

# Internal Formative Evaluation: Theory and Practice

Class IX

**Planning & Preparation**

Expert Committee on School Education



West Bengal Board of Secondary Education

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## **INTERNAL FORMATIVE EVALUATION: GUIDELINES FOR IMPLEMENTATION**

The WBBSE in consultation with the Expert Committee has issued a circular mentioning the framework for evaluation procedure in respect of the revised curricula and syllabi being followed in all affiliated schools of WBBSE from January 2015. On further recommendation of the Expert Committee, the WBBSE is now issuing the following guidelines for smooth implementation of the Internal Formative Assessment programme for Class-IX in the academic session in 2015:

In case of Internal Formative Evaluation, the following six modalities are to be followed:

1. Survey Report. 2. Nature Study. 3. Case Study. 4. Creative Writing. 5. Model Making.
6. Open Book Evaluation

Out of these six options noted above, any three are to be chosen in an academic year vis-a-vis Internal Formative Evaluation in each of the seven subjects. Therefore, each term will have one modality in relation to a particular subject. Subject teacher(s) are expected to correlate the modalities of Internal Formative Evaluation with the learning competencies of the concerned subjects. It may be noted that for a particular class, one modality is to be applied for one term. There should not be any repetition of a particular modality for a particular class in an academic year.

1. This programme of Internal Formative Assessment (IFA) should be considered as an integral part of teaching-learning process for enhancement of learning.
2. The IFA programme should be carried out in the classroom scenario in a stress-free manner before the respective summative evaluation for each term.
3. The assessment techniques should be integrated with the classroom processes and should focus on enhancement of understanding and application of knowledge.
4. During implementation of the IFA, innovative teaching-learning processes are expected to emerge. While planning for such processes, the diverse needs and capacities of students should be taken care of and school should ensure that students are able to participate and derive benefit.
5. The teachers in respective subjects in each school will decide the nature and difficulty level of the activities to be carried out under the banner of Survey, Nature Study, Case Study, Creative Writing, Model Making and Open Textbook Evaluation in a student-friendly manner according to the needs of the students of the school and accordingly design such IFA programme. However, some exemplar activities for different subjects for IFA are provided herewith.
6. It will be expected that the assessment will be done on the basis of innovative approaches adopted by the students and not necessarily on the accuracy of the end-results.
7. The written records of activities carried out in the classroom for IFA, duly endorsed and assessed by the subject-teacher and signed by the guardian will be preserved by each student until completion of Class- IX and will have to be produced at the school for any future requirement.
8. A student will be expected to demonstrate her/his abilities in the following manner during the innovative teaching-learning processes adopted for IFA:
  - Describing a case/event/phenomenon/situation/picture in her/his own language.
  - Exploring further- a case/event/phenomenon/situation/picture and produce new examples, alternative explanations, new vocabulary in conformity with the respective discipline.
  - Providing innovative opinions and suggestions in conformity with the discipline.
  - Elaborating the clues, ideas, dialogues, conversations etc.
  - Suggesting innovative approach for presentation of a concept and in problem-solving in conformity with the discipline.
  - Drawing conclusions, making inferences, and taking decisions in respect of a case/event/phenomenon/situation in conformity with the discipline.
  - Creating something new on her/his own.

## **TOOLS FOR INTERNAL FORMATIVE EVALUATION: A BRIEF NOTE**

### **1. Survey:**

The tenn survey is often used to mean collect and interpret information to demonstrate the achievement or otherwise of well-defined goal(s) or specified objective(s) (Devin Kowalczyk,2013). As a part of the Internal Formative Evaluation, the goals or objectives are those expected learning outcomes specified in each subject domain. A survey focuses on factual information and helps surveyors, who are students in the present context, to reinforce their learning under the able monitoring provided by teachers.

### **2. Case study:**

Case studies are stories or contexts. They present realistic, complex, and contextually rich situations and often involve a dilemma, conflict, or problem that students are expected to analyze/ solve by applying their acquired learning skills. It provides an in-depth look into a subject/context of study (the case), as well as its related contextual conditions. A case study involves an intensive study of a learning unit and inspires students to examine as condition, situation, or value of the given context.

### **3. Nature study:**

“NATURE-STUDY, as a process, is seeing the things that one looks at, and the drawing of proper conclusions from what one sees” (Hyde Bailey, 1904 ). Nature study involves observation of plants, animals, natural phenomena, and human activities as a mode of learning. Nature study attempts to reconcile scientific investigation with spiritual, personal experiences gained from interaction/ study with the world/contexts that students live in or are aware of.

### **4. Model making:**

A model connotes a pattern, ideal, reproduction or draft of things (increased, reduced or in actual size). “Apart from real things models can also be mental constructions” (Mueller Science, 1971). Model making is a logical next step in the thinking process for many ideas. It helps students to concretize abstract and complex concepts/ideas through hands-on experience. A model may be a two-dimensional or three-dimensional representation of concepts/ideas. Model making provides scope for reinforcement of critical and creative thinking skills as well as the problem-solving and decision making skills.

### **5. Creative writing:**

Creative Writing involves written expression that draws on creative and critical thinking to convey meaning. Creative writing focuses upon learning competencies in the subject domains, while harnessing the CCT skills. It provides scope or students to apply multiple learning strategies vis-a-vis demonstrating clarity of concepts and their application underlined by aesthetic appreciation a value judgements.

### **6. Open Text Book Evaluation:**

OTBE implies an application of theory to real life situations. It is based upon the principle that the whole objective of learning is not about constant delivery. There must be effective transaction of learning, not just content in the classroom. Therefore, OTBE not only reinforces learning competencies, but also provides scope for transference learning skills. It inspires students to use a range of strategies including accurate decoding to read for meaning, to describe, select or retrieve information, events or ideas from texts and to deduce, infer or interpret information, events or ideas from texts.

# Methods and Tools for Internal Formative Evaluation

## Curriculum Centred and Classroom Learning Based

Name of the Method	About the Method		Process-Methodology	Example
	Learning Objective	Expected Learning Outcome		
<b>Survey</b>	<ul style="list-style-type: none"> <li>Collection of information of known and unknown component with specific context.</li> <li>Determination of sequence of work and necessary follow-up activities.</li> <li>Unification of collected information.</li> <li>Analysis of collected information and follow-up explanation.</li> <li>Documentation of decision and evaluation.</li> </ul>	<ul style="list-style-type: none"> <li>Collection of information. Gaining ability to analyse collected information and take proper decision.</li> </ul>	<ul style="list-style-type: none"> <li>Learners would be provided with specific contexts. Learners will collect information (individually/in groups). They will deposit the document, prepared after analysis and evaluation of collected information, to their respective teachers.</li> </ul>	<ul style="list-style-type: none"> <li>Examples given in respective subject section.</li> </ul>
<b>Nature Study</b>	<ul style="list-style-type: none"> <li>Observation of surrounding environment / incidences related to plants, animals, birds and human activities.</li> <li>Data recording</li> <li>Understanding of recorded data.</li> </ul>	<ul style="list-style-type: none"> <li>Construction of observatory and critical attitude.</li> </ul>	<ul style="list-style-type: none"> <li>Learners would be provided with specific contexts.</li> <li>They will observe minute details of that particular context and prepare a report (individually/in groups). Finally, they will hand over the report to their respective teacher.</li> </ul>	<ul style="list-style-type: none"> <li>Examples given in respective subject section.</li> </ul>

## Curriculum Centred and Classroom Learning Based

Name of the Method	About the Method		Process-Methodology	Example
	Learning Objective	Expected Learning Outcome		
<b>Case Study</b>	<ul style="list-style-type: none"> <li>● Understanding of problem or related matter with respect to a particular incidence.</li> <li>● Determination of probable solutions.</li> <li>● Selection of the most effective solution by judging the demand of the situation.</li> </ul>	<ul style="list-style-type: none"> <li>● Analysis of problem (individually/in groups) of related matter.</li> <li>● Finding solution</li> <li>● Gaining of ability to exchange problem-solving clues.</li> </ul>	<ul style="list-style-type: none"> <li>● Learners would solve a problem with respect to given situation / phenomenon / context / circumstances(individually / in groups)</li> </ul>	<ul style="list-style-type: none"> <li>● Examples given in respective subject section.</li> </ul>
<b>Creative Writing</b>	<ul style="list-style-type: none"> <li>● Written expression of creative thoughts after editing and extending.</li> </ul>	<ul style="list-style-type: none"> <li>● Learners will gain the ability to express creatively of concept and ideas about any particular incidence / subject.</li> </ul>	<ul style="list-style-type: none"> <li>● Learners will be able to construct imaginary conversation, paragraph or narrative etc.</li> </ul>	<ul style="list-style-type: none"> <li>● Examples given in respective subject section.</li> </ul>
<b>Model Making</b>	<ul style="list-style-type: none"> <li>● Concretise any abstract thought or concept in detail.</li> <li>● Explain a definite subject area through creative and experimental work.</li> </ul>	<ul style="list-style-type: none"> <li>● Ability to express vividly a particular concept with the help of particular example or instance.</li> </ul>	<ul style="list-style-type: none"> <li>● Learners will perform different activities like model-making, chart, time-table (two-dimensional / three dimensional structures)</li> </ul>	<ul style="list-style-type: none"> <li>● Examples given in respective subject section.</li> </ul>
<b>Open Textbook Evaluation</b>	<ul style="list-style-type: none"> <li>● Identification of relevant information in context with particular incidence and its effective use.</li> <li>● Perceiving meaning of an incidence and working accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>● Gaining ability to understand and analyse any particular incidence from a specific point of view.</li> <li>● Gaining ability to take effective role in a given context.</li> </ul>	<ul style="list-style-type: none"> <li>● Learners will explore answers for given problems (application based and value based) on a given text.</li> </ul>	<ul style="list-style-type: none"> <li>● Examples given in respective subject section.</li> </ul>

বিষয়ভিত্তিক নমুনা



নিম্নে প্রদত্ত ছয়টি নমুনা বাংলা (প্রথম ভাষা) পাঠ্যবইয়ের 'দাম' গল্পটির নিরিখে নির্মিত। ঠিক এইভাবে অন্যান্য প্রথম ভাষার ক্ষেত্রেও সংশ্লিষ্ট পাঠ্যবইটিকে অবলম্বন করে, অন্তর্ভুক্তি প্রস্তুতিকালীন মূল্যায়ন করতে হবে।

## বাংলা (প্রথম ভাষা)

### ● সমীক্ষা (Survey)

#### শিক্ষক/শিক্ষিকার জন্য

নারায়ণ গঙ্গোপাধ্যায়ের 'দাম' ছোটগল্পটি আজকের সমীক্ষার জন্য নির্বাচিত পাঠ। শিক্ষার্থীদের পাঁচটি দলে গোটা শ্রেণিকক্ষকে ভাগ করে নেওয়া হলো। শিক্ষার্থীরা 'বাংলা শব্দভান্ডার' পড়েছে। 'দাম' ছোটগল্প থেকে পাঁচটি দলের কাজ হলো তৎসম, অর্থতৎসম, তদ্ভব, দেশি, বিদেশি এবং সংকর শব্দের নমুনা চিহ্নিতকরণ, নির্বাচন, শ্রেণিকরণ, শব্দের পরিমাণ নির্ণয় ও আদানপ্রদান। এই সঙ্গে তারা এককভাবে প্রস্তুত মৌলিক দৃষ্টান্তসহ সংক্ষিপ্ত প্রতিবেদন নির্দেশমতো তৈরি করবে।

#### শিক্ষার্থীদের জন্য

দলগতভাবে নমুনা চিহ্নিতকরণ এবং শ্রেণিকরণের কাজ। শ্রেণিকরণের নিরিখে গল্পে ব্যবহৃত ঐ শ্রেণির নির্ণয়। প্রতিটি দলের শিক্ষার্থী নিজের ধারণা থেকে একটি বা দুটি করে বিভিন্ন শ্রেণির নমুনা সহ প্রতিবেদন শিক্ষকের কাছে জমা দেবে। প্রতিটি দল একটি করে শ্রেণির শব্দ নিয়ে কাজ করবে এবং সেই দলের সব সমস্যা অন্য শ্রেণির শব্দ নিয়ে কাজ করবে। সেই দলের সব সদস্য অন্য শ্রেণিগুলি থেকে ব্যক্তিগতভাবে শব্দের উদাহরণ লিপিবদ্ধ করবে বা কোনো একটি শ্রেণি বিষয়ে তিন-চারটি বাক্য লিখবে।

একইভাবে, যদি সেই পর্যায়ে সন্ধি পড়ানো হয়, তাহলে কাজটি হবে বাক্য থেকে সন্ধিবন্ধ পদ খুঁজে বের করা এবং পরবর্তীতে দলগতভাবে স্বর ব্যঞ্জন/বিসর্গসন্ধি নির্ণয় ও সন্ধিবন্ধ পদ বিশ্লেষণ করে তালিকা নির্মাণ, পাঠ্যে ব্যবহৃত পদের পরিমাণ নির্ণয়। এভাবে ব্যাকরণের পাঠ্যসূচি অনুসারে যে কোনো ধরনের বিষয় (যেমন উপসর্গ, প্রত্যয় প্রভৃতি) এক্ষেত্রে দেওয়া যেতে পারে।

[ নির্ধারিত সময়: ৪৫/৪০ মিনিট — কাজটি সকলের সঙ্গে আদানপ্রদানের জন্য ১০ মিনিট + কাজটি দলগত/এককভাবে করার জন্য ২৫ মিনিট + সামগ্রিক আদানপ্রদান ১০/৫ মিনিট ]

### ● প্রকৃতিপাঠ (Nature Study)

#### শিক্ষক/শিক্ষিকার জন্য

'দাম' গল্পের কথক সুকুমার গল্পের কেন্দ্রীয় চরিত্র। গল্প থেকে তাঁর কার্যকলাপের একটি ঘটনামুহূর্ত নির্বাচন করা হবে। শিক্ষার্থীরা সেই অংশটি পাঠ করে ব্যক্তিত্বের প্রকৃতি নিরূপণের চেষ্টা করবে।

'দাম' গল্পের নিম্নলিখিত অংশটি শিক্ষিকা / শিক্ষক ব্ল্যাকবোর্ডে লিখে দিলেন।

#### শিক্ষার্থীদের জন্য

নীচের অনুচ্ছেদটি পড়ে প্রশ্নগুলির উত্তর দাও :

বুড়ো প্রিন্সিপ্যাল পর্যন্ত মুগ্ধ হয়ে আমাকে বললেন, ভারী চমৎকার বলেছেন আপনি, যেমন সারগর্ভ, তেমনি সুমধুর।

আমি বিনীত হাসিতে বললুম, আজ শরীরটা তেমন ভালো নেই, তাই মনের মতো করে বলতে পারলুম না।

পাশে দাঁড়িয়ে থাকা ছেলেরা বিস্ময়ে চোখ কপালে তুলল।

শরীর ভালো নেই, তাতেই এরকম বললেন স্যার, শরীর ভালো থাকলে তো —

অর্থাৎ প্রলয় হয়ে যেত। আমি উদার হাসি হাসলুম। যদিও মনে মনে জানি, এই একটি সর্বার্থসাধক বক্তৃতাই আমার সম্বল, রবীন্দ্র জন্মোৎসব থেকে বনমহোৎসব পর্যন্ত এটাকেই এদিক ওদিক করে চালিয়ে দিই।

- বক্তা সুকুমার শরীর ভালো না থাকার ভান করেছেন কেন বলে তোমার মনে হয়?
- একটি বক্তৃতাই এদিক ওদিক করে বিভিন্ন জায়গায় চালিয়ে দেওয়া চরিত্রের কোন দিককে প্রকাশ করে?
- উদ্ভূত অংশে সামগ্রিকভাবে বক্তার চরিত্রের কোন দিকটা ফুটে উঠেছে?

