Environmental Studies (Class-III)

Learning Outcomes	*Resource(s)*	*Week-wise Suggestive Activities (to be guided by Parents with the help of teachers)*
Child- • identifies relationships with and among family members. • describes roles of family members, family influences (traits/ features /habits / practices), need for living together, through oral/ written/other ways.	**NCERT/State developed Textbook** Children and Parents may also visit NROER, an online educational resource repository of NCERT and explore the EVS e-resource available online e.g., • Pahadon se samandar tak-	**WEEK-1** • <u>Draw your family tree. Ask about the likes/dislikes of each member and decorate it accordingly.</u> • Do some form of workout like skipping, yoga, free dance, puzzles, indoor games etc., at home. Parents may accompany their children to motivate them to be healthier and spend quality time together. (continue in week 2,3,4) **WEEK-2** • Children may enlist the work they do in a day (starting from the time they

• differentiates between objects and activities of present and past (at time of the elders). (e.g. clothes /vessels /games played/ work done by people). • creates drawings, designs, motifs, models, top, front, side views of objects, simple maps (of classroom, sections of home/school, etc.) and slogans, poems, etc. • observes rules in games (local. indoor, outdoor) and other collective tasks. • shows sensitivity for elderly and diverse family set ups in surrounding. (for diversity in appearance, abilities, likes/ dislikes and access to basic needs.) • describes need of food for people of different age groups; animals and birds, availability of food and water and use of water at home and surroundings	https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d25b99b16b51c0172408c91 • Parchhai- https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d1f17e216b51c0164772956 • Kahan se aya aya kisne pakaya (bhojan prakriya) https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d22d32716b51c01732f7abd • Kya kya khate hum https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d22dc3116b51c01732f7b1a	wake up till the time they sleep) and represent it pictorially through pie chart. It can be shared in class later. • Make a model of a house using waste material available at home like old newspaper, pieces of cloth, old box, match boxes, mud, clay etc. with the help of parents/elders. **WEEK -3** • What are the dos and don'ts recommended during Coronavirus outbreak? Make poster(s), of the same. • Children may be asked to record a voice message or write a message for their friend or family members. The message can be about anything like how they feel, what new they did/learnt during lockdown or anything which they wish to share. Children can give their message note to the family members or send the voice note to friends or relatives as surprise. **WEEK-4** • At home, children may be asked to observe the kitchen activities. Children may be encouraged to observe and list the activities and processes taking place in the kitchen. • Which other food items can be prepared using the listed cooking processes. Help your elders in the kitchen and other household activities.

Learning outcomes	***Resource(s)***	***Week-wise suggestive activities (to be guided by parents with the help of teachers)***

The learner • groups objects, according to differences/ similarities using different senses. (e.g., appearance/place of living/ food/ movement/ likes-dislikes/ any other features) using different senses. • identifies simple observable features (e.g., shape, colour, texture, aroma) of leaves, trunk and bark of plants in immediate surroundings • describes need of food for people of different age groups; animals and birds, availability of food and water and use of water at home and surroundings • differentiates between objects and activities of past and present. (e.g., transport, currency, houses, materials, tools, skills farming, construction, etc.) • identifies simple features (e.g., movement, at places found/kept, eating habits, sounds) of animals and birds) in the immediate surroundings • describes need of food for people of different age groups; animals and birds, availability of food and water and use of water at home and surroundings • records observations, experiences, information on objects/activities/ places visited in different ways and predicts patterns (e.g., shapes of moon, seasons)	https://www.youtube.com/watch?v=MhXIa9D3-ow Khel Khel Mein https://www.youtube.com/watch?v=GZj1297nf2s Wah kya swad hai	**Week 5** • Children may play the game 'Chinese Whisper' with their family. Everyone sits in a circle and one family member whispers a word in the ear of the neighbour who will pass it to the next one and so on. The last member speaks out the word loudly so that everyone can hear. If it is incorrect then he/she needs to do the task assigned by the person who said the word first. • Children may play Dumb Charade. One child enacts and other guess about it. • Children may learn to write a few alphabets in Braille and write secret messages for their friends/family members. **Week 6** • Take sprouted moong dal, chana and some peanuts and prepare sprout salad by mixing them and adding chopped tomato, onion, lemon juice and salt. • Find outrecipes of more salads from your elders, internet. **Week 7** • They will make a chart of what they eat daily. They may categorise them based on some of the following aspects— eaten as raw/ cooked/both the source part of plant eaten • Children may prepare healthy drinks with lemon, papaya or any other local fruits. They may name their brand and enlist the ingredients, manufacturing and expiry date, price, etc. **Week 8** • Children may enlist at least 8 to 10 food items that can be prepared from rice and wheat each and find out the recipes to prepare two to three items. What are the ingredients for preparing them? Help your elders to prepare if possible. • Prepare a chart with the name, colour of some grains and stick pulseson it.

• shows sensitivity towardsplants, animals, the elderly, differently-abled people and diverse family set ups in surroundings. (For the diversity in appearance, abilities, choices – likes/ dislikes, and access to basic needs such as food, shelter, etc.)		**Week 9** • Children may prepare an album (digital/hard copy) of different birds that they see around these days. • Parents or elders may pose riddles or puzzle games on birds, animals and their special features, like, the sounds they make, their nesting and food habits, etc. • They can make finger puppets of their favourite birds and animals and enact it through role play. **Week 10** • Parents may discuss with children about reduce and reuse of water in their house. Let them express this through drawing, poetry, letters, slogans, etc. • Students can click pictures or make videos with the help of their parents depicting how they save water in different activities at home. **Week 11** • Everyone of us is facing some or the other challenge these days. Write aletter to your friend/relative sharing how you feel and also what you think of them. • Collect some old letters from your elders and have a dialogue with them about the journey of a letter from the sender to the receiver. **Week 12** • Enlist the people and agencies who have a prime role in the time of any emergency situations (fire, earthquake, flood or even a pandemic like the present Coronavirus). • If you get a chance to talk to anyone of them then frame a few questions to ask/interact with them and prepare your report. Or • Visit the site associated with their services and prepare a brief report of what they do.

Environmental Studies (Class-IV)

Learning Outcomes	***Resources***	***Week-wise Suggestive Activities (to be guided by Parents with the help of teachers)***
Child- • identifies relationship with and among family members in extended family. • describes different skilled work (farming, construction, art/craft, etc.), their inheritance (from elders) and training (role of institutions) in daily life. • creates collage, designs, models, rangolis, posters, albums, and simple maps (of school/neighbour hood etc.) using local/waste material. • explains the process of producing and procuring daily needs (e.g., food, water, clothes) i.e., from source to home. • suggests ways for hygiene, reduce, reuse, recycle and takes care of different living beings (plants, animals, and the elderly, differently abled people)	**NCERT** Textbook /State developed Textbook Children and Parents may also visit NROER, an online educational resource repository of NCERT and explore the EVS e-resource available online eg. • Jaanm pramad patra- https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d1ef85916b51c016225de07 • Cylinder lo magar dhyan se https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d230fe116b51c01725581dd • Dadi ki rasoi se https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d1efb1116b51c016313bfa3 • Savdhani hi suraksha https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5d23098116b51c01725581d4	**WEEK-1** • Draw an extended family tree of your maternal and paternal side. Talk to your grandparents and parents about how different are your family tree from the family tree of their childhood. • Encourage the student to do some workout eg. skipping, free dance, yoga, puzzles, indoor games etc. at home. Parents may accompany their children to motivate to be healthier and spend quality time together. (continue in the following weeks also) • Children may help siblings and elders in various household tasks for the period they spend at home. **WEEK -2** • What are the changes that you see around now? How are these different from the life when you go to school? Are these different from when you had the summer or winter vacations? How? • At home, children may be asked to observe the kitchen activities. Children may be encouraged to observe and list the food items (cereals, pulses, spices etc.) and help the elders in the kitchen. • Use creative ways to prepare five innovative messages for public awareness on Corona outbreak.

		WEEK-3 • Talk to the people in family, or friends, neighbours or relatives over phone and develop a list of indoor games which they used to play in their times along with rules of the games. • Children may develop a 'Game Book'. Parents should encourage the children to play these games also. **WEEK-4** • Ask the children to write what they used to do in school during school hours (period wise) and what they do at home now during the school time and compare the two situations. Children may also do the same for other family members. • Write some ways in which you or your family members helped each other during the lockdown period.

Learning Outcomes	*Resource(s)*	*Week-wise suggestive activities (to be guided by parents with the help of teachers)*
The learner a. records her observations / experiences/ information for objects, activities, phenomena, places visited (mela, festival, historical place) in different ways and predicts patterns in activities/ phenomena. b. groups objects, materials, activities for features and properties, such as, shape, taste, colour, texture, sound, traits, etc. c. voices opinion on issues observed/ experienced in, family/school/ neighbourhood, e.g., on stereotypes (making choices/ decision making/ solving problems), discriminatory practices on caste in use of public places, water, MDM/ community eating, child rights (schooling, child abuse, punishment, labour). d. voices opinion on issues observed/ experienced in, family/ school/ neighbourhood,	*Samay Badal Gaya* https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d1f14ec16b51c016477294b *Kilometer ya Meter* https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d23337916b51c01732f8154	**Week 5** • Enlist different fuels being used at home. Compare them with respect to the use, cost, availability, pollution emitting aspects etc. • Children may collect data on price and consumption of petrol/diesel over the last fiveyears and present their results pictorially/ graphically. **Week 6** • Identify some material like notebook, pencil, pencil box, eraser,etc. What could be the various ways to measure their length? Try for other objects around, like, table, door, windows of your house. Record your observations. • Enlist various eatables in kitchen and find out the rate of each item. How are these weighed? (e.g., pav, ser, Man, tola, kilogram, gram, litre, mL or any other) . Which out of these are local units? Try to find the relation among local and standard units. • Visit the site of FSSAI and find out how you can check the adulterated food material at home. Try to do that yourself. **Week 7** • Children may play different games like treasure hunt with their siblings, parents or elders, involving rules for finding the object with suitable clues and directions. • Children may draw a lay out of their house/ lane and mark different areas. Parents can frame questions to help them acquire a sense of the directions. • Write your name in Braille. Try to learn a few alphabets in Braille and send a secret message to your friend **Week 8** • Children may do the activity of role play at home on safety in kitchen as a theme. • Prepare a list of guidelines to observe safety measures and to deal any emergency situations ?

e.g., on stereotypes (making choices/ decision making/ solving problems), discriminatory practices on caste in use of public places, water, MDM/ community eating, child rights (schooling, child abuse, punishment, labour). e. suggests ways for hygiene, health, managing waste, disaster/emergency situations and protecting/saving resources (land, fuels, forests, etc.) and shows sensitivity for the disadvantaged/ deprived. f. records her observations / experiences/ information for objects, activities, phenomena, places visited (mela, festival, historical place) in different ways and predicts patterns in activities/ phenomena. g. identifies different features (beaks/ teeth, claws, ears, hair, nests/shelters, etc.) of birds and animals. h. identifies relationship with and among family members in extended family.		**Week 9** • Are there any people who lost their jobs during this pandemic? Find out how are they supporting their families? • Collect the news items on this and suggest some ways how to help such people. **Week-10** • Using torch children can form shadows using objects of different shapes like ball, glass, bowl, spoon, plate, box pencil, andnotebook. In the dark room they may keep the light source at one side and keep the object in between the light source and the wall. Take your observations when the light source is— • far from the object. • near to the object. • on the right side of the object. • on the left side of the object. • do shadows change with the size of the object, distance between torch and the object, distance between object and the wall/both. • According to you, under which conditions does shadow formation take place? • Children can do this activity with their hands and fingers using a torch as mentioned above. **Week 11** • Children may prepare a chart and draw/ or paste pictures of animals with— • big ears • small ears • no visible ears • Compare these animals and enlist the similarities and dissimilarities among them. **Week 12** • Their parents can tell them their childhood stories like how they used to spend time without mobile andcomputer • Students can see their family pictures when they were not born. • Most of the families belong to any other place where their elders used to stay. • They can make a family tree of their mother's family and their father's family. • They can collect images even from mobile.

