Water- holding capacity of different types of soils worksheet

Learning outcome: Students *compare* the water-holding capacity (50 - x ml) and optional % water-holding capacity (50 ml - x = y, y/50 X 100 = %) of different soil types based on soil water retention, and *determine* which crops are suited to different soil types based on water requirement matched to water- holding capacity.

Overview of important crops and cropping seasons

Around 85% of total water usage in India is used for agriculture. Different crops are sown at different times of the year. Monsoon crops are dependent on rainfall for their water requirements. Winter and summer crops are only possible if and only if other water sources are available- *in other words stored water is available somehow- either on the surface or in the ground.*

Cropping Season	Monsoon (Kharif)	Winter (Rabi)	Summer (Zaid)	Yearly
Sowing time	A week after rain begins	After the monsoon, generally in the month of November	Around March	In the beginning of monsoon
Harvest time	3-4 months after sowing (varies from crop to crop) *	February to March (changes according to crops)	Around May	10-11 months after sowing **
Water source	Rainwater	Surface water storage like farm ponds, check dams, canals, streams, rivers / Groundwater through borewells, dug wells,		
Crops sown	Cotton, rice, soybean, Tur, maize, ragi	Wheat, jowar, gram, soybean	Pulses like moong, vegetables like tomato, eggplant (baingan)	Turmeric (haldi), potato, fruit like banana, papaya, sugarcane

*cotton can be kept for a longer time as it can grow flowers multiple times. If water is available or enough soil moisture is present farmers harvest cotton twice or thrice. In that case harvest time is 1-2 months after the regular harvest time.

Water requirements for different crops

Seasons	Monsoon	Winter	Summer	yearly
High water requirement	Rice, cotton	Wheat	Vegetables, pulses	Sugarcane, turmeric, fruits
Less water intensive	Ragi, tur	Jowar, bajra, gram		Potato

Water- holding capacity of different soils and appropriate crops

Soil type	**Grain size: coarse= CR, medium= MD, fine= FN)**	**x=Amount of water drained out in 3 mins (ml)**	**Water- holding capacity of soil: H= high, M= medium, L= low**	**<u>Optional</u> % Water- holding capacity** 50 ml - x = y y/50 X 100
Clayey				
Loamy				
Sandy				

Questions

1) Based on the results of the experiment, what do you think is the relationship between size of soil particles and water holding capacity?

2) Which type of soil holds more water? What could be 2 possible crops that can grow in such soil?

3) What happens to the type of soil that cannot hold water at all? Can trees/ crops grow in such soil?

4) What type of soil would be ideal for all kinds of crops?

5) Particle size is the physical property that differentiates between soils. But what about fertility? Can you name two important factors that affect the fertility of a soil?