



UNITED ARAB EMIRATES  
MINISTRY OF EDUCATION



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WE THE UAE  
2031

# Science

## Comprehensive Curriculum Guide

Grade 1 Main

Unit 3: Light and Shadows

Term 3

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2025-2026 A.D



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# 1. Empowering Science Teaching: The Comprehensive Curriculum Guide

A **Comprehensive Curriculum Guide (CCG)** is a structured, unified blueprint that supports teachers in delivering high-quality, coherent, and standards-aligned science instruction. It brings together all essential curriculum components into a single, organized reference to ensure consistency and efficiency across classrooms.

This guide aims to:

- Align science instruction with the UAE National Curriculum.
- Consolidate all core components—such as the curriculum overview, pedagogical strategies, instructional planner, cross-curricular links, diagnostic tools, assessment guidelines, and the use of AI tools and educational technology—into one accessible resource.
- Optimize and standardize instructional planning reducing teacher preparation time.
- Ensure a seamless implementation of STEM projects, hands-on learning and real-world applications as an integral part of the learning process.
- Support inclusive, differentiated, and student-centered teaching practices to meet the diverse needs of learners.
- Empower teachers to cultivate students' cognitive skills, values, and attitude, and a lasting disposition toward science for lifelong success.

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## 2. Glossary

This section provides clear definitions of key terms and concepts referenced throughout the guide. It supports teachers in developing a shared understanding of instructional approaches, curriculum components, and assessment tools used in the module.

Key term	Definition
<b>Performance Expectations (PEs)</b>	The NGSS is not a set of daily standards, but a set of expectations for what students should be able to do by the end of instruction (years or grade-bands). The performance expectations set the learning goals for students, but do not describe how students get there.
<b>Disciplinary Core ideas (DCI)</b>	The fundamental ideas that are necessary for understanding a given science discipline. The core ideas all have broad importance within or across science or engineering disciplines, provide a key tool for understanding or investigating complex ideas and solving problems, relating to societal or personal concerns, and can be taught over multiple grade levels at progressive levels of depth and complexity.
<b>Science Engineering Practice (SEP)</b>	The practices are what students DO to make sense of phenomena. They are both a set of skills and a set of knowledge to be internalized. The SEPs reflect the major practices that scientists and engineers use to investigate the world and design and build systems.
<b>Crosscutting Concepts (CCCs)</b>	These are concepts that hold true across the natural and engineered world. Students can use them to make connections across seemingly disparate disciplines or situations, connect new learning to prior experiences, and more deeply engage with material across the other dimensions. The NGSS requires that students explicitly use their understanding of the CCCs to make sense of phenomena or solve problems.
<b>Inquiry-based activity</b>	The inquiry-based activity engages students in exploring questions, problems, or scenarios, fostering critical thinking and deep understanding. This approach emphasizes student-centered learning through questioning, investigation, and evidence-based reasoning. It promotes 21 <sup>st</sup> century skills such as critical thinking, problem solving, collaboration, communication, and creativity that are essential for scientific inquiry.
<b>Phenomenon-based learning</b>	Phenomenon-based learning utilizes real-world events or observable phenomena to drive instruction. Students investigate these phenomena to understand underlying scientific principles, integrating multiple disciplines. This method encourages students to ask questions and seek explanations for events they observe in the natural world promoting science literacy.

<b>Claims, Evidence, Reasoning (CER)</b>	The CER helps students construct scientific explanations by making a claim, supporting it with evidence, and providing reasoning that links the evidence to the claim. This approach develops students' analytical and argumentative skills by engaging in argument from evidence.
<b>5E Instructional Model</b>	An instructional model followed by McGraw Hill's Inspire Science program. This model is designed to enhance critical thinking and problem-solving skills by actively engaging students with scientific concepts. The 5 Es are: engage, explore, explain, elaborate and evaluate.
<b>STEM Module Project</b>	STEM module projects are interdisciplinary tasks that integrate science, technology, engineering, and mathematics to solve real-world problems. These projects encourage hands-on learning and the application of knowledge across disciplines, fostering 21 <sup>st</sup> century skills, language literacy, digital literacy, financial literacy, numeracy, entrepreneurship, and innovation.
<b>Cross-Curricular Connections</b>	Cross-curricular connections involve integrating concepts and skills from multiple subject areas to provide a more cohesive learning experience. This approach reflects the interconnectedness of knowledge and skills enabling students to apply learning in various contexts.
<b>Differentiated Instruction</b>	Differentiated instruction is a strategic teaching approach that adapts content, process, and product to meet students' varying readiness levels, interests, and learning profiles. Through scaffolded support (approaching, on-level, beyond), leveled resources, and diverse instructional strategies, it ensures equitable access, fosters deeper understanding of scientific concepts, and acquisition of essential skills and competencies.
<b>Formative Assessment</b>	A process used by teachers and students during instruction that provides actionable feedback used to adjust ongoing teaching and learning to improve students' achievement of intended curricular learning targets and goals.
<b>Summative Assessment</b>	The goal of summative assessment is to evaluate student learning at the end of an instructional unit by comparing it against some standard or benchmark.
<b>The Three Dimensions</b>	These are the three strands of knowledge and skills that students should explicitly be able to use to explain phenomena and design solutions to problems. The three dimensions are the Disciplinary Core Ideas (DCIs), Crosscutting Concepts (CCCs), and Science and Engineering Practices ("the Practices" or SEPs).
<b>Three-Dimensional Learning</b>	This is what students' experiences in classrooms implementing the NGSS should reflect: developing and using elements of the three dimensions, together, purposefully (i.e., to explain phenomena or design solutions to problems). Lessons and units aligned to the standards should be three-dimensional; that is, they should allow students to actively engage with the practices and apply the crosscutting concepts to deepen their understanding of core ideas across science disciplines.

