

CLASS – X
LESSON PLAN
CHAPTER-14: STATISTICS

Unit	Geometry (Chapter 14: Statistics)
Class Transaction	Total: 12 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of The measures of Central Tendency 2. Frequency Distribution and Frequency Tables. 3. Basic Formulae to calculate the given measures.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. HW notebook
Objective	• Students would be able to identify the various types of Measures of Central Tendency, their application and calculation. • Students would be also be able to make cumulative frequency curves (ogive), thereby inculcating competencies like collaboration, critical thinking
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Various types of Measures of Central Tendency. 2. Different methods to calculate them. 3. Identification and application of suitable method for easy calculations. 4. Identification of the given type of frequency distribution and its corresponding curve. <u>SKILLS</u>- <i>Students would be able to</i> 1. Classify data as per the requirement of the situation . 2. Use the given data to interpret the required statistical concept, creatively and critically. 3. Solve complex questions based on the topics 4. Use analytical skills to visualize the given scenario and use the concepts learnt in everyday problems. 5. Use critical thinking to solve problems.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning, Brainstorming, graphic organizer, think pair and share Think Pair and Share: In this activity, students think about a particular question individually, then they form pairs to discuss their answers. Following this, the results are shared in a large classroom discussion. Alternatively, two pairs of students can pair up to compare and discuss answers. This process forces students to think individually, and then allows them to analyze and clarify their response collaboratively. Brain Storming: In this activity, students are asked to generate ideas on a certain

can use any other too.)	topic, category or question while facilitator facilitate and record the answers on the board. Inquiry Based Learning: Inquiry-based learning uses different approaches to learning, including small-group discussion and guided learning. Instead of memorizing facts and material, students learn by doing. This allows them to build knowledge through exploration, experience, and discussion. Inductive and Deductive Learning: In Inductive type students proceed from particular to general statement(example to formula) and in Deductive type students proceed from general to particular. Students are given formula and they solve problems using them. Muddiest Point: Check comprehension and identify confusion, what was most confusing about the material? <i>Story Boarding</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. The teacher would write the first term that comes to each student's mind, once she/he says statistics. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and Digital Content would be shared <i>Guided practice followed by Independent Practice</i>- NCERT questions to be discussed in the classroom. Techniques to be used: Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Any Other
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do some questions from NCERT and Exemplar in their H.W notebooks HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness.....1 mark Content.....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.

Assessments	Through Pen Paper Test Students will be assessed creatively and critically 3 UNIT TESTS (20, 30, 30) 80 Marks MID TERM EXAMINATION 80 Marks HALF YEARLY EXAMINATION 80 Marks PRE BOARD-I EXAMINATION 80 Marks PRE BOARD-II EXAMINATION 80 Marks ANNUAL BOARD EXAMINATION 80 Marks PERIODIC TEST Average of the best two tests to be taken that will have a weightage of 10 marks. Best 2 Tests out of: Units tests, Midterm examination, Half Yearly examination. INTERNAL ASSESSMENT 20 Marks - Periodical Test 10 Marks - Note Book Submission 05 Marks - Lab Practical (Subject Enrichment) 05 Marks - Through lab Practical Students are assessed for Collaboration, Character building, Character Building																								
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> - High order thinking questions from NCERT Exemplar <i>For weak students:</i> - Buddy help to be provided - Provide grade-up classes <i>For differently abled students:</i> - Ignore spelling mistakes and formulae, if not written - Call parents at regular intervals - Provide grade-up classes																								
Marks	The weightage would be given by CBSE.																								
Assessment Questions	- Find the modal class and the median class for the following distribution:<table><tr><td>Class Interval</td><td>0 - 10</td><td>10 – 20</td><td>20 -30</td><td>30- 40</td><td>40 -50</td></tr><tr><td>frequency</td><td>6</td><td>10</td><td>12</td><td>8</td><td>7</td></tr></table> - If the mean of the following data is 18.75, find the value of p<table><tr><td>x</td><td>10</td><td>15</td><td>P</td><td>25</td><td>30</td></tr><tr><td>f</td><td>5</td><td>10</td><td>7</td><td>8</td><td>2</td></tr></table> - What measure of central tendency is represented by the abscissa of the point where less than Ogive and more than Ogive intersect? - The median and mean of a frequency distribution are 24 and 28 respectively. Find the mode. - Draw ‘less than’ ogive curve for the following distribution:	Class Interval	0 - 10	10 – 20	20 -30	30- 40	40 -50	frequency	6	10	12	8	7	x	10	15	P	25	30	f	5	10	7	8	2
Class Interval	0 - 10	10 – 20	20 -30	30- 40	40 -50																				
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f	5	10	7	8	2																				

