Slope failure: in-class activity

In class today we will do **two** experiments that you will analyze in your groups. These simple experiments should provide you with insight on how slopes fail and how the material that makes up the slope changes the way failures occur.

Sand avalanching

In this simple experiment, we will make a sandpile. We will start with thoroughly mixed blue and yellow sand. The yellow sand is about half the size of the blue (the mixture is said to have a *bimodal* grain size distribution).

After you understand the experimental set up and what is going to happen, **as a group** make a prediction as to what you *think* will happen in the experiment. What do you think you will see?

While the experiment is going on, make observations of what is happening:

What's going on?

Red beans

Now we'll do a similar experiment, but not with sand. We'll use red beans instead. We also won't pour the beans, we'll start with them in a box and lower one side of the box in 0.5 cm increments. This simulates the lowering (by erosion) of a river as it cuts downward into the earth. We will catch the beans that fail in a bucket.

Before the experiment begins, look at the arrangement of beans in the box. How is this set up a bit more like real rocks? Describe what you see. Look for order. Can you link this order to anything you saw on the field trip this week?

After you understand the experiment, make a prediction as to what you think will happen.

Now, as the experiment progresses, two people in your group should fill in the table below. For each increment that I drop the gate, rank the amount of beans that fail in a simple way by circling either "none," "a few", or "a lot."

Increment	Amount failed				Increment	Amount failed		
1	None	a bit	a lot		26	None	a bit	a lot
2	None	a bit	a lot		27	None	a bit	a lot
3	None	a bit	a lot		28	None	a bit	a lot
4	None	a bit	a lot		29	None	a bit	a lot
5	None	a bit	a lot		30	None	a bit	a lot
6	None	a bit	a lot		31	None	a bit	a lot
7	None	a bit	a lot		32	None	a bit	a lot
8	None	a bit	a lot		33	None	a bit	a lot
9	None	a bit	a lot		34	None	a bit	a lot
10	None	a bit	a lot		35	None	a bit	a lot
11	None	a bit	a lot		36	None	a bit	a lot
12	None	a bit	a lot		37	None	a bit	a lot
13	None	a bit	a lot		38	None	a bit	a lot
14	None	a bit	a lot		39	None	a bit	a lot
15	None	a bit	a lot		40	None	a bit	a lot
16	None	a bit	a lot		41	None	a bit	a lot
17	None	a bit	a lot		42	None	a bit	a lot
18	None	a bit	a lot		43	None	a bit	a lot
19	None	a bit	a lot		44	None	a bit	a lot
20	None	a bit	a lot		45	None	a bit	a lot
21	None	a bit	a lot		46	None	a bit	a lot
22	None	a bit	a lot		47	None	a bit	a lot
23	None	a bit	a lot		48	None	a bit	a lot
24	None	a bit	a lot		49	None	a bit	a lot
25	None	a bit	a lot		50	None	a bit	a lot

The other person in your group should make observations about how failure occurs:

What's going on? Can you see any pattern to the data you collected above? How does failure appear to happen in this experiment?