

Open Basic Education – Curriculum

Subject – English

(Level 'C')

The learner at this stage is better equipped with language skills because of his age and two years exposure.

1. Listening

The learner at this level will be able to

1. understand English for local and global understanding.
2. understand the use of vocabulary items and underline meanings of the speakers involved in unfamiliar conversation.
3. understand the introductory speeches made by the speakers or anchors in certain talk shows or other activities.
4. understand detailed instructions to be carried out.
5. understand longer announcements, descriptions of events, people and places.
6. comprehend meaning of the unfamiliar words, phrases in context.
7. understand the intent of the speaker.

2. Speaking

The learner will be able to

1. speak for a longer duration with coherence of ideas.
2. deliver short speeches on different occasions.
3. sum up the speech delivered by the speaker.
4. extend welcome to the visitors and thank them for their co-operation/encouragement.
5. recite poems with appropriate modulation.
6. have reasonable control over volume of speech.
7. speak/participate in discussions without prior preparations.
8. make suggestions or interrupt in a befitting manner.
9. use appropriate vocabulary to convey his intent.
10. pronounce well with appropriate stress, pauses and rise and fall.
11. report orally what he had heard or read as an activity to brief others.
12. use courteous words/expressions e.g. please, thank you, excuse me, you are welcome etc.

3. Reading

The learner will be able to

1. read a given passage or provided input with proper understanding of the content/ message/ideas of the passage or poem without undue halt and with proper modulation of voice.
2. read silently with understanding of the intent of the writer, puzzle out the word meanings in context and central idea of the familiar/unfamiliar text material independently unaided.
3. understand details of description/directions and instructions
4. understand sequence of the narratives and also re-order jumbled sentences/words to provide proper sequence.
5. weed out the irrelevant ideas to focus on the relevant content.
6. infer meanings even when not explicitly stated.
7. read newspaper, magazines, posters, comic strips and notices and circulars and also any other printed as well as handwritten material with understanding.
8. refer to a dictionary, atlas, maps and any other reference material.

4. Writing

The learner will be able to

1. write a sustained piece of writing (controlled as well as free) such as personal and official letters, letters of complaints, applications and paragraphs on familiar topics.
2. give factual description of the events, people or places.
3. write original stories or re-write the stories read or heard earlier.
4. report the conversation already heard, in writing.
5. write brief messages, notices and instructions.
6. write/develop dialogues on familiar/life related topics and experiences.
7. write short speeches for different occasions.
8. write with appropriate punctuation marks such as ; | : | ! | along with (.) (,) (“.....”)

Level 'C'

Syllabus for developing listening and speaking skills

Recorded and live

Listening to

- announcements (Railway station/Airport/Bus stands)
- instructions/Commands
- requests/suggestions/negations
- conversation/dialogues
- speeches/description
- stories/poems/prose passages
- recognising the sounds and putting the words in cluster of words with similar sounds such as – ago, agree, arrive, ten, pen, eight, rain

Speaking

- participation in pair work, group work/group discussion/panel discussion
- individual performance (speeches, welcome, thanks giving, description of person/place/object)
- anchoring, summing up, giving commentary with appropriate pronunciation (RPs) proper stress, modulation and pauses

Role plays and simulation

- making enquiries (at the Railway station, Airport/Hospital/Shops)
- providing information use of appropriate language in different contexts; use of polite expression
- reporting the events/incidents
- reproduce/narrating stories (narratives without sacrificing major points)

Syllabus for developing reading skills

I. A good stock of unseen prose passages

- Types of passages**
1. **Factual** : Descriptions of people (biography of leaders, saints, etc.) buildings and places (cities of historical, scientific religious importance).
 2. **Reflective** : Passages raising issues of national, social and scientific importance.
 3. **Literary** : Poems and short stories to test ability to infer, unstated meaning, and interpret unsaid ideas;
Ability to decipher meaning of unfamiliar words used in the passage, from the context.

II. Text-based question

[For local and global comprehension of the passage]

The learner will be able to read the given input (text) and answer the questions on

- (i) content (facts, ideas, dominating thoughts)
- (ii) organise the relevant matter together in proper sequence and separate the irrelevant
- (iii) transcribe the information contained in the passage (text)
- (iv) interpret the given table, tree diagram or a pie chart
- (v) interpret the uttering and statements besides puzzling out the contextual meaning
- (vi) compare the characters/events/incidents and statements

Level 'C'

Syllabus for developing writing skills

(A) Short compositions

A1. Guided/controlled

- messages, notices, news, statements
- stories (based on clues/input/outline)
- short description of experiences/events/incidents/accidents

A2. Long Compositions (Guided as well as free comp.)

- stories (original and rewriting the story read earlier)
- speeches (welcome thanks)
- reporting events for magazines/newspaper
- letters personal/ (with personal touch, personal matters and expression of emotion)

Letters (formal) official

- complaints
- requests
- enquiry (to seek information)
- placing orders
- application

Language

formal & courteous

Appropriate format to the task

Grammar [Level 'C']

Note : Grammar has to be taught and learnt in context, **NOT** in isolation.

- 1. Noun**
 - Abstract Noun
- 2. Verbs**
 - Transitive/Intransitive
- 3. Adjectives**
 - Degrees of comparison
- 4. Transformation of sentences**
 - Positive/Negative/Interrogative
 - Clauses and phrases, linkers
 - Simple and complex sentences
 - Active Passive
- 5. Word formation**
 - Prefix and suffix
 - Transformation of parts of speech
- 6. Tenses**
 - Continuous (Progressive) V + ing
 - Perfect (has/have/had) Participle form of the verb
- 7. Phrasal verbs**
- 8. Reporting (speech)**
 - Event and dialogues (tenses, person)
- 9. Revision of concepts**
 - Determiners
 - Prepositions
 - Conjunctions
 - Clauses/phrases

मुक्त बेसिक शिक्षा पाठ्यक्रम

विषय : हिन्दी

स्तर-सी

औचित्य

भाषा एक औजार है - स्वयं को, समाज को और पूरी दुनिया को जानने और उससे संवादात्मक रिश्ता कायम करने के लिए। भाषा दुनिया की चुनौतियों का सामना करने की ताकत और विश्वास देती है। हम भाषा में बोलते हैं, लिखते हैं, पढ़ते हैं और भाषा में ही सोचते हैं। भाषा के बिना मनुष्य का अस्तित्व संभव नहीं है।

औपचारिक शिक्षा शुरू करने से पहले भी शिक्षार्थी के पास परिवेश से सीखी अपनी भाषा होती है। पाठ्य-सामग्री से अपने नजदीकी परिवेश और बाहरी दुनिया का संबंध स्थापित करते हुए वे अपनी भाषा का विस्तार करते हैं। बोली हुई और लिखित भाषा में अंतर होता है, शिक्षार्थी इनमें एक संबंध स्थापित करने का प्रयास करते हैं। यह रचनात्मक प्रयास उसकी अपनी भाषा को सृजनात्मक आयाम देने में समर्थ होगा।

भाषा शिक्षण के इस महत्त्व को ध्यान में रखते हुए राष्ट्रीय मुक्त विद्यालय ने स्तर 'सी' का पाठ्यक्रम प्रस्तुत किया है। इसमें शिक्षार्थी को सुनना और बोलना कौशल का अभ्यास कराने के साथ-साथ उसके पढ़ने और लिखने के कौशल का विकास भी किया जाएगा।

लक्ष्य

यह पाठ्यक्रम प्राथमिक शिक्षा पूरी कर चुके अथवा इसके समान योग्यता रखने वाले शिक्षार्थियों के लिए है। अतः इस पाठ्यक्रम में पूर्ण योग्यता प्राप्त करने के बाद शिक्षार्थी राष्ट्रीय मुक्त विद्यालय से माध्यमिक स्तर की शिक्षा प्राप्त कर सकते हैं। इस प्रकार यह पाठ्यक्रम प्राथमिक तथा माध्यमिक स्तर की शिक्षा को जोड़ने वाली कड़ी है किंतु इसका स्वतंत्र रूप से भी अध्ययन किया जा सकता है।

