



CONTINUOUS AND COMPREHENSIVE EVALUATION

SCIENCE

TEACHERS' MANUAL

STANDARD – IX

PREPARED BY

**STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING
CHENNAI – 600 006.**

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PREFACE

The Government of Tamil Nadu, in a pioneering initiative to reach the goal of quality in education, introduced Continuous and Comprehensive Evaluation (CCE) and Trimester Pattern in 2012-13 for class I to VIII. Subsequently, CCE is being introduced in Std IX from the year 2013-14 in all the High and Higher Secondary Schools of Tamil Nadu.

This strategic combination of CCE with Trimester has been implemented only in the State of Tamil Nadu in India with the intention of reducing the book load, learning load and subsequently the load of miscomprehension. This has impacted not only the learning styles of the students but also enthused the teachers to assess students for learning. Incidentally the teachers have become co-learners in the process of administering CCE to students. This transformation has inspired the teachers to become reflective practitioners and students enthusiastic constructors of knowledge from their own past experiences, peers, teachers, elders, community, library and digital resources. CCE has opened the avenues for student community to seek knowledge from diverse resources and learn to stand on their own legs.

SCERT has prepared Training Manuals on General Guidelines for CCE and Subject-Specific Guidelines to help teachers implement the student-friendly - CCE and Trimester system effectively. SCERT proposes to train all the teachers at the secondary level to assimilate the strategies involved in the implementation of both Formative and Summative Assessments. The assessment Activities have been designed so meticulously that teachers would naturally find it easy to use, adopt or create their own activities to witness and assess the miracle of learning happening in the class room in a fear-free, friendly and enabling environment.

The manuals deal with Scholastic and Co-Scholastic activities and also assessment of values, attitudes and life skills in each subject including Physical Education which has now been brought under curricular subjects. Formative and Summative Assessments are carried out while learning and after learning respectively.

The former assesses for learning and remedial activities are given for ensuring relearning and the latter is of learning and it has no scope for remedial measures.

In this radical method of assessment, Teachers assess not only the learning and achievement but also the students' social graces, their knowledge and application of social skills through Co-Scholastic assessment activities.

This assessment method facilitates the identification and nurturing of the innate potential of students. Teachers get to know the all-round development of students. Besides, the Training Manuals have included strategic suggestions to develop assessment activities for the differently-abled learners appropriate to their level of understanding and learning capacity.

Teachers are hereby requested to undergo the training earnestly and assimilate the ideas and strategies discussed in a positive way and implement CCE and Trimester effectively in their respective classrooms. Then only the teachers can ensure the transformation of the younger generation into well-rounded personalities and responsible citizens of this country capable of shaping the future destiny of this country. Teachers shall take into consideration the fact that destiny of a country is shaped inside the four walls of a class room. Hence SCERT and the manual development team expect the teachers to realize their precious responsibilities to the students and to the Society and implement CCE and Trimester in all academic seriousness and involvement in their Schools.

SCERT

Chennai

SCIENCE - CCE – IX STANDARD

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Continuous and Comprehensive Evaluation for Standard IX - Science

1. Introduction

Education should develop knowledge on Integrated Personality development and social awareness among the children. The role of teachers and the school is very important in imparting life-oriented education. Science means searching of truth through questioning. Teaching of science should be taught through active learning methods in schools, otherwise mere teaching will result in dumping of knowledge without developing. The application skill. In the classrooms suitable activities should be designed and implemented to make learning simple. It should create interest in science and to use one's acquired knowledge and skills in real life situations. This will result in producing knowledgeable persons in future, by bringing out the their inner potential and creative skills. It is responsibility of the teacher to enhance student's scientific skills through suitable teaching strategies.

2. Objectives of teaching science.

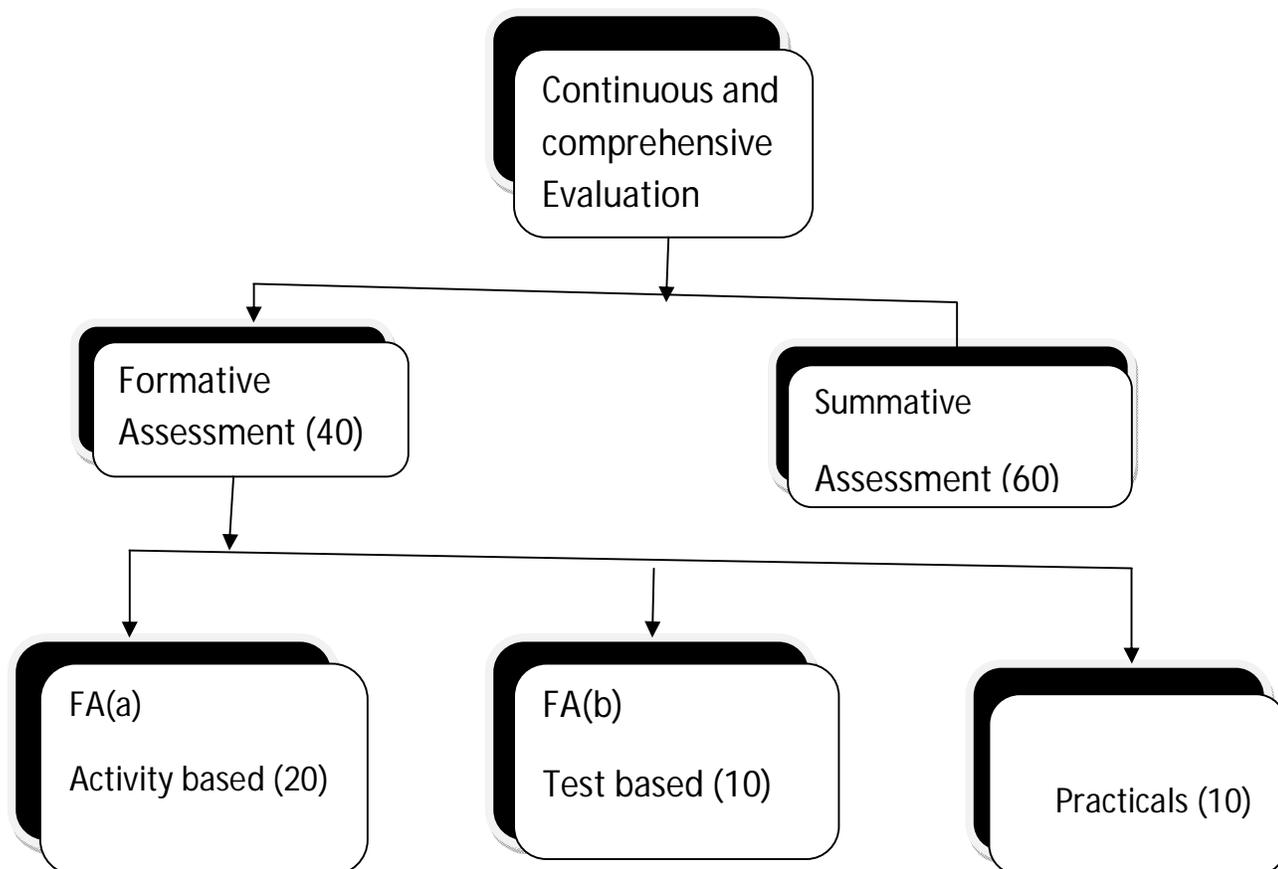
As per the recommendation of NCERT and NCF 2005 the objectives of teaching science at secondary level are as follow:-

- Participation of students in science activities.
- Observation of science related events.
- Designing and developing models.
- Skill in planning and conducting quiz, seminar and such projects in science.
- Skill in doing experiments.
- Skill in using the acquired scientific knowledge to real life situations.
- Enhancing interest in science and appreciation of Nature.
- Developing skills for solving problems with scientific outlook.

3.Allotment of lessons for . Science – IX Standard first Term.

SI.No	Lesson	Title/Topic	No. of hours required.
1	Zoology	Animal kingdom	20
2	Botany	Cell	18
3.	Chemistry	1. Mass	11
		2. Structure of Atom	11
4	Physics	1. Measuring instruments	9
		2. Motion	12
		3. Liquids	8
		Total	89 Periods

4. Evaluation in Science



4. Formative Assessments

- An assessment that takes place during the course of learning.
- Assessment for learning provides continuous feed back to teachers and learners. It facilitates to identified the ways for attaining goals.
- It helps the learner to find out the hurdles in learning and find remedial measures to rectify it.
- FA has two components namely – Formative Assessment
FA (a), Formative Assessment – FA (b)
- FA (a) Activity based – Assessment
- FA (b) Test based – Assessment (written)

4.1: Formative Assessment FA(a)- Activity based – Assessment

It is a broad based measure on the learner's participation and involvement in learning activities.

