B.Ed. II semester
Edu-204: Pedagogy-II: Teaching of Mathematics

UNIT 4: PLANNING FOR TEACHING MATHEMATICS

Mathematics Curriculum has a systematic three-step plan to blossom the students for understanding. As a teacher you have to plan accordingly. It is written in descending order. . .
(1)Year Plan (Annual Plan)
(2) Unit Plan
(3) Lesson Plan

1. Year Plan (Annual Plan)

This is a plan to be implemented during an academic year. Annual Plan is to plan for teaching and completing the mathematic curriculum in an academic year, The purpose of the Annual Plan is to create a teaching program that will classify the mathematics curriculum and analysis of a class during a school year. An annual plan is a collection of units in the mathematics curriculum. In this scheme, the period (in periods) for each unit is determined, goals per unit, months per unit (Or days) are written as sub-units in each unit.

Year (Annual) Plan Model:

1. Name of the school 2. Class
3. Subject Total number of periods

Month & Year	Unit	No. of Periods	Objectives							Teaching activity	Teaching learning material	Evaluation
			Knowledge	Understanding	Attitude	Aptitude	Interest	Application	Skill			

2. Unit Plan:

Unit: The meaning of the term 'unit' in mathematics education is the unit of combination, anthology and combination. To summarize the subject matter all the elements of the group together and to bring together into a unit. This unit has a title attached to it.

Definition: Some letters are associated with one another, deposited in a list and written in the form of a list, all under one heading. The unit itself is called the title.

Unit Plan - A systematic teaching plan is essential if the curriculum is to be introduced in schools through a practical teaching method. This pedagogy relates to the curriculum content of the mathematics curriculum. In a curriculum, the subjects should be closely examined and identified in a basic way and written in groups or groups. If each group is listed under a heading, then the list group is called as a unit. The mathematic curriculum is written into a few units. Each unit is then divided into sub-units according to a systematic formula. The segments thus divided are one another are related.

Definition: A unit can split into sub - units. The fields of the similarity of the contents can easily be turned into a sub-unit. The division of sub units is in a systemsatic and relative or correlation on its nature, such division is called the unit plan. The sections of the unit scheme (sub - units) facilitate daily teaching. These unit units are made to fit each period, 45

minutes. The unit scheme is a collection of segments prepared in this way. Each unit unit has goals and creations.

Model of Unit Plan

1. Class: 2. Unit (title):
3. Preferred Periods: 4. Duration (in months):

Sub Unit	No. of Periods	Objectives							Teaching activity	Teaching learning material	Evaluation
		Knowledge	Understanding	Attitude	Aptitude	Interest	Application	Skill			

3. Lesson Plan:

The Lesson Plan is designed to conform to the day-to-day teaching process in the classroom, parallel to the curriculum, the curriculum is chosen and divided into short lessons, and over a period of time. The teacher who has chosen the teaching methodology will take up the teaching learning program. Take a Mathematics Textbook and analyze the selective aspects and designing the teaching method, depending on the nature of the curriculum. While designing the teaching process, the psychological characteristics of the students, the psychological level and the ability to understand is taken into account. The teacher, who has chosen the teaching method, will take up the teaching learning program.

Definition: A program that teaches (ex. A topic in mathematics) through a period of time in the classroom through a set of selected subject lines is called Lesson Plan.

Herbart Steps in Teaching Lesson: The educator Herbart has made some guiding principles in the teaching of curriculum pedagogies is called Herbatarian Steps. Herbart curriculum writing and teaching of new curriculum based on prior knowledge and those will be through practice and practiced.

Steps:

1. **Preparatory:** In the preparatory or preparatory teaching process, the teaching program is carried out by the student and knowledgeable curriculum. Preparing the student for the curriculum to be teach, that means getting ready for things that need to be known. At this stage, the student is ready to learn a new lesson and get ready.
2. Presentation: The teacher divides the curriculum into a few concepts and subsets and teaches them in a logical order. New concepts are brought to the concrete stage by examples. Understanding the lesson is done.
3. **Association**: At this stage, a combination of preconceptions and new concepts related to the current text. It is through this combination that a strong knowledge is formed. This results in the consumption of awareness.
4. **Generalization:** The deductive ability is gained through the student's intuition and knowledge of the curriculum. This analogy, by the way the principles are practiced. This is called normally as Generalisation.
5. **Application:** Students are used for new mathematical messages derived from generalisation. Through this, the student is trained in problem solving. Through

stereotypes, the student who has secured the solving of mathematic problems develops in thinking and logical usage, improvement in understanding and skills.

6. **Recapitulation:** The curriculum is reviewed through instruction and question-and-answer. Knowledge and understanding are tested. To what extent the text is understood. The appraisal is done through meaning, non-cognitive curricula are identified. . .

Based on the above, Herbart can realize that there are six stages of teaching. 1. Preparation
2. Presentation
3. Association
4. Generalization
5. Application
6. Recapitulation

Template of Lesson Plan for Teaching of Mathematics

Name of the student Teacher : **Subject : Mathematics**
Unit : **Class :**
Topic : **Date :**
Name of the Practising School :Kendriya Vidyalaya, IGNTU Campus, Amarkantak **Duration: 30 minutes**
Period :

Objectives & specifications:-

1. **Knowledge:-**
   Specification:

2. **Understanding:**
   Specification:

3. **Application:-**
   Specification:

4.Skill:-
Specification:

Teaching Methods:-

Teaching Learning Material:-

Reference Books:-

Testing of Previous Knowledge:-

S. No.	Teacher's Activity	Student's Activity	BBA/TLM

Motivation:-

S. No.	Teacher's Activity	Student's Activity	BBA/TLM

Announcement of the Topic:-

Presentation:-

Content/ Analysis	Teacher's Activity	Student's Activity	TLM/BBA	Evaluation

Content/ Analysis	Teacher's Activity	Student's Activity	TLM/BBA	Evaluation

Content/ Analysis	Teacher's Activity	Student's Activity	BBA/TLM	Evaluation

Summarization:-
Today we have learnt about

Recapitulation:-
1.
2.
3.
4.
5.

Home Work:-

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UNIT 5: ASSESSMENT AND EVALUATION

INTRODUCTION

Measurements of one kind or another take place frequently in everyday life. The vegetable underweight vegetables, the carpenter measures certain dimensions of the wood, the driver observe the automobile speedometer etc., are consistent with the commonly accepted definition of a measurement process.

