

Section A. (Basic Description of the Chapter)

1. The document name

science_7_soil_amardeep_singh_gsssnandpurkesho_patiala.doc

2.

Name of The School	Government Senior Secondary School ,Nandpurkesho, Patiala
Name of The Teacher	Amardeep Singh Tinna
Class	7
Subject	Science
Name of The Chapter	Soil
No. of Periods Required To Teach The Chapter	10

Guidance & Edited by :

S.Jaswinder Singh, National Awardee

Lect. Physics ,GSSS Shekhupur

In charge Circle Inspection Team Nabha

1. The benefits of Understanding this concept in one's life

- *Soil is an essential part where our food chain survives .*
Soil is essential for almost all the plants to grow. This is because of plants that there is life on earth .Almost all the animals feed on plants .Even carnivorous feed on vegetarians which in turn need plants for their growth.
Thus we ultimately depend on soil for our food.
- Cotton comes from the cotton plants that grow in soil ,wool comes from sheep that eat grass . So our clothing depends upon soil
- We build our houses (buildings) with bricks ,sand which is soil .We use wood to make furniture ,doors and many other daily needs.
- Knowledge of type of soil is very important for the farmers & for students it can help them in gardening and encourage them for plantation & hence save our mother earth.
- They will know why some soil is fertile and other is lesser or not fertile at all.
- They will know the nature of soil needed to plant Rabi , Kharif & Pulses.

2. The Relative disadvantages of not knowing this concept

- They will not be knowing the base of our food chain

- They will not know about the nature of soil required for gardening.
 - They will not be knowing the role of soil in construction .
 - They will not be knowing about importance of soil in floods .
3. It will help in better understanding of
- Nature of soil needed for plantation.
 - Nature of soil needed for construction purposes.
 - Which soil is appropriate for planting Rabbi , Kharif and Pulse crop?
 - Which soil is used to make earthen pots?.
 - Soil is teeming with life .
 - Role of that life (which lives in soil)in our lives.
4. Careers they can chose from this concept
- Farming
 - Farming consultant .
 - Nursery
 - Researcher
 - Geologist
 - Architect
 - Pottery

B.2 Simplifying the complex

Various Concepts which are going to be covered are

1. Defining Soil
2. Soil is teeming with life .
3. Soil Profile
4. Types of Soil.
5. Properties of Soil
 - Soil has moisture
 - Soil has water .
 - Soil absorbs water
 - Percolation rate
 - Retention of water by different types of soil
6. Role of Soil in crops.

B3 LIFE SKILLS:

The following life skills can be inculcated through the teaching of this chapter in the class.

1. Team spirit (skill of working in a group)
2. Presentation skills.
3. Research skills (*This Skill will be developed a lot*)
4. Creative writing.(Tabulation of collected data)
5. Analytical Skills.(Mathematical calculations ,Comparison etc)

B.4 Vocabulary

Some general vocabulary to which the students would be exposed is mentioned below

S. No.	Word	Meaning In Puniabi
1.	Weathering	ਹਵਾ, ਪਾਣੀ ਅਤੇ ਵਾਤਾਵਰਣ ਕਾਰਨ ਖੁਰਨਾ
2.	Humus	ਮੱਲੜ (ਮਿੱਟੀ ਵਿਚ ਮੌਜੂਦ ਗਲੇ ਸੜੇ ਜੈਵ ਪਦਾਰਥ)
3.	Profile	ਖਾਕਾ ਜਾਂ ਵਰਣਨ ਜਾਂ ਰੂਪਰੇਖਾ
4.	Rodent	ਚੂਹਾ ਅਤੇ ਗਲਿਹਰੀ ਵਰਗੇ ਜਾਨਵਰ
5.	Mole	ਚਕੁੰਦਰ
6.	Beetle	ਭੁੰਡੀ
7.	Worm	ਕੀੜਾ
8.	Bedrock	ਅਧਾਰ ਚਟਾਨ
9.	Loam	ਚੀਕਣੀ ,ਰੇਤਲੀ ,ਗਾਰ ਅਤੇ ਮੱਲੜ ਦਾ ਮਿਸ਼ਰਣ
10.	Clay	ਚੀਕਣੀ ਮਿੱਟੀ
11	Percolate	ਰਿਸਨਾ ਜਾਂ ਟਪਕਨਾ
12	Teem	ਭਰਿਆ ਹੋਣਾ
13	Knead	ਗੁੰਨਣਾ
14	Silt	ਗਾਰ
15	Alluvial soil	ਚੀਕਣੀ ,ਰੇਤਲੀ ,ਗਾਰ ਅਤੇ ਕੰਕਰ ਦਾ ਮਿਸ਼ਰਣ

Section C. Building Bridges

Prerequisite for learning the new concepts in the chapter

1. Soil provides home to us .
2. It is needed for plantation.
3. Different types of soils like Sand , Clay & the one in their gardens or farms
4. Mathematical Division & Finding Percentage .
5. Units of mass & Volume.

Section D. Period wise break up for each chapter:

Period	What to be covered
1.	Introduction Of The Chapter Soil By Testing Of Previous Knowledge Through Preliminary Worksheet Performing Group Activity to know that soil is teeming with life Talking To The Students Regarding Various outcomes from their activity & making Tables. After Recapitulation, Also give them hint about next lectures that what if we dig out the earth !!!!
2.	Introduction to Soil Profile . Performing an activity to make them understand the concept. Showing relevant video.
3.	After P.K. Testing Weathering .(Complete Details) Video on weathering
4..	Performing activities to differentiate b/w different types of soils 1 st activity is physical verification 2 nd is by kneading to make balls of soil samples 3 rd is by making ribbon from kneaded soil. Introduction to Types of Soil.
5.	Activities to Show Presence of moisture in Soil. Presence of air in Soil
6.	Activity on Absorption of water by different types of Soil. .Role of absorption property for crops.
7..	Group Activity on Percolation Rate . Discussion about the results obtained. Role of percolation for crops and ground water. Explaining the difference between Percolation and Absorption
8, 9,10	Revision , Evaluation, Creative Session