Subject: Environmental Studies (Class V)

Learning outcomes	Resource(s)	Week-wise suggestive activities (to be guided by parents with the help of teachers)
The learner a. explains the use of technology and the process of accessing basic needs (food, water etc.) in our daily life. (e.g., farm produce to kitchen; grains to Roti, preservation techniques, storage and tracking of water source) b. records observations and experiences; information in an organised manner (e.g., in tables/ sketches/ bar graphs/ pie charts) and predicts patterns in activities/ phenomena (e.g., floating, sinking, mixing, evaporation, germination, spoilage) to establish relation between cause and effect c. guesses (properties, conditions of phenomena), estimates spatial quantities (distance, area, volume, weight, etc.) and time in simple standard units and verifies using simple tools/set ups. (e.g., floating/sinking/ mixing/evaporation/ germination /spoilage/ breathing /taste) d. suggests ways for health, managing waste, disaster/ emergency situations and protecting/ saving resources and shows sensitivity for the disadvantaged/ deprived.	*Jadon Ka Jadoo* https://www.youtube.com/ *Blow Hot Blow Cold* https://www.youtube.com/watch?v=nhwLyI7Nq1g watch?v=IyBrcRrLVBo	**Week 5** Children may take three bowls and put some dry chana (chick peas/black gram). In one of the bowls dip the chana under water and in the other wrap them in wet cotton whereas in the third one they can keep it as it is. Observe each one carefully and record the changes in the seeds in each bowl everyday. Tabulate your data to find out. ☜ In how many days were the seeds germinated? ☜ In which bowl did the seeds germinate first why? ☜ In which bowl, did the seeds not germinate or germinated last and Why? ☜ Watch the video at the given link **Week 6** • When we feel cold, we blow hot air in our palms to feel warm but when we blow on a hot cup of milk, we make it cool. Please refer to the video link and perform the activities as shown to understand the concept **Week-7** • Help children to collect materials made up of wood, metal, plastic, glass and test them for sinking and floating in a water-filled bucket. • Collect materials of different shapes, e.g. Plastic- bowl and spoon Wood- block and ice cream stick Glass- bowl ,plate Steel- pin, spoon , bowl Piece of Aluminium foil- flat sheet , rolled in a all Paper – sheet, boat, ball Try to make floating object sink and a sinking object float. • Children may collect a spoon of salt, sugar, coffee, chalk powder, milk powder, etc. Add them one by one to a glass of water. They may note their observations on which materials were dissolved and which were not. • Students may write their questions for the above mentioned activities and probable answers according to them. Later they may discuss them with their subject teacher.

e. identifies signs, directions, location of different objects/ landmarks of a locality / place visited in maps and predicts directions in context of positions at different places for a location f. describes the interdependence among animals, plants and humans. (e.g., communities earning livelihood from animals, dispersal of seeds, etc.) g. Traces the changes in practices, customs, techniques of past and present through coins, paintings, monuments, museum etc. and interacting with elders. (e.g., cultivation, conservation, festivals, clothes, transport, materials or tools, occupations, buildings and houses, practices activities like cooking, eating, working)	https://www.youtube.com/watch?v=M15OeCuhdtQ *Mera Janm Card*	**Week 8** • Enlist various activities (like agriculture, cleaning, medical, security, teaching, banking, designing, tailoring, construction work, photography, singing, dancing, cooking) that you see people do in your house and neighbourhood . • Categorise them into essential and non-essential for survival of life. • What do they feel about those persons who are still doing that work when most of the people are at home? **Week 9** • Children may read their birth certificates and answer the questions framed by the parents/ teachers/elders. Children can also frame questions. The corresponding video may be used as reference. • Children may read vaccination card to know about different vaccines, related diseases and other information.
h. explains the role and functions of different institutions in daily life. (Bank, Panchayat, cooperatives, police station, etc.)	*Kapaas Se Kapde Tak* https://www.youtube.com/watch?v=i0HkVaDAigY&feature=youtu.be *Faand Lee Deewar* https://www.youtube.com/watch?v=5iEFXLAT5Ls https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d22dc3116b51c01732f7b1a	**Week 10** • Watch the video and depict the journey of fibre to fabric through drawing. Give appropriate captions to each. **Week 11** • Which games do you and your friends play? • Which games have you heard of but never played? • Which games do you wish to play but cannot? What are the reasons for the same? • Do you think all games can be played by everyone irrespective of his/her age caste, gender, etc. • Are there any games whicharemeant for only boys or only for girls? What is your opinion about this? **Week-12** • Visit the site of NDMA and find out about the safety measures to be adopted during disasters/ emergencies. Try to assemble a kit that is most relevant to the area where you live in.

Science (Class-VI)

Learning Outcomes	*Source/Resources*	*Week-wise Suggestive Activities (to be guided by Parents with the help of teachers)*
The learner ● Identifies food items and their ingreadients; what animals are eating such as, squirrel eat nuts. ● Classifies food materials and sources into different groups such as, fruits, vegetables, cereals etc.; animals into Hervivores, Carnivores and Omnivores; food as animal products or plant products. ● conducts simple investigations to seek answers to queries, e.g., what are the nutrients present in honey? ● relates processes and phenomenon with causes such as, making of sprouts and seed germination. ● make efforts to protect environment such as, minimising wastage of food. ● exhibits creativity in designing, planning, making use of available resources. ● exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices.	***Source:*** NCERT/State developed Science Textbook for Class VI E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT. NCERT *Science Laboratory Manual* at Upper Primary Stage http://ncert.nic.in/ncerts/l/fhelm202.pdf NCERT Science Exemplar Problems class VI http://ncert.nic.in/ncerts/l/feep201.pdf Link 1 https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/58872e0d472d4a1fef81190f Link 2 https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5886fb11472d4a1fef810195 Link 3 http://aven.amritalearning.com/index.php?sub=99&brch=289&sim=1433&cnt=3271 2. Link 4 http://aven.amritalearning.com/index.php	***Theme: Food*** **WEEK 1** 1. The learner can be asked to observe different contexts and situations from the immediate environment such as things that are inside/outside their room/ kitchen/ house, etc. 2. The learner can prepare a list of food items available in the kitchen (with the help of an elder sibling). **WEEK 2** 1. The learners can make lists or menu charts containing dishes of their region generally prepared at their homes and discuss about it with family members/peers/ teachers. 2. The learners may be asked to watch Link 1 and make sprouts at home. They can use different cereals like *whole moong*, black gram, *rajma*, etc., for making sprouts. **3.** The learner can draw on chart paper the items they eat for their meals (breakfast, lunch and dinner). **WEEK 3** 1. The learner may be asked to watch Link-2 and use available resources at home such as, books, journals, internet, etc. to search for methods to test the following food components: □ Protein □ Starch □ Fat The learner may be asked to take some groundnut powder / coconut powder. He/ she should wrap it in a piece of paper and press on it gently,

• identifies components of food present in your diet. • Classifies components of food into starch, protein and fat; diseases/disorders caused by deficiency of vitamins and minerals. • conducts simple investigations to seek answers to queries, e.g., what are the nutrients present in salt? • draws labelled diagrams / flow charts of food items they eat. • relates processes and phenomenon with causes such as, deficiency diseases with diet. • applies learning of scientific concepts in day-to-day life, e.g., selecting food items for a balanced diet. • makes efforts to protect environment such as, minimising wastage of food. • exhibits creativity in designing, planning, making use of available resources. • exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices.	?sub=99&brch=289&sim=1433&cnt=3272 Link 5 http://aven.amritalearning.com/index.php?sub=99&brch=289&sim=1433&cnt=4185 Link 6 http://aven.amritalearning.com/index.php?sub=99&brch=289&sim=1433&cnt=3273	taking care that the paper does not tear. He/ she should observe the paper carefully. □ An oily patch on paper shows that the food item contains fat. □ If no oily patch, it means the food item does not contain any fat. 3. The learner may be asked to read the paragraph on balanced diet In NCERT Science textbook and prepare a chart/collage containing items present in a balanced diet. 4. The learner may be asked to take a tomato or a fruit such as an apple. He/she may cut it into small pieces (take precaution/ under observation of elder). Do your hands get wet while doing so? (many food materials contain water in themselves). 5. The learner may use different food items but take care not to waste food material. **WEEK 4** ***The learner may be asked*** □ In your kitchen, there are variety of food items, classify it into healthy and junk food items? □ Take one packaged food product of your kitchen and observe its packet carefully such as: ➢ Manufacturing date ➢ Expiry date ➢ Vegetarian/non-vegetarian ➢ Ingredients present in it ➢ Any other information Note down all the information and discuss with your family/peer/ teacher. □ Read and watch 3, 4, 5 and 6 links /documents and perform the task mentioned in the videos carefully.

Science (Class VII)

Learning Outcomes	*Source/Resources*	*Week-wise Suggestive Activities (to be guided by Parents with the help of teachers)*
The learner — • identifies different types of motions on the basis of observable features such as motion along a straight line or along a circular path etc. • differentiates between different types of motions on the basis of their properties such as the speed, change in direction of motion etc. • conducts simple investigations to seek answers to queries, e.g., change in time period on changing length of pendulum or mass of bob • measures and calculates time required to complete a task, cover a distance; speed of moving objects; time period of a simple pendulum, etc. • draws diagrams/ plots and interprets graphs e.g., distance-time graphs • constructs models	**NCERT/State Textbook** ***Theme: Moving Things, People and Ideas*** *Chapter: Motion and Time* Slow or Fast Speed Measurement of Time Measuring Speed Distance-Time Graph ttp://ncert.nic.in/textbook/pdf/gesc113.pdf Chapter 13 NCERT Science Textbook Class 7 Laboratory Manual in Science for Class VI-VIII ttp://www.ncert.nic.in/exemplar/labmanuals.html E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT.	**WEEK 1** ***The learner may be asked to*** □ Observe his/her surroundings and make a table of different things which are in motion. Further classify these moving things according to their type of motion. The observations can further be divided into fast and slow moving things. □ Write justifications for each entry you made in the table, i.e. why it has been kept in that column? □ Draw the pictures/diagrams of your observations and decorate it. (Art integrated Learning) □ Find the speed of hopping on one leg. (Activity 36 from the below link) http://ncert.nic.in/ncerts/l/fhelm205.pdf The activity may be modified so that it can be performed within the house or room. Use a regular stopwatch/ or stopwatch in the mobile. The distances can be changed so as to fit in within the available length. Then try to answer the questions given after the activity. □ **Search on the internet how people used to measure time before the invention of modern clocks/watches**. (links should not be provided everywhere because our learners need to become independent learners). □ **By using a time measuring device available in your house (clock, wrist watch or mobile) measure time required for different daily life activities.** For example, while cooking rice, pulses, filling one bucket of water, the time taken by a fan to completely come to rest after it is switched off, the time taken by ½ litre and 1 litre milk to boil under same conditions, etc. Record your observations in your copy

using materials from surroundings and explains their working, e.g. SUN DIAL, Simple Pendulum • discusses and appreciates stories of scientific discoveries • applies learning of scientific concepts in day-to-day life, e.g. in measuring speed of different moving objects • exhibits creativity in designing, planning, making use of available resources, etc. eg. Measuring distance in absence of standard scales by using objects of known lengths etc. • exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices etc such as reporting the findings honestly, supporting other friends in need etc		and discuss with your friends, elders or teachers. **WEEK 2** □ **Project**: Make your own sundial. (For details, refer to your textbook or the internet.) □ **Make a simple pendulum and find its time period**. (Activity 13.2 NCERT Textbook) □ **Perform the above mentioned activity by changing the length of the pendulum and also by changing the mass of the bob.** Write your observations in each case. ➢ Do you observe any change in time-period on changing the length of the pendulum or mass of the bob? ➢ Search on the internet to find the reasons for your observations or you can discuss with your friends, elders or teachers. Caution: Perform all the activities under the guidance of elders. □ **Measure speed of any rolling object**. (Activity 13.4 NCERT textbook) https://www.youtube.com/watch?v=SpyO-ty1j5o □ Watch this programme and try to understand about different types of graphs and their nature. □ Make a distance time graph for your toy car or any rolling object.Identify its type of motion and speed from this graph.
Learner: □ identifies electric components on the basis of observable features, i.e., appearance, functions, etc. eg. Identifying Switch,	**Theme: How Things Work — *Electric Current and its Effects*** Symbols of Electric Components Heating Effect of Electric Current Magnetic Effect of	**WEEK- 3** ***The learner may be asked to*** **Identify the electric components used in the house. Draw their diagrams; write their names and symbols.** □ Learners may take help from their textbook and also search on the internet for the symbols not available in the book. □ Open the link given below

