

1

---

---

---

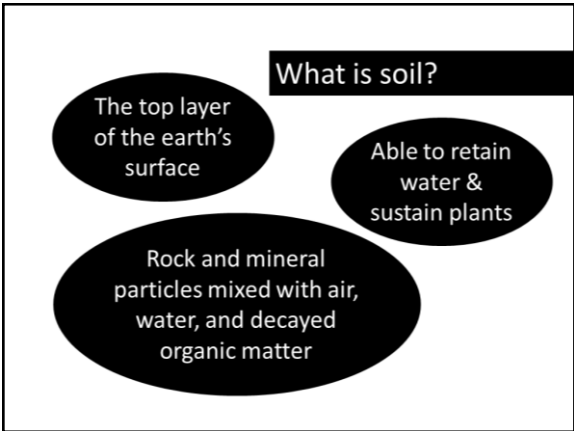
---

---

---

---

---



2

---

---

---

---

---

---

---

---



3

---

---

---

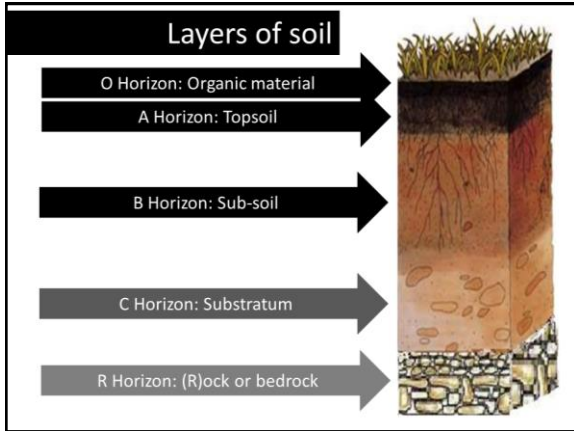
---

---

---

---

---



---

---

---

---

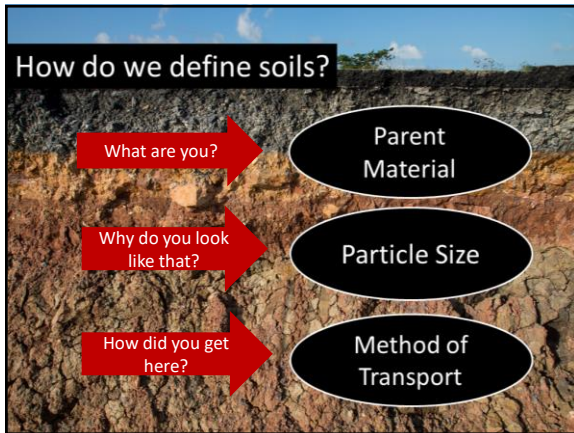
---

---

---

---

4



---

---

---

---

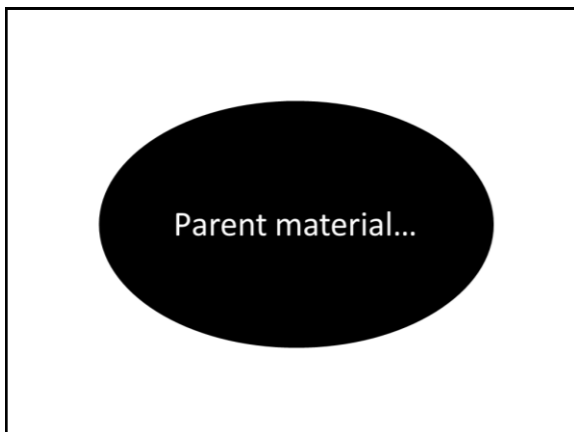
---

---

---

---

5



---

---

---

---

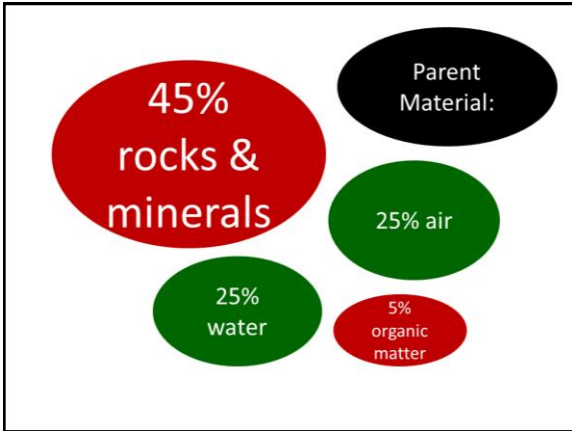
---

---

---

---

6



7

---

---

---

---

---

---

---

---

**Minerals**

Like all matter, minerals are composed of elements.

