

HANDOUT: Pack It In - Grain Packing Competition

What is hiding beneath the surface and why do we care?

In rocks (and soil), fluids are stored in void (pore) spaces (Fig. 1).

What is void space and porosity?

Void space is the left-over space in between grains.

Porosity is the ratio of void space volume to bulk rock volume.

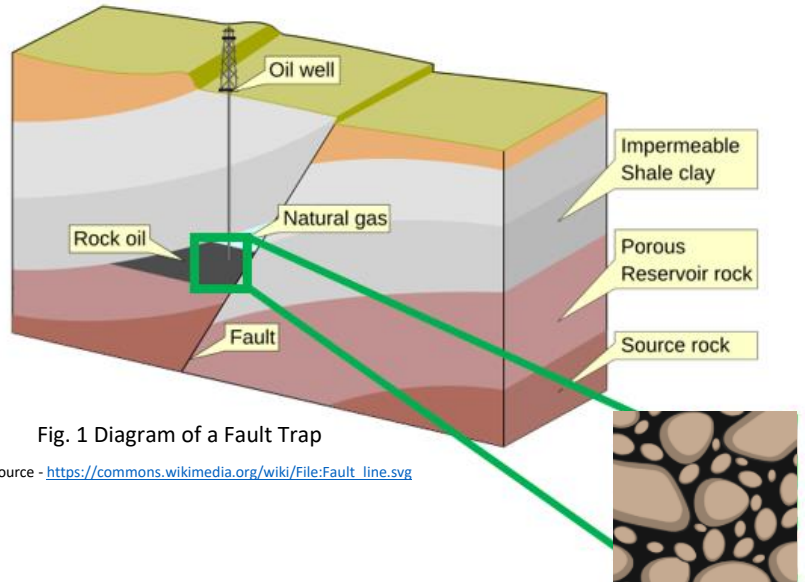
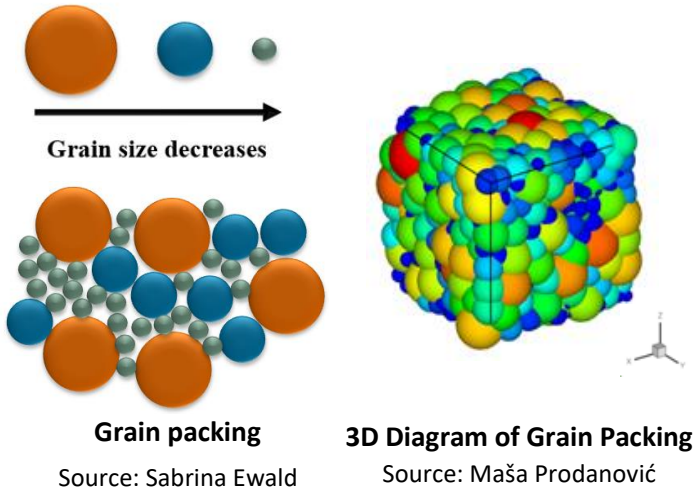


Fig. 1 Diagram of a Fault Trap

Source - https://commons.wikimedia.org/wiki/File:Fault_line.svg

How do grain size and grain packing affect void space?



Source: Sabrina Ewald

Source: Maša Prodanović

The **porosity** of a container will be determined by the **ratio of grain sizes** chosen.

This activity demonstrates how **varying grain size and grain packing** can affect the **void space**, thus influencing the quantity of fluid stored in this pore space.

Activity:

- In the cup provided, try to pack marbles as well as you can so that the void space is as small as possible. *This is a competition!*
- After you have packed your cup, your teacher will pour water into your cup from a graduated cylinder until the water reaches the line on the cup.
- Observe the water remaining in the graduated cylinder. Subtract this amount from the original volume of the graduated cylinder (provided by your teacher). Record this data.
- The porosity of each team's packing will be recorded so that everyone can see how different packings result in different porosities.
- Which combination of marbles resulted in the highest porosity and why did this combination have the highest porosity?