आवश्यक पूर्वज्ञान

इस स्तर के पाठ्यक्रम का अध्ययन करने के लिए शिक्षार्थी को निम्नलिखित पूर्वज्ञान होना आवश्यक है-

- ◆ कक्षा पाँच के स्तर की भाषा संबंधी योग्यताएँ अर्थात्
 - सामान्य बातचीत रेडियो कार्यक्रमों तथा विभिन्न उद्घोषणाओं को सुनने और समझने की सामान्य योग्यता।
 - सामान्य गति से अपनी बात को प्रस्तुत करने की योग्यता।
 - सरल काव्य पठन तथा गद्य पठन की योग्यता।
 - स्पष्ट हस्तलेख तथा मुद्रित लेखों के पठन की योग्यता।
 - पठित सामग्री को अपनी शैली में लिखने की योग्यता।
 - भाषा के सामान्य शब्द भंडार की योग्यता तथा नए शब्द बनाने का सामान्य ज्ञान।
 - कल्पनाशीलता और सृजनात्मकता की योग्यता।

सामान्य उद्देश्य

इस पाठ्यक्रम के सामान्य उद्देश्य निम्नलिखित हैं -

- ◆ दैनिक जीवन में व्यावहारिक भाषा का बेहतर ढंग से प्रयोग करने की योग्यता का विकास करना
- ◆ दैनिक जीवन में प्रयोग में आने वाले व्यावहारिक-व्यावसायिक क्षेत्रों में प्रयुक्त शब्द भंडार में वृद्धि करना
- ◆ सुनने, बोलने, पढ़ने और लिखने संबंधी योग्यताओं का अभ्यास करना
- ◆ समाचार पत्र, पत्रिकाएँ तथा अन्य पुस्तकें पढ़ने के प्रति रुझान पैदा करना
- ◆ किसी निश्चित उद्देश्य को लेकर पठन की योग्यता का विकास करना
- ◆ आनंद के लिए पढ़ने में रुचि जगाने की योग्यता का विकास करना
- ◆ सृजनात्मक अभिव्यक्ति का विकास करना
- ◆ प्रकृति प्रेम तथा राष्ट्र प्रेम की भावना का विकास करना

विशिष्ट उद्देश्य

क्रम संख्या इकाइयाँ

दक्षताएँ

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|------------------------|---|
| (1) सुनना, बोलना, | 1. निजी अनुभवों के आधार पर सृजनशील भाषा का प्रयोग कर सकेंगे। |
| | 2. परिचित परिवेश तथा विषयों से संबंधित निर्देश, वार्तालाप को सुनकर-समझकर उस पर अपनी प्रतिक्रिया कर सकेंगे। |
| | 3. वार्तालाप, कहानी, भाषण, चर्चा-परिचर्चा आदि के केंद्रीय बिन्दुओं को समझकर उन पर मौखिक एवं लिखित रूप में अपने विचार व्यक्त कर सकेंगे। |
| | 4. दृश्य एवं श्रव्य माध्यमों की सामग्रियों (पत्र-पत्रिकाएं, बाल-साहित्य, दूरदर्शन, कम्प्यूटर, जनहित कार्यक्रम नाटक, सिनेमा, भाषण, परिचर्चा आदि) को पढ़कर, देखकर, सुनकर उस पर स्वतन्त्र व सहज अपने विचार मौखिक और लिखित रूप में अभिव्यक्त कर सकेंगे। |
| | 5. विभिन्न साहित्यिक विधाओं और ज्ञान से सम्बन्धित अन्य विषयों की समझ का विकास कर सकेंगे। |
| | 6. लिखते समय घटनाओं के क्रम को ध्यान में रखकर लिख सकेंगे। |
| | 7. पढ़ी देखी सुनी विषय वस्तु तथा पाठ्य सामग्री में घटित घटनाओं के बीच तार्किक सम्बन्ध स्थापित कर सकेंगे। |
| (2) क्रम संख्या, कौशल, | 8. सार्वजनिक स्थानों पर सुनी, देखी, घटना, मेला खेल, आदि को अपने शब्दों में अभिव्यक्त कर सकेंगे। |

9. भाषा की बारीकी और सौंदर्य बोध को वैज्ञानिक समझने का प्रयास कर सकेंगे।
10. किसी पाठ को सरसरी तौर पर देखकर उसकी विषय वस्तु का पता लगाने के कौशल का विकास और किसी विशेष बिन्दु ओ खोजने के लिए पाठ की बारी की से जाँच करने की क्षमता का विकास कर सकेंगे।
11. विभिन्न विषय क्षेत्रों से सम्बन्धित शब्दावली, मुहावरे, लोकेक्तियों और कहावतों का रचनात्मक प्रयोग करने की क्षमता का विकास कर सकेंगे।
12. औपचारिक तथा अनौपचारिक पत्र लिखने की योग्यता का विकास कर सकेंगे।
13. पढ़े हुए समाचारों के आधार पर अपनी प्रतिक्रिया स्वरूप सम्पादक को पत्र लिख सकेंगे। एक जिम्मेदार नागरिक की तरह सामाजिक मुद्दों, समस्याओं के निवारण सम्बन्धी अपने विचार पत्र-पत्रिकाओं में लिखने का प्रयास कर सकेंगे।
14. स्वाभिमान और आत्म-निर्भरता की भावना के साथ आपसी सहयोग और तालमेल से निर्णय लेने की क्षमता का विकास कर सकेंगे।
15. विभिन्न विषयों कलाओं से सम्बन्धित, पाठ्य सामग्री (हिन्दी भाषा) को पढ़कर सराह सकेंगे और उनकी भाषिक प्रयुक्तियों का प्रयोग करते हुए लिख सकेंगे।

व्याकरण तथा भाषा प्रयोग

1. व्याकरण के सामान्य नियमों का उचित अनुप्रयोग करने की योग्यता का विकास करना।
2. मूल शब्दों में उपसर्ग और प्रत्यय जोड़कर शब्द निर्माण करने की योग्यता का विकास करना।
3. औपचारिक तथा अनौपचारिक मात्रा को सार्थक प्रभावपूर्ण तथा व्याकरणसम्मत अनुप्रयोग करने को योग्यता का विकास करना।
4. भाषा प्रयोग में मुहावरे हास-परिहास आदि का आवश्यकतानुसार प्रयोग करने की क्षमता का विकास करना।
5. वाक्य में 'ने' के प्रयोग का क्रिया रूप पर प्रभाव
6. कर्म के आधार पर क्रिया के भेदों की पहचान व प्रयोग
7. वाक्य के प्रकार और वाक्य परिवर्तन।

पाठ्यक्रम का विवरण

विद्यार्थी में सुनना, बोलना पढ़ना और लिखना कौशल का विकास करने के लिए निम्नलिखित सामग्री प्रदान की

जा रही है-

पढ़ने-पढ़ाने की प्रक्रिया में भाषा-शिक्षण के चारों कौशलों को संयुक्त रूप में देखा जाना चाहिए। किन्तु मूल्यांकन की सुविधा के लिए इनके अलग-अलग लक्ष्य गिनाए गए हैं।

सुनना और बोलना

समय

18 घंटे

लक्ष्य

इस इकाई का लक्ष्य शिक्षार्थियों में भाषा सुनने और बोलने के कौशल को विकसित करने से संबंधित विशेष जानकारी देना है जिससे वे दैनिक जीवन में बेहतर तरीके से दूसरों की बातों को समझ सकें और अपने मन की बात दूसरों तक पहुँचा सकें। इसके लिए सुनना और बोलना कौशल पर आधारित एक श्रव्य कैसेट तैयार किया जाएगा जिसके साथ एक अभ्यास पुस्तिका भी होगी।

