ALP Curriculum for Elementary

Package D & E | 2022

GENERAL SCIENCE

Directorate of Curriculum and Teacher Education
Khyber Pakhtunkhwa, Abbottabad

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ACKNOWLEDGEMENT

Education clarifies our perception of the world around us and helps changing it into a better place. It develops an insight of peeping deep into our lives. It is of utmost importance that every individual be educated for unlocking his/ her potential. Both on personal and national levels, education has been shown to increase economic growth and stability. Education strengthens economic and social status of an individual as well as contributes to a skilled human resource of a country.

Pakistan has many national and international commitments to provide quality education to all children in the country and to enroll all Out-of-School (OOS) Children. The government of Khyber Pakhtunkhwa is determined to provide innovative solutions to address the issue of OOSC in KP, which will pave ways to meet Sustainable Development Goals (SDGs) and Education 2030 targets.

To overcome these challenges the Directorate of Curriculum and Teachers Education (DCTE) has come forward with a solution of "Accelerated Education Programme" that provides fast track and cost-effective education opportunities to those who missed their first chance of education. The accelerated education programme will provide them a chance to re-connect to education and continue their education and training for improved living. The main objective of the AEP is to guide teachers/education providers to teach the curriculum in an accelerated mode without compromising the Student Learning Outcomes (SLOs) and required abilities and competencies.

Elementary & Secondary Education Department, Government of Khyber Pakhtunkhwa, introduces Elementary level Accelerated Education (AE) Curriculum that offers fast track Elementary (middle) education course/ program for children who cannot continue their education in formal schools system because of various reasons, such as being overage, dropped out before completing primary or elementary education cycle, involved in some work etc. It is worthwhile to mention that children out-of-school (OOSC), especially those between the ages of 10 to 16 constitute 82% of the total OOSC in the province. This curriculum will provide an opportunity to large proportion of children within this age cohort.

As part of the overall Non-Formal Education (NFE) programme of the Government, this AE curriculum is equivalent to the formal education elementary level curriculum. Being flexible, alternative and fast track in nature, this curriculum will fulfill the learning needs of a diverse, marginalized and complex group of out-of-school children in the province particularly those who overage, dropped out and have limited opportunities for re-entering the education stream.

The experts deserve enormous appreciation for accomplishing a complex task of developing, reviewing and refining the NFE/ AE curriculum for Elementary level. Although AE curriculum development is a breakthrough and huge accomplishment, but I take it as a new

beginning and first step towards the development of a new accelerated education program at this level.

Let me appreciate the technical and financial cooperation of development partners especially UNICEF who graciously extended their support.

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INTRODUCTION

Articles 25-A and 37(b) of the Constitution of Islamic Republic of Pakistan guarantee right to education (RTE) to all children between the ages of 5 and 16 It is pertinent to mention that basic education is free and compulsory according to these articles and the Government is responsible to provide free education (textbooks, tuition fee etc.) to all children of this age group. At the same time, the Government of Pakistan is bound to provide the right to quality and relevant education under Sustainable Development Goal # 4 (SDG-4) and education 2030 framework for action that is taking forward the agenda enshrined in Education for All (EFA).

In order to translate the constitutional and international commitments into reality and provide the right to free and compulsory education, the Government of KP has responded positively by developing and implementing KP Education Sector Plan. In addition, the E&SED is also strengthening the Non-Formal Basic Education sub-sector by developing provincial NFE policy and related accelerated education programmes for primary and elementary levels to provide alternative education opportunities to out-of-school children in the province. Alternative and accelerated education programmes at both primary and secondary levels will not only complement efforts to address the issue of out-of-school children, but also as stand-alone approach to provide basic education to older age out-of-school who cannot seek admission in formal schools.

Why Accelerated Elementary Education Programme

Following are major reasons that necessitated development of accelerated education programme (curriculum) for elementary level:

- In KP, 80.5% public sector schools are primary, whereas remaining 19.5% include elementary, secondary and higher secondary schools. The supply side proportion of schools in KP highlights its direct relationship with out-of-school children in the province i.e. only 18% children of 5-9 years of age are not in schools and that remaining 82% belong to 10-16 years of age cohort. This proportion validates that; more schools-less out-of-school children and less schools-more out-of-school children. Based on this fact, the province essentially needs a programme at elementary level that is cost effective, flexible and have the ability to be established quickly, so that the children of 10-16 years of age have extensive opportunities of education (Data source: Pakistan Education Statistics 2016-17).
- Accelerated elementary education will fill gap that has been caused by less number of elementary education schools in the province. This programme will essentially be offered in areas where OOSC are more and that only primary schools are available. This

programme may be offered in both morning and evening shifts as appropriate.

- Furthermore, a large number of children, especially girls between the ages of 10-16 in KP, have completed primary education and cannot go to schools owing to unavailability of elementary schools. Therefore, accelerated elementary education programme can offer them a second chance to reconnect to education. This programme will particularly be extremely useful for girls as 67% of the OOSC in KP are girls (Data source: Pakistan Education Statistics 2016-17).
- Accelerated elementary education (curriculum) programme will provide continuing education opportunities to primary pass-outs to transit to elementary level without any interruption. The elementary education programme will be offered in areas where accelerated primary education programme is offered.
- Accelerated elementary education programme, which is fast track and will offer completion of elementary cycle in 18-20 months instead of 36 months, will be an excellent option for those who have primary education certificate and have wasted a few years owing to unavailability of elementary school. This will help in bridging lost educational years and come at par with other children. The said fast track programme will also help in addressing the psychological fears of children that restrict them to reconnect to education.
- The accelerated elementary programme, being a fast track, flexible and cost effective, will require less cost to get operationalized. Therefore, the E&SED may expand the said programme to include most of the OOSC.

INTRODUCTION TO THE CURRICULUM

Curriculum consists of elements that promotes learners' intellectual, spiritual, aesthetic, emotional, social and physical development. Together with curricular and co-curricular activities, it includes approaches to teaching, learning and assessment, quality of relationships within the school, and the values embodied in the systematic functioning of a school especially in non-formal and accelerated education setting.

Subject based curriculum refers to a document describing learning outcomes, the scope and sequence of contents, learning activities, methods of delivery in the classroom. It also includes assessment and evaluation techniques consistent with the Curriculum Framework of a particular subject, and it also provides guidelines for developing pedagogical materials. The accelerated elementary curriculum builds logical connections with the national Curriculum 2006, equivalent to the same as well, and narrates terminal competencies accordingly.

The elementary AEP curriculum is standard based and provides indicators of expectations from learners at completion of each of the packages and grades defined in the curriculum. The curriculum provides a logical sequence of strands/ competencies, standards, benchmarks and students learning outcomes (SLOs). Each SLO is further elaborated by contents, preferred teaching methodologies and techniques to assess the SLOs, which are coded properly. The purpose of coding the SLOs is to enable teachers and education experts to understand the connection between a specific SLO and the corresponding topics provided in the textbook and the guide for teachers. In this way, the teachers will be able to meaningfully connect the topics with SLOs and eventually establish a link to the benchmarks, standards and the strand, which describe expectations from the learners. Such an arrangement is equally useful for the material developers/ authors to be specific while designing contents and activities and examples that suit the learning needs of the learners of NFBE schools, which are comparatively different from the learners studying in formal school environment. Similarly, the prescribed assessment techniques are useful for the teachers and evaluators to formulate relevant test items and apply a pertinent assessment method to assess the learning achievement of the learners.

