

Video 3A: Some Mechanical Engineering Basics

Here are some words and concepts you will need to know:

1) Tension: _____

2) Compression: _____

We can use machines to test materials for both tension and compression. The machines can give us numerical values so we can compare the strengths of materials. During testing, it makes a difference if the sample is bounded (kept inside a container that prevents it from going sideways) or unbounded (allows it to expand). Scientists have tested granite's compressive strength in unbounded conditions.

A) What happens to granite in an unbounded situation?

It is harder to test granite in a bounded situation, since there are limits on sample size and the strength of bounding containers. However, even using small-scale experiments, we can take a guess at what happens to granite deep underground.

B) What happens to granite if its compressive strength is exceeded in a bounded situation?

C) At what depth does this happen?

3) Equilibrium: _____

Will systems always try to achieve equilibrium, if possible? _____

4) Strain (elastic strain): _____
(example: stretched rubber band)

5) Shearing: _____

6) Isostatic rebound: _____

This is most often discussed in the context of glaciers that have retreated. It is also seen on floors of quarries as rock is removed.

Pressure in fluids:

1) Pressure always flows from _____ to _____.

2) Narrowing a passage causes a fluid to flow faster or slower? _____.

Pressure in gases:

1) Increasing the pressure will increase the _____.