This is an in class exercise to explore rheology and strength. I use it at the beginning of Structural Geology. Divide the students into groups of 4-5 students. Each groups is given the same assortment of food goodies, a cafeteria tray, plastic spoons or knives (utensils for spreading), and napkins or wipes.

The assignment: Build a structure on the tray. You must use some of each material. The challenge: which group can build the highest and strongest structure. During the building phase the students are ask to consider what is meant by strength, and what makes something strong. After a limited time, we evaluate the goals as a class.

Evaluating the height goal is easy. Evaluating strength is where the learning really comes in. The strength evaluation turns into an animated discussion that the students really care about, and therefore learn takes place. Ultimately each structure is ‘tested’ for strength. Yup, destruction! But first predictions, discussion, hypothesizing. Lots of food for thought.

I pose questions to make them further consider strength. It always seems to happen that one group increases their structures height by adding a tall flag, or the like. But then it would seem that this flag must be considered as part of the ‘strength’ evaluation. Lots of discovery, lots of discussion, lots of refiguring goes on. I let this all take its course.

Ultimately the students figure out that crushing the structures is part of the strength evaluation—but we also learn about shear strength (or lack thereof), normal stresses and shear stress, elastic versus permanent deformation, brittle and ductile. We watch as different parts of each structure deform in different ways. We see that some structures actually increase in strength during part of the evaluative deformation, and on and on. Throughout this exercise the students are asking, and answering, questions. Before the strength evaluation (i.e. destruction) the students are asked how the structure will respond to loading, how they predict the structure will respond to shearing, and how it will respond to torque. During the destruction of each structure the students make and test various predictions. In all cases different parts of individual structures fail, and therefore lead to a new structure, or new system as a result. With the subsequent destruction of each new structure the predictions become more detailed, and the tests become more elaborate.

We refer back to parts of this activity throughout the semester, and through this exercise the class seems much more comfortable with asking questions through out the semester. Some say the family that eats together stays together, we find the structure class that plays with their food together, learns together.

Throughout each semester I have always had students bring forward fantastic food examples of different structural/rheological concepts. I take this a evidence that this exercise is worth the class time and effort.