पढ़ना

समय

76 घंटे

लक्ष्य

इस इकाई का लक्ष्य विद्यार्थियों में पठन कौशल का विकास करने के उद्देश्य से काव्य तथा गद्य से संबंधित विविध प्रकार की सामग्री प्रदान की जा रही है जिसमें कुछ कविताएँ, कुछ लेख तथा कुछ कहानियाँ हैं। यह सभी सामग्री व्यावहारिक ज्ञान-वृद्धि के साथ-साथ साहित्य के विविध रूपों के पठन के प्रति भी रुझान पैदा करने में मदद प्रदान करेगी।

पढ़ना कौशल की संप्राप्ति के लिए कुछ सामग्री चुनकर पठन सामग्री के रूप में शिक्षार्थियों को उपलब्ध कराई जाएगी। यह अपेक्षा की जाती है कि यह सामग्री एक ओर तो भाषिक कुशलताओं में दक्षता प्राप्ति में सहायक होगी और दूसरी ओर हिंदी साहित्य की कुछ विधाओं की सामान्य जानकारी और उनके पढ़ने के प्रति रुझान पैदा करने में सहायक होगी। प्रस्तावित पाठ्यक्रम में प्रस्तुत की जाने वाली पठन-सामग्री की रूपरेखा इस प्रकार है-

कविताएँ- लगभग पाँच कविताएँ जिनमें कुछ रचनाएँ मध्ययुगीन कवियों को होगी और शेष खड़ी बोली हिंदी की।

गद्य-गद्य खण्ड में रोचक कहानियाँ अधिक होंगी। लगभग बारह गद्य पाठों में छह कहानियाँ और शेष जीवनी संस्मरण, संवाद, निबंध, यात्रा विवरण आदि होंगे। पाठों की विषय वस्तु आम जीवन से संबंधित होगी और उनमें परोक्षरूप से राष्ट्रीय पाठ्यचर्या के प्रमुख बिंदुओं का ध्यान रखा जाएगा।

लिखना

समय

50 घंटे

लिखना भाषा का सबसे अधिक व्यावहारिक पक्ष है। जो बात हम कह नहीं सकते या कहना नहीं चाहते उसे लिख कर दूसरे व्यक्ति तक पहुँचा सकते हैं। इस कौशल का विकास करने के लक्ष्य को ध्यान में रखते हुए इस पाठ्यक्रम में लेखन संबंधी सामान्य व्यावहारिक ज्ञान जैसे-लेखन के सामान्य नियम अनुच्छेद लेखन और भाव पल्लवन तथा प्रमुख प्रकार के पत्र और निबंध रखे गए हैं जो इस प्रकार हैं।

लिखने की कला

अनुच्छेद लेखन

कथा पल्लवन

भाव पल्लवन

विषय का चुनाव कर

स्वतंत्र अभिव्यक्त

पत्र लेखन

औपचारिक - प्रार्थना-पत्र शिकायती तथा सुझाव पत्र

अनौपचारिक पत्र - घरेलू पत्र (माता-पिता भाई-बहिन, मित्र आदि), लघु आयोजन के लिए निमंत्रण पत्र तथा धन्यवाद पत्र

व्याकरण तथा भाषा प्रयोग

समय

36 घंटे

लक्ष्य

व्यावहारिक व्याकरण तथा भाषा प्रयोग भाषा का अभिन्न अंग है। सरलता और व्यावहारिक प्रयोग को ध्यान में रखते हुए यहाँ हिंदी-व्याकरण के प्रमुख बिंदुओं को गद्य के पाठों में समाहित किया गया है और संदर्भ आने पर बिंदुओं को समझाया गया है। इसके निर्धारित बिंदु इस प्रकार हैं-

वर्तनी और उच्चारण

शब्द-मद-- पर्यायवाची विलोम, अनेक शब्दों के लिए एक शब्द, अनेकार्थी

शब्द निर्माण-- संधि समास (सामान्य परिचय), उपसर्ग तथा प्रत्यय

पदबंध--संज्ञा, सर्वनाम विशेषण क्रिया अव्यय की पहचान

वाक्य-संरचना--रूपांतरण, विराम-चिन्ह आदि का प्रयोग

मुहावरे, लोकोक्तियाँ, कहावतें (इन सभी बिंदुओं का पाठों के आधार पर व्यावहारिक व्याकरण के रूप में अभ्यास कराया जाए)

परीक्षा योजना

हिंदी विषय के मूल्यांकन के लिए कुल 100 अंक की परीक्षा होगी जिसका विवरण इस प्रकार है-

मौखिक परीक्षा	-- 10 अंक
लिखित परीक्षा (भाग-1) (वस्तुनिष्ठ)	-- 20 अंक
लिखित परीक्षा (भाग-2)	-- 70 अंक
कुल योग	-- 100 अंक

सुनना तथा बोलना कौशल का मूल्यांकन मौखिक परीक्षा द्वारा किया जाएगा। सुनना-बोलना का परीक्षण अध्ययन केंद्र पर होगा। यह दो भागों में सम्पन्न की जाएगी-- सुनना कौशल के लिए परीक्षार्थियों को सामूहिक रूप से

टेपरिकार्डर या वाचक द्वारा निर्धारित अंश सुना उन पर आधारित बोध प्रश्नों के उत्तर पूछे जायेंगे।

बोलना कौशल का परीक्षण एकल विधि से होगा।

पढ़ना तथा लिखना कौशल का मूल्यांकन लिखित परीक्षा द्वारा होगा। विषय की लिखित परीक्षा मुख्यतः दो भागों में होगी-

लिखित परीक्षा (भाग 1)

यह प्रश्न-पत्र कुल 20 अंक का होगा तथा इसमें एक-एक अंक के कुल 20 वस्तुनिष्ठ प्रश्न होंगे। इस प्रश्न-पत्र को हल करने के लिए कुल 30 मिनट का समय दिया जाएगा।

लिखित परीक्षा (भाग 2)

लिखित परीक्षा- इस भाग में शिक्षार्थी की पठन तथा लेखन की कुशलता का मूल्यांकन किया जाएगा। इसके लिए 70 निर्धारित किए गए हैं तथा समय दो घंटे है।

अंक वितरण

मूल्यांकन इकाई	अंक-वितरण		
	लिखित परीक्षा	मौखिक परीक्षा	वस्तुनिष्ठ परीक्षा
मद			
1. सुनना			
2. बोलना		05	
3. पढ़ना		05	
कविता-भाव ग्रहण	05		
-सराहना अथवा सौंदर्य	05		05
गद्यांशों पर ज्ञान और	22		05
4. व्याकरण बोध प्रश्न (भाषा प्रयोग)	10		09
5. रचनात्मक लेखन			
कथा पल्लवन	06		
अनुच्छेद लेखन	06		
भाव पल्लवन	04		
पत्र	07		
स्वतंत्र अभिव्यक्ति (निबंध)	05		01
कुल उप योग	70	10	20
कुल योग		100	

OPEN BASIC EDUCATION – CURRICULUM
SUB-MATHEMATICS
(LEVEL 'C')

1. Number System

1. Recapitulation of numbers and their properties of operations learnt earlier
2. Introduction to the sense of largeness and approximation of large numbers

2. Factors, Multiples and Prime Numbers

1. Concepts of factor and multiple of a number
2. Prime and composite numbers
3. Even and odd numbers
4. Common factors and common multiples, coprime numbers, concepts of HCF and LCM and relationship between HCF and LCM
5. Prime factorisation and finding HCF and LCM through prime factorisation
6. HCF and LCM by Division Method
7. Divisibility rules by 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 and properties of divisibility (e.g. If each of two numbers is divisible by a certain given number, then their sum as well as difference is also divisible by that number, etc.)
8. Validity and use of the result $HCF \times LCM = \text{Product of two numbers}$
9. Use of HCF and LCM in simplification of fractions and operations on fractions
10. Word Problems based on HCF and LCM.