- It is carried out on the basis of involvement, interest, and participation of learners and learning achievement.
- Individual or group activity can be carried out.
- Since assessment is based on Performance of learners in activities rote memorization is avoided and lead to meaningful learning.
- This assessment is based on acquisition of science skills and designing appropriate activities to achieve the skills. This will enhance the scientific attitude, analytical skills, appropriate activities to achieve the skills interest and the skills of exploration.
- Learning through individual and group activities and peer self learning peer group learning.

4:2: Criteria Designing for Activities.

- Number of students in the class.
- Appropriate to the age level of students.
- Nature appropriate to the age level of students of activity – individual / group
- Duration of time for activities.

- Looking for local resources .
- relevance of activities with concepts
- low-cost materials, not very expensive.
- Should stimulate interest.
- Facilitate self-learning.
- Able to develop one's scientific skills.

4:3 : List of Activities for Activity based assessments

1. Experiments
2. Concepts Map
3. Students work Sheets
4. Assessments
5. Projects
6. Model preparation
7. Role play
8. Field Trip
9. Reading Books
10. Discussion and debate
11. drawing
12. Album and scrip books
13. Presentation
14. web searching
15. interpretation
16. Science dictionary

Apart from this list of activities, Teacher can design more activities making use of the locally available resources, and one's imagination and do the assessments.

Out of four activities, per term, the best two can be selected for assessment, for each student.

4:4 : Steps for Activities based Assessment :

The Teacher Assess the performance of learners in doing activities following the steps for assessments given below:

1. Time and Nature of Activities
2. Topic and content
3. Learning objectives
4. Assessments activities
5. Needed materials
6. Procedure Assessment criteria
7. Learning out comes.
8. Suggested Remedial measure.

To the attention of Teacher

- | |
|--|
| <ol style="list-style-type: none">1. Teacher should organize activities using easily available low cost materials and local resources.2. Avoid developing Thermo coal models.3. Don't encourage learners to purchase readymade models in shops.4. Teacher should guide the learners to design activities.5. Teacher should give simple projects for the learners.6. Don't encourage learners to bring models done by their parents. |
|--|

5. Model Activities- Botany

1. Concept Map

Time: 10 Minutes

Individual/Group Activities

- Title & Content** : **Cell- Structure and cell organelles**
- Objectives** :
• To understand the structure of plant cell
• To learn the functions of each part of the cell
- Evaluation Activities** : Concept Map
- Materials Required** ; White paper, pencil/ pen and colour pencils
- Procedure** :
• Make the learners to understand structure of plant cell
• List out the cell organelles
• To create a between the cell organelles in the function.
• Learns to draw the structure & function of plant cell properly using their imagination

(Concept map missing)

Descriptive Indicators

To internalize the Main concepts	To put them proper sequence	To build links between them	To associate with previous knowledge	To make presentation with clarity	Marks
2	2	2	2	2	10

Learning outcome

Understand the structure and functions of plant cell clearly.

Learn to draw concept map of cell by organizing the concepts

Suggested Remedial Measures

- Teachers explain once again the structure of plant cell with a suitable diagram
- Write any four parts of the plant cell and learn with peer group and their functions.

2. Students Worksheets-Drawing Diagrams

Time: 30 Minutes

Individual Activities

- Title/Content : Cell- Structure of Animal cell
- Objectives : To draw the structure of Animal cell and label the parts
- Assessment Activities : student worksheet- Drawing the diagram
- Materials Required : White sheet, pencil ,scale, eraser and colour pencils
- Procedure :
1. White sheets are provided to the students.
 2. The students have to observe the structure of animal cell drawn on black board or chart or a model of it.
 3. Students draw the diagram of animal cell in the white sheets with help of pencil
 4. Animal cell should be coloured with help of colour pencils
 5. Cell organelles should be marked and worksheets from the learners should be assessed after completion of work.

Descriptive Indicators

Draw a diagram relevant to the content	completion of task	Reliability	Explaining with clarity	Clear Presentation	Marks
2	2	2	2	2	10

Learning outcomes

- ✓ Students are able to draw the structure of animal cell clearly
- ✓ Learns to identify the cell organelles
- ✓ Drawing skill will improve.

Suggested Remedial Measures

- Teachers draw the structure of animal cell on the black board step by step

- o Incomplete diagram of animal cell is given to students to complete the missing ideas.

3. Preparation of Static Model

Time: 5 days

Individual Activities

Title/Content : The Cell- Structure of DNA - Preparation of a Model

Objectives :

- To understand the structure of DNA
- To develop the skills in the preparation of DNA model.

Assessment Activities : Preparation of DNA static model

Materials Required ; Cardboard, Match sticks, coloured thread, zamki, beads, pencil, gum, sketch pen, fabric paint and science text book

Procedure :

- Paste a white sheet on a thick Cardboard
- Draw the structure of DNA on the white sheet
- Paste two different colour threads to create the strands of DNA
- Using the match sticks make Adenine, Guanine, cytosine and thymine of DNA.
- Paste colour Zamki and beads on the two parallel strands of DNA to show the sugars and phosphate molecules
- Static model of DNA should be evaluated
- Based on strength of students in the class, this activity can be carried out in groups

Descriptive Indicators

Conceptualization of Model	Identifying the resources for a model	Creating the Model	Correlation of the model with the concept	Presentation	Marks
2	2	2	2	2	10

Learning outcomes

- ✓ Students will learn to draw the structure of DNA
- ✓ Understand the structure of DNA
- ✓ Creative and imagination skills will develop

Suggested Remedial Measures

- The DNA Model in the laboratory can be shown to the students
- Developing a static DNA Model with peer group support

4. Flow charts

Time: 10 Minutes

Individual Activities

Title/Content : The Cell-cell division - Mitosis

Objectives :

- To know the types of cell division
- To know the stages of cell division during mitosis

Assessment Activities : Flow charts

Materials Required ; Incomplete flow charts and pen

Procedure :

- Incomplete flowcharts are provided to the students and ask them to read the flow chart
- The students are asked to fill the blanks in the flow charts with suitable words related to the concepts
- Completed flow chart should be assessed by the teachers
- A Model flow chart is given below

Descriptive Indicators

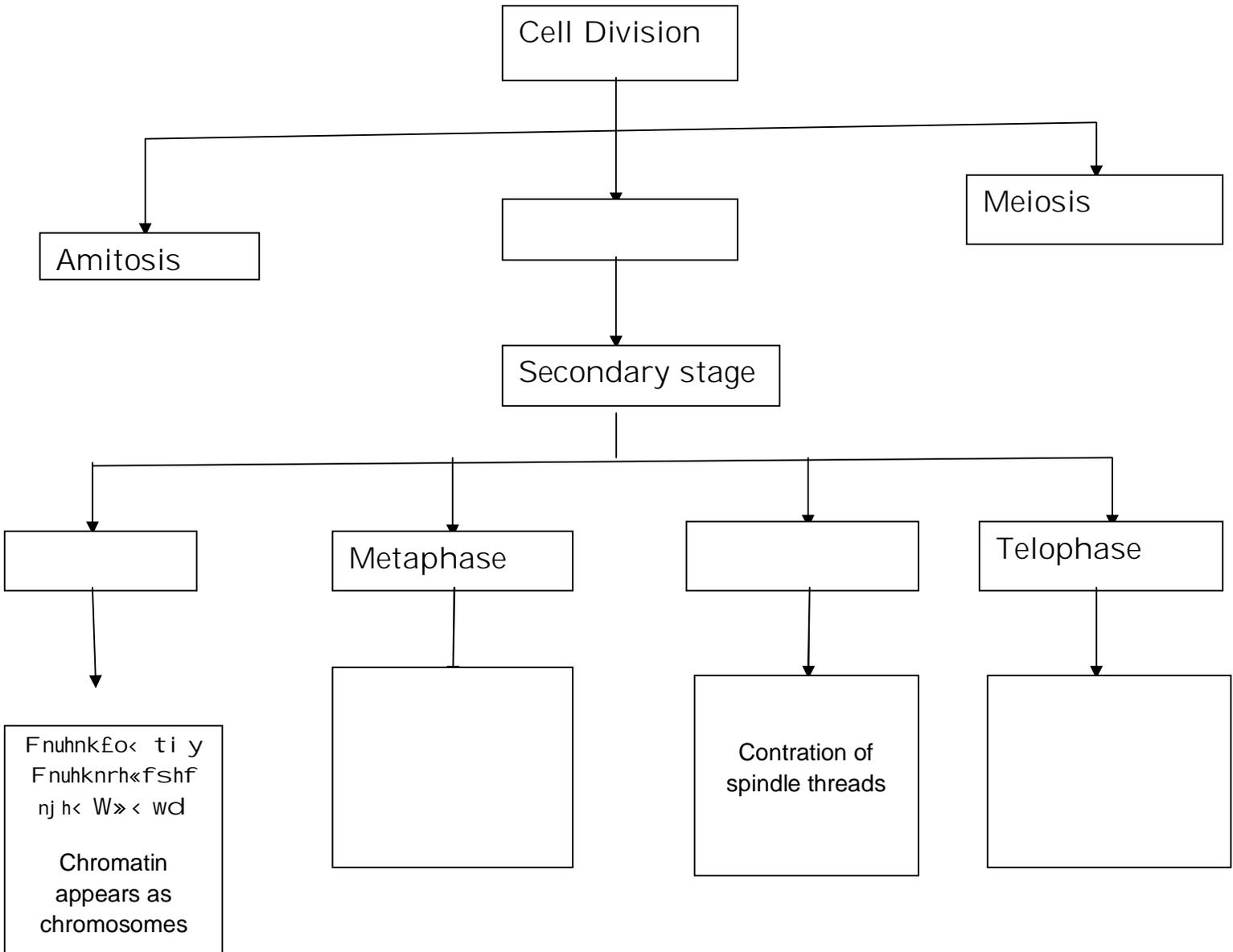
To identify relevant concepts	To organize concepts in a logical manner	To link concepts systematically	To complete the sequencing of concepts	To communicate comprehensively	Marks
2	2	2	2	2	10

