REPUBLIC OF KENYA
MINISTRY OF EDUCATION

JUNIOR SCHOOL CURRICULUM DESIGN

INTEGRATED SCIENCE

FOR LEARNERS WITH PHYSICAL IMPAIRMENT

GRADE 7

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT
A Skilled and Ethical Society

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FOREWORD

The Government of Kenya is committed to ensuring that policy objectives for Education, Training and Research meet the aspirations of the Constitution of Kenya 2010, the Kenya Vision 2030, National Curriculum Policy 2019, the United Nations Sustainable Development Goals (SDGs) and the Regional and Global conventions to which Kenya is a signatory. Towards achieving the mission of Basic Education, the Ministry of Education (MoE) has successfully and progressively rolled out the implementation of the Competency Based Curriculum (CBC) at Pre-Primary, Primary and Junior School levels.

The implementation of Competency Based Curriculum involves monitoring and evaluation to determine its success. After the five-year implementation cycle, a summative evaluation of the primary education cycle was undertaken to establish the achievement of learning outcomes as envisaged in the Basic Education Curriculum Framework. The Government of Kenya constituted a Presidential Working Party on Education Reforms (PWPER) in 2022 to address salient issues affecting the education sector. PWPER made far reaching recommendations for basic education that necessitated curriculum review. The recommendations of the PWPER, monitoring reports, summative evaluation, feedback from curriculum implementers and other stakeholders led to rationalisation and review of the basic education curriculum.

The reviewed Grade seven curriculum designs for learners with Physical Impairment build on competencies attained by learners at Primary school level. Emphasis at this grade is the development of skills for exploration and making informed decision on pathways based on careers.

The curriculum designs present National Goals of Education, essence statements, general and specific expected learning outcomes for the subjects as well as strands and sub strands. The designs also outline suggested learning experiences, key inquiry questions, core competencies, Pertinent and Contemporary Issues (PCIs), values, and assessment rubric.

It is my hope that all Government agencies and other stakeholders in Education will use the designs to plan for effective and efficient implementation of the CBC.

HON. EZEKIEL OMBAKI MACHOGU, CBS
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PREFACE

The Ministry of Education (MoE) nationally implemented Competency Based Curriculum (CBC) in 2019. Grade seven is the first grade of Junior school while Grade nine is the final grade of the level in the reformed education structure.

The reviewed Grade seven curriculum furthers implementation of the CBC from Primary Education level. The curriculum provides opportunities for learners to focus in a field of their choice to form a foundation for further education and training and/or gain employable skills. This is very critical in the realisation of the Vision and Mission of the on-going curriculum reforms as enshrined in the Sessional Paper No. I of 2019 whose title is: *Towards Realizing Quality, Relevant and Inclusive Education and Training for Sustainable Development* in Kenya. The Sessional Paper explains the shift from a content-focused curriculum to a focus on **nurturing every learner's potential.**

Therefore, the Grade seven curriculum designs for learners with Physical Impairment are intended to enhance the learners' development in the CBC core competencies, namely: Communication and Collaboration, Critical Thinking and Problem Solving, Creativity and Imagination, Citizenship, Digital Literacy, learning to Learn and Self-efficacy.

The curriculum designs provide suggestions for interactive and differentiated learning experiences linked to the various sub strands and the other aspects of the CBC. They also offer several suggested learning resources and a variety of assessment techniques. It is expected that the designs will guide teachers to effectively facilitate learners to attain the expected learning outcomes for Grade seven and prepare them for smooth transition to Grade eight. Furthermore, it is my hope that teachers will use the adapted designs to make learning interesting, exciting and enjoyable.

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ACKNOWLEDGEMENT

The Kenya Institute of Curriculum Development (KICD) Act Number 4 of 2013 (Revised 2019) mandates the Institute to develop and review curricula and curriculum support materials for basic and tertiary education and training. The curriculum development process for any level of education involves thorough research, international benchmarking and robust stakeholder engagement. Through a systematic and consultative process, the KICD conceptualised the Competency Based Curriculum (CBC) as captured in the Basic Education Curriculum Framework (BECF) 2017, that responds to the demands of the 21st Century and the aspirations captured in the Constitution of Kenya 2010, the Kenya Vision 2030, East African Community Protocol, International Bureau of Education Guidelines and the United Nations Sustainable Development Goals (SDGs).

KICD receives its funding from the Government of Kenya to facilitate successful achievement of the stipulated mandate and implementation of the Government and Sector (Ministry of Education (MoE) plans. The Institute also receives support from development partners targeting specific programmes. The revised Grade seven curriculum designs for learners with Physical Impairment were developed and adapted with the support of the World Bank through the Kenya Primary Education Equity in Learning Programme (KPEELP); a project coordinated by MoE. Therefore, the Institute is very grateful for the support of the Government of Kenya, through the MoE and the development partners for policy, resource and logistical support. Specifically, special thanks to the Cabinet Secretary-MoE and the Principal Secretary – State Department of Basic Education,

I also wish to acknowledge the KICD curriculum developers and other staff, all teachers, educators who took part as panelists; the Semi-Autonomous Government Agencies (SAGAs) and representatives of various stakeholders for their roles in the development and adaptation of the Grade seven curriculum designs for learners with Physical Impairment. In relation to this, I acknowledge the support of the Chief Executive Officers of the Teachers Service Commission (TSC) and the Kenya National Examinations Council (KNEC) for their support in the process of developing and adapting these designs. Finally, I am very grateful to the KICD Council Chairperson and other members of the Council for very consistent guidance in the process.

I assure all teachers, parents and other stakeholders that this curriculum design will effectively guide the implementation of the CBC at Grade seven and preparation of learners with Physical Impairment for transition to Grade eight.

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NATIONAL GOALS OF EDUCATION

Education in Kenya should:

1. **Foster nationalism and patriotism and promote national unity.**

   Kenya's people belong to different communities, races and religions, but these differences need not divide them. They must be able to live and interact as Kenyans. It is a paramount duty of education to help young people acquire this sense of nationhood by removing conflicts and promoting positive attitudes of mutual respect which enable them to live together in harmony and foster patriotism in order to make a positive contribution to the life of the nation.

