person when everybody has led.) Except as noted in the Climate Change model, you should begin by reading the info section. (It will be faster if each team member reads this on their own prior to group discussion and experimenting.)

When you are done with the lab, you should submit a lab report with all of the names of your lab team. The lab report should have a four to five sentence description of the highlights of your group discussion from each of the following models. The lab report is due in the dropbox as a .doc or .pdf file before the next class, and should be labeled **Lab5-yourlastnames.doc** or **Lab5-yourlastnames.pdf**.

1. Biology: Ants

- **Read the info section.** Discuss the model and what it is intended to model. Discuss the “things to notice” section. Also note how to create and edit your own “info” section.
- **Run the model.** (What does the forever checkbox on the “go” button do?)
- **Experiment.** What is the impact of the sliders on the simulation? What are the “things to notice?” What did you notice about them?
- **Modeling.** What are the abstractions in this model?
- **Look at the code:** How is chemical trail represented? How and where is it set or updated?

2. Biology: Flocking

- **Read the info section.** Discuss the purpose of the model and what it simulates.
- **Run the model and experiment.** What is the impact of the sliders on the simulation? What are the “things to notice?” What did you notice about them?
- **Modeling.** What are the abstractions in this model? What is the *emergent behavior* –the global phenomenon that results from autonomous agents make decisions on local information?
- **Look at the code:** How is the turning angle implemented? How is alignment done?

3. Biology: Wolf Sheep Predation

- **Before you run the model, read the info section and look closely at the interface.** How does the interface compare with the Ants interface?
- **Run the model and experiment.** Run several experiments with several values of sliders and discuss what you observe. Make use of the “Things to Notice” and “Things to Try” to guide your experiments and discussion.

- **Modeling.** How easy or difficult is it to create a population that remains stable for a long time? What are some things that cause collapse of a population?

4. Earth Science: Continental Divide

- **Read the info section.** What is the basic goal? What is the overall approach – the big idea of how it works.
- **Run the model.** Note that every time you run the model, it will produce the same result. There are no sliders and nothing to change, although you might want to run it more than once just to watch. *How is a model like this useful?*
- **Look at the code** and try to understand how it works. What do the turtles do? What do patches do or how are they used? Find several NetLogo commands that we haven't described in class or that you haven't yet used. What do they do? (You may use the NetLogo dictionary!) How are they used in this model?
- **Think of an alternate approach to finding a continental divide.** Instead of raising the water level, could you drop a raindrop on each patch and see where it ends up? How would you do that? What would a raindrop breed need to store and what would its movement look like?

5. Earth Science: Climate Change Don't read the info section yet!

- **Run it.** Just from looking at the model *without reading about it*, what does this model help visualize?
- **Look at the Code:** How are breeds used? How is the “watch a ray” button implemented? How are collisions handled with the Heats breed?
- **Contemplate and think creatively.** How might you modify? What could you add to the model? How might you change the interface, or add functionality?
- **Now go ahead and read the Info section** and compare your ideas for extending the model to those in the info section. Try any of the “things to try” that you didn't try.

End with three more models:

6. Social Science: Traffic Grid

7. Social Science: Team Assembly

8. *And any model of your own choosing.* (Whoever leads the last discussion can pick, or make it a group decision.)

For each of these, you can design the questions you want to ask and things you want to try. You may look at the “Things To Try” but only after discussion some of your own ideas. Be sure to:

Explore.

Observe.

Talk aloud.

Look at the code.

Spend five minutes brainstorming as a group about some possible agent-based models you might code.