Learning outcomes

- ✓ To learn about the types of cell division
- ✓ To know about the stages in mitotic cell division
- ✓ Analytical and thinking skills will develop

Suggested Remedial Measure

- Explaining the stages of mitotic cell division using chart



5. Role Play

Time: 30 Minutes

Group Activities

- Title/Content : The Cell-cell organelles
- Objectives :
 - To understand the functions of cell organelles through Role play activities
- Assessment Activities : Role play
- Materials Required ; Charts, pencils and colour pencils,
- Procedure :
 - Identifying students who are interested in doing role play
 - Each student takes a role of the cell organelle suitable to him/her
 - Each student draws his/her chosen part in a sheets
 - Guide the students to take part in role play
 - presentation of role play to the other students in the class

Descriptive Indicators

Ability to link appropriately with the textual content.	Ability to create characters / innovate with the idea to be presented	Ability to perform the role with clarity	Ability to perform different role / Ability to work as a team	Ability to express the theme	Marks
2	2	2	2	2	10

Learning outcomes

- ✓ To know the functions of cell organelles
- ✓ Memorization, Imagination and enacting (dramatizing) skills will improve.

Suggested Remedial Measures

- o Visualization of cell organelles with help of CDs and slide show

- o learns with peer group support.

6. Classification Game - Zoology

Time: 10 Minutes

Group Activities

Title/Content	:	Animal Kingdom
Objectives	:	<ul style="list-style-type: none"> • Understanding the complex concepts in a simple way through games. • Understanding the concept in the lesson through simple Activity. • Enhancing the classification skill among students
Assessment Activities	:	Classification game
Materials Required	:	Charts, tape which has glue on both sides, sketch pens and scissors.
Procedure	:	<ul style="list-style-type: none"> • Preparing the basic fundamental units of classification like species, genus, family, class, order, phylum and kingdom in small cards using different colours. • On the backside of each card the tape is attached. • The students are asked to fix the cards in the relevant place on a chart paper • Any example of animal is taken and placed in the classification table and the characteristics of the animal is discussed.

Descriptive Indicators

Is able to identify the concepts underlying the classification games	Is able to relate the process of classification with concepts	Understands the techniques of the classification game and the steps involved.	Interest in participation	Is able to use the acquired knowledge and skill for concept building.	Marks
2	2	2	2	2	10

Learning outcomes

The students understand the complex concepts in the lesson through simple games. In the same way the students will learn to classify the vertebrates and invertebrates

Suggested Remedial Measure:

- The students are given practice in the classification of Animal Kingdom using suitable charts.

7. presentation - Power Point

Time: 10 Minutes

Individual/Group Activities

Title/Content	:	Animal Kingdom- Birds Sanctuary
Objectives	:	<ul style="list-style-type: none"> • To help the students understand the characteristics of birds and about the sanctuaries and their migration. • To enhance the skill in power point presentation.
Assessment Activities	:	Power point presentation
Materials Required	;	A variety of books on Birds, CDs and the Internet notes.
Procedure	:	<ul style="list-style-type: none"> • The class is divided in to groups, for eg. ten students with similar interests put in a group.

		<ul style="list-style-type: none"> • The students are asked to collect information regarding the characteristics of birds, sanctuaries and their migration using resources like the library, internet and Encyclopedia. • The collected information is arranged in proper order as follows: <ol style="list-style-type: none"> 1. Habitat of birds 2. Reasons for habitating in sanctuaries. 3. Reasons for birds, migration 4. Bird Sanctuaries in Tamil Nadu 5. Kinds of birds found in the sanctuaries 6. Role of students in the protection of birds <ul style="list-style-type: none"> ➤ students must prepare slides on the given list of titles. ➤ Related information must be added with the guidance of teachers. Students are asked to give a ten minute power point presentation.
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Descriptive Indicators

Collects concepts relevant to the content.	Present accurate facts in video clips	Uses appropriate visuals	presents effectively (creative visualization)	Additional information (draws logical conclusions)	Marks
2	2	2	2	2	10

Learning outcomes

- Students understand the characteristics of birds, the sanctuaries, and about the migration of birds.
- Students get awareness about the protection of birds.
- Students learn to appreciate the Nature.

suggested Remedial Measure:

- Properly prepared slides can be shown to enhance the understanding of the students

8. Assignment

Time: 10 Minutes

Individual Activities

Title/Content	:	Animal Kingdom-Adaptation of parasites (like Round worms and Tape worms)
Objectives	:	<ul style="list-style-type: none"> • To understand the adaptations of Round worms and Tape worms, and their special features as parasites. • To improve the skill in collecting information and to prepare an assignment on it.
Assessment Activities	:	Assignment
Materials Required	;	Collecting information on parasites and their adaptation , from Encyclopedia, library books. Internet and Text books of Higher Classes.
Procedure	:	<p>The teachers should guide the students by listing the resources from where information can be collected.</p> <p>The students are asked to collect the structure of parasites, life cycle, pictures of parasite and parasitic adaptations from different sources available</p> <p>The students are asked to relate the collected information with the concept of the lesson.</p> <p>The collected information should be summarized Diagrams, tables and graphs can be added wherever necessary.</p> <p>The summarized information should be submitted in the form of assignment in the stipulated time</p>

Descriptive Indicators

Collection of data/resources relevant to the topic	Relates the data/resources to the topic	coherent sequencing of the information	Summarizing and Learning experience.	Present it in an effective manner	Marks
2	2	2	2	2	10

Learning outcomes

- ✓ Understanding the adaptation of Round worms and Tape worms to lead a parasitic life.
- ✓ Learning to use the resources to collect information and submitting in the form of assignment.

suggested Remedial Measures

- The students are encouraged to write a paragraph on Round worm and Tape worms.

9. Preparation of scrap Book

Time: 10 Minutes

Individual Activities

Title/Content	:	Animal Kingdom- Vertebrates
Objectives	:	<ul style="list-style-type: none"> • To collect pictures, Amazing facts and rare information regarding vertebrates • To prepare a scrap book based on the collected information
Assessment Activities	:	Preparation of scrap Book
Materials Required	;	Pictures, information, News paper cutting, Internet, magazines, children books, chart, gum, sketch pens.

Procedure	:	<ul style="list-style-type: none"> • The teacher should guide the students on the preparation of scrap book. • The class is divided in to 5 groups, for each group a topic like Pisces, Amphibians, Reptiles, Aves, Mammals can be given • Each group should collect pictures, related to amazing facts and rare information from various resources. • After a week time, the collected pictures can be pasted on a chart paper in proper order lighting important information. • Tie-up 4 or 5 sheets with pictures and make it in the form of book • The students are asked to prepare scrap book with aesthetic sense and creativity. • The groups should share the information with other groups, so that the students can learn additional information related to the topic.
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Descriptive Indicators

Collection of information on events/Pictures related to the topic	Logical sequencing	Presents relevant information about each topic/picture/event.	Aesthetic sense.	Comprehensive learning	Marks
2	2	2	2	2	10

Learning outcomes

- Learns additional information about the Vertebrates.
- Learns to appreciate wonders the Nature.

Suggested Remedial Measure:

Students are encouraged to paste pictures and snippets on charts.