Measurement is the process of assigning numbers is individuals or their characteristics according to specified rules. It requires the use of numbers but doesn't require that value judgements be made about the numbers obtained from the values, however measurement in education and psychology is more complex then measurement in physical situations. On the other hand, evaluation, the educator wishes a clear concept of the goals to reach by means of instruction. It involves the ways and means of measuring the extent to which these goals are realized in our students.

Written and essay type examinations were introduced in India with the outgrowth of the British pattern of education. Every test has its own merits and demerits. It measures the memorization and comprehensive person of a student.

Most of the tests, we conduct in schools are known as achievement tests which measures the progress of a student during a specified period and these measures the outcomes in structure. In this lesson we discuss about the qualities of good test, preparation, analysis and interpretation of the test scores.

EVALUATION – CONCEPT - PROCESS

Evaluation is a recent scientific concept and more comprehensive them more measurement. It is a continuous appraisal of the achievement of the aims of education as well as the methods of teaching and learning with a view to continuous improvement that educations become dynamic and self developing. Evaluation exercises a great influence on the pupils study habits and teachers methods of instruction and thus help not only to measure educational achievement.

According to Bradfield J.M. "Evaluation is the assignments of symbols to phenomenon, in order to characterize the worth or value of a phenomenon usually with reference to some social, cultural or scientific standards".

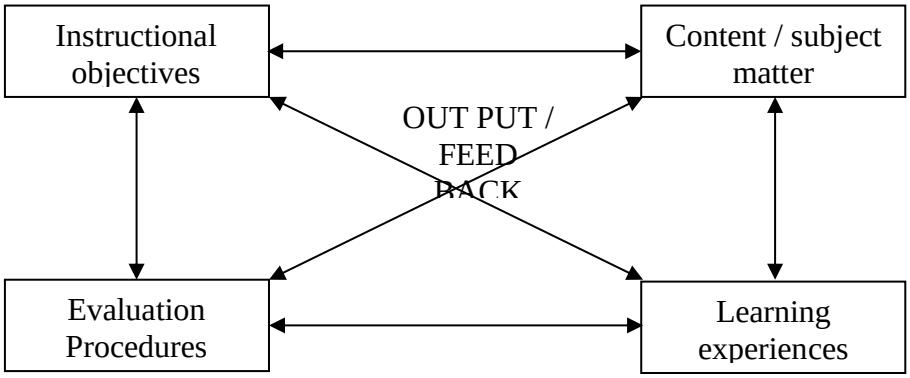
MEASUREMENT AND EVALUATION

Measurement I concerned primarily with the grade placement of an individual; evaluation is primarily concerned with its use to improve teaching and learning. The main differences between the two are.

Measurement	Evaluation
1) It gives only quantity	1) Its gives quantity and quality two
2) Its scope is limited	2) Its scope is widen
1) It helps in determine the present status	3) It helps the evaluation to make an estimate of his future progress
4) It doesn't continue process	4) It is a life long process.
5) It is a part of evaluation	5) Without measurement evaluation doesn't consideration.
6) It doesn't gives the totality of a child	6) It teachers every aspect of the students education.

PROCESS OF EVALUATION

In the previous steps, we come across that educational evaluation is a broad concept which involves the instructional objectives, content / subject matter, learning experiences and evaluation procedures. These all are interconnected to one another.



Steps involved in the evaluation process

The above evaluation process cycle clearly gives that a teacher must follow the steps:

1. First and foremost is to formulating and selecting worth while objectives of teaching in a subject.
2. The objectives and the behavioural changes are brought through proper content and subject matter.
3. Learning experiences can be brought through reading good number of text books listening and acquiring the subject matter.
4. In accordance learning experience, use devise proper evaluation procedures.
5. The expected out put can be obtained and suggest in turns by results or behavioural changes (i.e., feed back).

TYPES OF EVALUATION

Evaluation can be classified into four types.

(i) **Formative evaluation:** It concerned with making decisions relating to forming or development of students as well as of the courses. It is monitor the instructional process to determine whether learning is takes place as planned. The major function of formative evaluation in the classroom is to provide feed back to the teacher and to the student about how things are going. It requires the gathering of fairly detailed information on frequent occasions.

(ii) **Summative Evaluation:** It is conducted at the end of an instructional segment to determine if learning is sufficiently completed to warrant moving learn to the next segment of instruction. In other words it is concerned with making judgments about a finished product or process.

Table: Characteristics that distinguish classroom formative and summative Evaluation

Characteristics	Formative	Summative
1. Purpose	Monitor Progress	Check final status
2. Content focus	Detailed, narrow scope	General, broad scope
3. Methods	Observation, Daily tests Daily	Tests or final Examinations, projects
4. Frequency	Daily	Weakly or fortnight

The terms Formative and summative were introduced by Scriven (1967).

iii) Diagnostic Evaluation: It helps in identifying the defects or specific weakness or problems, of the learner during the course or in the beginning or the teaching learning

process. Some times it used in designing the courses or curricular to fulfill the needs of the learner.