Section E. Micro planning of the periods or minute to minute breakup of periods

Sub Section E.1 minute to minute breaks up of period 1

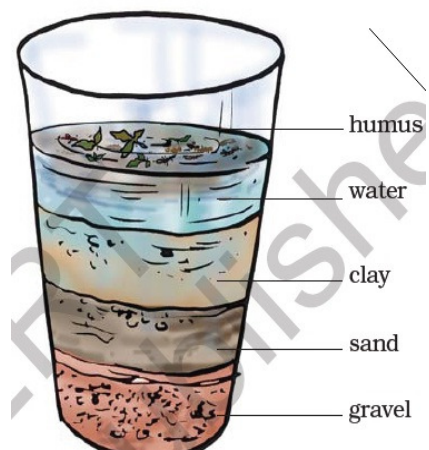
Concept	Time	Indicative / Guiding Script
Students have read Lessons on Food & Plants during last session. Teacher will correlate them to Soil & will introduce his topic	7-10 Min	<p>Teacher will take the class in the <u>laboratory</u></p> <p>He will ask the following questions.</p> <ol style="list-style-type: none"> 1. From where do we get food? 2. From where do we get our summer clothes ? 3. From where do we get our winter clothes ? 4. Where does the plants grow? 5. What are the other uses of soil? 6. Which materials are used for construction purposes?(if Needed) 7. Can we use sand to make pots ? <p>Let Me Ask You An Interesting Question .</p> <p>8. <i>Like Us Do the Soil Have Parents?</i></p> <p>Students may not be able to answer this question properly</p>
Introduction To Topic	1-2 Min	<p>Students soil don't have mom & dad like we all have . But then from where does it came from ??? After a Pause</p> <p>Teacher will now announce that in we learn about 'Soil' and you will definitely know about the question .</p>
Career Options	4-5 Min	<p>Teacher will acquaint them about the career options in the field of Soil as mentioned in B1.</p>
Activity Task	20 Min	<p>He will tell them that we will be doing an activity to show 'Soil is teeming with Life' as per GA1 and will tabulate their observations</p> <p>Teacher will go to each group and will encourage them to note down whatever they have found .</p> <p>Students will take part in this activity very curiously for sure .</p>
To Explore Writing And Thinking		
Q & A Session		<p>Teacher will ask questions to verify the knowledge gained by the students.</p> <p>Students will discuss about their findings with the teacher</p> <p>He will aware them about the environmental issues regarding soil pollution with them. He will stimulate them to ask questions about their observations.</p>
Home Task	5 Min	<p>Teacher will ask the students to draw a neat and clean Table & Also will ask them to think at home about digging deep into the earth .. what will be our findings then.</p>

Annexure Name	GA_1
Name of the activity	Soil is teeming with life
Specify the topic	Soil is teeming with life
Type of the activity	Activity is group based
Material required for the activity	Samples of soil from school garden , any roadside , any construction site (Sand), any canal site or any barren land (if possible) Magnifying Glass (Convex Lens)
Any specific preparations required in the class room for performing the activity	This activity is to be performed in the laboratory and number Magnifying Glasses equal to the number of groups will be needed.
Details of the activity and detailed instructions to carry it out	<p>Teacher will assign duties (One working day before the this class) to the students in groups ,in order to bring the samples of soils from the school garden , any roadside , any construction site(Sand), any river sight or any barren land (if possible) .</p> <p>Now he will divide the students into groups .Give them samples of each soil on a paper by naming each sample from where it was collected. He will provide each group with a convex lens(Magnifying Glass). Also he will draw table .</p> <p>Now he will ask the students to examine each soil carefully with the lens and note in the table.</p> <p>Next Day Preparations</p> <p>Teacher will perform the activity by taking a large beaker of glass and a sample of soil from school garden.</p> <p>Fill 2/3 of the beaker with water & pour a handful of soil sample in it. Stir it well.</p> <p>Allow the soil sample to settle down it will take same time.</p>

Needed Table

Sr. No,	Soil Source	Color of Soil	Size of The Particles	Plants (If Any)	Animals (If Any)	Any other thing found
1.	Garden Soil					
2.	Roadside Soil					
3.	Construction Sight Soil					
4.						

Pictures describing

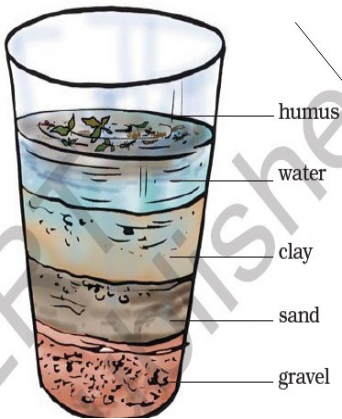
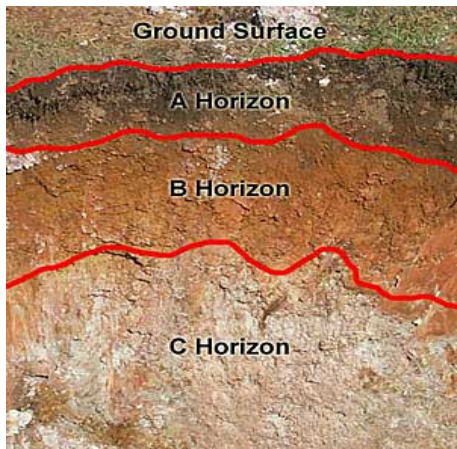


Any precautions to be kept in mind

The teacher will guide about using the lens.