regulator etc on their function • differentiates between different effects of electric current, on the basis of certain observations eg. Heating effect, magnetic effect etc. • conducts simple investigations to seek answers to queries, e.g., effect of adding more number of cells in an electric circuit • relates processes with causes, e.g., heating of conducting wire, deflection in magnetic needle due to a current, etc. • explains processes, e.g., heating and magnetic effects of electric current, etc. • draws labelled diagrams and circuit diagrams of electric components, electric circuits, organ systems electric circuits; experimental set ups; etc. • constructs models using materials from surroundings and explains their working, e.g.,	Electric Current Electromagnet Electric Bell Chapter 14 NCERT Science Textbook Class VII http://ncert.nic.in/textbook/pdf/gesc114.pdf Exemplar Problems, Ch. 14, Class VII Science http://ncert.nic.in/ncerts/l/geep114.pdf Laboratory Manual in Science for Class VI-VIII http://www.ncert.nic.in/exemplar/labmanuals.html E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT. Chapter 13, Class VI NCERT http://ncert.nic.in/textbook/pdf/fesc113.pdf	https://www.youtube.com/watch?v=4IIT2_s7Q1g8&feature=youtu.be **Watch the video carefully and try to make your own circuit for this and play with your family members**. • Open the link given below https://nroer.gov.in/5645d28d81fccb60f166681d/file/58871106472d4a1fef810c49 • **Watch the video carefully and try to make your own simple electric switch.** ***Note:*** *Instead of generator shown in the video you can use a combination of two dry cells and in place of crocodile clips you can use copper wires directly.* • **Make an electric circuit as shown in Fig. 14.7 in Ch. 14 of NCERT Textbook (Class VII Science).** ***Note:*** *Nowadays mostly we find LEDs instead of the bulb shown in the figure. If LED is available instead of the bulb shown in the figure, then make sure that you are connecting positive terminal of the cell to the longer leg of the LED.* For making these circuits, take help from your elders and try to find an old torch or other electrical devices from which you can collect the required items for your circuits. • **Make a simple electric circuit using few dry cells, LED or torch bulb and wires.** Observe the effect on intensity or glow of bulb on increasing the number of cells in the circuit. Repeat the activity with a fuse torch bulb and note the observations. Discuss the observation with your friends, elders and teacher. • Open the link given below https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5b4d793e16b51c01e4ec660a **It is an interactive simulation, play with the simulation to learn more about electric circuits.** ***Heating effect of electric current*** • **Make an electric circuit as shown in Fig. 14.7 or Fig. 14.9 or Fig. 14.10, Ch. 14**

electromagnets; electric fuse, etc. • discusses and appreciates stories of scientific discoveries eg. How magnetic effect of electric current was discovered etc. • applies learning of scientific concepts in day-to-day life, e.g., connecting two or more electric cells in proper order in devices; discussing the importance of electric fuse in the circuits etc. • exhibits creativity in designing, planning, making use of available resources, etc. eg. finding magnets from broken or non working speakers or headphones etc.		**NCERT Textbook (Class VII Science).** After keeping the switch ON for few seconds, touch the bulb (Fig. 14.7) or wire (Fig. 14.10) connected in the circuit. What have you observed? Discuss with your friends, elders and teacher about your observations. • **Collect information about various electrical equipments whose performances are based on the heating effects of electric current. This information can be collected by discussing with elders, friends, teachers or by surfing on internet. Try to identify the equipments in your house which work on this effect.** **WEEK-4** • **Make a circuit as suggested in Activity 14.4 in NCERT Textbook (Class VII Science), for understanding the purpose of a fuse in an electric circuit.** Discuss the importance of fuse in an electric circuit with your friends. **You can write a short narrative for emphasizing the need of an electric fuse in our household circuits. You can also make a poster showing the need of electric fuse in circuits.** • **Perform the activity 14.5 as suggested in NCERT Textbook (Class VII Science), for understanding the magnetic effects of electric current.** ***Note:*** *You may not have a magnetic needle in your house, for this you can use a magnetized pin fitted in cork or thermocol floating on water surface (Refer to Activity 6 Ch. 13 NCERT Text book Class VIh). You may have a magnet or try to find a magnet from the old radio, speakers or head phones which are unusable.* • Change the polarity of cell used or number of cells used in the circuit. • Note down your observations. Discuss your observations with your friends, elders or teacher.

• **Open the link given below** https://www.youtube.com/watch?v=_a1E_WahLuGY&feature=youtu.be **Watch the video carefully and try to understand how magnetic effect of current was discovered.** ***Project:*** *Make an electromagnet using dry cells, iron nail and insulated wire.* **During the project, try to find out answer of following questions:** **What do you observe when number of turns is increased or decreased?** **Do you observe if number of cells is increased or decreased in the circuit?** **Note your observations and discuss with your friends, elders and teacher.** **Try to find out the uses of electromagnets in our daily lives.** **Write down the differences between a permanent magnet and an electromagnet.** **Search on the internet and try to understand how an electric bell works. Which effect is responsible for its working?** **Discuss your findings with your friends, elders and teacher.** ***Note:*** *Since everyone is supposed to stay at home, therefore all the communications with friends and teachers should be done through call or chat. Learners may take pictures or videos of their circuits/devices and can share with their friends and teachers.*		

Science (Class-VIII)

Learning Outcomes	*Sources/Resource*	*Week-wise Suggestive Activities (to be guided by Parents with the help of teachers)*
Learner • classifies materials such as, natural and human made fibres; • differentiates different types of synthetic fibres based on their properties/ characteristics; biodegradable and non-biodegradable materials etc. • conducts simple investigations to measure strength of different fibres • draws flow charts to depict types of synthetic fibres , their characteristics and uses. • applies learning of scientific concepts in day to-day life such as why synthetic fibres should be avoided near fire, why to become fibre wise etc. • discusses and appreciates stories of scientific discoveries such as discovery of Nylon makes efforts to protect	**NCERT/State developed Textbook Theme-Synthetic Fibres** • **Synthetic fibres** • **Types of synthetic fibres** • **Characteristics of synthetic fibres** • **Plastic** Learners, Teachers and Parents may use the following materials: • E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT. • Live telecast of various science concepts at Swayam Prabha Channel (https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA) • Laboratory Manual in Science for Class VI-VIII http://www.ncert.nic.in/exemplar/labmanuals.html • Exemplar Problems in Science for Class	**WEEK 1** ***Theme- Material*** • **Synthetic fibres** • **Types of synthetic fibres** **Task** ***The learner may be asked to*** • Collect some samples of cloth materials made up of natural and synthetic fibres. • Compare their texture and strength. • Make an album/ scrap book by pasting these pieces and write differences you observed among them. • Ask elders about the names of various fabrics of cloth materials. **Task** • Write a story on discovery of Nylon • Make an audio clip on discovery of Nylon and share it in group created by your teacher. **WEEK 2** ***Theme- Material*** • **Characteristics of synthetic fibres** • **Plastic** **Task** • Identify the articles/cloth materials made up of synthetic fibres and observe their characteristics such as strength, action of water, action of heat under supervision of elders. • Observe household articles made of plastic. • Write a note on use of plastic in our daily lives. • Discuss your opinion on the use of plastic with your family members and

environment e.g., using plastic and its products judiciously; becoming fiber wise, develop	VIII http://www.ncert.nic.in/exemplar/index.html#view3 Synthetic Fibres and Plastics	friends. Do you think its use can be avoided? Discuss about alternatives of plastics with peers on group made by your teacher.

environment friendly habits by following 5 Rs	http://ncert.nic.in/ncerts/l/heep103.pdf Material: Metals and Non-Metals http://ncert.nic.in/ncerts/l/heep104.pdf Learning Outcomes at Elementary Stage http://www.ncert.nic.in/publication/Miscellaneous/pdf_files/tilops101.pdf	Discuss about Biodegradable and non-biodegradable materials with peers on group made by your teacher. Write slogans to create an awareness about 5Rs **(Reduce, Reuse, Recycle, Recover and Refuse)**
Learner differentiates materials such as, metals and non-metals. classifies materials based on their properties/ characteristics, e.g., metals and non- metals conducts simple investigations to seek answers to queries e.g. effect of air and water on different metallic and non-metallic substances, nature of metallic and non-metallic oxides, etc. relates processes and phenomenon with causes, e.g. why does iron get rusted etc, explains processes and phenomenon such as rusting of iron, loss of gold during cleaning of gold jewelry etc Writes word equation for chemical reactions, e.g., reactions of metals	***Theme- Materials: Metal & Non-metals*** **Physical properties of Metals and Non-metals** **Chemical properties of Metals and Non-metals** **Uses of Metals and Non-metals** Students, Teachers and Parents may use the following materials: E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT. Live telecast of various science concepts at Swayam Prabha Channel (https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA) Laboratory Manual in Science for Class VI-VIII	**WEEK-3** ***Theme- Material*** ***Physical properties of Metals and Non-metals*** **Task** **Identify items in your house which contain metals. Try to identify the metals in them.** Listen to the audios mentioned and try to understand the properties of metals and **explore physical properties of metals in your surroundings such as malleability, ductility, sonorous etc.** ***How metals are*** https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/59f0242e16b51c59f65dfa89 **Dazzling Flame** https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/59f0240716b51c59f65dfa43 **Discuss about physical appearance of metals on the basis of your observations with your friends on the group created by your teacher** **Attempt quiz on the link given:** https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5d38488a16b51c0173e679a2 Make a comic script on properties of metals and non-metals

and non-metals with air, water and acids, etc. • draws labelled diagram of activities , simple investigations related to metals and non-metals ,experimental set ups, etc. • applies learning of scientific concepts in day to-day life, e.g., purifying water; using appropriate metals and non-metals for various purposes , loss of gold during cleaning by jewelers etc • makes efforts to protect environment, e.g making controlled use of fertilisers and pesticides; • exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices	http://www.ncert.nic.in/exemplar/labmanuals.html • Exemplar Problems in Science for Class VIII http://www.ncert.nic.in/exemplar/index.html#view3 • Synthetic Fibres and Plastics http://ncert.nic.in/ncerts/l/heep103.pdf • Material: Metals and Non-Metals http://ncert.nic.in/ncerts/l/heep104.pdf • Learning Outcomes at Elementary Stage http://www.ncert.nic.in/publication/Miscellaneous/pdf_files/tilops101.pdf	**WEEK 4** ***Themes:*** • ***Chemical properties of Metals and Non metals*** • ***Uses of Metals and Non-metals*** **Task** • Watch the video on given link https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/58a3fd42472d4a68b79527f2 *Try to answer the following:* ➢ Name some metals used in daily life. ➢ Why metal sheets can be prepared? ➢ Metals are ductile. Comment on it. • Listen to the audio on the links given below and try to understand the reaction of sodium metal with water: **Sodium rap** https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/59f024ca16b51c59f65d fb62 • Listen to the audio on the link given below and try to understand the reaction of non-metal with air. Write its word equation. **Jal gaya sulphur** https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/59f0243616b51c59f65d faa0 • Listen to the audio and watch the video on the links given below: (**Munni kyon udaas hai**) Audio link: https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/59f0246316b51c59f65d fafe Video link: https://www.youtube.com/watch?v=BNExO7BapKc • Try to understand the reaction of metal with air and water. • Write word equation for the reaction. • Explore about the amount of loss occur due to rusting of iron every year in our country. Comment on what measures can be taken to prevent rusting of articles. • Collect some rust from rusted articles in your house and investigate its nature by using any available natural indicator • Create a rap song on uses of metals and non-metals and share it in your group.

