

CLASS X

Science

Learning Outcomes	Sources and Resources	Suggested Activities (to be guided by teachers/parents)
<p>The learner</p> <ul style="list-style-type: none"> classifies metals and non-metals based on their physical and chemical properties plans and conducts experiments simple activities/ experiments to verify the conditions necessary for rusting/ corrosion of objects and also metals are good conductor of heat, etc. explains about metals as good conductors of heat whereas non-metals are not with some exceptions, extraction of metals from ores etc. draws labelled diagrams for set up of activities / experiments such as metals are good conductors of heat, and also flow charts for extraction of metals from ores. uses scientific conventions to represent symbols, formulae, and equations for balanced chemical equation and also physical states of substances identifies laboratory apparatus and materials appropriately. applies scientific concepts in daily life for preventing corrosion of copper, silver and iron articles. 	<p>Theme - Materials</p> <p>Chapter 3- Metals and Non-metals</p> <p>Content discussed in the textbook</p> <ul style="list-style-type: none"> Physical properties of metals and non-metals Chemical Properties metals and non-metals <ul style="list-style-type: none"> What happens when metals are burnt in air? What happens when metals react with water? What happens when metals react with acids? How do metals react with solutions of other metal salts? The reactivity series How do metals and non-metals react? Occurrence of metals Corrosion <ul style="list-style-type: none"> E-Resources developed by NCERT, which are available on NROER and also attached as QR Code in textbooks of NCERT. 	<p>WEEK 5</p> <ul style="list-style-type: none"> Read the chapter <i>Metals and Non-metals</i> from your Textbook carefully. If you do not have hard copy of textbook, open the link and read from e-book http://epathshala.nic.in/process.php?id=students&type=eTextbooks&ln=en Open the given link https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/58871312472d4a1fef810dbc Watch the video carefully; you can see many reactions taking place in the video. Pause the video after each reaction and do the following: <ul style="list-style-type: none"> Write the symbol and formulae for the metals, acids and salt solutions used in the video. Write the physical states for the substances used in the reactions. Translate each reaction into chemical equations and then balance them. Find out the locations of the deposits of metals such as, zinc, iron, aluminum, etc., in India and their uses by surfing net. Prepare it in the form of project report. You may also paste or draw pictures of metals and their uses. Share and discuss it with your friends through email or WhatsApp group. You can also share this project report with your classmates once your school will reopen. Open the given link https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5b3dc76816b51c01da81ec29