[ নির্ধারিত সময়: ৪৫/৪০ মিনিট — কাজটি সকলের সঙ্গে আদানপ্রদানের জন্য ১০ মিনিট + কাজটি দলগত/একক ভাবে করার জন্য ২৫ মিনিট + সামগ্রিক আদানপ্রদান ১০/৫ মিনিট ]

## ● সমীক্ষণ (Case Study)

### শিক্ষক/শিক্ষিকার জন্য

‘দাম’ গল্প পাঠের পর এই গল্পের চরিত্রগুলির বিভিন্ন দিক সম্পর্কে শিক্ষার্থীদের মনে একটি ধারণা গড়ে উঠেছে। চরিত্রের সেই বিশেষত্বগুলি বজায় রেখে একটি কাল্পনিক ঘটনামুহূর্তের নিরিখে চরিত্রগুলির ভূমিকা বা প্রতিক্রিয়া সম্পর্কে মতামত গঠন। তাই ‘দাম’ গল্পের নিরিখে একটি কাল্পনিক অনুচ্ছেদ রচনা করে দু-একটি প্রশ্নের মাধ্যমে বিচার্য বিষয়টিকে শিক্ষার্থীরা অনুধাবন করে নিজেদের মতামত লিখতে পারছে কিনা তা দেখে নিতে হবে।

### শিক্ষার্থীদের জন্য

নীচের অনুচ্ছেদটি পড়ে প্রশ্নগুলির উত্তর দাও :

সুকুমারের মাস্টারমশাই অত্যন্ত নিষ্ঠার সঙ্গে ছাত্রদের শেখাতেন। তাঁর অঙ্কে অসামান্য দক্ষতা ছিল। কিন্তু ছেলেদের অঙ্ক না পারা তিনি সহ্য করতে পারতেন না। তাই সব পড়ুয়াই তাঁর ক্লাসে তটস্থ হয়ে থাকত। স্কুলের বার্ষিক পত্রিকায় একবার একটি ছেলে ছদ্মনামে মাস্টারমশাইয়ের কড়া শাসনের বিতীষিকার কথা জানিয়ে একটি গল্প লিখল। মাস্টারমশাই ছাত্রের বেনামে লেখা সেই গল্পটি পড়লেন।

প্রশ্ন: (১) অঙ্ক কষতে না পারার ব্যাপারটিকে মাস্টারমশাই মন থেকে মেনে নিতে পারতেন না কেন?

(২) গল্পটি পড়ার পর মাস্টারমশাইয়ের প্রতিক্রিয়া ও আচরণ কেমন হয়েছিল বলে তোমার মনে হয়?

[ নির্ধারিত সময়: ৪৫/৪০ মিনিট — কাজটি সকলের সঙ্গে আদানপ্রদানের জন্য ১০ মিনিট + কাজটি দলগত/একক ভাবে করার জন্য ২৫ মিনিট + সামগ্রিক আদানপ্রদান ১০/৫ মিনিট ]

## ● সৃষ্টিশীল রচনা (Creative Writing)

### শিক্ষক/শিক্ষিকার জন্য

‘দাম’ গল্পটি পাঠ করার পরে সেই গল্পের ভিত্তিতে একটি সৃষ্টিশীল, কাল্পনিক সংলাপ লিখতে দেওয়া হবে।

### শিক্ষার্থীদের জন্য

‘আমি তাঁকে দশ টাকায় বিক্রি করেছিলুম। এ অপরাধ আমি বইব কী করে, এ লজ্জা আমি কোথায় রাখব।’

‘দাম’ গল্পের শেষে বক্তা সুকুমারের অপরাধবোধ, লজ্জা ও অনুশোচনার কথা পাঠক হিসাবে আমরা অনুভব করি। কিন্তু মাস্টারমশাইয়ের কাছে এই অনুশোচনা প্রকাশের কথা গল্পে নেই। শিক্ষার্থীরা সুকুমারের অনুতাপের কথা কল্পনা করে মাস্টারমশাইয়ের সঙ্গে সুকুমার কথা বলছে — এমন পরিস্থিতির কথা কথোপকথনের আকারে ১০টি বাক্যে লিখবে।

[ নির্ধারিত সময়: ৪৫/৪০ মিনিট — কাজটি সকলের সঙ্গে আদানপ্রদানের জন্য ১০ মিনিট + কাজটি দলগত/একক ভাবে করার জন্য ২৫ মিনিট + সামগ্রিক আদানপ্রদান ১০/৫ মিনিট ]

### ● মডেল নির্মাণ (Model Making)

#### শিক্ষক/শিক্ষিকার জন্য

‘দাম’ গল্পটির নিরিখে কথকের মানসিকতার বিবর্তনের কয়েকটি ঘটনাক্রম চিহ্নিত করা হবে। শিক্ষার্থীরা চিহ্নিত ঘটনাগুলি পড়ে চরিত্রের মানসিক অবস্থান / বিবর্তন বিষয়ে নিজেদের মতামত লিখবে। প্রয়োজনে দু-একটি দৃষ্টান্ত দিয়ে দেখিয়ে দেওয়া যেতে পারে।

#### শিক্ষার্থীদের জন্য

ঘটনা	মতামত
১. ‘ছবির মতো অঙ্কটা সাজিয়ে দিয়েছেন’	মাস্টারমশাই অঙ্কে অসামান্য দক্ষ ছিলেন।
২. ‘পুরুষ মানুষ হয়ে অঙ্ক পারিসনে’	অঙ্কে নিবেদিতপ্রাণ মাস্টারমশাইয়ের বিষয়টির প্রতি প্রগাঢ় ভালোবাসা ছিল। তাঁর কাছে পৌরুষের অর্থই ছিল অঙ্কে পারদর্শিতা।
৩. ‘অহেতুক তাড়না করে কাউকে শিক্ষা দেওয়া যায় না।’	
৪. ‘কিন্তু আমি খুশি হতে পারলুম না।’	
৫. ‘দেখলুম মাস্টারমশাইয়ের চোখ দিয়ে জল পড়ছে।’	

[ নির্ধারিত সময়: ৪৫/৪০ মিনিট — কাজটি সকলের সঙ্গে আদানপ্রদানের জন্য ১০ মিনিট + কাজটি দলগত/একক ভাবে করার জন্য ২৫ মিনিট + সামগ্রিক আদানপ্রদান ১০/৫ মিনিট ]

### ● পাঠ্যপুস্তক ও শিখন সামগ্রীর সহায়তায় মূল্যায়ন (Open Textbook Evaluation)

#### শিক্ষক / শিক্ষিকাদের জন্য

‘দাম’ গল্পটিতে সুকুমার স্কুলের অঙ্কের মাস্টারমশাইয়ের সঙ্গে শিক্ষার্থীরা পরিচিত হয়েছে। একই বিষয় পড়ানোর ক্ষেত্রে একজন অন্য মানুষের দৃষ্টিভঙ্গি ও পদ্ধতি আরেক রকম হতে পারে। এই দুইয়ের তুলনামূলক আলোচনার সাপেক্ষে এবং প্রশ্নোত্তরের নিরিখে শিক্ষার্থীদের স্বাধীন মতামত এবং মূল্যবোধের প্রতিফলন ঘটাতে হবে।

#### নীচের অনুচ্ছেদটি পড়ে প্রশ্নগুলির উত্তর দাও :

একটু পরে মাখনলাল সুর স্কুলে এসে ক্লাসে বেড়াতে বেরুলেন। মাখনলাল সুর দু-তিনটি তেলের কলের মালিক। কালো, মোটাসোটা চেহারা,

মুখখানাতে দাঙ্গিকতা মাখানো। লেখাপড়া বিশেষ কিছু জানেন না, টাকার জোরে স্কুলের সেক্রেটারি হয়েছেন বলে শিক্ষকদের ওপর প্রভুত্ব বেশি করে খাটান। ...

যদুবাবুর ক্লাস। ইতিহাস পড়াচ্ছেন যদুবাবু, মন দিয়ে শিবাজির জীবনী বর্ণনা করছেন ছেলেদের কাছে।

মাখন সুর এক অবাস্তুর প্রশ্ন করে বসলেন — বলো দিকি, দাশু রায় পাঁচলি লিখেছিলেন কত সালে? মাস্টার বলে দাও না ওদের। দাশু রায় — আহা, অমন গান আর কেউ বাঁধতে পারবে না —

তারপরে নারায়ণবাবুর ক্লাস। নারায়ণবাবু মশগুল হয়ে গিয়েছেন অধ্যাপনায়; কিন্তু তিনি অঙ্ক ছেড়ে রবীন্দ্রনাথের কবিতা আবৃত্তি করছেন ক্লাসে। মাখন সুর ঢুকে জিজ্ঞাসা করলেন — আপনি না অঙ্কের মাস্টার। আমি শুনোচি আপনি ক্লাসের পড়া না করিয়ে ছেলেদের কাছে বাজে গল্প করেন।

নারায়ণবাবু বললেন — কথাটা উঠল কিনা, আবৃত্তি সর্বশাস্ত্রাণং বোধদপি গরীয়সী বিশেষত কবিতার। তাই আবৃত্তির নিয়মটা ওদের —

— তা শেখবার কোনো দরকার নেই। আপনি যে জন্যে, আছেন, তাই করুন। ...

বললেন — আপনি কোনো কাজ করেন না ক্লাসে — ছেলেদের যা পড়ান তা সিলেবাসের বাইরে। সেকেন্দ্র ক্লাসে অ্যালজেব্রা কতদূর করিয়েছেন দেখি এ বছর। মোটে সিম্পল ইকোয়েশন ধরাচ্ছেন? তা হলে কবে কোর্স শেষ করবেন আপনি? আপনাকে নিয়ে বড়ো মুশকিল হল দেখছি। আপনার পুরোনো রোগ গেল না। সেই বাজে গল্প করা। (অনুসন্ধান : বিভূতিভূষণ বন্দ্যোপাধ্যায়)

- যদুবাবু ক্লাসে কী পড়াচ্ছিলেন?
- মাখনলাল সুর নামক মানুষটিকে কেমন বলে তোমার মনে হলো?
- অঙ্কের মাস্টারমশাই নারায়ণবাবু ক্লাসে কী পড়াচ্ছিলেন?
- নারায়ণবাবু ক্লাসে এক বিষয় থেকে অন্য বিষয়ে গিয়ে যেভাবে পড়ানোর চেষ্টা করছিলেন, তা কতটা গ্রহণযোগ্য বলে তুমি মনে করো? তোমার সিদ্ধান্তের স্বপক্ষে যুক্তি দাও।

[ নির্ধারিত সময়: ৪৫/৪০ মিনিট — কাজটি সকলের সঙ্গে আদানপ্রদানের জন্য ১০ মিনিট + কাজটি দলগত/একক ভাবে করার জন্য ২৫ মিনিট + সামগ্রিক আদানপ্রদান ১০/৫ মিনিট ]

**বিশেষ জ্ঞাতব্য তথ্য :** একটি পাঠ্যবিষয়কে অবলম্বন করে এখানে ছয়টি পদ্ধতি-সম্পর্কিত ছয়টি উদাহরণ দেওয়া হলো। এটি নমুনা মাত্র। এভাবে বিভিন্ন পাঠ্যবিষয় অবলম্বনে যেকোনো পর্যায়ক্রমিকের পাঠ্যসূচি (ব্যাকরণ ও প্রোফেসর শঙ্কুর ডায়রিসহ) অনুসারে বিভিন্ন পদ্ধতির চর্চা করা যাবে। নির্দিষ্ট কোনো বিদ্যালয়ের শিক্ষার্থীদের সবলতা ও সামর্থ্যের নিরিখে কাঠিন্যমাত্রার তারতম্য ঘটানো যেতে পারে।

The examples cited below will hold good for all second language subjects

## ENGLISH (SECOND LANGUAGE)

Textbook : Bliss

Lesson no.11: A Shipwrecked Sailor

### ● Survey

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- (a) Topic: identifying simple, complex and compound sentences
- (b) Learning outcome: ability to identify simple, complex and compound sentences and differentiate among those sentences from a given topic included in the textbook
- (c) Teacher's role: dividing the class into groups and assigning specific tasks for each group
- (d) Time: 1 (one) period
- (e) Students' role: engage in groups to identify different type of sentences as assigned to them and to write five sentences of their own
- (f) Assessment procedure: written records of the students will be assessed
  - (i) Group work:

Go through the lesson, 'A Shipwrecked Sailor' carefully. Now find out the number of simple sentences, complex sentences and compound sentences in the text. Work in groups as suggested by the teacher. Each group is given specific assignment:

Group A	Group B	Group C
Simple sentences	Complex sentences	Compound sentences

- (ii) Individual work:

Now write five sentences of your own under each category.

