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# Permeability in soils

How fast does water travel through soils?

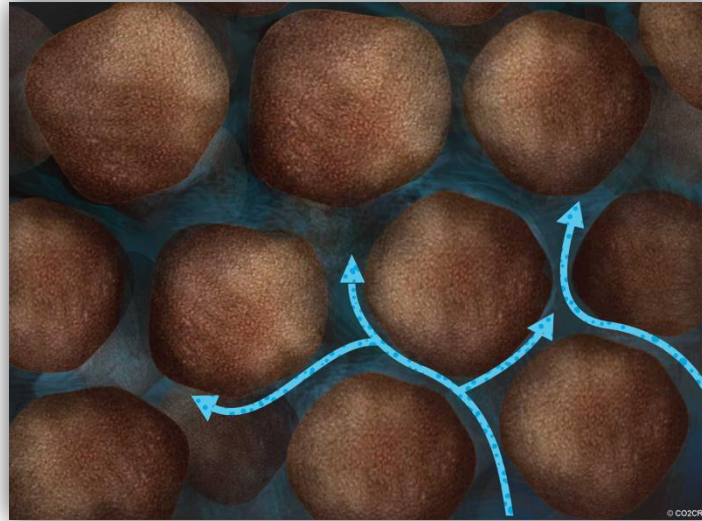
By  
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# Permeability in Soils - Definition



**Permeability is the measurement of the soil's ability to allow water to flow through its pores or voids**

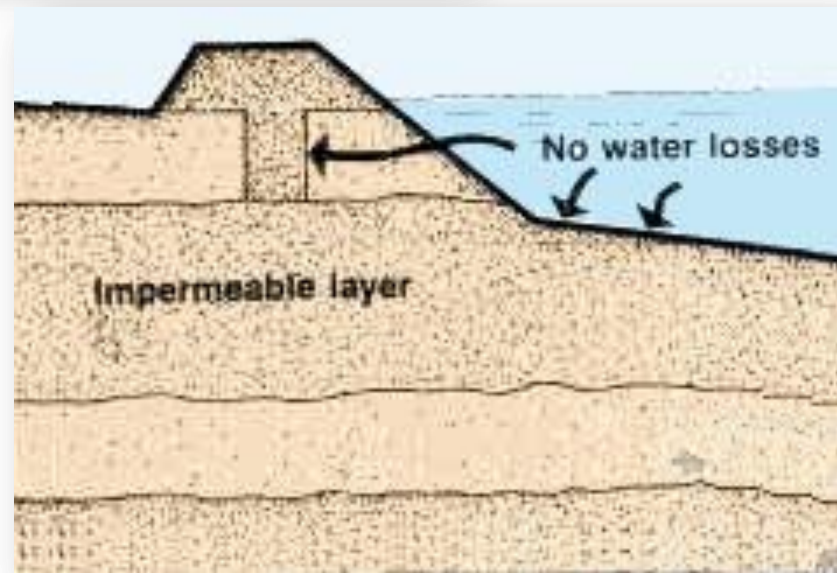
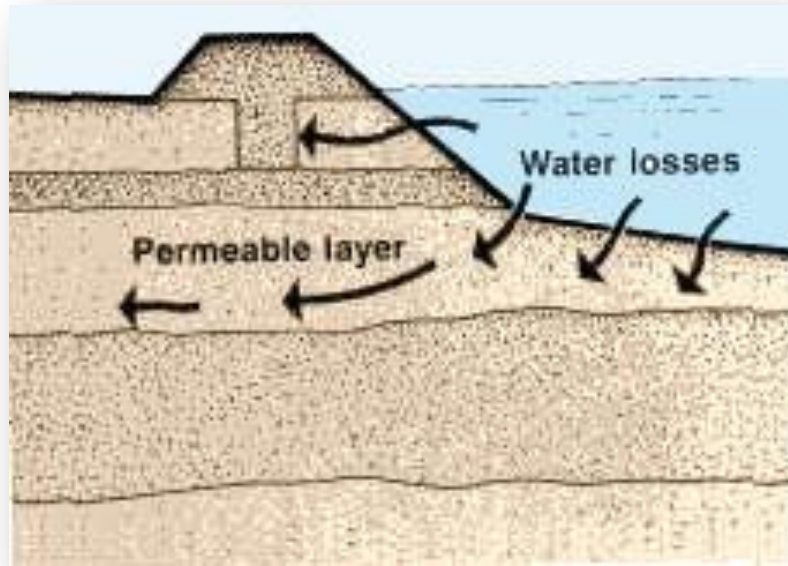
# Importance of permeability