<ul style="list-style-type: none"> • draws conclusion for various investigations, such as, metals are good conductors of heat. Necessary conditions for rusting etc. • exhibits values of honesty, objectivity, rational thinking by reporting and recording experimental data accurately and honestly • communicates the findings and conclusions of the activities/ experiments/projects or any task orally and in written form effectively using appropriate figures, tables, graphs, and digital forms, etc. • makes efforts to conserve environment by doing activities/ experiments making judicious use of resources. 	<ul style="list-style-type: none"> ✓ Live telecast of various science 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/advisory_board/PDF/teaching_sc.pdf ✓ Laboratory Manual in Science for Class X ✓ http://ncert.nic.in/ncerts/1/jelm102.pdf ✓ Exemplar Problems in Science for Class X • Chapter on Metals and Non- Metals • http://ncert.nic.in/ncerts/1/jeep103.pdf <p>Link to find out the Answers to the Questions http://ncert.nic.in/ncerts/1/jeep1an.pdf</p>	<ul style="list-style-type: none"> ✓ This is an Interactive Quiz based on the properties of metals and non-metals. Learn more and have fun. ✓ Develop a crossword puzzle based on Metals and Non-metals. Share it with your friends on WhatsApp Group or email. Each one of you may note down the time to complete this crossword puzzle. Discuss the key and clear your doubts. ✓ Time to relax! <p>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. Have a balanced diet. This you should follow even when your schools will reopen.</p> <h3>WEEK 6</h3> <ul style="list-style-type: none"> ✓ Try to perform this activity at home • Take three dry bottles and label them as A, D and C • Place clean iron nails/ or any iron objects and place these in each one of them. • Pour some water in bottle A and tightly screw its lid. • Pour boiled water in bottle B and tightly screw its lid • Pour boiled water in bottle C. Add one tablespoon of oil on it and tightly screw the bottle with its lid. Make sure that a layer of oil should float on water. <p>Caution: Be careful!</p> <p>Do not spill hot water on your hand. Perform these steps in the presence of some elderly person.</p> <ul style="list-style-type: none"> • Leave these bottles for a few days and record your observations on the following parameters: <ul style="list-style-type: none"> ✓ In which bottle(s) you found rusted iron nails/ iron objects and why?
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		<ul style="list-style-type: none"> ✓ What does this tell us about the conditions under which iron articles rust? ✓ State the ways by which you can prevent the rusting of iron nails/ iron objects. • Explore the young scientist in you. You can further investigate by dipping iron articles in various solutions, such as, juices, milk, salt solution etc. Plan and design your experiment/activity accordingly. Prepare the report like a scientist. • You can also draw diagram of this experimental setup • You can also click photographs or make video of the activity/ experiment and share it with your teacher and friends on WhatsApp Group. <p>(Remember we are not moving out of home due to COVID19.</p> <p>So, you are requested whatever material you have at home,try to do the activity / experiment accordingly).</p> <ul style="list-style-type: none"> ✓ Collect information and pictures about the field of metallurgy in ancient India by surfing the Internet. Compile it in the form of a report. Share it with your teacher and classmates on Google Group / WhatsApp Group / e-mail. With the help of your teacher you can also disseminate this report by publishing in your school magazine. ✓ Open this link. Learn and have fun. ✓ https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5b3dc7f916b51c01d90b5ff4#; <p>This is an Interactive Quiz consisting of Multiple Choice Questions with answers on Reactivity and Extraction of Metals. You can do self- evaluation. If you still have any doubts, ask your teacher or friends.</p>
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WEEK 7

- ✓ Collect pictures and information related to the historical background of two rust resistant monuments built in India.
- ✓ Compile it in the form of report. Share information with your friends on the Group created by your teacher.
- ✓ Try to perform this activity at home.
- Take metallic spoon, plastic spoon and wooden spoon. If you do not have plastic or wooden spoon, you can take wooden broom stick, plastic stick/rod. Remember all the three objects should be of same length, width and thickness.
- Take a tumbler/container and pour hot water in it.

Caution: Ask some elderly person at home to pour hot water in the tumbler/container. Be careful! Do not touch the hot tumbler/ container with your hands.

- Now touch each one of the spoons / objects one-by- one and note down your observations after every two minutes.
- Which spoon/ object is the best conductor of heat and which one is not so good?

(Remember we are not moving out of home due to COVID19.

So, you are requested whatever material you have at home,try to do the activity / experiment accordingly).

- ✓ Find out the answer to these questions by surfing the Internet. Some answers to these questions you can also find inside your home only.
- Which metals and non-metals are used in your home and for which purpose? Write in detail.
- Which metal is present in chlorophyll?
- Which metal is found in human blood?



- Which non-metals are usually used in day-to-day life?

Share and discuss it with your friends through email or WhatsApp group. Compile it in the form of a report. You can also share this project report with your classmates once your school will reopen.

WEEK 8

- ✓ Develop a game using cards (you can make them from thick sheets of paper). Write information about some important metals and non-metals such as name of the metals/non-metals, their symbol, their atomic number, physical properties, chemical properties and uses on different cards. Pick up one card having name of the metal. Now look for the card showing its symbol. Similarly pick up the card showing its atomic number, its physical or chemical properties and use. You can play this game with your parents or siblings.

You can make video of this game and share with your friends. You can also play the developed game with your classmates when your schools reopen.

