

RATIONALISED SCHEMES OF WORK



INTEGRATED SCIENCE

GRADE 9

TERM 3

TEACHER'S NAME.....

TSC NUMBER.....

SCHOOL.....

WK	LSN	STRAND	SUB-STRAND	LESSON LEARNING OUTCOMES	LEARNING EXPERIENCES	KEY INQUIRY QUESTIONS	LEARNING RESOURCES	ASSESSMENT METHODS	REFL
1	1	Living Things and Their Environment	The interdependence of life - Components of the environment The interdependence of life - Competition	By the end of the lesson, the learner should be able to: - Define ecosystem, ecology and environment - Identify biotic and abiotic components - Show interest in interactions in ecosystems	- Study diagrams of ecosystems - Identify living and non-living components - Discuss relationships between organisms	What is an ecosystem?	- Textbooks (KLB Integrated Science pg. 115) - Digital resources - Charts of ecosystems - Textbooks (KLB Integrated Science pg. 116) - Reference books	- Written assessment - Oral questions - Observation	
	2	Living Things and Their Environment	The interdependence of life - Predation	By the end of the lesson, the learner should be able to: - Define predation, predator and prey - Explain adaptations of predators and prey - Show interest in predator-prey relationships	- Search for information on predation - Discuss adaptations of predators and prey - Analyze predator-prey population dynamics	How does predation affect population dynamics?	- Textbooks (KLB Integrated Science pg. 117) - Digital resources - Videos on predation	- Written assessment - Oral questions - Group discussions	
	3	Living Things and Their Environment	The interdependence of life - Parasitism	By the end of the lesson, the learner should be able to: - Define parasitism, parasite and host - Explain effects of parasites on hosts - Show interest in parasite-host relationships	- Search for information on parasitism - Discuss types of parasites affecting humans and animals - Analyze effect on distribution of organisms	How do parasites affect their hosts?	- Textbooks (KLB Integrated Science pg. 119) - Digital resources - Charts on parasitism	- Written assessment - Oral questions - Group discussions	
	4	Living Things and Their Environment	The interdependence of life - Symbiosis The interdependence of life - Saprophytism	By the end of the lesson, the learner should be able to: - Define symbiosis - Describe examples of symbiotic relationships - Appreciate mutual benefits in symbiosis	- Search for information on symbiotic relationships - Discuss root nodules, lichens, and ox-pecker relationships - Analyze benefits to each partner	How do organisms benefit from symbiotic relationships?	- Textbooks (KLB Integrated Science pg. 120) - Digital resources - Charts on symbiosis - Textbooks (KLB Integrated Science pg. 121) - Photographs of fungi	- Written assessment - Oral questions - Group discussions	

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	5	Living Things and Their Environment	The interdependence of life - Temperature effects	By the end of the lesson, the learner should be able to: - Measure environmental temperature - Explain effects of temperature on organisms - Show interest in abiotic factors	- Suspend thermometer to measure air temperature - Measure soil and water temperature - Discuss effects of temperature on organisms	How does temperature affect living organisms?	- Textbooks (KLB Integrated Science pg. 122) - Thermometers - Water in basin - Digital resources	- Practical skills - Written assessment - Oral questions	
2	1	Living Things and Their Environment	The interdependence of life - Light effects	By the end of the lesson, the learner should be able to: - Explain how light affects organisms - Describe importance of light intensity, quality and duration - Show interest in light as an ecological factor	- Discuss aspects of light affecting organisms - Explain how light affects plants and animals - Discuss measurement of light in ecosystems	How does light affect organisms in an ecosystem?	- Textbooks (KLB Integrated Science pg. 123) - Digital resources - Light meter if available - Secchi disc	- Written assessment - Oral questions - Group discussions	
	2	Living Things and Their Environment	The interdependence of life - Atmospheric pressure The interdependence of life - Humidity effects	By the end of the lesson, the learner should be able to: - Define atmospheric pressure - Explain effects of atmospheric pressure on organisms - Show interest in pressure as an ecological factor	- Discuss meaning of atmospheric pressure - Explain how pressure changes with altitude - Analyze effects on organisms	How does atmospheric pressure affect organisms?	- Textbooks (KLB Integrated Science pg. 124) - Digital resources - Barometer if available - Textbooks (KLB Integrated Science pg. 125) - Cobalt(II) chloride paper - Forceps - Stopwatch	- Written assessment - Oral questions - Group discussions	
	3	Living Things and Their Environment	The interdependence of life - Wind effects	By the end of the lesson, the learner should be able to: - Define wind and explain how it is measured - Describe effects of wind on organisms	- Discuss meaning of wind and wind parameters - Explain effects of wind on plants and animals - Construct simple	How does wind affect living organisms?	- Textbooks (KLB Integrated Science pg. 126) - Digital resources - Materials for windsock/wind vane	- Practical skills - Written assessment - Group work	