### ● Nature Study

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- (a) Topic: studying nature through literary texts
- (b) Learning outcome: ability to think critically about the effects of nature on man
- (c) Teacher's role: assigning a reading comprehension task extracted from the textbook (Lesson 11) and setting questions on critical thinking

- (d) Time: 1 (one) period
- (e) Students' role: reading the passage to find the challenges of nature on man
- (f) Assessment procedure: written records of the students will be assessed

**Read the following passage:**

The rain continued through the next day with gusts of wind. Only a wreck of my ship was to be seen at low water. I swam to the wreck to rescue and secure for my survival some food and other provisions. I was able to collect some wood, cable, string, a knife, nails and a gun. I also collected a hammock and some canvas with which I made tent. I got some ink and paper. I also found some money, but they were useless to me in this barren island. I was some hundred leagues out of the ordinary course of the trade of mankind. I was convinced I had to spend the rest of my life alone in this wild, desolate island.

**Answer the following questions:**

- (a) Why did he make a tent?
- (b) Do you think that money is useless in a barren island?
- (c) What character quality of the narrator do we come across when he says "I was convinced"?
- (d) Would you like to spend your entire life in a very ordinary fashion or face adventures? Give reasons.

(Or)

- (a) Topic: conversation between two shipwrecked sailors after they reached the island
- (a) Learning outcome: critically think about nature and man
- (b) Teachers' role: arranging pair activity- a role play or an imaginary conversation
- (c) Time: 1 (one) period
- (d) Student's role: discussing with peers on the topic
- (e) Assessment procedure: written records of the students will be assessed

Write an imaginary conversation between two-wrecked sailors after they reached the island.

**● Case Study** 

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- (a) Topic: Lost in the Woods
- (b) Learning outcome: ability to analyse and evaluate the information through introspective study
- (c) Teacher's role: providing a case to the students and engaging them to solve the problem
- (d) Time: 1(one) period
- (e) Students' role: discussing with peers on the topic for problem-solving
- (f) Assessment procedure: written records of the students will be assessed

**Read the following case:**

Arka was feeling nervous. It was getting dark, and the jungle seemed more dangerous than it had appeared in the morning, when he had entered the jungle with Dipu, Priya and Alam. Everything seemed perfect till noon. After having lunch, and in spite of repeated warnings from his friends, Arka had walked down a path following the cry of a bird. Half an hour later, Arka wanted to return. But to his horror, he found that he had lost his way. He blew his whistle again and again, but no response came. Now he wished he had carried a piece of chalk, like his friends, to mark the trees. Arka realised that he was lost in the woods. As evening deepened, Arka could hear the dull thud of hammer beats from far. He felt he must follow the sound.

**Answer the following question:**

- (a) Why was Arka feeling nervous?
- (b) Arka made two major mistakes. What were those?
- (c) What should Arka do to go out of the jungle?

**● Creative Writing** 

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- (a) Topic: Story Writing
- (b) Learning outcome: ability to develop a story from a given lead
- (c) Teacher's role: providing the cue of a story, engaging them into group discussion, facilitating them to imagine situations and motivating them for creative writing
- (d) Time: 1 (one) period
- (e) Students' role: discuss in groups and develop the lead into a story
- (f) Assessment procedure: written records of the students will be assessed

Following is the beginning of an unfinished short story. Use your imagination to complete the story:

Ramlal was returning home from his fishing trip. He had been out in the deep waters for a week. He was missing his family now. He remembered the face of his little daughter. Restless, he started...

**● Model Making** 

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- (a) Topic: making a timeline
- (b) Learning outcome: ability to understand the chronology of events
- (c) Teacher's role: providing a story (Lesson 11) and engaging them into the group-activity
- (d) Time: 1 (one) period
- (e) Student's role: discussing with peers on the topic for making a timeline
- (f) Assessment procedure: written records of the students will be assessed

Make a timeline of the incidents in the story 'A Ship Wrecked Sailor'.

## ● Open Textbook Evaluation

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- (a) Topic: The Man of the Island: reading comprehension
- (b) Learning outcome: ability to analyse, think logically, compare and contrast between two situations.
- (c) Teacher's role: providing a passage to the students and engaging them to analyse the situation in reference to concept developed in the lesson (i.e. 'A Shipwrecked Sailor')
- (d) Time: 1 (one) period
- (e) Student's role: applying the concept developed in the lesson in analysing the given situation
- (f) Assessment procedure: written records of the students will be assessed

Read the following carefully:

### THE MAN OF THE ISLAND

From the side of the hill, stones fell rattling and hounding through the trees.

My eyes turned quickly in that direction and I saw a figure leap with great rapidity behind the trunk of pine. What it was, whether bear or man or monkey, I could not tell.

I turned on my heels, and looking sharply over my shoulder, began to retrace my steps in the direction of the boat.

Instantly the figure reappeared. From trunk to trunk it flitted like a deer, running manlike on two legs, but unlike any man that I have ever seen, stooping almost double as it ran. Afraid I was, I gathered courage when the recollection of my pistol flashed in my mind. I set my face resolutely for this man of the island, and walked briskly towards him.

He was concealed by this time behind another tree trunk, but he must have been watching me closely. As soon as I began to move in his direction he reappeared and took a step to meet me. Then he hesitated, drew back, came forward again, and at last, to my wonder and confusion, threw himself on his knees and held out his clasped hands.

"Who are you?" I asked.

"Ben Gunn," he answered, and his voice sounded awkward, like a rusty lock. "I am poor Ben Gunn, I am; and I haven't spoken with a human being properly these three years."

I could now see that he was a man like myself. His skin was burnt by the sun; even his lips were black; and his fair eyes looked quite startling in so dark a face. He was clothed with tatters of old ship's canvas and old sea cloth; and this was all held together by various brass buttons and bits of sticks.

"Three years!" I cried. "Were you ship-wrecked?"

"Nay, Mate," said he, "marooned."

I had heard this word, and I knew it stood for a horrible kind of punishment common enough among the

pirates, in which the offender is put ashore with a little powder and shot and left behind on some desolate and distant island.

“Marooned three years ago,” he continued, “and lived on goats since then and berries and oysters.”

**Adapted from R.L Stevenson’s Treasure Island**

1) Give reasons for the following statements:

a) The narrator couldn’t decide whether it was a man or an animal.

Reason : .....

b) The narrator felt Ben to be ship-wrecked.

Reason : .....

2) Answer the following questions :

a) There are some similarities as well as dissimilarities between a ship-wrecked person and a person marooned. Mention these similarities and dissimilarities in the space provided below:

Similarities :

.....

Dissimilarities:

.....

b) Do you think that the narrator went to the island willingly or he reached there by chance? Give reasons for your answer.

.....

**Mathematics: Class IX**  
**Sample for Internal Formative Evaluation**  
**Textbook: Ganit Prabha**

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**1. Survey**

Selected text: Factorization (Lesson-8)

**Step I:**

The teacher will instruct the students to read the lesson (Lesson-8) carefully. Every student will have to set a question paper individually on the said lesson. Each paper should comprise of 10 questions along with the student's name and roll number. A sample of the question paper is given below:

- (i) Factorise the number 12 into two factors.
- (ii) Factorise the algebraic expression  $x^2 + 3x$  into two factors.
- (iii) What are the things that we have learnt to factorise?
- (iv) Can the number 48 be factorised into prime factors? If so, factorise it.
- (v) Can all the natural numbers (excluding 1 and prime numbers) be factorised into prime factors?
- (vi) Can the number 6 be factorised into two factors so that none of the factors is a natural number? If so, factorise it.
- (vii) Factorise a number into two factors of which one is the number itself. Give examples.
- (viii) Factorise the polynomial expression  $x^2 - 1$ .
- (ix) Factorise the polynomial expression  $x^2 - 8$ .
- (x) Factorise the polynomial expression  $x^2 + 12x + 35$ .

**Step II:**

Following the instruction of the teacher, the students will exchange the question papers among themselves and solve the peer's question paper. Observing the answers of the respective question papers, each paper setter will try to understand whether the concept of Factorization and the skill of factorising a number have been developed in the peer.

**Step III:**

Each paper setter will have to write a report expressing his/her opinion in reference to his/her observation of the answered script. He/she will have to submit the report to the teacher along with his/her question paper and the answered script. On the basis of his/her report, marks will be awarded to the student (paper setter) by the teacher.

**Allotment of marks:**

Paper setting- 4 marks; evaluating the answers correctly- 4 marks; written report- 2 marks

Time allotted: 2 periods

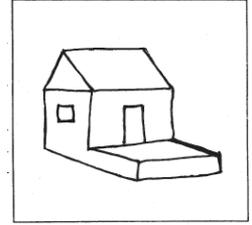
[This distribution and allotment of marks is applicable only for mathematics. Teacher of other subjects will take decisions accordingly]

## 2. Nature Study: ---

Selected text: Calculating the area and perimeter of a triangle and a quadrilateral (Lesson-15)

### Step I:

The teacher will tell the students that each of them will draw a picture of their environment using pen and paper. They will have to use triangles and quadrilaterals in their respective images. The teacher will also tell them to measure the approximate value of the area and perimeter of the various geometrical figures (included in the syllabus) of their respective images.



### Step II:

The teacher will collect their drawings that include their respective names and roll numbers.

### Allotment of marks:

Geometrical figures- 2marks; beautiful organisation of geometrical figures- 2marks; concept of area and perimeter of the geometrical figures- 3 marks; ability to understand nature using geometrical figures-3 marks

Time allotted: 2 periods

## 3. Case Study ---

Selected text: Polynomial expression (Lesson-7)

### Step I:

The teacher will write down some questions on the blackboard. A sample of the set of questions is given below:

1. Find out the term, degree and the coefficient numbers in each of the polynomial expression given below:

i)  $3x^2 + 2x + 7$

ii)  $\frac{1}{3}x^4 + \frac{2}{3}x^3 + \frac{7}{5}x^2 + \frac{9}{5}x + \frac{3}{8}$

iii)  $-3x^3 - 5x^2 - 9x - 1$

iv)  $\sqrt{2}x^5 + \sqrt{11}x^4 + \sqrt{7}x + \sqrt{3}$

v)  $\sqrt{15}x + 4$

vi) 15

vii) 0

viii)  $2x + 3y$

2. Give examples of algebraic expressions which are not polynomial expressions.
3. I had Rs. 225. I bought 4 books of same price and yet I have Rs.5 with me. Form an equation of polynomial expression to find out the price of one book.
4. Let us create a problem like the one given above. Then form an equation of polynomial expression of the problem and solve it.

**Step II:**

Every student will have to prepare his/her answer script and submit it after writing his/her name and roll number.

**Allotment of marks:**

Concept regarding term, degree and the type of coefficient numbers of polynomial expressions- 4 marks; example of algebraic expression which are not polynomial expressions- 2 marks; able to answer Question no. 3- 2marks; able to answer Question no. 4— 2 marks

Time allotted: 2 periods

**4. Creative Writing** 

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Selected text: factorization (Lesson 8)

**Step I:**

The teacher will write down on the blackboard some examples of factorisation as given below:

Example: Factoring 6 we get  $2 \times 3$ . Here 2 and 3 are natural numbers.

Again, factoring 6 we get  $(-2) \times (-3)$ . Here  $(-2)$  and  $(-3)$  are integers.

Again, factoring 6 we get  $\frac{36}{5} \times \frac{5}{6}$ . Here  $\frac{36}{5}$  and  $\frac{5}{6}$  are rational numbers.

Again, factoring 6 we get  $\sqrt{2} \times \sqrt{18}$ . Here  $\sqrt{2}$  and  $\sqrt{18}$  are irrational numbers.

**Step II:**

On the basis of the examples stated above, the teacher will invite the students to write creative essays on factorization of two polynomial expressions. Every student will make a comparative study of factorization in respect of the examples stated above and write an essay on it.

**Step III:**

The teacher will evaluate the essays and award marks individually.

**Allotment of marks:**

Factorizing two polynomial expressions into two algebraic expressions-2 marks; factorizing a polynomial expression which is not an algebraic expression-2; factorizing a polynomial expression into various types of algebraic expression-2 marks; ability to make a comparative report on factorization of polynomial expressions and algebraic expressions-4 marks

Time allotted: 2 periods

#### 4. Model making

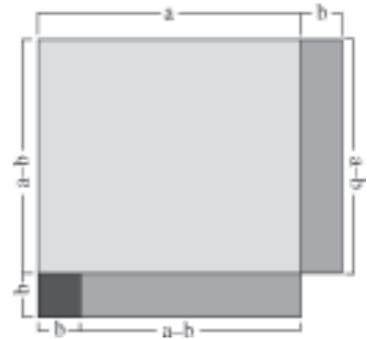
Selected text: Factorization (lesson- 8)

##### Step I:

The teacher will write down the following text on the blackboard;  
a and b are positive whole numbers and  $a > b$ .

In an event  $(a + b)$  persons donated Rs.  $(a - b)$  each and the total subscription was Rs. x.

In another event 'a' persons donated Rs. 'a' each as subscription and from the total amount 'b' persons were given Rs. 'b' and thereby the remaining amount became Rs. 'y'. Is 'x' and 'y' are equal? Which identity is to be adopted to understand whether  $x = y$ ? Make geometric models of those identities.



##### Step II:

Every student will make an algebraic model and a geometric model of the algebraic expression of the statement given above in his/her answer script and submit it to the teacher.

##### Step III:

The teacher will assess the models made by each student and award marks.

##### Allotment of marks:

For making an algebraic model of the statement i.e.  $x = (a+b)(a-b)$  and  $y = a^2 - b^2$ - 3 marks;

For concept of geometric model of  $a^2$  and  $b^2$ -3marks;

For making geometric model of the identity  $(a+b)(a-b) = a^2 - b^2$ - 4marks

Time allotted: 2 periods

#### 5. Open Textbook Evaluation (OTBE)

Selected text: Factorization (lesson- 8)

##### Step I:

The teacher will write down the following on the blackboard and ask them to prove them:

We know that-

$$1 - c^2 = (1 - c)(1 + c)$$

$$1 - c^2 = (1 - c)(1 + c + c^2)$$

$$1 - c^2 = (1 - c)(1 + c + c^2 + c^3) \text{ and}$$

$$1 - c^2 = (1 - c)(1 + c + c^2 + c^3 + c^4)$$

(Let us prove the above identities)

**Step II:**

The teacher will write down the following question on the blackboard:

Let us try to factorise  $I-c^{11}$  and  $I-c^{13}$  like those given above. Let us prove that our factorization is correct.