2. **Promote the social, economic, technological and industrial needs for national development.**

   Education should prepare the youth of the country to play an effective and productive role in the life of the nation.

   a) **Social Needs**

      Education in Kenya must prepare children for changes in attitudes and relationships which are necessary for the smooth progress of a rapidly developing modern economy. There is bound to be a silent social revolution following the wake of rapid modernisation. Education should assist our youth to adapt to this change.

   b) **Economic Needs**

      Education in Kenya should produce citizens with the skills, knowledge, expertise and personal qualities that are required to support a growing economy. Kenya is building up a modern and independent economy which is in need of an adequate and relevant domestic workforce.

   c) **Technological and Industrial Needs**

      Education in Kenya should provide learners with the necessary skills and attitudes for industrial development. Kenya recognises the rapid industrial and technological changes taking place, especially in the developed world. We can only be part of this development if our education system is deliberately focused on the knowledge, skills and attitudes that will prepare our young people for these changing global trends.

3. **Promote individual development and self-fulfilment**

Education should provide opportunities for the fullest development of individual talents and personality. It should help children to develop their potential interests and abilities. A vital aspect of individual development is the building of character.

4. **Promote sound moral and religious values.**

Education should provide for the development of knowledge, skills and attitudes that will enhance the acquisition of sound moral values and help children to grow up into self-disciplined, self-reliant and integrated citizens.

5. **Promote social equity and responsibility.**

Education should promote social equality and foster a sense of social responsibility within an education system which provides equal educational opportunities for all. It should give all children varied and challenging opportunities for collective activities and corporate social service irrespective of gender, ability or geographical environment.

6. **Promote respect for and development of Kenya's rich and varied cultures.**

Education should instil in the youth of Kenya an understanding of past and present cultures and their valid place in contemporary society. Children should be able to blend the best of traditional values with the changing requirements that must follow rapid development in order to build a stable and modern society.

7. **Promote international consciousness and foster positive attitudes towards other nations.**

Kenya is part of the international community. It is part of the complicated and interdependent network of peoples and nations. Education should therefore lead the youth of the country to accept membership of this international community with all the obligations and responsibilities, rights and benefits that this membership entails.

8. Promote positive attitudes towards good health and environmental protection.

Education should inculcate in young people the value of good health in order for them to avoid indulging in activities that will lead to physical or mental ill health. It should foster positive attitudes towards environmental development and conservation. It should lead the youth of Kenya to appreciate the need for a healthy environment.

LESSON ALLOCATION AT JUNIOR SCHOOL

S/No	Learning Area	Number of Lessons Per Week
1.	English	5
2.	Kiswahili / Kenya Sign Language	4
3.	Mathematics	5
4.	Religious Education	4
5.	Social Studies	4
6.	Integrated Science	5
7.	Pre-Technical Studies	4
8.	Agriculture and Nutrition	4
9.	Creative Arts and Sports	5
	Pastoral /Religious Instructional Program	1
Total		**40 + 1**

LEARNING OUTCOMES FOR JUNIOR SCHOOL

By the end of Junior School, the learner should be able to:

a) Apply literacy, numeracy and logical thinking skills for appropriate self-expression.
b) Communicate effectively, verbally and non-verbally, in diverse contexts.
c) Demonstrate social skills, spiritual and moral values for peaceful co-existence.
d) Explore, manipulate, manage and conserve the environment effectively for learning and sustainable development.
e) Practise relevant hygiene, sanitation and nutrition skills to promote health.
f) Demonstrate ethical behaviour and exhibit good citizenship as a civic responsibility.
g) Appreciate the country's rich and diverse cultural heritage for harmonious co-existence.
h) Manage pertinent and contemporary issues in society effectively.
i) Apply digital literacy skills for communication and learning.

ESSENCE STATEMENT

Science is a dynamic, collaborative human endeavour that enables use of distinctive ways of logistical valuing, thinking and working to understand natural phenomena in the biological, physical and technological world. The emphasis of science education at Junior School level is to enhance learners' scientific thinking through learning activities that involve planning, designing, measuring, observing, evaluating procedures, examining evidence, and analysing data. This is envisaged in the Kenya Vision 2030, which states in part that; "The achievement of the vision greatly depends on Science, Technology and Innovation." Equally, Sessional Paper No.1 of 2005 highlights the fact that "for a breakthrough towards industrialisation, achievement of the desired economic growth targets and social development, a high priority needs to be placed on the development of human capital through education and training by promoting the teaching of sciences and information technology." Both Sessional Paper No. 14 of 2012 and Sessional Paper 1 of 2019 equally underscore the need for sustainable basic and higher education, with an emphasis on Science, Technology and Innovation.

Integrated Science, as a learning area, is therefore expected to inculcate a scientific culture and enhance scientific literacy among learners to enable them to make informed choices in their personal lives and approach their life challenges in a systematic and logical manner. This learning area intends to enable learners to practically explore and discover knowledge within their environment and in the laboratory to allow them understand themselves and relate with their environment through application of scientific principles and ideas. It will equip learners with the relevant basic integrated scientific knowledge, skills, values and attitudes needed for their own survival and/or career development. Concepts in Integrated Science are presented as units within which there are specific strands that build on the competencies acquired in Science and Technology at Upper Primary School level. This provides the learner with the basic requisite knowledge, skills, values and attitudes necessary for specialisation in pure sciences (Physics, Chemistry, and Biology), Applied Sciences, Careers and Technology Studies (CTS) and Technical and Engineering offered in the STEM pathway at Senior School. Integrated Science is taught through inquiry-based learning approaches with an emphasis on the 5Es: engagement, exploration, explanation, elaboration and evaluation.

GENERAL LEARNING OUTCOMES

By the end of Junior School, the learner should be able to:

1) Acquire scientific knowledge, skills, values and attitudes to make informed choices on career pathways at Senior School.
2) Select, improvise and safely use basic scientific tools, apparatus, materials and chemicals effectively in everyday life.
3) Explore, manipulate, manage and conserve the environment for learning and sustainable development.
4) Practise relevant hygiene, sanitation and nutrition skills to promote good health.
5) Apply the understanding of body systems with a view to promote and maintain good health.
6) Develop capacity for scientific inquiry and problem solving in different situations.
7) Appreciate the use of scientific knowledge, skills, principles and practices in everyday life.
8) Apply acquired scientific knowledge, skills, principles and practices in everyday life.