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3				- Show interest in wind as an ecological factor	wind measuring instruments				
	4	Living Things and Their Environment	The interdependence of life - pH and salinity The interdependence of life - Energy flow	By the end of the lesson, the learner should be able to: - Define pH and salinity - Measure pH of soil and water samples - Explain effects of pH and salinity on organisms	- Test pH of water samples - Test pH of soil samples - Discuss effects on organisms	How do pH and salinity affect living organisms?	- Textbooks (KLB Integrated Science pg. 127) - Universal indicator paper - Soil and water samples - Test tubes - Textbooks (KLB Integrated Science pg. 128) - Digital resources - Charts on energy flow	- Practical skills - Written assessment - Observation	
	5	Living Things and Their Environment	The interdependence of life - Food chains	By the end of the lesson, the learner should be able to: - Define food chain - Construct simple food chains - Show interest in feeding relationships	- Observe feeding habits of organisms - Record what each organism feeds on - Construct food chains based on observations	What is a food chain?	- Textbooks (KLB Integrated Science pg. 129) - Digital resources - Charts on food chains	- Written assessment - Food chain construction - Observation	
3	1	Living Things and Their Environment	The interdependence of life - Food webs	By the end of the lesson, the learner should be able to: - Define food web - Construct food webs from food chains - Appreciate complexity of feeding relationships	- Observe feeding habits of organisms - Construct multiple food chains - Combine food chains into food webs	How do food chains interact to form food webs?	- Textbooks (KLB Integrated Science pg. 130) - Digital resources - Charts on food webs	- Food web construction - Written assessment - Group presentations	
	2	Living Things and Their Environment	The interdependence of life - National Parks ecosystem The interdependence	By the end of the lesson, the learner should be able to: - Identify organisms in Kenyan National Parks - Describe interrelationships in	- Select a National Park for study - Research organisms found in the park - Construct food webs based on park organisms	What interrelationships exist in Kenyan National Parks?	- Textbooks (KLB Integrated Science pg. 131) - Digital resources - Reference books on National Parks - Textbooks (KLB Integrated Science pg.	- Project work - Written assessment - Group presentations	

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			of life - Decomposers	National Parks - Appreciate biodiversity conservation			132) - School compost site - Hand lens		
	3	Living Things and Their Environment	The interdependence of life - Human activities	By the end of the lesson, the learner should be able to: - Describe effects of human activities on ecosystems - Explain habitat change, conservation, and species introduction - Show concern for environmental conservation	- Search for information on human impacts - Discuss habitat change, poaching, and introduced species - Analyze conservation methods	How do human activities affect the environment?	- Textbooks (KLB Integrated Science pg. 133) - Digital resources - Reference books	- Written assessment - Group presentations - Debates	
	4	Force and Energy	Curved mirrors - Types of curved mirrors	By the end of the lesson, the learner should be able to: - Identify different types of curved mirrors - Describe curved mirror surfaces - Show interest in curved mirrors	- Observe different reflector surfaces - Discuss the description of concave, convex and parabolic reflectors - Compare the surfaces of different curved mirrors	How are curved mirrors used in day-to-day life?	- KLB Integrated Science pg. 147 - Car driving mirrors - Car headlight reflectors - Laboratory curved mirrors - Digital content on curved mirrors	- Observation - Oral questions - Written assignments	
	5	Force and Energy	Curved mirrors - Types of curved mirrors Curved mirrors - Images formed by concave and convex mirrors	By the end of the lesson, the learner should be able to: - Distinguish between concave and convex mirrors - Compare parabolic reflectors with other curved mirrors - Show interest in different types of reflectors	- Examine the curving of different mirrors - Identify the reflecting surfaces of different mirrors - Draw diagrams to illustrate different curved mirror surfaces	How do different curved mirrors differ in structure?	- KLB Integrated Science pg. 147 - Laboratory curved mirrors - Digital resources - Drawing materials - KLB Integrated Science pg. 148 - Internet resources - Digital devices - Geometrical sets - Curved mirrors	- Observation - Drawing assessment - Oral questions	
4	1	Force and Energy	Curved mirrors - Images formed by	By the end of the lesson, the learner should be able to:	- Locate the pole, center of curvature, and radius on	How do the parts of curved mirrors relate to	- KLB Integrated Science pg. 149 - Diagrams of curved	- Observation - Drawing	