Curriculum provides base of the teaching and learning system which derives its inspiration and vision from the Education Policies. It sets its structure accordingly to describe concepts, skills and attitudes that have to be developed in the students. It aims to address key questions such as what is the purpose of teaching; what is the desired level of the students as measured by standards and benchmarks, and what will be taught to the students to prepare them for higher studies and the world of work. Curricula documents provide guidelines for textbook developers and authors to develop textbooks and supplementary reading material according to the defined and agreed competencies, scope and guidelines. These enable teachers to plan their classroom lessons; examiners to set formative and summative assessment according

to the prescribed competencies, and to textbook reviewers to review the textbooks according to the contents and scope. The curriculum is also a guiding document for the general public and parents about the wider aims of education and the academic processes that learners experience.

Curriculum Development Process

Department of Elementary and Secondary Education (ESED), Government of KP, decided to develop and offer accelerated education programme for a specific group of OOSC after carrying out a thorough survey to identify OOSC. At the same time, Technical Working Group (TWG) for Non-Formal Education (NFE) conducted a detailed situation analysis of education in general and Non-Formal Education in particular that gave concrete recommendations to go for Elementary level Accelerated Education Programme (AEP) and its curriculum that offers elementary cycle in short period of time in Khyber Pakhtunkhwa. OOSC situation and general situation analysis of the education sector precisely recommended development of accelerated education curriculum for both primary and elementary levels in KP.

DCTE engaged curriculum experts, non-formal education experts and subject specialists for Pashto, Urdu, English, Mathematics, Science, Islamiyat, Geography and History. A couple of workshops were held to review the national curriculum 2006 that showed a variety of different ways of curriculum framework for each subject. However, DCTE experts agreed have standard framework for all the subjects. The framework agreed highlighted vertical and horizontal sequence. The vertical sequence narrated strands/ competencies or themes, learning standards, benchmarks and SLOs. Similarly, the horizontal sequence suggested contents for authors/ materials developers, strategies for teachers and assessment techniques for assessors. Following key strategies were used to condense the curriculum:

- Merging the grades/ levels such as Katchi & 1 to be merged as package A, grades 2 & 3 as Package B, and grades 4 & 5 to be merged as Package C. This vertical integration of the grades/ levels helped in reducing levels/ grades and SLOs
- Review SLOs
- Finding out SLOs that can be integrated, without harming the acquisition of competencies
- Deleting the SLOs that appears to be repetitive
- Integrating SLOs that help in clubbing grades/ levels
- Analyzing where lower order competencies can easily be merged with the higher order skills/ competencies
- Integrating SLOs with other subjects that have alike (similar) learning outcomes.
- Integrating alike contents (concepts) of different subjects (based on SLOs' alignment)
- Emphasis on pedagogy (interactive activities) proposed in the curriculum.

DCTE has conducted a thorough review of elementary level national curriculum 2006 and merged certain levels, such as Grades 6 & 7 were merged as Package D, while Grade 8 was termed as Package E. However, Grade 6 and 7 were kept as it is under Package D and grade 8 under Package E for the purpose of equivalence and certification. Therefore, the accelerated elementary curriculum offers two levels instead of conventional three levels. Similarly, the experts conducted a detailed analysis of the SLOs and merged those appearing to be similar, repetitive and were not compatible with the age of the learners. However, competencies, standards and benchmarks, were kept as they were in the curriculum to obey equivalency principles. Curriculum experts and Subject specialists proposed viable contents, teaching and assessment strategies in the curriculum.

After that, experts review the curriculum and made it ready for approval and further use.

Curriculum Framework

The curriculum framework provides a generic introduction of the curriculum and a brief description of curriculum for non-formal basic education, aims and specific standards elaborated in the national guidelines. Briefly, Curriculum Framework is a broad policy guideline regarding development of learning materials, professional development of teachers/ instructional delivery system, assessment and testing of students' learning outcomes and feedback for changes required for effective future revision of curriculum.

Strand / Competency or Themes

Strand or competency is a key learning area, and used as the top most learning expectation of a particular topic of any subject. Strand and competencies are used interchangeably in different curricula, but convey the same meaning as the top learning expectation in a curriculum hierarchy.

Standards

Standards are broad descriptions of the levels of knowledge, skills and values we expect students to reach in a specific subject during specific time period of learning. The standards describe what all students should know, be able to do and values they should develop in each subject. Knowledge includes the important facts, concepts, issues and information. Skills include the ways of thinking, working, communication, reasoning and investigating that characterize each subject. The values are the feelings, attitudes, conscience, dispositions, principles, sanctions that are developed in each subject.

Benchmarks

Benchmarks are clear, specific descriptions of developmentally appropriate knowledge, skills and values that students should have by a certain point in time in their schooling. The benchmark statements indicate what students should know, be able to do and the values they should develop at each of the developmental levels i.e. early year, primary, elementary in order to meet the standards.

Student Learning Outcomes (SLOs)

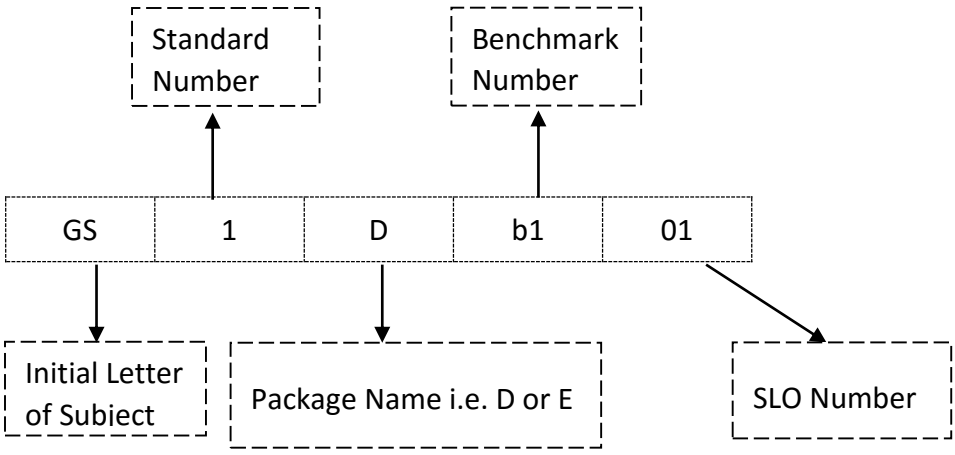
Student Learning Outcomes (SLOs) are specific statements that describe the knowledge, skills and values that students are expected to attain at the end of a particular grade. The SLOs must be SMART i.e. specific, measurable, achievable, realistic, time bound and observable. SLOs differ from objectives in that the focus is not on what the teacher will do but on what students should achieve.

Coding Scheme:

To understand alignment among Standards, Benchmarks, SLOs, Content and Assessment, a systematic coding scheme has been followed.

The elaboration of coding scheme is as follows:

Complete Code : **GS1Db101**



ALTERNATIVE LEARNING PATHWAYS (ALP) CURRICULUM OF GENERAL SCIENCE-PACKAGE – D & E (VI-VIII)

Introduction:

The General Science Curriculum for Package – D and E of ALP is specifically developed for Out of School (OOS) children in Khyber Pakhtunkhwa. The Curriculum is based on the belief that science education enhances students' ability to explore and question the nature of phenomena in the world around them. The curriculum is student-centred with an approach to develop higher order thinking.

