

Systems modeling feedback worksheet

Experiment 1

Experiment 1a: In the Interface level of the Bathtub Feedback Model_Exp1, set Water in bathtub = 10 liters (using the dial or typing in the dial box). Run the model and observe the results in the Interface level graph.

What happens to the volume of water in the bathtub over the course of 60 seconds? Why?

How does this compare to equilibrium vs. non-equilibrium conditions we saw in Unit 3?

Experiment 1b: Next, in the Interface level of the Bathtub Feedback Model_Exp1, set the Water in bathtub = 15 liters. Run the model and observe the results in the Interface level graph.

What happens to the volume of water in the bathtub over the course of 60 seconds? Why?

Experiment 1c: Next, in the Interface level of the Bathtub Feedback Model_Exp1, set the Water in bathtub = 5 liters. Run the model and observe the results in the Interface level graph.

What happens to the volume of water in the bathtub over the course of 60 seconds? Why?

Would you describe the observed model behavior as a balancing (negative) or reinforcing (positive) feedback? Why?

Experiment 2

Experiment 2a: In the Interface level of the Bathtub Feedback Model_Exp2, set Water in bathtub = 10 liters (using the dial or typing in the dial box). Run the model and observe the results in the Interface level graph.

What happens to the volume of water in the bathtub over the course of 60 seconds? Why?

Experiment 2b: Next, in the Interface level of the Bathtub Feedback Model_Exp2, set the Water in bathtub = 15 liters. Run the model and observe the results in the Interface level graph.

What happens to the volume of water in the bathtub over the course of 60 seconds? Why?

Experiment 2c: Next, in the Interface level of the Bathtub Feedback Model_Exp2, set the Water in bathtub = 5 liters. Run the model and observe the results in the Interface level graph.

What happens to the volume of water in the bathtub over the course of 60 seconds? Why?

Run the model several times, with values for Water in bathtub of your choice.

Why is the model in equilibrium *only* if the Water in bathtub = 10 liters? What does that imply about the nature of positive (reinforcing) feedbacks?

Reflection

One way to improve your learning is to reflect on the experiments you have just completed. How do you think your understanding of the effects of positive (reinforcing) and negative (balancing) feedbacks on system behavior has improved by using the bathtub model in this unit?