10. Field Trip

Time: 1 day

Group Activity

Lesson Title :	<ul style="list-style-type: none"> • Animal Kingdom- biodiversity
Content Objectives :	<ul style="list-style-type: none"> • learns about living beings living in the same habitat. • Improving the observation skill curiosity and Appreciation of nature.
Assessment Activities :	Field trip
Needed material :	Note book, pen, habituate, binocular
Procedure :	<ul style="list-style-type: none"> • The teacher explains about biodiversity • Choosing the habitats where there are it variety of leaning organisms. (eg. School campus, park) • Observe the organizes there with curiosity. • Relating the notes taken to the concepts learnt in the lesson. • Attempting a write-up on the experiences gained in field trip.

Field trip provides experiential learning. It helps in synergizing formal learning with informal learning. It also helps in understanding concepts in a given social environment.

Understands the objectives and nature of the Field Trip	Prepares a list of possible learning experiences	Makes observations and records	Relates one's observations to past learning experiences	Consolidates and summarizes the Field Trip learning experiences
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Learning out come:

- Gains first hand experience on a remedy of living organisms.
- Appreciation of Nature / Science.
- Enriching their knowledge on concepts learnt by learning about the adaptations and relationship to each other.

Suggested Remedial measure:

Taking the students to a few more habitats, and make them observe a variety of living organisms.

Model Activities- Chemistry

11. Debate

Time: 30 Minutes

Group Activities

Title & Content	:	Is Matter around us pure? – Composition of Air
Objectives	:	Students learn about, <ul style="list-style-type: none">• Composition of air, air as a mixture• Reason for air pollution and its effects• Creating awareness on air pollution and methods of controlling air pollution
Assessment Activities	:	Debate
Materials Required	:	Topic cards, Set up for Debate.
Procedure	:	<ul style="list-style-type: none">• Teachers may divide the students in to two groups, each group contains five students.• Give a topic card to each group• Teacher may give the topic “our air is pure” to one group and “our air is not pure” to another group• Make the students discuss the reasons for air pollution and measures to be taken to control it.• Teacher acts as a facilitator.

Descriptive Indicators

Collection of relevant ideas / information to the topic	Listening carefully & responding to others' views	Defending the argument with relevant facts	Holding the focused attention of the listeners	Critical review and consolidation	Total
2	2	2	2	2	10

Learning outcome

- Students may understand the reason for air pollution and the controlling measures.
- Get awareness on protecting the eco system.

Suggested Remedial Measure

- ✓ Sensitize the learners on strategies for controlling air pollution using information from different media.
- ✓ Encourage the students to involve in green crop activities.

12. Reading Books

Time: 30 Minutes

Individual Activities

Title & Content	:	Atomic structure – Isotopes
Objectives	:	<ul style="list-style-type: none"> • Students may able to know uses of Isotopes in the fields of medicine, agriculture and industries.
Assessment Activities	:	Reading Books

Materials Required	:	Science Text book, library and internet sources
Procedure	:	<ul style="list-style-type: none"> • Students should collect the books about uses of isotopes from school/nearby library. • Teacher should guide the students to select the books related to their topic and help them by giving suitable website. • Students should discuss the topic with the peer groups.

Descriptive Indicators

Interest in reading	involvement	Discursion with others	consolidation	presentation	Marks
2	2	2	2	2	10

Learning outcome

- Students may learn uses of isotope in different fields through books and internet.
- They would be interested to know additional information on science

Suggested Remedial Measure

- ✓ Teacher may guide the students to read suitable books with peer group support.

13. Creative Writing

Time: 30 Minutes

Individual Activities

Title & Content	:	Is matter around us pure?-Distillation.
Objectives	:	<ul style="list-style-type: none"> Students may able to understand purification of water through distillation methods.
Assessment Activities	:	Creative writing
Materials Required	:	papers and pens
Procedure	:	<ul style="list-style-type: none"> Teacher should give a situation related to the topic, and instruct the students to attempt a write - up on how they will react in that situations. eg. Imagine that a ship got struck up at an Island in the Pacific Ocean. The passengers bring match box, some woods and pots write how they get pure water from sea water.

Descriptive Indicators

Interest	Link to concept	writing skill	Argument with coherence	Expressing ability	Marks
2	2	2	2	2	10

Learning outcome

- Students learn about purification of water through distillation
- Improvement in their scientific knowledge and creative skills

- Suggested Remedial Measure**

- ✓ Teacher may take the students to nearby water purification plant and make them understand the actual process.
- ✓

14.Album

Time: 30 Minutes

Individual Activities

Title & Content	:	Atomic structure – Atomic scientists who develop the atomic models
Objectives	:	<ul style="list-style-type: none"> • Students may know about atomic scientists
Assessment Activities	:	Album
Materials Required	:	Drawing sheets, science Textbooks, science magazines, journals, gum and scissors
Procedure	:	<ul style="list-style-type: none"> • Teacher may give instruction to students in advance to collect the pictures of atomic scientists and their inventions. • Tell them to neatly paste the pictures of scientists on chart or note book. • Students may file the pictures, tag reposted papers and present it beautifully.

Descriptive Indicators

Collecting pictures	classifying appropriately	suitable title	expressing one's interest through tasks	good presentation	Marks
2	2	2	2	2	10

Learning outcome

- Students may know the details of Atomic scientists through album.
- Students gain interest on science and develop the scientific temper to create new things.
- **Suggested Remedial Measure**

Teacher may show the visuals of atomic scientists and their inventions in the computer / laptop and help students have a clear knowledge about them.

15.Project

Time: 1 day

Individual Activities

Title & Content	:	Is matter around us pure?- purification of water
Objectives	:	<ul style="list-style-type: none"> Purification of contaminated water
Assessment Activities	:	Project
Materials Required	:	Water bottle, pebbles, sand, a tube.
Procedure	:	<ul style="list-style-type: none"> Teacher may give instructions to search for simple methods of water purification. To select the most practical one, and guide them to do it. Students may submit the report on how impure water will be converted in to pure water

Descriptive Indicators

Learns the main theme`	collects related information	Recording the process	Taking decisions	Report writing	Marks
2	2	2	2	2	10

Learning outcome

- Students should know simple method of water purification.
- Students may gain scientific knowledge and skills to design new instruments and its usage and improve their interest in science, to create new devices.
- Students will develop the scientific temper and experimenting skills. skills to solar problems.

- **Suggested Remedial Measure**

To screen the simple methods of water purification through multimedia as computer.