THE PERIODIC TABLE OF THE ELEMENTS

8

---

---

---

---

---

---

---

---

**Minerals**

The "building blocks" for rocks.

- Inorganic
- Natural
- Specific chemical structure
- Crystalline structure

9

---

---

---

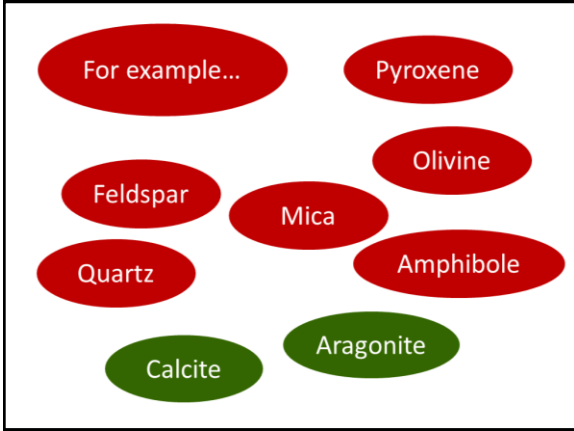
---

---

---

---

---



---

---

---

---

---

---

---

---

10



---

---

---

---

---

---

---

---

11



---

---

---

---

---

---

---

---

12

Rocks

Composed of minerals

13

---

---

---

---

---

---

---

---



14

---

---

---

---

---

---

---

---

Rocks

Composed of minerals

Naturally occurring

Do not have a specific or common structure

Differentiated by mineral composition and texture

15

---

---

---

---

---

---

---

---



16

---

---

---

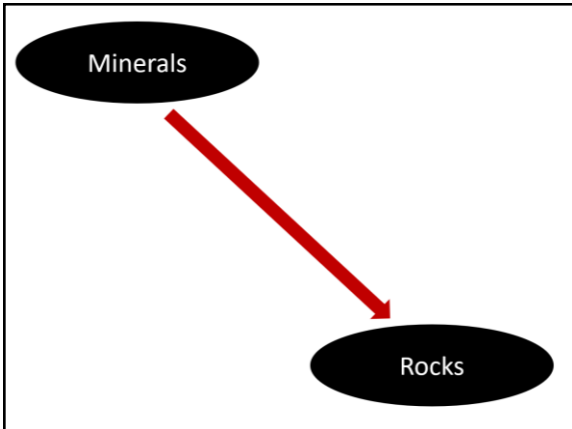
---

---

---

---

---



17

---

---

---