### 3. Scope and Sequence

This section includes a termly overview reflecting the units, modules, lessons, and performance expectations and the corresponding pacing of each module.

Subject	Grade	Stream	Term	Week	Unit Number	Unit Name	Module Number	Module Name	Lesson number	Lesson Name	Number of Periods	Remarks
Science	1	Main	3	Week 1-2	U3	Light and Shadows	U3M1	See Objects	U3M1L1	Light	7	Shifted from T2
				Week 2-4					U3M1L2	Light and Materials	6	
				Week 4-6					U3M1L3	Light Uses	9	
				Week 6-8	U4	Sky Patterns	U4M1	Observe the Sky	U4M1L1	Objects in the Sky	7	
				Week 8-9					U4M1L2	Day and Night Patterns	6	
				Week 9-11					U4M1L3	Patterns During the Year	9	

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Module Number	Module Name	PE Code	Performance Expectation	Prioritization	Lesson	Remarks
Unit 3 Module 1	See Objects	1-PS4-2	Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated	Power Outcome	Lesson 1: Light	Shifted from T2
		1-PS4-3	Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.	Support Outcome (Basic)	Lesson 2: Light and Materials	
		1-PS4-4	Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	Support Outcome (Basic)	Lesson 3: Light Uses	
Unit 4 Module 1	Observe the Sky	1-ESS1-1	Use observations of the sun, moon, and stars to describe patterns that can be predicted.	Power Outcome	Lesson 1: Objects in the Sky	
		1-ESS1-2	Make observations at different times of year to relate the amount of daylight to the time of year.	Power Outcome	Lesson 2: Day and Night Patterns	
					Lesson 3: Patterns During the Year	

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## Unit 3 Light and Shadows

### Module 1 See Objects

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## 4. Module Overview

The Module Overview provides a detailed breakdown of the module, including the module’s performance expectations, disciplinary core ideas, science and engineering practices, resources, and “diagnose and intervene” section.

Unit and Module	Unit 3 Module 1 See Objects
<p>The learning experiences throughout the module will develop students’ acquisition of the following:</p> <p><b>Performance Expectation(s):</b></p> <ul style="list-style-type: none"> <li>• <b>1-PS4-2.</b> Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated</li> <li>• <b>1-PS4-3.</b> Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.</li> <li>• <b>1-PS4-4.</b> Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.</li> </ul> <p><b>Disciplinary Core Ideas (DCIs) building towards the module’s PEs</b></p> <ul style="list-style-type: none"> <li>• <b>PS4.B: Electromagnetic Radiation</b> <ul style="list-style-type: none"> <li>- An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)</li> </ul> </li> <li>• <b>PS4.C: Information Technologies and Instrumentation</b> <ul style="list-style-type: none"> <li>- Digitized information transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa. (4-PS4-3)</li> </ul> </li> <li>• <b>ETS1.C: Optimizing the Design Solution</b> <ul style="list-style-type: none"> <li>- Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3) (secondary to 4-PS4-3)</li> </ul> </li> </ul> <p><b>Science Engineering Practices (SEPs) building towards the module’s PEs:</b></p> <ul style="list-style-type: none"> <li>• <b>Constructing Explanations and Designing Solutions</b> <ul style="list-style-type: none"> <li>- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-PS4-2)</li> </ul> </li> <li>• <b>Planning and Carrying Out Investigations</b> <ul style="list-style-type: none"> <li>- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-3)</li> </ul> </li> </ul>	

