

# Strike-slip Fault with Spaghetti Asperities—Vice Method

From John Lahr's Fun With Science "Spaghetti Fault" ([www.jclahr.com/science/earth\\_science/spagh\\_fault/index.html](http://www.jclahr.com/science/earth_science/spagh_fault/index.html)). This fault model is a variation of one invented by Paul Doherty (<http://www.exo.net/~pauld/index.html>).

## Time

Construction 1 hour; demo 5-15 minutes

## Content

Students will learn about forces in the Earth and be able to describe sequential earthquakes on a fault when steady force is applied. In this model, each piece of spaghetti acts as an asperity that must be broken for slip to occur.

## Materials

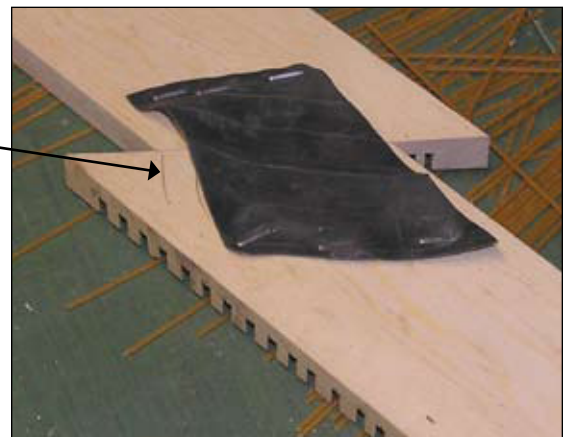
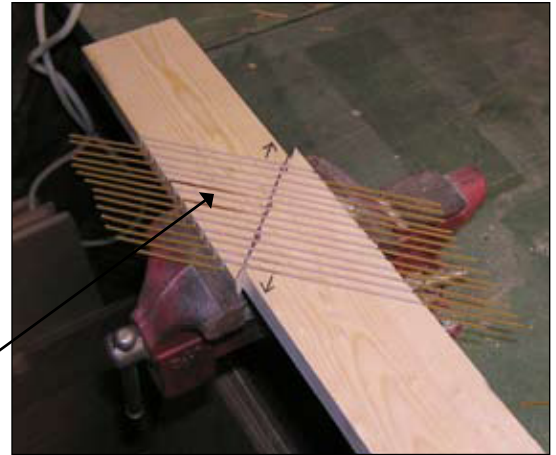
- 1 x 6 board 12-18 inches long. Cut shallow grooves in it with table saw at an angle of  $45^\circ$  to the length of the board. Then cut the board in two on the opposite  $45^\circ$  diagonal as shown in the picture (upper photo).
- Scrap of plastic or rubber sheet to staple on the back to hold the wood together, but loose enough so it doesn't resist the vice. (center)
- Vice
- Spaghetti noodles

**Tools:** Table saw, vice, staple gun

## Set up and Demonstration

Prepare board as described under **Materials**. Staple the plastic to the back. Place it in the vice with just enough pressure to hold it in place and have the grooves lined up perfectly. Set spaghetti noodles in the grooves. Turn vice very slowly at a controlled rate throughout the process. TIn this model, each piece of spaghetti acts as an asperity that must be broken for slip to occur. Sometime just one noodle breaks, somewhat analogous a small earthquake.

Quite a few break (foreshocks) a few seconds prior to a "massive event" (main shock) in which many break in rapid succession. This is followed by one or two remaining pops (aftershocks).



See next page for a modified version of this activity

# Strike-slip Fault with Spaghetti Asperities—Clamp Method

## Modified from "Strike-slip Fault with Spaghetti Asperities"

This is the same concept as the Vice Model, but lacks the control on the rate of block movement.

### Time:

Construction 1 hour;  
demo 5-15 minutes

### Content:

Students will learn about forces in the Earth and be able to describe sequential earthquakes on a fault when steady force is applied. In this model, each piece of spaghetti acts as an asperity that must be broken for slip to occur.

