

# Heuristics or Rules of Thumb for Modeling

1	Keep it simple. Use the leanest model for the purpose at hand.	10	Look for useful notations. Finding the right notation helps you think through the model.
2	Plan your output. What will you do with it and how do you expect it to look? For example, do you need numbers out to three decimal places?	11	If a formula is used, be sure to understand why it fits. Be cautious of pulling formulae out of books and using them without understanding the assumptions behind them.
3	Anticipate your results. If you get what you anticipate - good!  If actual results do not agree with anticipated results, make sure you understand why.	12	Cut through "gordian" knots (Gordian knots are things that are messy and there are no clear means to untie them easily).  Either leave it out or find a simple way through it. Make simplifying assumptions, but keep a list of them!
4	Look for upper and lower bounds. What is the biggest number? Smallest number? If they are close, there may be no need to look further. If not, you need to study further.	13	Plan for a sensitivity analysis. Plan to test a range of parameter values.
5	Choose appropriate spatial and temporal scales. What does the model see or not see at those scales?	14	Plan a assumption analysis to test the major assumptions you made.
6	Graphs, pictures, and histograms are usually better than words or numbers to explain model results.	15	Press ahead. Don't get bogged down. Get something working as soon as possible. Always be prepared to throw away your model and start again. This concept is called rapid prototyping.
7	Keep a list of assumptions and review them frequently. Have the "guts" to make assumptions. List your assumptions as you develop the model.	16	Be prepared to explain your model.
8	If in doubt, leave it out. Revisit the decision later.	17	Think yourself into the problem.
9	Use salami tactics. You may not be able to solve the whole problem in one step. Ask for one slice of the salami then ask for another one. Slice the problem and solve it as a series of steps.		