

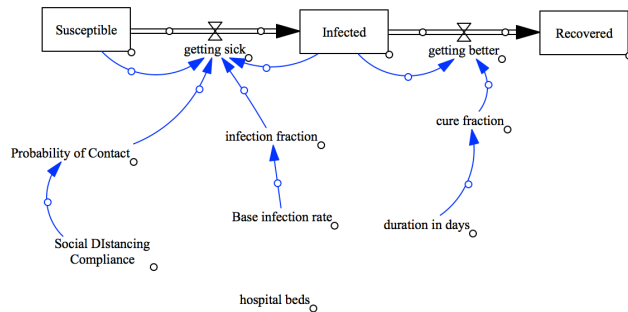
## COSC150 ICA3 (20 April 2023)

Name/Pledged no help on first take \_\_\_\_\_

(Open Web/Notes allowed ONLY for rework)

We started this course by asserting that scientists communicate in two basic ways: drawing pictures and telling stories. We've spent several weeks doing that!

1. A model that has at least one element of randomness can be described as \_\_\_\_\_.
2. A model whose behavior depends solely on its parameter values and the initial conditions can be described as \_\_\_\_\_.
3. Consider the following simple *system model* of the spread of a communicable disease:



- a. Identify the 4 basic components (building blocks) of system models and give examples of each in the above model:

4. Models in a scientific investigation usually serve one or more of four main purposes. They are:

a. S \_\_\_\_\_

b. E \_\_\_\_\_

c. P \_\_\_\_\_

d. V \_\_\_\_\_

e. A \_\_\_\_\_

5. In an agent-based model, we always start with a well-told story using sentences that are of the form: If . . . . . Then . . . . .Else

a. What are the 4 basic components of the stories of most agent-based models?

b. Tell me a good agent-based model story of the spread of a communicable disease, including movement, catching the disease, and one or more ways to recover:

6. List as many of the characteristics of System Models and Agent Models that you remember that distinguish one from another:

SYSTEM MODELS

AGENT MODELS

7. In terms of a process for building and testing an agent model, what are the three stages of model development:

- a. First you determine which agents \_\_\_\_\_
- b. Then you define how those agents \_\_\_\_\_
- c. Then you define how those agents \_\_\_\_\_

8. What is the main characteristic of a model that would require time-synched (Jacobi) updating of agents as opposed to sequential updating of agents (Gauss-Seidel)? (Hint: think of the difference of the forest fire model vs. the “usual” SIR disease model.)