Model Activities - Physics

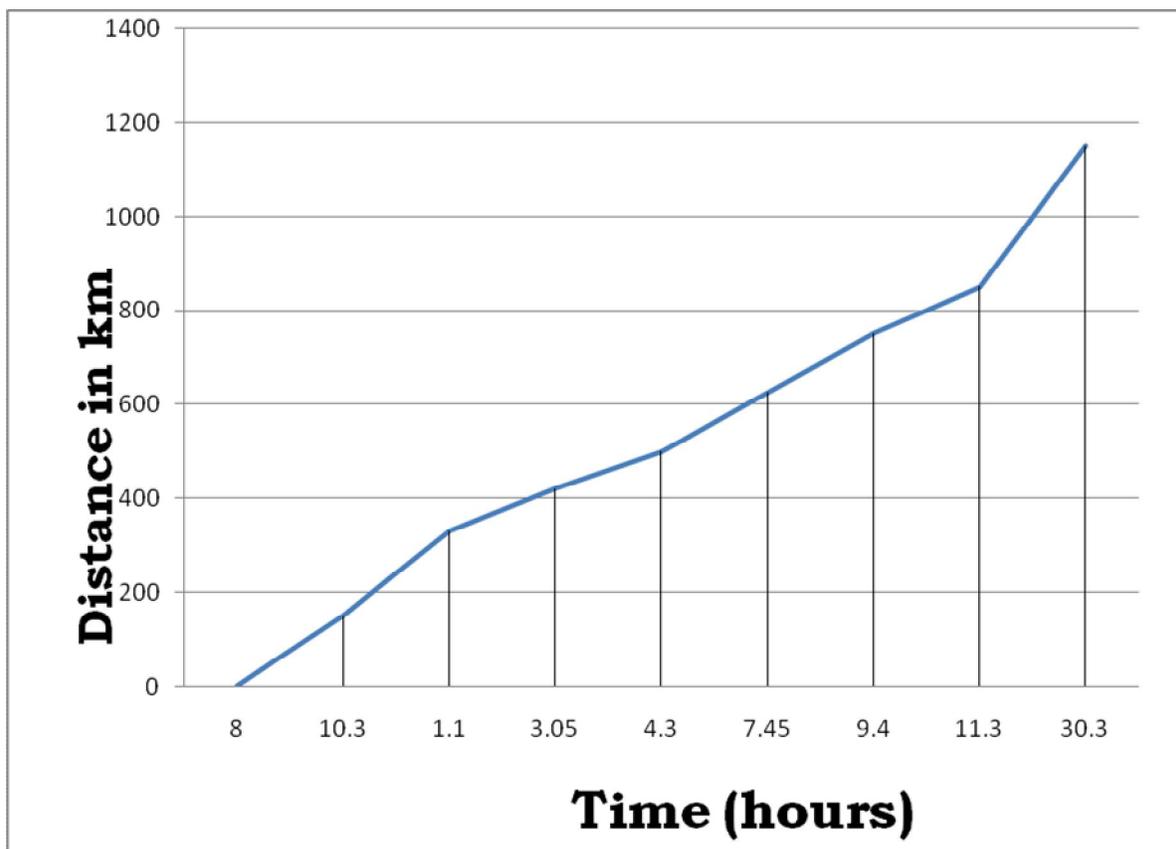
16. Graphical Method

Time: 15 Minutes

Individual Activity

Title & Content	:	Motion															
Objectives	:	<ul style="list-style-type: none"> ❖ To know the motion of body mass and types of motion ❖ Rate of change of motion ❖ To know the importance of graphical method in daily life 															
Assessment Activities	:	Graphical method															
Materials Required	:	Graph sheet, pen and pencil															
Situation	:	<ul style="list-style-type: none"> • Guruvayur Express Train started from Egmore station, Chennai, at 8.00 a.m., and reached Guruvayur junction next day by 6.30 a.m. crossing Trichy, Dindugal, Madurai, Tirunelveli, Nagarkoil and Trivandram. • Rail way stations, the arrival time and distance taken by the Guruvayur Express train has been given in the following table. <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Name of the place</th> <th style="text-align: left;">Time of arrival (hours)</th> <th style="text-align: left;">Distance in KM</th> </tr> </thead> <tbody> <tr> <td>Chennai</td> <td>8.00 am</td> <td>0</td> </tr> <tr> <td>Villupuram</td> <td>10.30</td> <td>150</td> </tr> <tr> <td>Trichy</td> <td>13.10</td> <td>330</td> </tr> <tr> <td>Dindigul</td> <td>15.05</td> <td>420</td> </tr> </tbody> </table>	Name of the place	Time of arrival (hours)	Distance in KM	Chennai	8.00 am	0	Villupuram	10.30	150	Trichy	13.10	330	Dindigul	15.05	420
Name of the place	Time of arrival (hours)	Distance in KM															
Chennai	8.00 am	0															
Villupuram	10.30	150															
Trichy	13.10	330															
Dindigul	15.05	420															

		Madurai	16.30	500
		Tirunelveli	19.45	625
		Nagarkoil	21.40	750
		Thiruvananthapuram	23.30	850
		Guruvayur	30.30	1150
Procedure	:	<ul style="list-style-type: none"> • Instruct the students to take a graph sheet and point out x and y axis in the graph under the correct units • Take time along 'x' axis and distance along 'y' axis. • Using the information given in the table draw a straight line in the graph • From the graph, answer the questions given below <ol style="list-style-type: none"> 1. What is the total distance covered by the Guruvayur Express train? 2. What is the time taken by the Guruvayur Express train to reach Guruvayur from Chennai? 3. Find the distance between Trichy and Nagarkoil using the graph. 4. Calculate how much of distance is covered by the Express train at 6.00 PM, using the graph. 5. Calculate the Average velocity of the train. 		



Descriptive Indicators

Select the correct variables	Construct Associations	Linking the concept variables	Graph usage	Consolidation & Report preparation	Marks
2	2	2	2	2	10

Learning outcome

Students understand motion and types of motion from the graph and way to calculate the rate of change of motion.

Suggested Remedial Measures

- Explain the Importance of graph method in daily life.
- To encourage students, to draw graphs using with computers.

17.Presentation

Individual Activity

Time: 10 Minutes

Title & Content : Measuring Instruments

Objectives : To know the Least Count of different measuring instruments

Assessment Activities : Report presentation

Materials Required : Meter scale, Ammeter, Voltmeter, Vernier scale, Screw gauge, Physical balance, Chemical balance, Odometer, Ordinary balance, Spring balance, Barometer and Thermometer.

Procedure :

- Teacher has to instruct the students to find the least count of the various measuring instruments available in the laboratory and outside the school
- Tabulate the calculated value and present the report for discussion

Sl.No	Measuring Instrument	Least Count
1	Meter Scale	1mm
2	Thermometer	1°C
3		
4		
5		

Descriptive Indicators

Collection of information	Related to the topic/the me	Appropriateness	Proper Display	Collection	Marks
2	2	2	2	2	10

Learning outcome

Students learn the least count of different measuring instruments.

Suggested Remedial Measures

Teacher has to explain the least count with diagrams of measuring instruments to those who are not able to understand and find the measure.

18. Doing Experiments

Time: 10 Minutes

Individual Activity

Title & Content : Liquids

Objectives : To know the upward pressure of the liquids

Assessment : Learning through experiments.

Activities

Materials Required : Plastic bucket, ball, water, cork, empty flask and glass beaker.

Procedure :

- Take the required amount of water in the plastic bucket
- Push the ball in the water
- What do you feel while you push the ball into the water?
- Push the ball further deep in to the water.
- What do you feel while you push to depth?

Descriptive Indicators

Relate the lesson to the experiment	Collect the required material	Doing experiment	Observation and Recording	Compare the result with objective.	Marks
2	2	2	2	2	10

Learning outcome

Students understand that water has upward pressure.

Suggested Remedial Measure:

Teachers explain once again the same procedure using different floating objects.

19. Model Making – working model

Time: 15 Minutes

Individual Activity

Title & Content : Liquids

Objectives : To know the working principle of submarine

Assessment : Model making
Activities

Materials : Floating vessel, water tank, water expelling unit.
Required

Procedure : **Laws of Floatation**

1. The weight of the floating body is equal to the weight of the liquid displaced by it.
2. The centre of gravity of the floating body and the centre of gravity of the liquid displaced (Centre of buoyancy) are in the same vertical line.

By using the laws of floatation and the given materials make a model of a **submarine**.

Descriptive Indicators

Preparation of the concept of model	Find the required materials for the model	Structure of model	Expression of topic using model	Explain the model	Marks
2	2	2	2	2	10

Learning outcome

Students understand the working principle of submarine.

Suggested Remedial Measures

- Explain the principle of ship/boat model floating in the water.
- Based on this, explain the function of submarine.

20.Science Dictionary

Time: 15 Minutes

Individual Activity

Title & Content : IX std Science Text Book

Objectives : To know and learn to apply meaning of technical words given in the text book.

Assessment Activity : Science dictionary usage.

Materials Required : Science text book, science dictionary, paper and pencil.

Procedure :

- Instruct the students to underline the technical words in the science text book using pencil.
- Write the underlined words in a note book.
- By using Science Dictionary find the meaning of the underlined words and write them in the note book.
- Use these words in the class room activities.

Descriptive Indicators

Identifying the technical words	Find the meaning	Understanding and usage	Collection	Application	Marks
2	2	2	2	2	10

Learning outcome

Students understand the meaning of the hard words.

Suggested Remedial Measures

- Teacher encourages students to use the science dictionary in the Library.
- Teacher can guide them on how to use the website for finding meaning for the technical words.

6. FORMATIVE ASSESSMENT (B) – TEST BASED ASSESSMENT

- ♣ It is conducted either during the learning process. or at the end of a lesson to find the growth in learning and to assess the achievement level of students.
- ♣ It is conducted for a shorter duration (15 to 20 minutes) using the question paper.
- ♣ All types of objective type questions are asked depending upon the skills to be tested.
- ♣ According to the achievement level of a student, it is conducted with or without prior announcement.
- ♣ It is a measurement used to ensure students achievement level and his / her place in the learning curve.
- ♣ It helps teachers to follow diagnostic and remedial measures.
- ♣ Out of two short tests conducted for each term, one test score is taken for assessment, by awarding ten marks for it. one mark could be given to objective type questions, two marks for very short questions and five mark for short answer questions.

6.1. Category of Question for Assessment:

- ♣ Multiple Choice
- ♣ Fill in the blanks
- ♣ Matching
- ♣ Quiz
- ♣ Very Short Answers
- ♣ Short Answers
- ♣ Draw Diagram

To the teacher's attentions:

- ♣ Test should be designed for a shorter duration. (say 15 to 20 min.)
- ♣ A wide range of objective type questions are given to assess the learning outcome of students.
- ♣ The questions should kindle students critical thinking and higher order thinking skills.
- ♣ If teacher handles more than one class, separate question papers must be prepared for each class, shall not use the same question paper for all the classes.

