Lesson – Factors Affecting Infiltration

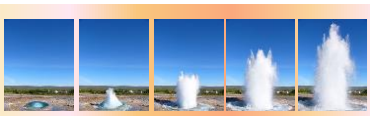
THE FOLLOWING **VIDEO** HAS BEEN APPROVED FOR
ALL AUDIENCES
BY THE EARTH SCIENCE TEACHERS ASSOCIATION OF AMERICA , INC

THE VIDEO HAS BEEN RATED

I	INTELIGENT
	UNDER 15 REQUIRES TEACHER ASSISTANCE
	STRONG EARTH SCIENCE LANGUAGE, DETAILED DIAGRAMS, AND SUPER AWESOMENESS

- I can divide the earth's surface into layers
- I can describe the factors that affect infiltration
- I can explain porosity
- I can describe permeability
- I can define capillarity
- I can describe factors that affect runoff

Need 3 things
1. Underground water tunnels
2. One must vent to the top
3. Water must come in contact with a rock rich in silica
   - The silica dissolves in the hot water than coats & seals the channels allowing water and steam to be forced through the channels at high pressure; otherwise, the pressure would be dissipated through various cracks and side-channels.

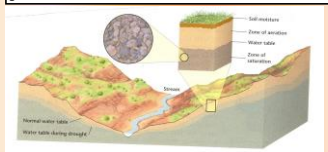


Water at a depth of 23 meters (75 ft) is around 120 °C (248 °F), but cannot boil because of the weight of the water pushing down on it from above. However heat makes some of the water expand pushing the water up. When this water is forced up to around 16 meters (52 ft), some of the water may be above boiling point, which sets off the chain reaction: the pressure decrease allows more water to boil and flash boil into steam, which drives the unboiled water further up the conduit. As this happens closer and closer to the surface, with increasing velocity, the water and steam is forced out, and it is this mixture of water and steam that forms the eruption.

Earth's surface divided into 2 zones:

Zone of Saturation

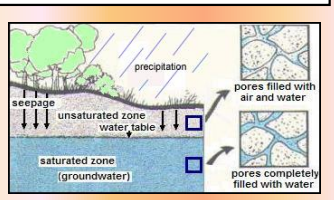
-Part of Earth's surface that is FILLED with ground water



-Upper surface of this zone is called the **WATER TABLE**

Zone of Aeration

-ABOVE the water table where particles are filled with air & water



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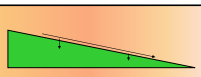
Factors Affecting Infiltration

SLOPE of the LAND

- STEEPER the slope, the LESS the Infiltration

Less time to SEEP into GROUND



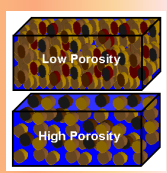
DEGREE of SATURATION

-More SATURATED the ground, the LESS infiltration

POROSITY

-Amount of open space between particles

-GREATER the porosity the GREATER infiltration



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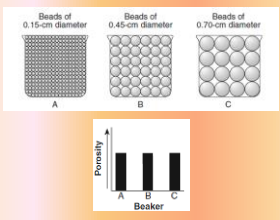
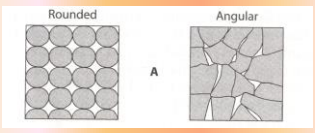
Same size containers & uniform material= same porosity



3 factors that effect porosity are:

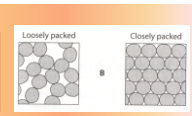
SHAPE

Well-rounded particles have GREATER porosity



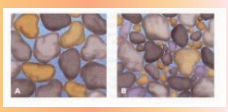
PACKING

More closely packed the particles, the lower the porosity



SORTING

-Material with well-sorted particles has high Porosity



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PERMEABILITY

-Ability of a material to allow fluid to pass through it

-Materials can be porous & yet impermeable

EXAMPLES:

CORK

SPONGE

SHALE

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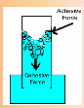
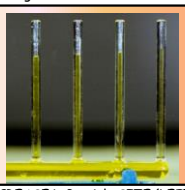
CAPILLARITY

-Ability of water to RISE in small openings





-SMALLER the particle size, the GREATER the capillarity

DECREASE in Particle SIZE (LEFT to RIGHT)

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Factors Affecting Runoff

- Rate of precipitation > Rate of Infiltration
- Ground is 100% saturated
- Slope of surface to GREAT to allow infiltration

- Water is not evaporating fast enough

VEGETATION
Ground with grasses, trees, & other plant types have HIGH infiltration

LAND-USE
Impermeable surface like roads, parking lots, & buildings decrease infiltration

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