The following Objectives are framed for General Science Curriculum designed for ALP to benefit Out of School children at the end of Package – D and E, the Students will be able to:

- Promote Inquiry-based science where students articulate their own questions, and try to answer the questions through investigative processes.
- Encourage 21st skills i.e. Critical thinking, Creativity, Communication and Collaboration in students and make confident analytical thinkers.
- Impart the knowledge to the students about the basic fields of Science i.e., Life Science, Physical Science, Earth and Space sciences.
- Use science and technology to acquire new knowledge and to create new opportunities to solve problems that would enable them improve quality of their own lives and lives of others.
- Observe Scientific Knowledge and its application in real life.
- Critically address social, economic, ethical and environmental issues related to science and technology.
- Expose students of various aptitudes to the wide variety of career prospects related to science, technology and the environment.

COMPARISON OF QUANTIFICATION OF DOMAINS, BENCHMARKS AND SLOs BETWEEN SNC (Grade VI – VII) AND ALP (Package – D)

S.NO	**DOMAINS**		**Benchmarks**		**SLOs**	
	SNC	**ALP**	**SNC**	**ALP**	**SNC**	**ALP**
1	A	A	04	04	48	30
2	B	B	09	09	112	52
3	C	C	02	01	11	11
Total	**03**	**03**	**15**	**14**	**171**	**93**

PACKAGE-D

Domain-1:	**LIFE SCIENCES**
Organisms - Characteristics and Life Processes of Living Things	
Benchmark I **By the end of package – D , students will be able to:** • Describe the structure and function of specialized plant and animal cells.	

Coding Key	**Students Learning Outcomes (SLOs)**	**Content**	**Suggested Activities/Methodologies**	**Assessment Strategies**
GS1Db101	**Chapter 1** **Cellular Organization** Recognize Cell as the basic unit of life that are organized into tissues, organs, systems and organisms.	• Cell • Tissues • Organs • System • Organism	Show the charts of a cell, tissues, organs and systems.	• Oral questions • Written questions • Flash cards • Observation
GS1Db102	Relate the structures of some common cells (nerve, muscle, epithelium and blood cells) to their functions	Structure of (nerve, muscle, epithelium and blood cells) Functions of cells	Show the charts and diagrams of nerve, muscle, epithelium and blood cells.	• Oral questions • Written questions • Flash cards • Observation • Activity • Model
GS1Db103	Identify the structures present in an animal cell and plant cell as seen under a simple microscope and relate them to their functions (only cell membrane, cytoplasm, nucleus, cell wall, chloroplast, mitochondria and vacuole).	Difference between plant cell and animal cell.	Observe slides of animal and plant cells through microscope and draw a labelled diagram.	
GS1Db104	Compare and contrast an animal cell and plant cell by preparing slides using onion peels and cheek cells.	Similarities between plant and animal cells.	Use the microscope to observe the structure of cell in onion peels and cheek cells.	

Benchmark 2
By the end of package – D , students should be able to:

- Explain the root and shoot system of plants emphasizing the process of photosynthesis, respiration and transpiration.
- Identify the different types of reproduction in plants.
- Compare and contrast the artificial and natural reproduction in plants.

Coding Key	Students Learning Outcomes (SLOs)	Contents	Suggested Activities/Methodologies	Assessment Strategies
	Chapter 2 **Plant Systems and Reproduction on Plants**		• Show the charts diagrams and models of external and internal structures. • Demonstrate the original specimen of Plant. • Observe the slides of internal structure of leaf, stem and root. • Classroom discussion focusing the role of Xylem and Phloem in transport of water and food in plants.	• Oral questions • Written questions • Flash cards • Observation • Discussion • Model • Activity • Mini-project
GS1Db201	Explain the root and shoot system in plants. Label different parts of leaf, stem and root (external and internal structure)	Root and shoot systems in plants Internal structure of leaf, stem and root.		
GS1Db202	Predict the role of xylem and phloem in transport of water and food in plants by observing the cross section of the stem.	Role of Xylem and phloem		
GS1Db203	Describe the process of photosynthesis and respiration in plants and derive word equations for it.	Photosynthesis and Respiration in plants		

GS1Db204	Describe the different types of reproduction in plants.	• Reproduction in plants	• Show the charts of photosynthesis and respiration in plants. • Activity/Group Discussion (Photosynthesis)	
GS1Db205	Compare and contrast types of reproduction (sexual and asexual) in plants.	• Types of reproduction in plants.	• Demonstrate the charts of different types of reproduction in plants • Show the charts sexual and asexual reproduction in plants • Assign project work to students to grow the plants using the Budding, Bulbs and Tuber techniques in the disposable cups.	• Oral questions • written multiple choice questions • Observations • Flash Cards • Project work
GS1Db206	Distinguish between artificial and natural asexual reproduction in plants. (Budding, grafting, Bulbs and Tuber)	• Artificial and natural asexual reproduction in plants		

DOMAIN -1:	LIFE SCIENCES
Organisms - Structure and Functions (Animals)	
Benchmark 3 **By the end of package – D , students should be able to:** ● Describe and explain the human respiratory, circulatory and digestive systems. ● Explore and explain the structure and function of major human organ systems, and relate them to the basic biological processes required to sustain life.	

Coding Key	Students Learning Outcomes (SLOs)	Content	Suggested Activities/Methodologies	Assessment Strategies
GS1Db301	**Chapter 3** **Human Respiratory and Circulatory system** Describe the process of respiration and write word equations for it.	Human Respiratory System	Demonstrate the process of respiration through students	• Brainstorming • Oral questions • written questions • Observations • Flash Cards • Role Model etc.
GS1Db302	Describe the role and function of major organs in the human respiratory system including trachea, lungs and alveoli (air sacs).	Organs in the respiratory system	Explain the human respiratory system through model and charts.	
GS1Db303	Differentiate between the processes of respiration and breathing.	Differentiate between respiration and breathing.	Prepare charts and cards showing respiration and breathing	
GS1Db304	Differentiate between aerobic and anaerobic respiration.	Aerobic and Anaerobic Respiration		
GS1Db305	Sketch and label the human circulatory system.	Human Circulatory system.	Show the chart of human circulatory system.	• Oral questions • written questions

GS1Db306	Describe the structure and function of the human heart.	Human heart Structure and function	Show the model/ chart of human heart. Group discussion on the composition of blood. Show the videos of human circulatory and respiratory system	• Observations • Flash Cards • Model etc • Label diagram of heart
GS1Db307	Explain how blood circulates in the human body through a network of vessels (arteries, veins and capillaries), and transports gases, nutrients, wastes and heat	Blood Circulation in the human body		
GS1Db308	Describe the composition of blood and the functions of red blood cells, white blood cells, platelets and plasma.	Composition of blood		
	Chapter 4 **Human Digestive System**			
GS1Db309.	State the importance of digestion in the human body and describe physical and chemical digestion.	Human Digestive system	Show the model/ chart of human digestive system. Demonstrate the charts/ video showing the enzymes in digestions.	• Oral questions • Written questions • Observation • Model
GS1Db310	Sequence the main regions of Alimentary Canal, its associated organs and describe the functions of different parts of the Alimentary Canal.	Organs of Alimentary Canal		
GS1Db311	Briefly describe the role of enzymes in digestion.	Enzymes		
GS1Db312	Briefly describe some major digestive disorders.	Digestive disorders		

Domain-1: **LIFE SCIENCES**
Human Health and Disease
Benchmark 4

By the end of package – D , students should be able to:
Identify the constituents of balanced diet and understand the consequences dietary deficiencies, which lead to different disorders.
Describe the causes and prevention of infectious diseases and how the natural immune system response to it.