## Applications in Civil Engineering

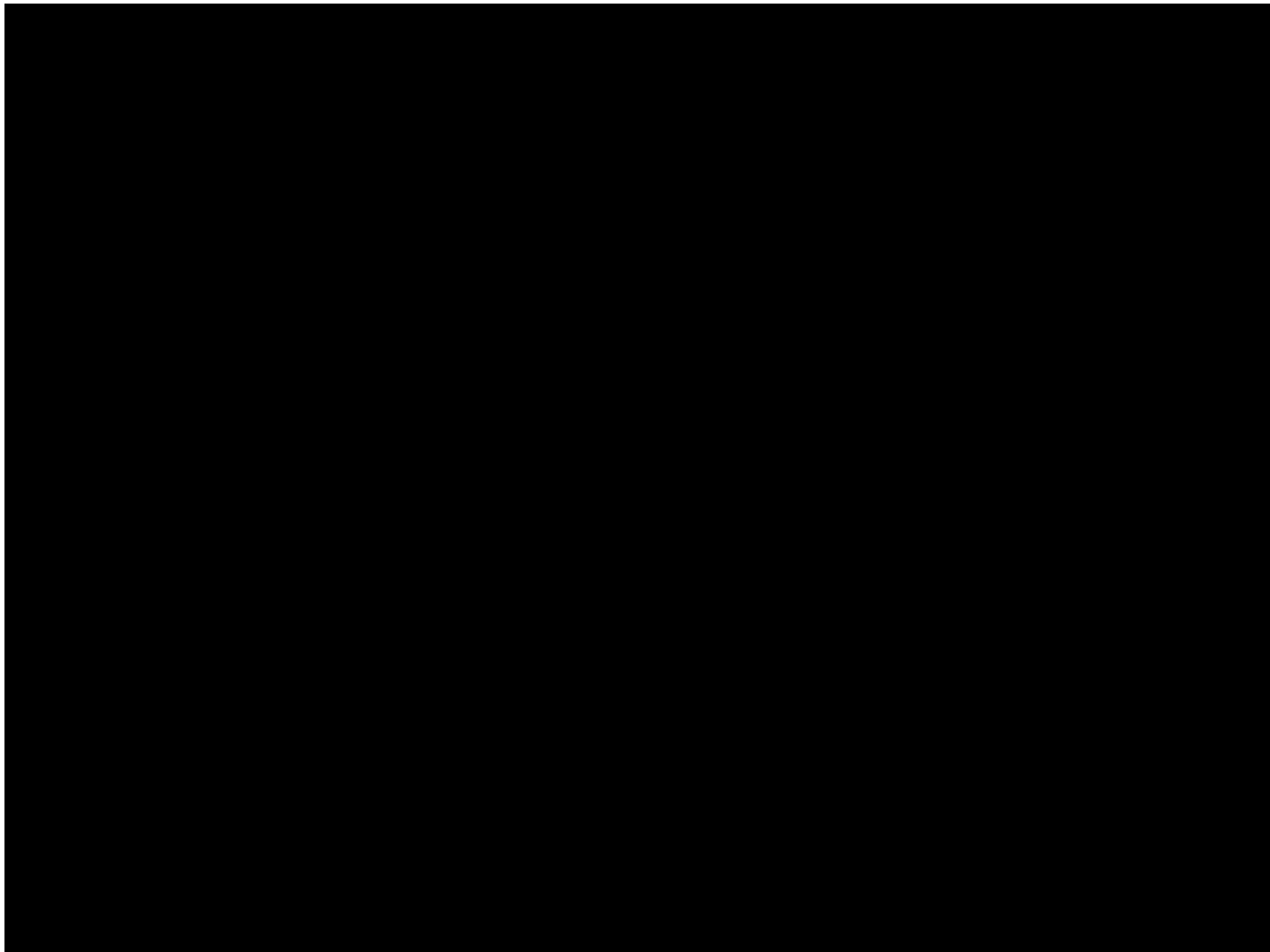
- Design of earth Dams ▶▶
- The slope stability (mountains stability) ▶▶
- Retaining walls
- Filters
- Underground seepage and aquifers ▶▶



