

Coefficient of friction

What happens when you put a ball on a smooth slope? The ball starts to roll. What about if you were to put a brick on a slight rough slope? The brick stays still. What if that rough slope was increased to a steep slope? It is likely that the brick will start moving. If you take that brick and throw it along the floor, it will eventually come to a stop. These are all examples of something called friction. Friction opposes movement.

Objectives:

- Students will experience the engineering design process and testing through a hands-on and mentally challenging activity
- Students will find the coefficient of static friction between four different samples

Words to know:

- Friction
- Coefficient of friction
- Kinetic, static friction
- Slope
- Failure (engineering tense)
- Factor of safety
- Friction angle
- Joint angle



Materials (per team):

- Friction tables
- Samples
- Worksheet
- Calculator
- Protractor



Activity:

- Students will conduct several trials of experiments to find the coefficient of static friction between two rough surfaces

Steps to follow:

1. Introduce civil and geotechnical engineering and why it is important.
2. Talk about what was stated in the intro paragraph at the top of page 1.
3. Separate students into even teams (1 team per table), and make sure each team has something to write with.
4. Select a sample to begin with and place on friction table while table is almost level.
5. Very slowly and smoothly increase the angle of the table until the block breaks free and slides down.
6. Record sample type, and angle
7. Repeat with the same sample to receive several data points.
8. Repeat steps 4 – 7 with the other samples.
9. Complete all calculations given on the worksheet with the data available.
10. Compare and discuss results with other teams.