- ✓ Solve all the questions given at the back of your textbook in your notebook. If you have any doubts, ask your teacher or friends. You can also get them evaluated by your teacher through email or show her/him when your school will reopen.
- ✓ Develop a flow chart of steps involved in the extraction of metals from ore on a chart paper. Share photographs with your friends on WhatsApp group. You can also paste this flow chart in your class when your school will reopen.
- ✓ Open this link and try to solve the questions in your notebook
- ✓ <http://ncert.nic.in/ncerts/l/jeep103.pdf>



The learner

- relates processes and phenomena with causes and effects, such as, impact of human activities on the environment.
- explains processes and phenomena, such as, food chains, food webs, ozone layer depletion, etc.
- draws labelled diagrams, flow charts, concept maps, graphs, such as, ecosystem, waste management, etc.
- applies learning to hypothetical situations, such as, ecosystem without mosquitoes, ecosystem without human beings.
- analyses and interprets graphs and figures the increase in CFC and ozone layer depletion, etc.
- applies scientific concepts in daily life and solving problems, such as, reducing use of non-biodegradable products.

NCERT/State Textbook

Chapter: Our Environment

Link 1

Chapter 15: Our Environment

- <http://ncert.nic.in/textbook/textbook.htm?jesc1=15-16>

Link 2

Interactive resource with questions on components of ecosystem

- <https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5c90ce7d16b51c01e4209ccb>

You can self-evaluate the answers by clicking on the given link

<http://ncert.nic.in/ncerts/l/jeep1an.pdf>

If you have any doubts, discuss with your friends and teacher on the group created by her/him.

Time to relax!

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. Have balanced diet. This you should follow even when your schools will reopen.

WEEK 9**Activity 1**

- Students may read Section 15.1 (Link 1).

Activity 2

- Students may check Link 2 and learn more about ecosystem and check their understanding as well based on multiple choice questions provided at the end of the link.

Activity 3

- Students may write down the chain of events which could take place in the ecosystem if mosquitoes were wiped out from the face of the earth.

Note: Students may take the help of internet to find out the role of mosquitoes in the ecosystem.

Activity 4

- Students may write down the chain of events which could take place in the ecosystem in the absence of human beings.

Activity 5

- Students may prepare a chart of an ecosystem based on the theme “Me in the Ecosystem”.



	<p>NCERT/State Textbook</p> <p>Chapter: Our Environment</p> <p>Link 3</p> <p>A slide about ozone hole</p> <ul style="list-style-type: none"> • https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5a9e56ec16b51cebb41cc50f <p>Link 4</p> <p>An article about ozone hole and CFC</p> <ul style="list-style-type: none"> • https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/58da80b4472d4a2c0ef2d176 	<p>WEEK 10</p> <p>Activity 6</p> <ul style="list-style-type: none"> • Students may read Section 15.2 (Link 1). • They may also look up Links 3, 4 and 5 related to ozone layer. • Students may do Activity 15.4 provided in Link 1. <p>Activity 7</p> <ul style="list-style-type: none"> • Students may perform Activity 15.5 provided in Link 1. <p>Activity 8</p> <ul style="list-style-type: none"> • Students may find out the different kinds of waste generated in their homes. • They may calculate the amount of waste they produce in their homes. • They may trace the journey of the waste they generate and find out what finally happens with the waste. • They may come up with some ideas as to how they can reduce waste generation in their homes. • They may present their findings in appropriate format such as table, charts, diagrams, etc. <p>Activity 9</p> <ul style="list-style-type: none"> • Students may complete Activity 15.6 provided in Link 1. • They may record their findings in their scrapbook. <p>Activity 10</p> <ul style="list-style-type: none"> • Using internet and other sources, students may find out how long it may take for different kinds of plastics to degrade.
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The learner