**Step III:**

The teacher will award marks to each student assessing his/her answer or the process of his/her answer

**Allotment of marks:**

For proving the first two identities- 2 marks;

For proving the third and fourth identities- 2 marks;

Understanding the nature of factorization of  $I-c^{11}$  and  $I-c^{13}$  -2 marks

For factorising  $I-c^{11}$  and  $I-c^{13}$  – 4 marks

(The students can take the help of their textbook while answering this question in the classroom)

Time allotted: 2 periods

**Note:** Some examples of Internal Formative Assessment on six different areas are given here with reference to certain lessons of the Mathematics textbook for class IX. In this way the teachers will assess the learners in reference to Ganit Prakash in a much better way.

## Life Science and Environment

### Survey

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#### 1. Topic : Over-utilization of water

**Theme 5 : Environment and its resources (Sub-theme : Natural resources and its sustainable use)**

**Required time : One period**

**Desired learning outcome**

- i) Students will learn about daily approximate requirement of water at home and also the activities where water is used in excess.
- ii) After this survey they will be able to convince their family members to stop over-utilization of water, if needed.

**Instruction for the students**

Make a survey on the over-utilization of water at home of five of your classmates. Try to find out the following aspects from this survey – name of the activities in the house where water is needed, approximate amount of water needed daily for each activity, name of the activities where water is used in excess, name of the activities where the use of water can be reduced, the steps to be taken to save water etc.

**Teacher's activities**

- i) To split the students in groups of six members and to explain to them what to do.
- ii) Explain to them about the questions that they are to ask one another.
- iii) After the end of the class to collect students' copy and assess the work done by the students.

**Students' activities**

**Part-I (Group activity)**

- Collecting data, exchange of ideas and forming views about over-utilization of water.

**Part-II (Individual activity)**

To write about collected data, ideas, analysis or conclusion in their respective copies and deposit the same to the teacher.

**Criteria for assessment**

To assess how one has achieved desired learning competency and to what level.

#### 2. Topic : Energy Usage

**Theme 5 : Environment and its Resources (Sub-theme : Natural resources and its sustainable use)**

**Required time : One period**

**Desired Learning outcome**

- i) Students will become aware about the ways energy can be wasted by preparing a questionnaire for making a survey on the use of energy.

- ii) Once the students become aware about how energy wastage can be reduced, the students will refrain from wasting energy in their own life.

### **Instruction for the students**

Prepare a questionnaire to make a survey on energy usage in different household work of your classmates' house. Try to find out the following with the help of a questionnaire – what is the main source of energy that is used at home, which activities are energy-intensive, activities where energy is misused, how misuse of energy can be minimised etc.

### **Teacher's activities**

- i) To explain the relevant aspects on which the questions are to be set while preparing the questionnaire on energy usage.
- ii) To frame one or two questions for the purpose of illustration, if needed.
- iii) To divide the students in groups.
- iv) To assess the questionnaires prepared by the students at the end of the class.

### **Students' activities**

- Collecting relevant data, exchange of ideas and forming views about energy usage.

### **Criteria for Assessment**

To assess how one has achieved desired learning competency and to what level.

## **3. Topic : Infectious diseases and their propagation**

### **Theme 4 : Biology and Human Welfare (Sub-theme : Immunity and Human Diseases )**

#### **Required time : One period**

#### **Desired Learning outcome**

- To discern the infectious diseases from other common diseases.
- To demarcate the symptoms of the infectious diseases and identify those diseases on the basis of symptoms.
- To identify the ways through which the germs of infectious diseases can enter the body.
- To find out the time of the year when the germs of some particular infectious disease can enter the body.
- To identify the age group which is the most affected by infectious diseases.
- To identify when infectious diseases can turn into epidemics.
- To know how to avoid infectious diseases or how to save yourself from it and apply the same.

### **Instruction for the students**

Discuss about the outbreak of infectious disease in your locality in recent time. Try to find out how many people have fallen victim to the disease, how the disease has spread in the locality, what are the problems of the diseased people, how the infectious diseases can be avoided or what precautions can be taken and the programmes undertaken for locality-wise public awareness.

### Teacher's activities

- To divide the students in small groups and provide necessary help to each group.
- To familiarize the students with the steps to be undertaken in the course of survey.
- To help in analysing the obtained data.
- To help in coming to appropriate conclusions from the obtained data.
- To assess work done by the students.

### Students' activities

#### Part-I (Group work)

Collect data about infectious disease, exchange of ideas and forming views.

#### Part-II (Individual work)

- Collecting relevant data, exchange of ideas and forming views about infectious diseases.

### Criteria for Assessment

To assess how one has achieved desired learning competency and to what level.

4. Discuss about the various food chains of your locality with your classmates. Prepare a list of those food chains. Try to find out how those food chains are associated with each other.
5. Perform a survey among your classmates on the methods and necessity of wash. Try to know how WASH is related with healthy and disease-free lifestyle. Also try to find out the awareness among people about this relationship between WASH and healthy, disease-free lifestyle.

### Nature Study

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#### 1. Topic : Making a list of animals observed on the way from house to school and classifying them

#### Theme 1 : Life and its diversity (Sub-theme : Classification of Kingdom animalia)

#### Required time : One Period

#### Desired learning outcome

- i) Developing observation power by thinking and writing about animals seen on the way from house to school.
- ii) Acquiring hands-on experience of classifying animals by arranging animals in various phyla and classes. As a result, gaining practical knowledge about the characteristics of different phyla and classes.

#### Instruction for the students

Make a list of the animals seen today on the way from house to school. Classify them. Mention the class of animals belonging to phylum chordata.

#### Teacher's activities

- i) Explain the activity to the students.
- ii) Classify some of the animals he/she has seen on the way from home to school, if needed.
- iii) Assessing the work of students at the end of the class.

## Students' activities

### Part-I (Group Activity)

- To make a list of the animals seen on the way from house to school.
- To classify them in appropriate phylum or class.

### Part-II (Individual Activity)

Collected data, opinion and analysis or inference should be recorded in the student's copy and submitted to the teacher.

## Criteria for Assessment

To assess how one has achieved desired learning competency and to what level.

### 2) Topic : Making a list of animals of an ecosystem.

## Chapter 5 : Environment and its resources (Ecology and ecological organization)

### Required time : One Period

### Desired learning outcome

- i) By making a list of the animals of an ecosystem, concept would be cleared about the animals that are part of the ecosystem.
- ii) To understand which animals are producers and which animals are consumers.
- iii) To understand the organization of food chain by placing the organisms of the ecosystem in food chains.

### Instruction for the students

Make a list of the animals of an ecosystem observed by you. Try to ascribe places to them on the basis of primary, secondary, tertiary and quaternary consumers in different food chains.

### Teacher's activities

- i) To explain the activity to the students.
- ii) If required, explain by placing the organisms of an ecosystem in food chains.
- iii) To assess the work of students at the end of the class.

## Students' activities

### Part-I (Group Activity)

- To make a list of the animals of an ecosystem.
- To allot places to the organisms of an ecosystem in different food chains.

### Part-II (Individual Activity)

- Collecting relevant data, exchange of ideas and forming views about infectious diseases.

## Criteria for Assessment

To assess how one has achieved desired learning competency and to what level.

### 3. Topic : Identifying the process of excretion of local plants.

#### Theme 3 : Physiological processes of life (Sub-theme : Excretion)

#### Time required : One Period

#### Desired learning outcome

- To explain necessity of excretion in plants.
- To identify excretory processes in plants.
- To identify which plant excretes in what way.
- To identify whether excretion occurs in a particular season of the year or occurs throughout the year.

#### Instruction for the students

Make a list of local plants. Mention their excretory processes.

#### Teacher's activities

- To explain the characteristics of plant excretion.
- To divide students in small groups, engage them in observation and write questions (for them) on the blackboard.
- To help record received information or answer.
- To assess the work of the students.

#### Questions

- Do plants have specific excretory organs?
- What kind of materials are excreted by plants?
- How are the excretory products are stored in the plant body?
- By what process do plants excrete?
- Which plants uses which method? Do the same plant use various processes of excretion?
- In which other plants are these processes seen?

#### Students' activities

##### Part-I (Group Activity)

- Collecting information, exchange of opinions, form opinions.
- To find answers to the teacher's question through nature study.

##### Part-II (Individual Activity)

- To submit answers gathered during nature study to the teacher.

#### Criteria for assessment

To assess how one has achieved desired learning competency and to what level.

## Case Study

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### 1. Topic : Role of plant excretory products in daily life

#### Theme 3 : Physiological processes of life (Sub-theme : Excretion)

#### Required time : Two Periods

#### Desired Learning outcome

- i) To make the students understand how we use of different kinds of plant excretory products in our daily life.
- ii) To make students understand the beneficial role of plants in our daily life.

#### Instruction for the students

Read the passage given below and solve the problem.

Iman, Suman's brother, started crying from the very morning. Somehow the cover of his story book has been torn. Suman promptly pasted the cover with gum. His brother was relieved and stopped crying. In the meantime their mother appeared with a ladle in her hand. Iman then was intently listening to Suman reading a story from the book. His mother asked "Will you like to have pumpkin curry with 'asafoetida'. The two brothers jumped up with joy. They exclaimed. "Hurrah!"

So you have read about the story of Suman and Iman. Do you know the above story contains the names of some plant excretory products. Try to identify them. Try to write names of other plant excretory products from which we benefit in our daily life. Also write how do we use these excretory products in our daily life.

#### Teacher's activities

- i) Select a subject/issue which has some relation with the curriculum.
- ii) Then identify a problem related with the subject which can be given to the students to solve.
- iii) Divide the students into groups and make them understand what activities they are supposed to do.

#### Students' activities

##### Part-I (Group Activity)

- i) To read the selected subject matter intently.
- ii) To discuss the problems with the other members of his/her group.
- iii) To find a solution to the given problem by discussing among themselves. They should also write down the solution.

##### Part-II (Individual Activity)

- To submit answers gathered during nature study to the teacher.

#### Criteria for Assessment :

To assess how one has achieved desired learning competency and to what level.

## 2. Topic : Role of Natural Resource and their Crisis

### Theme 5 : Environment and its Resources (Sub-theme : Ecology and ecological organization)

#### Time Required : Two Periods

#### Desired Learning Outcome

- i) The students should come to understand how different natural resources are utilized in our daily life.
- ii) They should also understand how to use different natural resources effectively in our daily life without depleting them.

#### Instruction for the students

#### Read the passage given below and solve the problem :

Afsana while trying to fetch some water found to her dismay that the tubewell is dry. What will happen? Nothing can be done without water. Water is indispensable for drinking, cooking, washing clothes, bathing, cleaning utensils. Afsana's brother, Salim suggested, "There is a tubewell in front of uncle Karim's house. Sister, let's go and fetch some water from that tubewell" Afsana objected, "That is far away". Her brother assured : Don't worry! we'll manage it together".

What have you understood after reading the story? Water is absolutely necessary in our daily life. Water is a natural resource. We cannot survive without natural resources. Water is absolutely indispensable for drinking, agricultural and industrial use. Other natural resources (forest, food, energy) like water have definite impacts on our lives. Again indiscriminate use of these natural resources may lead to their scarcity in the environment. Write on the uses of different natural resources in your daily life. You should also write on the ways of solving the problem of the crisis of these natural resources.

#### Teacher's activities

- i) Select a subject/issue which has some relation with the syllabus.
- ii) Then identify a problem related with the subject which can be given to the students to solve.
- iii) Divide the students into groups and make them understand what activities they are supposed to do.

#### Students' activities

##### Part-I (Group Activity)

- i) To read the selected subject matter intently.
- ii) To discuss the problems with the other members of his/her group.
- iii) To find a solution to the given problem by discussing among themselves. They should also write down the solution.

##### Part-II (Individual Activity)

- To submit answers gathered during nature study to the teacher.

#### Criteria of Assessment

To assess how one has achieved desired learning competency and to what level.

### 3. Topic : Malaria and its propagation

#### Theme 4 : Biology and human welfare (Sub-theme : Immunity and human diseases)

#### Time required : Two Periods

#### Desired Learning Outcome

- To mention how does the parasite that causes malaria enters the human body.
- To identify the mosquito that causes malaria.
- To identify the common breeding grounds of mosquitoes.
- To locate the problems regarding the spread of malaria in our locality.
- To identify the possible solutions to eradicate malaria
- To understand and implement the programme for prevention of malaria.

#### Students' activities

Read the passage given below, identify the problem and answer the questions. Submit your answer to your teacher :

Malaria is a fatal disease caused by mosquitoes. A Protozoa named 'Plasmodium' causes malaria. Malaria is spread by the bite of a female anopheles mosquito when it transfers the parasite from the infected person to that of a healthy person's body. The female anopheles mosquito needs to suck blood in order to mature their eggs.

Today above 40% people living in the poorest countries of the world stand the chance of getting infected with malaria. Although malaria was eradicated in many quarters in the 20th Century in the world, it has returned as a menace in today's world.

Anopheles mosquitoes lay eggs in transparent water. Nowadays it is noticed that in both urban and rural areas water gets clogged here and there due to different human activities. Female Anopheles mosquitoes lay eggs there. Malaria infections are on a steady rise. The steady rise in temperature has added to the problem. So, nowadays we get to hear people getting affected with malaria even in colder regions.

Now discuss the questions in your group and write down the answers.

#### Questions pertaining Survey :

- State if there are incidences of malaria infection in your locality.
- In which cities have you noticed water logging? What are the causes of water logging?
- In what kinds of places in the rural areas do you find water logging? What are the causes?
- Locate the places in your house where mosquitos can breed and lay eggs in collected water.
- What problem is caused when the trunks are left after felling the trees?
- What problems arise from the excess use of plastic bottle, jar and cup?
- What problems arise from the irregular clearance of water hyacinth in ponds and drains?
- How can we use the rain water by not allowing it to collect in any particular place?
- How can you restrict the mosquitoes from laying eggs?
- What are the human activities responsible for the rise of global temperature?
- What steps do you need to adopt to check the rise in global temperature? How will this have an effect on

restricting the spread of malaria?

### Teacher's activities

- The teacher will frame relevant questions related to the topic and note it down in small pieces of paper and hand them over to the students. He/she will help the students for registering their personal opinion in their own copies.
- The teachers may supply some write up, paper cutting, report bearing conformity with the topic of the case study to the students.
- To assess the students' work.

### Criteria of Assessment

To assess how one has achieved desired learning competency and to what level.