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			concave and convex mirrors	- Describe the pole of a mirror - Explain the center of curvature and radius of curvature - Show interest in features of curved mirrors	- Diagrams - Draw and label the parts of curved mirrors - Discuss the significance of each feature	image formation?	- mirrors - Geometrical sets - Drawing materials	assessment - Oral questions	
	2	Force and Energy	Curved mirrors - Images formed by concave and convex mirrors Curved mirrors - Focal length	By the end of the lesson, the learner should be able to: - Describe the principal axis of curved mirrors - Explain the principal focus and focal plane - Show interest in optical features	- Draw the principal axis for concave and convex mirrors - Locate the principal focus on mirror diagrams - Discuss the focal plane and its significance	How does the principal focus relate to image formation?	- KLB Integrated Science pg. 150 - Diagrams of curved mirrors - Geometrical sets - Drawing materials - KLB Integrated Science pg. 152 - Concave mirrors - Meter rule - White screen - Mirror holder	- Observation - Drawing assessment - Written assignments	
	3	Force and Energy	Curved mirrors - Position of image formed by concave mirrors	By the end of the lesson, the learner should be able to: - Locate images formed by concave mirrors experimentally - Describe image characteristics for different object positions - Show interest in image formation	- Set up apparatus to locate images formed by concave mirrors - Place objects at different positions relative to the mirror - Record image characteristics for each position	How do image characteristics change with object position?	- KLB Integrated Science pg. 153 - Concave mirrors - Mirror holders - Meter rules - Screens - Candles	- Observation - Practical skills assessment - Written reports	
	4	Force and Energy	Curved mirrors - Position of image formed by convex mirrors	By the end of the lesson, the learner should be able to: - Locate images formed by convex mirrors - Describe image	- Observe images formed by convex mirrors - Record image characteristics - Compare with	How do images formed by convex mirrors differ from those formed by concave mirrors?	- KLB Integrated Science pg. 154 - Convex mirrors - Mirror holders - Objects - Meter rules	- Observation - Oral questions - Written assignments	

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				characteristics for convex mirrors - Compare images formed by concave and convex mirrors	images formed by concave mirrors				
	5	Force and Energy	Curved mirrors - Rays commonly used for ray diagram construction	By the end of the lesson, the learner should be able to: - Identify rays used in ray diagram construction - Explain how different rays are reflected - Show interest in ray diagram construction	- Search the Internet for information on ray behavior - Sketch ray diagrams showing reflection of different rays - Discuss with peers and display sketches	Which rays are most useful for locating images in ray diagrams?	- KLB Integrated Science pg. 155 - Internet resources - Digital devices - Manila paper - Drawing materials - KLB Integrated Science pg. 156 - Ruler and protractor - Reference materials	- Observation - Drawing assessment - Oral questions	
5									
	1	Force and Energy	Curved mirrors - Rays commonly used for ray diagram construction	By the end of the lesson, the learner should be able to: - Construct ray diagrams for concave mirrors - Locate images using ray diagrams - Show interest in graphical representation	- Draw ray diagrams for different object positions - Use ray diagrams to locate images - Determine image characteristics from ray diagrams	How can ray diagrams be used to predict image characteristics?	- KLB Integrated Science pg. 157 - Manila paper - Drawing materials - Ruler and protractor - Reference materials	- Observation - Drawing assessment - Written assignments	
	2	Force and Energy	Curved mirrors - Rays commonly used for ray diagram construction	By the end of the lesson, the learner should be able to: - Construct ray diagrams for convex mirrors - Locate images using ray diagrams - Compare ray diagrams for concave and convex mirrors	- Draw ray diagrams for convex mirrors - Use ray diagrams to locate images - Compare with concave mirror ray diagrams	How do ray diagrams for convex mirrors differ from those for concave mirrors?	- KLB Integrated Science pg. 159 - Manila paper - Drawing materials - Ruler and protractor - Reference materials	- Observation - Drawing assessment - Written assignments	
	3	Force and Energy	Curved mirrors - Uses of concave mirrors	By the end of the lesson, the learner should be able to:	- Search for information on applications of	What makes concave mirrors suitable for	- KLB Integrated Science pg. 161 - Digital devices	- Observation - Oral presentations -	

