The Groundwater 'two' plus 'two':

Porosity—Percent of void space in the rock. How much of the rock is empty space where you can put a liquid like water.

Primary porosity---formed when the rock is forming. Vesicles and columnar jointing in igneous rocks. Unconsolidated sands and gravels in floodplain deposits along a river or delta deposits when a river flows into a lake or the ocean in sedimentary rocks.

Porosity in unconsolidated sands and gravels depends upon:

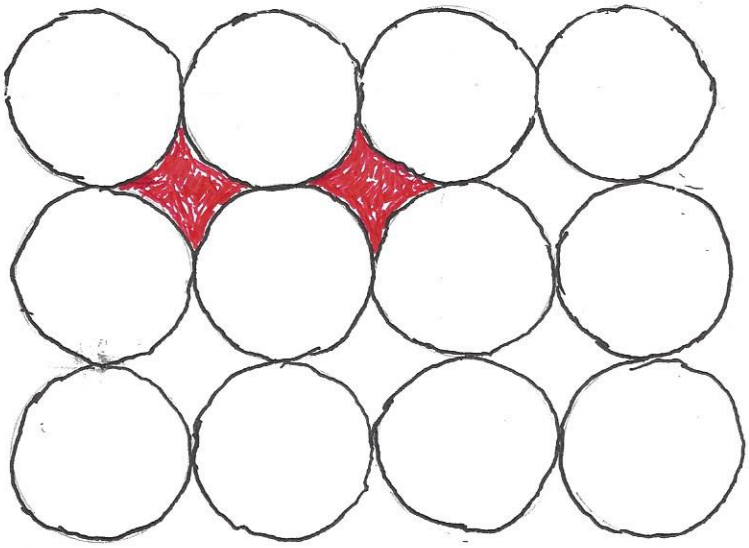
(1) particle shape

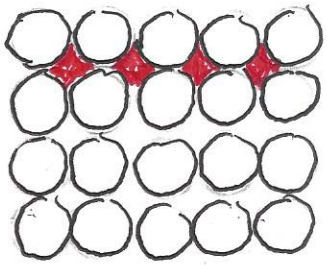
(2) degree of packing

(3) degree of sorting

(4) degree of cementation

Porosity does <u>not</u> depend upon particle size. Large particles (gravel size) have large pores but a fewer number of them. Smaller particles (silt and clay size) have small pores but a larger number of them.





4 X 2 = 8 **2 X 4 = 8**

Secondary porosity---formed after the rock forms such as jointing during exfoliation of batholiths or jointing allowing water to flow through limestones forming caves.

Permeability---**ability of the rock to transmit a fluid, in this case water. It is a measure of how well connected are the pores.**

Think of these two terms like a house. The rooms are the porosity. The doorways are the permeability. As long as the doors are open, you can move from room to room. The house is permeable to you. If you close the doors, you cannot move room to room. The porosity has not change, but the house is no longer permeable. The size of the liquid molecules also influences permeability. Smaller molecules like water may move, while larger organic molecules will not.

The other 'two'.

Aquifer---a porous and permeable rock material. Typically this is unconsolidated sands and gravels, sandstones, in sometimes limestone where solution has occurred (caves).

Aquiclude or aquitard----may or may not be porous but is impermeable. Typically shale.