3. Integers

1. Need of integers; introduction by a pattern; absolute value of an integer
2. Representation of integers on the number line
3. Ordering of integers using symbols $<$ or $>$;
4. Operations on integers and their properties

4. Rational Numbers

1. Introduction to rational numbers (with representation on number line)
2. Operations on rational numbers (all operations)
3. Properties of rational numbers (using general form of expression to describe properties e.g. $a + b = b + a$, etc)
4. To understand that infinitely many rational numbers lie between any two given rational numbers
5. Simplification of Expressions involving rational numbers
6. Word problems based on rational numbers

5. Exponents and Powers

1. Introduction (exponents as natural numbers and integers only)
2. Laws of exponents [$a^m \times a^n = a^{m+n}$, $a^m \div a^n = a^{m-n}$, $(a^m)^n = a^{mn}$, where m and n are integers and $a^0 = 1$]

6. Squares, Square roots, Cubes, Cube roots

1. Squares and square roots
2. Square roots using both factor and division methods [upto two decimal places only]
3. Cubes and cube roots
4. Cube roots (by factor method only) of perfect cubic numbers
5. Estimating square roots and cube roots

7. Introduction to Algebra

1. Introduction to literal numbers, variables and coefficients
2. Expressions and Terms (monomial, binomial, trinomial, etc.) of expressions
3. Like and unlike terms
4. Degree of an expression (exponent ≤ 3); value of an expression for a given value of unknown
5. Addition and subtraction of algebraic expressions
6. Multiplication and division of algebraic expressions (coefficients should be integers only and exponents of coefficients/variables to be whole numbers only)
7. Identities (formulae)
 - (i) $(a \pm b)^2 = a^2 + b^2 \pm 2ab$
 - (ii) $a^2 - b^2 = (a + b)(a - b)$
 - (iii) $x^2 + (a + b)x + ab = (x + a)(x + b)$
8. Factorisation (simple cases only)
 - (i) $ax \pm ay = a(x \pm y)$
 - (ii) Based on identities given in item No. 7 stated above

8. Simple Linear Equations in One Variable

1. Introduction to linear equations (through contextual problems)
2. Distinction between equality and equation
3. Solution of linear equations
4. Method of solving linear equations
5. Simple word problems based on linear equations

9. Ratio and Proportion

1. Concept of ratio
2. Proportion: as equality of two ratios

3. Property of proportion; Product of means equals the product of extremes
4. Mean and third proportionals of two given numbers
5. Variation – direct and inverse
6. Unitary Method
7. Word problems based on unitary method and direct and inverse variations (Time and work, work and wages, pipes and cisterns, time and distance, etc.)

10. Percentage and Its Application

1. Meaning of a per cent, percentage
2. Converting fractions, decimals, ratios, etc. into per cents and vice versa
3. Simple problems based on percentage (on Population, Area, etc.)
4. Application of per cents to profit and loss and discount-word problems

11. Simple and Compound Interest

1. Concepts of simple and compound interests
2. Related terms - Principal, Rate, Time, Amount, Interest
3. Distinction between simple and compound interests
4. Given any three of Principal, Rate, Time and Simple Interest, to calculate the fourth and the Amount
5. Arriving at the formula for compound interest through patterns
6. Calculating compound interest compounded yearly upto 3 years or half-yearly upto 3 steps only
7. Word problems from everyday life (Rate of growth, Banking, etc.)

12. Basic Geometrical Concepts

1. Concepts of point, line, plane, line-segment and ray
2. Open and closed figures, interior and exterior of closed figures
3. Properties of lines in a plane
4. Collinear points and concurrent lines

13. Lines and Angles

1. Concept of an angle, arms (sides), vertex, measure, acute, obtuse, right, straight, reflex, zero and complete
2. Pairs of lines : (i) intersecting lines (ii) perpendicular lines (iii) parallel lines
3. Pairs of angles : (i) linear (ii) complementary (iii) supplementary (iv) adjacent (v) vertically opposite (vi) alternate (vii) corresponding
4. Properties of parallel lines (alternate angles, corresponding angles, interior angles, exterior angles, etc.)

14. Triangles

1. Triangles – vertices, sides, angles, interior, exterior, exterior angle, altitude, median
2. Types : isosceles, equilateral, scalene, acute, right, obtuse
3. Properties
 - (i) Sum of three angles equals 180°
 - (ii) Exterior angle equals the sum of two opposite interior angles
 - (iii) The sum of two sides of a triangle is greater than its third side
 - (iv) In a right Δ ABC right angled at B, $AB^2 + BC^2 = AC^2$ (Pythagoras Theorem)
 - (v) Isosceles triangle property
4. Concept of congruence and criteria of congruence of two triangles.

Experimental verifications only

15. Quadrilaterals

1. Concept, sides, vertices, angles, diagonals, adjacent sides, opposite sides, interior, exterior
2. Types of quadrilaterals : Parallelogram, Rhombus, Rectangle, Square, Trapezium, Kite
3. Properties of various types of quadrilaterals (experimental verifications only)

16. Circles

1. Concepts : circle, centre, radius, diameter, arc, chord, circumference, semi circle, segment, sector, interior, exterior
2. Properties :
 - (i) Angle in a semi-circle is a right angle
 - (ii) Diameter is the largest chord of a circle
 - (iii) Greater chord is nearer the centre

Experimental verifications only

17. Introduction to co-ordinate Geometry

1. Concepts of axes, cartesian plane
2. Plotting of points
3. Drawing various graphs - time - distance graph, interest - time graph, etc.
4. Reading and interpreting various graphs

18. Symmetry

1. Concept
2. Identification of symmetrical and non-symmetrical figures
3. Axis (axes) of symmetry
4. Identification of figures having
 - (i) only one line of symmetry
 - (ii) only two lines of symmetry
 - (iii) more than two lines of symmetry

19. Constructions

1. Angle of a given measure with a protractor
2. Angles of 60° , 45° , 90° , 120° with a ruler and compass only
3. Right bisector of a line-segment
4. Lines parallel to a given line
5. Perpendicular to a given line from a point
 - (i) on the line
 - (ii) outside the line
6. Bisector of an angle
7. Construction of triangles (SSS, SAS, ASA, right triangle)
8. Construction of quadrilaterals given
 - (i) four sides and one diagonal
 - (ii) three sides and two diagonals
 - (iii) three sides and two included angles
 - (iv) two adjacent sides and three angles
9. Construction of a circle with a given
 - (i) radius
 - (ii) diameter

20. Mensuration

1. Concepts of perimeter, area and volume
2. finding perimeters of various figures for given measures
3. Perimeters of rectangles and squares using formulae
4. Perimeter of a circle (circumference) using $2\pi r$ when its radius or diameter is given
5. Area of a square, rectangle, triangle (including Hero's Formula), parallelogram, trapezium, circle
6. Volume of a cube and a cuboid
7. Surface area of a cube and a cuboid

21. Data Handling

1. To draw a bar graph for a given data
2. To interpret a given bar graph
3. To find mean of ungrouped data [mean = $\frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$]
4. To find median of ungrouped data arranged in ascending order only having

- (i) odd number of observations
 - (ii) even number of observations
5. To find mode (observation having highest frequency) of a given data
 6. To draw pie charts for simple data only
 7. To give feel of probability using data through experiments like tossing coins, dice, etc.

OPEN BASIC EDUCATION – CURRICULUM
Sub–Science
Level – 'C'

Rationale

To know about nature and natural phenomena is normal human instinct. Young children possess an inquiring attitude. They try to pick up objects and view them carefully or observe the common phenomena and events occurring around them with much curiosity. They ask questions which may sound trivial but often they may be highly complex and intelligent. The questions are sometimes answered correctly, sometimes wrongly due to ignorance or preconceived unscientific notions, or sometimes not answered at all. Thus there is a need for dissemination of science and for developing the scientific attitude from as early a stage as possible.

The present syllabus in science has been specially designed to cater to the needs of learners at Upper Primary stage. This course aims at teaching the learner what Science is and help him know the scientific principles that abound all over. The emphasis throughout the syllabus is to familiarise the learners with practically all facets of nature around them and even what goes on inside their own bodies.

