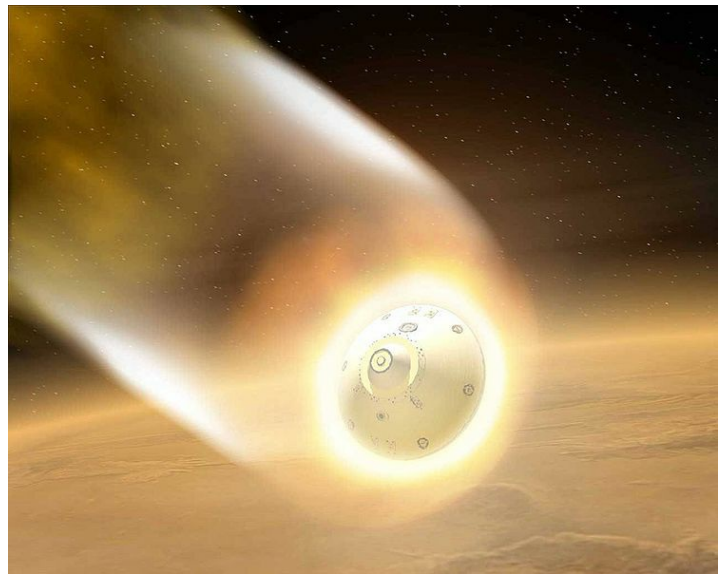


# Assumptions, Abstractions, and Ethics

## Introduction

No model is perfect, and none today could attempt to fully model all of the behavior of the human brain, let alone the entire world. Yet by abstracting some details and leaving others out entirely, we can produce useful models of phenomena as large in scale as the orbits of asteroids or as limited in scope as the heat distribution over the surface of a space capsule re-entering earth's atmosphere.

When we make assumptions about behavior, abstract out details, or leave them out altogether, it is important to acknowledge the limitations that those omissions or abstractions pose for the predictive power of the model.



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## Materials

- Paper and writing utensil
- Computers with NetLogo installed

## Procedure

### Part I: Assumptions and Abstraction

1. Form pairs as directed by your teacher. Meet or greet each other to practice professional skills.
2. Review the Assumptions presentation along with the slide notes.

Refer to your downloadable resources for this material. Interactive content may not be available in the PDF edition of this course.

3. With your partner compose a list of **assumptions** that the creators of the Wolf Sheep

Predation model make about the environment.

4. With your partner compose a list of phenomena that the Wolf Sheep Predation model abstracts.
5. With your partner choose **File > Models Library** and then **Sample Models > Biology > Virus**.
  - Read the information on the Info tab.
  - Run the simulation a few times, adjusting parameters.
  - Describe the **assumptions** that the model makes as well as what details it **abstracts**.
  - Share with the class as directed by your instructor.
6. You and your partner are asked to create a simulation that models how the flu is spread within a city. Your simulation is to be more robust than the virus simulation by having fewer abstractions. It is your goal to determine who is at highest risk for catching the flu.
  - What details would you want to include in your model, and which ones would you abstract?
  - What assumptions would you make within your model?
7. With your partner, choose a simulation that interests you from the Models Library:
  - Describe the **assumptions** that the model makes.
  - Describe what details it **abstracts**.
  - Make a list of what improvements to the simulation you would like to see.
  - Share out to the class as directed by your instructor.

## Part II: Ethics

You can find the complete Code of Ethics for The Society For Modeling & Simulation International, at <http://www.scs.org/ethics>. Ethical considerations for simulationists are very important as they are for anyone who works with information technologies. Other people, mostly non-experts, will rely on simulationists to provide them with the best quality information for making decisions in fields as diverse as eco-preservation, economics, and engine design. To that end each of the Professional Competence elements in Section 2 of the code of ethics are especially important.

7. Form teams of three to four as directed by your instructor.
8. Your instructor will assign you one of the Professional Competence commitments that simulationists make. Discuss within your team what you believe this commitment means.
9. Create a written description of a scenario that would create an ethical dilemma of some kind for a simulationist that is centered around that commitment.
10. Swap scenarios with another team. Explain the scenario you created to that team and answer any questions they have.
11. Create a one to four minute script for a play involving all of your team-members that will showcase the moral dilemma or conflict of interests that a simulationist might face based on the scenario that the other team provided to you in Step 9.
12. Perform your play in front of the class. At the end of each play, record which professional competence you believe the play was addressing as well as any comments/questions you have for your instructor about that professional competence. Submit these to your instructor as directed.

## Conclusion

1. Think of a phenomenon that you would like to simulate.

- What is the phenomenon?
  - What details would you want to include in your model, and which ones would you abstract?
  - What assumptions would you make within your model?
2. What consequences could you foresee resulting from a trusted and respected simulationist acting unethically?