SUMMARY OF STRANDS AND SUB STRANDS

Strands	**Sub Strands**	**Suggested Number of Lessons**
1.0 Scientific Investigation	1.1 Introduction to Integrated Science	12
	1.2 Laboratory Safety	14
	1.3 Laboratory apparatus and instruments	16
2.0 Mixtures, Elements and Compounds	2.1 Mixtures	18
	2.2 Acids, bases and indicators	22
3.0 Living things and the Environment	3.1 Human reproductive system	16
	3.2 Human Excretory System	18
4.0 Force and Energy	4.1 Electrical Energy	18
	4.2 Magnetism	16
Total Number of Lessons		**150**
Note The suggested number of lessons per sub strand may be less or more depending on the context.		

STRAND 1.0: SCIENTIFIC INVESTIGATION

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
1.0 Scientific Investigation	**1.1 Introduction to Integrated Science** **(12 lessons)** ● *Components of Integrated Science as a field of study* ● *Importance of science in daily life (health, agriculture, industry, transport, food and textile and career opportunities).*	By the end of the sub strand, the learner should be able to; a) outline the components of Integrated Science as a field of study, b) explain the importance of science in daily life, c) show interest in learning Integrated Science at junior school.	The learner is guided to: ● Brainstorm in purposive pairs the components of Integrated Science. Learners with speech difficulties could use Alternative modes of Communication as they brainstorm. ● Use digital/ adapted digital or print media to search for information on components of integrated science and share with peers. Learners with manipulation difficulties could use alternative functional part of the body as they interact with digital devices. Adjust light intensity when using the digital device for learners with visual difficulties. • Collaboratively discuss the importance of science in daily	How is the knowledge acquired in Integrated Science useful in daily life?

			life and take notes. Learners with manipulation difficulties could use alternative functional parts of the body or appropriate assistive technology or use adapted writing materials to take notes. • Search for information from print or digital/ adapted digital media on pathways related to Integrated Science at Senior School. Adjust light/ glare on the screens of the digital devices appropriately for learners who are sensitive to light. Learners who may not turn pages to use page turners or be supported by peers. **Project** • Use locally available materials to construct a career chart or generate it using adapted digital device and display.	

Core competencies to be developed:

- Communication and collaboration: The learner acquires listening and speaking skills as they discuss the importance of science in daily life.
- Digital Literacy: The learner acquires digital manipulative skills as they search for information from digital media on pathways related to Integrated Science at Senior School.

Values:

- Respect: The learner respects each other's opinion(s) as they discuss the importance of scientific knowledge in daily life.
- Unity: The learner cooperates and works harmoniously as they brainstorm on the e components of Integrated Science.

Link to other learning area:

- The learner is able to link the importance of science to career pathways in Pre-technical Studies.

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Suggested Key Inquiry Questions**
1.0 Scientific Investigation	**1.2 Laboratory Safety** **(14 lessons)** ● *Common hazards and their symbols in*	By the end of the sub strand, the learner should be able to; a) identify common hazards and their symbols in the laboratory, b) explain causes of common accidents in the laboratory,	The learner is guided to: ● Brainstorm with peers on common hazards and their symbols. Learners with speech difficulties could use residual speech as they are lip read by the teacher or peers. ● Discuss in purposive groups	● How do accidents happen in the laboratory? ● How are safety measures considered while working in the laboratory?

	the laboratory (flammable, corrosive, toxic, carcinogenic, and radioactive substances), ● *Common accidents in the laboratory, (cover Causes and First Aid: burns and scalds, cuts, and ingestion of harmful substances),* ● *Safety measures in the laboratory.*	c) describe First Aid measures for common laboratory accidents, d) appreciate the importance of safety in the laboratory and access to a healthy working environment.	causes of common laboratory accidents and their related first aid measures and write/type a summary. • Collaboratively role-play some first aid procedures for common accidents in the laboratory. Learners with mobility difficulties could be given physical support by peers, learner support assistant or teacher as they role-play. • Practice safety measures in the laboratory and the general school learning environment. Learners with fine motor difficulties could use alternative functional parts of the body or appropriate assistive technology to carry out the activity. Safety precaution should be observed when carrying out this activity. ● Discuss in purposive pairs the importance of safety measures in the laboratory. Allow more	

			time for learners with speech difficulties to express their views. ● Use digital/ adapted digital or print media to search for information on laboratory safety procedures. Learners with manipulation difficulties could use alternative functional part of the body as they interact with digital devices. Adjust light/ glare on the screens of the digital devices appropriately for learners who are sensitive to light.	
Core competencies to be developed: ● Learning to learn: The learner learns new concepts and identifies their talents as they role-play some First Aid procedures for common accidents in the laboratory. ● Critical thinking and problem solving: The learner reflects and identifies solutions to some challenges that require First Aid while role-playing some First Aid procedures for common accidents in the laboratory.				
Values: Unity: The learner harmoniously works with peers as they role-play some First Aid procedures for common accidents in the laboratory.				

Pertinent and Contemporary Issues (PCIs) Safety: The learner learns some safety measures to take as they practice safety measures in the laboratory and the general school learning environment.
Link to other learning areas: The learner is able to relate safety and importance of safety measures in the laboratory to safety measures at work place in Pre Technical studies.