The basic objective of teaching science is to enable the learner to

- (a) explain the meaning of science and appreciate the manner in which the nature functions;
- (b) familiarise the learner with various facets of science and the role it plays in human welfare;
- (c) appreciate the diversity in the living world as also inter-relation between various living forms;
- (d) acquire scientific attitude and temper and inculcate in the learner, the skill of keen observation and rational thinking; and
- (e) motivate the learners to apply scientific methods in their day-to-day activities.

The approach adopted here aims to train the learners and find solution thereof. Simultaneously, the learners will be motivated to perform simple experiments and link the results of their experiments and come to a logical conclusion.

Course Content

The syllabus has been divided into seven modules as given

Module	Marks
1. The Nature in General	14
2. Matter and Material	15
3. Changes Around Us	14
4. Motion and Force	12
5. Energy	15
6. Life Processes	16
7. Better Living	14
<hr/>	
Total	100

Module-1 The Nature in General

Study Time : 30 hours

Approach

The purpose of this module is to develop an understanding of nature in general, the scientific principles involved and to develop a scientific approach in the natural happenings. It also aims to help the learner realise the importance of natural resources in our life and one's role in proper management and conservation of natural resources.

Contents

Unit 1.1 Exploring Nature

What is nature; natural resources meaning, resources-man made and natural. types of natural resources (renewable and non-renewable, living and non-living,); balance in nature, interdependence of plants and animals, judicious use of resources.

Learning Outcomes

After studying this unit the learner should be able to

- explain the meaning of nature and cite examples
- explain the term resource and list various natural resources
- distinguish between natural and man-made resources
- classify natural resources as renewable and non-renewable and living and non-living
- explain the interdependence of plants and animals, justify the need for balance in nature with suitable example and one's role in maintaining it
- argue in favour of judicious management and conservation of natural resources.

Unit 1.2 Air

Presence of air around us and its importance for living, composition of air with importance of each constituent: humidity; air pollution – air pollutants, sources and hazards of air pollution; our role in preventing air pollution (Including incidences such as Bhopal gas tragedy, fire crackers, cutting of trees, burning of leaves, generators etc.)

Learning Outcomes

After studying this unit the learner should be able to

- demonstrate the presence of air around us through suitable experiments
- give composition of air and explain the importance of its each constituent
- explain the humidity and relate it with weather
- define air pollution
- list common air pollutants and their sources
- enumerate the hazards of air pollution
- suggest ways of preventing air pollution.

Unit 1.3 Water

Water as an essential component for life, sources and states of water, properties of water, composition of water, hard and soft water; purification of drinking water, water cycle, water.

Learning Outcomes

After studying this unit the learner should be able to :

- explain with reasons that water is essential for life
- list various sources of water
- give properties of water
- distinguish between hard and soft water
- explain various methods to obtain potable water
- explain water cycle with the help of a diagram
- list the common water pollutants and their sources
- list hazards of water pollution
- suggest methods of preventing water pollution
- justify the need for proper management of water
- suggest methods to conserve water.

Unit 1.4 Soil

Soil as a natural resource formation of soil, soil profile, contents of soil mineral and biotic; soil pollution and its pollutants, measures to prevent soil pollution; soil erosion, soil conservation.

Learning Outcomes

After studying this unit the learner should be able to

- describe soil as a natural resource
- describe formation of soil
- illustrate soil profile, diagrammatically
- list various types of soils
- differentiate between biotic and abiotic components of soil
- define soil erosion and give its causes
- indicate various sources of soil-pollution
- suggest measures to prevent soil-pollution
- emphasise the need for soil-conservation

Unit 1.5 Forests

Forests - importance of forests, deforestation-reasons and its impact conservation and afforestation reforestation, importance of wild life, its conservation.

Learning Outcomes

After studying this unit the learner should be able to

- explain what a forest is and its importance
- classify forests into different types
- list important forest products
- give reasons of deforestation and its impact on nature.
- justify the need for conservation of forests, reforestation, afforestation and social forestry
- emphasise the importance of wild life in nature
- differentiate between pets, domesticated and wild animals
- relate depletion of wild life with deforestation
- suggest methods of conservation of wild life

Module 2: Matter and Materials

Study Time : 30 hours

Approach

The purpose of this module is to highlight the existence of different forms of matter and their importance in our life.

Unit 2.1 Matter Around Us

After studying this unit the learner should be able to :

- define matter with examples
- classify matter properties
- demonstrate that the three states of matter are inter-convertible
- state characteristics of elements, compound and mixture, with examples
- define atom and molecule and explain how the atom is the smallest stable particle of an element
- explain valency with examples
- write the formulae of a few chemical compounds used in daily life
- recognise the need and different ways of separation of substance from mixture
- establish relationship between the type of constituents to be separated and the method of separation employed

Matter and its states (solid, liquid, gas), Inter conversion of different states of matter: Properties of matter; classification of matter into elements, compounds and mixture and their properties: atoms and molecules, symbols of common elements: simple chemical equations is separation of substances. common methods of separation-hand picking, winnowing, sieving, magnetic separation, decantation, sedimentation, loading filtration, evaporation, sublimation, distillation.

Unit 2.2 Acids, Bases and Salts

Acid and bases – properties of acids and bases with examples; salts – formation of common salts. Uses of acids, bases and salts.

Learning Outcomes

After studying this unit the learner should be able to

- define acids, bases and salts with common examples
- list properties of acids and bases, and relate them with the formation of salts
- name common salts and mention their uses
- recognise presence of acids, bases and salts in items of everyday use

Unit 2.3 Carbon and its compounds

Existence of carbon in the biosphere. materials rich in carbon – charcoal. coke, carbon black and their uses; forms of carbon – graphite and diamond, their properties and uses; carbon compounds – carbon dioxide and carbon monoxide; their properties and uses.

Learning Outcomes

After studying this unit the learner should be able to

- recall carbon as an element and recognise its presence in nature
- name materials rich in carbon such as charcoal, coal, carbon black and mention their uses
- distinguish between the two forms of carbon - graphite and diamond on the basis of their properties
- explain the uses of graphite and diamond
- list uses of carbon dioxide and carbon monoxide.

Unit 2.4 Fuels

Types of fuels - fire wood. cow dung, coal. agriculture waste bio-gas, petroleum; petroleum formation petroleum products; LPG: properties of each of the compounds listed and their uses, CNG.

Learning Outcomes

After studying this unit the learner should be able to

- explain the term fuel with examples
- recognise the necessity of fuel in everyday life
- compare different types of fuels
- give an elementary idea of formation of petroleum
- name some common petroleum products and mention their properties and uses
- suggest measures for conservation of fuel

Unit 2.5 Materials We Use

Classification of materials-natural and man-made with examples: minerals their properties and uses. classification of minerals with example. mineral wealth of India; metallic minerals (ores), properties of metals and non-metals, uses of metals, conductors and non-conductors, uses of metals (iron.copper aluminum); alloys-their properties and uses, Man-made materials-needs and examples, glass, synthetic fibre, polythene, detergents, soap, cement, fertilizers pesticides and their hazards; bio-degradability

Learning Outcomes

After studying this unit the learner will be able to

- differentiate between material and object
- list examples of materials used in everyday life
- explain the meaning of minerals with examples
- list properties and uses of minerals
- appreciate the mineral wealth of India
- define ore with examples
- distinguish between metals and non-metals
- list uses of some common metals (Iron, Copper, Aluminum)
- define an alloy and list the properties and uses of alloys of zinc, copper, iron and aluminum
- relate depletion of naturally occurring materials with the effects on our life
- justify the need for substitution of naturally occurring materials with man-made materials
- list examples and uses of some man-made materials (synthetic fibres, polythene, soap, fertilizers etc.)
- explain biodegradability
- enumerate the demerits of man-made materials (non-biodegradability)

Module 3: Changes Around Us

Study Time : 24 hours

Approach

This module highlights that change is an integral part of nature. Changes occur in various forms and can be classified in a variety of ways.