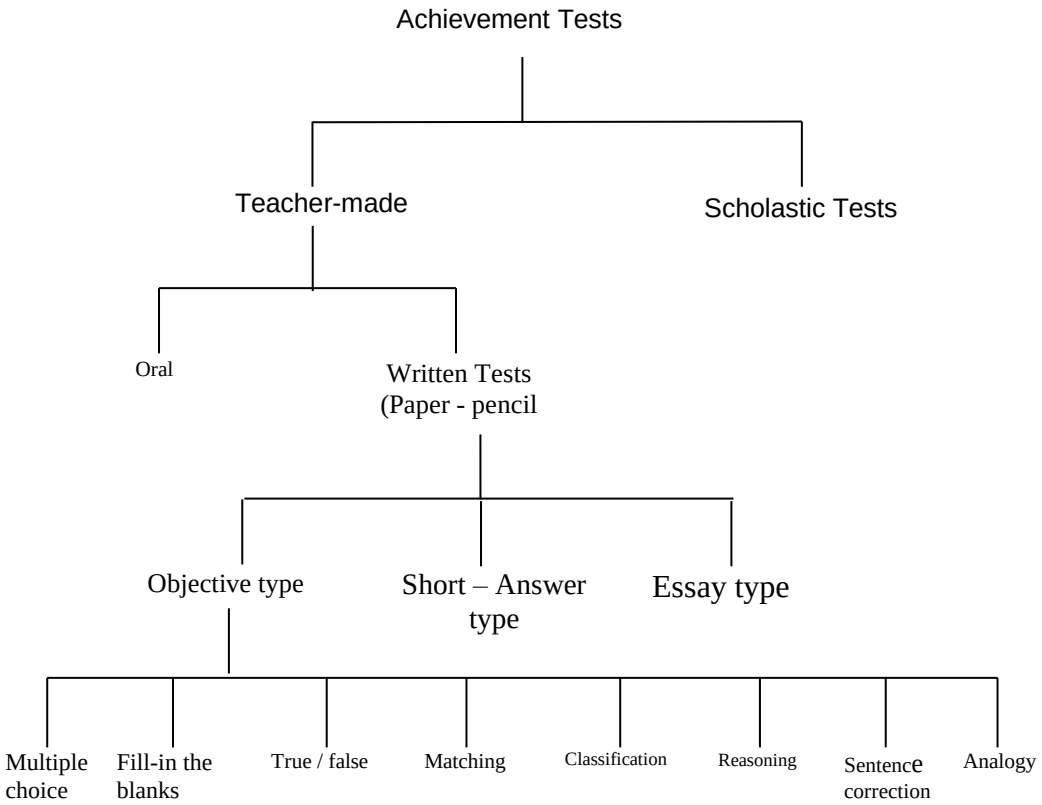
TOOLS OF EVALUATION

A tool of evaluation is used in education as a technique that will facilitate the process of measuring and recording the characteristics of pupils. The following are the some of main tools of Evaluation in education:

(i) Tests
(ii) Questionnaires
(iii) Observation
(iv) Check Lists
(v) Rating Scales
(vi) Anecdotal Record
(vii) Interview

1. Test: A test is defined to estimate that the acquire knowledge or situation by the person after a certain period of instruction. Examinations and tests have been regarded as the major tools of evaluation in education.

Achievement tests constitute an important tool in school evaluation programme. According to Dowinie N.M. "any list that measures the attainments or accomplishments of an individual after a period of training or learning in called an achievement test".



Essay type tests:

The essay type test is allow the student in relative freedom of response in answering the question, at the same time to time requires the student to recall rather than recognisition information and sequentially express his views clearly and concisely. It prior to high subjectivity.

Advantages:

1) Easy to construct
2) Developing good study habits and also reading and writing skill.
3) Controlling the mass copying and guessing
4) Free to express his in heart ability skill, ideas.
5) More priority given to application and skill objectives
6) Developing logical reasoning, simplifying and explaining.
7) Promoting the language caliber and matter organization.

Limitations:

1) Low validity and reliability
2) Less objectivity and high subjectivity
3) They not test the real knowledge
4) Lack of comprehensiveness
5) Encouraging rote memory or by hate.
6) Time taken in scoring
7) Can't test all the objectives
8) Can't caver all the teaching learning points (syllabus)

Short-answered type tests:

These types of tests are testing high through –providing. They used in testing somewhat we actually expert from the students. They test the objectivity as well as subjectivity of the student, because the student answers to these types of questions in the forms of a few sentences or words.

Objective type Tests:

"An objective type test is importing to the objectivity rather than the subjectivity". It tests the factual information. There are several types of objective tests used in Evaluation. Few of them are given in the above diagram.

Advantages:

1) Extensive sampling
2) Objectivity of scoring
3) Economy of Time
4) No bluffing,
5) Equal icy of time opportunity
6) Speed and Accuracy
7) Testing all the objectives
8) Easy to conducts and scoring

Limitations:

1) Often Antiguans.
2) Constructions of these tests are difficulty and considerable cost.
3) Lack of availability of skilled persons in construction.
4) Providing guessing priority.
5) Fail to measure the intellectual skills of students.

2. Questionnaire:

Questionnaire is a set of questions for securing answers (information seeking) from a sample of population.

The information collected with a questionnaire helps in evaluation of personality traits, interests, attitudes, applauds etc. sometimes it helps in providing guidance and councelling.

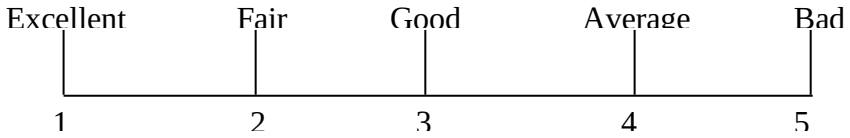
3. Check Lists:

It is a simple tool or evaluation which tests various aspects of an individual's behavioural adjustment. Some times it useful to evaluate the physical conditions of the persons institutions or objects.

4. Rating Scales:

It is a device by which the opinion concerning a traits can be systematized. Rating is a term to express an opinion or judgement. They are usually expressed on a scale of value is also called rating scales.

For Ex: How beautiful she is?



Types of Rating Scales

a) Numerical:

- 3 point numerical scale
- 5 point numerical
- 3 point numerical

} In which numbers are assigned to each trait. The above example is 5 point rating scale.

b) Graphic: To rate a person on a particular trait in descriptive phases at various points.

Ex : He attends the meeting

c) Method of paired comparison: The rater compares each person being rated with respect to the trait of every other individual interms of 'equal', 'better' or 'worse'.

d) Man of man Scale: An individual is asked to rate the person to be rated by comparing him to a person already rated and assigned a position on the scale. The rate is assigned his position.

e) Score Cards: In which whatever is being rated is analysed into its component Parts.

5. Observation:

Observation is a tool to evaluate an external behaviour of a person in controlled uncontrolled situation can be verified and recorded. They are two types

1) Direct observation-controlled and Natural direct observation
2) Indirect observation – controlled and natural indirect observation.

6. Anecdotal Record:

It is a record of written description of a specific incident/s which a teacher has observed the students behaviour from time to time.

Previously, it is supplied to every student after completion of his SSLC/SSC. But in the year 1985 the A.P. State Government is winding the record in school system.

7. Interview:

It is the face of face method of collecting information. It is used in guiding the student, diagnosing and counseling purpose too.

They are two types

1) Structured interview seeking the information for a list of prepared items
2) Unstructured interview-seeking information spontaneous items but not previously prepared.