Coding Key	Students Learning Outcomes (SLOs)	Content	Suggested Activities/Methodologies	Assessment Strategies
	Chapter 5 **Balanced Diet, immunity and diseases**			
GS1Db401	Identify the constituents of a balanced diet for humans as including protein, carbohydrates, fats and oils, water, minerals (limited to calcium and iron) and vitamins (limited to A, C and D), and describe the functions of these nutrients.	Balanced diet	Activity: Asked the students to bring the different foodstuff to the classroom, identify the constituents present in it, and discuss it.	• Brainstorming • Oral/written questions (Short questions/MCQs) • Observations • Flash Cards • Homework Assignment
GS1Db402	Identify the essential nutrients, their chemical composition, and food sources.	Essential nutrients and their chemical composition	Group Discussion: discuss the different food sources available to us. Class presentation: make groups of three students (large class) and assign to each group the contains of healthy diet. Make a pie Chart showing balanced diet	• Quiz on food nutrients
GS1Db403	Recognize that a healthy diet contains a balance of foodstuffs.			• Flash Cards • Oral/written questions (Short questions/MCQs) • Observations • Flash Cards
GS1Db404	Describe the parts of the immunity system and how they function to produce an immune response.	Immunity system		

GS1Db405	Describe the three types of immunity in humans – innate, adaptive, and passive.	Types of immunity	Group Discussion: explain and discuss the concept of immunity Role play: play role of different types of immunity Show charts of pathogens of different infectious diseases Chart/ drawing competition: the students prepare a chart/ drawing and show the ways in people can safeguard against the spread of infectious diseases.	• Oral/written questions (Short questions/MCQs) • Discussion • Flash Cards • Role play • Chart/ drawing competition
GS1Db406	Identify the various types of pathogens that cause infectious diseases.	Pathogens		
GS1Db407	Explain how infectious diseases such as hepatitis, covid-19, typhoid, and dengue are caused /contracted, how they are tested and diagnosed, and how they can be prevented.	diseases: hepatitis, covid-19, typhoid, and dengue		
GS1Db408	Suggest ways in which communities of people can safeguard against the spread of infectious diseases.	Safeguard against the spread of infectious diseases		

DOMAIN-2: PHYSICAL SCIENCES

Benchmarks: 1
By the end of package – D students will be able to;

- Analyse the complexity of matter and energy, particle model of matter, different states of matter.
- Differentiate between elements and compounds and draw structure of simple Elements.
- Distinguish between physical and chemical changes.
- Explain formation of chemical bonds.
- Investigate mixtures and apply the separating techniques
- Describe formation of solution and identify the different types of solution

Coding Key	Students Learning Outcomes (SLOs)	Content	Suggested Activities/Methodologies	Assessment Strategies
	Chapter 6 **Atomic Structure**			
GS2Db101	Describe the structure of matter in terms of particles (i.e., atoms and molecules).	The particle theory of matter Atoms Molecules Element Compound	Group discussion: discuss the particle theory of matter.	• Brainstorming • Oral questions • written questions (MCQs, Short Questions) • Flash cards • Observation • Table of elements and compounds competition
GS2Db102	Describe the structure of an atom in terms of electrons, protons and neutrons.	structure of an atom electron proto neutron	Demonstration using charts and flash cards to show the electrons, proton and neutrons in atoms. Activity: perform an activity to show that how compounds are	
GS2Db103	Differentiate between atomic number and mass number.	Atomic number and Mass number		

GS2Db104	Recognize the names and symbols for some common elements (first 10 elements of the Periodic Table) and recognize their physical properties	Name, symbols of elements and their physical properties	formed, such as burning of sugar or reaction of Iron and sulphur. Prepare diagram atom showing the electron, proton and neutron • Demonstration cum discussion: Collect some common elements (such as pencil lead (carbon, electric wire (aluminium) and compounds (water, sugar, salt etc).	
GS2Db105	Explain that compounds are formed by different types of elements joining together chemically forming a new substance.	Uses of elements and compounds in our daily life		
GS2Db106	Explore the common elements and compounds in our daily life (Carbon, Nitrogen, Hydrogen, Aluminium, Water, Common salt, Sugar).	common elements and compound in daily life		
GS2Db107	Explain the Particle Theory of Matter	Theory of Matter.		
GS2Db108	Use particle model of matter to investigate the movement and arrangement of particles in three states.			
GS2Db109	**Chapter 7** **Physical and Chemical Change** Differentiate between physical and chemical changes while considering daily life examples.	Physical change Chemical change	Activity: Perform an activity of combustion of paper in classroom; keeping in view the necessary precautionary measures.	• Brainstorming • Oral questions • written questions • Observations. • Activity • Inquiry • Flash Cards
GS2Db110	Recognize that oxygen is needed in combustion, rusting and tarnishing.	Combustion, Rusting and Tarnishing	Activity: Heating the ice cubes, to show the three states of matter.	
GS2Db111	Relate uses of materials to their chemical properties (e.g., tendency to rust, flammability).	Physical properties such as Melting point and Boiling point		
GS2Db112	Relate uses of materials to their physical properties (e.g., melting point, boiling point,).			
GS2Db113	Define valency and explain the formation of ions.	Valency and Ions		

GS2Db114	Recognize that a chemical bond results from the attraction between atoms and that the atoms' electrons are involved in this bonding	Chemical bond		
	Chapter 8 **Mixture and Solutions**		Activity: separate the mixture by sieving, evaporation, distillation etc.	• Brainstorming • Oral /written questions MCQs/Short Questions • Observations. • Flash Card
GS2Db115	Identify and explain different types of mixtures by giving common mixtures from daily life	Mixture Types of mixture		
GS2Db116	Justify why air is considered as a mixture of gases.	Air is mixture of gases		
GS2Db117	Demonstrate ways of separating different mixtures.	Separating techniques		
GS2Db118	Demonstrate the process of solution formation (using water as universal solvent)	Solution water as universal solvent		
GS2Db119	Distinguish among solute, solvent and solution; saturated and unsaturated solution.	Differentiate between Solute and Solvent Differentiate between Saturated and unsaturated solutions		
GS2Db120	Explain what is meant by a concentrated and dilute solution	Dilute and concentrated solution		
GS2Db121	Define solubility and identify the factors which affect the solubility of a solute in a solvent and recognize the importance of these factors in homes and industries.	Solubility Factors affecting solubility	• Brainstorming • Discussion on factors affecting solubility • Demonstrate the process of dissolving	
GS2Db122	Identify ways of accelerating the process of dissolving materials in a given amount of water and provide reasoning (i.e., increasing the temperature, stirring, and breaking the solid into smaller pieces increases the process of dissolving).	The Process of Dissolving		

Benchmarks: 2
By the end of package – D students will be able to;

Investigate and describe force and motion
Discuss the effect of force on changing the speed
Describe the SI units (force, speed)

Coding Key	Students Learning Outcomes (SLOs)	Contents	Suggested Activities/Methodologies	Assessment Strategies
	Chapter 9 **Force and Motion**			
GS2Db201	Define force and state the SI unit of force.	• Force and unit of force • Motion • Speed and unit of speed Distance • Time • Action and reaction forces	• Activity: perform an activity of force by pushing and pulling of objects. • Activity: perform an activity of force of action and reaction using different objects such as football. • Group discussion: discuss the terms force, force of action and reaction and speed.	• Brainstorming • Oral questions • written questions • Observations. • Flash Cards. • Activity
GS2Db202	Describe the effect of force on changing the speed and direction of motion with time.			
GS2Db203	Formulate the relationship between speed, distance and time.			
GS2Db204	State SI (System International) unit of speed			
GS2Db205	Demonstrate that forces always work in action and reaction pairs (equal in magnitude, opposite in direction).			