		Class interval	20 – 30	30 - 40	40 – 50	50 - 60	60 70	70 - 80	80 - 90	
		frequency	10	8	12	24	6	25	15	

DAY	ONE
Objective	To enhance aware about class mark, class size, deviation, the mean and various formulas for calculating mean like direct method, assumed mean method and step deviation method and developing critical thinking .
Assessment of qualifying knowledge	Quiz and knowledge testing on raw data and frequency of arranged data.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> the difference between discrete frequency distribution and grouped frequency distribution <u>SKILLS and COMPETENCIES</u><i>Students would be able to</i>Reason effectively and criticallyextend the study of measures of central tendencies from ungrouped data to grouped data.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning, Brainstorming Anticipatory Set: 10 min Facilitator will ask few questions to introduce the topic • What is mean ? • What is median? • What is mode ? • What is the formula of calculating mean? • What is the formula of calculating median? • What is cumulative frequency? • What is grouped frequency distribution? • What is class mark? • What is class size? Discussion of topic through Collaborative Learning: 15 min <u>Inquiry based learning</u> (Critical Thinking and Problem Solving) Students would be asked to write class mark, class width and organize the data from ungrouped data to grouped data. The facilitator would take rounds and ensure that each learner is engaged. Guided practice: 10 min The students will be explained the direct method to calculate the mean of given grouped data The facilitator would take rounds and help the students in solving the questions. Independent Practice: Students will go through the solved examples before Ex 14.1 of NCERT text book. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar

Self Study, Home Work, Assignments	Independent Practice: Students would some questions from NCERT in their H.W. notebooks.
Assessments	Oral Test (5 minutes)
DAY	TWO
Objective	Students will be able to identify the difference between various types of methods to solve the problems based on Mean of grouped data in collaborative manner .
Assessment of qualifying knowledge	Written questions on finding mean by selecting an appropriate method
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and</i> Demonstrate the ability to differentiate which method to be used for calculating mean. <u>SKILLS and COMPETENCIES</u>- <i>Students will be able to</i> differentiate and classify various types of methods of calculating mean, in collaboration with each other.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning Recapitulation: 5 min Brainstorming on the previously taught concept would be done. Discussion of topic through Collaborative Learning: 15 min (Critical Thinking, Collaboration) An oral quiz will be taken first to solve the given question by direct method and the facilitator would ask how much time it took with respect to calculation. Then Assumed Mean Method would be introduced to learners and slowly an insight into Step Deviation method would also be given. Guided practice: 15 min The students, with the help of the facilitator, will solve the questions from NCERT book of Exercise – 14.1 in their notebook in the class with the help of their facilitator. The facilitator would ensure that each student tries to be independent at the work as well as be under the facilitator’s guidance. Independent Practice: Students will complete the related HW parts given in Exercise 14.1 in their Math HW notebook. Students who would have difficulty in solving the problem would solve with the help of their buddies. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would some questions from NCERT in their H.W. notebooks.

Assessments	Oral quiz (5 minutes)
DAY	THREE
Objective	To solve the questions of Ex- 14.1 based on step deviation method of calculating mean.
Assessment of qualifying knowledge	Written questions
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will develop the ability to understand the appropriate method to solve questions based on mean and appreciate the effectiveness of various methods</i> <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to critically apply the concepts in given situations and collaboratively realize the usage of each method to be used in different type of problems.</i>
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Think pair and share Recapitulation: 5 min Oral test on the previous concept would be taken up. Discussion of topic through Collaborative Learning: 15 min Exercise 14.1 would be discussed and students would solve different questions per group and then the questions would be crosschecked. Digital content would be used. The facilitator would take rounds and help students with their doubts. Guided Practice: 15 min The students will solve the questions from NCERT book of Exercise – 14.1 in their notebook in the class with the help of their facilitator. The facilitator would ensure that each student tries to be independent at the work as well as be under the facilitator's guidance. Independent Practice: Students will complete the remaining HW parts of Exercise 14.1 in their Math HW notebook. Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	FOUR
Objective	To understand the method of calculating mode of grouped data
Assessment of qualifying knowledge	Written test on identifying the class interval with maximum frequency