### Creative Writing

---

#### 1) Topic : Importance of blood donation

#### Theme 3 : Physiological process of life (Sub-theme : Circulation)

#### Required time : One period

#### Desired learning outcome

1. To understand the importance of blood donation.
2. To inspire others to donate blood in future.
3. Express ability for presenting organized thoughts about something through skillful writing.

#### Instruction for the students

“Importance of blood donation in our society” — express your thought on the subject by writing.

#### Teacher's activities

- i) To tell the students how much to write.
- ii) To mention the subjects to be included in the write-up, if needed.
- iii) To assess the students' work.

#### Students' activities

- i) To make an initial scheme of the various aspects to be included in the write-up before starting to write.
- ii) Accordingly present his/her thoughts in an organized manner.

#### Criteria of Assessment

To assess how one has achieved desired learning competency and to what level.

#### 2) Topic : Interaction between organisms in nature.

#### Theme 5 : Environment and wealth (Sub-theme : Ecology and ecological organization )

#### Required time : one period

#### Desired learning outcome

1. Understand the importance of various kinds of interactions between organisms in nature.
2. Understand how these interactions help in the maintenance of balance in the environment.

3. Express ability for presenting organized thoughts about something through skillful writing.

### **Instruction for the students**

You have already learnt about the various kinds of interactions in nature (competition, prey-predator relationship, parasitism, cooperation)

### **Teacher's activities**

- i) To mention how much to write.
- ii) To mention the aspects to be included in the write-up if needed.
- iii) To evaluate the work of students.

### **Students' activities**

- i) To make an initial scheme before starting to write.
- ii) Accordingly present her/his thoughts in an organized manner.

### **Criteria of Assessment**

To assess how one has achieved desired learning competency and to what level.

### **3) Topic : Human food, required energy and related problem**

#### **Theme 3 : Physiological processes of life (Sub-theme : Nutrition)**

#### **Required time : One period.**

### **Instruction for the students**

An incomplete description of an observation is given below. Use your imagination to complete the writing.

Amal's mother usually gives him various vegetables to eat. Sometimes he takes them reluctantly, but mostly he would not eat. He likes butter, ghee and eggs. Nowadays his weight has increased a lot.

### **Desired learning outcome**

- To understand need and importance of various food components in human body.
- To identify health problems from prolonged consumption of food that are rich in only one or two food components.
- To adopt correct lifestyle through analysis of collected data.

### **Teacher's activities**

- To supply incomplete description to the students.
- To give various hints for creative writing.
- To assess students' write-up.

### **Students' activities**

#### **Part-I (Group Activity)**

- To collect material for creative writing.

## Part-II (Personal activity)

- To do alternate thinking, analytical thinking and submit it in writing to the teacher.

### Criteria for Assessment

To assess how one has achieved desired learning competency and to what level.

4. 'Chemical fertilizer vs bio-fertilizers' – write a paragraph on this topic.
5. 'Food problem and alternative food sources' – write your thoughts on this subject.
6. 'An endangered animal and endangered plant seen by you' – write your thoughts on the subject. Mention where you have seen them and how they look like and behave.

### Model Making

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#### 1 Topic : Blood circulation through the heart

#### Theme 3 : Physiological processes of life (Sub-theme : Circulation)

Time required : Two periods

#### Desired learning outcome

- i) The student will be able to express his / her idea of blood circulation through heart.
- ii) To exhibit skills regarding drawing pictures and line diagrams.

#### Instruction for the Students

Explain blood circulation through the heart with the help of picture and flow diagram.

#### Teacher's activities

- i) Explain how to represent blood circulation through heart.
- ii) Evaluate the drawings and line diagrams in the students' copies .

#### Students' activities

- i) To organize the steps of blood circulation through heart and write them down in the copy.
- ii) Draw a diagram of heart to explain blood circulation through heart.

#### Criteria for Assessment

To assess how one has achieved desired learning competency and to what level.

#### 2) Topic : The process of inhalation and exhalation in human

#### Theme 3 : Physiological processes of life (Sub-theme : Respiration)

#### Desired Learning outcome

- i) To express his/her idea about the processes of inhalation and exhalation.
- ii) To exhibit skills regarding drawing pictures and line diagrams.

#### Instruction for the students

Represent the underlying physiological processes behind inhalation and exhalation with the help of flow diagram.

### Teacher's activities

- i) To explain how to represent the process of human breathing in the students' copy.
- ii) To assess the flow diagrams in the students' copy.

### Students' activities

- i) Organize the steps of breathing in orderly manner in the students' copy.
- ii) To explain the process of inhalation and exhalation through flow diagram.

### Criteria for Assessment

To assess how one has achieved learning competency and to what level.

### 3) Topic : Construction of human body

#### Theme 2 : Levels of Organization of life (Sub-theme : Biomolecules and their behaviour)

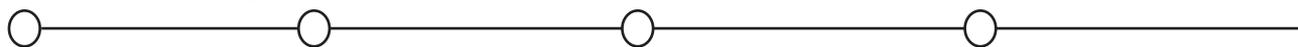
#### Time required : Two periods

#### Instruction for the students

Represent the intermediate steps of formation of the complete body of an organism through a model.

You can start like this -

Element                  Inorganic compound



(Example : )      (Example : )

#### Desired learning outcome

- To know the constituents of the body of an organism.
- To represent through a model the various changes in organization that an organism has undergone from the primitive to the present state.
- To identify the correlation between different levels of organization.
- To represent the steps in the levels of organization through which human body is formed with the help of a model.

### Teacher's activities

- To explain how to represent the level of organization of the body of an organism through a model.
- To assess the works of students.

### Students' activities

- To identify the organizational levels of the body of an organism.
- To represent through models how previous level of organization is changed to the next level.

### Criteria for Assessment

To assess how one has achieved desired learning competency and to what level.

- 4) Explain through a flow diagram how urine is produced in our kidney.

## Open Book Evaluation

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### 1) Topic : Pacemaker

#### Theme 3 : Physiological processes of life (Sub-theme : Circulation)

Time required : Two period

#### Desired learning outcome

- i) To find application of functioning of the pacemaker in real life .
- ii) To understand importance of implanting and artificial pacemaker in human body.

#### Instruction for the student

Read the passage below and answer the questions :

A few days ago Amalbabu suddenly fell unconscious while talking. Coming to his senses, he said that this had happened twice in the last one month. His daughter took him to the doctor. Amalbabu told the doctor that recently he had been feeling weak and did not get any energy for work. He was also having breathing troubles, while doing any work hastily. The doctor examined him thoroughly. He prescribed blood tests and halter monitoring and told him to come after a few days. When the reports came the doctor said that the rate of Amalbabu's heartbeat had decreased and is the cause behind his problems. An operation had to be done to implant an artificial pacemaker in his body.

- i) Do our body possess a natural pacemaker ? What is its function?
- ii) Which part of the heart generate heartbeat? Do any other part of the heart also generate heartbeat?

#### Teacher's activities

- i) To bring up a real incident related to SA node or pacemaker.
- ii) To frame questions whereby the student can apply his / her knowledge of SA node or pacemaker.

#### Students' activities

- i) To read attentively the paragraph on pacemaker.
- ii) To find relation between the pacemaker related content and the concerned area of the syllabus.
- iii) To write answers in the student's copy.

#### Criteria for Assessment

To assess how one has achieved desired learning competency and to what level.

### 2) Topic : Polio Vaccination

#### Theme 4 : Biology and human welfare (Sub-theme : Immunity and human diseases)

Time required : One period

#### Desired learning outcome

- i) To understand the importance of vaccination in preventing diseases.
- ii) To apply the acquired knowledge about various types of vaccines.

#### Instruction for the student

Read the passage below and answer the questions:

It has been a year since the World Health Organization (WHO) has declared India to be a polio - free country. Our state had a fair share of contribution in the country's success. To stop polio attacks for four years the State Health Department and the Administration has kept sharp vigil. Even if India was declared polio - free, there was cause to worry about West Bengal. In a Howrah village a polio victim was discovered four year ago. The scenario has changed since then. But the Health Department assumes that there is no cause for complacency. Vigil continues from border areas to distant villages. Health Director Biswaranjan Satpathi says, 'The State Government is carrying on the vigil actively in every area. Special attention is being given to the children of border areas.' He says that vaccination programme have been stepped up in places where anti-polio campaign were far from satisfactory. — From a newspaper report.

- i) What role do you think vaccination has in making India polio-free?
- ii) You have learnt about various categories of vaccines. Can you tell the category of vaccines under which polio vaccine falls?

#### **Teacher's activities**

- i) Collect a passage on polio vaccination. If necessary, he / she should frame such a passage. The paragraph should be in conformity with the relevant topic in the syllabus.
- ii) Questions are to be framed in conformity with the syllabus to instil inquisitiveness in the students.
- iii) To assess the answers given by the students.

#### **Students' activities**

- i) To read the paragraph on polio vaccination attentively.
- ii) Write the answers in students' copies.

#### **Criteria for Assessment**

To assess how one has achieved desired learning competency and to what level.

## Physical Science and Environment

### Survey :

Subunit : 4.6.5      Water pollution

**(i) Name of the task :**

Survey on different sources of water, water pollution and the harmful effects of such pollution.

**(ii) Time :** 40 minute

**(iii) Desired learning outcome :**

- (a) To become aware of the different sources of water, and the uses of water from such sources.
- (b) To be able to identify the causes of water pollution.
- (c) To become aware of the harmful effects of water pollution and be able to form opinion about it.

**(iv) Task :**

Drawing examples from their everyday experience, the learners will discuss the following topics among themselves. They will write the information on those topics in their notebook and analyze the accumulated data.

a) Names of the water sources around your home or school	
--	--

b) What are the uses of water from such sources?

Source of water	Use of water from it

c) Which source is polluted by what pollutant?

Source of water	Polluted by
	Detergents
	Pesticides, fertilizers

d) Pollution of which source of water leaves what harmful effect on the environment and biodiversity?

Pollution of	Harmful effect
	Eutrophication, algal bloom

**(v) Role of teacher :**

The teacher will

- a) divide the learners in small groups and explain to them how the task should be performed;
- b) instruct the learners to write the informations in their notebooks; assess each individual learner on the basis of his/her analysis as recorded in his/her notebook.

**(vi) Assessment :**

The assessment will be based upon the extent to which an individual learner has acquired the desired learning competencies.

**Nature Study :** 

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**Subtheme :** 4.4.8 Simple presentation of pH

**(i) Title of the task :**

Estimation of pH of different natural and familiar substances and classification of such substances in acidic / basic / neutral categories on the basis of the result of such experiments.

**(ii) Time :** 30 minute

**(iii) Desired learning outcome :**

- (a) Estimation of the pH of different substances through hands-on activities.
- (b) To be able to classify substances into acidic / basic / neutral on the basis of pH.

**(iv) Role of the teacher :**

The teacher will :

- (a) ask the students to bring samples of various natural and familiar substances.
- (b) provide the students with pH paper and test tubes.
- (c) explain the experimental procedure to his/her students.
- (d) divide the learners in to small groups and help them perform the experiment and discuss the topic within the group; if necessary he/she will participate in the discussion.
- (e) ask each individual learner to record his/her findings in his/her own notebook.

**(v) Activity for the learner :**

**(a)** The learners, working as a group, will bring different substances . e.g. lemon juice, vinegar, lime water, cucumber juice, tea extract, drinking water, soda water, milk of magnesia etc. from their home/environment.

**(b)** They will measure the approximate pH of each substance, and discuss within the group and with the teacher, and record the result in their notebook.

Sample	Estimated pH	Nature of sample (acidic / basic / neutral)

**(vi) Assessment :**

The assessment will be based upon the ability of the students to perform hands-on experiments, their ability to observe, to collect data and to present the data in the proper way.

**Case Study :**

**Subtheme :** 4.6 water, **key concept:** 4.6.2 Quality parameters of drinking water and 4.6.6 Arsenic compounds and fluoride in ground water.

**(i) Title of the task:** Investigating the cause of arsenic toxicity in different regions of West Bengal.

**(ii) Time : 40 minute**

**(iii) Desired learning outcome:**

Through this activity the learners will be :

- a) able to make connections between conventionally adopted means of harvesting water in village and urban areas and arsenic toxicity.
- b) able to invent solutions to this problem.

**(iv) Activity for the learner :**

Analysis of samples of water from different regions of West Bengal has revealed the presence of dissolved arsenic compounds in alarming level. Studies have identified the following to be two important reasons for this :

- (a) use of deep tubewells in almost all multistoried housing complexes in city areas.
- (b) use of deep tubewells for irrigation in agricultural areas.

Discuss about this topic in your group, express your opinion in written form and suggest possible remedial measures to combat the problem.

Problem of which area	Cause of the problem	Possible remedial measure
Water scarcity in multistoried complexes in city		
Irrigation of agricultural land in village areas		

**(v) Role of the teacher :**

The teacher will

- (a) divide the class into small groups ;
- (b) inform them about the nature of the task;
- (c) encourage the learners in group discussion, and give inputs to enrich it.

**(vi) Assessment :**

Assessment will be based upon the extent to which an individual learner has acquired the desired competencies.

## **Creative Writing**

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**Example 1 :**

**Time:** 40 minute

**(i) Theme :** 4. Matter : atomic structure; physical and chemical properties of matter. **Subtheme** 4.6 Water  
**Key concept :** 4.6.1. Physical properties of water that influenced proliferation and maintenance of life.

**(ii) Activity of the learner :**

If water were not transparent to visible light, how could it prevent proliferation of life on earth? Participate in a group discussion on this topic. If necessary, take help from your teacher or your textbook and prepare a write-up.

**(iii) Role of the teacher :**

The teacher will divide the class into small groups comprising of 4 - 5 students. He/she will give the groups ample time for discussion, and encourage each individual learner to present the consensus reached by the group in a written form. When the writing session is over, he/she will explain the main concept (role of photosynthesis in proliferation of life) to the students.

**(iv) Assessment :**

The assessment should be based upon the novelty in presentation, analytical skill and scientific reasoning as apparent in the write-up.

**Example 2 :**

**Theme** 4 Matter : atomic structure; physical and chemical properties of matter **Subtheme :** 4.6 water

**Key concept :** 4.6.1. Physical properties of water that influenced proliferation and maintenance of life.

**(i) Title of the task :** Write a short article on the necessity of conservation of water.

**(ii) Time :** 40 minute

**(iii) Desired learning outcome :**

- a) To be able to identify the importance of water in everyday life.
- b) To be able to investigate the reason for wastage of water.
- c) To be able to invent innovative ways to reduce wastage of water.