Unit 3.1 Changes in Daily Life

Changes in daily life with example such as evaporation of water seasonal changes, curd preparation, burning of candle, etc, classification of changes-slow and fast, periodic and non-periodic, reversible and irreversible, physical and chemical changes with examples: mention fermentation, rusting, curd formation seasonal changes, formation of day and night, phases of moon as different categories of changes.

Learning Outcomes

After studying this unit the learner should be able to

- list a number of changes occurring around us and classify them into natural changes (occurring by themselves) and induced changes
- differentiate fast and slow change
- distinguish between periodic changes and non-periodic changes with examples
- differentiate between physical change and chemical change
- describe fermentation

Unit 3.2 Combustion

Combustion (everyday experience of combustion), kinds of combustion-spontaneous, rapid and slow combustion with examples; flame

Learning Outcomes

After studying this unit the learner should be able to

- explain combustion and cite its examples
- list the condition required for combustion
- differentiate between rapid and slow combustion, spontaneous and non-spontaneous combustion, with examples
- explain that every combustion reaction requires certain temperature to ignite

Unit 3.3 Evolutionary Change

Evolution of life, from single to multicellular forms. extinction of dinosaurs. evolutionary change still in progress

Learning Outcomes

After studying this unit the learner should be able to

- trace the evolution of life from single celled to multicellular organisms
- establish a close similarity between most animals and plants in their basic structure
- describe the importance of fossils in explaining evolution
- cite the example of dinosaurs as an evidence of evolutionary change
- explain that more complex forms including plants and animals had been evolving through the ages

Unit 3.4 Devastating Changes

Earthquake – causes and effects, volcano – causes and effects; cyclone – causes and effects; climatic changes – drought and flood, causes and their effects; global warming: green house effect: disaster management. precautionary measures to be taken during natural disasters.

Learning Outcomes

After studying this unit the learner should be able to

- differentiate between normal and devastating change with examples
- list a few earthquakes in the recent past in India
- describe the kind and extent of damages due to earthquake
- name the instrument used to measure the intensity of earthquake
- relate intensity of earthquake with the damages it causes
- describe the common causes of earthquake
- suggest precautionary measures to be adopted during earthquake
- describe a volcano
- explain the causes and effects of volcano
- show the relationship between distribution of volcano and earthquake-belts on the world map

- explain the causes of occurrence of a cyclone
- give examples of cyclones in India in recent years
- dist the kind of damages that can be caused by cyclones
- suggest precautionary measures to be adopted during cyclone
- describe the damage caused by drought
- suggest precautionary measures to be adopted during drought
- give common causes of flood and damages it causes
- suggest precautionary measures to be adopted during floods
- explain floods
- explain global warming and give its effects
- suggest precautionary measures to prevent global warming.

Module 4: Motion and Force

Study Time : 18 hours

Approach

The aim of this module is to highlight the various aspects of motion and force as they occur in nature and as required and applied by human beings for their requirements.

Unit 4.1 Motion – Causes, Kinds and Measurement

Motion, Types of motion, displacement and distance, SI units (length, time, speed, mass, volume); force, effects of force; friction; laws of motion; gravitational force and weight.

Learning Outcomes

After studying this unit, the learner should be able to:

- explain motion and rest with examples
- explain various types of motion such as linear, periodic with their examples
- distinguish between distance and displacement with the help of common examples
- define measurement
- justify the need for use of Standard International units of measurement
- measure volume of irregular objects
- state and explain the unit of distance i.e. length
- describe time and its units
- establish relationship between distance and time for moving objects
- define speed and give its unit
- explain the cause of motion i.e. forces
- describe different types of force
- define weight and mass and give their units

- distinguish between weight and mass
- explain three laws of motion and their uses in day-to-day activities
- list the advantages and disadvantages of friction
- describe the effects of gravitational force.

Unit 4.2 Simple Machines

Simple machines - lever, pulley, wheel inclined plane with examples

Learning Outcomes

After studying this unit the learner should be able to

- state various types of simple machines and their uses
- explain how machines work
- classify lever and describe their action
- give examples of different types of lever
- describe applications of lever

Unit 4.3 Pressure

Pressure, atmospheric pressure, thrust direction of pressure; vacuum with example from daily life. buoyancy, Archimedes Principle – floating of bodies.

Learning Outcomes

After studying this unit the learner should be able to

- explain pressure with examples
- demonstrate the atmospheric pressure with experiments
- establish relationship between the speed of fluids and the pressure
- distinguish pressure, force and thrust with example of each
- explain buoyancy
- state applications of Archimedes principle
- recognise the importance of vacuum giving examples such as vacuum cleaner, holding an object by creating vacuum.

Module 5: Energy

Study Time : 24 hours

Approach

This module highlights the importance of energy in our daily life. It also emphasises upon the recognition of various forms of energy available and its economic utilisation and management.

Unit 5.1 What is Energy

Energy, SI unit of energy, different forms of energy, sources of energy (Conventional and non-conventional), alternate sources of energy – wind mill, bio-ga. solar energy Sun as the ultimate source of energy: principle of conservation of energy.

Learning Outcomes

After studying this unit the learner should be able to:

- explain energy
- list various forms of energy giving examples
- state different units of energy
- list different sources of energy in nature
- classify different sources of energy into conventional and non-conventional sources
- emphasise the need of non-conventional sources of energy
- argue that Sun is the ultimate source of energy
- justify the need for proper management and conservation of energy

Unit 5.2 Mechanical Energy and Heat

Mechanical energy, kinetic and potential energy, with examples, inter conversion of energy; heat energy, its SI unit; temperature – its measurement; different types of thermometers; melting, freezing and boiling points, expansion of solid, liquids and gases due to heat; conduction, convection and radiation; effects of heat and radiation in our daily life; solar heat relative to distance from Sun.

Learning Outcomes

After studying this unit the learner should be able to

- explain mechanical energy with examples
- list various forms of mechanical energy
- differentiate between kinetic and potential energy, giving examples
- explain inter-conversion between different forms of energy
- explain heat as energy and give its unit
- explain temperature and units for its measurement
- handle and read thermometers
- differentiate between boiling point and melting point of a substance
- explain that heat can cause expansion of solid, liquid and gas
- state the mode of transmission of heat energy
- identify the effects of heat and radiation in our life
- give reasons for unequal distribution of Sun's energy on earth.

Unit 5.3 Light and Sound

Sources of light – luminous and non-luminous objects: transparent: translucent and opaque; path of light, speed of light, shadows: eclipses – lunar and solar eclipse, safety measures during eclipse; reflection and refraction of light: types of lenses and their uses; structure of the eye, defects of vision: sound production. and vibration, sound speed, noise pollution.

Learning Outcomes

After studying this unit the learner should be able to

- list various sources of light
- classify sources of light as luminous and non-luminous with examples
- distinguish among transparent, translucent and opaque objects and cite examples of each of these
- demonstrate that light travels in straight line
- demonstrate shadows and co-relate them with the eclipse
- differentiate between lunar and solar eclipses
- explain safety measures to be adopted during solar eclipse
- demonstrate and list the properties of light such as reflection and refraction of light
- list various types of lenses and their uses
- draw and explain the structure of eye
- give reason for proper care of eye
- describe sound as an energy with examples
- explain that vibrations cause sound
- demonstrate that some medium is required for sound to travel
- give various characteristics of sound
- list various uses of sound by humans and animals
- recognise that any sound which is intolerable is noise pollution.

Unit 5.4 Electricity and Magnetism

Static electricity; electric charges (positive and negative) and attraction and repulsion between them); electric conductors and insulators; Atmospheric electricity lightning and thunder, dry cell, electric current, risks of electric current and safety precautions – fuse wire.

Magnets – properties, attraction and repulsion (North and South poles); magnetic compass, magnetic field of the earth, electromagnets.