Sub Section E.2 minute to minute breaks up of period 2

Concept	Time	Indicative / Guiding Script
Teacher will discuss about home task and will ask the questions .	2-3 Min	Testing / re-teaching previous knowledge by asking 1.What is soil made up of? 2.Can we grow plants in sand? 3.What is effect of plastic on soil? 4.What if we dig deep down the earth? Students may not give appropriate answers for the last question.
Introduction To Topic Soil Profile	2-3 Min	The teacher will announce the topic ‘soil profile
Activity To be performed by the Teacher	20-25Min	Teacher will start the activity as mentioned in Annexure GA2 The teacher will explain the different layers formed in the jar. Students will carefully look towards the beaker He will now show them the video & images on actual soil profile. He himself will narrate the video .Refer Annexure GA2 He will draw the diagram. He will make them understand the names & the properties of different layers. He will correlate the activity and video.
Q & A Session		1. Why the gravels settled on the base ? 2. Why the humus is floating on the top? 3. What do you think about clay? One Interesting question the teacher will ask for the students to think at home ? <i>Do Soil care about time ?</i> we will discuss about this during next class .
Home Task	4-5Min	1.The _____layer contains humus 2. The layer of Soil below the top soil is_____ 3..Humus and Smallest Particles of the Rock form the a) A- Horizon b) B-horizon c) C-Horizon d) Bedrock. 4. Which layer of soil has most nutrients for plants? a) Topsoil b) Subsoil c) Parent Rock d) Bedrock 5 Which horizon consist of minerals ? 6. Which horizon consist of humus? 7.Write down on a note on horizons and draw a labeled diagram.

Annexure Name	GA_2(Concept2)	
Name of the activity	Soil Profile .1.Soil profile in Jar 2. Video/images of soil	
Specify the topic and its convergence (inter discipline)	Soil	
Type of the activity (individual activity/ group activity / home activity etc.)	Both activities are Group	
Material required for the activity	Material has been arranged during last class.	
Any specific preparations required in the class room for performing the activity		
Details of the activity and detailed instructions to carry it out	<p>Teacher will continue from the last day's started activity.</p> <p>the soil must have settled down., He will draw the diagram of beaker on board and start labeling the different layers with the help of students. The teacher can also show them humus by taking the sample on the sand paper.</p> <p>HE will show them the video & images of actual soil profile. He will ask them to correlate what they have looked in the jar and the video or images.</p> <p>Students will be made to understand that due to gravity heavier particles have settled down hence topsoil is the lightest and Bedrock is the heaviest.</p>	
Pictures/Links describing the activity, if any 1.Class room activity with Jar 2. Video on Soil Profile Soil Profile Video 1 Soil Profile Video 2		
Any precautions to be kept in mind	The teacher will guide about using the lens.	

Sub Section E.3 minute to minute breaks up of period 3

Concept	Time	Indicative / Guiding Script
Entry Behavior Of Teacher. Teacher will discuss home task first and then will ask the following questions	5 Min	Testing / re-teaching previous knowledge 1.What is humus ? 2.What is Soil Profile? 3.Name the Horizons sequence wise? 4.Which horizon is responsible for the soil we have ? 5.How is soil is formed ?
Performing Activity. and Making them understand the Weathering Process	25-30Min	Teacher will show the image of soil profile Teacher will start with weathering by showing a video on weathering. He himself will narrate the video. Refer Annexure GA3 He will make them write down the content. Role of water , Role of Roots of Trees, Role of change of temperature, Role of Wind. Even Biological/Chemical reasons for its formation can be given. Teacher will draw a labeled diagram again.
Q & A		Students will note down the diagrams and definitions of each layer from the B.B. He will give definitions and role of each layer. He will ask what happens to solids on heating ? (They have read in class 6 th Lesson 6 th) What happens to water when it freezes ? It expands or contracts? One Interesting question the teacher will ask for the students to think at home ? <i>Why do plants like soil & do plants like soil from every place ?</i> Think over this !!! We will discuss it tomorrow.
Home Task	5-7 Min	1.Which of these does not cause weathering a)Clouds b)Wind c)flowing water d) freezing of rain water 2. What is weathering? 3.How the change in temperature causes weathering? 4.How does the roots of tree cause weathering? 5. How does oxygen causes weathering? 6. Is their any biological cause of weathering , if yes then give note? 7.What is the role of rain on weathering ? 8.What is the role of trees on weathering? 9. Explain how soil Pollution and soil erosion could be prevented?

Annexure Name	GA3(Concept_3)
Name of the activity	Video on weathering
Specify the topic and its convergence (inter discipline)	weathering
Type of the activity (individual activity/ group activity / home activity etc.)	Group
Material required for the activity	A device to show the video
Any specific preparations required in the class room for performing the activity	
Details of the activity and detailed instructions to carry it out	The teacher will show them the video on weathering. He will explain the soil formation process.
Link to the Video .	Weathering
Pictures describing the activity, if any	 <p>The image block contains two distinct visual elements. On the left is a cartoon illustration of a red earthworm in a soil profile, with a flower growing above it. A speech bubble from the worm says 'THE SYSTEM WORKS!'. The flower has a human-like face. On the right is a photograph of a dark, rounded rock with a prominent vertical crack, illustrating weathering.</p>
Any precautions to be kept in mind	

Sub Section E.4 minute to minute breaks up of period 4

Concept	Time	Indicative / Guiding Script
Entry Behavior Of Teacher. After discussing home task he will ask them the questions.	5 Min	<p>Testing / re-teaching previous knowledge of soil, He will ask the following questions.</p> <ol style="list-style-type: none"> 1.From where the soil is made up of? 2.From which horizon all other horizons were made? 3.Name the Horizon just above bedrock? 4.Which horizon is important for our lives? <p>Students will respond to the questions</p>
Introduction of the topic. Activity about types of Soil	5-7 Min 15-20Min	<p>The teacher will now tell them that we will discuss today about the topsoil .He will tell them the importance of this part.</p> <p>The teacher will perform a group activity to understand the types of soil. Refer Annexure GA4 Students will participate in the activity in groups.</p> <p>He will tell the name and the size of clay particles which is 0.002nm. He will tell the size of sand particle which is 0.2mm Teacher will make them fill the table drawn Refer Annexure GA4 He will tell them the size of Loamy Soil particles as to be b/w 0.002nm -0.2mm Students will answer to the questions while performing the activity and will note down the extra knowledge gained.</p> <p>He will then show them the VIDEOS & IMAGES to build more strong interest in the content. Refer Annexure GA4</p> <p><i>In the end he will tell them about Alluvial soil which is very fertile ,it flows from Himalayas to the plans & is made up of silt, clay , sand and gravel.</i> Teacher will remind (as it is expected that the know this) the students that the soil is used to make <i>earthen pots & status</i> but there is difference in way the soil is used to make them. He will tell them the difference. Refer Annexure GA4.</p>