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Suggested Key Inquiry Question(s)**
1.0 Scientific Investigation	**1.3 Laboratory apparatus and instruments** **(16 lessons)** ● *Basic skills in science (manipulative, observation, measurement, classificatio*	By the end of the sub strand, the learner should be able to; a) describe the basic skills in science, b) use and care for apparatus and instruments in the laboratory, c) use the SI units for basic and derived quantities in science, d) appreciate consumer protection when handling different apparatus,	The learner is guided to: ● Discuss in purposive pairs the meaning and use of basic skills in science and record findings. Learners with speech difficulties could use alternative communication modes as they share their views during discussion. ● Practice use and care for apparatus and instruments in the laboratory *(for heating, measuring mass, temperature,*	1. Why are basic skills in science important? 2. How are quantities in science expressed?

	n, prediction, communication and conclusion skills), ● *Laboratory instruments and apparatus* ● *International System of Units (SI) for basic and derived quantities in science.*	instruments and other materials in day to day life.	*length, volume, weight, magnification and time)* (*include parts, functions and care of a light microscope; and parts of a bunsen burner*) and write/type a summary. Learners with manipulation difficulties could use adapted writing materials or type on adapted digital devices. ● Collaboratively carry out activities on measurements of basic quantities and express them in the international system of units (SI) *(length, mass, time, electric current, temperature, amount of substance, light intensity)* and take notes. Create a conducive environment and adequate space for learners with mobility difficulties and ensure safety for all learners as they perform the activity. ● Work with peers to carry out activities to determine derived units from basic units *(area,*	

			volume, speed, density) and take notes. ● Collect packaging with labels of quantities and discuss in purposive pairs the importance of the information on labels then do a presentation. Learners with manipulation difficulties could use alternative functional part of the body or use appropriate assistive technology and devices as they collect packaging and make presentations.	

Core competencies to be developed:

- Learning to learn: The learner practices use and care for apparatus and instruments in the laboratory.
- Communication and collaboration: The learner collaboratively carry out activities on measurements of basic quantities and express them in the International System of Units.

Values:

- Respect: The learner work harmoniously with peers when carrying out activities to determine derived units from basic units working.
- Responsibility: The learner learns how care for apparatus and instruments as they practise how to care and use them in the laboratory.

Pertinent and Contemporary Issues (PCIs) Socio economic issues: The learner links the quantity of goods parked to their prices as they collects packaging with labels of quantities and discuss the importance of the information on labels.
Link to other learning areas: • The learner is able to link the packaging of goods and labels of quantities form inputs and product labels learnt in Agriculture and Nutrition. • The learner uses mathematical manipulation skills in recording and working measurements.

Suggested Assessment Rubric				
Level **Indicator**	**Exceeds expectations**	**Meets expectations**	**Approaches expectations**	**Below expectations**
Ability to identify common hazards and their symbols in the laboratory.	The learner identifies common hazards and their symbols in the laboratory exhaustively.	The learner identifies common hazards and their symbols in the laboratory satisfactorily.	The learner identifies most of the common hazards and their symbols in the laboratory correctly.	The learner identifies a few common hazards and their symbols in the laboratory correctly.

Ability to describe First Aid measures for common laboratory accidents.	The learner describes all First Aid measures for common laboratory accidents systematically and comprehensibly.	The learner describes all First Aid measures for common laboratory accidents systematically.	The learner describes most First Aid measures for common laboratory accidents systematically.	The learner describes a few First Aid measures for common laboratory accidents systematically.
Ability to use and care for apparatus and instruments in the laboratory.	The learner uses and cares for all apparatus and instruments in the laboratory innovatively.	The learner uses and cares for all apparatus and instruments in the laboratory.	The learner uses and cares for most of the apparatus and instruments in the laboratory.	The learner uses but care cares for a few apparatus or instruments in the laboratory.
Ability to use the SI units for basic and derived quantities.	The learner uses all the SI units for basic and derived quantities correctly giving examples.	The learner uses all the SI units for basic and derived quantities correctly.	The learner uses most of the SI units for basic and derived quantities correctly.	The learner uses a few of the SI units for basic and derived quantities.

STRAND 2.0: MIXTURES, ELEMENTS AND COMPOUNDS

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Mixtures, Elements and Compounds	**2.1 Mixtures** **(18 Lessons)** ● Homogeneous mixtures *(solid-solid, solid-liquid, liquid-liquid and gas-gas),* ● Separation of homogeneous mixtures *(evaporation, crystallisation, Simple distillation, fractional distillation, sublimation, solvent extraction and*	By the end of the sub strand, the learner should be able to; a) separate homogeneous mixtures using appropriate methods, b) outline applications of separating homogeneous mixtures in day to day life, c) appreciate the use of different methods of separating mixtures in day-to-day life.	The learner is guided to: ● Collaboratively categorise the mixtures as homogeneous or heterogeneous and record. Learners could use adapted writing materials or type on appropriate digital devices to record. ● Discuss in purposive groups meaning of the terms solvent, solute and solution. Learners with speech difficulties could use alternative communication modes as they share their views during discussion. ● Share tasks as they carry out activities to separate homogeneous mixtures. Learners with fine motor difficulties could use alternative functional parts of	How is separation of mixtures important in day-to-day life?

	chromatography), ● Applications of methods of separating mixtures in real life.		the body or appropriate assistive technology to carry out the activity. Safety precaution should be observed when using flames and solvents with strong odour. ● Discuss in purposive pairs the applications of separating mixtures in day to day life. ● Use digital/ adapted digital or print media to search for more information on fraction distillation as a method of separating a mixture. Adjust light/ glare on the screens of the digital devices appropriately for learners who are sensitive to light. Preferentially seat the learners while watching the video according to their individual needs.	

Core competencies to be developed:

- Communication and collaboration: The learner learns data presentation as they work collaboratively to categorise the mixtures as homogeneous or heterogeneous.
- Learning to learn: The learner learns how to separate various mixtures as they carries out activities to separate homogeneous mixtures.

Values:

Unity: The learner work harmoniously with peers while carrying out activities to separate homogeneous mixtures.

Pertinent and Contemporary Issues:

Peer education and mentorship: The leaner practices sharing of tasks as they carry out activities to separate homogeneous mixtures.