- | | | |
|-----------------------|---|----------------------|
| 2. Protein Production | - | Leaves |
| 3. Nucleus | - | Watson & Creek |
| 4. Golgai bodies | - | Ribosomes |
| 5. Cholorophyll | - | Robert Brown |
| | | Roots |
| | | Hereditary character |

V). Answer in a word or two

1. What is the name of the joint of two chromatids in chromosomes?
2. What is the name of the cylindrical shaped part in Nucleoplasm.

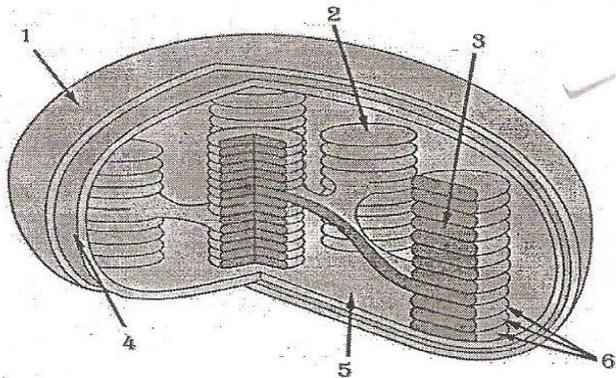
VI). A). Look at the diagram and answer the questions

1 Name of diagram?

a. How is it called ?



B.) Look at the diagram and name the 1 - 6 parts asked.



VII) Short Question

2x2=4

1. The cell organelle in which photo synthesis take place is chlorophyll
 - I. What is the name of the structure that seems like coins arranged one on the other in the chlorophyll?.

- II. Which is the non Thylakoid region?
2. DNA, RNA – Describe the given words

VIII) Paragraph questions

3x5=15

1. Plant cell and Animal cell – Distinguish
2. Describe chromosomes on the basis of location of centromere . Explain any one with suitable diagram.
3. Describe DNA with a suitable diagram.

Zoology FA (b)

I) Choose the correct answer

1. Which of the following organism has tube feet?

a) Apple snail b) round worm c) starfish 4) centipede
2. The lowest unit of classification is

a) family b) order c) species 4) genus

II) Fill in the blanks

1. Father of Taxonomy is -----

III) Match the following

a)	Stinging cell	Cockroach	echinoderms
b)	open type blood system	mussel	insect
c)	star fish	Anemone	mantle
d)	mollusca	compound eye	chitin
e)	nymph	tubefeet	coelenterata

IV) True / False

1. Tape worm is a parasite living in human body
2. Human body can change their body temperature according to their environment.
3. Locomotion of frogs takes place with the help of fins.

V) Yes / No

1. Bats are flying mammals
2. Budding is a type of reproduction which take place in porifera

VI) Give reasons :

1. Of all the animals, insects are the most successful organism. why ?
2. Does whale warm blooded animal or cold blooded animal?

VII) Write in correct order

- 1) Family Genus phylum species order kingdom class
- 2) Mammals fish birds amphibians reptile.

VIII) Answer in one or two lines:

1. In which order of animals external ear is present? give examples
2. Define - metamerism

IX) Write answer in a paragraph:

1. Write the adaptations of fish to lead aquatic life.
2. Imagine that you are a farmer. What activities will you follow to improve the fertility of soil? Will you use organisms?

Chemistry FA (b)

I. Choose the correct answer

1. An Isotope has a varied -----
a) electron b) proton c) Neutron d) Positron

2. ----- Filter is used in the Vacuum Proof shield used by the army and the fire fighters (or) fire brigade.
- a) refrigeration b) Carbon filter c) liquid fuel d) water filter

II. Fill in the blanks

1. The pencil / lead is made of graphite. graphite is a mixture of -----
2. An atom has equal number of protons and electrons. Both are oppositely charged. Neutron is neutral so, the nature of atom is -----

III. Match

- | | | |
|----------------------|---|------------------------|
| 1. Smoke | - | Gas in liquid |
| 2. electron | - | Goldstein |
| 3. Carbonated drinks | - | J.J.Thomson & Lawrence |
| 4. Proton | - | Solidified gas |

IV. True / False

1. The Isotope cobalt -60 is used in the treatment of anemia.
2. Elements have different types of atoms.

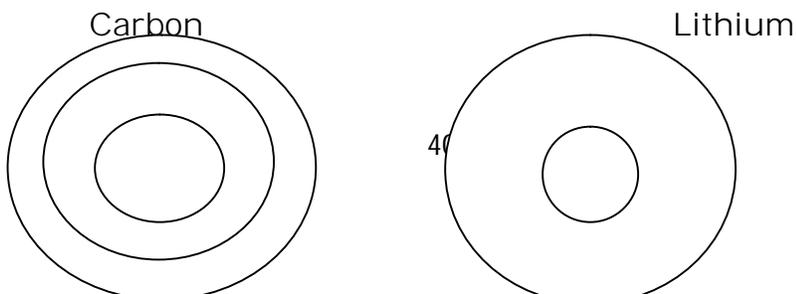
V. Circle the odd one :

1. Electron, Isotope Proton, Neutron
2. Sublimation, Filtration, Production, Sedimentation

VI. Arrange these elements in their atomic number order

Magnesium, Fluorine, Carbon, Helium

VII. Complete the diagram. Complete the electrons in the given electrons shells.



VIII. Riddles

1. I have different names in different countries. I am made of paper or a metal. People cannot buy or sell anything without me who am I ?
2. Children love me very much. The moment you hold me, I will start melting. I am a mixture. who am I ?
3. I am always on the move. I am not a fan In fact the fan gives breeze only because of me. Who am I?

IX. Explain the graph with given information

Composition of air

Sl.No	Gas	Mass%
1	Nitrogen	75.10
2	Oxygen	23.20
3	Argon	1.0
4	Carbon di Oxide	0.046
5	Helium & Neon	Very less

X. Riddles

1	2			
			3	
				4

Top to bottom

1. It cannot be further separated by chemical reaction (4)
2. The method of separating water from kerosene (5)

bottom to top

3. Gaseous state of water (3)

Right to the left

4. Example for gas in liquid.

XI. Very short answer

1. who discovered electron?
2. Write the valence of carbon

XII. Short Answer

2x2=4

1. What are Alpha particles?
2. Arrange the following as mixture, compound and element
a. Oxygen, b. common salt, c. Ice cream, d. carbon dioxide.
3. Define law of constant composition.

XIII. Paragraph question.

2x5=10

1. Saravanan wanted to go to temple. The camphor and salt he carried had been mixed up accidentally. He remembered his science teacher's lesson on how to separate it. Using that method he separated the camphor from the salt. How could it have been made possible? Explain the process with a diagram.

2. Explain the distillation process with a diagram.

Physics FA (b)

I. Say True or False

1. The physical balance is used to measure an object's length.
2. The least count of vernier scale is 0.1mm
3. Spring balance helps to measure an object's weight.

II. Say Yes or No.

1. Can the clock be used to measure time even during nights?
2. The atom clock that shows Indian standard time is kept in the National Physics Laboratory in New Delhi.
3. A Nano Metre is equal to 10^{-12} mtrs.

III. Find the odd one

1. a) Metre scale b) Vernier scale c) Spring balance
2. a) Water clock b) atom clock c) Calendar.

IV. Find answers for the given sums

1. If it is 10 pm in India, what is the time in England?
2. Fill up the blanks in the given table

Sl.No	mass in kg	weight in N
1	10	
2		490
3	35	
4	60	

V. Choose the right answer:

1. Pressure (P) of liquid at any one of the points is
(1) dgm (2)gvh (3) hdg (4) hdt.
2. The density of air is approximately ----- times greater than hydrogen gas.
(1) 14 (2) 41 (3) 34 (4) 24
3. Solution used to find relative density of liquid-----.
(1) Water (2) Soda Water (3) Salt water (4) Sugar solution.

VI. Match the following.

1.	Archimedes	$\frac{ml}{gcm^{-3}}$ $\frac{ml}{m^2}$
2.	Density	$\frac{\text{density of object}}{\text{density of water}}$
3.	Relative density	$\frac{\text{mass}}{\text{volume}}$
4.	Relative density of liquid	$(W1 - W2) = (W4 - W3)$

5.	Relative density of Solids	$\frac{W1}{W2}$
----	----------------------------	-----------------

VII. Substantiate : (A)

An iron ball floats in mercury but sinks in water.

Give reason : - The density of mercury is less than the density by water.