CLASS IX

Science (Class-IX)

Learning Outcomes	*Sources/ Resources*	*Week-wise Suggestive Activities (to be guided by teachers/parents)*
The learner • relates processes and phenomena with causes and effects, such as, symptoms with diseases and causal agents • explains processes and phenomena, such as, spread of diseases and their prevention • measures physical quantities using appropriate apparatus, instruments, and devices, such as, temperature using thermometer, etc. • applies scientific concepts in daily life and solving problems, such as, takes preventive measures to control disease causing agents, etc. • exhibits values of honesty, objectivity,	**NCERT/State Textbook** ***Theme:*** Why Do We Fall Ill • Link 1: https://www.who.int/diseasecontrol_emergencies/publications/idhe_2009_london_inf_dis_transmission.pdf • Link 2: https://www.youtube.com/watch?v=bB_Pk0Wr1Zg&t=130s • Link 3: https://www.youtube.com/watch?v=36WwOX1yFqQ&feature=youtu.be • Link 4: https://www.mohfw.gov.in • Link 5: https://www.mohfw.gov.in/pdf/ProtectivemeasuresEng.pdf • Link 6: https://www.mohfw.gov.in/pdf/ProtectivemeasuresHin.pdf	**WEEK 1** • After reading Link 1, try to answer the following: ➢ Explain how different modes of transmission cause different diseases. ➢ Make a table of the different kinds of diseases, their mode of transmission and their symptoms. ➢ What kinds of diseases can be prevented by practicing hand-washing? • After the videos in Link 2 and 3 and reading the information in Link 4, 5, 6, 7 and 8, try to answer the following: ➢ Explain how the virus can be spread. ➢ What is the correct procedure to wash hands? ➢ Explain the preventive measure for COVID-19. ➢ What can you do as an individual to avoid the spread of COVID-19? **WEEK 2** • If there is a clinical thermometer in your house, measure your body temperature by keeping it in your armpit and compare it with the room temperature. Find out from authentic sources in the internet what the normal body temperature is. Take precautionary measure not to break the thermometer since it contains mercury. If there is no thermometer in your home, watch some videos on how body temperature or temperature in liquids is measured. • Make your own poster about the precautionary measures to be taken in order

thinking,	Link 7:	to avoid the spread of COVID-19 and share

freedom from myths, superstitious beliefs while taking decisions, respect for life, etc., such as, myth about transmission of diseases, belief that vaccination is not important for prevention of diseases, etc. • communicates the findings and conclusions effectively, such as, those derived from experiments, activities, and projects both in oral and written form using appropriate figures, tables, graphs, and digital forms, etc.	https://www.mohfw.gov.in/pdf/Poster_Corona_ad_Eng.pdf • Link 8: https://www.mohfw.gov.in/pdf/Poster_Corona_ad_Hin.pdf • Link 9: https://www.indiatoday.in/india/story/coronavirus-cases-in-india-covid19-states-cities-affected-1653852-2020-03-09	the picture of the poster with your friends, relatives, etc. • What changes in your lifestyle have you made to avoid contracting various diseases? Make a list on a chart paper/sheet of paper and share a picture of it with your classmates. **WEEK 3** • Read your textbook and other resources from the internet to explain some of the myths associated with the spread of diseases such as HIV, Tuberculosis, vaccination, COVID-19, etc. Make your own poster about the myths associated with COVID-19 and share the picture of the poster with your friends, relatives, etc., via email, Whatsapp, Facebook, etc. • Collect data from reliable sources from the internet about the trends in the number of people infected by COVID-19 in different states in India (Link 9) or in different countries and the number of people who have recovered or succumbed due to the infection. Present your data in the form of an appropriate graph. **WEEK 4** E. Recall the modes of transmission of diseases which you have learned. Now explain the modes of transmission of various diseases in the form of a diagram. Make it as elaborate as possible.

Students and Parents/Guardians may also visit NROER, an online educational resource repository of NCERT and NCERT website and explore e-resources available online related to the topic. The following are the links for the activities for easy access.

- Supplementary material on Sanitation and Hygiene: http://www.ncert.nic.in/publication/Miscellaneous/pdf_files/Sanitation_hygiene.pdf

- Diseases and its causes: https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5c8f1e7116b51c01ee839478
- What is Rotavac? https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5835786616b51c4587b7aaf5
- Vector and Disease: https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5d39993d16b51c0167542412

Disease caused by microorganisms: https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5d3add0616b5

CLASS X

Science (Class-X)

Learning Outcomes	*Sources/ Resources*	*Suggested Activities (to be guided by teachers/parents)*
The learner • classifies chemical reactions on the basis of their properties. • plans and conducts simple activities/ experiments to verify the reactions and seek answer to his/her own queries • explains various types of reactions and their conditions • draws labelled diagrams for set up of activities/ experiments • calculates using the data given, such as, number of atoms in reactants and products to balance a chemical equation • uses scientific conventions to representsymbols, formulae, and equations for	**NCERT/State Textbook** **Chapter 1- Chemical Reactions and Equations** **Content discussed in the textbook** • Writing a chemical equation • Balancing a chemical equation • Types of chemical reactions • Corrosion • Rancidity ➢ E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbook of NCERT. ➢ Live telecast of various science concepts at Swayam Prabha	***Theme – Material*** **WEEK 1** • Open the given link https://www.youtube.com/watch?v=_AiYmM1OTJI&feature=youtu.be Watch the video carefully, you can see many reactions taking place in the video. Pause the video after each reaction and translate each reaction into chemical equation and then balance it. • Open the given link https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5b1e12bf16b51c01dc2f95c3 This is an interactive image based on experimental setup. Write the balanced chemical equation for the same. ☐ Have fun with your friends. Develop a crossword puzzle based on chemical reactions. Share with your friends on Whatsapp group. Give at least half an hour to complete and then discuss with them the key along with reasons. ☐ Identify and note at least ten chemical reactions taking place in your home/ kitchen and give

balanced chemical equations and also physicalstatesof substances • identifies the apparatus and handles the materials carefully • applies scientific concepts in dailylife	https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA ➢ ITPD package developed for teachers teaching Science at Secondary Stage http://www.ncert	reasons for the same. You can discuss about them with your parents or friends on Google group/ WhatsApp group, etc. After doing couple of activities, do some work out at home. For example, stretching exercises, skipping, dance, yoga, indoor games, etc. Parents must motivate their children. This you should follow even after your school

such as concept of oxidation reactions which make food rancid, corrosion of objects, etc.

- draws conclusion for various reactions taking place in home/kitchen
- exhibits creativity in designing the game.
- exhibits values of honesty, objectivity, rational thinking by reporting and recording experimental data accurately.
- communicates the findings and conclusions of the activities/ experiments/orally and in written form effectively
- makes efforts to conserve environment by making judicious use of materials and keeping the surroundings/ home clean.

.nic.in/departments/nie/dse/activities/advisory_board/PDF/teaching_sc.pdf

- Laboratory Manual in Science for Class X

http://ncert.nic.in/ncerts/l/jelm102.pdf

- Exemplar Problems in Science for Class X

- Chemical Reactions and Equations

http://ncert.nic.in/ncerts/l/jeep101.pd f

reopens.

WEEK 2

- Develop a game using cards (cards you can make from thick sheets of paper). Write symbols of elements, formulae, valencies and names of various reactions on different cards.These cards can be used for learning balancing of chemical equations and also in classifying chemical reactions.
- You can make video of this game and share with your friends. You can also play the game with your classmates ones your school reopens.
- Take grape juice, lemon juice, orange juice, soap solution, baking soda solution separately in different containers. You may also take solutions available at your home. Dip one shining iron nail.
- in each of these solutions and keep one nail for comparision.
- Record your observations for a week or so on the basis of following:
  - Change in physical apperance of the nails
  - Change in the appearance of the solutions
  - Identify the changes as physical or chemical with reasons.
  - You can also draw diagram of this experimental setup.

(Remember that we are not moving out of the home due to COVID19. So, try to do the activities with whatever material is avaliable at home).

Read the chapter carefully from your textbook. Also, open the link and watch the video carefully
https://www.youtube.com/watch?v=_AiYmM1OTJI&feature=youtu.be
Draw a Table/Flow chart writing various chemical reactions with their examples.

		• Open the given link and try to solve the questions in your note book. http://ncert.nic.in/ncerts/l/jeep101.pdf You can check your answers with the given key. If you have any doubts, discuss with your friends and teacher on the group created by your teacher.
• differentiates acidic, basic, and neutral substances using different indicators • plans and conducts simple activities/ experiments to verify acidic, basic and neutral solutions and seek answer to the queries on his/her own • relates processes with causes and effects such as tooth decay with pH of saliva, growth of plants with pH of the soil, survival of aquatic life with pH of water, • explains about various types of acids, bases and salts and their reactions • draws labelled diagrams for set up of activities/ experiments. • analyses and interprets data such as pH of solutions to predict the nature of substances. • uses scientific	**Chapter 2 - Acids, Bases and Salts** **Content discussed in the textbook** • How do acids and bases react with metals? • How de metal carbonates and metal hydrogencarbonates react with acids? • How do acids and bases react with each other? • Reaction of metal oxides with acids • What do have all acids and bases in common? • How strong are acid and base solutions? • Importance of pH in everyday life • More about salts ➢ E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT. ➢ Live telecast of various science	**WEEK 3** □ Are toothpastes acidic or basic in nature? Find out from the internet the pH of different tooth pastes available in the market. Compile it in the form of report. Share your findings with your friends on Whatsapp group or through email. □ Take materials of various brands such as shampoo, soap, hand wash, etc., and find out their pH by surfing internet and compile the data in the form of report. Share your findings with your friends on Whatsapp group or through email. □ Take various substances, such as, amla juice, lemon juice, tamarind solution, tomato juice, baking soda, soap solution, common salt solution, sugar solution, water from tap, etc., and classify their nature as acidic, basic and neutral using black grapes/red cabbage/beetroot/ turmic as indicators. You can also use extracts of flowers such as China rose/ Periwinkle/Rose etc as indicators. □ You can also draw labelled diagrams of the set up of the experiment, diagram of flowers, fruits and vegetables which you have used as indicators. ***(Remember as advised, we are not moving out of home due to COVID19. So, whatever material is available at home, try to do the activities accordingly).***

	experimental data accurately	
conventions to represent symbols, formulae, and equations for balanced chemical equation and also physical states of substances • identifies the apparatus and handles materials properly. • applies scientific concepts in dailylife such as concept of decomposition reaction of baking soda to make spongy cakes, importance of pH in animals and plants, pH is the cause of tooth decay, etc. • draws conclusion for various reactions such as acids reacts with metals to form salt and hydrogen gas, metal oxide reacts with acid to from salt and water, acid and base react to form salt and water, etc. • exhibits creativity in designing model of soda acid fire extinguisher using eco-friendly resources • exhibits values of honesty, objectivity, rational thinking by reporting and recording		concepts at *Swayam Prabha* Channel https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA ➢ ITPD package developed for teachers teaching at Secondary Stage http://www.ncert.nic. in/departments/nie/dse/activities/advisor y_board/PDF/teachin g_sc.pdf ➢ Laboratory Manual in Science for Class X http://ncert.nic.in/nc erts/l/jelm102.pdf • Chemical Reactions and Equations http://ncert.nic.in/nc erts/l/jeep101.pdf ➢ Exemplar Problems • Acids, Bases and Salts http://ncert.nic.in/nc erts/l/jeep102.pdf

- Open the given link http://nroer.gov.in/55ab34ff81fccb4f1d806025/page/58870b46472d4a1fef810919
- Watch the video carefully and note down the reactions showing in this video. Close the video and write down the balanced chemical equation for each reaction.
- Find out from the internet and textbook – How pH of saliva effects tooth decay, effect of pH on growth of plants and effect of pH on aquatic animals. Compile it in the form of a report.

WEEK 4

- Make an innovative collage of various substances such as fruits, vegetables, flowers and other substances and identify them as acidic, basic and neutral using natural and man-made indicators.
- You can make a collage by cutting pictures or you can also draw the pictures. You may colour and decorate them. You may click photographs of this collage and share with your friends on the group created by your teacher. You can showcase this collage in class once you are back to school.
- Bake a cake in the presence of an elder. Write down the recipe and try to verify the scientific concept about the formation of spongy cake. Write down the reaction involved to make the cake spongy and fluffy.
- Plaster of Paris is used for making toys and decoration items. Find out from internet — why calcium sulphate hemihydrate is called Plaster of Paris? Discuss with your friends on the group created by your teacher.
- Try to design and develop eco-friendly Soda Acid Fire Extinguisher

• communicates the findings and conclusions of the activities/experiments/projects or any task orally and in written form effectively using appropriate figures, tables and digital forms, etc. • makes efforts to conserve environment by doing activities/ experiments by making use of materials judiciously and keeping surroundings/ home clean.		with the material available at home. Click a photograph or make a video and share with your friends at Whatsapp group. You can also display this model when you are back to school. Open this link and try to solve the questions in your note book. http://ncert.nic.in/ncerts/l/jeep102.pdf You can check your answers with the given key. If you have any doubts, discuss with your friends and teacher on the group created by your teacher.