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<http://www.youtube.com/watch?v=8uRtKOrJqx0>



# Permeability Tests

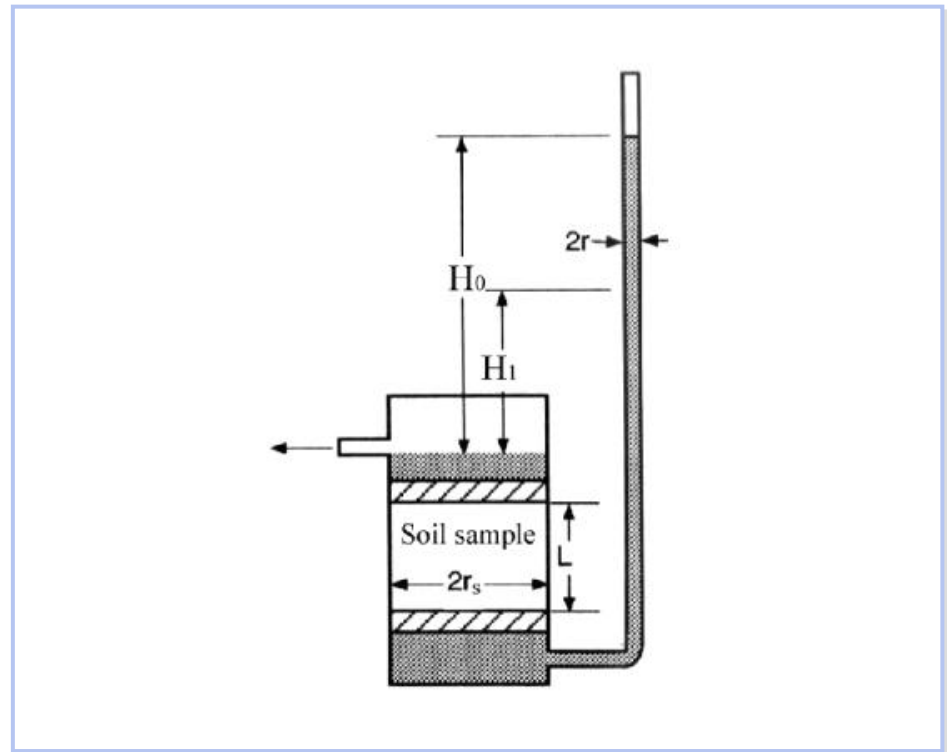
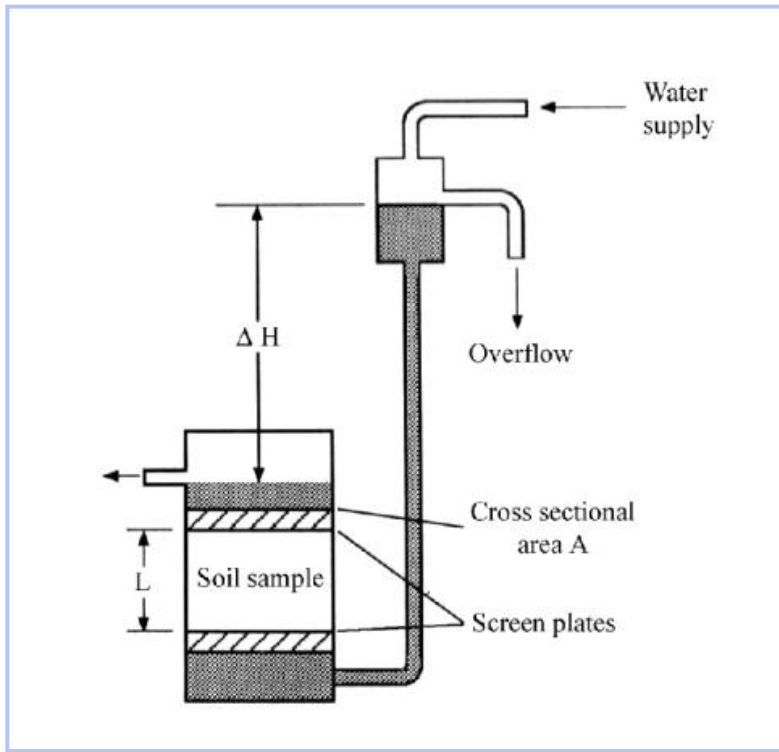
## Constant Head vs. Falling (drop) Head