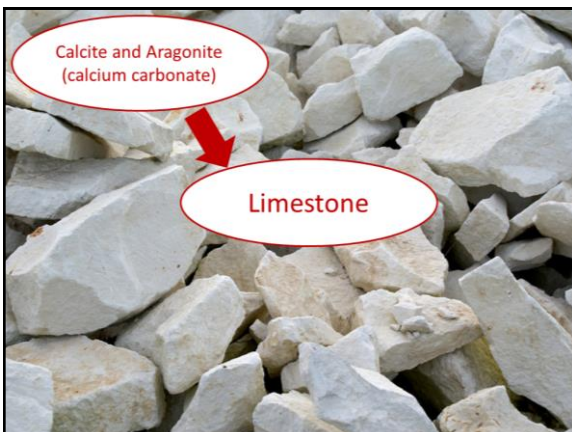
---

---

---

---

---



18

---

---

---

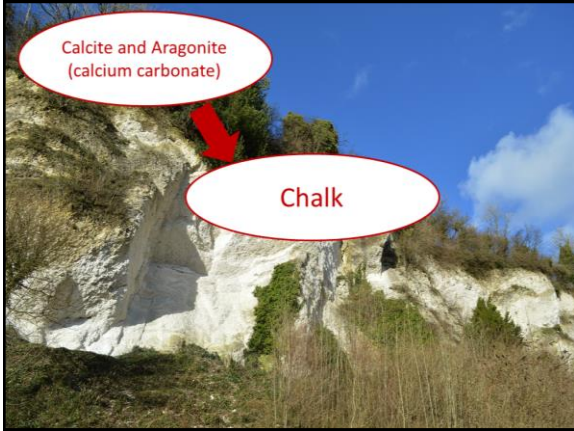
---

---

---

---

---



19

---

---

---

---

---

---

---

---



20

---

---

---

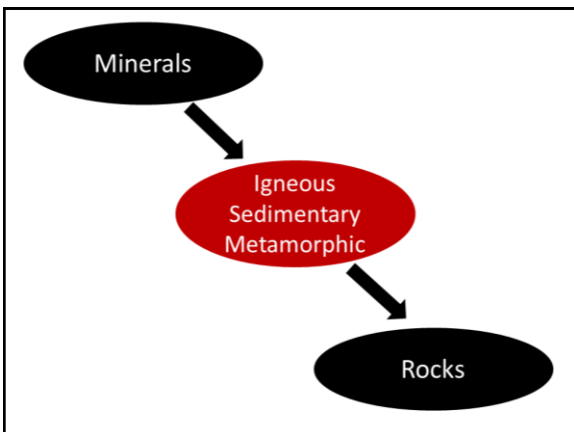
---

---

---

---

---



21

---

---

---

---

---

---

---

---



22

---

---

---

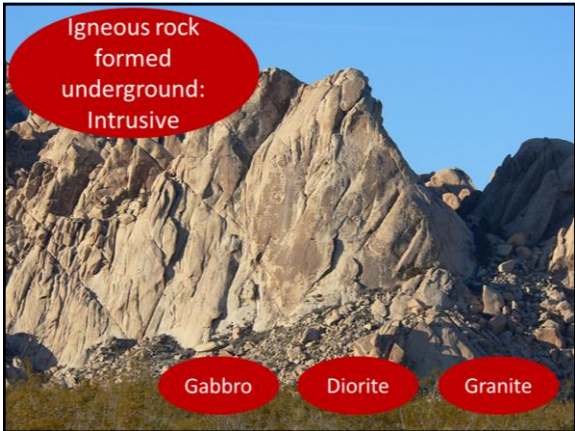
---

---

---

---

---



23

---

---

---

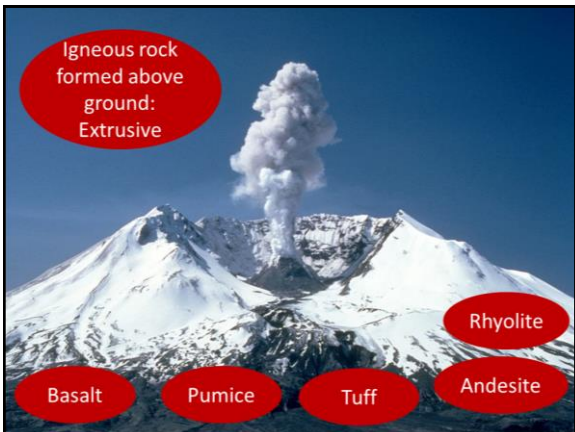
---

---

---

---

---



24

---

---

---

---

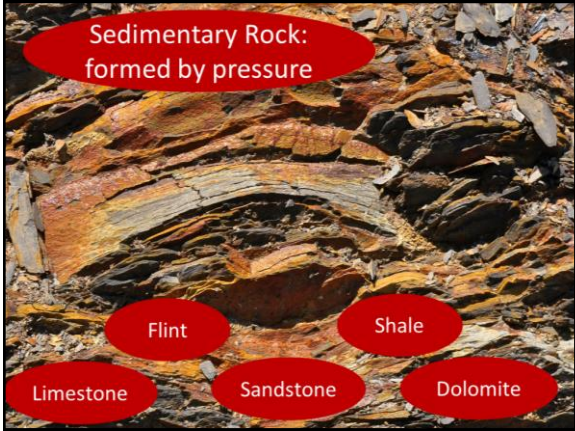
---

---

---

---





25

---

---

---

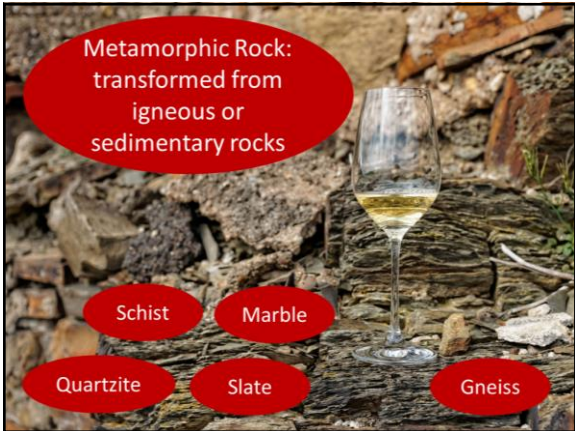
---

---

---

---

---



26

---

---

---

---

---

---

---

---



27

---

---

---

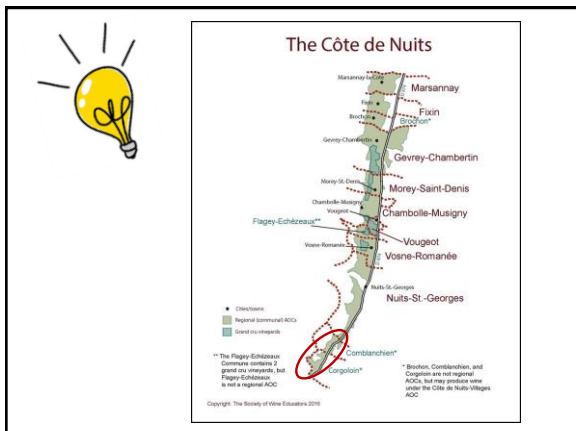
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