- differentiates between convex and concave surfaces; between erect and inverted image based on, properties/ characteristics
- plans and conducts investigations/ experiments to arrive at and verify the facts/ phenomena related to reflection and refraction to seek answers to queries on their own
- draws labeled ray diagrams/ tables/ flow charts about the setup of the activities / experiments based on spherical mirrors, spherical lenses and glass slab
- measures physical quantities using appropriate apparatus such as focal length of spherical mirrors and spherical lenses, etc.
- uses scientific conventions/ symbols to represent various quantities /units, related to reflection, refraction, power of lenses, etc.
- relates processes and phenomena with causes/ effects, such as, bending of light when light passes from one medium to another medium, everyday life experiences related with reflection and refraction, etc.
- calculates using the data given, such as, object distance, image distance, focal length, refractive index of a material, magnification of spherical lenses, etc.

Chapter 10- Light

- Content of chapter 10 of Science Textbook (English version)

Link 1

(English version)

- <http://ncert.nic.in/textbook/textbook.htm?jesc1=10-16>
- Content of chapter 10 of Science Textbook

(Hindi version)

- <http://ncert.nic.in/textbook/textbook.htm?jhsc1=10-16>

Link 2

Experiments on reflection light using laser

- <https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5699f92981fccb15fb2145f7>

Link 3

Sign convention for spherical mirrors shown with graphics

- <https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5a9e57b916b51cebb41cc9c4>

Link 4

Numerical problems based on spherical mirrors

- <https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5c795fab16b51cbe62be7b77>

Link 5

A quiz based on refraction of light

WEEKS 11 AND 12**Activity 1**

- Take a large shining spoon. Try to view your face in its curved surface.
- Do you get the image? Is it smaller or larger?
- Move the spoon slowly away from your face. Observe the image.
- How does it change?
- Reverse the spoon and repeat the Activity. How does the image look like now?
- Compare the characteristics of the image on the two surfaces.

Activity 2

- Draw the ray diagram for image formation by a concave mirror and convex mirror for different positions of the object. Compare your diagram with those given in Fig. 10.7 and Fig. 10.8.
- Describe the nature, position and relative size of the image formed in each case.
- Tabulate the results in a convenient format. and check your answers with Table 10.1 and Table 10.2

(Observe Links 2 and 3)

Activity 3

- Observe the image of a distant object, say a distant tree, in a plane mirror.
- Could you see a full-length image?
- Try with plane mirrors of different sizes. Did you see the entire object in the image?
- Can a concave mirror show full length image of the object? Discuss with a ray diagram.