QUALITIES OF A GOOD TEST

The selection of a measuring instrument or examination or test is not a haphazard process. We require an accurate tool to assess the students real knowledge and behaviour. An accurate test or a good test must need the following qualities.

1. Validity: It refers to the test quality to measure what it is intended to measure. "A test is valid, when it measures truly and accurately the ability or quality one wants to appraise". It also referred as 'truthfulness' of the test.

Factors affecting the validity of a test:

a. **Cultural influences:** Cultural back ground of a person including socio economic status influence the general factor of the intelligence of a person.
b. **Response Sets:** Too many of these are most likely to reduce the logical and empirical validities of a test.
c. **Lack of clarity in direction:** Lack of proper instructions, language clarity usage of meaningful words is use in the test lead decrease the validity.
d. **Excess reliability:** A test having large number of items it that leads to low validity.

Types:

i. **Content Validity:** A test is adequately comes both the content and objectives of the subject matter on which the test is based.
ii. **Face Validity:** It doesn't refer to what the test actually measures but refers to what the test seems to measure.
iii. **Construct Validity:** It refers to the extent to which the test measures a particular characteristic of an individual i.e. individuals actual achievement of instructional objectives.
iv. **Concurrent Validity:** This type can distinguish between two or more groups of individuals whose status at the time of testing is different.

2. Reliability:

It refers a test is reliable if it measures efficiently what it purposes to measure or what it does measure. A test is reliable; it gives same rating to the student even if he is examined by different examiners or even different times by the same examiner. Simply it refers as "consistency" of a test.

Factors affecting reliability:

a. The length of the test: The longer test is more reliable than a shorter one i.e. a considerable number of questions need a test.

b. Objectivity in scoring**:** priority given to objective based questions.
c. Clarity of instructions**:** The instructions should not ambiguous.

Methods of determination

i. **Test-Re test method (co-efficient of stability):** Pre test and post test are done on a same test item. The results of correlation give high for post test gives the reliability of the test.
ii. **Split – half method (co-efficient of equivalence):** Either dividing the test items equally or odd and even then correlation of the two halves. From this we can get reliability by applying spearman – Brown formula $r = \frac{2r\frac{1}{2}}{1+r\frac{1}{2}}$

r1 = reliability coefficient of whole test
r 1/2 = reliability of half of test.

iii. **Parallel form (co-efficient of stability and equivalence):** The parallel form of test items i.e. in the form of content and difficulty are prepared and found the correlation between them.

iv. **Kudder-Richerdson Method (co-efficient of internal consistency):** Items in a test has common with another.

3. Objectivity:

The degree to which equally complement users get the same result. It eliminates the examiner's personal opinion; bias or judgment on the given test.

4. Practicability:

Easy to administration, scoring and low cost in preparation. It should be according to abilities of the sample.

5. Interpretability:

The scores obtained from the test are interpreting commonly.

6. Administrability:

The test should be conducting easily other wise it is waste.

7. Scorability:

The test should be summarize and providing to score easy.

PREPARATION OF A SCHOLASTIC ACHIEVEMENT TEST

Achievement tests are to measure the extent learning of the students. These are diagnosing the students learning strengths and weakness. The achievement test is a predominant procedure at present to assessing the progress of the pupils. These are prepared by the classroom teachers to test the students progress and test of his instruction. "A test which is constructed based on the objectives formed and tested is called scholastic achievement test".

CONSTRUCTION OF A SCHOLASTIC ACHIEVEMENT TEST:

Every teacher can construct a scholastic achievement test based on these points.

1) The content, time allocation, and maximum marks
2) Framing the objectives and test items and
3) Allot the sufficient score to the item according to the level of difficulty. All these are depends on the following table.

(i) CONSTRUCTION OF WEIGHTAGE TABLES

Before constructing an achievement test first of all we prepare the whole content in the form of different weightage tables.

a) **Weightage to objectives:**

Weightage must be properly covers to each objective.

S.No	Objective	Marks allotted	Percentage
1.	Knowledge	8	32
2.	Understanding	6	24
3.	Application	6	24
4.	Skill	5	20
		25	100

b) **Weightage to content:**

Distribute equally the content and properly coverage weightage to each sub - content (Sub-Unit).

S.No	Sub Units	Marks allotted	Percentage
1.	Measuring mass	10	40
2.	Time measurement	9	36
3.	Simple-pendulum-introduction, formulas	6	24
		25	100

c) **Weightage to test items:**

Weightage to be given properly to the each type of test items.

S.No	Test item	No. of Questions	Marks allotted	percentage
1.	Objective based	10	10	40
2.	Short answered based	5	10	40
3.	Essay based	1	5	20
			25	100

d) **Weightage to difficulty level:**

To discriminate the students, the test fulfills the needs of their difficulty level.

S.No	Difficulty Level	Marks allotted	Percentage
1.	Easy level	7	28
2.	Average level	11	44
3.	Difficulty level	7	28
		25	100

(ii) PREPARATION OF BLUE – PRINT

It is a three dimensional tables consists of contents, objectives and test items. It occupies a prominent place in constructing the scholastic achievement test. With this table, we can easy to understand a question in the test can question based on which objective, in which content it takes and the type of question.

Objectives / Sub-Units	Knowledge			Understand			Application			Skill			Total
	O	S.A	E	O	S.A	E	O	S.A	E	O	S.A	E	
Measuring mass	$(1)^{1}$	$(1)^{2}$	-	$(1)_{1}$	-	-	$(1)_{1}$	-	-	-	-	$(1)_{5}$	$(5)^{10}$
Time measurement	$(1)^{1}$	$(1)^{2}$	-	$(1)_{1}$	$(1)^{2}$	-	$(1)_{1}$	$(1)^{2}$	-	-	-	-	$(6)^{9}$
Simple Pendulum	$(2)^{2}$	-	-	$(2)_{2}$	-	-	-	$(1)^{2}$	-	-	-	-	$(5)^{6}$
Sub Total	$(4)^{4}$	$(2)^{4}$	-	$(4)_{4}$	$(1)^{2}$	-	$(2)_{2}$	$(2)^{4}$		-	-	$(1)_{5}$	$(16)^{2}_{5}$
Total	$(6)^{8}$			$(5)^{6}$			$(4)^{6}$			$(1)^{5}$			

Note:1. Numerals within the brackets are question numbers

2. Numerals outside the brackets are allotment of marks.

(iii) **PREPARATION OF A QUESTION PAPER**

On the lines of weightage tables and Blue Print the question paper should be prepared. No question can repeat and take care on leading questions. Instructions should be clearly given. Preliminaries namely class, subject, Maximum Time and Marks and the Contents of the test should be neatly typed boldly on the question paper.

