

Modeling Paper Outline (Interesting/Useful Title, in Question Form, If Possible)

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Introduction.

Explain the problem you studied and what you wanted to find out. State the question(s) that your project will answer. Explain some of the problems you ran up against trying to get off the ground with your model.

The Model.

Capture a picture of the model you created in Stella and put it here. Such pictures have been known to be full-page for some models.

Figure 1. Always put a caption centered under your picture explaining it and identifying it with a number so that you can refer to it in your paper, if necessary.

Explain how the diagram is set up and the overall structure of the model. This could take several paragraphs.

You may want to explain subparts of your diagram, so capture the picture of the subpart here. This may be repeated.

Figure 2. Always explain the picture briefly in a caption.

If there are subparts of your main diagram that need more explanation, capture that part above and explain it in more detail. This may be repeated.

Equations.

Include copies of the equations with units and documentation here. These may be more appropriately organized with the subparts, if you have subparts to explain. Some equations may be appropriately relegated to the appendix.

Model Feedback (really important!).

Explain the feedback loops in your model and how they operate. Refer to your diagram(s) and equations as necessary. Explain any modifiers in the feedback loops. Trace around each loop explaining how each component will affect the next (for instance, say whether an increase in the current component value will cause the next component value to increase/decrease). Also explain whether the feedback loop is positive or negative, and why.

Choice of Time.

Explain the choice you made for time specs and why. This includes time units, beginning and ending simulation time, choice of DT, and choice of Euler versus Runge-Kutta (2 or 4) method for numerical integration.

Final Graph.

Capture a picture of your final graph here. Set the picture wide if your picture is wider than your text.

Figure 3. This is the result of the model run for the full time.

Explain the graph and why you chose to put in the graph the quantities that you did. Explain what each curve tells you based on how you understand the system.

Final Table.

Capture a picture of the most important part of your table results here. Remember that in MS Word you can format tables to look good.

Figure 4. This is a really cute table.

Explain what the numbers are telling you and how they support what the model is demonstrating, or what the graph is telling you.

Validation.

Explain how you validated your model. If you have real or theoretical data with which to compare your results, do so. When it is not possible to do such a comparison, at least indicate how you checked your model's validity as you constructed it part by part.

Capture a table comparing real/theoretical data to model data here.

Figure 5. Table of validation data and/or error analysis.

Explain what causes the discrepancies between the theoretical (or real) data and the data the model calculates.

Conclusions.

What can you conclude from running your model? Do you answer the question with which you originally began?

Were your conclusions what you expected? What led to the differences, if any.

What are the assumptions you made in your model (for instance, to simplify it)? (If you made none, then your model must a copy of reality.)

What are the limitations of your model? (There certainly are some if you made simplifying assumptions.)

Future Plans.

How would you change the model to test other ideas?

Appendix.

You may include further printouts, diagrams, equations and documentation thereof, graphs, and tables in an appendix. Include intermediate print-outs requested in the your system story.

The End.

Exclusive of appendix, 5-10 pages should be your goal.