SCIENCE

BIOLOGY (CLASS XI-XII)

Biology (Class-XI)

Learning Outcomes	*Sources/ Resources*	*Suggested Activities (to be guided by teachers)*
The learner − differentiates organisms, phenomena and processes based on certain characteristics and salient features such as living and nonliving, acellular, unicellular and multicellular; different groups of organisms, etc. − identifies and classifies organisms based on certain characteristics / salient features systematically in more scientific and organised manner; such as five kingdom classification, several levels of organisation of classification of Plant and Animal Kingdom, taxonomic categories, etc. − efficiently explains systems, relationships, processes and phenomena, such as, systematic binomial nomenclature of organisms; basis and systems of biological classification and their characteristics; life cycles of various plants and animals; importance of	**NCERT/State Textbook** **All flip textbooks of NCERT are available on the following website** https://epathshala.nic.in//process.php?id=students&type=eTextbooks&ln=en QR codes on the *Textbook of Biology*,Class XI for e-resources E-resource available on NROER National Repository of Open Educational Resources (NROER) https://nroer.gov.in/home/e-library/ *Exemplar Problem – Biology*, Class XI http://ncert.nic.in/ncerts/l/Keep401.pdf http://ncert.nic.in/ncerts/l/Keep402.pdf	**WEEK 1** **Unit I** Diversity in Living World **Chapter 1:** Living World 1. Learners in biology class may be involved using the available resources, such as, textbooks available on e-pathshala, e-resources available on QR codes etc., in making a survey of literature and explore their surroundings and differentiate life forms on the basis of their defining features, such as, growth, reproduction, metabolism, consciousness, etc. 2. Learners may explore videos on YouTube to find out various life forms on the earth to understand diversity in life forms; the biodiversity. 3. Learners may be involved to enlist organisms in their surroundings and may be allowed to surf internet to find out the generic and specific names of the organisms enlisted by them. Later they may be assessed for the importance of naming the plants and how to write the generic and specific names of an organism. 4. Learners may be involved in an activity such as collecting data about any common plants having two species under the same genus, two genera under the same family, and other taxonomic categories and so on to understand the hierarchical arrangement of these taxonomic categories and submit a report. 5. Learners may be involved in an investigatory project on the topic “Taxonomical Aids and their importance” using various resources and make a presentation for five minutes on Zoom or any video conferencing platform.

taxonomical aids, Biodiversity, etc. − draws labelled diagrams,flow charts, concept maps, and graphs,such as, structure of various organisms; life cycles of various plants and animals, systematic classification, etc. − plans and conducts investigations and experimentsto arrive at and verify the facts, principles,phenomena, or to seek answers to queries on their own,with organisms in nature to verify their lifecycle and seek answer to the queries on their own, such as, bryophytes and pteridophytes follow haplo-diplontic life cycle, etc. − applies scientific concepts in dailylife and solving problems,such as, conserving and using medicinal plants or products for maintaining health and wellbeing,etc. − handles laboratory and agricultural tools, and apparatuses, instruments and devices properly for performing activities/ experiments/investigations, such as,developing a kitchen garden/ vertical garden,etc. − draws conclusion from activities/experiments and investigatory projects they perform,	http://ncert.nic.in/ncerts/l/Keep403.pdf http://ncert.nic.in/ncerts/l/Keep404.pdf *Laboratory Manual of Biology*, Class XI http://ncert.nic.in/ncerts/l/kelm301.pdf http://ncert.nic.in/ncerts/l/kelm302.pdf http://ncert.nic.in/ncerts/l/kelm303.pdf NCERT Official – YouTube https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA Live telecast on Swayam Prabha Channel for various concepts of Biology MOOCs at Swayam ITPD package on Biology developed for teachers at Higher Secondary Stage	**WEEK 2** **Chapter 2** Classification of Living Organisms 1. Learners may be encouraged to watch YouTube video on five kingdom classification and draw a concept map in the form of a tree showing all five kingdoms with their characteristic features. 2. Learners may be encouraged to work on computer and using paint and brush they may be encouraged for making colored drawing and painting of different organisms with proper labelling with important features and organise them under five kingdom classification and make an e-book and pdf version of the e-book may be shared with peers. The e-book may later be compiled by all learners of Class XI and kept for reference for all school learners. 3. The learner may be facilitated with the YouTube video links and to surf the internet to collect the information about the acellular and may be encouraged to self-assess with the interactive assessment items. **WEEK 3 AND 4** **Chapter 3:** Plant Kingdom 1. Learners may be encouraged for surfing internet on given topics related to Plant Kingdom, '*Plantae'* in groups and develop a power-point presentation and share with all on google group. After anincubation period of one day teacher may initiate discussion on the given investigatory projects on WhatsApp group where learners will find the opportunity to argue, discuss, share and assess their own thoughts. 2. The learner may be facilitated to make a herbarium of 10 common weed plants in their area. Using herbarium sheets, write their systemic positions and share with peers. 3. Learners must be facilitated to collect five cereals, five pulses, five spices and condiments, three oil yielding and two beverages from their kitchen. With the help of internet, write their

such as, there are a variety of life forms on the earth; a group of organisms likethose under plantae or animalia may have many similar characteristics; etc. − communicates the findings and conclusions effectively,such as, takes part in the discussion over ZOOM platforms or WhatsApp media about characteristics of different phyla under animal kingdom;or methanogens are present in guts of ruminants and they play an important role in biogas production, etc. − exhibits creativity in designing models using eco-friendly resources/preparing charts/paintings/sketc hing,etc., on different topics, such as, role of plants or animals in environmental conservation or structure of an insect, etc. − exhibits values of honesty, objectivity, rational thinkingand freedom from myth and superstitious beliefs while taking decisions,such as, reports and records experimental data accurately, reveals respect for life by		levels of organisation of classification and prepare a poster under the topic "Plants Products in Daily Life". Discuss and share it with peers. 4.Each Learner may be assigned to draw/trace life cycle of any one plant from any of the five groups under *plantae* and be allowed to discuss the type of alternation of generation of each of the plants. Later all learners relate the presence of the type of alternation of generation in algae, bryophytes, pteridophytes, gymnosperms and angiosperms. 5.Learners may be allowed to plant five indoor plants and conserve them. Take their pictures and make a poster on power point and write their classification using internet. They may be allowed to share their work with peers. **WEEK 4** **Chapter 4:** Animal Kingdom 1.Learners may be divided in 11 groups and each group is allowed to work on 11 different *phyla* of *animalia*. They may be encouraged to record their salient features such as, level of organisation, symmetry, *coelom*, etc., and member animals belonging to that particular *phylum* and put colored pictures from internet with their classification. The report of each group may be presented by the group members using Zoom/Google platform and circulated for review among all 11 groups for comparison with other phyla and comments. Later the learners may be encouraged to draw a concept map of different phyla and share with peers for discussion and improvement. 2.The learner may be called upon at ZOOM/Google platform to debate upon the topic 'Role and Importance of Animals in Biodiversity Conservation', or 'Role of methanogens in biogas production', where all learners are encouraged to share their views. Learners were allowed to work as reporters in each-others' sessions and they may be encouraged to make a brief report.

conserving plants and animals, etc. − makes efforts to conserve environment realising the inter-dependency and inter-relationship in the biotic and abiotic factors of environment, such as, by appreciating conservation of medicinal plants and rearing of pets etc − applies scientific concepts in dailylife and solving problems, such as, by maintaining aquarium, conserving medicinal plants, etc.		The report may be kept in the school library as reading material.

Find out whether all such strategies are adopted by all the organisms mentioned in the book or given links or online resources which you could explore. If no, then try to explore the reasons.

✓ Draw neat and labeled diagrams of various asexual reproduction strategies in plants and animals

✓ Communicate with your peers or teacher in case of any query or to share experience and understanding.

Biology (Class XII)

Learning Outcomes	***Sources/ Resources***	***Suggested Activities (to be guided by teachers)***
The learner − appreciates limited life span of organisms and therefore the need of the reproduction process for sustenance of a species over a long period of time − comprehends and able to explain the processes of reproduction i.e., asexual and sexual in different organisms − comprehends and able to explain various strategies adopted by different organisms for asexual reproduction, e.g., binary fission, budding, sporulation, vegetative propagation, fragmentation etc. − appreciates the similar fundamental pattern of sexual reproduction in all such organisms where it occurs, in which germ cells of two different	**NCERT/State Textbook** **Theme** Reproduction in Organisms Content discussed in the textbook ✓ Concept of life span of an organism and its sustenance by the process of reproduction ✓ Methods of Reproduction: Asexual and Sexual ✓ Asexual Reproduction: Binary Fission, Encystment, Sporulation, Budding, Gemmule formation, Vegetative propagation (in plants), Fragmentation ✓ Similarity in the pattern of sexual reproduction in organisms: Vegetative and Reproductive phase ✓ Events in Reproductive phase: Pre-fertilisation, Fertilisation and Post Fertilisation Events ✓ Pre-fertilisation Events: Gametogenesis i.e., formation of male and female gametes in male and female	Remember that for any of the activities or exploration learners must not venture out of their home due to the Covid-19 pandemic. All explorations are to be done at home if materials are available, otherwise online exploration should be done. **WEEK 1** ✓ Explore the life span of different organisms from different sources including textbook of Biology for Class XII (Chapter 1) and other online resources ✓ Compare the lifespan of any organism with its sustenance over a long period of time on earth. You will realise that such sustenance of any organism is possible only by leaving progeny after death. ✓ The strategy adopted by an organism to continue by producing its progeny is called reproduction. ✓ Click and open following links to understand different strategies adopted by organisms for reproduction. ✓ Reproduction methods: https://opentextbc.ca/biology/chapter/24-1-reproduction-methods/; https://samagra.kite.kerala.gov.in/uploads/12/botony/916/1716/12_Ch916_12151/main.html Asexual Reproduction https://ciet.nic.in/swayam_biology03_module01.php **Activity 1:** Prepare list of plants and

organism produces male and female gametes and after	✓ organism Transfer of gamete and Fertilisation	animals which are capable of reproducing— ✓ Only asexually

fertilisation offspring is produced. − comprehends and appreciates the process of gametogenesis to produce gametes in which number of chromosomes are reduced to half (diploid to haploid) − comprehends and appreciates that fertilisation restores the diploid condition in offspring − appreciates the fact that sexual reproduction brings variability among offspring − comprehends and appreciates that the process of fertilisation may be internal or external with its features and significance − understands different mechanisms of early development i.e., embryogenesis in different organisms mainly plants and animals − understands and explains oviparity and viviparity among animals	✓ Post fertilisation events: Zygote formation, Embryogenesis **Resources** ✓ E-Resources developed by NCERT, which are available on NROER and also embedded in QR Code in textbooks of NCERT. ✓ Live telecast of various science concepts at Swayam Prabha Channel https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA ***Links of resources given below*** ✓ About Reproduction methods: https://opentextbc.ca/biology/chapter/24-1-reproduction-methods/; https://samagra.kite.kerala.gov.in/uploads/12/botony/916/1716/12_Ch916_12151/main.html ✓ Asexual Reproduction: https://ciet.nic.in/swayam_biology03_mo dule01.php ✓ Binary fission in prokaryotes: https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/6%3A_Cult

- ✓ Only sexually
- ✓ Both asexually and sexually
- ✓ (Also compare the life span of asexually and sexually reproducing organisms)

Activity 2: Identify various events taking place during asexual reproduction (different methods) and sexual reproduction from the book or other online resources.

- ✓ Click and open the following links to understand different types of asexual reproduction strategies in different types of organisms:
- ✓ Binary fission in prokaryotes: https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Boundless)/6%3A_Culturing_Microorganisms/6.6%3A_Microbial_Growth/6.6A%3A_Binary_Fission
- ✓ Sporulation as reproduction process: https://www.microscopemaster.com/sporulation.html

Activity 3: Students can grow bread mould or may observe developing mould or fungus on bread pieces left for few days at a humid place. They may observe some of these mould or fungus using their magnifying lenses. Think from where these fungi have appeared.

- ✓ Vegetative propagation in plants: https://www.sciencelearn.org.nz/resources/1662-vegetative-plant-propagation

Activity 4: Children can observe some of the potatoes available in their home. They may keep two-three old potatoes at a humid place. After a few days they may observe germinating eye buds and if left for few more days they may even observe growth of roots and shoot.