Learning Outcomes

After studying this unit the learner should be able to

- explain static electricity with examples, differentiate between positive and negative charge and attraction and repulsion between them
- give reasons for lightning in the sky
- explain the transmission of electricity with examples
- mention sources of electric current, dry cell and electric generator
- distinguish between the electric current in a cell and the household electricity
- list the possible hazards due to mishandling of electric current and suggest the precautionary measures.

- recognise the need of earth wire and fuse wire in electric circuits.
- state the importance of electricity in our daily life and the need for its proper management
- define magnetism and give properties of a magnet
- explain that the earth is a giant magnet
- list uses of magnet (magnetic compass) locate direction separation of an element from mixture etc.)
- explain electromagnetism and its applications

Module 6: Life Processes

Study Time: 30 hours

Approach

This module is aimed at providing a general idea of diversity in the living world and acquainting the learner with broad aspects of various life processes essential for survival, maintenance and continuance of life. The learner will also have the knowledge of body organisation related to these processes.

Unit 6.1 The living World

Diversity of life, unity in common characteristics in living organism (exchange of material with environment, use of energy by organisms; composition of body cell /cells, reproduction, definite life span); classification: similarity and differences among the living forms; bacteria and single-celled organisms: fungi; plants and animals; role of energy in the life processes.

Learning Outcomes

After studying this unit the learner should be able to

- differentiate between living and non-living
- Identify the vast variety of living beings (from mosses to plants, from ants to elephants etc.)
- list similarities and differences among living forms
- classify various living forms into five major groups (bacteria algae fungi, plants and animals)
- explain the role of energy in the life process (producers/consumers/decomposers)

Unit 6.2 Living Beings – Structure and Functions

Parts of the single-celled organisms, their relationship with the functions of the body, multi-cellular organisms (structure of the fungi, plant parts – root, stem, leaves, flower, fruit and seed; animal-diversity in external forms).

Learning Outcomes

After studying this unit the learner should be able to

- illustrate the general structure of a single-celled organism (*Amoeba* and *Chlamydomonas*)
- draw and label the structure of a fungus like bread mould
- list various parts of plant
- identify various body outline in animals (sponge, scorpion, butterfly, fish bird, elephant).

Unit 6.3 Functions of the Plant Body

Food formation by plants – autotrophs, heterotrophs, saprotrophs and parasites; insectivorous plants: photosynthesis; translocation (ascent of sap, movement of nutrients); respiration; removal of wastes (gum and resins); growth; reproduction pollination and fertilization; dispersal of seed.

Learning Outcomes

After studying this unit the learner should be able to

- explain that the plants are able to produce their own food with the help of CO₂ and H₂O in the presence of sun-light
- classify plants into autotrophs, saprotrophs, parasites and insectivorous plants with examples.
- explain the process of ascent of sap from the roots to the upper parts of the plant
- describe the movement of food manufactured in the leaves to the other parts of the plant
- explain that plants also respire
- explain that plants also excrete certain products from their body such as water. gum and resins
- relate growth in plants to the increase in plant substance
- explain various methods by which plants produce their own kinds, increase their number and maintain their race
- list the ways of dispersal of seeds in plants.

Unit 6.4 Working of the Human Body-I

Organs and processes of movement nutrition, respiration, circulation.

Learning Outcomes

After studying this unit the learner should be able to:

- describe that the human body is a complicated machine with various sets of structures acting in a co-ordinated manner
- list the systems in the body related to support and movement, nutrition, respiration, and transport of materials
- describe the organs responsible for support and movement of the body (simple idea about skeleton and muscle)
- differentiate between breathing and respiration
- describe the organs concerned with respiration
- list the organs concerned with circulation of body fluid
- draw the structure of heart and describe its working
- explain the importance of blood

Unit 6.5 Working of the Human Body-II

Organs and processes of - excretion, reproduction and co-ordination

Learning Outcomes

After studying this unit the learner should be able to:

- explain urinary system giving a brief idea about urine formation and excretion
- describe the organs and working of male and female reproductive system
- describe the parts of the nervous system – brain, spinal cord and nerves (sensory and motor)
- indicate the complexity of brain and the high level of intelligence in humans
- list the sensory organs of humans and describe the functions of eyes and ears

Module 7: Better Living

Study Time : 24 hours

Approach

This module highlights the contribution of science towards physical, mental and social well being of humans. It also aims at providing a glimpse of the life and contribution of some international and national personalities in science.

Unit 7.1 Healthy Life

What is health; food and its constituents – carbohydrates, fats, proteins, minerals, vitamins – sources and their nutrient value; common deficiency disorders; obesity and its prevention; hygiene; diseases – causes symptoms and prevention; immunization.

Learning Outcomes

After studying this unit the learner should be able to

- explain the advantages of healthy life
- explain the advantages of healthy life
- relate importance of food to healthy life list constituents of food – fats, carbohydrates, proteins, minerals, vitamins etc.
- identify sources of various food constituents
- explain the concept of malnutrition, under-nutrition and over-nutrition
- list and identify dietary deficiency diseases, vitamin deficiency, PEM, mineral deficiency
- explain the concept of balanced diet and the use of five food groups
- explain obesity, give its reasons and the ways it can be prevented
- identify the need for personal and environmental hygiene
- develop various hygienic habits
- explain disease, giving examples, causes and symptoms of common diseases (fever, gastroenteritis, cough and cold, jaundice, typhoid, water-borne disease, chicken pox, measles)
- suggest means for prevention of these diseases
- explain the meaning of immunization
- state the need and advantages of immunization
- explain the consequences of loss of immunity

Unit 7.2 Body Care

Healthy habits with respect to the care of teeth, eyes, ears, hair, nail and other parts of the body; concept of early to bed early to rise makes a man healthy, wealthy and wise; balanced diet; cleanliness of one's surroundings.

Learning Outcomes

After studying this unit the learner should be able to

- identify the need for care of every part of the body
- justify the need to establish healthy habits
- explain the need and methods of taking care of teeth, eyes, ears, hair nail and other parts of the body
- identify the importance of healthy food habits
- list various behavioural patterns related to good food habits
- identify the need for adequate sleep and rest
- identify the need for cleanliness of surroundings

Unit 7.3 Plants and Food Production

Increasing population and food, Green revolution, improvement in agricultural practices – mechanised farming better irrigation fertiliser, pest control, pesticides, weedicides; harvesting and storage; soil management (crop rotation, multiple farming); improved varieties of crops; food preservation; food pasteurisations. animal husbandry white revolution blue revolution poultry.

Learning Outcomes

After studying this unit the learner should be able to

- justify food as one of the primary needs of humans
- explain the need for increasing food production with the rising population
- list major steps towards producing more food
- explain Green revolution
- list the common practices for improving agriculture-yield
- describe the ways of providing better irrigation
- explain the meaning of white revolution and the need of increased milk production
- describe blue revolution
- describe the role of poultry in providing food, differentiate between fertiliser and manure
- explain the need for judicious use of fertilisers
- name the common pests of agricultural crops and methods of their control
- differentiate between pesticide and weedicide
- explain the need for proper harvesting and storage
- describe the significance of crop rotation and multiple farming in soil management

- list improved varieties of wheat, rice, a fruit (such as mango), a vegetable (such as tomato potato).
- explain the need for food preservation
- describe the conventional methods of food preservation.
- outline the steps in pasteurisation of milk
- differentiate between pasteurisation and sterilisation.

Unit 7.4 Communication

Communication in animals. means of communication-telephone. fax, television, computers, internet and satellite, weather forecasting, natural and artificial satellite and their uses, communication in animals.

Learning Outcomes

After studying this unit the learner should be able to

- explain communication in animals
- list various means of communication
- identify the progress in means of communication (information technology)
- construct a crude telephone
- explain various kinds of telephone and principle of working
- explain in simple terms the working of FAX and E-mail
- distinguish between the educational, information and entertainment value of television
- outline in simple terms the process of telecast of television
- list the use and convenience of calculators and computers
- explain in simple terms working of a computer
- appreciate the closeness brought about between all parts of the world by information technology
- explain what is a satellite and its working
- explain communication in animals
- explain in simple terms communication in honey-bees through specific dance postures and formations.