---

---

28




---

---

---

---

---

---

---

---

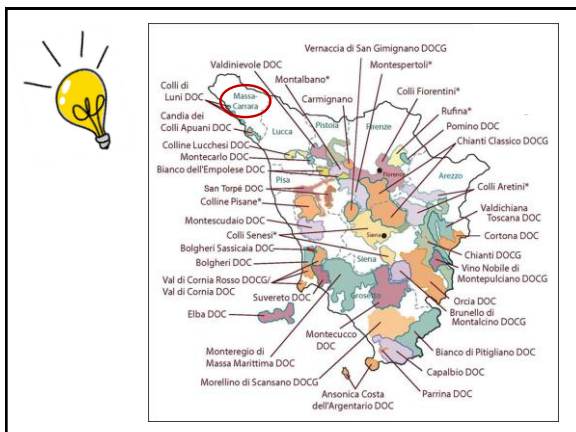
---

---

---

---

29




---

---

---

---

---

---

---

---

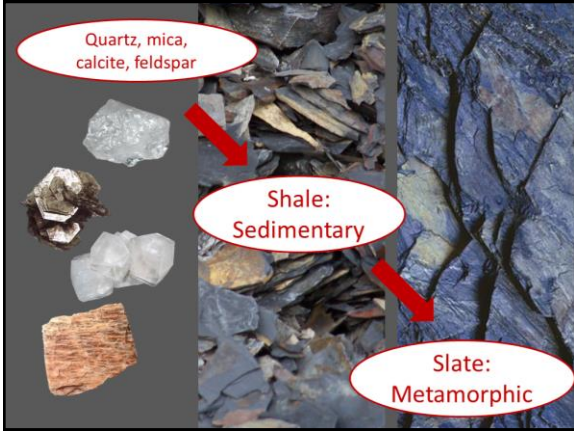
---

---

---

---

30



31

---

---

---

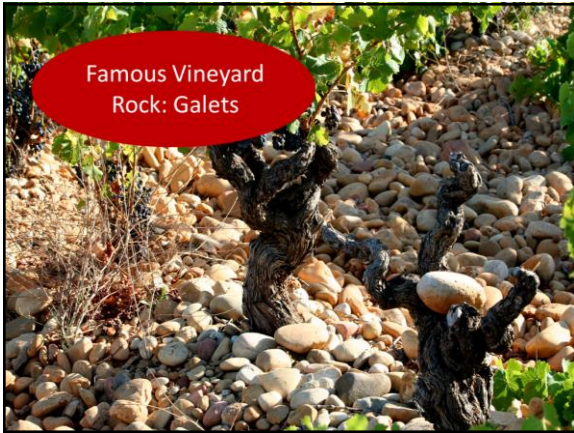
---

---

---

---

---



32

---

---

---

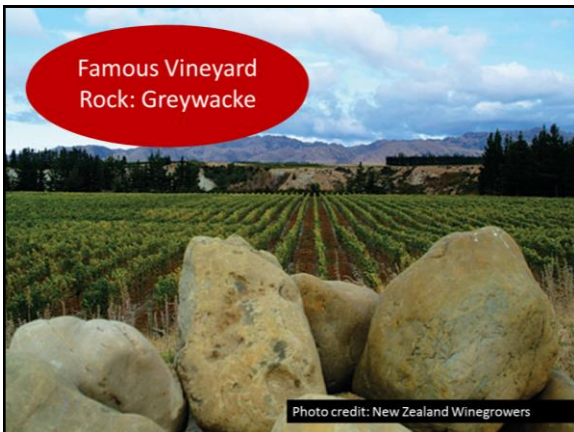
---

---

---

---

---



33

---

---

---

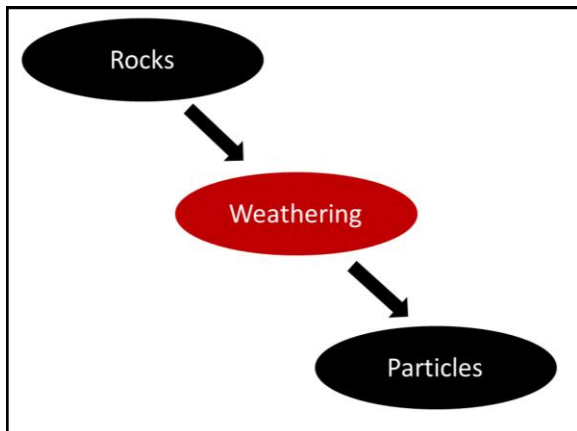
---

---