DOMAIN-2: PHYSICAL SCIENCES

Benchmarks: 3
By the end of package – D students will be able to;

1. Use evidence to construct an explanation on how energy is transferred, transformed, and conserved.
2. Compare types and properties of waves.
3. Discuss waves terminologies (wavelength, frequency, time period and amplitude)

Coding Key	Students Learning Outcomes (SLOs)	Content	Suggested Activities/Methodologies	Assessment Strategies
	Chapter 10 **Energy and Waves**			• Brainstorming • Oral /written questions. • Flash cards • Observation • Assignment • Homework Assignment • Activity
GS2Db301	Recognize energy as a physical quantity.	Energy	Activity: perform an activity for the production of waves by using a string.	
GS2Db302	Relate potential energy and kinetic energy.	Potential energy and Kinetic energy	Group discussion/ demonstration: discuss and demonstrate the listed terms; wave length, frequency, time period and amplitude	
GS2Db303	State the Law of Conservation of Energy and explain how the law applies to different situations.	Law of Conservation of Energy	Activity: Make a drum by using empty jars, plastic bags, balloons and rubber bands and produce the waves	
GS2Db304	Compare the Renewable Energy Sources (wind, water and Sun) and Non-Renewable Sources of energy (coal, natural gas, crude oil).	Renewable Energy Sources and Non-Renewable Sources		
GS2Db305	Define a wave and compare the types of waves (mechanical and electromagnetic) with daily life examples.	Wave Types of Waves (Mechanical and electromagnetic) Distinguish between		
GS2Db306	Distinguish between Longitudinal and Transverse waves.	Longitudinal and Transverse waves		
GS2Db307	Define the terms: Wavelength, frequency, amplitude and time period of wave.	Wavelength Frequency Time period of wave Amplitude		
GS2Db308	Find the inverse relation between time period and frequency	inverse relation between time period and frequency		

DOMAIN-2: PHYSICAL SCIENCES

Benchmarks: 4

By the end of package – D students will be able to;

1. Describe the relationships between electricity and magnetism and series and parallel electrical circuits.
2. Discuss permanent and electromagnet magnets

Coding Key	Students Learning Outcomes (SLOs)	Content	Suggested Activities/Methodologies	Assessment Strategies
	Chapter 11 **Electricity and Magnetism**			• Brainstorming • Oral/written questions-answer techniques • Flash cards • Observation • activity • Models presentation • Homework Assignment
GS2Db401	Recognize electric current as a flow of charges.	Electric current	Group discussion: discuss the concept of electric as a flow of charges.	
GS2Db402	Differentiate between open and closed circuits	Open and closed circuits	Demonstrate and draw the diagram of open and closed circuit.	
GS2Db403	Draw and construct a series and parallel circuits	Series and parallel circuits	Discussion about series and parallel circuits and draw diagrams of series and parallel circuits.	
GS2Db404	Draw magnetic field of a bar magnet using iron filings	Magnetic field of Bar magnet	Activity: perform an activity using a bar magnet and compass needle to draw magnetic field of bar magnet	
GS2Db405	Explain that electric current has a magnetic field around it using a magnetic compass.	Electric current has magnetic field	Discuss the properties of Permanent magnet and Electromagnet.	

GS2Db406	Compare and contrast permanent Magnet and electromagnet	Differentiate between Permanent magnet and electromagnet		

	DOMAIN-2: PHYSICAL SCIENCES			
	Benchmarks: 5 **By the end of package – D students will be able to;** 1. Identify heat and temperature 2. Compare three scales of temperature 3. Discuss the concepts of heat conduction, convection and radiation			
Coding Key	**Students Learning Outcomes (SLOs)**	**Content**	• **Suggested Activities/Methodologies**	• **Assessment Strategies**
GS2Db501	**Chapter 12** **Heat and Temperature** Define the terms heat and temperature on the basis of Kinetic Molecular Theory.	Heat and Temperature	Group Discussion: discuss the three scales of temperature show the freezing and boiling point of water and relate them	• Brainstorming • Oral/written questions • Activity • Models • Flash Cards • Homework Assignments
GS2Db502	Compare all three scales of temperature (including inter-conversion of temperature scales).	Temperature scales	Demonstrate the phenomenon of conduction using air filled balloon and candle	
GS2Db503	Construct the concept of heat conduction, convection and radiation by applying particle theory including daily life examples.	Conduction, convection and radiation	Demonstrate the phenomenon of convection using ink, water and candle.	
GS2Db504	Explain why metals are good thermal conductors and fluids are poor conductors of heat using the particle model.	Metals are good while fluids are poor conductors of heat.	Activity: perform the activity by placing a steel/metal plate in sun for a while and discuss the phenomenon of radiation and conduction.	

DOMAIN- 3: EARTH AND SPACE

Benchmarks: 01

By the end of Package – D, Students will be able to;

- Describe the physical features of celestial bodies.
- Explain how gravity is the force that keeps objects in the Solar System in regular and predictable motion and describe the resulting phenomena
- Integrate scientific concepts/ STEAM in daily life to improve the quality of their own life and lives of others.
- Understand how scientific concepts/ STEAM affect their life and society.
- Identify the importance of growing seasonal plants,
- Apply methods of preserving food
- Prepare hand sanitizer, and solar oven etc.

Coding Key	Students Learning Outcomes (SLOs)	Content	Suggested Activities/Methodologies	Assessment Strategies
	Chapter 13 **Earth and Space**			
GS3Db101	Recognize that the force of gravity keeps planets and moons in their orbits.	• Differentiate between Mass and Weight • Weightlessness on the surface of moon • Earth's annual revolution around the sun	Demonstrate: demonstrate measurement mass and weighing using digital balance and spring balance. Video/Discussion on a video/chart showing planets and moons in their orbits Group Discussion: discuss the concept of weightlessness on the surface of moon.	• Brainstorming • Oral/written questions • Observations. • Models • Role play • Discussion • Homework Assignment
GS3Db102	Differentiate between mass and weight, using examples of weightlessness experienced by astronauts on the surface of the Moon.			
GS3Db103	Describe the effects of the Earth's annual revolution around the Sun, given the tilt of its axis (e.g., different seasons, different constellations visible at different times of the year).			

GS3Db104	Describe the uses of various satellites in space i.e., geostationary, weather, communication and Global Positioning System (GPS).	• Satellites • Geostationary, weather, communication and Global Positioning System (GPS) • Asteroids, • Meteorites • Comets • Differentiate between planets and Dwarf planets	Activity: perform an activity by using three labelled boxes asteroids, meteorites and comets. Ask the students to put them in the correct basket and write their characteristics of each on paper. Role-play by students: student play a role of geostationary, weather, communication and Global Positioning System (GPS) satellites and discuss.	
GS3Db105	Identify the characteristics of asteroids, meteorites and comets.			
GS3Db106	Differentiate between planets and dwarf planets.			
GS3Db107	**Chapter 14** **Technology in Everyday life.** Describe growing seasonal plants and vegetables.	Growing of seasonal plants and vegetables.	Activity: every student of the class grow a seasonal plant or vegetable in disposable cups and bring it to the classroom on specified day.	• Brainstorming • Oral/written questions • Models • Observations. • Flash Cards • Projects • Homework Assignment
GS3Db108	Use different techniques of preserving foods like orange juice, apple jam and pickles	Food preservation: orange juice, apple jam and pickles	Activity: prepare pickles of different vegetables in the classroom. Activity: Make (show the video) orange juice and show the methods of preserving orange juice.	
GS3Db109.	Prepare yogurt and cheese from milk to demonstrate the beneficial microorganisms.	Prepare yogurt and cheese from milk	Activity: Make the yogurt from milk in the classroom.	
GS3Db110.	Make a sanitizer using suitable substances.	Making of sanitizer	Demonstration of preparing sanitizer.	
GS3Db111	Design a solar oven to convert solar energy into heat energy.	Design solar oven	Activity: prepare a solar oven from low cost/no cost materials such as greeting cards, shoe boxes etc.	