Home Task	7-10 Min	1.Size of sand particles is _____ 2. Size of clay particles is _____ 3.. Size of loamy soil particles is _____ 4.. Which Soil when felt with hand will be smoothest a) Sand b) Loamy c) Clay d) None 5..Which of these has the smallest size of particles a) Sand b) Silt c) Clay d) Gravel 6.What is clay soil ?Tell about its texture and give its uses? 7.What is sand ?Tell about its texture and give its uses? 8.What is Loamy Soil? Tell about its texture and give its uses? 9.List the differences between clayey and sandy soil? (N.C.E.R.T.) 10. Why horse is dung is mixed with soil by the potter? 11. Make any model from clay .
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Annexure Name	GA4(Concept_4)
Name of the activity	1. Soil Types 2. How earthen pots are made.
Specify the topic and its convergence (inter discipline)	Soil Types
Type of the activity (individual activity/ group activity / home activity etc.)	Group
Material required for the activity	Clay, Sand , Loamy Soil, Sand Papers, Water ,Beakers
Details of the activity and detailed instructions to carry it out	<p>1. Teacher will divide the class into groups .He will give them samples of each soil by naming each sample as A,B and C. He will ask them to tabulate their values .</p> <p>2. During the last few minutes teacher will show them a video on earthen pots ,Clay Art and some images on Clay Art. Note if Possible it will be great experience for the students if you take them to a nearby Potter. He will ask them to make models from clay at home.</p>
<p>First Link for video assistance0 to the teacher only.</p> <p>Link 2 is to be shown to the students.</p> <p>Link 3 is to be shown to the students.</p>	<p>1. Soil Texture by Feel</p> <p>2. Making of an Earthen Pot</p> <p>3. Awesome Clay Art</p>



AWESOME CLAY ART



Sr. No,	Name of Soil Sample	Color of Soil	Size of The Particles	Type of Ball formed	Type of Ribbon Formed	Name of Soil
1	A					
2	B					
3	C					

Explanation of the outcomes of the activity

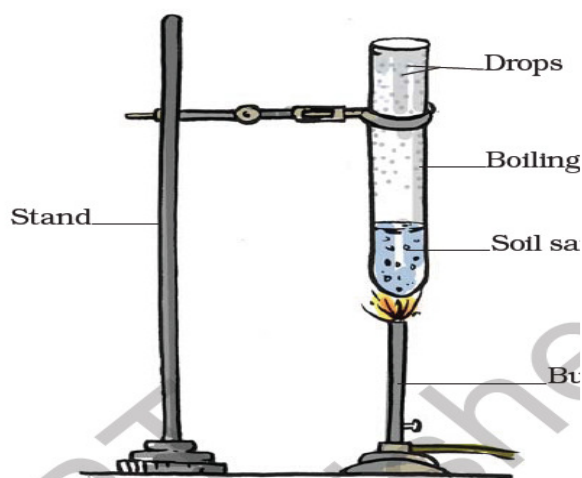
Students will understand about assessment of

Sub Section E.5. minute to minute breaks up of period 5

Concept	Time	Indicative / Guiding Script
Entry behavior of teacher	10-12 Min	<p>Teacher will Recall the studied content by asking questions .</p> <p>Which soil has largest particle size?</p> <p>Which soil is smoothest?</p> <p>What is the size of loamy soil particle?</p> <p>Name the substances present in topsoil?</p> <p>Students will respond positively</p> <p>The Students will not count Air & Water in the topsoil</p>
Introduction to topic	1-2 Min	Teacher will say Students do you know the soil has 'Moisture & Air'
Demonstration of activity	20-25 Min	<p>Teacher will Perform the activities .Refer Annexure GA5</p> <p>Students will curiously take part in the activities.</p> <p>Teacher will explain the role of moisture in Soil.</p> <p>Teacher will explain the role and need of air in soil.</p> <p>He will tell the students about earthworms He will tell them how earthworms aerate soil . For assistance on Earthworms. Refer Annexure GA5</p>
Q & A session		<p>Why water came out of soil on heating?</p> <p>Why air bubbles came out in the upward direction?</p> <p>Teacher will help them to reach at the answers?</p> <p>Students will try to answer the questions.</p>
Home task	2-3 Min	<p>1.In general which is best soil for growing plants?</p> <p>a)clayey b) sandy c) Loamy d) Subsoil</p> <p>2.Write an activity on moisture in soil.</p> <p>3. Why cant clay had much air ?</p> <p>4.Make any shape you like with the readymade clay.</p> <p>5. Write an activity on soil has air?</p> <p>Refer Worksheet in Annexure GA5</p>

Annexure GA5 Performa for giving details about an activity

Annexure Name	GA5 (Concept5)
Name of the activity	1.Air in Soil 2.Moisture in Soil
Specify the topic and its convergence (inter discipline)	Properties of Soil
Type of the activity(individual activity/ group activity / home activity etc.)	Group
Material required for the activity	Soil Sample from Garden, Test Tube , Test Tube Holder, Beaker, Burner
Any specific preparations required in the class room for performing the activity	The activity is to be performed in the Lab (Where Available)
Details of activity	<p>Activity1.Teacher will take water in the beaker and will drop some large pebbles of soil in the water .The air bubbles will start popping up. He will ask from the students what are these bubbles .</p> <p>Activity2.Teacher will take small amount of soil in a a dried test tube (pre heat the empty test tube). Now he will heat the sample . The moisture will come out of soil and will stick to the walls of the test tube</p>
For Video Assistance go to the link and look into playlist soil (For Teachers Only)	AIR & WATER in soil
For assistance on earthworms	Earthworm Facts



Tick the most suitable answer in questions 1 and 2.