---

---

---



34

---

---

---

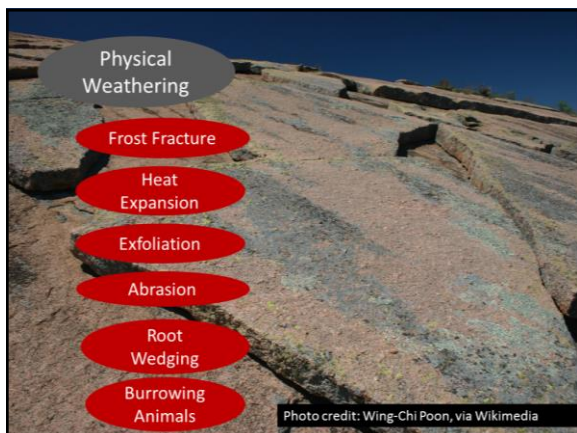
---

---

---

---

---



35

---

---

---

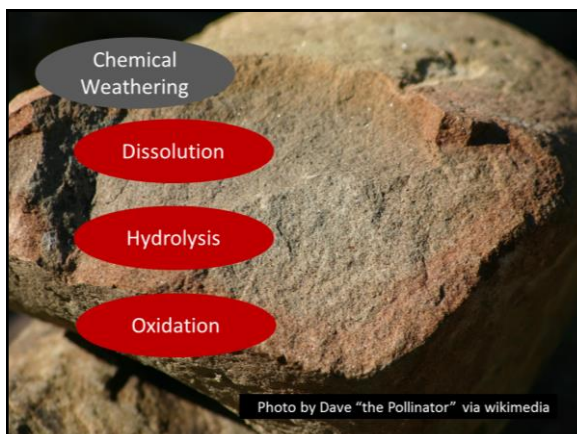
---

---

---

---

---



36

---

---

---

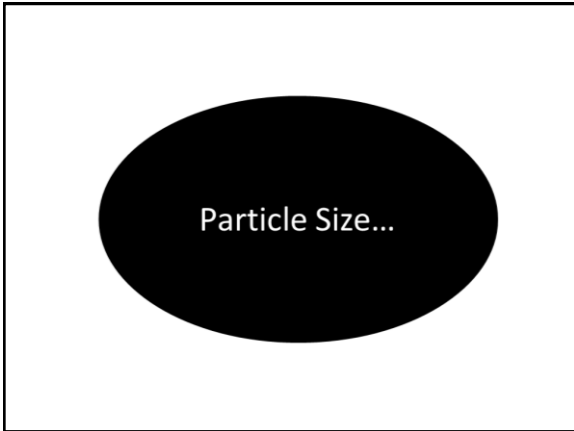
---

---

---

---

---



37

---

---

---

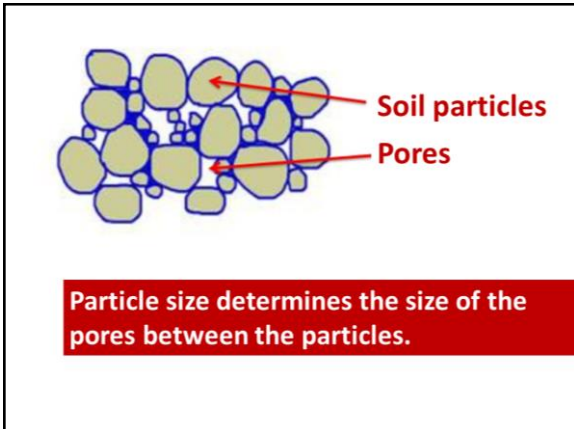
---

---

---

---

---



38

---

---

---

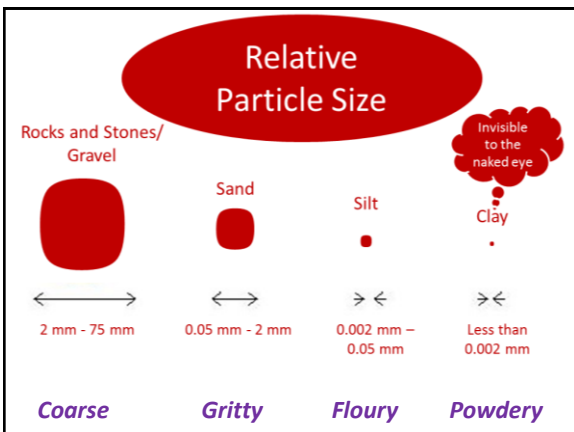
---

---

---

---

---



39

---

---

---

---