1. A & B Right
2. A & B false
3. A Right B. False.
4. A false B. Right

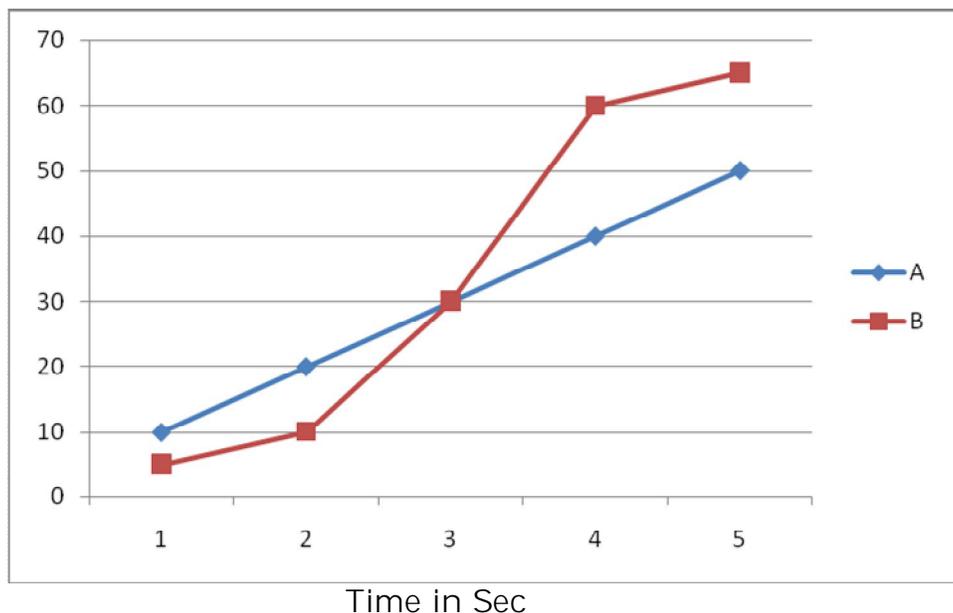
VIII. Fill in the blanks.

1. Archimedes belongs to ---- country.
2. Eureka means -----
3. The basic principle of liquid parameter-----

IX. Fill up the details given from the bracket.

1. (1000 KKM⁻³, 13600KKM⁻³
Density of Water -----
Density of mercury,-----
2. What are the Principles of floatation
3. What is the principle that is used in submarines.
4. When is the use of lactometer? What does it belong to ?

X. The velocity and time of two buses A & B is given below: Answer the questions from the given graph.



1. Which bus reached on uniform acceleration among the 2 buses?
2. At what time both the buses reach the same velocity? What is its value?
3. What is the velocity of both buses at the 5th second?
4. What is the difference in velocity of bus A, when it moves from $t=2$ to $t = 5$ seconds.

XI. Answer the questions:

1. An object is thrown vertically at 60m/second speed
 - a)How much the object reach its movement
 - b) How long the object would take to reach the ground.
 - c) What is its speed when it reaches the ground.
2. when the wheels of your bicycle rolls once, what is its movement?

7. Formative Assessment- Practical

List of practical for First Term

SI .No	Name of the Experiment
1	Plant cell-Preparation of slides.
2	Paramecium- Preparation of glass slides.
3	Identification of micro organisms.
4	Measuring the volume of liquids.
5	Preparation of saturated, unsaturated and hyper saturated solution
6	Fine radius of a cylindrical object
7	Finding the density of a solid

7.1. Procedures to do Science Experiments

- ❖ There are 7 science experiments for the first term

- ❖ Students should do all the experiments following the guidelines given in their Text book and record them neatly
- ❖ Each experiment is assessed for ten marks based on the assessment criteria.
- ❖ Minimum four experiments should be conducted and assessed
- ❖ After awarding marks for 40, (4x10) find its average and take it as the final score.

7.2. Assessment norms for projects

Time-40min

Marks-10

1. plant cell- preparation of slide

Objective	Needed	Procedure	observed	Conclusion	Record Work	Total
1	2	2	1	2	2	10

2. paramecium- Glass slide preparation

Objective	Needed	Identification	Observation	Record Work	Total
2	2	2	2	2	10

3. Identification of micro organisms in the pond water

Objective	Needed	Procedure	Observation	Drawing diagram	Conclusion	Record Work	Total
1	1	2	1	1	2	2	10

4. Finding the volume of a solution using the pipette

Objective	Needed	Procedure	Table		Conclusion	Record Work	Total
1	1	2	3		1	2	10

5. Formation of solutions

Objective	Needed	Principal	Procedure	Table	Conclusion	Record Work	Total
1	1	1	2	2	1	2	10

6. Finding the radius of a cylindrical object

Objective	Needed	Formula /Theory	Procedure	Table	Conclusion	Record Work	Total
1	1	1	2	2	1	2	10

7. Finding the relative density of a solid

Objective	Needed	Formula	Procedure	Table	Conclusion	Record Work	Total
1	1	1	2	2	1	2+	10

--	--	--	--	--	--	--	--

To the attention of Teachers

- For the 1st term 7 experiments have been prescribed.
- As per the guidance given in the text book, all the experiments should be carried out and recorded in the notebook.
- Each experiment should be assessed based on the evaluation criteria for ten marks.
- Minimum 4 experiments should be evaluated.

The total 40 would be reduced to ten as a final score.

8. Summative Assessment

- ♣ S.A. evaluates the learning Achievement of learners through test at the end of the term
- ♣ SA could be conducted based on blue print for 60 marks with the duration of 2 hours
- ♣ blue print should be developed based on subject disciplines-physics, chemistry, botany, zoology

- ♣ it is a method to assess the acquisition of all skills-knowledge, understanding, application, and skills
- ♣ SA must be carried out using the questions blue print. The questions must be chosen from the lessons of the first term
- ♣ the objective type, short answer and paragraph question should be given. It should be asked in such away that it kindles students thinking skills
- ♣ allocation of category of questions includes knowledge-20%, understanding-30% ,application30%,skills-20%

8.1. Term I- Lessons and allotment of period

S.No.	Lessons	Topic	Periods	Marks
1	Zoology	Animal Kingdom	20	23
2	Botany	Cell	18	22
3	Chemistry	1. Mass	11	21
		2. Structure Of Atom	11	
4	Physics	1. Measuring Instruments	9	24
		2. Motion	12	
		3. Liquids	8	
Total			89	90

8.2. Blue Print of the Question Paper

Standard-IX

Marks-60

	Knowledge				Understanding				Application				Skill				Total marks
	1	2	5		1	2	5		1	2	5		1	2	5		
	OB	SQ	PQ		OB	SQ	PQ		OB	SQ	PQ		OB	SQ	PQ		

Zoology	1	2	0	5	1	1	0	3	1	1	1	8		1	1	7	23
Botany	1	1	0	3		2	1	9	1	2		5			1	5	22
Chemistry	1	2		5	1		1	6		1	1	7	1	1		3	21
Physics	1	2		5		2	1	9		1	1	7	1	1		3	24
	18				27				27				18				90

♣ OB- Objective type, SQ- Short Answer Question, PQ- Paragraph Question

8.3.Allotment of Question Category – Subject Discipline wise

Sl.No.	No.of questions				Total Marks
	Objective	Short Answer	Paragraph question	Total No of questions	
Zoology	3(1)	5(2)	2(5)	10	23
Botany	2(1)	5(2)	2(5)	9	22
Chemistry	3(1)	4(2)	2(5)	9	21
Physics	2(1)	6(2)	2(5)	10	24
Total No.of Questions	10	20	8	38	90
No.of questions to be answered	10	15	4	29	60

8.4.Summative Assessment – Model question paper

Section –A

Time : 2 hours

Total Marks : 60

I. Choose the correct answer :

10x1=10

1. which of the following animals, hunt for its prey at nights using ultrasonic sound?
a) Owl b) Vulture c) bat d) dog
2. Which of the following character is not appropriate to phylum Arthropoda.
a) The hard shell chitin b) compound eyes c) blood vessels d) joined ankles.
3. The animal with similar segments is
a) Tapeworm b) earthworm c) filarial worm d) Ascaris worm
4. Which of the following is a prokaryotic organism?
a) Yeast b) Virus c) Spirogyra d) Bacteria
5. Which type of cell division takes place during healing of wounds in Human body?
a) Amitosis b) Meiosis c) Mitosis d) Meiosis and mitosis
6. Immiscible liquids are usually separated by corrected method
a) filtration b) separating funnel c) sublimation 4) sedimentation
7. Valency of carbon atom
a) 5 b) 6 c) 4 d) 3
8. Which of the elements differs with others in physical state
a) Oxygen b) Hydrogen c) Lithium d) Nitrogen
9. The density of liquid increases its impulse force
a) increases b) Reduces c) Constant d) increases or Decreases
10. The unit of angle in SI system
a) Degree b) Radian c) Radian / second d) candila

II. Answer any 15 questions .

15 x 2 =30

11. Match the following

Sl.No	A	B	C
1	Hydra	Larva	Soft body
2	Grasshopper	shell	parasite
3	Tape worm	stinging cells	protection
4	Mussel	Looks and suckers	moulting

12. Define – colom

13. List2 differences between frog and toad

14. You could see some men with swollen legs resembling that of elephant's leg. Why the happens? What is the name of the disease?

