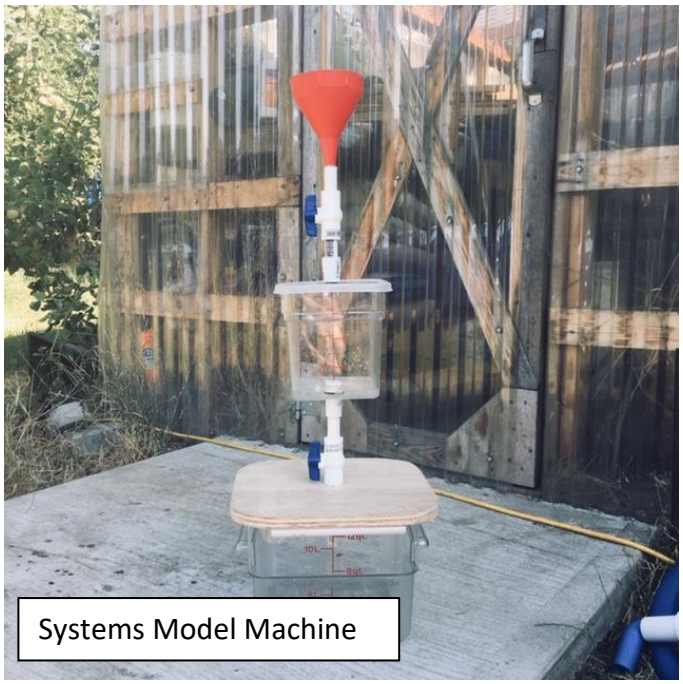
Systems Model – Climate Change Foundation lesson for grades 2-3



Systems Model Machine

NGSS Cross-Cutting Concepts: Grades 3-5

Systems and System Models ♣ A system can be described in terms of its components and their interactions.

Energy and Matter ♣ Energy can be transferred in various ways and between objects.

NGSS Cross-Cutting Concepts: Grades 6-8

Cause and Effect ♣ Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8) ♣ Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS1-4),(MSLS1-5)

Scale, Proportion, and Quantity ♣ Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1)

Energy and Matter ♣ The transfer of energy can be tracked as energy flows through a designed or natural system.

Systems and System Models ♣ Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems. (MS-PS2-1),(MS-PS2-4)

Patterns ♣ Graphs and charts can be used to identify patterns in data. (MS-PS4- 1)

Structure and Function ♣ Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS4-2) ♣ Structures can be designed to serve particular functions. (MS-PS4-3)

Stability and Change ♣ Small changes in one part of a system might cause large changes in another part. (MSLS2-4), (MS-LS2-5)

Plan:

Demonstrate the model with the valve open (stable). Discuss what happened.

Demonstrate the model with the valve less open (unstable). Discuss what happened.

Demonstrate the model with the valve closed. Discuss what happened.

Discussion of system – use Earth's system (earth and sun) as the example with energy (light) in and energy (heat) out.

Note: Use food coloring with water (yellow water as light in), red coloring in the earth tank that changes the yellow to orange (heat). We can show a stable (valves open) and unstable (less open) system where more heat (orange water) gets trapped.