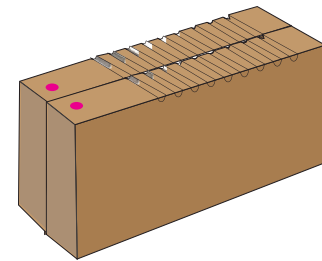
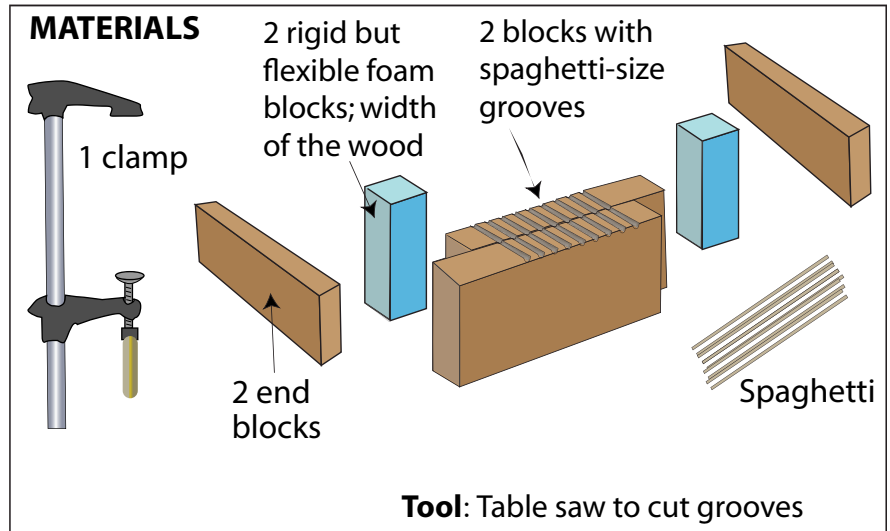
### Procedure

Clamp two equal-length blocks together matching the ends. Cut shallow, narrow grooves in the two larger blocks with a table saw. Note that the pink dots (●) on the ends are together for groove cuts, but are flipped 180° horizontally for the assembly.

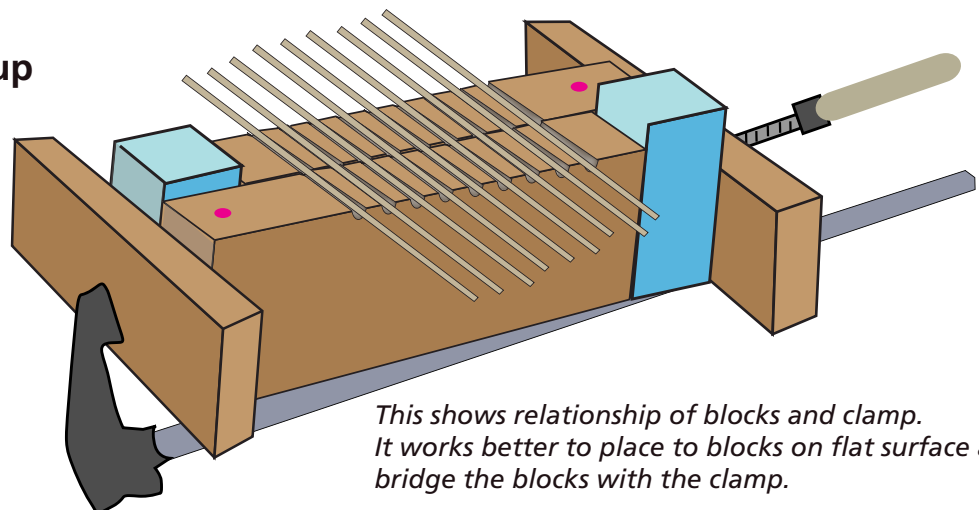
Assemble according to drawing below. Foam needs to be compressible, yet firm, and cut to the width of the gaps left at the grooved-wood ends when the grooves are aligned.

Set spaghetti noodles in the grooves. Turn clamp very slowly at a controlled rate throughout the process. In this model, each piece of spaghetti acts as an asperity that must be broken for slip to occur. Sometime just one noodle breaks, somewhat analogous a small earthquake.

Quite a few break (foreshocks) a few seconds prior to a "massive event" (main shock) in which many break in rapid succession. This is followed by one or two remaining pops (aftershocks).



### Setup



*This shows relationship of blocks and clamp. It works better to place the blocks on a flat surface and bridge the blocks with the clamp.*