- d) To take measures for proper utilization of ground water.
- e) To be able to present a topic in one's own language and strike a balance between information, theory and style of one's writing.

**(iv) Role of the teacher :**

- a) The teacher will divide the class into small groups of different sizes.
- b) Encourage group discussion and express his/her opinions.
- c) If the activity involves several stages of discussion, the teacher will issue instruction to the learners to guide them in the right direction.

**(v) Activity for the learner :**

- a) Through discussion among themselves and with the teacher, the learners will try to appreciate the gravity of the topic.
- b) The learners will try to understand how to address the topic and from which angle.
- c) Each individual learner will write about his/her view on the topic in his/her own notebook.

**(vi) Assessment :**

The assessment should be based upon (a) understanding of the topic, (b) writing style, (c) presentation (d) compatibility of the presentation with the topic and (d) the extent to which each individual learner has acquired the desired learning competency.

**Example 3 :**

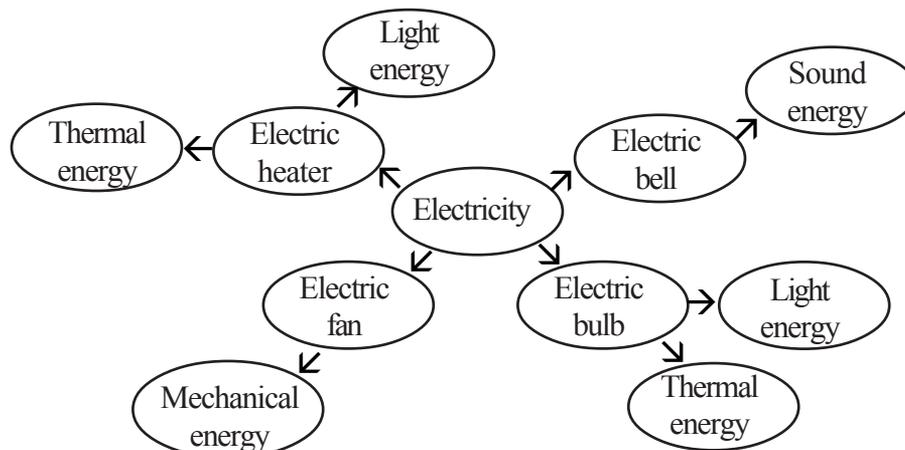
**(i) Theme : 5 Energy in action, work, power and energy**

**(ii) Learning outcome :**

Through this activity the learners will be able to identify transformation of energy from one form to another and will be able to cite examples of such conversions.

**(iii) Role of the teacher :**

The teacher will divide the learners into small groups and define the task to be performed by each group. He/she will show the learners some chart like the one given below :



The teacher will help in group discussion and ask each of the learners to write an article on the knowledge acquired through group discussion. He/she will assess these articles and record the observations.

**(iv) Activity for the learners :**

Write an article on the following topic “conversion of energy is extremely important”. The learners will write articles on this topic and when the writing session is over, one member from each group will read his/her article aloud and the rest of the class will listen to it.

**(v) Assessment :**

Assessment will be based upon the extent to which an individual learner has acquired the desired learning competency.

**Example 4 :**

**Time :** 40 minute

**(i) Theme :** 4. Matter : atomic structure, physical and chemical properties of matter. **Subtheme :** 4.4 Acids, bases and salts. **Key concept :** 4.4.3 Industrial use of NaOH, H<sub>2</sub>SO<sub>4</sub>, HCl and HNO<sub>3</sub>.

**(ii) Desired learning outcome :**

One of the major produce of the chemical industry is sulfuric acid. Through this activity, the learners will be able to understand the fact that the production of many chemicals used in daily life is either directly or indirectly dependent upon the production of sulfuric acid.

**(iii) Activity for the learner :**

“ How much sulfuric acid do we see in our average daily life? Let us imagine that from tomorrow onwards, no sulfuric acid will be produced by the world’s chemical industry. What long term effect could it have upon your daily life? Discuss about it in your group. It necessary take help from your teacher or your textbook and prepare a write-up.”

**(iv) Role of the teacher :**

The teacher will divide the class into small groups comprising of 4 - 5 students. He/she will give the groups ample time for discussion, and encourage each individual learner to present the consensus reached by the group in a written form. When the writing session is over, he/she will explain the central concept (significance of sulfuric acid in chemical industry) to the students. In order to give the learners a perspective, the instructor may use current global production data on sulfuric acid.

**(v) Assessment :**

The assessment will be based upon the novelty in presentation, analytical skill and scientific reasoning as apparent in the write-up.

## **Model Making**

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**Example 1 :**

**Subtheme** 4.6. water **Key concept :** 4.6.1

Physical properties of water that influenced proliferation and maintenance of life.

**(i) Title of the task :**

Making a chart or poster on the topic ‘Water is life’

**(ii) Time :** 40 minute to 1 hour (2 period)

**(iii) Desired learning outcome :**

Through this activity the students will (a) be able to identify the various roles that water plays in our life ; (b) be able to summarize a large set of information in a meaningful way ;

**(iv) Role of the teacher :**

The teacher will

- (a) ask the learners to bring necessary materials;
- (b) divide the learners in to small groups of different sizes;
- (c) encourage the learners to discuss about the topic within the group and give his/her inputs;
- (d) inform the learners about the way in which the work is to be performed.

**(v) Activity for the students :**

- (a) The learners will build the necessary concept through discussions among themselves and with the teacher;
- (b) They will make meaningful charts using the information gathered through discussion;
- (c) They will record the draft chart/poster in their own notebooks.

**(vi) Assessment :**

Assessment will be based upon the extent to which each individual learner has acquired the learning competencies as described above.

**Example 2 :**

**Subtheme :** 4.5 Separation of components of mixtures **Key concept :** 4.5.1 Distillation and fractional distillation.

**(i) Title of the task :**

Drawing a diagram of the set up for fractional distillation in computer notepad (applicable to schools where computer facility is available) and obtaining a print out of the work.

**(ii) Time : 1-2 Period**

**(iii) Desired learning outcome :**

Through this activity, the learners will be able to (a) identify the difference between distillation and fractional distillation ; (b) identify the area of application of fractional distillation (c) Utilize available technology in the learning process and develop the skill in using such technologies.

**(iv) Role of teacher :**

The teacher will

- (a) divide the learners into small groups of different sizes;
- (b) give the learners the necessary idea about the work and make the computer facility available to the them;
- (c) encourage the learners to discuss about the topic among themselves and give his/her inputs, and supervise the work.

**(v) Activity for the learners :**

Similar to those described in the task mentioned above (i.e chart or poster making).

**(vi) Assessment :**

Assessment will be based upon the extent to which each individual learner has acquired the learning competencies as described above.

**Example 3 :**

**Time : 40 minute**

**(i) Observing the effectiveness of different antacids**

**(ii) Theme :** 4. Matter : atomic structure ; physical and chemical properties of matter. **Subtheme :** 4.4 Acids, bases and salts. **Key concept :** 4.4.13 Antacid

**(iii) Desired learning outcome :**

Major constituents of commercially available antacids are aluminium hydroxide and magnesium hydroxide. These are sparingly soluble in water, and are used either as tablets or aqueous suspensions. The activity described below invites the learners to observe the reaction between different antacids and hydrochloric acid solution as a 'model' for the reaction between gastric acid and antacids, and asks them to find a correlation between surface area of solids and rate of chemical reaction.

**(iv) Activity for the learners :**

- (a) Procure two samples of different antacid tablets that are commercially available. In one test tube place one tablet and pour some dilute HCl on it. In another test tube place a powdered tablet and pour the same volume of HCl on it. Observe and record your findings.
- (b) Repeat this experiment for each brand of antacid tablet that you have procured.
- (c) From the results of your experiments, can you find any relationship between the surface area of solid and the rate of a chemical reaction that the solid participates in ?
- (d) From the result of your experiments, is it possible to predict which one of the following - an antacid tablet or an antacid suspension - is likely to reduce gastric acidity quickly ?
- (e) Major constituents of commonly used antacids are  $\text{Al}(\text{OH})_3$  and  $\text{Mg}(\text{OH})_2$ . Write the balanced equa-

tions for the reaction between these chemicals and aqueous HCl.

**(v) Role of the teacher :**

The teacher will divide the class into small groups of 5-6 students. He/she will provide each group with the necessary apparatus and chemical (test tube, test tube rack, water and dilute HCl) and allow them to perform the experiment cautiously. If necessary, he/she will perform the test before the learners. When the activity is over, the teacher will explain the central concept. Considering the age of the learners and other aspects, the teacher may use models/diagram/calculations to illustrate the notion of increase of surface area of a solid upon its division into finer particles.

**(vi) Assessment :**

Assessment will be based upon the extent to which each individual learner has acquired the learning competency.

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## Open Text Book Evaluation

### Example 1 :

**(i) Atomic weight : A relative notion**

**(ii) Desired learning outcome :**

The learners will be able to understand the notion of atomic weight is a relative one.

**(iii) Role of teacher:**

The teacher will divide the class into small groups comprising of 4-5 students. He/she will ask them to read the given text and will give them ample time for group discussion. The teacher will answer the pertinent questions from the groups, listen to the group discussions and encourage them to reach a consensus.

**(iv) Text : Theme :** 4. Matter : atomic structure; physical and chemical properties of matter **Subtheme :** 4.2 Mole concept. **Key concept :** 4.2.3 Atomic mass unit.

At present the masses of atoms of different elements are determined with respect to that of an atom of  $^{12}\text{C}$ . The mass of a  $^{12}\text{C}$  atom is defined as 12.0000 unit, and the mass of an isotope of an element is determined with respect to the former. In this scale, the relative isotopic mass of an element is defined like the following:

$$\text{Relative isotopic mass} = \frac{\text{Actual mass of an atom of that isotope}}{1/12(\text{actual mass of an atom of } ^{12}\text{C})}$$

In this scale,  $^{16}_8\text{O}$  has a relative mass of 15.9949.

If different isotopes of an element occur in nature, the average atomic mass of the element is determined by taking into account the relative isotopic masses and the natural abundance of the isotopes. For example, two more isotopes  $^{13}_6\text{C}$  and  $^{14}_6\text{C}$  of carbon occur naturally, albeit in low abundance. When these isotopes are taken into account, the relative atomic mass or atomic weight of carbon turns out to be 12.011. In a similar way, calculations that take into account the three naturally occurring isotopes of oxygen ( $^{16}_8\text{O}$ ,  $^{17}_8\text{O}$ ,  $^{18}_8\text{O}$ ), show the atomic weight of oxygen to be 15.9994.

**(v) Questions :**

1. If the reference of the present atomic weight scale is changed from  ${}^{12}_6\text{C} \equiv 12.0000$  units to  ${}^{12}_6\text{C} \equiv 24.0000$  units, would it affect the magnitudes of the different relative isotopic masses and the atomic weight of different elements? If your answer is 'yes', explain your position.
2. Do you think that a change in atomic weight scale involves a change in the magnitude of the atomic mass unit? Explain.
3. Does the change in atomic weight scale ( ${}^{12}_6\text{C} \equiv 12.0000$  unit to  ${}^{12}_6\text{C} \equiv 24.0000$  unit) necessarily change the magnitude of Avogadro's number? Justify your answer.
4. If we change our reference of the present atomic weight scale in the way indicated above, what will be the molar volume of an ideal gas at STP? Will it still remain 22.4 L or will it change? Explain.

**(vi) Activity for the learners:**

The learners will read the given text and engage themselves in group discussion. If essential, they may ask the instructor for a clarification of the central concept. Each participant will have to record the conclusion reached by the group in his/her own note book.

**(vii) Assessment :**

The teacher can assess the learners by observing the extent to which each individual learner has acquired the desired analytical skill.

**Example 2 :**

**Time :** 40 minute

**(i) Subtheme:** 4.4 Acids, bases and salts. **Key concept :** 4.4.10 Acidic, basic and amphoteric oxides.

**(ii) Title of the task :**

Building concepts regarding acidic, basic and amphoteric oxides.

**(iii) Desired Learning outcome :**

- a) To be able to understand the formation of acidic, basic and amphoteric oxides from elements (metals and non-metals).
- b) To be able to identify the properties of acids, bases, salts and different oxides.
- c) To be able to build clear concepts about (1) reactions of acidic and basic oxides with water; (2) reactions of acidic and basic oxides with basic and acidic solutions respectively, (3) direct reaction between acidic and basic oxides.

**(iv) Role of teacher :**

The teacher will provide the learners with an incomplete concept map. He/she will ask them to discuss among themselves about the relevant concepts and will facilitate the group discussion if required. (The concept map is attached with this document).