- ✓ Fragmentation: https://www.biologyonline.com/dictionary/fragmentation
- ✓ Study about all asexual reproduction strategies adopted by different plants and animals.

	al_Growth/6.6A%3A_Binary_Fission ✓ Sporulation as a reproduction process: https://www.microscopemaster.com/sporulation.html ✓ Vegetative propagation in plants: https://www.sciencelearn.org.nz/resources/1662-vegetative-plant-propagation ✓ Fragmentation: https://www.biologyonline.com/dictionary/fragmentation ✓ Sexual Reproduction: https://www.biologyonline.com/dictionary/sexual-reproduction ✓ Gametogenesis: https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(Boundless)/43%3A_Animal_Reproduction_and_Development/43.3%3A_Human_Reproductive_Anatomy_and_Gametogenesis/43.3C%3A__Gametogenesis_(Spermatogenesis_and_Oogenesis)	**WEEK 2** ✓ Study events of sexual reproduction process from your textbook and try to conceptualise the necessity of these events. ✓ Click to open the following links to know more about different gamete formation in unicellular organisms, plants and animals: Sexual Reproduction: https://www.biologyonline.com/dictionary/sexual-reproduction ✓ Now when you have understood the importance of gamete in the process of sexual reproduction, try to explore the part of plants or animals where gametes are produced. **Activity 5**: List names of plants in which flowers are unisexual and bisexual. **Activity 6**: Prepare a list of animals which do not exhibit sexual dimorphism (separate male and female) and explore the process of fertilisation in them. ✓ Correlate the process of gametogenesis and fertilisation with meiotic cell division ✓ Explore the process of embryogenesis and production of offspring in plants and animals. **WEEK 3** ✓ Observe the different parts of any flower available in any plant in
□ understands flower as the organ of sexual reproduction and role of its different parts. □ explains structure of different parts of androecium and	**Theme** Reproduction in Flowering Plants Content discussed in the textbook ✓ Flower as reproductive structure of angiosperm plants ✓ Structure of stamen,	

gynoecium (male and female parts of the flower) and their functions.

- explains different structural variation and arrangement of male and female parts of the flower (androecium and gynoecium) in different flowering plants.
- comprehends and appreciates the pre-fertilisation events in male and female parts of the flower.
- understands the process of development of microspores (pollen) and megaspores (ovule).
- understands and appreciates the process of pollination and appreciate its significance.
- appreciates the role of different pollinating agents especially insects.
- understands post pollination events, fertilisation, embryogenesis and seed development.
- appreciates the role of pre-fertilisation, pollination and

microsporangium and pollen grains

- ✓ Microsporogenesis
- ✓ Structure of pollen grain
- ✓ Structure of pistil, megasporangium and embryo sac
- ✓ Megasporogenesis
- ✓ Pollination strategy in flowering plants
- ✓ Double Fertilization
- ✓ Endosperm and embryogenesis
- ✓ Plant seed and fruit
- ✓ Apomixix and Polyembryony

Resources

- ✓ E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT.
- ✓ Live telecast of various science concepts at *Swayam Prabha* Channel https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA

Online links of resources

- ✓ Flower reproductive parts: Fertilisation: https://www.ncbi.nlm.nih.gov/books/NBK26843/
- ✓ Reproductive development structure: https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(OpenStax)/6%3A_Plant_Structure_and_Funct

your house, if available. (Please do not venture out of your house premise due to lockdown)

- ✓ Identify the reproductive parts, i.e., stamen and pistil in the flower
- ✓ Study about the parts of flowers from different sources including *Textbook of Biology* for Class XII (Chapter 2) and other online resources
- ✓ Click and open following links to understand the reproductive structure of flower:
- ✓ Flower reproductive parts—Fertilization: https://www.ncbi.nlm.nih.gov/books/NBK26843/
- ✓ Reproductive parts of flower and test items: https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(OpenStax)/6%3A_Plant_Structure_and_Function/32%3A_Plant_Reproduction/32.E%3A_Plant_Reproduction_(Exercises)
- ✓ Study about the structure of stamen, microsporangium, process of microsporogenesis from Biology Textbook Class XII (Chapter 2) and other resources.

Activity 7: Draw neat and labeled diagrams of a section of young and mature anther.

- ✓ Study about the structure of pistil, megasporangium, process of megasporogenesis from the Class XII Biology textbook (Chapter 2) and other resources.

Activity 8: Draw neat and labelled diagrams of different stages of megaspore and embryo sac.

- ✓ Online Link: Reproductive development structure: https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(OpenStax)/6%3A_Plant_Structure_and_Function/32%3A_Plant_Reproduction/32.1%3A_Reproductive_Development_and_Stru

post-fertilisation event in artificial hybridisation for crop improvement and parthenocarpy. □ understands the structure of fruit and seed. □ comprehends and appreciates a few rare methods of reproduction like Apomixis and polyembryony	ion/32%3A_Plant_Reproduction/32.1%3A_Reproductive_Development_and_Structure ✓ Pollination and fertilization: https://courses.lumenlearning.com/biology2xmaster/chapter/pollination-and-fertilization/ ✓ Pollination: https://www.intechopen.com/books/pollination-in-plants/introductory-chapter-pollination ✓ Fertilization, embryogenesis and seed development in plants: http://bio1520.biology.gatech.edu/growth-and-reproduction/plant-reproduction/ ✓ Fertilisation: https://www.ncbi.nlm.nih.gov/books/NBK26843/ ✓ Pollination: https://www.intechopen.com/books/pollination-in-plants/introductory-chapter-pollination ✓ Fertilisation, embryogenesis and seed development in plants: http://bio1520.biology.gatech.edu/growth-and-reproduction/plant-reproduction/	cture ✓ Study the process of pollination in different plants from the Biology textbook and other resources including the following links: ✓ Pollination and fertilisation: https://courses.lumenlearning.com/biology2xmaster/chapter/pollination-and-fertilization/ ✓ Pollination: https://www.intechopen.com/books/pollination-in-plants/introductory-chapter-pollination ✓ Study about different strategies adopted by plants having bisexual flower for cross pollination **Activity 9:** Search different examples of pollination mechanisms and list with example. ✓ List advantages of cross pollination in plants **WEEK 4** ✓ Study about pollen-pistil interaction and post pollination events in flower ✓ Write about the importance of artificial hybridisation for crop improvement and strategy adopted for this ✓ Study about the process of double fertilisation in angiosperm flower in the Biology textbook and other resources including the following link: ✓ Fertilisation, embryogenesis and seed development in plants: http://bio1520.biology.gatech.edu/growth-and-reproduction/plant-reproduction/ ✓ Pollination and fertilisation: https://courses.lumenlearning.com/biology2xmaster/chapter/pollination-and-fertilization/ ✓ Post fertilisation event: Endosperm development

▪ Embryogenesis and formation of embryo in dicot and monocot ✓ Study about seed formation and its type from the Biology textbook and other resources ✓ Write about your understanding on fruits and seeds. ✓ Parthenocarpic fruit ✓ Study about formation of seeds without fertilisation (apomixis) ✓ Understand about polyembryony with example ✓ Draw labelled diagrams of different types of seed ✓ Test your understanding by solving problems given in the book entitled, “Exemplar Problem in Biology for Class XII” and solve problems given to test your understanding		**Activity 10:** Prepare a list of edible parts of 20 different types of fruits

CHEMISTRY (CLASSES XI-XII)

Chemistry (Class XI)

Learning Outcomes	*Sources/Resources*	*Suggested Activities (to be guided by teachers)*
The learner • understands and appreciates the contribution of ancient chemistry of India and its role in different spheres of life such as, *Rasayan Shastra, Rastantra, Ras Kriya* or *Rasvidya,* etc. • Identifies and appreciates the modern principles of chemistry in different spheres of life such as weather patterns, functioning of brain and operation of a computer, production in chemical industries, manufacturing fertilisers, alkalis, acids, salts, dyes, polymers, drugs, soaps, detergents, metals, alloys, etc. • explain the characteristics of three states of matter such as solids, liquids and gases • classifies different substances as elements, compounds and mixtures • uses SI Units, symbols, definitions, nomenclature of physical quantities and formulations as per international standards, such as, length (m), mass (kg), etc.	**NCERT/State Textbook** Chemistry Part I **Theme** Some Basic Concepts of Chemistry Contents discussed in the textbook • Importance of chemistry • Nature of matter • Properties of matter and their measurement • Uncertainty in measurement • Laws of chemical combinations • Dalton atomic theory • Atomic and molecular masses • Mole and Molar mass • percentage composition • Stoichiometry and stoichiometric calculations E-Resources developed by NCERT, which are available on NROER and also attached as QR Codes in textbooks of NCERT http://ncert.nic.in/ncerts/1/khepsol.pdfhttps://www.youtube.com/watch?v=DN8SINM9y9U	**WEEK 1** The Learners are told to use textbooks / web resources to explore the following: • Ancient chemistry vs Modern chemistry • Importance of chemistry in everyday life • Issues which affectour environment such as effects of pesticides, acid rain, green houses gases, use of heavy metals, etc. • Compile the report and share with your classmates on Zoom, a Googlegroup or WhatsApp group • Open the given link https://www.youtube.com/watch?v=DN8SINM9y9U https://www.youtube.com/watch?v=lJKT3DSZUd0&list=PL0OtfIH2_0K3dKPkoYY-jTihD9IUi3NXo • Observe the videos and try to solve problems given in your textbook related to these concepts. If you have any doubts, discuss with your friends or teacher. • Solve the various types of questions given in *Exemplar Problems for Class XI Chemistry*, prepared by NCERT, on a daily basis. • Involve yourself in some indoor activities like yoga, meditation, etc. • Get enrolled on the NROER CIET platform, use other e-resources available on NROER, e-pathshala **WEEK 2** Open the given links. These videos discuss so-me basic concepts of

• differentiates between precision and accuracy; • explains various laws of chemical combination such as Law of conservation of mass, Law of multiple proportion etc. • plans and conducts investigations and experiments to arrive at and verify the facts or principles to seek answers to queries on their own, such as, to verify various Laws of Chemical Combinations, etc. • takes initiative to know about scientific discoveries and inventions, such as, Antoine Lavoisier, Joseph Proust, Joseph Louis for discovering various Laws of Chemical Combinations • calculates and appreciates significance of atomic mass, average atomic mass, molecular mass and formula mass, stoichiometric calculations, etc. • handles laboratory apparatus instruments, and devices properly, such as, analytical balance, graduated cylinders, volumetric flask, burette, pipette, etc. • communicates the findings and conclusions effectively (orally and written form) • realises and appreciates the	https://www.youtube.com/watch?v=lJKT3DSZUd0&list=PL0OtfIH2_0K3dKPkoYY-jTihD9IUi3NXo https://www.youtube.com/watch?v=3JhpdUt3CMM https://www.youtube.com/watch?v=40OiAt2t658 https://www.youtube.com/watch?v=sSlObBndH-A&list=PLDAj64x1PE-nVzv4Kn-7uOlRCR7RITsF3 https://www.youtube.com/watch?v=OqUSjzJ_wng https://www.youtube.com/watch?v=bOzArOtRtSY https://www.youtube.com/watch?v=L9JHyT9wvbs https://www.youtube.com/watch?v=hhMO7GPi3VI https://www.youtube.com/watch?v=WPmYlBk_utE	chemistry. https://www.youtube.com/watch?v=3JhpdUt3CMM https://www.youtube.com/watch?v=40OiAt2t658 https://www.youtube.com/watch?v=sSlObBndH-A&list=PLDAj64x1PE-nVzv4Kn-7uOlRCR7RITsF3 https://www.youtube.com/watch?v=OqUSjzJ_wng https://wwwtube.com/watch?v=bOzArOtRtSY https://www.youtube.com/watch?v=L9JHyT9wvbs https://www.youtube.com/watch?v=hhMO7GPi3VI https://www.youtube.com/watch?v=WPmYlBk_utE After watching these videos, read the chapter from your textbook. Try to solve the questions given at the end of the chapter in your notebook. • Try to develop assignments based on the concepts given in the chapter and exchange them with your friends. Discuss the innovative questions developed in this process with your friends. • Prepare some simple activities of your own on mole concept, states of matter, etc. • Identify some homogeneous and heterogeneous mixtures present in your home/ surroundings. • Read and find out more about scientists and their experiments based on chemistry. Prepare the report and share with your friends. You can carry the report to school once it is open. The report can be placed in the library as an example for other learners. • Balance some chemical reactions given in NCERT Textbook. • Try to read some research papers

interface of chemistry with other disciplines, such as Biology, Physics, Mathematics, etc. • applies concepts of chemistry in day-to-daylife while making decisions and solving problems • takes initiatives to know and learn about the newer research, and inventions in Chemistry • appreciates the role and impact of Chemistry and technology towards the improvement of quality of human life. • exhibits values of honesty, objectivity, rational thinking, while sharing experimental results.		which interest you based on these concepts. • Involve yourself in various indoor fitness activities
• understands about the discovery of electron, proton and neutron • takes initiative to learn about the Thomson, Rutherford and Bohr atomic models • understands features of the quantum mechanical model of atom • understands properties of electromagnetic radiations and Planck's quantum theory • explains photoelectric effect and atomic spectra • understands de Broglie relation and Heisenberg uncertainty principle • learns about quantum numbers	**Theme** Structure of Atom Content discussed in the textbook • Sub-atomic particles • Atomic models • Developments leading to the Bohrs atomic model of atom • Bohr model for hydrogen atom • Quantum mechanical model of the atom https://www.youtube.com/watch?v=RhiDeoQYHR0 https://www.youtube.com/watch?v=4dXlkdThEfM https://www.youtube.com/watch?v=VAMMvv7UG3k	**WEEK 3** Learners are told to use the textbook / web resources and try to explore the following: • discovery of electron, proton and neutron • Thomson, Rutherford and Bohr atomic models • quantum mechanical model of atom • electromagnetic radiations and Planck's quantum theory • photoelectric effect and atomic spectra • de Broglie relation and Heisenberg uncertainty principle • quantum numbers • Aufbau principal, Pauli exclusion principle and Hund's rule of maximum multiplicity • write electronic configuration of atoms Open the links which are given