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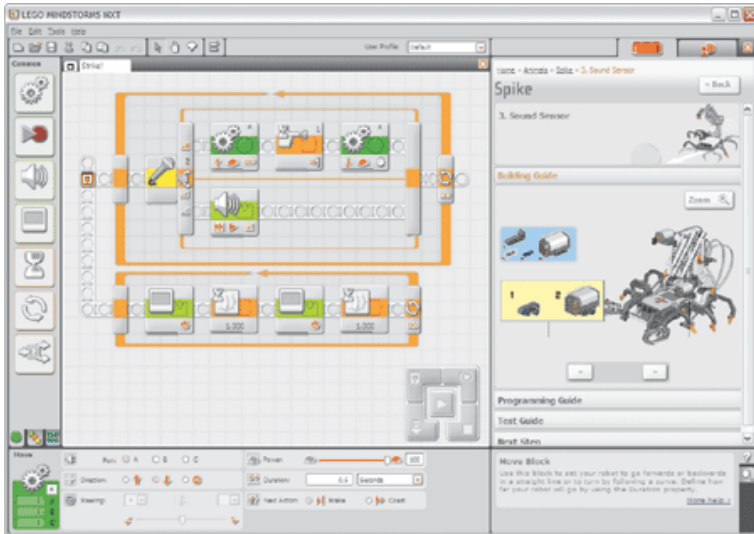
The constant head test is used primarily for coarse-grained soils

The falling head test is used both for coarse-grained soils as well as fine-grained soils



# Mechatronics on Permeability

A Ultrasonic Sensor is used to find out where objects are! Using this sensor it is possible to detect an object and measure how far it is.

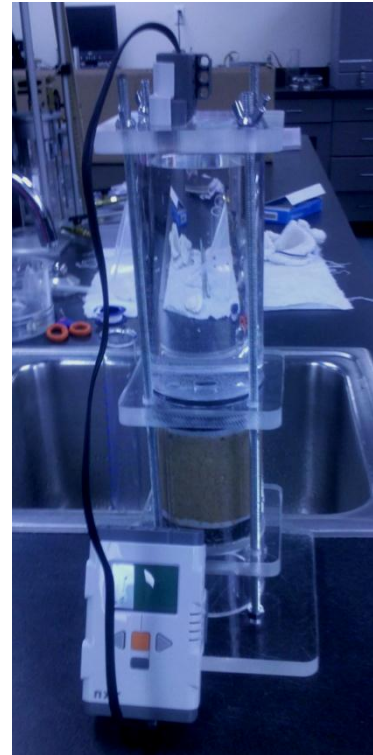




# Advantages of mechatronics in permeability test



<http://earthlearningidea.blogspot.com/2008/04/great-soil-race.html>



Permeameter with ultrasonic sensor and NXT to measure water volume and time

# My expectations

- The ability to define and understand permeability in soils.
- The capacity to identify differences in size between gravel, sand, and clay
- The ability to identify advantages and disadvantages of having a highly permeable soil
- The ability to understand porosity in soils
- The ability to understand the function of sensors, and mechatronics importance



# THANK YOU !



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