<ul style="list-style-type: none"> <li> <b>Analyzing and Interpreting Data</b> <ul style="list-style-type: none"> <li>Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. (K-2-ETS1-3)</li> </ul> </li> </ul>					
<b>Lessons</b>		<b>Lesson Objectives</b>			
Lesson 1 Light		Students will make observations and construct explanations to observe what causes objects to be seen when illuminated.			
Lesson 2 Light and Materials		Students will carry out investigations to determine the effect of placing objects in the path of a beam of light.			
Lesson 3 Light Uses		Students will begin to construct explanations and design solutions for people who use modern technology to communicate over a distance.			
<b>STEM Module Project</b>					
<b>Design a Light Message:</b> Students will use what they have learned throughout the module to design and send a light message.					
<b>STEM Module Project</b> (TE p. 57 till 58)					
<b>Disciplinary Core Ideas (DCIs) and Science Engineering Practices (SEPs) throughout Module 1 See Objects</b>					
		<b>Lesson 1</b>	<b>Lesson 2</b>	<b>Lesson 3</b>	<b>Module Project</b>
<b>Disciplinary Core Ideas (DCIs)</b>	PS4.B: Electromagnetic Radiation	.	.		
	PS4.C: Information Technologies and Instrumentation			.	.
	ETS1.C: Optimizing the Design Solution			.	.
<b>Science Engineering Practices (SEPs)</b>	Constructing Explanations and Designing Solutions	.		.	
	Planning and Carrying Out Investigations		.		
	Analyzing and Interpreting Data			.	.

Module Assessment Tools (TE p. 2F)		
<b>Pre-Assessment:</b> Includes Page Keeley Science Probes and McGraw-Hill Module Pretest	<b>Formative Assessment:</b> Includes Claim-Evidence-Reasoning, Three-Dimensional Thinking questions, Talk About It, Inquiry Activities, Quick Check, and Page Keeley Science Probes	<b>Summative Assessment:</b> Includes Lesson Reviews, McGraw-Hill Lesson Checks and Module Test, Vocabulary Check, and STEM Module Project
Resources		
Student book: available on Minhaji Inspire Science Platform – to be accessed through LMS Teacher Guide		

Diagnose and intervene
The "Diagnose and Intervene" section aims to diagnose students' prior knowledge required before exploring the new content. This helps identify and address any gaps from previous years and pre/misconceptions.
Diagnose
Students should demonstrate understanding of the following prior knowledge to be able to explore new content.
<b>Electromagnetic Radiation</b> <ul style="list-style-type: none"> <li>Identify the difference between light and dark.</li> <li>Recognize that we need light to see things.</li> <li>Identify simple sources of light (sun, lamp, flashlight).</li> </ul>
<b>Information Technologies and Instrumentation</b> <ul style="list-style-type: none"> <li>Identify simple ways people share messages (talking, waving, pictures).</li> </ul>

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## Intervene

### Gaps from previous learning

Use the findings from the diagnosis to address any identified gaps.

### Possible pre/misconceptions

#### Students may think that:

- Light is something that simply exists around us at all times. They may fail to realize that light travels in a straight line from its source or that light interacts with materials.
- We see objects because they absorb light. They may have trouble understanding that light bounces off items, and our eyes receive the light. The eyes send a signal to the brain to interpret this information. Students may think we can see in the dark, especially after our eyes have had time to adjust to the darkness. However, students have likely never experienced true darkness and therefore do not understand that nothing can be seen without light.
- Not all objects emit electromagnetic radiation. Because most of this radiated energy falls into the infrared region or below, much of this energy goes unseen. Light bulbs, flashlights, and hot stoves all emit electromagnetic radiation within the spectrum of visible light that can be seen. Introduce students to nonvisible forms of energy like heat or sound. Although we cannot see these waves, they also exist.
- Light interacts with all objects in the same way. They may not realize that reflections we see in mirrors are really light bouncing back into our eyes. Students may think that light only passes through objects that are perfectly clear, but it also passes through colorful objects that are transparent or translucent.
- Light must be entirely absorbed or entirely reflected and that partial reflection is not possible. Students may think that light is an object. They may not understand that light is energy rather than matter.
- Communication only happens through speaking. Students may not realize that light can also be used to communicate and send messages.

*Refer to the TE Pages 2, 7, 12, 21,28 and 37 of the “Teacher Toolbox – Identifying Preconceptions”*