15. Draw the structure of paramecium and label the following parts.

a. Small uncles

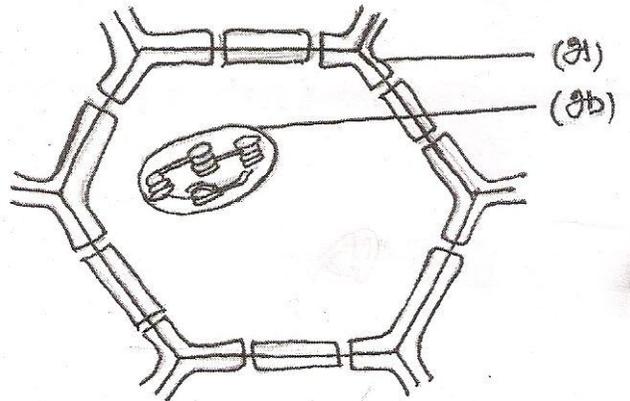
b. Contractile vacuole.

16. Read the statement given and rearrange it

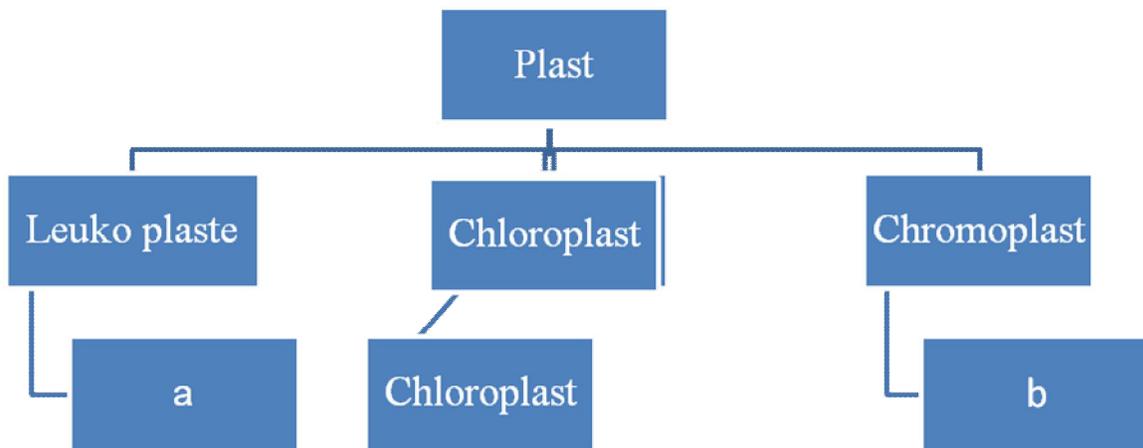
a. Golgi apparatus was first described by Robert Brown.

b. A mitotic cell division will occur in Eukaryotic cells

17. See the given Diagram and answer the questions



- a. Mention the parts (a) and (b) in the given diagram
 - b. Write down the function of every part.
18. Identify and write the odd man out
- a. Stroma, Grana , Chlorophyll, Crustae
 - b. Nucleoplasm, Chromatin, Nucleolus, Mitochondria
19. See the given flow chart and fill the empty Boxes A & B



20. Match the following:

1.	Chromosome	-	Mitochondria
2.	Power house	-	Tonoplast
3.	Lyso some	-	Genes
4.	Vacuole	-	suicide bags Protein synthesis Golgi Apparatus

21) Naphthalene balls grow smaller in size on its use give reason

22) Iron dust and Rava are mixed together how would you separate them.

23) Substantiate : Benzene and Toluene can be separate by fractional distillation

Give reason : The difference in their boiling points is 31K

1. (a) True (b) False

2. (a) True (b) False

3. (a) True (b) False

4. (a) True (b) False

24) Match following

Atom	Atomic Number	Valency
Oxygen	11	3
Nitrogen	8	1
Sodium	7	2

25. In vernier calipers the difference between the value of 1 main scale division

and 1 vernier scale division is 0.1mm. what does it mean ?

26. Match the following

SI.No	Instrument	No	Place of use
1	Ordinary balance	a	Jewellery shop
2	Medical weighing machine	b	Laboratory
3	Physical Balance	c	Hospitals
4	Digital balance	d	Market

27. Fill up the table using the answers given below.

(m/s, radian/s², radian, m/s², radian/s)

SI.No	Physical quantity	Unit
1	Velocity	
2	Acceleration	
3	Angular displacement	
4	Angular velocity	

28. Statement: In uniform circular motion the value of velocity and its direction is constant at different points. Is the above statement right or wrong ? Give reason.

29. Weight of the object in air is 20N and the weight of the object immersed in liquid is 18N. Find the relative density of liquid.

30. Swimming in sea water is easier than in river water. Why?

SECTION - C

4 x 5 = 20

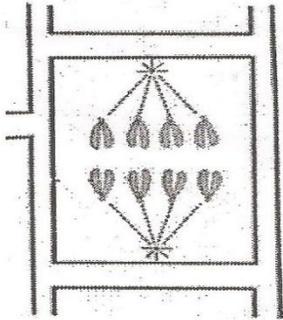
ANSWER ALL THE QUESTIONS :-

31. Give an example to echinoderms. Explain the mode of locomotion in echinoderms.

(or)

How the larva of butterfly transformation to a full insect? Explain the changes in the life cycle of butterfly with a suitable diagram.

32. Look at the diagram and say,



- Which stage of mitosis cell division is presented here?
- Look at the diagram, draw and mark the parts.
- Explain the Mitosis cell division state schools in the above diagram.

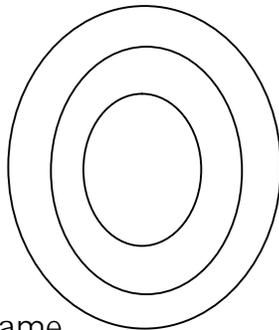
(or)

- Which is the controlling centre of cell?
- Describe its structure and functions.

33. How to separate the mixture of Benzene and Toluene – Explain with a diagram. (or)

Observe the atomic Structure of the atom and answer the questions given below.

Proton -8 , Neutron -8



- Atom Name
- Atomic Number
- Mass Number
- Valency

V) Write the name of the orbit in valency shell.

34.

- a) Define least count .
- b) Explain the types of Zero error in vernier calipers
- c) Explain the method of measuring any dimension of the object by using vernier calipers.

(or)

Derive the three equations of motion by graphical method

9. GRADES- TEACHER ASSESSMENT RECORD

CLASS: IX

SUBJECT: SCIENCE

TERM: I

Sl.No	Name	FA (b) activity			FA (b) test	FA Practical					FA	SA	Total
		1	2	Total	1	Phy	che	bot	zoo	reduced (10)	FA (a+b+prac)	Exam	FA+SA
		10	10	20	10	10	10	10	10	10	40	60	100
1													
2													
3													

GRADES FOR FORMATIVE ASSESSMENT (FA)

ASSESSMENT FOR 40 MARKS

MARKS	GRADES	GRADE POINT
37-40	A1	10
33-36	A2	9
29-32	B1	8
25-28	B2	7
21-24	C1	6
17-20	C2	5
13-16	D	4
9-12	E1	-
8 & Below	E2	-

GRADES FOR SUMMATIVE ASSESSMENT (SA) - ASSESSMENT FOR 60 MARKS

MARKS	GRADES	GRADE POINT
55-60	A1	10
49-54	A2	9
43-48	B1	8
37-42	B2	7
31-36	C1	6
25-30	C2	5
19-24	D	4
13-18	E1	-

12 & Below	E2	-
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CUMMULATIVE GRADES FOR ((FA-40) + (SA-60)) =100 MARKS

ASSESSMENT FOR 100 MARKS

MARKS	GRADES	GRADE POINT
91-100	A1	10
81-90	A2	9
71-80	B1	8
61-70	B2	7
51-60	C1	6
41-50	C2	5
33-40	D	4
21-32	E1	-
20 & Below	E2	-