

Chain Reaction Machine

Specialized tools/technology used:	Experience level required:
Shop materials, Found objects	None

Grade Level (of this example): 3-12 **Time:** Varies

Content Standards (of this example): STEM: simple machines
 More subject area ideas - see next page.

Summary of Project

Students will design and construct a [chain reaction machine](#). The objective of this project is to build a multi-part machine which completes an end task - e.g. the machine must take 10 steps to ring a bell - but just as importantly, students will be required to practice effective communication skills. The whole class will work together to make the machine, with individuals or pairs each working on one component of the machine. Project presentation should include exploration of the machine's components, the cooperative building process, and demonstration of working machine. For content-specific ideas about presentation and evaluation, see next page.

Student work





Possible content explorations

STEM:

- transfer of energy - using a “small” input to generate a “big” output - given an initial component, can each team contribute to a “heavy” end task? (Shutting a door, hammering a nail, etc.). For inspiration:
 - [massive dominos](#)
 - [Ok Go video](#)
- use as culminating or introductory activity to demonstrate the actions of simple machines (ramp, wedge, lever, wheel, etc.) - require a quota of specific simple machines to create the whole chain reaction
- illustration of a complex process that requires several preexisting conditions to reach a final outcome
 - necessary conditions for natural selection
- toxins bioaccumulating in a food web (DDT), or removing a keystone species (otters) from a ecosystem

ELA:

- students can demonstrate a social process, trace a series of events leading to a final historical event, or tell a story where each step of the machine reflects a piece of a narrative arc of causal events ([Why Mosquitoes Buzz in People's Ears](#), [There Was an Old Lady Who Swallowed a Fly](#)) - could be presented to a group of younger visiting students

Social Studies:

- Build a machine with several independent pathways that all feed into causing the same historical event (fall of a civilization, revolution)
 - find and model patterns in similar events (machine reflecting fall of Roman Empire vs. machine reflecting fall of Mayan Empire)
- Students could build a machine with a variety of beginning events with end events that are all required for the final event to occur