---

---

---

---



40

---

---

---

---

---

---

---

---



41

---

---

---

---

---

---

---

---



42

---

---

---

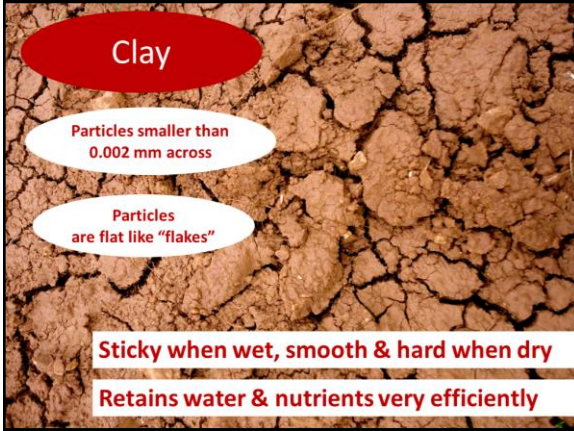
---

---

---

---

---



43

---

---

---

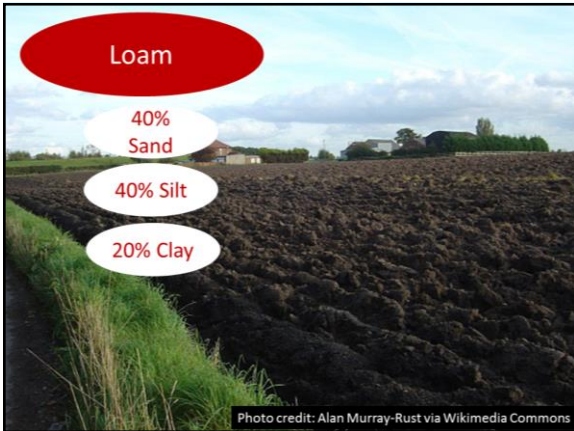
---

---

---

---

---



44

---

---

---

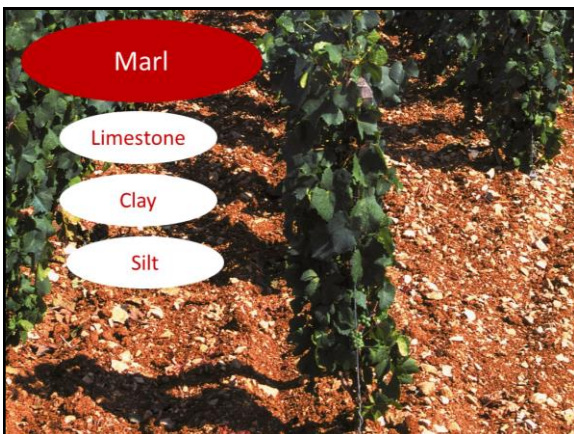
---

---

---

---

---



45

---

---

---

---

---

---

---

---

Soil also contains  
air, water, organic  
material...