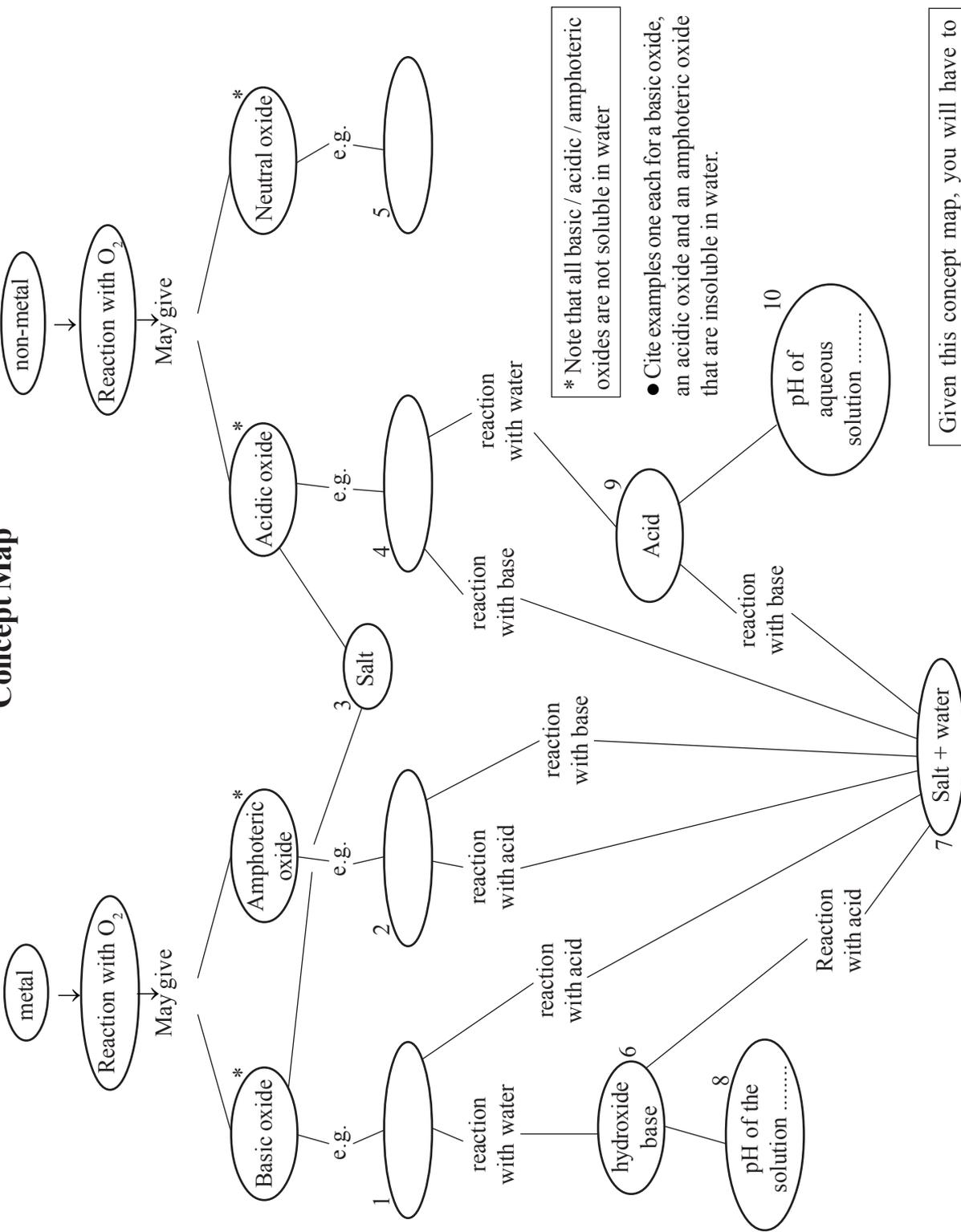
**(v) Activity for the learners:**

- (a) The learners will complete the concept map by writing relevant informations. They may discuss with the teacher if necessary, and may take help of their textbooks.
- (b) The learners will write the balanced equations for the chemical reactions referred to in the concept map.

**(vi) Assessment :**

The teacher can assess the learners by observing the extent to which each individual learner has acquired the desired analytical skill.

# Concept Map



\* Note that all basic / acidic / amphoteric oxides are not soluble in water

● Cite examples one each for a basic oxide, an acidic oxide and an amphoteric oxide that are insoluble in water.

Given this concept map, you will have to furnish information / formula / equations relevant for boxes 1 - 10

### Example 3 :

Time : 40 minute

**(i) Title of task :**

Experiment on the pressure exerted by liquids and gases.

**(ii) Desired learning outcome :**

Building concept about pressure exerted by air.

**(iii) Role of the teacher :**

The teacher will divide the learners into small groups and define the work to be carried out by each group. He/she will ask them to read the given text. If necessary, he/she will draw relevant diagrams on the board and evaluate the written answers.

**(iv) Activity for the learners :**

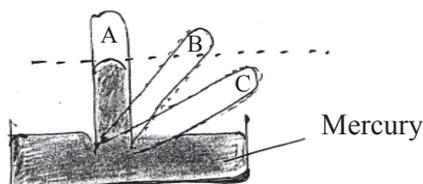
The learners will read the texts thoroughly and discuss about it in their respective groups. They will write the answers to the questions in their notebook. When the each group will read aloud a written record to the whole class.

**(v) Text :**

A body remains at equilibrium when two equal and opposite forces operate on it. Air exerts pressure in all direction. If a force is applied on an enclosed, static fluid, it is transmitted through the fluid in all directions with equal magnitude. A vessel is filled partly with mercury. A 1m long glass tube, open at one end, is filled to the brim with mercury. The tube with its open end closed with a finger, is then carefully inverted into the mercury - filled vessel and the finger is removed. It is seen that the mercury level within the tube drops somewhat and reaches an equilibrium state. This indicates that there are two equal forces acting simultaneously in opposite directions. In this case, the force exerted by the mercury column perpendicularly on unit surface area equals the pressure exerted by air.

**Question :**

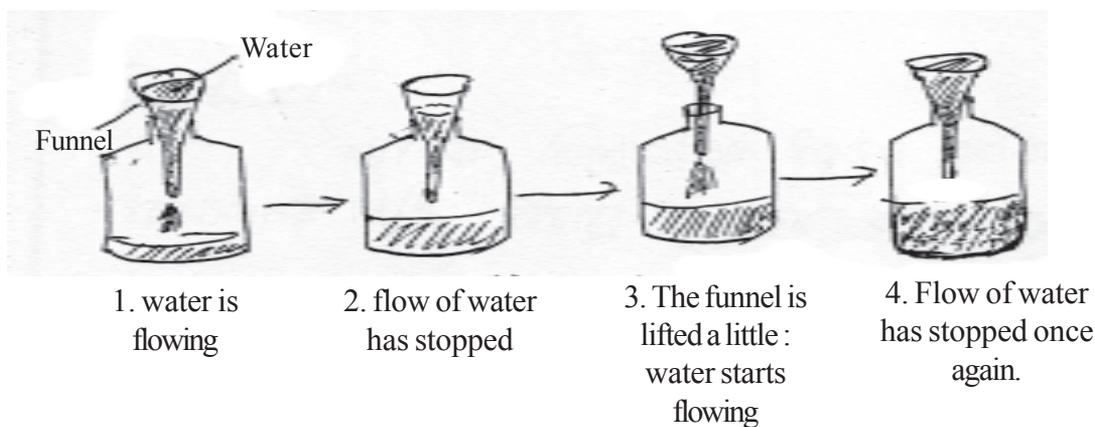
1. Draw a diagram and explain how air pressure supports the mercury column.
- 2.



A, B and C are the different positions of the same tube.

use colour to fill in the vacant portion of the tubes in positions B and C above to indicate the length of the mercury column within the tubes.

**Experiment :** A glass bottle with a narrow neck was taken. A funnel was placed on the open mouth of the bottle in such a way that it rested snugly on the mouth of the bottle. A substantial volume of water was poured into the funnel. It was observed that at first water flows into the bottle easily. Then a point was reached when the downward flow of water stopped. When the funnel was lifted from the mouth of the bottle and then placed over it once again, water began to flow for some time.



**Question :**

1. Explain why this happens.
2. If there is some space between the mouth of the bottle and the funnel what will happen and why?
3. What will happen if we perform the same experiment with oil instead of water?

**(vi) Assessment**

The assessment will be based upon the extent to which an individual learner has acquired the desired learning competency.

## History and Environment

### SURVEY

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1. Take two maps of seventeenth century and twentieth century Europe. Compare the maps in regards to territory, names of the different states and countries, and other aspects. What are the similarities and dissimilarities do you find in these two maps? Make a record of them.

- Comparative study of two maps (Chapter: Foreword); time: 1 period
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of Survey as a method of studying History and also the significance of map-study.

#### Desired competency:

- The objective of the activity is to assess the understanding level of the learners in regards to the changes of geographical locations, territory etc. with reference to maps. It is necessary to give emphasis on the causes and ways of the territorial changes in the maps. Such an activity will facilitate the learners to develop their concept of time and place in history. The activity will also emphasize the changes in the maps caused due to politico-economic change.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

2. Take two maps: one, of the period prior to World War I and another immediately after World War II. Compare the maps in regards to territory, names of the kings and countries and other aspects. What are the similarities and dissimilarities do you find in the two maps? Make a record of them.

- Comparative study of the two maps (Chapters: 5 & 6); time: 1 period
- At the outset, the teacher will motivate the learners to understand the importance of such activity by discussing with them both individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of Survey as a method of studying History and also the significance of map-study.

#### Desired competency:

- The objective of the activity is to assess the level of understanding of the learners in regards to changes of geographical locations, territory etc. with reference to maps. It is necessary to give emphasis on the causes and ways of the territorial changes in the maps. Such an activity will facilitate the learners to develop their concept of time and place in history. The activity will also emphasize the changes in the maps caused due to politico-economic change.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

### NATURE STUDY

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1. What impact had the Industrial Revolution of Europe on its environment? Suggest some means by which industrialization can be attained without causing destruction to nature.

- Comparative study about the evolution of history and the integration of nature and man (Chapter 4); time: 1 period
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of studying environment and geography and also environmental history along with the study of history.

**Desired competency:**

- It is expected that in group discussions various exemplifiers of the interdependence of environment and man or society in respect to history would be cited. It is necessary to give emphasis on the impact of man on environment in the various periods of history and the analysis of how the crisis in history was caused due to the crisis in environment. The activity will facilitate the learners in developing their concept of environment with reference to time and place in history. The teacher will assess the learners on the basis of the above said parameters of understanding.

2. Various anti-war movements have been initiated following World War II on restraining nuclear weapons. Write a report on the harmful effects of nuclear weapons on environment and man. Write two slogans on anti-war movement.

- Comparative study about the evolution of history and the integration of nature and man (Chapter 4); time: 1 period
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of studying environment and geography and also environmental history along with the study of history.

**Desired competency:**

- It is expected that in group discussions various exemplifiers of the interdependence of environment and man or society in respect to history would be cited. It is necessary to give emphasis on the impact of man on environment in the various periods of history and the analysis of how the crisis in history was caused due to the crisis in environment. The activity will facilitate the learners in developing their concept of environment with reference to time and place in history.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

**CASE STUDY**

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1. A survey was conducted by the UNO on issues of socio-economic, cultural-educational and mass health. Prepare a questionnaire for making surveys on education and mass health.

- Comparative study of the functions of international institutions and its impact on environment and man (Chapter 7); time-1 period
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of Case Study for studying history.

### Desired competency:

- It is expected that in group discussions various exemplifiers of the interdependence of environment and man or society in respect to history would be cited. Emphasis given should be on the critical thinking for the betterment human livelihood and the holistic and mutual liability for the same. In this respect, importance should be given on understanding the role and significance of the UNO. The activity will help the learners to understand their respective society and livelihood. Besides, emphasis will also be given on the skill of setting suitable questions for conducting the Case study.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

2. Make a linear-diagram of the social structure of France before the revolution of 1789. What kind of social system is applicable for this linear-diagram? Make another linear-diagram of the social structure of France in the aftermath of the revolution. Identify the main differences in the two linear-diagrams.

- Comparative study about the evolution of history and the integration of nature and human life (Chapter 4); time: 1 period
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them both individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of Case Study and the use of linear-diagrams, statistical data base for studying History.

### Desired competency:

- It is expected that in group discussions various instances of politico-economic societies, different social life and the gradual changes in human livelihood are elicited. Emphasis should be given on the critical understanding of how a socio-economic system can be displayed through different geometrical figures. In this respect, importance should be on understanding the relation of a triangular figure with feudal system of governance. The activity will help them to evaluate their own concept of different social systems and also of their own society and its development. Besides, their cognitive skill will be enhanced by their ability to think critically using geometrical figures.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

### CREATIVE WRITING

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1. Napoleon Bonaparte was exiled in the isle of St. Helena. Prepare a questionnaire to interview him. Select suitable questions which can elicit the thoughts and contributions of Napoleon.

- Comparative study of the works of historical persona and the influence of the contemporary period on them effecting original creative writings. (Chapter 2) time-1 period
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them both individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of objective evaluation of different creative writings of various authors and also other means of creativity (like interview, report etc) that are sources of history which help them in their multidimensional observations of the study of History.

**Desired competency:**

- It is expected that in the group discussions there will be objective evaluation of the contributions of different personae coming from different economic-political and social systems. It is necessary to give emphasis to the objective analysis of how history, geography, society, economy, culture, life experience etc. have their impact on the contributions of an individual. In this context importance should be given on understanding the criteria of the questionnaire for interviewing Napoleon. The activity will facilitate the learners in developing their concept of history as a paradigm shift from idol worshipping to the comprehensive development of the society and individual development in a period of time. Besides, the activity will also help in the cognitive development of the learners to understand what type of questions are to be selected for other persona (like, an ordinary soldier taking part in World War I, a serf in Czar of Russia or Count Cavour)
- The teacher will assess the learners on the basis of the above said parameters of understanding.

2. Suppose a man had come from his native village in England to work in a factory during the time of Industrial Revolution. He wrote his experience in a diary. Write an account in the form of a diary about his personal experience of a week in the factory.

- Comparative study of the comprehensive effect in different historical eras and composing original creative writing (time:1 period)
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them both individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of objective evaluation of different creative writings of various authors and also other means of creativity (like diary, letter, autobiography, family lineage etc) which are sources of history and they help the learners in their multidimensional observations of the study of History.

**Desired competency:**

- It is expected that in the group discussions there will be objective evaluation of the contributions of different personae coming from different politico-economic social systems. It is necessary to give emphasis to the objective analysis of how history, geography, society, economy, culture, life experience etc. have their impact on the contributions of an individual. In this context, importance should be given on the understanding of the nature of the interview. Besides, the activity will also help in the cognitive development of the learners to understand the nature of questionnaire for other persona (like, an ordinary French and a German soldier having the experience of World War I, the views of Count Cavour and Garibaldi regarding the ways of Italian unification, two women labourers during Industrial revolution etc.)
- The teacher will assess the learners on the basis of the above said parameters of understanding.

3. There are some cartoons on World War I and II in your History textbook. Write about the attitude or outlook expressed through the cartoons that you have observed.

- Comparative study of the comprehensive effect in different historical eras and composing original creative writing (time:1 period)

- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them both individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of objective evaluation of different creative writings of various authors and also other means of creativity (like pictures, cartoon, illustrations, poster, cinema, stamps etc) which are sources of history and they help the learners in their multidimensional observations of the study of History.

### Desired Competency

- It is expected that in the group discussions there will be objective evaluation of different politico-economic social systems. It is necessary to give emphasis to the objective analysis of how history, geography, politics, society, economics, culture, life experience etc. have their impression on art like cartoons. In this context, importance should be given on the understanding of how opinions are manifested through the cartoons.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

### MODEL MAKING

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Arrange the various incidents in respect of time regarding Unification of Germany and Italy. Write a short note on them and make a timeline.

