CAST
COMPUTATION AND SCIENCE FOR TEACHERS

# Module 2C
# Introduction to Systems Modeling

## Overview

**Overarching Goal: Understand how to use a systems model as a tool for learning in science and mathematics.**

1. Identify problems that have similar model structures.
2. Identify the measurable variables and rates of change in a systems model.
3. Represent the relationships between variables in a systems model mathematically.
4. Validate a systems model through comparison to real-world data.
5. Develop an inquiry-based investigation that uses a systems model.

Agenda:

1. Why systems modeling?
2. Identify problems with similar model structures.
3. Recognize that graphs hint at the relationships between variables in a model.
4. Discuss the modeling cycle.
5. Formulate a model from a problem description.
6. Build the model in Vensim.
7. Experiment with the model by modifying parameters.

Needed resources:

1. Intro Systems Power Point
2. Intro Systems Overview document
3. Computer with projection capabilities, internet access with Java-enabled browser, Power Point and Vensim software
4. Chart paper and markers for posting goals
5. Square Post-it Notes for participant use
6. Large Post-it Notes for participant reflection
7. Computers for participants with internet access with Java-enabled browser and Vensim
8. Intro Systems handout
9. Moose Model handout
10. Vensim files: Linear3.mdl, ExpDecay3.mdl, BoundedGrowth2.mdl, FreeFall.mdl, moose.mdl, predprey.mdl, ProjectileMotion.mdl, VerticalSpring.mdl