46

---

---

---

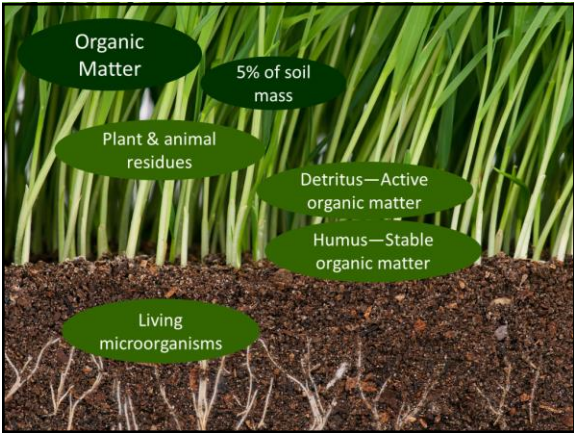
---

---

---

---

---



47

---

---

---

---

---

---

---

---

Method of  
Transport...

48

---

---

---

---

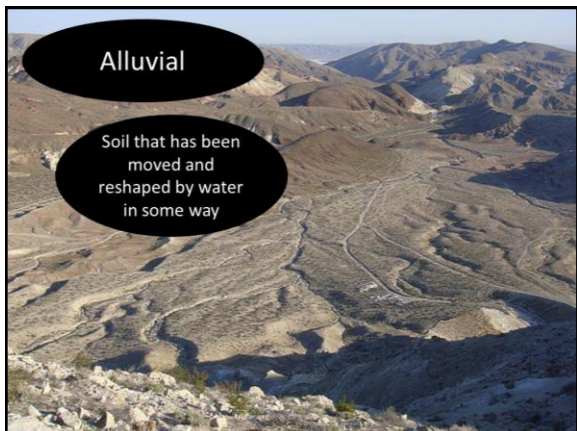
---

---

---

---





49

---

---

---

---

---

---

---

---

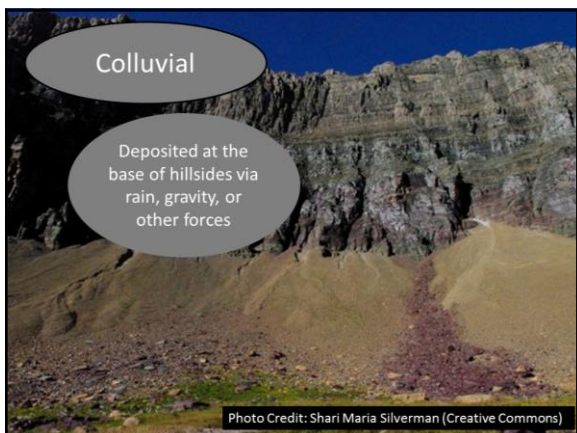


Photo Credit: Shari Maria Silverman (Creative Commons)

50

---

---

---

---

---

---

---

---



51

---

---

---

---

---

---

---

---



A Quick Re-Cap:

52

---

---

---

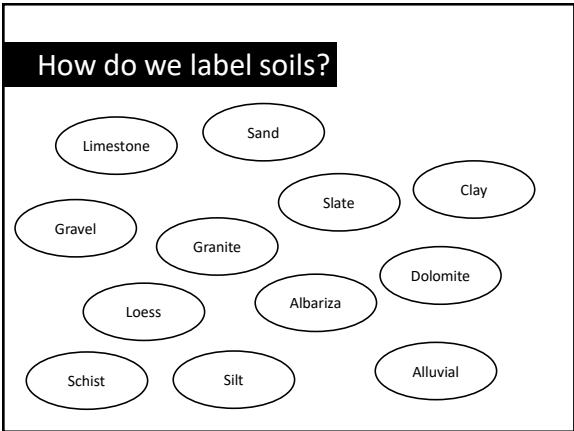
---

---

---

---

---



How do we label soils?

Limestone

Sand

Gravel

Granite

Slate

Clay

Loess

Albariza

Dolomite

Schist

Silt

Alluvial

53

---

---

---

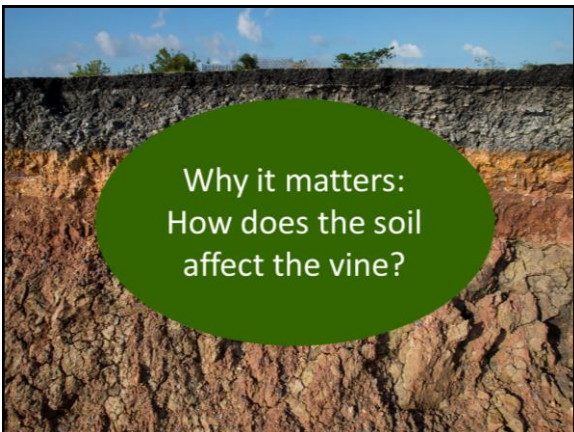
---

---

---

---

---



Why it matters:  
How does the soil  
affect the vine?