Link to other learning area:

The learner is able to relate methods of separating mixtures in cereals to heterogeneous mixtures in Agriculture and nutrition:

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
2.0 Mixtures, Elements and Compounds	**2.2 Acids, bases and indicators** **(22 Lessons)** ● *Introduction to acids and bases,* ● *Identification of acids and bases using a litmus paper,* ● *Preparation of acid-base indicators from plant extracts,* ● *Classification of commonly used substances as acids and*	By the end of the sub strand, the learner should be able to; a) identify acids and bases using a litmus paper, b) prepare an acid-base indicator from plant extracts, c) describe the physical properties of acids and bases, d) outline applications of acids, bases and indicators in real life, e) appreciate the uses of acids and bases in real life.	The learner is guided to: • Use litmus paper to classify household solutions into acids and bases. Safety precautions should be taken when dealing acids and spills. • Work with peers to prepare acid-base indicators from plant extracts, and dispose of laboratory waste responsibly. Learners with manipulation difficulties could use alternative functional parts of the body or appropriate assistive technology to carry out the activity. Safety precaution should be observed to avoid acid spills. Extra time could be allowed for learners to complete the task.	Why are acids and bases important?

	bases using acid -base indicator from plant extract, ● *Physical properties of acids and bases,* ● *Uses of acids, bases and indicators in real life.*		● Use acid-base indicator from plant extracts to classify common household solutions as either acidic or basic. ● Collaboratively carry out activities to investigate the physical properties of acids and bases. Create conducive environment and adequate space for learners with mobility difficulties and ensure safety for all learners as they perform the activity. ● Use digital/ adapted digital or print media to explore applications of acids and bases. Adjust light/ glare on the screens of the digital devices appropriately for learners who are sensitive to light.	
Core competencies to be developed: • Communication and Collaboration: The learner acquires data recording and presentation techniques as carry out activities to investigate the physical properties of acids and bases. • Critical thinking and problem solving: The learner develops research skills as they explore applications of acids and				

bases using print or digital media.

- Creativity and Imagination: The learner acquires innovative practices as they use acid-base indicator from plant extracts to classify common household solutions as either acidic or basic.

Values:

- Responsibility: The learner engages in assigned roles as they carry out activities to prepare acid-base indicators from plant extracts collaboratively.
- Respect: The learner works with peers and recognises each other's contribution(s) as they prepare acid-base indicators from plant extracts, and dispose of laboratory waste responsibly.

Pertinent and Contemporary Issues (PCIs):
Environmental Education: The learner learn how to use flowers sparingly to protect plants as they use acid-base indicator from plant extracts to classify common household solutions as either acidic or basic.

Link to other learning area:
The learner is able to relate the content of acids and bases is to testing soil acidity and application of lime and fertilizers to improve soil fertility and pH in agriculture and nutrition.

Suggested Assessment Rubric

Level / Indicator	Exceeds expectations	Meets expectations	Approaches expectations	Below expectations
Ability to separate homogeneous mixtures using	The learner consistently separates all the homogeneous mixtures	The learner separates all of the homogeneous	The learner separates most of the homogeneous mixtures using appropriate	The learner separates a few homogeneous mixtures

appropriate method.	using appropriate methods.	mixtures using appropriate methods.	methods.	inappropriate methods.
Ability to identify acids and bases using litmus paper.	The learner correctly and exhaustively identifies any substances as acids or bases.	The learner correctly identifies all of the provided substances as acids or bases.	The learner correctly identifies most of the provided substances as acids or bases.	The learner correctly identifies a few of the provided substances as acids or bases.
Ability to outline applications of acids, bases in real life.	The learner outlines all the applications of acids and bases exhaustively.	The learner outlines the applications of acids and bases.	The learner outlines most of the applications of acids and bases.	The learner outlines a few applications of either acids or bases.

STRAND 3.0: LIVING THINGS AND THEIR ENVIRONMENT

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key Inquiry Question(s)
3.0 Living things and the Environment	**3.1 Human reproductive system** **(16 lessons)** • *Parts of the human reproductive system and their functions (Male; penis, testis and urethra. Female; vagina, cervix, uterus, oviduct, and*	By the end of the sub strand, the learner should be able to; a) identify parts of the male and female reproductive systems, b) describe functions of parts of the male and female reproductive system, c) describe the physical changes that take place in boys and girls during adolescence, d) develop a plan to manage developmental challenges during adolescence, e) appreciate that physical changes in boys and girls during	Learners is guided to: • Use charts and other print materials to observe and identify parts of the male and female reproductive systems. Learners with postural limitation could be preferentially positioned for enhanced viewing. • Discuss in purposive groups the functions of parts of the male and female reproductive systems and share. Allow more time for learners with speech difficulties to express their views. • Use print and non-print material to search for information on physical changes that take place in boys and girls during	1. How do the physical, social and emotional changes affect the adolescents? 2. How are developmental changes managed during adolescence?

	ovaries), ***Note:*** *Detailed internal structures of testis and ovaries are not required,* • *Changes in boys and girls during adolescence and their implications,* • *How to manage developmental challenges during adolescence (physical, social and emotional*).	adolescence have social and reproductive implications.	adolescence. Adjust light/ glare on the screens of the digital devices appropriately for learners who are sensitive to light when using non-print media. • Use print and non-print material to search for information on developmental challenges during adolescence. • Discuss with peers the coping mechanisms for developmental challenges during adolescence. Learners with speech difficulties could use alternative communication modes as they share their views as they discuss. • Collaborate with peers and develop a plan to manage developmental challenges during adolescence.	

Core competencies to be developed:

- Self-efficacy: The learner develops confidence as they learn how to manage developmental challenges during adolescence.
- Communication and collaboration: The learner acquires speaking, listening skills and self-expression as they discusses with peers the coping mechanisms for developmental challenges during adolescence.

Values:

- Integrity: The learner shows self-discipline in coping with developmental challenges during adolescence.
- Respect: The learner learns how to live harmoniously with peers already experiencing different developmental challenges as they develop a plan to manage developmental challenges during adolescence.

Pertinent and Contemporary Issues (PCIs):

Human sexuality: The learner develops the skill of self-awareness as they discuss with peers the coping mechanisms for developmental challenges during adolescence.