1. In addition to the rock particles, the soil contains

- (i) air and water
- (ii) water and plants
- (iii) minerals, organic matter, air and water
- (iv) water, air and plants

2. The water holding capacity is the highest in

- (i) sandy soil
- (ii) clayey soil
- (iii) loamy soil
- (iv) mixture of sand and loam

3. Match the items in Column I with those in Column II:

Column I

- (i) A home for living organisms
- (ii) Upper layer of the soil
- (iii) Sandy soil
- (iv) Middle layer of the soil
- (v) Clayey soil

Column II

- (a) Large particles
- (b) All kinds of soil
- (c) Dark in colour
- (d) Small particles and packed tight
- (e) Lesser amount of humus

4. Explain how soil is formed.

Sub Section E.6 minute to minute breaks up of period 6.

Concept	Time	Indicative / Guiding Script
Entry behavior of teacher	10-12 Min	Teacher will give worksheet for Previous Knowledge. Refer Annexure GA6 Students may not answer last two questions .
Introduction to topic	2-3 Min	Teacher will announce the topic by saying that today we will now which type of soil is best suited for which crop
Demonstration of activity	15-20 Min	Teacher will perform the activity and will keep talking about the crops with the students . He will tell them which crop requires more water . For details and video assistance Refer Annexure GA6 Teacher will make the students tabulate their values in the table drawn on B.B. For table refer Annexure GA6 Students will note down the observations .
Home task	7-10 Min	<ol style="list-style-type: none"> Which soil absorbs more water a) Clay b) Sand c) Loamy d) all absorb same amount of water Which Soil is best for paddy crop? a) Clay b) Sand c) Loamy d) all are equivalent. Water logging can be expected in soil which is rich in a) Sand b) clay c) silt d) humus Paddy grows best in a) Only clay soil b) clayey-humus soil c) sandy soil d) loamy- sandy soil Cotton grows best in a) Only clay soil b) clayey-humus soil c) sandy soil d) loamy- sandy soil. _____ Soil has least absorption of water Earthworms are also known as _____ Which type of soil absorbs the most amount of water ? Why clay was not able to absorb large amount of water as compared to loamy soil and sand? Write a note on activity performed & give draw the table .

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Annexure Name	GA6 (Concept6)
P.K Testing Worksheet/ Home Task Discussion	<p>1.Soil is our natural resource ?Yes or No</p> <p>2.In general which is best soil for growing plants?</p> <p>3.Humus and Smallest Particles of the Rock form the</p> <p>a) A- Horizon b) B-horizon c) C-Horizon d) Bedrock.</p> <p>4.Which of these has the smallest size of particles</p> <p>a) Sand b) Silt c) Clay d) Gravel</p> <p>5.Which of these does not cause weathering</p> <p>a)Clouds b)Wind c)flowing water d) freezing of rain water</p> <p>6. Which soil absorbs more water</p> <p>a) Clay b) Sand c) Loamy d) all absorb same amount of water</p> <p>7. Which Soil is best for paddy crop?</p> <p>a) Clay b) Sand c) Loamy d) all are equivalent</p>
Name of the activity	Absorption of water by the different types of soil.
Specify the topic and its convergence (inter discipline)	Properties of Soil
Type of the activity	Group
Material required for the activity	Clay , Sand, Loamy Soil, Three funnels ,Beakers, Sand Papers, Tripod Stands . Water (See the picture)
Any specific preparations required in the class room for performing the activity	Arrange the soil samples prior to the class
Details of the activity	<p>This activity demonstrates the difference in the water retention abilities of soil and sand. Use filter paper to create three cones and fill one with soil , the other with sand and one with clay taking care to use equal amount of material. Soil is a combination of clay and humus, the composting remains of organic material such as fallen leaves and dead matter.. Pour equal amounts of water through these cones and measure the water that flows through them. Less water is collected under the cone with clay, slightly more in loamy soil and maximum is</p>


	collected under the sand sample.
For Video Assistance Go to the link.	Absorption of Water by Soil

Sr No	Soil Sample	Amount of water Poured (A)	Amount of water collected under the funnel(B)	Water Retained by the Soil = A- B	Water Retention capacity Rank (1st, 2 nd & Third)
1	Clay				
2	Sand				
3	Loamy Soil				



Sub Section E.7 minute to minute breaks up of period 7

Concept	Time	Indicative / Guiding Script
Entry behavior of teacher	5-7 min	Teacher will ask following questions for P.K. Testing. Refer Annexure GA7 Students will respond partially to some questions
Introduction to topic	4-5 Min	Teacher will tell the students as you have guessed that clay will be best suited for the paddy crop .But students remember that a plant not only needs water .it needs humus also. So the correct answer is clay rich soil with organic matter in it . Similarly for cotton sandy-loam soil is most suited. Today we will say how fast water percolates into the soil He will announce that we will be discussing Percolation Rate of water into soil Teacher will demonstrate with activity with the help of students. Refer Annexure GA7
Demonstration of activity	15-20 Min	Teacher will tell the students the advantage of knowing percolation rate in farming Teacher will tell the students that this percolation takes care of the ground water level . The students will tabulate the measurements . Refer Annexure GA7 Teacher will ask the students to calculate the percolation Rate.
Q & A session	3-4 min	Calculate the percolation rate of the samples ? Why percolation rate is higher in sand and lesser in loamy soil?
Home task	5-7 Min	1.Define Percolation Rate ? 2.Give difference between percolation and absorption with suitable example? 3.Draw the table of percolation rate and write a note on the activity performed . 4.Razia conducted an experiment in the field related to rate of percolation. She observed that it took 40 min for 200 ml of water to percolate through the sample. Calculate the rate of percolation. (N.C.E.R.T.) 5. Unscramble each of the following to form a word u have read in this chapter? (i)IOSL (ii) RIHZONO(iii) MOAL(IV)LATIPERONCO 6. Puzzle .

		<p>Search for 7 words related to soil in the given box by going upward , downward , across or diagonally.</p> 
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Annexure Name	GA7 (Concept7)
P.K. Testing Worksheet	<p>1. Water expands when it freezes .What role does it play in soil formation?</p> <p>2. What kind of soil will hold more water –one made with smaller particles or bigger particles?</p> <p>3. Which soil is best suited for paddy crop ?</p> <p>4. Which soil is best suited for cotton crop?</p> <p>5. Which soil is best for growing pulses?</p>
Name of the activity	Percolation Rate
Specify the topic	Properties of Soil
Type of the activity	Group
Material required for the activity	Soil samples, Bottles, Stop watch (your Mobile has it) , Measured amount of water , Some color to have better view of percolation (See Image)
For assistance go to the link and look into playlist 'soil'	Percolation Rate Test On Soils
Any specific preparations required in the class room for performing the activity	Arrange soil samples prior to the Lecture.