Learning Outcomes	KNOWLEDGE- <i>Students will develop the conceptual ability to understand the relationship between frequencies and limits of modal class interval</i> SKILLS and COMPETENCIES - <i>Students would be able to</i> 1. Critically apply the concepts in given situations and collaboratively calculate the mode of grouped data 2. Comprehend that if mode of data is given then missing frequency can be calculated.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning, number head Recapitulation: 5 min Quick revision on the previous concept would be taken up. Discussion of topic through Collaborative Learning: 15 min (Creativity, Collaboration) Formula to calculate mode will be introduced to students. They will know how modal class is determined and use the formula to calculate the mode of given data. This would be discussed in detail with vivid examples. Guided Practice: 15 min The students will solve the questions from NCERT book, solved examples before Ex 14.2 in their notebook in the class with the help of their facilitator. The facilitator would take rounds and help the students in solving the questions. Independent Practice: Students will find modal class and corresponding frequency to use in the formula. Closure: 5 min Discussion of muddiest point. .
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks
Assessments	Written test (5 minutes)
DAY	FIVE
Objective	To solve the questions from NCERT book of Exercise – 14.2
Assessment of qualifying knowledge	Oral test on identifying modal class of given data.
Learning Outcomes	KNOWLEDGE- <i>Students will develop the ability to critically reason the relationship between frequencies and limits of modal class interval</i> SKILLS and COMPETENCIES - <i>Students would be able to</i> 1. Critically apply the concepts in given situations and collaboratively

	calculate the mode of grouped data
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: think pair and share Recapitulation: <u>5 min</u> Quick revision on the previous concept would be taken up. Discussion of topic through Collaborative Learning: <u>15 min</u> (Critical Thinking, Collaboration) This would be discussed in detail with vivid examples. Guided Practice: <u>15 min</u> The students will solve the questions from NCERT book, solved examples before Ex 14.2 in their notebook in the class with the help of their facilitator. The facilitator would take rounds and help the students in solving the questions. Independent Practice: Students will solve problems of Ex- 14.2 in view of its formula. Closure: <u>5 min</u> Discussion of muddiest point. .
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ (5 minutes)
DAY	SIX
Objective	To calculate missing frequency when mode is given.
Assessment of qualifying knowledge	Written test
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand that mode of data determines the modal class of data</i> <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Apply the given knowledge with 100 % accuracy
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: number head, think pair and share Recapitulation: <u>5 min</u> Oral test would be taken. Discussion of topic through Collaborative Learning: <u>15 min</u> (Critical Thinking) How to use given data to calculate the mode would be discussed in detail.

	Guided Practice: 15 min The students will solve the questions from NCERT book of Exercise – 14.2 in their notebook in the class with the help of their facilitator. Independent Practice: Students will complete the remaining HW parts given in Exercise 14.2 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks as given in NCERT
Assessments	Written test (5 minutes)
DAY	SEVEN
Objective	To understand the method of calculating Median and critically analyze the cumulative frequency
Assessment of qualifying knowledge	Written test on cumulative frequency and its significance
Learning Outcomes	<u>KNOWLEDGE-</u> <i>Students will know and understand</i> The concept of cumulative frequency and its usage to calculate the median <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to critically study the data and Classify median class in the given data and use the formula to calculate the median.</i>
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning Recapitulation: 5 min Warming session would be taken. Discussion of topic through Collaborative Learning: 15 min (Critical thinking, communication) Solved examples from the book would be taken up. Brainstorming on classification of median class would be done. Guided Practice: 20 min The students will solve the questions from NCERT book of Exercise 14.3 in their notebook in the class with the help of their facilitator. The facilitator would explain the questions from Ex 14.3 with a collaborative approach towards them. Independent Practice: Students will complete the remaining HW parts given in Exercise 14.3 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, would be taken to check proper assimilation of the topic discussed.

Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks as mentioned in NCERT.
Assessments	Written test (5 minutes)
DAY	EIGHT
Objective	To convert less than type or more than type data in to grouped frequency data with proper class intervals.
Assessment of qualifying knowledge	Written test on cumulative frequency of given data.
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and read and analyze different forms of Cumulative type frequency table</i> <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Critically visualize the cumulative type distribution in the table of the given data 2. Differentiate between less than type and more than type cumulative frequency distribution.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Inductive and deductive reasoning, think pair and share Recapitulation: <u>5 min</u> One-minute test would be taken. Discussion of topic through Collaborative Learning: <u>15 min</u> (Creativity) Redefining the data with cumulative frequency distribution Guided Practice: <u>15 min</u> The facilitator would explain through different examples. Collaborative approach would be taken up. Independent Practice: Students will go through the solved examples before Ex 14.3 of NCERT text book. Closure: <u>5 min</u> Muddiest Point Discussion would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Written test (5 minutes)
DAY	NINE
Objective	To solve the questions from NCERT book of Exercise – 14.3 with 100% accuracy

