I. **"Soils and Sponges"** is great for teaching a unit in Soils, Landscaping, Horticulture, Turf Management, Ecology, Conservation of Natural Resources, Soil and Water Management, Science, etc.

II. **SOIL TEXTURE and SURFACE AREA --SOILS WATER HOLDING CAPACITY (AWC) Available Water Capacity**

A. **Sand** (**Largest Particle** Size)
Least Amount of **Surface Area**

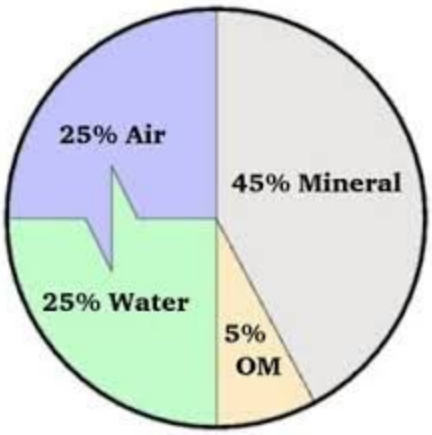
B. **Silt** (**"Medium" Particle** Size) "
Medium" Amount of **Surface Area**

C. **Clay** (**Smallest Particle** Size
Largest Amount of **Surface Area**

D. **Texture Triangle**

From: http://www.hwr.arizona.edu/globe/globe2/soilpb42.html

E. Ideal Soil:



Source: http://courses.soil.ncsu.edu/resources/physics/composition/compo3b.png

http://courses.soil.ncsu.edu/index.php?expand=0

III. DEMONSTRATE SOIL WATER PRINCIPLES

A. FIELD CAPACITY -

a. Permeability of a Soil
b. Drainage
c. Soil Structure (aggregate/pore space)
d. Soil Organic Matter (OM)
    i. Increase O.M. by 1% = 20,000 gal. water/Acre increase
e. Erosion (1 sheet of paper = 5 T/A loss)

B. GRAVITATIONAL WATER-

C. **CAPILLARY WATER-**

D. **HYGROSCOPIC WATER-**

IV. CAPILLARY ACTION of SOIL WATER

A. Water Table "bottoms up"

V. WATER MOVEMENT IN SOIL HORIZONS

A. Capillary Water (higher to lower concentration & water hydraulic movement
   a. Fills up each soil horizon before movement to next horizon
B. Gravitational Water Movement
C. Effects of Fragipans (Reduces Water Holding Capacity by ½ for that Horizon)

VI. STUDENT ACTIVITIES:

A. Demonstrate all the Terms and Principles above
B. With Different Sponge Pore Sizes - Could Measure Water Held by each (pore space)
C. Discuss Watering Methods of Potted Plants
D. Calculate Water Holding Capacities of each Soil Horizon based upon texture and depth of horizons to depths of 36 inches

E. Explain How to Improve Soil

F. Hands-on learning

a. **Students See it**
b. **Students do it**
c. **Students talk and understand the Terminology**
d. **Increased Retention Rates on Concepts, Principles and Test/Quiz scores**
e. **Application of Soil and Water Concepts and Projects**

G. Questions???

H. Sign up to get Outline and Video

I. THANK YOU FOR ATTENDING!

-Mike Keilholz