Sr No	Soil Sample	Amount of water percolated (x)	Time Taken(t)	Percolation Rate = x/t ml/min
1	Clay			
2	Sand			
3	Loamy Soil			



Sub Section E.8 minute to minute breaks up of period 8

Concept	Time	Guiding / Indicative Script
Entry behavior of teacher	35 MIN	Teacher will write down the Title of topic done during last seven days. He will recapitulate all the topics taught one by one . He will also discuss some of the questions done earlier and questions from the assignment given in Annexure GH1
Q & A session		
Home task		To complete the Annexure GH1 prepare the whole chapter for their Evaluation Next Day

Sub Section E.9 minute to minute breaks up of period 9

Concept	Time	Guiding / Indicative Script
Evaluation as Per Section (Except B3)	40Min	Teacher will give an assessment tool to the students for solving . Teacher will check their activity skills through oral question or through any activity. As mentioned in Sub sections H1 , H2 & H4 Teacher will assign them Home Work .Refer Annexure GP2

Sub Section E.10. minute to minute breaks up of period 10

Concept	Time	Guiding / Indicative Script
Creative Session (Evaluation As Per B3)	15 Min	Teacher will assign Project .Refer Annexure GP1 Teacher will check their Team work skill through quiz .Refer Annexure GP3

Annexure 1 Performa for giving details about an activity

Annexure Name	GH1 (For_Home)
Name of the activity	Worksheet
Specify the topic	Questions on Soil
<p>Chapter Soil</p> <p>Very Short Answer Type Questions</p> <p>Q1. 1. Soil is our natural resource ? Yes or No</p> <p>Q2. In general which is best soil for growing plants?</p> <p>a) clayey b) sandy c) Loamy d) Subsoil</p> <p>Q3. Humus and Smallest Particles of the Rock form the</p> <p>a) A- Horizon b) B-horizon c) C-Horizon d) Bedrock.</p> <p>Q4. Which of these has the smallest size of particles</p> <p>a) Sand b) Silt c) Clay d) Gravel</p> <p>Q5. Which of these does not cause weathering</p> <p>a) Clouds b) Wind c) flowing water d) freezing of rain water</p> <p>Q6. Which soil absorbs more water</p> <p>a) Clay b) Sand c) Loamy d) all absorb same amount of water</p> <p>Q7. Which Soil is best for paddy crop?</p> <p>a) Clay b) Sand c) Loamy d) all are equivalent.</p> <p>Q8. Water logging can be expected in soil which is rich in</p> <p>a) Sand b) clay c) silt d) humus</p> <p>Q9. Paddy grows best in</p> <p>a) Only clay soil b) clayey-humus soil c) sandy soil d) loamy- sandy soil</p> <p>Q10. Cotton grows best in</p> <p>a) Only clay soil b) clayey-humus soil c) sandy soil d) loamy- sandy soil.</p> <p>Q11. Which layer of soil has most nutrients for plants?</p> <p>a) Topsoil b) Subsoil c) Parent Rock d) Bedrock</p> <p>Q12. Which Soil when felt with hand will be smoothest</p> <p>a) Sand b) Loamy c) Clay d) None</p> <p>Fill in the Blanks</p> <p>Q13. The layer of Soil below the top soil is _____</p> <p>Q14. The largest soil particles are of _____</p>	

Q15. _____ Soil has least absorption of water

Q16.The _____ layer contains humus.

Q17 Earthworms are also known as _____

Q18.Size of sand particles is _____

Q19. Size of clay particles is _____

Q20. Size of loamy soil particles is _____

Short Answer Type Questions

Q1. Explain how soil Pollution and soil erosion could be prevented?

Q2. What is weathering?

Q3.How the change in temperature causes weathering?

Q4..How does the roots of tree cause weathering?

Q5. How does oxygen causes weathering?

Q6, Is there any biological cause of weathering , if yes then give note?

Q7. Why can't clay hold much air ?

Q8. Why can't sand hold much water?

Q9.Write an activity on moisture in soil.

Q10. What is the difference between percolation and absorption?

Q11. Unscramble each of the following to form a word you have read in this chapter?

(i)IOSL (ii) RIHZONO(iii) MOAL(IV)LATIPERONCO

Q12. Puzzle .

Search for 7 words related to soil in the given box by going upward , downward , across or diagonally.

T	O	P	S	O	I	L	L
S	A	N	D	C	T	K	E
I	R	Z	O	N	C	L	P
L	O	A	M	O	I	Z	S
T	C	P	R	F	R	U	L
M	K	D	O	P	M	F	I
K	E	R	O	U	N	C	D
B	P	P	H	K	Z	P	L

Section F :The Content

Concept 1. Soil is teeming with life.

<http://www.soils4teachers.org/biology-life-soil>

<http://www.soils4kids.org/about>

Concept 2. Soil Profile

(i). http://en.wikipedia.org/wiki/Soil_horizon

(ii). Follow the link for playlist & click on soil profile video.