Assessment of qualifying knowledge	Oral test on cumulative type distribution and classify the median class in the given data
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and read and analyze</i> 1. Cumulative type frequency table <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 3. Critically visualize the cumulative type distribution in the table of the given data 1. Differentiate between less than type and more than type cumulative frequency distribution.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Brainstorming, think pair and share Recapitulation: 5 min Oral test would be taken. Discussion of topic through Collaborative Learning: 10 min (Communication and critical thinking) Solved examples from the book would be taken up. Mind mapping would be used and would discuss different questions Guided Practice: 20 min The teacher, as a facilitator, would explain the questions from Ex 14.3 would be taken up and collaborative approach towards them so that the facilitator would help them with their doubts. Independent Practice: Students will complete the remaining HW parts given in Exercise 14.3 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, would be taken to check proper assimilation of the topic discussed. .
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	Oral test (5 minutes)
DAY	TEN
Objective	To study the calculation of median and empirical formula involving all the three central tendencies.
Assessment of qualifying knowledge	MCQ test on empirical formula
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Identification of Median Class and Calculation of median 2. Know that if two central tendencies are known then third can be calculated through Empirical formula. <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i>

	Develop various techniques to calculate all three central tendencies, creatively
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: number head, think pair and share Recapitulation: 5 min One minute test would be taken. Discussion of topic through Collaborative Learning: 15 min (Critical and creative thinking) Identification of median class would be done if median is given and any frequency is missing. Guided Practice: 15 min The facilitator would explain the questions from Ex 14.3 with a collaborative approach towards them. Independent Practice: Students will complete the remaining HW parts given in Exercise 14.3 in their Math HW notebook. Closure: 5 min Summarization, preferably by a student, would be taken to check proper assimilation of the topic discussed. .
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks.
Assessments	MCQ test (5 minutes)
DAY	ELEVEN
Objective	Representation of less than type ogive
Assessment of qualifying knowledge	Written test on less than type cumulative frequency distribution table
	Apply the concepts and evaluate the given questions with 90% accuracy
Learning Outcomes	KNOWLEDGE- <i>Students will deductively understand</i> 1. Process of formulating less than type cumulative frequency distribution table 2. Plotting of coordinates on the graph to draw curve of less than type ogive SKILLS and COMPETENCIES - <i>Students would be able to</i> 1. Critically visualize the representation and position of coordinates on the graph for less than type ogive curve. 2. Analyze and read the graph to calculate median through graph
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable,	Transaction would proceed in the following manner- Strategy Used : Think pair and share Recapitulation: 5 min

and can use any other too.)	Oral Test would be taken up. Discussion of topic through Collaborative Learning: <u>15 min</u> (Communication and critical) Representation of less than type ogive on graph will be discussed Guided Practice: <u>15 min</u> The students, with the help of the facilitator, will solve the questions from NCERT book of Exercise – 14.4 in their notebook in the class with the help of their teacher. Independent Practice: Students will complete the remaining HW parts given in Exercise 14.4 in their Math HW notebook. Closure: <u>5 min</u> Summarization, preferably by a student, would be taken to check proper assimilation of the topic discussed. .
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks
Assessments	MCQ test (5 minutes)
DAY	TWELVE
Objective	Representation of more than type ogive and hence finding Median
Assessment of qualifying knowledge	Written test on more than type cumulative frequency distribution table.
	Apply the concepts and evaluate the given questions with 90% accuracy
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will deductively understand</i> 1. Process of formulating more than type cumulative frequency distribution table 2. Plotting of coordinates on the graph to draw curve of more than type ogive 3. Find median graphically <u>SKILLS and COMPETENCIES</u> - <i>Students would be able to</i> 1. Critically visualize the representation and position of coordinates on the graph for more than type ogive curve 2. Analyze and read the graph to calculate median through graph
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Strategy Used: Brainstorming Recapitulation: <u>5 min</u> Oral Test would be taken up. Discussion of topic through Collaborative Learning: <u>15 min</u> (Critical and creative thinking) Representation of more than type ogive on graph will be discussed Guided Practice: <u>15 min</u>

	The students, with the help of the facilitator, will solve the questions from NCERT book of Exercise – 14.4 in their notebook in the class with the help of their teacher. Independent Practice: Students will complete the remaining HW parts given in Exercise 14.4 in their Math HW notebook. Closure: <u>5 min</u> Summarization, preferably by a student, would be taken to check proper assimilation of the topic discussed.
Resources	Text Book: NCERT text book for Mathematics Reference Book CBSE Exemplar
Self-Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their H.W. notebooks
Assessments	Quiz (5 minutes)