<ul style="list-style-type: none"> explains processes and phenomena, such as, reflection and refraction, etc. Analyses and interprets data/graph/figure to draw conclusion regarding reflection and refraction from spherical mirrors and lenses, glass slabs, etc. Communicates the findings and conclusions effectively, such as those of experiment/ activity/ project orally and in written form using appropriate figures/ ray diagrams tables/ graphs/ digital form, etc. applies scientific concepts in daily life in solving problems, such as, numerical problems; why coin in a bowl disappears from sight at a certain position of observer and appears again on pouring water in the bowl, etc. exhibits values of honesty/ objectivity/ rational thinking while taking decisions, such as, records and reports experimental data honestly, etc. 	<ul style="list-style-type: none"> https://nroer.gov.in/55ab34ff81fccb4f1d806025/file/5b3dc8be16b51c01d82d9b1c <p>Link 6</p> <p>Experiments to demonstrate reflection and refraction of light</p> <ul style="list-style-type: none"> https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5699f8b581fccb15fb214089 <p>Link 7</p> <p>Simulation to show refraction of light</p> <ul style="list-style-type: none"> https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5b4d7da316b51c01e2fe50f2 <p>Link 8</p> <p>Observe refraction</p> <ul style="list-style-type: none"> https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5699f90281fccb15fb214426 <p>Link 9</p> <p>Refractive disappearance</p> <ul style="list-style-type: none"> https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5699f8eb81fccb15fb214308 <p>Link 10</p> <p>Observe refraction-magical coin</p> <ul style="list-style-type: none"> https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5699f8bd81fccb15fb2140e2 	<p>Activity 4</p> <ul style="list-style-type: none"> Solve numerical problems and quiz questions given in Links 4 and 5. See Link 13. Perform experiments/ activity if feasible. Caution: Do not go out of the house. You can search and observe video of experiments. Experiments can be performed after opening of school. Solve problems given in Link 14. <p>Activity 5</p> <p>Observe Links 6 to 12.</p> <p>Activity 6</p> <ul style="list-style-type: none"> Place a coin at the bottom of a bucket filled with water. With your eye to a side above water, try to pick up the coin at once. Did you succeed in picking up the coin? Repeat the Activity. Why did you not succeed in doing it in one go? Ask your friends to do this. Compare your experience with theirs. <p>Activity 7</p> <ul style="list-style-type: none"> Place a large shallow bowl on a Table and put a coin in it. Move away slowly from the bowl. Stop when the coin just disappears from your sight. Ask a friend to pour water gently into the bowl without disturbing the coin. Keep looking for the coin from your position. Does the coin become visible again from your position? How could this happen? (Links 10 and 11)
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	<p>Link 11 Observe the coins</p> <ul style="list-style-type: none"> • https://nroer.gov.in/55ab34ff81fcb4f1d806025/page/5699f83e81fcb15fb213b50 <p>Link 12 Observe refraction-hiding fish</p> <ul style="list-style-type: none"> • https://nroer.gov.in/55ab34ff81fcb4f1d806025/page/5699f89281fcb15fb213eac <p>Link 13 (English version) Experiments based on the concepts of reflection and refraction given in Laboratory Manual</p> <ul style="list-style-type: none"> • http://ncert.nic.in/ncerts/l/jelm104.pdf <p>(Hindi version) Experiments based on the concepts of reflection and refraction given in Laboratory Manual</p> <ul style="list-style-type: none"> • http://ncert.nic.in/ncerts/l/jhlm105.pdf <p>Link 14 Assessment-Exemplar Problems (English version)</p> <ul style="list-style-type: none"> • http://ncert.nic.in/ncerts/l/jeep110.pdf <p>Link 15 Assessment-Exemplar Problems (Hindi version)</p> <ul style="list-style-type: none"> • http://ncert.nic.in/ncerts/l/jhep110.pdf <p>Link 16 Enjoy the optical patterns</p>	<p>Activity 8</p> <ul style="list-style-type: none"> • Draw a thick straight line in ink, over a sheet of white paper placed on a Table. • Place a glass slab over the line in such a way that one of its edges makes an angle with the line. • Look at the portion of the line under the slab from the sides. What do you observe? Does the line under the glass slab appear to be bent at the edges? • Next, place the glass slab such that it is normal to the line. What do you observe now? Does the part of the line under the glass slab appear bent? • Look at the line from the top of the glass slab. Does the part of the line, beneath the slab, appear to be raised? Why does this happen? <p><i>Note- A glass tumbler with flat bottom can be used if glass slab is not available at home.</i></p>
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	<ul style="list-style-type: none">• https://nroer.gov.in/55ab34ff81fccb4f1d806025/page/5699f8ce81fccb15fb214184	<p>Activity 9</p> <p><i>Draw ray diagram to show nature, position and relative size of the image formed by a convex lens for various positions of the object and check with Table 10.4 and fig.10.16.</i></p> <p>Activity 10</p> <p><i>Draw ray diagram to show nature, position and relative size of the image formed by a concave lens for various positions of the object and check with Table 10.5 and Fig.10.17.</i></p> <p>Activity 11</p> <ul style="list-style-type: none">• See Link 13. Perform experiments/ activity if feasible.• Solve problems given in Link 14.• Observe Activity given in Link 15. Try to design some pattern of optical illusion
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