Question paper should be divided into three sections with objective type, short answer type and essay type questions. Section – A contains 10 objective based questions (3 questions for multiple choice and fill in the blanks respectively with 1mark for each question; 2 questions for True/False and Matching type questions respectively with 1 mark for each question). Section – B have 5 short answered questions with 2 marks for each question and Section-C has to be awarded with 5 marks of 1 Essay type question.

Take care in typographical error and visibility.

(iv) SCORING KEY

While preparing a question paper besides the examiner prepares a scoring key. It helps if other than the paper setter in evaluation awarding the marks for the respected question.

It gives the test is as a culture free test. A model of the scoring key is as follows:

Sl. No.	**Question Number**	**Total marks for each question**	**Expected Answer in points wise for each question**	**Marks allotted for each item**
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				

(v) QUESTION /ITEM WISE ANALYSIS

After completion of the question paper and scoring key, the paper setter should analysis the each and every question that it satisfies the expected objectives contents, and difficulty level of the students or not. A model of the question wise analysis is given under:

Question Number	**Objective & Specification**	**Marks awarded**	**Analysis of the Question**	**Sub Unit**	**Type of question**	**Alloted Time**	**Level of Difficulty**
1.							
2.							
3.							
4.							
5.							
6.							

7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							
16.							

ANALYSIS AND INTERPRETATION OF SCORES

After conducting the test, the teacher should prepare the individual scoring scheme. It helps the teacher to know the individual interest on the contents and type of item. A model of the individual scoring scheme is given under.

Individual marking Scheme:

The obtained scores of the individuals (Raw scores) are tested with the statistical techniques namely measures of central tendency (Mean, Median and Mode), Measurer of dispersion (Range, Quartile Deviation, Mean Deviation, Standard Deviation and Variance), Measures of divergence (Skewness and Kurtosis). With all these we can estimate the students innate knowledge on the subject.

The scores are plotted into different graphs namely Histograms, Frequently Polygons, Upper/Lower Cumulative Frequency curves and Ozive curve. With these, a person can get glance of idea about the standard of the students, class and teaching of the teacher. For knowledge the difficulty level of the items, item difficulty index, item discrimination index are also calculated.

After all interpretation of the above statistical analysis the teacher inform the students about their level of knowledge, the area in which they lag behind, the type of questions which they felt difficulty. The teacher should explain the proper remedial measure to the students for their upliftment.

PLANNING, PREPARATION AND CONDUCT OF ACHIEVEMENT TEST IN CCE MODEL

INTRODUCTION

Continuous and Comprehensive Evaluation (CCE) refers to a system of school based evaluation of a student that covers all aspects of a student development. It is a developmental process of student which emphasizes on two fold objectives. These objectives are continuity in evaluation and assessment of broad based learning and behaviourial outcomes on the other.

The term 'continuous' is meant to emphasise that evaluation of identified aspects of students 'growth and development' is a continuous process rather than an event, built into the total teaching-learning process and spread over the entire span of academic session. It means regularity of assessment, frequency of unit testing, diagnosis of learning gaps, use of corrective measures, retesting and feedback of evidence to teachers and students for their self-evaluation.

The second term *'comprehensive'* means that the scheme attempts to cover both the scholastic and the co-scholastic aspects of the students' growth and development. *Since abilities, attitudes and aptitudes can manifest themselves in forms other than the written word, the term refers to application of variety of tools and techniques (both testing and non-testing) and aims at assessing a learner's development in areas of learning, like:-*

- Knowledge
- Understanding
- Applying
- Analyzing
- Evaluating
- Creating

Continuous evaluation helps in bringing awareness of the achievement to the child, teachers and parents from time to time. They can look into the probable cause of the fall in performance if any, and may take remedial measures of instruction in which more emphasis is required. Many times, because of some personal reasons, family problems or adjustment problems, the children start neglecting their studies, resulting in sudden drop in their performance. If the teacher, child and parents do not notice the sudden drop in the performance of the child in academics, it could result in a permanent deficiency in the childs' learning.

The major emphasis of CCE is on the continuous growth of students ensuring their intellectual, emotional, physical, cultural and social development and therefore, it will not be merely limited to assessment of learner's scholastic attainments. CCE uses assessment as a means of motivating learners to provide feedback and follow up work to improve upon the learning in the classroom and to present a comprehensive picture of a learner's profile.

Objectives of CCE are:

- To help develop cognitive, psychomotor and affective skills.
- To lay emphasis on thought process and de-emphasise memorization.
- To make evaluation an integral part of teaching-learning process.
- To use evaluation for improvement of students' achievement and teaching – learning strategies on the basis of regular diagnosis followed by remedial instruction.
- To use evaluation as a quality control device to maintain desired standard of performance.
- To determine social utility, desirability or effectiveness of a programme and take appropriate decisions about the learner, the process of learning and the learning environment.
- To make the process of teaching and learning a learner-centered activity.

Guidelines for Filling in the CCE Card

1. Name of Student: As required in the Certificate

2. Date of Birth: In words and numbers (Twenty Sixth of November Nineteen Ninety Two e.g. 26-11-1992)

3. Mother's Name: As on Birth /Registration Certificate

4. Father's Name: As on Birth /Registration Certificate

5. Admission No.:

6. Board's Registration No.: Provided at the time of filling entries.

7. Self Awareness: To be filled at the end of 2years after discussion with the student.

8. My Goals:

9. My Strengths:

10. Interests and Hobbies:

Inside Cover

- **Part - I Academic Performance:**
- **Scholastic Areas.**

A. Formative Grade = F1 + F2 + F3 + F4 = _____ Grade

B. Summative Grade = S1 + S2 = _____ Grade

Overall Grade: FA-1 (10%) + FA-2 (10%) + FA-3 (10%) + FA-4 (10%) + SA-1 (20%) + SA-2 (40%)

Percentile Rank: $\frac{\text{No. of score below} \times 100}{\text{n (Total number of students)}}$ = Percentile

PART 1 (A) : Scholastic Areas

Overall grade of formative Assessments over the two terms (F1+F2+F3+F4) needs to be given and the overall grade of summative Assessment (S1+S2) must be given. A total of the two grades need to be given in the relevant column.