ALP CURRICULUM FOR GENERAL SCIENCE-PACKAGE E (VIII)

COMPARISON OF QUANTIFICATION OF DOMAINs, BENCHMARKS AND SLOs BETWEEN SNC (Grade VIII) AND ALP (Package – E)

S. No	Strands		Benchmarks		SLOs	
	SNC	ALP	SNC	ALP	SNC	ALP
1	1	1	06	06	36	18
2	1	1	03	03	61	46
3	**1**	**1**	**01**	**01**	**06**	**04**
Total	**03**	**03**	**10**	**10**	**103**	**72**

STRAND-1: LIFE SCIENCES

Benchmarks-1:

By the end of Package E, students will be able to;

- Describe cell division, heredity, variation and inheritance.
- Describe the structure of DNA, its modification and application in biotechnology in various fields.
- Describe the energy flow in ecosystem, major ecological issues and environmental conservation.

Coding Key	Students Learning Outcomes (SLOs)	Contents/Themes	Suggested Activities/Methodologies	Assessment Strategies
GS1Eb101	**Chapter 1** **Ecology** Describe global warming and explain how threats to the carbon-oxygen balance such as overpopulation, reliance on fossil fuels, and deforestation are contributing to global warming and climate change.	Global warming Effects of Global warming	Brainstorming Group discussion: discuss the concept of global warming Discussion: Discuss the effects of climatic changes	• Oral questions • Written questions • Discussion • Observations. • Home work
GS1Eb102	Draw a food web diagram to illustrate the food relationships between organisms.	Food web	Question answer Mini lecture Use of writing board (Draw food web on writing board) Reinforcement: (Ask students to draw food web in their note books)	• Draw food web with some blank boxes on writing board and ask students to fill blank boxes and complete food web.

			Explain food relationships between organisms	
GS1Eb103	Describe and illustrate through examples key ecological relationships between organisms, including competition, predation and symbiosis.	Interactions in Ecosystem	Explain ecological relationship between organisms Write terms competition, predation and symbiosis on writing board and explain with the help of relevant examples	• Ask students to make three columns of competition, predation and symbiosis. Write at least two examples of the given terms. • Invite some students to share their work in the classroom.
GS1Eb104	**Chapter 2** **Variations, Heredity& Cell division** Explain and illustrate the differences between variation and adaptation.	Variation Adaptation	Brainstorming Differentiate between variation an adaptation	• Assign Homework • (collect data from your family members differences in their eye colour skin colour and height)
GS1Eb105	Identify sources of variation from environmental and genetic factors.	sources of variation from environmental and genetic factors	Define genetics Invite two students of different height in front of class and ask students what difference you can see in their heights? Tell students the difference in their height is a genetically factor Tell them there are many other genetically factors such as Crossing over and Mutation Explain these terms	
GS1Eb106	Recognize Genetics as the study of Heredity and describe heredity as the transfer of genetic information that specifies structure, characteristics, and functions, from parents to offspring.	Genetics Heredity Parents Offspring		• Class work • (Ask 2 students collect data from your class fellows about the differences in their eye colour skin colour and height) • After data collection share findings with class.

GS1Eb107	Differentiate between the concept of genes and chromosomes and relate them to how genetic characteristics are inherited.	Chromosome and gene	Draw diagram of chromosome on writing board Define and explain chromosome and gene with the help of diagram Questioning and answering	• Invite 2 to 3 students to draw diagram of chromosome on writing board
GS1Eb108	Describe the composition and structure of DNA.	Chemical composition of DNA	Draw diagram of DNA on writing board or show model of DNA (if available) Explain DNA with the help of diagram or model	• Ask students draw colourful diagram of DNA in your notebooks
GS1Eb109	Describe cell division and its types – mitosis and meiosis and relate them to the passage of genetic information through reproduction.	Cell division Mitosis and meiosis	Mini lecture Explain cell division with the help of already prepared chart of mitosis and meiosis	• MCQs type test
GS1Eb110	**Chapter 3** **Human Nervous system** Identify the organs, functions and processes of the Human Nervous System.	Human nervous system	Paste the already prepared chart of human nervous system on writing board Explain human nervous system (functions and processes)	• Home assignment: As students write different functions of human nervous system in their notebooks
GS1Eb111	Identify the three major parts of the brain – fore brain, mid brain and hindbrain, and describe their various functions.	Brain and its parts	Discussion Question answer	• Write name of three parts of brain on writing board and ask

GS1Eb112	Match various body functions with the relevant part of the brain that controls or regulates them (for instance, associating breathing with the brain stem)	Body functions of various parts of brain	Mini lecture Discussion Make table of various body functions are associated with the relevant part of the brain	students to write their functions • Oral questions written questions • Flash Cards of body functions related with brain)
GS1Eb113	**Chapter 4** **Biotechnology** Define biotechnology as the use of living cells and organisms in products and processes that can improve the quality of life.	Biotechnology	Brainstorming (Biotechnology) **Mini lecture**: Considering the following points -use of living cells -organisms in products and processes that can improve the quality of life Questions and Answers	• MCQs test • Home Assignment: Make a list of some products we are using in our home are technology oriented
GS1Eb114	Discuss the applications of biotechnology in the Pakistani context and their effects on the people and the environment of Pakistan over time. Illustrative examples: bread-making, making of yogurt and cheese, vaccines for immunization, insulin production, dyes, etc.	Applications of biotechnology Bread-making Making of yogurt Cheese Vaccination	Discussion Group work on application of biotechnology in the Pakistani context Pesentation	

STRAND-2: PHYSICAL SCIENCES

Benchmarks -1:

By the end of Package E, students will be able to;

- Compare systematic organization of elements in the periodic table.
- Explain Chemical reactions and its types and acids, Alkalis and salts.
- Explain that light can be refracted and dispersed, also describe the principle of formation of images by lenses.
- Describe effect of force, balanced and unbalanced forces and identify simple machines.
- Identify current electricity, define voltage, resistance and electric power.