- Comparative study of the time-line (Chapter-3); time: 1 period
- At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them both individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of time-line in studying History and also the ways of analyzing a time-line.

### Desired competency:

- The objective of this activity is to assess the learner's understanding the practical use of maps for geographical location, gradual changes in territory etc. emphasis should be given on the reason for changes in territory, ways of presenting data through maps and the logic behind the inferences. The activity will help the learners develop their concept of time and place in history. Emphasis should be given on the understanding how the map changes due to the influence of society, politics and economics.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

### OPEN TEXTBOOK EVALUATION

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There was a time when the merchants possessed only commodities. Now man has become their commodity. In this respect let us try to understand the difference between the past and the present system. In that era, the king reigned where his kingdom was: that is, savings and expenses came from one account.

But now, there has been incessant flow of the sovereignty day and night alike the import-export of the commercial domain. And so, a novel thing happened in world history: it is the reign of one nation over another. Incidentally, these two nations are located on the either sides of the sea.

Such colossal supremacy never existed in the world. And Asia and Africa became the domain of Europe's supremacy.

Now Germany is in trouble. He woke up late. He reached the banquet at the fag-end, completely out of breath. He is quite famished. He could smell the fish but has nothing to devour, save the bones. So he is purple in anger. He said, if no arrangements are there for me, I will not wait for invitation. Rather I will use my might and devour the food of others.

[Translated version of ‘Laraier Mul’, Kalantar, Rabindranath Tagore]

Read the passage above and answer the questions that follow:

1. What is the relation between the spread of European industrialization and imperialism in Asia and Africa?
  2. What do you understand by the expression that Germany woke up late? What was the reason for the delay?
  3. What happened when Germany tried to use power to devour other’s food? Who were responsible for that conflict?
- Comparative study of the concepts and ideas included in the textbook and the relevant lessons (Chapter 4); time- 1 period
  - At the outset, the teacher will motivate the learners to understand the importance of the activity by discussing with them both individually and in groups. The teacher will act as mentor in such group discussions. It is necessary to make the learners realize the importance of analyzing such a with reference to the ideas included in the textbook. However, while selecting a text it has to borne in mind that the passage should be free from caste, creed,, gender, class and regional/economical/ cultural inequalities. Care should be taken so that no biased ideas or opinions are developed in the learners through the selected text. It is better to select the text from an article, story, poem, picture, cinema, a current newspaper report, database, some contemporary text material, research based historical document etc. that have relevance to the concept developed in the textbook.

**Desired competency:**

- The objective of this activity is to observe whether the learners can relate the concept developed in the textbook with that of the given text material. The activity will facilitate them in the reinforcement of the concepts and ideas that they have developed. Besides, it will also help them in critical thinking and critical analysing of the text material.
- The teacher will assess the learners on the basis of the above said parameters of understanding.

# Geography and Environment

## (A) Survey

**1. Activity** - Survey of drinking water in your school

**Time** – 40 min. [group discussion- 5/10 min, group/ individual work 20/25 min, exchange of opinion 5/10 min.]

**Teacher's role-** The students are to be divided into groups. A list of points/issues on which the group-discussions will be conducted has to be written on the blackboard. Time has to be provided for writing the report (individual/group). The students are to be encouraged for presentation of the report (individual/group).

**Student's activity** –Participate in group discussion on the points given on the blackboard. The exchanged ideas are to be written individually/in groups (depending on the number of students present in the class) and give opinions on them. Individual/group report (within 80 words) has to be presented.

**Topic-** Water resources of West Bengal

**Sub topic-** Ground water.

### **In school :**

- \* Source of drinking water
- \* Sufficient availability of drinking water
- \* Depth of tube well (if necessary, teacher's help may be taken)
- \* Taste of Drinking Water
- \* Purity
- \* Maintenance
- \* Wastage and its reason
- \* Measures to be taken for preventing wastage

**Desired competency:** - Awareness development on prevention of wastage of drinking water

**2. Activity-** Survey on relief and drainage map of West Bengal

**Time-** 40 mins. [Group/individual map observation- 5/10 mins., Group/individual collection of information -5/10 mins, Group discussion- 5mins, Report making and exchange of opinion- 10/15 mins.]

**Teacher's role:** The students are to be divided into groups. They are told to observe the relief and drainage map of West Bengal. Points are to be written on the black board on which observations have to be made. Later, the reports are to be submitted to the teacher on the basis of the collected information, enlisting, exchange of opinion etc.

**Students' activity :** Relief and drainage map of West Bengal has to be observed on the basis of the given points and individual notes are to be made. Inferences are to be drawn on the basis of the exchange of opinion. Individual report is to be submitted.

**Topic-** Physical Environment of West Bengal

**Sub-topic :** Relation between relief and drainage of West Bengal

The following points to be noted after minute observation of the relief and drainage map of West Bengal :

- \* A river has to be selected each from the northern, western and southern part of West Bengal.
- \* The flow direction of three rivers have to be observed.
- \* Confluence of the river has to be observed.
- \* The districts through which the rivers are flowing are to be observed.
- \* Different types of physiographic region through which the rivers are flowing are to be observed.
- \* Length of the rivers is to be measured with thread and the respective lengths are to be compared.
- \* A report has to be presented on the slopes indicated, based on the direction of flow of the rivers.

**Desired competency** -Understanding the relation between slope and drainage of different regions of West Bengal.

**Rubric of evaluation-**

1. Collection of primary data and assimilation- 2
2. Analysis and explanation- 2
3. Inference and Evaluation -2
4. Correlating textual objective with acquired competence- 4

**(B) Nature Study**

**1. Activity-** Water logging due to flood and sewage system

**Time-** 40 mins [Group discussion 5/10 mins, registering information, drawing inference and writing-20/25mins, exchange of opinion- 5/10mins]

**Teacher's work** - It is natural to the students to observe nature. Students should be allowed to make a report individually on nature related topic (written on the black board) on the basis of their personal experience. Individual reports are to be collected.

**Students' activity:** Collected information is to be written on the basis of group discussion. Individual reports (within 80 words) are to be submitted after exchange of opinion.

**Topic:** Hazards and disaster

**Sub-topic:** Flood

Most of the regions of West Bengal are prone to flood. Almost all the students have heard/seen flood or water logging in an area for a period of time.

- \* Possible reasons of water logging caused due to heavy rain/opening of flood gates are to be written down.
- \* Brief discussion should be made on human interference causing flood/water logging.
- \* The sewage systems of the students' locality are to be explained.
- \* Students' individual opinions are to be collected.

**Desired competency-** To increase awareness of sewage system of his/her locality and understanding the measures to be taken

**Rubric for Evaluation:**

1. Observation and exchange of experience-2
2. Registration/ enlisting-2
3. Realisation and critical presentation-2
4. Correlating textual objective with acquired competence-4

**(C) Case Study :**

**1. Activity-** Aruna's dream.

**Time-** 40 mins [Individual/ group reading of the given story- 5/10mins., Understanding the problem and suggesting solutions through group discussion- 20 mins., writing of answers individually/ group -5/10 mins.]

**Teacher's role-** Students are to be divided into groups. The matter (or case) is to be written on a paper and supplied to each group. The questions are to be written on the black board.

**Students' activity:** Questions (written on the black board) are to be discussed in groups and to be written individually. (within 80 words)

**Topic-** Major economic activities of West Bengal

**Sub topic-** Causes of development, problems and solutions of tourism industry in West Bengal.

The place is five minutes walking distance from Aruna's house. While going to her uncle's house with her mother, Aruna stands under the shaggy-headed sisoo tree for two minutes. A wide spread lake called Ayanamoti lies in front. Migratory birds visit here during winter. There is a hillock behind the *sisoo* tree. A little effort can take one to the top of the hillock. River Monbhasi can be seen from the top of the hillock. Sunlight gleams on the river. To the north of the hillock a stone quarry can be seen. A faint sound of cutting of rocks comes from the quarry. An asphalt road has passed by the quarry towards the large town. Aruna feels that this place could have been a tourist spot. But she is very hopeful. She wants to see, in future, this little known place in the tourist map of West Bengal.

- \* Why does Aruna feel the place mentioned may become a tourist spot?
- \* What are the other facilities to be available in the place to develop it as a tourist spot?
- \* What are the steps to be taken to preserve the sanctity of the place from human interference?

**Desired competency-** Understanding the problems related to the development of tourism industry and the solutions thereof. Causes of development, problems and solutions of tourism industry in West Bengal

**Rubric for Evaluation.**

1. Problem and realisation of given topic-2
2. Finding probable solution-2
3. Identifying the best solution-2
4. Correlating textual objective with acquired competence-4

**(D) Creative Writing**

**1. Activity** - Imaginary conversation on setting up a new factory at Sudipta's house.

**Time-** 40 mins. [Group discussion- 5/10 mins, writing dialogue individually/group-20/25 mins, exchange of opinion 5/10 mins.]

**Teacher's role:** Directing students to write a dialogue on a specific subject.

Topic may be read out/ written on black board.

**Student's work-** After the group discussion, imaginary dialogue would be written.

**Topic** - Major economic activities of West Bengal

**Sub-topic-** Importance of small scale industry in West Bengal

Various juicy fruits are cultivated in and around Sudipta's place. Many people in the locality have small units for manufacturing jam, jelly from fruit juice, pickles etc. Sudipta's parents want to set up a similar small factory in the unused rooms of their ground floor. Now write an imaginary dialogue between you and Sudipta on the measures to be taken to accomplish their dream (within 80 words).

**Desired competency-** Understanding self- sufficiency through small scale industry.

**Rubric for Evaluation.**

1. Ability of expression-2
2. Originality of expression-2
3. Logicality -2
4. Correlating textual objective with acquired competence-4

**(E) Model Making**

**1. Activity** - Prepare a chart on fold mountain formation

**Time-** (40 + 40) = 80 mins. (Two periods) [group discussion and planning - 10/15 mins., work to be done through mutual cooperation- 65/70mins).

**Teacher's role:** Students are to be divided into groups. They are helped to collect subject related materials. They should be told to prepare model/chart on the subject.

**Students' activity-** Prepare a model/ chart with the help of necessary material.

**Topic-** Landform processes and different types of landforms

**Sub-topic-**Origin of Fold Mountains

\* Draw a chart of the stages of fold mountain formation on the basis of plate tectonic theory.

**Desired competency -** Understanding the role of plate movement for the formation of Fold Mountain.

**2) Activity -** Make a chart on the physiographic division of West Bengal.

**Time :** (40+40)=80 mins. (2 periods)

[Group discussion and planning- 10/15 mins., the work to be done through mutual co-operation 65/70 mins.]

**Teacher's role -** Divide students into groups. Cooperate with them to collect materials.

**Students' activity-** Prepare a chart/ model with the help of required materials. (one from each group)

**Topic-** Physical Environment of West Bengal

**Sub-topic -** Relief of West Bengal

\* Prepare a three dimensional physiographic map of West Bengal on a chart paper. Students may use papers, colour, adhesive etc.

**Desired competency:** Understanding the regional physiographic variation in West Bengal.

**Rubric for Evaluation.**

1. Conversion of abstract thought to concrete-2
2. Eagerness for creative and experimental work-2
3. Explanation and presentation-2
4. Correlating textual objective with acquired competence-4

**(F) Open Text Book Evaluation**

**1. Activity-** Positive and Negative aspects of natural hazards and disaster

**Time-** 40mins. [group discussion- 5/10 mins, complete the work individually/ in group-20/25 mins., exchange of opinion- 5/10mins]

**Teacher's role:** to supply study material to each group.

**Student's activity-** Answer the given questions (within 80 words) on the basis of study material.

**Topic** - Hazards and disaster.

**Sub-topic**- River bank erosion

Flood brings destruction of embankments. People settled on the banks are not scared of flood. They know that after the water recedes new silt would give large production. But destruction of embankments is very dangerous. It takes away lands, houses, markets, schools, mosques and temples. 174 km course of the river Ganges, from Bhutnidiyara to Shikarpur (Murshidabad-Nadia border) through Farakka, is under great threat from the river bank erosion. In the last few decades approximately 200 sq.km area covering three blocks in Malda district were eroded. Sand bars amounting to equal area have risen on the opposite bank (near Jharkhand border) of the river. Extensive areas of Dhalkuliyān, Suti, Lalgola, Bhagobangola, Raninagar and Jalangi in Murshidabad are under the threat. The number of land losers is increasing every year. Socio-economic structure is breaking down alarmingly [Source- 'Banglar Nadikatha- Kalyan Rudra page- 98, 2nd paragraph]

- \* Cite examples of another normal physical phenomena which causes threat to human society.
- \* The normal physical phenomena sometimes affect negatively on human lives. State the positive impact of these physical phenomena.

**Desired competency** Understanding the positive and negative aspect of physical phenomena.

**Rubric for Evaluation:**

1. Identification of data and analysis-2
2. Understanding of data-2
3. Use of data -2
4. Correlating textual objective with acquired competence-4

**Note:** *Samples of evaluation for formative assessment and its methodologies for class IX are given above. The teachers may change the subject or topic according to the cognitive level of his/her students.*

## DIRECTIVE REGARDING EVALUATION

(Full marks for each item is 10. Distribution of marks is given below.)

1) Survey			
Collection of primary data and sequential compilation	Analysis and interpretation	Decision making and demonstration of evaluation	Application of acquired competencies in a subject-specific domain
2	2	2	4
2) Nature Study			
Observation	Documentation	Understanding and demonstration with critical perception	Application of acquired competencies in a subject-specific domain
2	2	2	4
3) Case Study			
Understanding of problem	Determining probable solutions	Selection of best possible solution in a particular situation	Application of acquired competencies in a subject-specific domain
2	2	2	4
4) Creative Writing			
Expression of ideas	Editing and extending relevant points	Originality in writing	Application of acquired competencies in a subject-specific domain
2	2	2	4
5) Model Making			
Quality to convert abstract into concrete	Interest in creative and experimental work	Interpretation and demonstration	Application of acquired competencies in a subject-specific domain
2	2	2	4
6) Open Text Book Evaluation			
Identification and analysis of relevant data	Comprehension of given data	Proper utilization of data and demonstration of critical perception	Application of acquired competencies in a subject-specific domain
2	2	2	4