As far as Scholastic (B) relating to Work Experience, Art Education and Physical and Health Education/Games is concerned.

PART 2: Co- Scholastic Areas

Part (2A): Life Skills

These are to be filled in after a period of observation over one year by the Class Teacher in consultation with the subject teachers. Students will be assessed on all the groups of Life Skills. The guidelines for filling this are given in detail later in the document.

PART 2(B): Attitude and Values

Attitude towards *Teachers, School Mates, School Programmes* and *Environment* needs to be assessed on a three point scale after observation over one year. The various tools and techniques to be used as well as the Indicators of Assessment need to be taken into consideration by the teachers. **These will be filled in by the Class Teacher in consultation with all subject teachers.**

PART 3(A): Co- Curricular Areas

Co-Curricular activities consist of *Literary and Creative Skills, Scientific Skills, Aesthetic Skills* and *Performing Art and Clubs* which include *Eco-clubs, Health and Wellness Clubs*, etc. A student will be expected to choose *two activities* from these four groups and will be assessed on their level of participation and achievement on a *three point grading scale* by the concerned teachers.

PART 3(B): Health and Physical Education

Students will be assessed on any two activities that are chosen from within the *eight* different activities grouped under *Health and Physical Education.* The objective is to benefit from Physical fitness activities to maximize health benefits. These will also be assessed on a *three point grading scale.* They will be assessed by teachers involved in various activities in school.

These have to be filled in after a period of observation over one year.

The areas given in the CCE card provide adequate opportunities to the learners for all round development. It has been widely understood that class room transaction in academic subjects alone cannot foster development in all areas or help to develop Life Skills. The development of qualities such as *Self Esteem, Positive Attitude* and *Life Skills* of *Creative* and *Critical Thinking, Problem Solving* and *Decision Making, Managing Stress* and *Emotions* require development of positive and adaptive behaviors over a period of time. These Life Skills can be integrated into the entire personality of a learner over the ten years of schooling and are essential for fostering personal qualities, nurturing good relationships and developing effective Communication Skills. The developing of good physical health, formation of positive attitude towards others including environment and cultivation of universal values is possible only through learner's involvement in Life Skills and Co-Curricular activities.

The most commonly used tools/techniques by the teachers are paper-pencil tests/tasks, written and oral tests, questions on pictures, simulated activities and discussion with students. Short class tests are used by most teachers as a quick and easy way of assessing the learning progress of children. As these are generally conducted at the end of a unit/month covering the specified content taught during that period, these are no doubt useful but they need to be used effectively.

Similarly, tests can be formal, informal, written or oral, based on specified content desired to be tested. They are diagnostic in nature as they enable the teacher to identify or reveal the strength and weaknesses of students. A test should not create any fear among students and it should be administered in an informal way.

PLANNING OF A CCE SCHOLASTIC ACHIEVEMENT TEST

In order to have Continuous and Comprehensive Evaluation, both Scholastic and Co-Scholastic aspects need to be given due recognition. Such a holistic assessment requires maintaining an ongoing and comprehensive profile for each learner that is honest, encouraging and discreet. While teachers frequently reflect, plan and implement remedial strategies, the child's ability to retain and articulate what has been learned over a period of time also requires periodic assessment. These assessments can take many forms but all of them should be as comprehensive and discreet as possible. *Weekly, fortnightly,* or *quarterly* reviews (depending on the learning area), that do not openly compare one learner with another are generally recommended. The objective is to promote and enhance not just learning and retention among children, but their soft skills as well.

Scholastic Assessment

The objectives of the Scholastic domain are:-

- Desirable behaviour related to the learner's knowledge, understanding, application, evaluation, analysis and the ability to apply it in an unfamiliar situation.
- To improve the teaching learning process.
- Assessment should be both *Formative* and *Summative.*

Part 1: Scholastic Areas: Formative and Summative Assessment

i. **Formative Assessment:** It is a tool used by the teacher to continuously monitor student progress in a non-threatening, supportive environment. It involves regular descriptive feedback, a chance for the student to reflect on the performance, take advice and improve upon it. It involves the students' being an essential part of assessment from designing criteria to assessing self or peers. If used effectively, it can improve student performance tremendously while raising the self-esteem of the child and reducing the work load of the

teacher. Formative Assessment is carried out during a course of instruction for providing continuous feedback to both the teachers and the learners. It is also carried out for taking decisions regarding appropriate modifications in the transactional procedures and learning activities.

Features of Formative Assessment

- Is diagnostic and remedial
- Makes provision for effective feedback
- Provides a platform for the active involvement of students in their own learning
- Enables teachers to adjust teaching to take account of the results of assessment
- Recognizes the profound influence assessment has on the motivation and self-esteem of students, both of which are crucial influences on learning
- Recognizes the need for students to be able to assess themselves and understand how to improve
- Builds on students' prior knowledge and experience in designing what is taught
- Incorporates varied learning styles to decide how and what to teach
- Encourages students to understand the criteria that will be used to judge their work
- Offers an opportunity to students to improve their work after they get the feedback
- Helps students to support their peer group and vice-versa

The formative assessment tasks have been designed keeping the following principles in mind:

- Formative assessment is an integral part of classroom practices. So they have been related to the syllabus to be transacted.
- The tasks generally specify the following:
  - Unit/ Lesson
  - When to conduct the task.
  - Approximate time required for each task.
  - Objectives of the task.
  - Task specifications.
  - Procedure for conducting the task including preparation, if any.
  - Criteria for assessment
  - Feedback and follow-up.

Teachers, however, have the freedom to make minor modifications in the overall design of the task to suit their requirements.

Formative Assessment (FA)

- Class work
- Quizzes
- Experiments
- Homework
- Projects (Group/Individual)
- Conversation/Interviews
- Oral questions
- Assignments/Tests

ii. **Summative Assessment**: It is carried out at the end of a course of learning. It measures or *'sums-up'* how much a student has learned from the course. It is usually a graded test, i.e., it is marked according to a scale or set of grades. Assessment that is predominantly of summative nature will not by itself be able to yield a valid measure of the growth and development of the student. It, at best, certifies the level of achievement only at a given point of time. The paper pencil tests are basically a onetime mode of assessment and to exclusively rely on it to decide about the development of a student is not only unfair but also unscientific. Overemphasis on examination marks that focus on only scholastic aspects in turn makes student assume that assessment is different from learning, resulting in the *'learn and forget'*

syndrome. Besides encouraging unhealthy competition, the overemphasis on Summative Assessment system also produces enormous stress and anxiety among the learners.