	Chapter 5 **Periodic table**			
GS2Eb101	Recognize Periodic Table as a way of classifying the elements in groups and periods.	Periodic Table	Brainstorming Mini lecture Paste the chart and Demonstrate periods and groups to students Question answer	• Oral/written questions • Observations. • Flash Cards. • Homework
GS2Eb102	Identify the names and location of the first 18 elements only.	Periods and Groups (Modern Periodic Table)		
GS2Eb103	Identify properties of metals and non-metals.	Metals, Non-metals	Discussion Question answer Mini lecture Discussion Make table of and write the properties and uses of metals on the writing board.	
GS2Eb104-	Relate the properties to the uses of metals.	Properties and uses of metals		
	Chapter 6 **Chemical Reactions and Bonds**			
GS2Eb104	Identify chemical reactions and give examples.	Chemical Reactions	Brainstorming Mini lecture Discussion on Chart elaborating different types of Chemical Reactions	• Oral/written questions • Observations. • Flash Cards. • Homework

GS2Eb105	Define the law of conservation of Mass and demonstrate the law with an experiment	Law of Conservation of Mass	Brainstorming Discussion Activity: Demonstrate a Chemical reaction of silver nitrate ($AgNO_3$) and sodium chloride (NaCl) test and explain law of conservation of Mass. Question and answer	• Oral/written questions • Observations. • Flash Cards. • Homework
GS2Eb106	Write and balance chemical equations	Balancing Chemical equations	Mini lecture Practicing students on writing Chemical equation Practicing students on balancing Chemical equation	
GS2Eb107	Distinguish between different types of reactions. (combination, decomposition, displacement and double displacement, combustion)	Types of Chemical Reactions	Brainstorming Mini lecture Discussion on elaborating the different types of Chemical reactions with examples Question and answer Presentation	
GS2Eb108	Distinguish between endothermic and exothermic reactions and recognize their importance.	Endothermic and Exothermic reactions	Mini lecture Discussion Demonstrate endothermic process by melting of ice cubes. Demonstrate Exothermic Process by a candle flame.	
GS2Eb109	Discuss formation of ionic bonds as a result of electrostatic forces between atoms (e.g NaCl)	Ionic Bond	Mini lecture Discussion on Charts elaborating the formation of Ionic and	

GS2Eb110	Discuss types and formation of Covalent bonds as a result of sharing of electrons between atoms (e.g H_2, O_2, N_2)	Covalent Bond and its types	Covalent Bonds and its types Group discussion Question and answer Presentation	
GS2Eb111	Name certain ionic and covalent compounds.	Ionic and Covalent Compounds		
GS2Eb112	**Chapter 7** **Acids, Bases and Salts** Define acids, bases and salts and give examples of each.	Acids, Bases and Salts	Mini lecture Brainstorming Group discussion Question and answer Presentation Use pH paper to find out the pH value of different items and match it with the pH scale. Activity: perform an activity to check the pH of saliva using pH paper.	• Oral/written questions • Observations. • Flash Cards. • Home Assignment: Make a list of some items that we use in our home and classify them as acid, base and salt.
GS2Eb113	Identify the physical properties of acids, bases and salts.	Physical Properties of Acids, Bases and Salts pH and its Ranges pH scale		
GS2Eb114	Define pH and its range with references to indicators.			
GS2E115	Interpret the pH scale and identify acids, bases and salts.			
GS2Eb116	Observe and write the uses of acids, bases and salts in daily life.	Uses of Acids,Bases and Salts		

Benchmark 2

By the end of Grade 8, students will be expected to:

- Use evidence to construct an explanation on how energy is transferred, transformed, and conserved.
- Compare types and properties of waves and explain how they interact with matter.
- Investigate that light can be reflected, refracted, and/or absorbed.
- Describe the relationships between: electricity and magnetism, static and current electricity, and series and parallel electrical circuits.

GS2Eb201	**Chapter 8** **Reflection & Refraction of Light** Identify basic properties of light (i.e., speed, transmission through different media, absorption, reflection and dispersion).	Light and their properties speed, transmission through different media, absorption, reflection dispersion	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Ask students to summarize. • Projects /assignments
GS2Eb202	State the Laws of Reflection.	Laws of reflection	Brainstorming Activity based method Inquiry based method Group discussion Demonstration	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Class test/ practical performance
GS2Eb203	Describe different optical instruments which use curved mirrors.	Optical instruments which use curved mirrors	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Ask students to summarize. • Projects /assignments

GS2Eb204	Distinguish between reflection and refraction with of light with daily life example.	Reflection and refraction of light	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Ask students to summarize. • Projects /assignments
GS2Eb205	Identify spherical mirror Describe the characteristics of image(s) formed by concave mirrors and convex mirrors.	Spherical mirrors and their types Characteristics of concave mirrors and convex mirrors images	Brainstorming Activity based method Group discussion Demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Class test /practical observation • Ask students to summarize. • Projects /assignments
GS2Eb206	Describe use of different optical instruments in which plane and spherical mirrors are used.	Optical instruments which use plane and spherical mirrors	Brainstorming Activity based method Inquiry based method Group discussion Practical demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • practical observation • Ask students to summarize.
GS2Eb207	**Chapter** **Electricity & Magnetism** Define resistance and its SI unit.	Resistors and its SI units		
GS2Eb208	Define voltage & current state their SI units	Current and voltage		
GS2Eb209	Formulate that resistance is the ratio of voltage to current	Relation among current ,voltage ,resistors		
GS2Eb210	Define electric power and state its unit.	Electric power		

GS2Eb211	Analyse the danger of overloading and short circuit and identify the importance of earth wire, fuses and circuit breakers.	Danger/hazard of electricity		
GS2Eb212	List precautionary measures to ensure the safe use of electricity.	Safety measure electricity	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Class test • Ask students to summarize. • Projects /assignments
GS2Eb213	Describe the properties that are unique to electromagnets (i.e. the strength varies with current, number of coils and type of matter in the core; the magnetic attraction can be turned on and off; and the poles can switch.	Electromagnetisms	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	
GS2Eb214	Describe briefly the working principles of electromagnetic devices such as speakers and doorbell.	Electromagnetics devices	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Class test • Ask students to summarize. • Projects /assignments
Benchmark 3 **By the end of Grade 8, students will be expected to:** • Investigate and describe types of forces, including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational. • Measure and record data from experiments to produce speed-time graphs and interpret them to accurately describe motion. • Evaluate through investigation the relationship between pressure, force and area.				
GS2Eb301	**Chapter 9** **Force and Pressure** Recognize that several forces may act on an object and that they may or may not balance each other.	Forces Multiple forces Net forces Balanced Forces Unbalance Force	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share

GS2Eb302	Examine the effect of an unbalanced force on an object.	Application of forces Effect of an unbalanced force		• Class test • Ask students to summarize. • Projects /assignments
GS2Eb303	Define 'pressure' with examples and its unit	Pressure		
GS2Eb304	Examine the effect of force in the presence of air pressure.	Effect of force in the presence of air pressure		
GS2Eb305	Make a hydraulic elevator. (STEAM)	Hydraulic elevator	Brainstorming Activity based method Inquiry based method Group discussion Practical demonstration low cast material (Model) Video displaying	• An open-ended question that gets them writing/talking. • Use quizzes. • Response Flash cards. • Think-pair-share • Project /Model preparation • Ask students to summarize. • Projects /assignments
GS2Eb306	Build a two stage rocket model. (STEAM)	Build a rocket	Brainstorming Activity based method Inquiry based method Group discussion Practical demonstration by using low cast material model Video displaying	• Use quizzes. • Response Flash cards. • Think-pair-share • Class test • Ask students to summarize. • Projects /assignments
GS2Eb307	Investigate the factors that affect the strength of an electromagnet.	Factors that affect the strength of an electromagnet.	Brainstorming Activity based method Inquiry based method Group discussion Demonstration Video displaying	
GS2Eb308	**Chapter 10** **TECHNOLOGY IN EVERYDAY LIFE** Make bio-plastic from milk and vinegar as an application of biotechnology	Bio- plastic	Discussion Demonstration	

GS2Eb309	Make toothpaste, soap and detergent as an application of acids and bases in daily life	Make toothpaste, soap and detergent	Discussion Demonstration	• Oral/written questions • Observations. • Flash Cards. • Homework
GS2Eb310	Demonstrate the working of UPS and use it to operate a fan or energy saver bulb.	Working of UPS	Discussion Demonstration	

STRAND-3: EARTH AND SPACE SCIENCE

Benchmark-1:

By the end of Package E, students will be able to;

- Explain galaxy with its types and concept of different constellations visible at different places and frame of time.
- Explore the life cycle of a star including usage of astronomical apparatus to collect information from space.
- Recognize technological research, development and its usage.