[Soil_profile-Videos](#)

Concept 3. Weathering

(i) [Text On Weathering](#)

(ii) Follow the link for playlist & click on 'weathering' video.
[Weathering](#)

Concept 4. Soil Types

[Text On Soil Types](#)

[Soil Texture by Feel](#)

[Making of an Earthen Pot](#)

Concept 5. For properties of soil

Follow the link for playlist & click on the appropriate video

[Properties of Soil](#)

An awesome site for taking online quiz is

[Quiz On Soil](#)

Section G. Listing of Possible Activities

Name of the concept/ Skill/outcome	Name of the possible activities	Reference of the annexure where the details of the activities have been given in the already specified format of reference to the web address
A. Recalling Previous Knowledge	Discussion about What has been learnt during last class.	Included in Each Lecture's initial Minutes

B. Introduction to the Topic	Any Curious question on the day or one day before the Class	For Example Look at E2 The Question Ctrl +Click
C. Career Options	Aware the Students Time to time	
D. Concept 1- Soil is Teaming with Life	1.Activity. 2.Tabulation	GA1
E. Concept 2 – Soil Profile..	1.Activity. 2.Video	GA2 Soil Profile Video 1 Soil Profile Video 2
F. Concept 3- Soil Formation (Weathering)	Video	GA3 Weathering
G. Concept 4- Types of Soils	1.Activity. 2.Tabulation 3.Video	GA4. Soil Texture by Feel Making of an Earthen Pot
H. Concept 5- Moisture and Air in soil.	1.Activity on Air in Soil. 2.Activity on Moisture in Soil 3.Video Assistance for teachers	GA5 Moisture & Air in soil
I. Concept 6- Absorption capacity of soil & its relation with crops	1.Activity 2.Table for activity 3.Video assistance for the teacher	GA6 Absorption of Water by Soil
J. Concept 7- Percolation Rate & its relation with crops	1.Activity 2. Table for activity 3.Video assistance for the teacher.	GA7 Percolation Rate Test On Soils
K. Revision Cum Doubt Session	Worksheet	GH1
L. Evaluation	Evaluation Tools as per Section H	H1 H2
M. Creative Session	1.Project Activity 2.Worksheet 3.Quiz	GP1 GP2 GP3

Section H. Model assessment tool for students.

As the Farmer Plants a crop & then he looks after it . This is the journey he had with the crop (his care) which accesses his hard work . In the same way it is very important for the teacher to check his outcomes of teaching. Here is the assessment tool which can be used for the purpose. It has three sections first two are to be filled during the commencement of the Lesson & Last one is to be filled at the end Lesson as per Sub Sections H1 ,H2 ,H3

Sr .No.	Formative assessment	Parameters used	Tools & Techniques used	Skills to be assessed	Max Marks 50
1	Class Room Participation (Only Theory)	Legible writing	Note book Drawing diagram	Managing & handling records .	4
		Regularity	Home assignment & task completion	Discipline, Obedience, Time management	4
		Mathematical Skills	data collection & Tabulation	Interpretation of data & inductive reasoning, analytic skills	4
		Curiosity	Asking questions . Giving ideas	Self confidence	4
2	Practical/Activities	Practical/Activities/Project	Investigatory Project/activities	understanding concept, creativity, innovation, Application	4
		Team Work	Group Activity	Group Behavior, team spirit, Art of listening	4
		Presentation (this part is being assessed in sub section H3 therefore has been given less weight age here)	Black Board, Inter group discussion, Articulation of ideas	self confidence, art of public speaking, self expression	2
3.	Evaluation Tools	Sub Section H1	Based on Sub Section B1 Usefulness In Life		5
		Sub Section H2	Based On Sub Section B2 Simple to Complex		5
		Sub Section H3	Based On Sub Section B3 Life Skills		7
		Sub Section H4	Based On Sub Section B4 New Vocabulary		3

Sub Section H_1: Assessment tool to assess students on objectives mention in subsection B1 (Usefulness in Daily Life)

Q1.In general which is best soil for growing plants?

a)clayey b) sandy c) Loamy d) Subsoil

Q2.Which of these has the smallest size of particles

a) Sand b) Silt c) Clay d) Gravel

Q3.Which Soil is best for paddy crop?

a)Clay b) Sand c) Loamy d) all are equivalent.

Q4. Which soil is used for making pots , toys and status?

a)Clay b) Sand c) Loamy d) all are equivalent.

Q5. Percolation rate of water is maximum in

a)Clay b) Sand c) Loamy d) all are equivalent.

Q6. Water logging can be expected in soil which is rich in

a)Sand b) clay c) silt d) humus

Q7. Paddy grows best in

a)Only clay soil b) clayey-humus soil c) sandy soil d) loamy- sandy soil

Q8. Cotton grows best in

a) Only clay soil b) clayey-humus soil c) sandy soil d) loamy- sandy soil.

Q.9 What is the purpose of plant Nursery?

Q10. What does an archeologist do?

Q11. How a farming consultant helps a farmer?

Q12. Why cannot we grow tomatoes in water only?

Q13. Which Soil when felt with hand will be smoothest

a) Sand b) Loamy c) Clay d) None

Q14. _____ Soil has least absorption of water

Q15. What is the use of manure for a plant ?

Sub section H_2: Assessment tool to assess students on objectives mention in subsection B2

- Q1. Size of clay particles is _____
- Q2. Size of loamy soil particles is _____
- Q3. The layer of Soil below the top soil is _____
- Q4. The largest soil particles are of _____
- Q5. Humus and Smallest Particles of the Rock form the
a) A- Horizon b) B-horizon c) C-Horizon d) Bedrock.
- Q6. Which of these does not cause weathering
a) Clouds b) Wind c) flowing water d) freezing of rain water
- Q7. Which layer of soil has most nutrients for plants?
a) Topsoil b) Subsoil c) Parent Rock d) Bedrock
- Q8. What is weathering?
- Q9. How the change in temperature causes weathering?
- Q10. How does the roots of tree cause weathering?
- Q11. How does oxygen causes weathering?
- Q12. Is there any biological cause of weathering, if yes then give note?
- Q13. Why cannot clay hold much air?
- Q14. Why cannot sand hold much water?
- Q15. What is the difference between percolation and absorption?

Sub section H_3: Assessment tool to assess students on objectives mention in subsection B3

For this objective class room can be divided into groups .

