

MATHEMATICS (CLASSES XI-XII)

Mathematics (Class XI)

Learning Outcomes	Sources/ Resources	Suggested Activities (to be guided by teachers)
<p>The learner</p> <ul style="list-style-type: none"> develops the idea of Set from the earlier learnt concepts in Number System, geometry, etc. identifies relations between different sets. 	<p>NCERT Textbook (NCERT Textbook for Class XI)</p> <p>Theme 1-Sets Theme-2 Relations and Functions</p> <p>E-resources- Link for textbook/ Laboratory Manual/Exemplar problem book— ncert.nic.in – publications--- PDF (I to XII); ncert.nic.in – publications--- Exemplar problems; ncert.nic.in – publications--- science laboratory manuals</p> <p>(Other mentioned at the bottom)</p>	<p>WEEK 1</p> <ul style="list-style-type: none"> The discussion about sets can begin by asking learners to send lists of collections of objects around them, for example, on a table, in a room, etc. The meaning of well-defined collections can then be discussed. Collections that do not form sets may also be discussed, such as, collection of best mathematicians in the world. The discussion may now shift to collections of mathematical objects like collection of Natural numbers, collection of shapes with three/four sides, solutions of equations, collection of big numbers etc. Learners should be motivated to generate many such collections. The concept of Set can then evolve after getting online responses from Learners. Formal symbolism related to sets can then be discussed. For e.g. set of Natural numbers is denoted by N, etc. <p>WEEK 2</p> <ul style="list-style-type: none"> Different Sets may be formed, and Learners may be encouraged to observe the relationships between these sets. They may search and send those sets whose elements are also present in another set. For example, all elements of N (natural numbers) are present in W (whole numbers), etc. The concept of subsets and related notions can then be discussed. Use of Venn diagrams for visual representations of sets can be explored and discussed. Learners may be encouraged to refer to the e-resources available on NROER related to sets. The learners may be motivated to extend the analogy of operating upon numbers by way of different operations to that of operating on sets by way of their union, intersections, etc. Teachers may encourage Learners to attempt exercises and circulate among other Learners. The group members may discuss the questions through emails/mobiles and get their queries resolved.

	<ul style="list-style-type: none"> • Activities (Activity 1 to 4) relevant to Sets from the Laboratory Manual of Class XI, available online may be done by the learners and shared with the other learners. After every activity they should write what they learnt from that activity. • Exemplar Problem Book which is available on the NCERT website can be used to solve and discuss more problems for getting a better idea of the concept of Sets and their applications. • Assessment of Learners can be done by observing their responses. Appropriate feedback can then be given. <p>WEEK 3</p> <ul style="list-style-type: none"> • Learners may be asked to send a list of relations that they observe in their day-to-day life. For e.g. Relation between mother and children, relation between teacher and Learners etc. This list can be compiled and sent to all the Learners online for their comments. This list can now be extended to mathematical objects for which Learners need to apply their previously learnt knowledge of numbers, geometrical objects, etc. • The idea of ordered pairs can then evolve initially from daily life examples and then from mathematical objects. • The relevance of sets can then be discussed and concept of relations can then evolve after understanding the importance of relation between objects. • Teachers may encourage Learners to attempt exercises and circulate among other Learners. The group members may discuss the questions through emails/mobiles and get their queries resolved. • Particular cases for relations can be seen and conditions can be discussed leading to the concept of Functions. <p>WEEK 4</p> <ul style="list-style-type: none"> • Different notions like Domain, Range, co-domain of functions may then be discussed. Learners may be motivated to form a function and show these mathematical objects. After learners send their examples of functions teacher may change their domain or co-domain and ask whether it still remains a function or not. For example, $f: R^+ \rightarrow R$ such that, $f(x) = \sqrt{x}$ is function, but will it remain a function if co-domain R is replaced by N? Many such examples may be sent by the teacher. Also, learners
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		<p>may be encouraged to form such examples and send to other learners. In this way a live interaction can take place.</p> <ul style="list-style-type: none"> • Learners may be encouraged to sketch graphs of functions. After constructing the graph of a function, they may be encouraged to comment on its nature. Activities (Activity 5 to 6) relevant to Relations and Functions from the Laboratory Manual of Class XI, available online may be done by the learners and shared with the other learners. • Exemplar Problem Book which is available on the NCERT website can be used to solve and discuss more problems for getting a better idea of the concept of Sets. • Assessment of learners can be done by observing their responses. Appropriate feedback can then be given. • Learners may be encouraged to use e-resources related to relations and functions available on the NROER website.
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