Link to other Learning areas:

The leaner is able to relate content on the reproductive system is human to reproductive systems in other animals in Agriculture.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Suggested Key Inquiry Question(s)
3.0 Living Things and their Environment	**3.2 Human Excretory System** **(18 Lessons)** ● *Components of the excretory system.* ● *Parts of the human skin and their functions,* ● *Parts of the urinary system and their functions (external appearance of the kidney and vessels*	By the end of the sub strand, the learner should be able to; a) identify parts of human skin and their functions, b) identify parts of the urinary system and their functions c) describe causes of kidney disorders, d) develop and maintain a daily log on activities that promote skin and kidney health, e) appreciate the need for a healthy lifestyle to promote kidney and skin health.	The learner is guided to: ● Use a hand lens to observe the external parts of the skin (*hair and sweat pores*) and note findings. Learners with manipulation difficulties could use alternative functional parts of the body, be given physical support by peers/learner support assistant as they handle the hand lens. ● Use a chart or model to discuss in purposive groups parts and functions of the human skin (*epidermis, dermis, sweat glands, sweat duct and sweat pore –indicate position of the hair and avoid homeostatic functions of the skin*). Allow more time for learners with speech difficulties to express their views. Learners with	1. How is the excretory system important? 2. How can a healthy excretory system be maintained?

	serving kidney, ureter, bladder, urethra), ***Note:*** *avoid details of the nephron and osmoregulation,* ● *Common kidney disorders and their causes*.		postural limitation could be preferentially positioned for enhanced viewing of the chart. ● Search for information on the waste products excreted through the skin (*excess salts and water in sweat)*, lungs (*carbon iv oxide*) and kidneys (excess *salts and water in urine*). ● Discuss in purposive groups parts of the urinary system. ● Use locally available materials to model the urinary system. ● Use charts/ models/ animations to discuss in purposive pairs the external parts and functions of the human kidney. Learners with speech difficulties could use alternative communication modes as they share their views. ● Use print and non-print materials to search for information on the causes and prevention of kidney disorders. Learners using print media could be provided with book holders and page turners.	

			Control light to learners who are sensitive to light. ● Do a library search for information on healthy lifestyles that promote kidney and skin health. ● Collaborate with peers to develop a daily log on activities that promote skin and kidney health.	

Core competencies to be developed:

- Communication and Collaboration: The learner acquires speaking and listening skills as they discuss parts of the urinary system.
- Self-efficacy: The learner develops confidence in live healthier life as they search for information on healthy lifestyles that promote kidney and skin health.

Values:

- Love: The learner appreciates and embraces their natural skin as they develop and maintain a daily log on activities that promote skin and kidney health.
- Unity: The learner works collaboratively and harmoniously with peers as they develop a daily log on activities that promote skin and kidney health.

Pertinent and Contemporary Issues (PCIs)

Health promotion issues: The learner learns how to improve skin and kidney health as they develop a daily log on activities that promote skin and kidney health.

Link to other learning areas:
The learner is able to relate the content on healthy lifestyles that promote kidney and skin health is linked to nutrition for healthy skin and kidneys in Agriculture and Nutrition.

Suggested Assessment Rubric

Level / Indicator	Exceeds expectations	Meets expectations	Approaches expectations	Below expectations
Ability to describe functions of parts of the male and female reproductive system.	The learner describes all functions of parts of the male and female reproductive system comprehensively.	The learner describes all functions of parts of the male and female reproductive system.	The learner describes most of the functions of parts of the male and female reproductive system.	The learner describes a few functions of parts of the male or female reproductive system.
Ability to develop a plan to manage developmental challenges during adolescence.	The learner fully develops an innovative plan to manage developmental challenges during adolescence systematically.	The learner fully develops a plan to manage developmental challenges during adolescence.	The learner partially develops a simple plan to manage developmental challenges during adolescence.	The learner develops a sketchy plan to manage developmental challenges during adolescence partially.

Ability to identify parts of the excretory system and their functions.	The learner identifies all parts of the excretory system and their functions exhaustively.	The learner identifies all parts of the excretory system and their functions satisfactorily.	The learner identifies most parts of the excretory system and their functions.	The learner identifies a few parts of the excretory system and their functions.
Ability to develop and maintain a daily log on activities that promote skin and kidney health.	The learner comprehensively develops and maintains a purposeful daily log on activities that promote skin and kidney health.	The learner satisfactorily develops and maintains a daily log on activities that promote skin and kidney health.	The learner partially develops and maintains a simple daily log on activities that promote skin and kidney health.	The learner partially develops and maintains a daily log on activities that promote skin or kidney health leaving out some key parts.

STRAND 4.0: FORCE AND ENERGY

Strand	Sub Strand	Specific learning outcomes	Suggested learning experiences	Suggested Key inquiry question(s)
4.0 Force and Energy	**4.1 Electrical Energy** **(18 lessons)** • *Sources of electricity,* • *Flow of electric current,* • *Common electrical appliances,* • *Safety measures when using electrical appliances,* *Use of electricity.*	By the end of the sub strand, the learner should be able to; a) identify sources of electricity in the environment, b) connect simple electrical circuits to demonstrate the flow of electric current, c) identify common electrical appliances used in day to day life, d) identify safety measures observed when handling electrical appliances, e) appreciate the use of electricity in day to day life.	The learner is guided to: ● Discuss in purposive pairs the sources of electricity in the environment. ● Use print or digital/ adapted digital media to search for more information on sources of electricity in nature (*hydro-electric power, geothermal, solar, wind power, nuclear, tidal-wave, fossil fuels, biomass, natural gas, electrical cells).* Learners with manipulation difficulties could use alternative functional part of the body as they interact with digital devices. ● Collaboratively set up simple electrical circuits in series and in parallel *(using*	1. How does electric current flow? 2. How is electricity used in day to day life?

			*electrical cells, connecting wires, switch, bulb, bulb holder)*to demonstrate the flow of electric current. ● Discuss in purposive groups common electrical appliances used in day to day life *(pressure cooker, electric cooker, electric blender, electrical lamp and torch, electric iron box, electric kettle, electric guitar, electric fan, air conditioner, electric oven, television, electric speaker, washing machine and electric refrigerator.* Allow more time for learners with speech difficulties to express their views. ● Discuss in purposive pairs safety measures observed when using electrical appliances. Learners with speech difficulties could use residual speech as they are	

			lip read by the teacher or peers. ● Collaboratively explore uses of electricity in day-to-day life. ● Use digital/ adapted digital or print media to search for more information on electrical appliances and safety measures observed when using them. Learners using print media could be provided with book holders and page turners. Control light to learners who are sensitive to light.	
Core competencies to be developed: ● Learning to learn: The learner leans how to set up a simple electric circuit as they carry out activities of series and in parallel circuits. ● Communication and collaboration: The learner collaboratively works with peers to set up simple electrical circuits in series and in parallel.				