OPEN BASIC EDUCATION – CURRICULUM

Subject – Social Science

Level ‘C’

Rationale

To be meaningful, an educational programme needs to strike a dialogue with its target learners by making them aware of their place in their immediate surroundings and their relation to the society of the past and future. The role of social sciences in this context is of great significance.

The various components of social science, viz. History, Geography and Civics have been integrated in this curriculum. The task of social sciences is to focus in a systematic way on the study of human behaviour. This curriculum therefore, focuses on the various activities of human beings. A theme-based approach has been adopted here, which means that topics are to be studied through the ages, instead of studies in more depth of particular periods. Details about names, dates, places, etc. are to be avoided. This approach traces the change in our social systems, pausing briefly here and there to go into case studies of some historically representative types, culminating in a detailed discussion about the present, which is where Geography, Economics and Civics come in.

Insets are to be used to provide anecdotes, biographical sketches of kings and other famous people, brief descriptions of outstanding events, etc., wherever possible. Illustrated time-lines are also to be used alongside the text material.

The attempt is to make the study of social sciences a mental engagement in understanding rather than an exercise in memory where the learner hardly sees any meaning in what he/she memorizes. The kind of approach mentioned above would help pupils understand similarity and difference, caution and the processes by which change takes place in human affairs. It also renders the task of integrating the various components of social sciences, easier.

Objectives :

The broad objectives of the social science curriculum are as follows

- (a) To help achieve a greater awareness of themselves, to examine and clarify their values and to establish a sense of self-identity.
- (b) To provide learners with an understanding of past events and persons and of their roles in shaping present-day lives.
- (c) To promote in learners an understanding and acceptance of other people with different values and lifestyles.
- (d) To provide learners with an awareness of the interaction between man and environment and its effects on the physical and social world.
- (e) To provide learners with the skills necessary to systematically analyse situations and to arrive at possible alternative.

Introduction to History

1. Nomadic life, beginning of agriculture, settlements, development of community life, mixed farming, town planning-Indus Valley civilisation – Social, Economic, Political and Religious beliefs.
2. Vedic culture and the Aryans – Social, Economic and Political life. *Ramayana* and *Mahabharata*. Sources of information.
3. Mauryan Empire–Nanda dynasty, Janapedas, Mahajanapedas.
Mauryas, Rise of Jainism and Buddhism foreign invasions–Sakas, Parthians
4. Gupta Empire – Chandragupta, Samudragupta brief Political history, cultural, administrative contributions, History of southern kingdoms – Pallavas, Chalukyas.
5. History of Harshavardhana, Kanishka, Cholas, Cheras, Pandyas.
6. Establishment of Delhi sultanate
coming of Arabs to India,
Invasions of Ghazani, Ghoris
Establishment of slave dynasty, Tughlaks, Khiljis.
Rise of Province kingdoms in the south.
7. Establishment of Mughal Empire.
Babur’s invasions and the Lodhis, Rajputs, Sher Shah Suri, Akbar, Jahangir, Shah Jahan, Aurangzeb administrative and cultural achievements.
Marathas, Rajputs.
8. Coming of British to India and rise of regional powers to British colonial system – (a) agrarian (b) trade and (c) industry and its impact on the country.
9. Social and religious reform movement in the 19th century. Education and its impact.
10. Revolt of 1857 and changes in British administration, other revolts – Jats, Sikh, Satnami etc.
11. Rise of Nationalist Movement
12. Arts : Painting, literature, sculpture and its development.
13. India after Independence.

Some Geographical Facts

The aim of social science, under its Geography component, is to give the knowledge to its learners. ‘The Earth as an unique living planet of the solar system.’ Learners should have the knowledge of Lithosphere, Hydrosphere, Atmosphere and Biosphere and also the knowledge of Environment and the relation with the human beings. Learners should have the knowledge of Resources, their use and their conservation. Knowledge of the Global problems, like economic, Racial, boundaries and the problems emerged due to the resources.

Topics

1. **Origin of our Earth**, Solar system and big bang theory (Introduction). Motions of Earth, Rotation, Revolution, Day and Night, change of seasons. Latitudes, longitudes, standard meridian, local time
2. **Internal Structure of Earth**, Crust, Mantle and core, Realms of Earth Lithosphere, Hydrosphere, Atmosphere and Biosphere formation of continents and oceans and continental Drift, theory.
3. **Major Land forms**, Mountains, Plateau and plains, volcanic eruptions, Earthquake and Tsunami waves.
4. **Weathering gradation and degradation** type of weathering, physical, Chemical and Biological weathering, agent of weathering, glaciers, water, Air sea waves Plants and Animals. Land formations made by different agents of gradation like U shape valley, cirque Horn, Moraine, V shape valley, water fall, Oxbow lake, meanders Delta, Barkhan, Mushroom Rock cliff Beach, Sea Bridge etc.
5. **Composition of Atmosphere**. Temperature zones, air pressure and winds, Humidity, weather and climate.
6. **Oceans**, relief features of ocean bottom, Movement of ocean water waves, tides and currents, ocean Resources.
7. **India**, physical Divisions of India, monsoon climate of India. Resources of India, soil, types of soil, soil conservation, water resource, harvesting of water, Hydro power, forest resource, deforestation, afforestation, wild life, National Parks and Abhyaranya of India.
8. **Mineral resource**, Metallic and non-Metallic. Iron, coal, petroleum Atomic mineral and Atomic power stations in India.
9. **Agriculture**, Types of Agriculture, Main crops, cereals, beverage, fiber and commercial crops, crops seasons, Rabi Kharif and Jaiad. Green revolution.
10. **Industries** of India from ancient to modern days. Iron, Textile and chemical Industry. Comparative study of Tata Nagar Jamshedpur and Detroit of USA and Mumbai and Osaka, Japan.
11. **Transportation, communication**, and Trade. Road, Rail and water transport. Satellite communication and National and International trade.
12. **Population in context of India**, Birth rate, Death rate, sex Ratio Problems due to thick population of India. Human settlements urban and rural. Comparative study of the people life of Amazon and Ganga River valley.

Social and Political life

Unit 1. Diversity as a fact of (human) life :

Diversity in India (linguistic, cultural, socio-religious)

Diversity as a source of conflict

Unity and Diversity in India – need for peace and harmony

Unit 2. Understanding Society :

Social life – Gender, family, community

Economic life – Division of labour, contribution of women as work Force and other roles Role of market

Unit 3. Government :

The need of government
Various forms of government
Functioning of democratic government

Unit 4. The Constitution :

Ideals of Indian Constitution e.g. secularism in the context of India as a myth - religious society.
Fundamental Rights
Fundamental Duties

Unit 5. Structure of Government

- (a) Parliamentary Democracy-Its suitability for India
Parliament - composition and functioning
Executive - President, PM, council of Ministers
- (b) Federal structure – with unitary features.

Unit 6. Indian Judiciary : Lower to higher courts

Unit 7. State Government : Legislature and Executive

Unit 8. Local Government : Rural and urban

Unit 9. Institutional Representation of Democracy : Universal Adult Franchise, Elections, Political Parties, Media, Coalition Government

Unit. 10. Social Justice : Marginalised Groups – SC. ST and OBCs forms of social inequality, Reservation

Unit 11. Economic Presence of the Governement :

Infrastructure and social sector.

Open Basic Education (OBE)
NIOS

Curriculum

Level – 'A'
(Eng., Hindi, Maths, EVS)

Open Basic Education (OBE)
NIOS

Curriculum

Level – 'B'
(Eng., Hindi, Maths, EVS)

Open Basic Education (OBE)
NIOS

Curriculum

Level – 'C'
(Eng., Hindi, Maths, Science & Social Science)