• understands Aufbau principal, Pauli exclusion principle and Hund's rule of maximum multiplicity • takes initiative to know and learn about electronic configuration of atoms • exhibits values of honesty, objectivity, rational thinking, while sharing experimental results.		https://www.youtube.com/watch?v=RhiDeoQYHR0 After watching the video discuss it with friends and teachers online and try to find solutions to your queries. Solve Exemplar problems for Class XI in Chemistry prepared by NCERT and also use E-resources available on NROER and e-pathshala. Try to understand the gas discharge tube, determination of e/m of cathode rays, Millikan's oil drop experiment. Read about Madame Curie, James Chadwick, Thomson, Rutherford and their discoveries **WEEK 4** Open the links which are given here https://www.youtube.com/watch?v=4dXlkdThEfM https://www.youtube.com/watch?v=VAMMvv7UG3k and try to understand the concepts which you have seenin videos. Understand the nature of light and various developments related to it Learn about Black body radiations, Photoelectric effect, dual nature of light and atomic spectrum and solve Exemplar problems for Class XI in Chemistry prepared by NCERT and use E-resources available on NROER and e-pathshala. Involve yourself in various indoor fitness activities.

Chemistry (Class XII)

Learning Outcomes	*Sources/Resources*	*Suggested Activities (to be guided by teachers)*
The learner — describes importance of solid state in daily life — describes general characteristics of solid state; — distinguishes between amorphous and crystalline solids; — classifies crystalline solids on the basis of the nature of binding forces; — defines crystal lattice and unit cell; — distinguish between unit cells of different types of crystal lattices; — explains close packing of particles — describes different types of voids and close packed structures — calculates the packing efficiency of different types of cubic unit cells — correlates the density of a substance with its unit	**WEEK-1** **Link-1** Video Lecture (Episode-1): (Amorphous and crystalline solids, Classification of solids) https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/57cfea6516b51c6b39a806b5 **WEEK-2** **Link-2** Video lecture (Episode 2) (Unit cell and crystal lattice, number of atoms in a unit cell) https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/57cfeac316b51c6b39a806d7 **Link-3** Animation (Crystal lattice and unit cells) https://www.youtube.com/watch?v=VPCDSmoomGk **Link-4** Animation (Number of atoms in unit cells) https://www.youtube.com/watch?v=qAeaHYSX0hs **WEEK-3** **Link-5** Video lecture (Episode-3): (Packing and closed pack structures,	**Unit -1:** Solid State Twelve learning outcomes are expected to be covered in this unit. Remember we are not moving out of our homes due to COVID-19 therefore, we are required to work at home and make the best use of the time available to us . Solid State is the first unit in the textbook of chemistry. It provides insight into the structure of solids.It also tells us how the properties of solids are affected by the arrangement of atoms,molecules and ions involved in the formation of structure of solid.Understanding the topic requires a lot of abstract thinking and concentration. Yoga and pranayam can help in keeping one'sfocus on atopic for a longer time. After understanding the topic, learners may become interested in knowing how can one proceed todevelop materials of required properties. We can plan the time schedule for learning the topic as follows: **WEEK 1** Learners may try to make a list of the solids used at home for various purposes. Now they may think of the property that makes the solids in the list useful for the particular purpose for which these are used. This will make students realise the importance of solids in the daily life. After that they may see the **Video lecture (Link-1)** and classify the solids in the list prepared by them as crystalline and amorphous. After seeing the video, they may go through the text material in the textbook of chemistry for Class XII published by NCERT and read it up to section 1.3. This will help them to classify solids as amorphous and crystalline. They will be able to classify solids on the basis of nature of binding forces. Also, they may make a WhatsApp group with their classmates and discuss the topic learnt. They may make the list of common difficulties and mail it to the teacher or connect her/him through

cell properties; — describes the imperfections in solids and their effect on — Properties correlates the electrical and magnetic properties of solids and their structure	packing efficiency) https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/57cfeb0d16b51c6b39a806f9 **Link-6** Animation (Hexagonal close packed structure) https://www.youtube.com/watch?v=uKpr-9vmgsc **Link-7** Animation (Close packed structures in three dimensions) https://www.youtube.com/watch?v=liwX_lLb2ds **Link-8** Animation (Packing efficiency in crystals) https://www.youtube.com/watch?v=WIcb1WfJvJc **WEEK-4** **Link-9** Video lecture (Episode-4) (Defects and imperfections) https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/57cfeb8516b51c6b39a8071b **Link-10** **Text** A brief on Semiconductors https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5b4c84cc16b51c01e1912483	WhatsApp or any other mode suggested by her/him to get the solution of their problems. For more clarification of the concepts learnt, they may solve problems related to the concepts learnt using exercise given in the end of chapter. Also, they may solve problems given in the book 'Exemplar Problems' for Class XII, published by NCERT for more clarification of the concepts learnt. **WEEK 2** They may see the links-2, 3 and 4 these links will cover Section 1.4 and Section 1.5 of the textbook. These links will give insight into the concepts of crystal lattice and unit cell, types of unit cells and number of atoms per unit cell in a crystal lattice. Students may prepare the models for different lattice systems. For example they may prepare the model of sodium chloride crystal using beads of two different colours and sizes and the sticks if available or any other material available. This will help them understand the meaning of face centred cubic lattice. In case material for making models is not available, links of Animations will help them understand the concept. They may discuss the concepts learnt with their classmates in the WhatsApp group and may make the list of common difficulties and mail it to the teacher or connect her/him through WhatsApp or any other mode suggested by her/him to get the solution of their problems. For more clarification of the concepts learnt, they may solve problems related to the concepts learnt using exercise given in the end of chapter. Also, they may solve problems given in the book 'Exemplar Problems' for Class XII, published by NCERT for more clarification of the concepts. **WEEK 3** **Links 5,6,7,8** cover Section 1.6, 1.7 and 1.8 of the textbook. Concepts covered are close packing of particles, different types of voids and close packed structures, packing efficiency and calculations involving unit cell dimensions. This will allow learners understand the patterns of packing of

		particles which form different types of lattices. They will be able to locate different types of vacant spaces in the close packing and make them recognise the shape of different vacant spaces in the packing. They will be able to recognise the pattern in which particles are most closely packed. After seeing links students may read the Section 1.6, 1.7 and 1.8 of the textbook. They will be able to solve the problems related to the concepts given in these Sections. Problems given at the end of the Unit in the Textbook of Chemistry may be solved for deep insight into the concepts. Also, problems given in the Book- *Exemplar Problems in Chemistry*, Class XII, published by NCERT may be solved. Learners may discuss the topic with their classmates on WhatsApp. One can use fruits like orange or any other material available with them for making packing patterns to get more clarity of the concepts. They may get solution of Their problems as they did in the first weak. **WEEK 4** **Links 9 and 10** cover sections 1.9 and section1.10 of the textbook. These give insight about the imperfactions left in the crystalls during the process of crystallisation. After going through the links, students will be able to explain the importance of imperfactions in making semiconductors. Learners may discuss the topic with their classmates on WhatsApp and contact the teacher through mode suggested by her to get the solution of their difficulties.

PHYSICS (CLASSES XI-XII)

Physics (Class XI)

Learning Outcomes	*Sources/ Resources*	*Suggested Activities (to be guided by teachers)*
The learner − explains that the disciplinary approach of Physics is a transition from general sciences. − analyses the observations from the surroundings to appreciate the basic conceptual understanding of physics. − promotes process-skills, problem-solving abilities and applications of concepts/content in Physics, useful in real-life situations for making Physics learning more relevant, meaningful and interesting. − explains the fact that the theory and experiments go hand in hand in physics and help each other's progress. − explains domains of interest in physics: macroscopic (classical physics), mesoscopic and microscopic. Also, understands the scope and excitement of physics. − explains the scientific methods for developing the hypothesis, axioms, models and laws. − analyses through examples, the connection between physics, technology and society; and physics-related technological/industrial aspects to cope up with changing demand of society committed to the use of physics, technology and	**NCERT/State Physics Textbook for Class XI; Part - I** http://ncert.nic.in/textbook/textbook.htm?keph1=0-8 Physics - PheT Simulations https://phet.colorado.edu/en/simulations/category/physics **NCERT Official – YouTube** https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA National Repository of Open Educational Resources (NROER) https://nroer.gov.in/home/e-library/ *Apply filter for Level (Higher Secondary) and Subject (Physics) to view the relevant e-resources.* *Laboratory Manual of Physics*, Class XI, Published by the NCERT http://www.ncert.nic.in/exemplar/labmanuals.html http://ncert.nic.in/ncerts/l/kelm101.pdf http://ncert.nic.in/ncerts/l/kelm102.pdf	**WEEK 1** **Unit I** Physical World and Measurement **Chapter 1** Physical World Using the resources, learners may be asked to explore and learn about 1. Science, Natural Science, Physics, Experiments and Theory in Physics and overlaps of Physics with other natural sciences 2. Scope and excitement of physics; Interrelationship of physics with technology, society and informatics. 3. Nature of fundamental forces; Unification of forces 4. Nature of physical laws ***Project*** Learners may prepare life sketches of prominent physicists. Using the Internetand other reference books. A learner is envisaged as reading about the explanations and demonstrations of some classic experiments in physics. **WEEK 2** **Chapter 2** Units and Measurements Using the resources, learners may be asked to explore and learn about

− explains the fundamental forces in nature – gravitational, electromagnetic, strong and weak nuclear forces; and unification of forces. − explains the nature of fundamental laws such as conservation laws, etc. − uses international system of units (SI Units), symbols, nomenclature of physical quantities and formulations; SI base and derived quantities and their units. − derives methods of measurement of lengths – large as well as small; measurement of mass; and measurement of time. − explains the range of lengths, masses and time intervals. − explains the need of accuracy, precision, errors and uncertainties in measurement; and classify errors. − explains the rules for arithmetic operations with significant figures; rounding off the digits. − derives dimensional formulae and dimensional equations using the dimensions of physical quantities. − applies understanding of dimensional analysis in checking the dimensional consistency of relations and deducing the relations between different physical quantities. − gets acquainted with the Greek alphabet; Common SI prefixes and symbols for multiples and sub-multiples; Important constants; Conversion factors; Mathematical formulae; SI derived units	Bibliography of physics books for additional reading on the topics covered (reference: *Physics, Textbook for Class XI*, Part II, p. 405 – 406, Published by the NCERT http://ncert.nic.in/textbook/textbook.htm?keph2=an-7 A list of 14 websites for downloading textbooks free of charge can be obtained at https://www.ereader-palace.com/14-sites-download-textbooks-free/ Another website for downloading books free of cost is www.pdfdrive.com Textbook contains QR codes and one can access e-resources linked to those QR codes by following step by step guide given at the beginning of textbook.	1. Need of standard units; base and derived units; different unit systems and relationship between corresponding units of different physical quantities; SI system of units; SI base quantities and units (with their definitions as per new IAPAP rules). 2. Measurement of length – large distances (parallax methods) and very small distances (indirect methods); Measurement of mass and time intervals; Range and orders of lengths, masses, and time intervals. 3. Accuracy, precision, certainty and errors in measurements of physical quantities; Systematic, random and least count errors; Absolute, relative and percentage errors; Combination of errors. 4. Significant figures; Rules for arithmetic operations with significant figures; Rounding off digits in measurements (or calculations); Determining the uncertainties in expressing results. 5. Dimensions of physical quantities; Dimensional formulae and dimensional equations; Applications of dimensional analysis. 6. Appendices: The Greek alphabet; Common SI prefixes and symbols for multiples and sub-multiples; Important constants; Conversion factors; SI derived units (expressed in SI base units); SI derived units with special names;