& assign them the activities as mentioned in [Annexure GP1](#) [Annexure GP2 \(Individual Activity\)](#) [Annexure GP3](#)

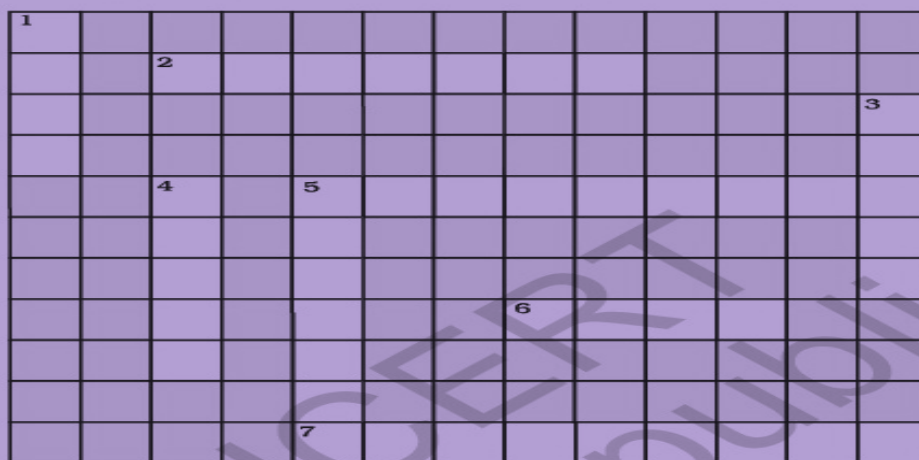
Annexure Name	GP1 (Project_1)
Name of the activity	Separating sand and iron Filings from Garden Soil
Parameters Under Check	Creative Thinking ,Logical Thinking, Presentation skills,
Type of the activity(individual activity/ group activity / home activity etc.)	Individual
Material required for the activity	Garden Soil, Sand, Iron Filings, and Teacher may ask the students if any other material is needed he will provide on demand .
Any specific preparations required in the class room for performing the activity	Teacher will arrange Sand, Garden Soil prior to the Lecture.
Details of the activity and detailed instructions to carry it out	<p>Teacher will mix the three before the class & will ask them to separate them .He will divide the sample equally among the students.</p> <p>Students will perform the activity & Will come with different ideas .</p> <p>Note: Students can separate iron from soil with the help of magnet.</p> <p>They can mix the water and then allow the mixture to settle down. Sand will form a different layer in the jar.</p>

Annexure Name	GP2 (Project_2)
Name of the activity	Fill is The Blanks .Answers are hidden in the Box
Parameters Under Check	Creative Thinking ,Logical Thinking & Crossword puzzle
Type of the activity	Individual to be performed at home
Material required for the activity	See Images below

- _____ is like a cake made from lots of different things.
- Soil contains crumbling rock or sand, clay, dead plant and animal remains, _____ and even manure
- _____ turn the plant and animal material into nutrients. They also _____ through the soil, which lightens and loosens it so plants grow better.
- The top layer of the soil are rich in _____ matter which are best for growing crops, underneath are layers that are _____ and also beneath these layers are _____.
- _____ soil is very rich because minerals
- Plants need nitrogen, phosphorus, potassium, magnesium, copper and other _____ to grow.
- Human can change the soil by _____.

D	S	G	R	I	E	A	R	T	H	W	O	R	M	S	E
E	C	O	R	N	I	L	O	R	I	G	N	U	F	O	A
I	C	R	I	J	U	N	E	L	E	S	K	I	M	O	S
K	I	G	K	L	C	A	T	M	A	D	I	G	P	S	R
I	S	A	O	W	O	R	L	D	E	A	H	A	R	D	E
U	P	N	U	N	C	I	N	G	I	N	L	R	N	O	G
P	I	I	S	O	C	O	M	P	O	S	T	I	N	G	I
I	S	C	I	N	A	C	L	O	V	N	I	S	A	L	T

10. Solve the following crossword puzzle with the clues given:



Across

- Plantation prevents it.
- Use should be banned to avoid soil pollution.
- Type of soil used for making pottery.
- Living organism in the soil.

Down

- In desert soil erosion occurs through.
- Clay and loam are suitable for cereals like.
- This type of soil can hold very little water.
- Collective name for layers of soil.

Annexure Name	GP3 (Project_3)
Name of the activity	Quiz
Parameters Under Check	Team Work , Presentation Skills
Type of the activity(individual activity/ group activity / home activity etc.)	Group
For questions for quiz must visit	Quiz On Soil

Sub section H_4: Assessment tool to assess students on objectives mentioned in subsection B4

- Q1. What is silt in Punjabi or Hindi called?
- Q2. What is meaning of clay in Punjabi or Hindi ?
- Q3. What are earthworms called in Punjabi or Hindi?
- Q4. Define percolation and give its name in Hindi or Punjabi?
- Q5. What is weathering ?
- Q6. Which animals live in soil give their English as well as Hindi or Punjabi name ?
- Q7. What is in soil which converts dead plants into nutrients
a) Moles b) Snacks c) air d) Earthworms
- Q8. What does organic mean regarding soil?
a) Easily Obtained b) From Plants & animals c) Man made d) Metal type
- Q9. In addition to the rock particles soil contains
a) Minerals b) Organic Matter c) Air & water d) All a), b) & c
- Q10. Breaking down of big pieces of rocks into small pieces is known as
a) Percolation b) weathering c) potatoes d) Breakdown

Section I Model assessment tool for the teachers

The resource person will conduct a doubt session on the last day of training session. He will give them the evaluation tool as per Sub Section I-1 & Then he will conduct a discussion session on Sub Section I-1.

After the discussion session He will give Invite them to present their topics one by one and will access them as per sub section I-2.

Sub Section I-1

Each question has 4 Marks (Maximum Marks 40)

1. Write a note on chemical weathering ?
2. Write a note on biological Weathering?
3. Write a note on Mechanical Weathering?
4. Write difference b/w absorption & Percolation?
5. Why horse dung is mixed with clay to make earthen pots?
6. In the activity ' Air in Soil' Why air bubbles come in the upward direction only?
7. Why we don't define the widths (in units of distance) of horizon layers?
8. What are the skills you will be able to develop while teaching percolation rate to the student ?
9. What is the benefit of teaching the students in the Lab?
10. What do you think about teaching through activities?

Sub Section I-2

Total Marks For this session 10

Teacher will give a presentation on any Topic assigned to him one day before.

Skill Assessed	Marks
Teaching Aptitude	3
Content Knowledge	4
Presentation Skill	3

Assessment Criteria

Marks Obtained	Grade
More Than 40	A1
35-40	A
30-35	B
Below 30	C

