Through modeling, students will create a representation of a real process, system, or object.

Modeling is an iterative process.

Different assumptions suggest different representations.

Define a purpose or need for the model.

Make informed simplifications and assumptions during the construction of the model.

Choose an appropriate representation method.

Perform model testing and sensitivity analysis.

Gather information about the process, system, or object being modeled.

Specify initial conditions and boundary conditions for the model.

Fit model to known data.

Make trade-offs between effort and accuracy.

Translate information into the "language" of the chosen representation:

Check the model's predictions against experimental data.

Run tests to determine the consistency of model and its range of validity.

Validate against test cases.

Use language to model salient features.

Symbolic

Use mathematical operations to mimic salient features of the real process, system, or object.

Numerical

Compare to simulations.

Compute error bounds.

Digital

Visual

2D or 3D

Physical