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				- Explain applications of concave mirrors - Relate object positions to specific applications - Show interest in practical applications	- Relate applications to image characteristics - Present findings to class	specific applications?	- Internet connectivity - Charts of ray diagrams - Digital resources - Torch with reflector	Written assignments	
	4	Force and Energy	Curved mirrors - Uses of concave mirrors	By the end of the lesson, the learner should be able to: - Explain the use of concave mirrors in astronomy - Describe applications in dental examination - Show interest in specialized applications	- Discuss the principle of reflection telescopes - Explain how dental mirrors provide magnified images - Research other specialized applications	How do concave mirrors contribute to professional fields?	- KLB Integrated Science pg. 162 - Digital resources - Internet connectivity - Reference materials	- Observation - Oral presentations - Written assignments	
	5	Force and Energy	Curved mirrors - Uses of convex mirrors	By the end of the lesson, the learner should be able to: - Explain applications of convex mirrors - Describe security and safety uses - Show interest in practical applications	- Discuss the use of convex mirrors for surveillance - Explain their applications in security systems - Research use at road junctions and corners	How do convex mirrors enhance security and safety?	- KLB Integrated Science pg. 163 - Digital resources - Internet connectivity - Reference materials - KLB Integrated Science pg. 164	- Observation - Oral questions - Written assignments	
6	1	Force and Energy	Curved mirrors - Review and assessment	By the end of the lesson, the learner should be able to: - Summarize key concepts about curved mirrors - Apply knowledge to solve problems - Show confidence in understanding curved mirrors	- Review main concepts in curved mirrors - Answer revision questions - Discuss solutions to problems	How does understanding curved mirrors help us in daily life?	- KLB Integrated Science pg. 166 - Previous notes - Assessment questions - Reference materials	- Written test - Observation - Oral questions	

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	2	Force and Energy	Waves - Generation of waves	By the end of the lesson, the learner should be able to: - Define waves in scientific terms - Describe how waves are generated - Show interest in wave phenomena	- Observe waves created in water - Generate sound waves using a drum/speaker - Discuss energy transfer through waves	What are waves and how are they generated?	- KLB Integrated Science pg. 170 - Water in a basin - Drum - Speaker connected to radio - Small stones	- Observation - Oral questions - Written assignments	
	3	Force and Energy	Waves - Classification of waves	By the end of the lesson, the learner should be able to: - Generate longitudinal waves - Describe characteristics of longitudinal waves - Show interest in wave classification	- Use a slinky spring to generate longitudinal waves - Observe particle displacement direction - Compare with wave travel direction	What distinguishes longitudinal waves from other wave types?	- KLB Integrated Science pg. 172 - Slinky spring - Rope - Smooth surface - Rigid support - KLB Integrated Science pg. 173	- Observation - Practical skills assessment - Written assignments	
	4	Force and Energy	Waves - Characteristics of waves	By the end of the lesson, the learner should be able to: - Identify parts of a wave - Measure the amplitude of a wave - Show interest in wave properties	- Generate waves with a slinky spring - Identify and measure amplitude - Draw wave patterns	What are the key components that define a wave?	- KLB Integrated Science pg. 175 - Slinky spring - Meter rule - Chalk - Drawing materials	- Observation - Measurement skills assessment - Written assignments	
	5	Force and Energy	Waves - Characteristics of waves	By the end of the lesson, the learner should be able to: - Define wavelength - Identify crests and troughs - Explain wave phase	- Generate waves and identify crests and troughs - Measure wavelength - Identify points in phase	How is wavelength measured and what is its significance?	- KLB Integrated Science pg. 177 - Slinky spring - Meter rule - Chalk - Drawing materials	- Observation - Measurement skills assessment - Written assignments	

