

Fun with Foam

A fun way to introduce strike and dip!

Goals: To give students a short, interactive hands-on experience to help them understand strike and dip

Preparation: Students should have been briefly introduced to the concept that rocks can be deformed, you might show an image or a sketch first of the strike and dip of a bed before engaging in the exercise. In addition, you should spend a few minutes on compass directions and how to describe them. I use bearing directions (not azimuth) in the introductory class, because it seems to be easier for most students to visualize.

I use a large piece of 'dipping' foam board that I am hold on a lab table to demonstrate the concept of strike direction, by having a student 'intersect' the dipping foam board with another board, and drawing a line with a bright marker on the dipping bed.

Materials:

Large sheets of paper showing the four compass directions, N, S, E, W posted at appropriate locations in the classroom or lab.

1 flexible foam sheet per student (I prefer 11.5 x 17" in lots of different colors, other sizes will work as well. These can be obtained at any craft store, such as Michael's). For larger class sizes, you can pair students up. The foam is used to represent a sedimentary rock layer that will be 'deformed'.

Exercise:

- 1) Start by having all of the students hold their foam horizontally (dip = 0°)
- 2) Progress to having them show a 'gentle' dip in any direction (their choice), followed by a steeper dip.
- 3) Now, you can have students get more technical by having them orient the foam to dip in a particular direction (i.e. 80° to the southeast). The angles won't be exact, but you can visually assess if people have their foam dipping steeply or gently. Encourage students to help one another.
- 4) On the board, write a specific strike direction (N 45° E) and have the students orient the foam to match. This one will take a while for some, particularly if you do not specify the dip direction. Take time at this stage to move around the room, and assist students that are having difficulty. You can have fun with this, and ask about the dip direction at the end and have a vote on which is 'right'. I choose not to introduce the concept of the right hand rule, so I emphasize that we need to specify the dip direction.
- 5) Break the class into 2 large groups, and have one group decide on a strike direction and dip direction for the other group to reproduce. Every student should be participating in the 'foam' response. Alternate between groups 2-3 times, to get practice in.
- 6) If you like, you can have students progress to folds. (I usually put up a simple image of a fold geometry on a slide or on the board) Have them first make an antiform with their foam, and identify the fold axis, followed by a synform.
- 7) Have the students orient an antiform with the fold axis trending S 30° E. Once this is accomplished, you can ask about the direction the limbs are dipping.
- 8) You can now have the students orient the foam to represent a plunging antiform (gently or steeply, or at a specific angle if you prefer).

Assessment: I don't do a formal assessment, but rather use visual cues to see which students might need more assistance on the structural geology lab that follows this in class exercise.