GS3Eb101	**Chapter 11** **Our Universe** Explore and understand the terms star, galaxy, milky way and the black holes	Galaxies Milky way Black holes	Explain terms (Star, Galaxy, Milky way and the Black holes) with the help of writing board Assign group discussion task (Star, Galaxy, Milky way and the Black holes) Allow groups to share their ideas Conclude activity	•
GS3Eb102	Discuss the birth and eventual death of our sun	The life of sun		• Ask students to drw picture of star, milky ways in their notebooks
GS3Eb103	Show how information is collected from space by using telescopes (e.g Hubble space telescope) and space probes(e.g. Galileo).	Information from space	Mini lecture: Birth and eventual death of our sun Discussion	
GS3Eb104	Discuss advancement in space technology and analyse the benefits generated by the technology of space exploration	Space technology	Ask question how we can collect information from space? Tell: We use different space technologies or instruments (e.g Hubble space telescope) and space probes (e.g. Galileo).	• Oral Questions • Home assignment: Ask students to write the

			Explain the importance or role of each space technology Brainstorming (Benefits of space technology) Tell: the most recent advancement in space technology	importance of Hubble space telescope in their notebooks • 3 to 4 MCQs Questions

GUIDELINES FOR TEXTBOOK DEVELOPERS:

A textbook is an important teaching and learning tool and a standard source of information for formal/Informal study of a subject. Writing a textbook is an extremely important and a technical task as it requires the translation of curriculum learning outcomes at the proper cognitive level of the students. Textbook authors of ALP need to consider the following guidelines:

- A textbook author should be able to translate the spirit of ALP curriculum into content and activities / exercises of textbook. Therefore, curriculum should be studied repeatedly in order to have an in depth understanding in its true spirit.
- Prepare a mind map of themes and learning outcomes; chapter wise distribution / presentation scheme of SLOs.
- Since the curriculum is designed for out of school children who are out of the formal school system for some reasons, therefore limit the textual material to the learning outcomes details. Consider the time allocated to a subject in the scheme of studies. This will help to decide length, width and depth of chapters / topics and concepts.
- Select accurate, authentic, and up-to-date text in simple language with real life examples.
- Write SLOs at the beginning of each chapter.
- Highlight Key words, Definitions and Terms in the text.
- Always use hands on activities to encourage students to make their own inquiries.
- Inculcate skills and processes to infuse values, ethics and attitudes.
- Make the concepts of Science interesting and easy to understand for the children through relevant activities, information boxes and pictures etc.
- The material must help to enhance the knowledge of students, develop their inquiry skills and engage them in higher order thinking.
- The content should be interactive, interesting and motivating for further learning of students.
- The material should help students understand the world in which they live in, and make them lifelong learners.
- The material must be error free and relevant.
- The material must be free from gender, ethnic, regional and all sorts of biases.
- Text must be attractive and engaging. Illustrations, tables, graphs etc. should be clearly, accurately, appropriately and neatly drawn. These must be properly labelled and captioned.
- Exercises should include clues to encourage students to think, develop skills and use information for a variety of purposes.

- The textbook must contain a Table of Contents and Glossary.
- The textbook must be contextually relevant and feasible to be used in ALP classroom environment.
- The figures, illustrations and pictures should be from local / Pakistani environment.
- Add an assessment after a few concepts / themes, topics / subtopics or chapters.
- Students should be given extra material to enable them to think out of the box.
- Give Key Points to provide a summary of the concepts and principles in the chapter.

GUIDELINES FOR TEACHING ALP MATERIAL:

While teaching ALP textbooks for out of schools' children teachers must keep in mind the following points:

- Use real / daily life examples while teaching contents / themes of the curriculum
- Use language / medium of instruction pertinent to the level of understanding of students
- Always use interactive approach or students centred / based teaching techniques for teaching Science Curriculum
- Whenever possible, use videos of different experiment / activities / concepts / contents for better understanding of students.
- Always use no cost / low cost teaching aids (easily available in the surroundings) for more clarification of the concept.

GUIDELINES FOR ASSESSMENT.

- Students should be assessed on combination of test items (Objectives type, long questions and short questions)
- Oral questions may also be asked to judge the level of understanding of students
- The questions framed should include different ability levels (knowledge, Understanding and Application)
- Students should also be guided / judged on manipulation of instruments while doing experiment / activities
- The suggested strategies for assessment are Observations, Interviews, Group/Peer assessment, Self-assessment, Performance based Assessment, Visual Display, Laboratory report, E-assessment, Portfolio, Paper Pencil Test, Homework assignment etc.

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Dated Abbottabad the, 27.09.2022

NOTIFICATION

No. 4436-43/ADL(C&TR): In exercise of powers conferred under the *"Khyber Pakhtunkhwa Supervision of Curricula, Textbooks and Maintenance of Standard of Education Act. 2011"* and consequent upon the recommendations of the Review Committee notified vide No. 4340-45 dated 16.09.2022, **Mr. Muhammad Shoukat, Director, Curriculum & Teacher Education Khyber Pakhtunkhwa Abbottabad**, being Competent Authority is pleased to notify the **"Alternate Learning Pathways (ALP) Elementary (Grades VI-VIII) Curriculum 2022"**.

1. The Directorate of Professional Development Khyber Pakhtunkhawa (DPD), Regional Professional Development Centers (RPDCs), FATA Institute for Teacher Education, Elementary Colleges of Khyber Pakhtunkhawa shall align Training Manuals/Material, related to ALP with Curriculum 2022.
2. All development partners, NGOs/INGOs working or intends to work in the area of ALP activities shall obtain prior approval/NOC for their training, textual materials and align them with the ALP Curricula 2022 (Grades VI-VIII) from DCTE Khyber Pakhtunkhawa Abbottabad in the educational institutions / allotted ALP centers of Khyber Pakhtunkhawa and Newly Merged Districts.
3. In case of non-compliance, the institutions/ firms at fault shall be proceeded against under Section (4) of the Khyber Pakhtunkhawa Supervision of Curricula, Textbooks and Maintenance of Standard of Education Act. 2011.

DIRECTOR

Endst: of even No & Date
Copy for information to the:

1. Secretary to Government of Khyber Pakhtunkhwa E&SE Department, Peshawar.
2. CPO Elementary and Secondary Education Department Khyber Pakhtunkhwa Peshawar.
3. Chairman Khyber Pakhtunkhwa Textbook Board Phase V Hayatabad Peshawar.
4. Ms. Gulnaz Jabeen, Education Officer UNICEF Peshawar.
5. Director, Elementary & Secondary Education Khyber Pakhtunkhwa Peshawar.
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11. Director General, Information & Public Relations Khyber Pakhtunkhwa Peshawar.
12. All Heads of Development partners, NGOs/INGOs working in education sector Khyber Pakhtunkhwa.
13. Section Officer (B/T), Elementary & Secondary Education Department Peshawar.
14. P.S to Director, Local Directorate.

Syed Amjad Ali
Additional Director
Curriculum & Textbooks Review