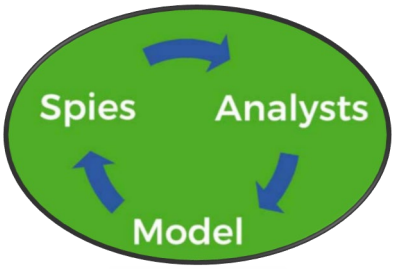
Modeling Process

Modeling is a process that uses mathematics to represent, analyze, make predictions or otherwise provide insight to real-world phenomenon.

General Modeling Principles

- It is usually easier to develop useful models by starting with a simplified version of a situation than with one that is closer to reality. The first model is rarely the final model.
- Pay attention to what you "want." If you need a number, make up a value, but note what you did. That number may become a variable later.
- Be conscious of decisions/assumptions.
- Ask, "What if?" What would happen if (pick a number or assumption) changed?
- Ask, "What question are we trying to answer? How can I 'measure' that?"



Modeling Steps

Step 1: Spies–*What information do I need and how do I acquire it?*

- Do I understand the problem?
- What information do I need?
- How will I acquire it?
- What assumptions am I going to make? What facts or statements am I going to take for granted?

Step 2: Analysts–*Take the information and work with it to figure out how to use it.*

Part 1

- Decide what information to keep and what if any to discard? Is there other information still needed?
- Create a picture, graph, chart, or other representation (or revise the spies initial model) to help me understand the data?
- Do the math. Show calculations and label units.
- What is your solution? Does it make sense? Is it clear? Does it answer the question? Is the level of precision appropriate?
- Do I need to revise my model and/or solution?

Step 3: Model–*Use the model and verify that it works.*

- How can I communicate my solution to others?
- Can I use my model to make accurate predictions?
- What if our assumptions are wrong? How does that impact our answer?
- What if our scenario changes a little? Do our results change a little or a lot?
- Can my model be generalized to a broader situation? Use may need to use variables.