Features of Summative Assessment

- Assessment *of* learning
- Generally taken by students at the end of a unit or semester to demonstrate the *"sum"* of what they have or have not learned
- Summative assessment methods are the most traditional way of evaluating student work

Differences between formative and Summative Assessment

Formative assessment is assessment *for* ***learning***	Summative assessment is assessment *of* ***Learning***
Formative assessment is pedagogy	Summative assessment is essentially evaluation
Formative assessment can be 'practice'	Summative assessment can be thought of as seen as performance after practice

- A good comprehensive assessment programme balances formative and summative assessments

iii. Co-Scholastic Assessment: The desirable behaviour related to learner's life skills, attitudes, interests, values, co-curricular activities and physical health are described as skills to be acquired in co-scholastic domain. The process of assessing the students' progress in achieving objectives related to scholastic and co-scholastic domain is called comprehensive evaluation. It has been observed that usually under the scholastic domain such as knowledge and understanding of the facts, concepts, principles etc. of a subject are assessed. The Co-Scholastic elements are either altogether excluded from the evaluation process or they are not given adequate attention. For making the evaluation comprehensive, both Scholastic and Co-Scholastic aspects should be given importance. Simple and manageable means of assessment of Co-Scholastic aspects of growth must be included in the comprehensive evaluation scheme.

Part-2: Co-Scholastic Areas: Part 2 consists of Co-Scholastic Areas where students' are assessed in four parts on a Five Point Grading Scale once in a session.

Part 2(A):

Life Skills consists of -

- Self Awareness
- Problem Solving
- Decision Making
- Critical Thinking
- Creative Thinking
- Interpersonal Relationships
- Effective Communication
- Empathy
- Managing Emotions
- Dealing with Stress

Part 2(B):

- Work Education

Part 2(C):

- Visual and Performing Arts

Part 2(D): Attitudes & Values

- Attitudes towards *Teachers, Schoolmates, School Programmes* and *Environment* .
- Value systems refers to the framework which must be developed right through Primary to Secondary level.
- These are to be filled in after a period of observation over the year by the Class Teacher in consultation with the subject teachers.

Part 3: Co-Curricular Activities: Co-curricular Activities wherein choice in participation and assessment thereof is available. It has two sub parts to be assessed on a five-point grading scale.

Part 3(A)

1. Literary and Creative Skills
2. Scientific Skills
3. Information and Communication Technology (ICT)
4. Organizational and Leadership Skills (Clubs)

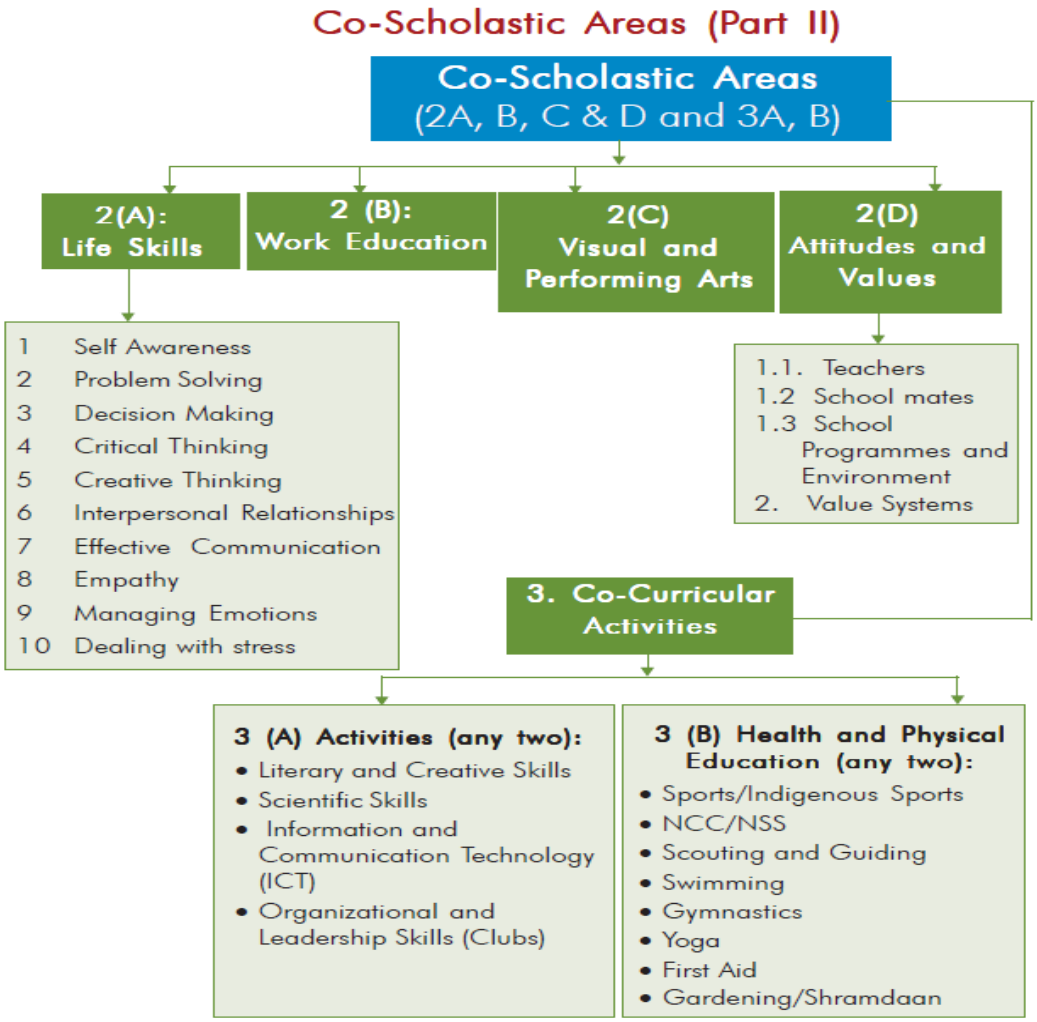
A student will be expected to choose *two* activities from these four groups and will be assessed on their level of participation and achievement.

