BUILDING MOUNTAIN BELTS

This activity is a small-scale version of the experiments that go on in the analog modeling laboratory at UNL Department of Earth and Atmospheric Sciences, under the guidance of Dr. Cara Burberry. When you push the back wall of the models, it is similar to a continental collision, where two pieces of continent collide and create glorious folded rocks called fold-thrust belts. You are going to make a fold-thrust belt from materials that you can easily find in your home!

You will need:

1. A square-ish or rectangular Pyrex dish. 2. A rigid material to act as the driving wall. You could use thick cardboard or poster board. You will need to cut a piece to the same size as one of the ends of the Pyrex dish. 3. Several different "granular" materials. This means granulated sugar, colored sugar, flour, cornstarch, baking soda, or talc. You will need some colored sugar to make visible marker layers. 4. A teaspoon	

The Experiments:

1. Cut a driving wall, with part protruding above the Pyrex dish, to act as a handle.

2. Place driving wall at the back of the Pyrex dish.

3. Layer granular materials inside the Pyrex dish. For example, you could layer white cane sugar with colored sugar, to make marker layers so that you can see the pattern of the folding, as shown in the images overleaf. Use a teaspoon to smooth the layers as much as possible, although perfectly even layers are not necessary.

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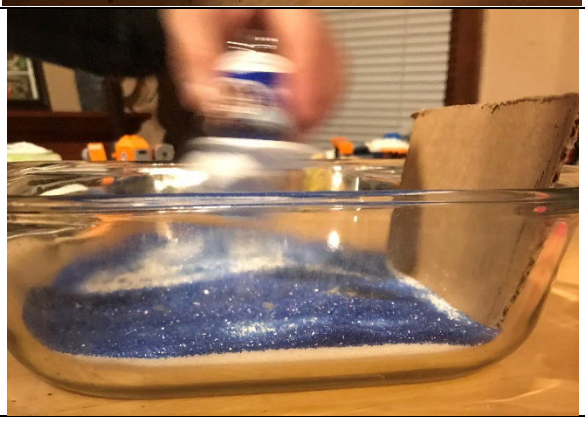
4. Carefully push the driving wall towards the other end of the Pyrex dish. Don't let it ride up, over the granular materials. Watch the side of the Pyrex dish and see bends (folds) and breaks (faults) in the marker layers developing.

5. Now repeat the experiment with different granular materials! If you use cornstarch, do you get a different pattern of bends and breaks? If you use flour, do you get a different pattern of bends and breaks? Just remember to use a colored sugar marker layer, and off you go!

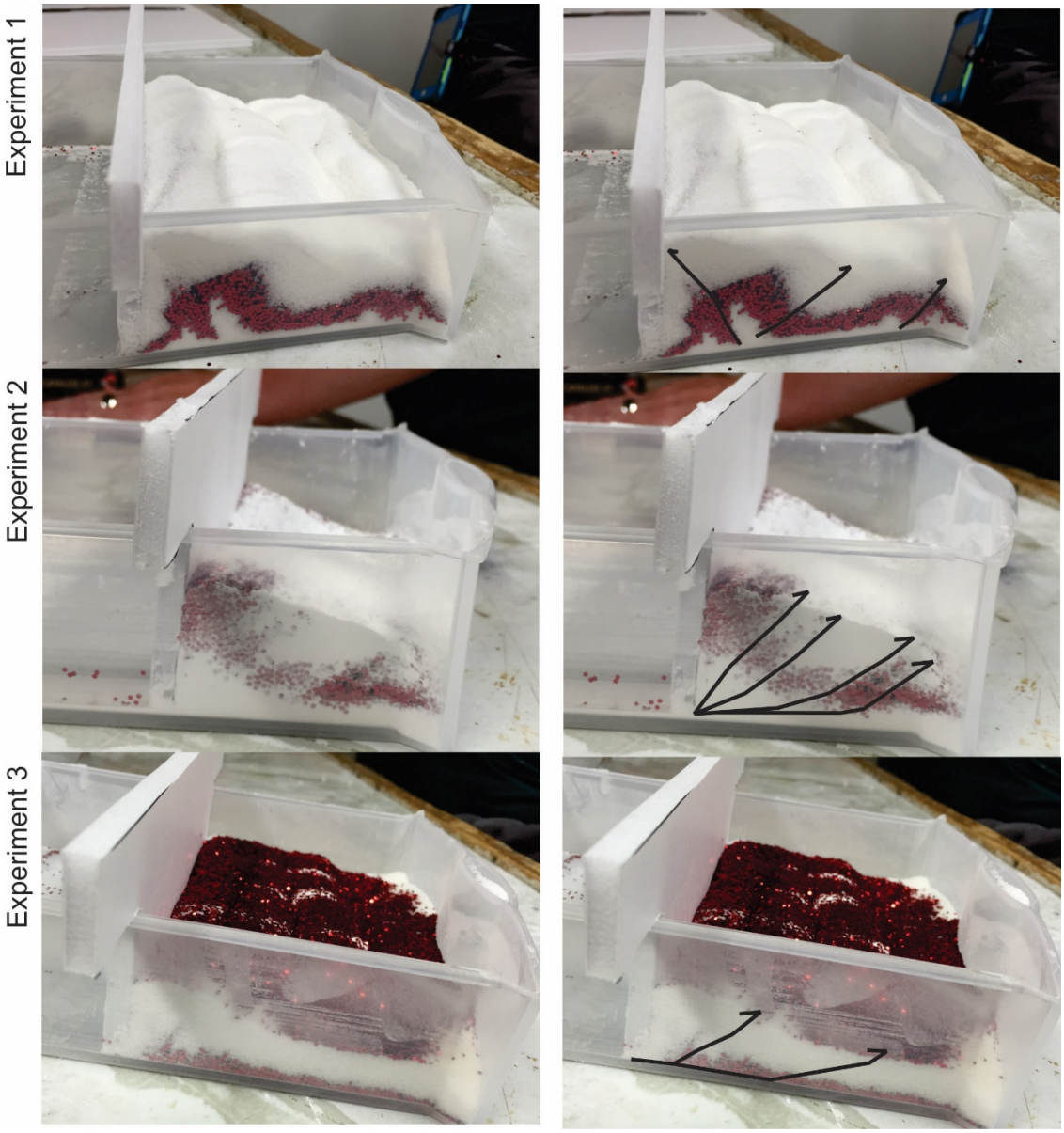
Place the cardboard or poster board driving wall at the back of the Pyrex dish. Add a layer of granulated or cane sugar Smooth the layers with a teaspoon to make them as flat as possible.	
Alternate layers of white sugar and colored sugar to make a marker layer so that you can see the pattern of bends and breaks. We used two layers of white sugar and one internal marker layer in this example. The photograph shows the addition of the colored marker layer above one layer of white sugar.	

The following images are from a series of end-member experiments.

Experiment 1: Lower and upper layer are granulated sugar, middle layer is glitter. This is the "representative" model, showing faults dipping in opposite directions, characteristic of a collision zone. The fold-thrust belt has started to propagate to the RHS of the image.

Experiment 2: Lower and upper layers are talc, middle layer is glitter. This is a classic thrust belt, where the bottom layer of sediments is something like a shale unit. Note the faults all dip in the same direction and get less steep towards the RHS of the image. An example is the Appalachians, or parts of the Rocky Mountains.

Experiment 3: Lower and upper layers are glitter, middle layer is sugar. This is a classic "salt-floored" belt, like the Zagros, where the fold-thrust belt is very wide and doesn't attain great elevation.



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