Pertinent and Contemporary Issues (PCIs): Environmental awareness: The learner learns how to identify sources of electricity from the environment as they discuss sources of electricity in the environment.
Values: • Unity: The learner with peers harmoniously to set up simple electrical circuits in series and in parallel. • Responsibility: The learner practices carefully handles various apparatus as they set up simple electrical circuits in series and parallel while working.
Link to other Learning Areas: The learner is able to relate concepts in electrical circuits to electrical energy in Pre-Technical Studies.

Strand	**Sub Strand**	**Specific learning outcomes**	**Suggested learning experiences**	**Suggested Key Inquiry Question(s)**
4.0 Force and Energy	**4.2. 1 Magnetism** **(16 lessons)** • *Properties of a magnet,* • *Classification of materials as magnetic or*	By the end of the sub strand, the learner should be able to; a) demonstrate the properties of a magnet, b) classify materials as magnetic or non-magnetic,	The learner is guided to: • Collaboratively carry out activities to demonstrate properties of a magnet *(attractive and repulsive, directional, poles and magnetic strength properties)* and note findings. Those with fine	How are magnets used in day-to-day life?

	non-magnetic, • *Uses of magnets.*	c) identify the uses of magnets in day-to-day life, d) appreciate the applications of magnets in day-to-day life.	motor difficulties could use alternative functional parts of the body or appropriate assistive technology to carry out the activity. • Carry out activities to investigate the nature of force between different poles of magnets *(basic law of magnetism)* and record. Learners with manipulation difficulties could use appropriate assistive technology, be given physical support by peers/ learner support assistant to carry out the activities. • Use a permanent magnet to test different materials, sort and classify them into either magnetic or non-magnetic materials with peers. • Discuss in purposive	

			groups the applications of magnets in day to day life *(separation of mixtures, in radios, speakers, refrigerator door, magnetic compass and magnets used in toys to give magic effect).* • Use digital/ adapted digital or print media to search for information on applications of magnets in day-to-day life. Learners using print media could be provided with book holders and page turners. Control light to learners who are sensitive to light.	
Core competencies to be developed: Communication and collaboration: The learner collaborates with others to carry out activities to demonstrate properties of a magnet.				
Pertinent and Contemporary Issues (PCIs): Socio-economic Issue: The learner links different materials to their cost based on magnetic properties as they use a permanent magnet to test different materials, sort and classify them into either magnetic or non-magnetic materials.				

Values:

- Responsibility: The learner diligently engages in assigned roles when carrying out activities to investigate the nature of force between different poles of magnets.
- Unity: The learner works with others harmoniously to carry out activities to demonstrate properties of a magnet.

Link to other Learning Areas:

The learner is able to link the concept leant in magnetism to the application of magnets and magnetic materials in Pre-Technical studies.

Suggested Assessment Rubric

Level / Indicator	Exceeds expectations	Meets expectations	Approaches expectations	Below expectations
Ability to identify sources of electricity in the environment.	The learner identifies all the sources of electricity in the environment exhaustively.	The learner identifies all the common sources of electricity in the environment.	The learner identifies most of the sources of electricity in the environment.	The learner identifies a few sources of electricity in the environment.
Ability to identify common electrical appliances used in day-to-day life.	The learner exhaustively identifies common electrical appliances used in day-to-day life.	The learner identifies all common electrical appliances used in day-to-day life.	The learner identifies most of common electrical appliances used in day-to-day life.	The learner identifies a few common electrical appliances used in day-to-day life.

Ability to identify safety measures observed when handling electrical appliances.	The learner identifies all safety measures observed when handling electrical appliances correctly and exhaustively.	The learner identifies all safety measures observed when handling electrical appliances correctly.	The learner identifies most of the safety measures observed when handling electrical appliances correctly.	The learner identifies a few safety measures observed when handling electrical appliances.
Ability to identify the uses of magnets in day-to-day life.	The learner correctly identifies all the uses of magnets in day-to-day life exhaustively.	The learner identifies all uses of magnets in day-to-day life correctly.	The learner identifies most uses of magnets in day-to-day life correctly.	The learner identifies a few uses of magnets in day-to-day life correctly.

APPENDIX 1: GUIDELINES FOR INTEGRATING COMMUNITY SERVICE LEARNING (CSL) PROJECT

Introduction

Community Service Learning (CSL) is an experiential learning strategy that integrates classroom learning and community service to enable learners reflect, experience and learn from the community. The CSL activity is hosted as a strand in Social Studies. The Social Studies teacher will be expected to coordinate teachers from other learning areas to carry out the integrated CSL class activity. Learners will be expected to apply knowledge, skills, attitudes and values from the different Learning Areas to undertake the integrated CSL class activity. Learners will undertake **one common** integrated class CSL activity following a 6-step milestone approach that is:

Milestone	**Description**
Milestone 1	**Problem Identification** Learners study their community to understand the challenges faced and their effects on community members.
Milestone 2	**Designing a solution** Learners create an intervention to address the challenge identified. Learners with speech difficulties could use Alternative and Augmentative modes of Communication-AAC (residual speech/ digital devices with text-to-speech application/ point/sign/write) during the discussion.
Milestone 3	**Planning for the Project** Learners share roles, create a list of activities to be undertaken, mobilise resources needed to create their intervention and set timelines for execution. Learners with manipulation difficulties could use alternative functional parts of the body, appropriate assistive devices or be assisted by peers or teacher to perform the task.

Milestone 4	**Implementation** The learners execute the project and keep evidence of work done.
Milestone 5	Showcasing /Exhibition and Report Writing Exhibitions involve showcasing learners' project items to the community and reflecting on the feedback Learners write/type a report detailing their project activities and learnings from feedback. Learners with manipulation difficulties could be provided with adapted writing materials such as pen/pencils with grip. They could also type on an adapted digital device or be assisted by a scribe or learner support assistant to write/type the report. Those with postural deformities could require appropriate positioning.
Milestone 6	**Reflection** Learners review all project work to learn from the challenges faced. They link project work with academic concepts, noting how the concepts enabled them to do their project as well as how the project helped to deepen learning of the academic concepts.

ASSESSMENT OF CSL INTEGRATED ACTIVITY

Assessment for the integrated CSL activity will be conducted formatively. The assessment will consider both the process and end product. This entails assessing each of the milestone stages of the integrated CSL class activity. It will focus on 3 components namely: skills from various learning areas applied in carrying out the activity, core competencies developed and values nurtured.