54

---

---

---

---

---

---

---

---



55

---

---

---

---

---

---

---

---



56

---

---

---

---

---

---

---

---



57

---

---

---

---

---

---

---

---



58

---

---

---

---

---

---

---

---



59

---

---

---

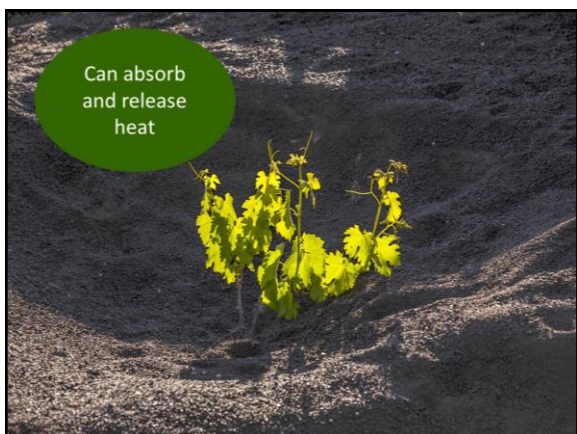
---

---

---

---

---



60

---

---

---

---

---

---

---

---



61

---

---

---

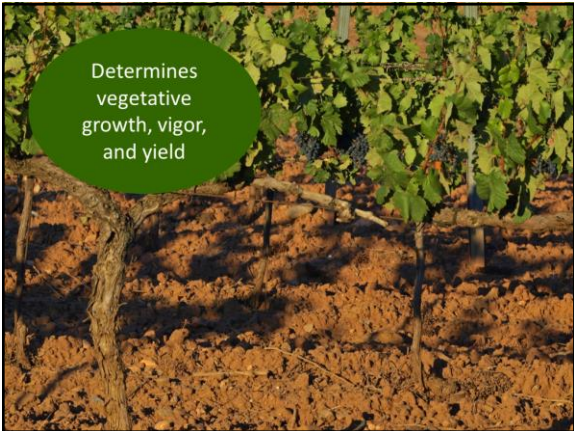
---

---

---

---

---



62

---

---

---

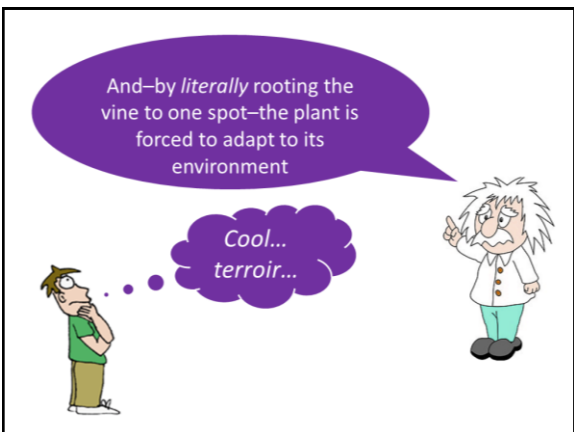
---

---

---

---

---



63

---

---

---

---

---

---

---

---



*The Dish on Dirt*  
with Jane A. Nickles,  
CSE, CWF

**References/for more information:**

- Feiring, Alice (2017). *The Dirty Guide to Wine*. New York: The Countryman Press.
- Franzmeier, Donald, William McFee, John Graveel, and Helmut Kohnke (2016). *Soil Science Simplified*, 5th edition. Long Grove, Illinois: Waveland Press.
- Goode, Jamie (2014). *The Science of Wine from Vine to Glass*, 2nd edition. Los Angeles: University of California Press.
- Skelton, Stephen (2007). *Viticulture: An Introduction to Commercial Grape Growing for Wine Production*. London: Stephen Skelton, MS.
- White, Robert (2009). *Understanding Vineyard Soils*. Oxford University Press.
- Wilson, James (1998). *Terroir: The Role of Geology, Climate, and Culture in the Making of French Wines*. South San Francisco: The Wine Appreciation Guild.
- USDA Soil Survey/National Resources Conservation Service:  
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/>
- Soil Science Society of America: <https://www.soils.org/>
- Soil: National Geographic Magazine. Originally published September 2008. Retrieved on May 10, 2016:  
<http://ngm.nationalgeographic.com/2008/09/soil/mann-text>
- From the Ground Up: The Science of Soil: <http://www.thescienceofsoil.com/>

jnickles@societyofwineeducators.org

64

---



---



---



---



---



---



---



---