Part 3(B) Health and Physical Activities

Eight different kinds of Health and Physical Activities have been provided.

1. Sports/ Indigenous sports *(Kho-Kho etc.)*
2. NCC / NSS
3. Scouting and Guiding
4. Swimming
5. Gymnastics
6. Yoga
7. First Aid
8. Gardening/Shramdaan

Students will be assessed on any two activities that are chosen from within the *eight* different activities. The objective is to benefit from Physical activities to maximize health benefits. They will be assessed by teachers involved in various activities in school. The areas given in the Report Book provide adequate opportunities to the learners for all round development. It has been widely understood that class room transaction in academic subjects alone cannot foster development in all areas or help to develop Life Skills. The development of qualities such as *Self Esteem, Positive Attitude* and *Life Skills* require development of positive and adaptive behaviors over a period of time. These Life Skills can be integrated into the entire personality of a learner over the ten years of schooling and are essential for fostering personal qualities, nurturing good relationships and developing effective Communication Skills. The development of good physical health, formation of positive attitude towards others including environment and cultivation of universal values is possible only through learner's involvement in Life Skills and Co-Curricular Activities.



Evaluation of Scholastic aspect: Scholastic Part 1(A)

Type of assessment	% of weightage in academic session	Month	Term wise weightage
FIRST TERM			
Formative Assessment-1	10%	April-May	FA-1+2=20%
Formative Assessment-2	10%	July-August	
Summative Assessment-1	20%	September	SA- 1=20%
SECOND TERM			
Formative Assessment-3	10%	October-November	FA-3+4=20%
Formative Assessment-4	10%	January-February	
Summative Assessment-2	40%	March	SA-2=40%

Total Formative Assessments = FA-1 + FA-2 + FA-3 +FA-4 = 40%
Summative Assessments = SA-1 + SA-2 = 60%

Grading Scale

Assessment of Scholastic attainments Part 1 will be reported *twice in* a year. The *nine point grading scale* for measuring *Scholastic achievements* is given below:

Grade	Marks Range	Grade point
A1	91 -100	10.0
A2	81 - 90	9.0
B1	71 - 80	8.0
B2	61 - 70	7.0
C1	51 - 60	6.0
C2	41 - 50	5.0
D	33 - 40	4.0
E1	21- 32	3.0
E2	00 -20	2.0

Minimum qualifying grade in all the subjects under Scholastic Domain is D.

Note : All assessment with regard to the academic status of the students shall be done in marks and the assessment will be given in grades. Co-Scholastic attainments 2 (A, B, C& D) and 3 (A, B) will be done on 5 point Scale (shown in the table below). *It will be done once in* a session.

Grade	Grade Points
A	4.1 – 5.0
B	3.1 – 4.0
C	2.1 – 3.0
D	1.1 – 2.0
E	0 - 1.0

Minimum qualifying grade in Co-Scholastic Domain is D.

Note: As per the Directives of RTE, no child will be detained till class VIII

PREPARATION OF A CCE SCHOLASTIC ACHIEVEMENT TEST

The following are the list of tools and techniques that can be used in CCE are stated below:

Tools

1. Questions
2. Observation
3. Tests and inventories
4. Checklist
5. Rating scale
6. Anecdotal records
7. Document analysis
8. Portfolio

Techniques

1. Examination
2. Assignments
3. Quizzes and competitions
4. Projects
5. Debates
6. Elocution
7. Group discussions
8. Club activities
9. Experiments
10. Research

Based on the availability the following formative and summative prepared tests are given below:

Formative Assessment 1 – Slip Test

Sub: Physical Science Class: 10 EM

Name: ……Roll No: …… Max. Marks: 25

I. Answer the following questions. (4x1=4)

1. Define magnification?
2. Why do we prefer a convex mirror as a rear-view mirror in vehicles?
3. $KMnO_4+H_2SO_4+FeSO_4 \rightarrow K_2SO_4+MnSO_4+Fe_2(SO_4)_3+H_2O$ Balance the equation.
4. What is a neutralization reaction? Give two examples?

II. Answer the following questions. (3x2=6)

5. Give any two uses of Baking Soda?
6. What information do you get from balanced chemical equation?
7. Distinguish between real and virtual mirrors.

III. Answer the following questions. (4x2=8)

8. Find the distance of the image when an object is placed on the principal axis at a distance of 20cm in front of a concave mirror whose radius of curvature is 12cm.
9. Draw a heat diagram for showing acid solution in water conducting electricity.

IV. Fill in the blanks. (4x1=4)

10. PH of blood ……..
11. Metals when reacts with acids evolves ……. gas.
12. 1 mole of any gas occupies ……liters at STP.
13. All the distances related to spherical mirror will be measured from …….

Formative Assessment - I
Sub: Science

Class: X **Marks: 25**

I. Answer any TWO of the following questions. 2 x 4 = 8

1. Write the difference between evaporation and boiling?
2. Define types of chemical reactions and give example to each?
3. Write the balanced chemical equation to the following.
   a) zinc + silver nitrate zinc nitrate + sliver
   b) aluminum + copper chloride aluminum chloride + copper
   c) hydrogen + oxygen water
   d) calcium hydroxide + nitric acid calcium nitrate + water

II. Answer the following questions. 2 x 2 = 4

1. Explain rancidity?
2. What would be final temperature of mixture of 50g of water at 200c temperature and 50g of water 400c temperature?

III. Answer the following questions. 3 x 1 = 3

1. Convert 2670c into kelvin scale?

2. Why do we apply paint on iron articles?

3. Give two example for oxidation – reduction reaction.

IV. Fill in blanks. 4 x ½ = 2

1. The latent heat of fusion of ice is _____

2. Ice floats on water because _____

3. The reaction 2N2o 2N2 + O2 is example for _____ reaction.

4. The sultriness in summer days is due to _____

V. Choose the correct answer. 6 x ½ = 3

1. Evaporation [ ] a) warming process

2. Condensation [ ] b) solid to liquid

3. Melting [ ] c) cooling process

4. Boiling [ ] d) liquid to solid

5. Freezing [ ] e) hotness or coldness

6. Temperature [ ] f) liquid to gas

VI. Project work . 5 Marks