APPENDIX 2: LIST OF ASSESSMENT METHODS, LEARNING RESOURCES AND NON-FORMAL ACTIVITIES

Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non-Formal Activities
1.0 Scientific Investigation	1.1 Introduction to Integrated Science	● Observation ● Practical Work ● Assessment Rubrics ● Checklist ● Anecdotal Records ● Written Test ● Oral Questions and Answers	Course book Library	● Watching video tapes on components of Integrated Science as a field of study ● Oral Speeches on the importance of Integrated Science in daily life
	1.2 Laboratory Safety	● Practical Work ● Observation Schedule ● Checklist	● Science Kit ● Basic Laboratory Apparatus, equipment and selected specimens/ adapted laboratory apparatus ● SEPU Kit ● First Aid Kit ● Internet ● Library	● Interacting actively with resource persons to understand issues to do with common hazards and their symbols in the laboratory. ● Preparing charts, posters and slogans, First Aid safety measures for common laboratory accidents

	1.3 Laboratory apparatus and instruments	• Assessment Rubric • Practical Work • Observation Schedule • Checklist	• Course book • SEPU Kit • Basic Laboratory Apparatus, equipment and selected specimens (including microscope)/ adapted laboratory apparatus	• Writing articles in school magazines on units (SI) for basic and derived quantities in science. • Engaging resource persons in discussing basic science process skills • Engaging resource persons to talk about how to safely handle and use apparatus and instruments in the laboratory
2.0 Mixtures, Elements and Compounds	2.1 Mixtures	• Written Test • Assessment Rubrics • Checklist • Anecdotal Records • Oral Questions and Answers	• Course book • Basic Laboratory Apparatus, equipment and selected specimens/ adapted laboratory apparatus • Ice • Candle wax • Water/salty water.	• Organising and participating in exchange programmes / field trips to distinguish between pure and impure substances using melting and boiling points

			• Sieve • magnet	
	2.2 Acids, bases and indicators	• Assessment Rubrics • Checklist • Oral Questions and Answers • Written Test	• Course book • Basic Laboratory Apparatus, equipment and selected specimens/ adapted laboratory apparatus • Universal indicator, pH scale and pH chart • Antacid tablets, common fruits in the locality, fertilisers, liming of soil, detergents	• Engaging resource persons on how to use plant extracts as acid-base indicator.
	2.3 Solid–Liquid Mixture separation	• Practical Work • Observation Schedule • Checklist	• Basic Laboratory Apparatus, equipment and selected specimens/ adapted laboratory apparatus • Portfolio and file	• Inviting a resource person to talk about different methods of separating mixtures in day-to-day life • Conducting debates during club meetings on

			• Course book	separate mixtures using different methods
3.0 Living Things and their Environment	3.1 Reproduction in human beings	• Observation • Practical Work • Assessment Rubrics • Checklist • Anecdotal Records • Written Test • Oral Questions and Answers	• Charts • Course book • Basic Laboratory Apparatus, equipment and selected specimens/ adapted laboratory apparatus	• Engaging in straight talk on reproduction in human beings. • Engaging a resource person to talk about reproduction in human beings
	3.2 Human Excretory System-Skin and Kidneys	• Practical Work • Observation • Oral Questions and Answers • Assessment Rubrics • Checklist • Anecdotal Records • Written Test	• Basic Laboratory Apparatus, equipment and selected specimens/ adapted laboratory apparatus • Charts • Salts and water • Course book	• Conducting document analysis on human Excretory System-Skin and Kidneys • Holding discussions on causes of kidney disorders • Inviting a resource person to talk about how to adopt a healthy lifestyle to promote kidney and skin health.

4.0 Force and Energy	4.2 Electrical Energy	• Written Test • Assessment Rubrics • Checklist • Anecdotal Records • Practical Work • Observation Schedule	• Basic Laboratory Apparatus, equipment and selected specimens/ adapted laboratory apparatus • Course book	• Initiating projects on how to set up simple electrical circuits in series and parallel using dry cells, bulbs, ammeters and voltmeters. • Writing articles in school magazines on safety measures when handling electrical appliances
	4.3 Magnetism	• Portfolio • Written Test • Observation Schedule • Assessment Rubrics • Checklist • Anecdotal Records • Practical Work	• Basic Laboratory Apparatus, equipment and selected specimens / adapted laboratory apparatus • Course book	• Engaging resource persons to discuss uses of magnets in day-to-day life • Organising and participating in exchange programmes to identify force between like and unlike poles of magnets

NOTE: Assessment methods may be modified to accommodate a learner's diverse needs so that he/she can participate and achieve the learning outcomes. The table below shows how modes of assessment may be adapted for learners with physical impairment:

S/No	**Assessment Methods/Modes And Suggested Adaptations**	
	Methods	**Suggested Adaptations**
1.	Written assessment	• Typing, stamping or signing • Description of the task as a scribe or learner support assistant writes Audio visual recording of the learner as he/she makes oral responses • Provision of Adapted digital devices and writing/drawing resources • Adjustment of time according to individual needs • Providing illustrations to be interpreted for activities that involve drawing • Use of worksheets
2.	Oral or Aural assessment	• Written responses • Use of AAC (*Augmentative and Alternative modes of Communication) e.g. talking books, gestures, body movement, sign language, alphabet cards, facial expressions* • Adjustment of time according to individual needs
3.	Portfolio	• Use of E-Portfolio • Provision of physical support • Use of assistive technology • Provision of Adapted digital devices and writing/drawing resources • Adjustment of time according to individual needs • Description of how to carry out a practical activity while being audio/video recorded

4.	Practical assessment/ Experiments	• Provision of physical support • Provision of Adapted resources (learner specific) • Description of how to carry out a practical activity while being audio/video recorded • Adjustment of time according to individual needs • Rest intervals according to individual needs • Environmental adaptation
5.	Project	• Provision of physical support • Provision of Adapted resources (learner specific) • Description of how to carry out a practical activity while being audio/video recorded • Adjustment of time according to individual needs • Environmental adaptation

Note: Safety of all learners should be observed during assessment