(expressed in SI base units); SI derived units with special names; Guidelines for using symbols for physical quantities, chemical elements and nuclides; Guidelines for using symbols for SI units etc.; Dimensional formulae of physical quantities. − explains motion as change in position with time. − differentiates between distance and displacement; speed and velocity; rectilinear and curvilinear motions; kinematics and dynamics; inertial and non-inertial frames of references; average, relative, and instantaneous velocity and speed etc. − derives (graphically) kinematic equations for uniformly accelerated motion − explains elementary calculus (both differential and integral) that is required to describe motion. − plans and conducts investigations and experiments to arrive at and verify the equations of motion of bodies under uniformly accelerated motions. − handles tools and laboratory apparatus properly; measures physical quantities using appropriate apparatus, instruments, and devices, such as, scales, balances, watches, etc. (optional) − analyses and interprets data, graphs, and figures, and draws conclusion about the state of motion, speed (and velocity),		Guidelines for using symbols for physical quantities, chemical elements and nuclides; Guidelines for using symbols for SI units etc.; Dimensional formulae of physical quantities. 7. Revision, doubt clearing and practice solving problems ***Project*** Learners may be given the suggestion to measure astronomical distances, such as, the distance between earth and an identified star etc., using the parallax method. Learners may be advised to look at the BIPM/IAPAP website to prepare a chart on the definitions of SI base units. Using vernier callipers/screw gauze/spherometer learners may perform activities and experiments to measure small lengths and radius of curvature, etc. (optional) **WEEKS 3 AND 4** **Unit II** Kinematics **Chapter 2** Motion in a Straight Line Learners may be asked to make observations about their surroundings and use the following resources to learn about: 1. State of motion; Frames of reference; Position,

acceleration (uniform and non-uniform), distances (and displacements) covered, etc. **Learning Outcomes cut across different themes** ***The learner*** − communicates the findings and conclusions effectively. − applies concepts of physics in dailylife while making decisions and solving problems. − takes initiatives to learn about the newer research, discoveries and inventions in Physics. − realises and appreciates the interface of Physics with other disciplines, such as with Chemistry as various materials. − develops positive scientific attitude, and appreciates the role and impact of Physics and technology towards the improvement of quality of life and human welfare − exhibits values of honesty, objectivity, rational thinking, and freedom from myth and superstitious beliefs while taking decisions, respect for life, etc.		path length and displacement 2. Elements of Calculus (Appendix 3.1) 3. Mathematical Formulae (Appendix A5 placed at the end of textbook) 4. Average velocity and average speed 5. Instantaneous velocity and instantaneous speed 6. Acceleration; Solving problems; and discussion on learners' doubts 7. Kinematic equations for uniformly accelerated motion – graphical method; 8. Free fall; Reaction time; and Relative velocity 9. Solving problems ***Project*** Ask children to calculate their own reaction time.

Physics (Class XII)

Learning Outcomes	*Sources/ Resources*	*Suggestive Activities (to be guided by teachers)*
The learner • explains processes and phenomena with the understanding of the relationship between nature and matter on scientific basis, such as, force between charges, electric field and potential due to charges; force on charges in an electric field. • derives formulae, equations, and laws, such as, torque on a dipole in uniform electric field, effective capacitance of combination of capacitors in series and in parallel, energy stored in a capacitor. • plans and conducts investigations and experiments to arrive at and verify the facts, principles, phenomena, or to seek answers to queries on their own, such as, to estimate the charge induced on each one of the two identical Styrofoam balls	The following list of resources is suggestive. In addition to these, the teachers may curate more resources from internet for sharing with their Learners. • *Physics, Textbook* for Class XII, Part I, Published by NCERT – http://ncert.nic.in/textbook/textbook.htm?leph1=1-8 – http://ncert.nic.in/textbook/textbook.htm?leph1=2-8 • Many web links are given in the side margins of the above-mentioned textbook. These may also be accessed. • In addition, thetextbook contains QR codes and one can access e-resources linked to those QR codes by following step by step guide given at the beginning of textbook. The links of those e-resources are	**WEEK 1** **Unit I:** Electrostatics **Chapter 1:** Electric Charges and Fields • Using Gmail group as well as a WhatsApp group of all learners in the class, the teacher may encourage the learners to attempt to explore and understand the following concepts on their own, using the textbook and the web resources— – electric charges; conservation of charge, – Coulomb's law - force between twopoint charges, – forces between multiple charges; superposition principle, continuous charge distribution, – electric field, electric field due to a point charge, – electric field lines, electric flux • The learners may be facilitated to use PhET interactive simulations to explore the concepts of static electricity, electric charges and fields. They can also observe how changing the sign and magnitude of the charges and the distance between them affects the electrostatic force. • Learners should also attempt to solve concept-based problems given in the resources on a daily basis (in-text examples, exercises at the end of the chapter in textbook, and in Exemplar problems) • The learners may do an Investigatory Project 'To estimate the charge induced on each one of the two identical Styrofoam (or pith) balls suspended in a vertical plane by making use of Coulomb's law' and share their findings with each other. • The learners may collect information from internet and explain in their own words for 'How did the scientist Coulomb arrive at the inverse square law?'

suspended in a vertical plane.analyses and interprets data, graphs, and figures, and draws conclusion, such as, field due to a uniformly charged thin spherical shell is zero at all points inside the shell. - communicates the findings and conclusions effectively. - uses SI Units, symbols, nomenclature of physical quantities and formulations as per international standards, such as, coulomb (C), farad (F). - applies concepts of physics in dailylife while decision-making and solving problems, such as, if a certain capacitance is required in a circuit across a certain potential difference then suggesting a possible arrangement using minimum number of capacitors of given capacity which can withstand a given potential difference. - exhibits creativity and out-of–the-box thinking in solving problems, such as, will a	given below also – https://www.youtube.com/watch?v=FpzlZq_wDL4 – https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5b20ab8616b51c01f44555f0 – https://h5p.org/h5p/embed/181155 – https://www.youtube.com/watch?v=GDvecCS6UXk – https://www.easel.ly/index/embedFrame/easel/6186012 • Exemplar Problems – Physics, Class XII, Published by NCERT – http://ncert.nic.in/ncerts/l/leep101.pdf – http://ncert.nic.in/ncerts/l/leep102.pdf • Laboratory Manual of Physics, Class XII, Published by NCERT – http://ncert.nic.in/ncerts/l/lelm314.pdf • Physics - PhET Simulations – https://phet.colorado.edu/en/simulation/balloons-and-static-electricity – https://phet.colorado.edu/en/simulation/charges-and-fields	- Using the ideas given at the suggested web link, the learners may make toys using ordinary throw away stuff at home to further explore science concepts and deepen their understanding - The learners may be encouraged to enroll in MOOCs on Swayam portal for Physics Class XII developed by NCERT. - Using desktop, laptop, tablet or mobile handset, the teacher may develop videos in regional language as per the context of learners, each video corresponding to roughly one period of the school timetable. These videos may be shared with the learners, one video per day. (In Physics at higher secondary level, lots of figures and mathematical equations are involved, and hence, for developing the videos, the teacher may develop power point presentations superimposed with her/his voice explaining the concepts. Or if the teacher happens to have a white board at home, she/he may record a video of her/him explaining on the white board, the way she/he does in the class). - Then the learners can post their doubts on the group the same day by a certain time fixed by the teacher. Some time may be allocated for the Learners clear any doubts amongst them by interacting with each other via online group discussion. The teacher may also be part of this to ensure that the discussion remains on track. - Finally, the teacher can have a face to face interaction with learners via Skype facilitating the clarification of doubts. - If it is possible to connect to all the learners simultaneously for a longer duration via skype, the teacher may also take a live class online. - All through this the teacher should be continuously assessing learners' learning progress while motivating and keeping their morale up. **WEEK 2** **Unit I:** Electrostatics **Chapter 1:** Electric Charges and Fields (contd.) - Following the same approach as of the first week, the teacher may facilitate the

man get an electric shock if he touches the large aluminium sheet fixed outside his house on the top of a two-metre-high insulating slab? • takes initiative to learn about the newer research, discoveries and inventions in Physics, such as, research on the possibility of static electricity charging electronic devices. • recognises different processes used in Physics-related industrial and technological applications, such as, using electrostatic shielding in protecting sensitive instruments from outside electrical influences. • realises and appreciates the interface of Physics with other disciplines, such as with Chemistry as various materials give rise to interesting properties in the presence or absence of electric field. • develops positive scientific attitude, and appreciates the role and impact of Physics and technology	– https://phet.colorado.edu/en/simulation/coulombs-law – https://phet.colorado.edu/en/simulation/capacitor-lab-basics – https://phet.colorado.edu/en/simulation/legacy/capacitor-lab • National Repository of Open Educational Resources (NROER) https://nroer.gov.in/home/e-library/ Apply filter for level (higher secondary) and Subject (Physics) to view the relevant e-resources. • MOOCs at Swayam https://swayam.gov.in/nd2_nce19_sc07/preview • NCERT Official – YouTube channel https://www.youtube.com/channel/UCT0s92hGjqLX6p7qY9BBrSA • Arvind Gupta Toys http://www.arvindguptatoys.com/electricity-magnetism.php	learners' attempt to explore and understand— – Electric dipole, electric field due to a dipole, – Torque on a dipole in uniform electric field, – Continuous Charge distributions, Statement of Gauss' theorem, – Applications of Gauss' Law to find field due to infinitely long straight uniformly charged wire and uniformly charged infinite plane sheet, – Uniformly charged thin spherical shell (field inside and outside) • Using PhET interactive simulations, the learners may arrange positive and negative charges in space and view the resulting electric field. They may also create models of electric dipole. • Learners should also attempt to solve concept-based problems given in the resources on a daily basis. • The learners may be encouraged to read up (using internet) on the ongoing research on the possibility of static electricity charging electronic devices. They may then have an online discussion amongst themselves. **WEEK 3** **Unit I:** Electrostatics **Chapter 2:** Electrostatic Potential and Capacitance • Following the same approach as of the first week, the teacher may facilitate the learners' attempt to explore and understand the following— – electric potential, potential difference, electric potential due to a point charge; – electric potential due to an electric dipole – electric potential due to a system of charges, – equipotential surfaces, relation between field and potential, – electrical potential energy of a system of charges, – potential energy of a single charge and of a system of two charges in an external field;

towards the improvement of quality of life and human welfare. • exhibits values of honesty, objectivity, rational thinking, and freedom from myth and superstitious beliefs while taking decisions, respect for life, etc.		• The learners may plot equipotential lines and discover their relationship to the electric field using PhET interactive simulations • The learners should also attempt to solve problems given in the resources on a daily basis • The learners may collect information about 'Faraday cage' from internet. They may then develop a theoretical idea for an innovative application of Faraday cage in daily life. **WEEK 4** **Unit I:** Electrostatics **Chapter 2:** Electrostatic Potential and Capacitance (contd.) • Following the same approach as of the first week, the teacher may facilitate the learners' attempt to understand the following— − potential energy of electric dipole, in an external field; − electrostatics of conductors; − dielectrics and electric polarisation, capacitors and capacitance, − capacitance of a parallel plate capacitor with and without dielectric medium between the plates; − combination of capacitors in series and in parallel, energy stored in a capacitor; • Using PhET interactive simulations, the learners can explore how a capacitor works. They can change the size of the plates and the distance between them; add a dielectric to see how it affects capacitance. They can also change the voltage and see charges build up on the plates. • Learners should also attempt to solve problems given in the resources on a daily basis • Learners may be encouraged to find out where capacitors are used in daily life and for what purpose, by collecting information from internet.