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7	1	Force and Energy	Waves - Frequency and periodic time	By the end of the lesson, the learner should be able to: - Define frequency and periodic time - Measure periodic time - Calculate frequency from periodic time	- Demonstrate frequency and periodic time - Measure time for complete oscillations - Calculate frequency from measurements	What is the relationship between frequency and periodic time?	- KLB Integrated Science pg. 180 - Slinky spring - Meter rule - Stopwatch - Chalk - KLB Integrated Science pg. 181 - Calculators - Graph paper - Reference materials - Problem sets	- Observation - Calculation skills assessment - Written assignments	
	2	Force and Energy	Waves - Speed of a wave	By the end of the lesson, the learner should be able to: - Define wave speed - Derive the wave equation - Apply the wave equation to solve problems	- Derive the relationship between wavelength, frequency and wave speed - Practice using the wave equation - Solve sample problems	How are wavelength, frequency, and wave speed related?	- KLB Integrated Science pg. 183 - Calculators - Reference materials - Problem sets	- Observation - Problem-solving assessment - Written assignments	
	3	Force and Energy	Waves - Speed of a wave Waves - Properties of waves	By the end of the lesson, the learner should be able to: - Solve complex problems using wave equation - Explain the relationship between wavelength and frequency - Apply wave concepts to real situations	- Work through more complex wave problems - Discuss how the wave equation applies in real scenarios - Create a concept map of wave relationships	How does changing one wave parameter affect others?	- KLB Integrated Science pg. 184 - Calculators - Reference materials - Problem sets - Chart paper - KLB Integrated Science pg. 186 - Ripple tank - Straight edge - Metal reflectors - Water	- Observation - Problem-solving assessment - Concept map evaluation	
	4	Force and Energy	Waves - Properties of waves	By the end of the lesson, the learner should be able to: - Demonstrate refraction of waves	- Set up a ripple tank with regions of different depths - Observe changes in wave speed and wavelength	What happens to waves when they pass from one medium to another?	- KLB Integrated Science pg. 187 - Ripple tank - Glass block - Water - Wave generator	- Observation - Practical skills assessment - Written reports	

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				- Explain how waves are refracted - Show interest in wave behavior	- Discuss the principle of refraction				
	5	Force and Energy	Waves - Properties of waves	By the end of the lesson, the learner should be able to: - Demonstrate diffraction of waves - Explain the factors affecting diffraction - Show interest in wave behavior	- Set up a ripple tank with barriers having gaps - Observe spreading of waves through gaps - Investigate the effect of gap size	How do waves spread around obstacles or through openings?	- KLB Integrated Science pg. 188 - Ripple tank - Metal barriers - Water - Wave generator	- Observation - Practical skills assessment - Written reports	
8	1	Force and Energy	Waves - Remote sensing	By the end of the lesson, the learner should be able to: - Define remote sensing - Explain the principles of remote sensing - Show interest in remote sensing applications	- Study photographs of environments - Discuss the source of energy in photography - Research remote sensing processes	What is remote sensing and how does it work?	- KLB Integrated Science pg. 189 - Digital resources - Photographs - Internet connectivity - KLB Integrated Science pg. 190 - Drawing materials	- Observation - Oral questions - Written assignments	
	2	Force and Energy	Waves - Applications of waves	By the end of the lesson, the learner should be able to: - Identify applications of waves in medicine - Explain how waves are used in medical imaging - Show interest in medical applications	- Research applications of waves in medicine - Discuss ultrasound, X-rays, and MRI scans - Create presentations on medical applications	How are waves applied in medical imaging?	- KLB Integrated Science pg. 191 - Digital resources - Internet connectivity - Presentation materials	- Observation - Presentations - Written assignments	
	3	Force and Energy	Waves - Applications of waves	By the end of the lesson, the learner should be able to: - Explain the use of waves in surgery	- Research laser surgery applications - Discuss radiation therapy for cancer - Create information posters	How have waves revolutionized medical treatments?	- KLB Integrated Science pg. 192 - Digital resources - Internet connectivity - Poster materials	- Observation - Poster assessment - Written assignments	

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