## 5. Learning Progression

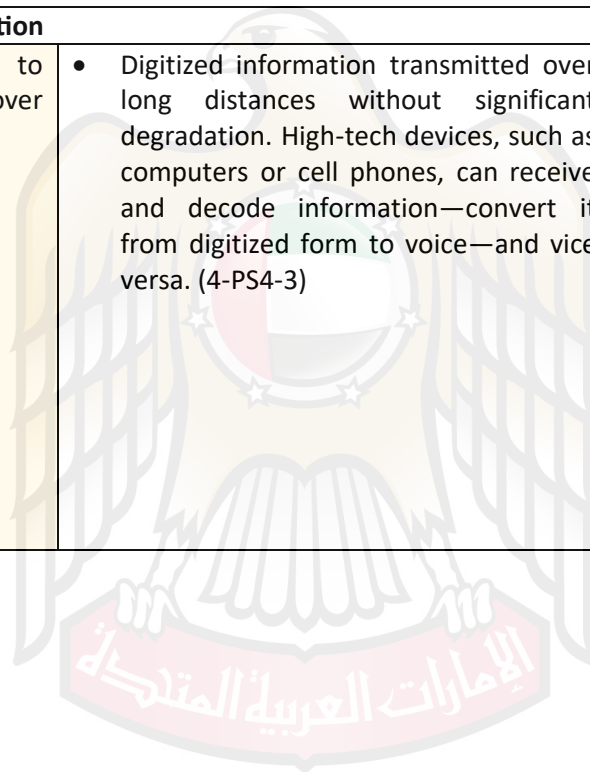
Learning progression is fundamentally about **sequencing** and **scaffolding** concepts in a logical way, ensuring students **build on prior knowledge** to reach deeper understanding and mastery.

In this section, you will find the content learning progression of Unit 3 - Module 1 See Objects

Content Learning Progression		
Grades K-2	Grades 3-5	Grades 6-8
<b>PS4.B: Electromagnetic Radiation</b>		
<ul style="list-style-type: none"> <li>Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2)</li> <li>Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1-PS4-3)</li> </ul>	<ul style="list-style-type: none"> <li>An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)</li> </ul>	<ul style="list-style-type: none"> <li>When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. (MS-PS4-2)</li> <li>The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends. (MS-PS4-2)</li> <li>A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between media. (MS-PS4-2)</li> <li>However, because light can travel through space, it cannot be a matter wave, like sound or water waves. (MS-PS4-2)</li> </ul>

**PS4.C: Information Technologies and Instrumentation**

- |   |  |  |
|---|--|--|
| <ul style="list-style-type: none"> <li>• People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)</li> </ul> | <ul style="list-style-type: none"> <li>• Digitized information transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa. (4-PS4-3)</li> </ul> | <ul style="list-style-type: none"> <li>• Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. (MS-PS4-3)</li> </ul> |
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## 6. Scheme of Work

The scheme of work section provides pedagogical considerations, performance standards, differentiated activities, English language support, and the assessments embedded in each lesson.

### Explore and learn

#### Pedagogical Considerations:

Teachers incorporate the 5E instructional model (Engage, Explore, Explain, Elaborate, Evaluate) in the pedagogical approach. The 5E model includes:

- **Engage:** Encounter the phenomenon, question, or challenge to stimulate curiosity.
- **Explore:** Students conduct hands-on investigations, experiments, or simulations to discover scientific concepts in an inquiry-driven way.
- **Explain:** Students analyse their findings, and teachers introduce formal explanations, scientific vocabulary, and key concepts.
- **Elaborate:** Students apply their understanding to new scenarios, engineering challenges, or interdisciplinary connections.
- **Evaluate:** Students demonstrate their learning through assessments, reflection, and performance-based tasks.

#### Students will engage in learning through:

- Inquiry-based Activities (Hands On – Research – Simulation – Data Analysis – Demonstration – Stem Module Project)
- Phenomenon-based activities
- Cross-curricular connections
- STEM connections (online resources)

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## Lesson 1: Light

### Inquiry Activity Planner (TE p. 2G)

This is used to preview and prepare for the labs and investigations in this lesson.

*To ensure effective instructional delivery and enhance learning experience, inquiry activities should be seamlessly integrated into the teaching of the lesson, allowing students to make direct connections between theory and practice.*

### Lesson at Glance (TE p. 8C)

- This is used to facilitate the integration of the **5E instructional** module and incorporation of the inquiry-based and phenomenon-based activities into each lesson.
- Additionally, it highlights the **cross-curricular connections** used to further integrate students' understanding of science in the natural world when applicable.

### Possible pre/misconceptions

#### Students may think that:

- We see objects because they absorb light. They may have trouble understanding that light bounces off items, and our eyes receive the light. The eyes send a signal to the brain to interpret this information. Students may think we can see in the dark, especially after our eyes have had time to adjust to the darkness. However, students have likely never experienced true darkness and therefore do not understand that nothing can be seen without light.
- Not all objects emit electromagnetic radiation. Because most of this radiated energy falls into the infrared region or below, much of this energy goes unseen. Light bulbs, flashlights, and hot stoves all emit electromagnetic radiation within the spectrum of visible light that can be seen. Introduce students to nonvisible forms of energy like heat or sound. Although we cannot see these waves, they also exist.

*Refer to the TE Pages 7 and 12 of the “Teacher Toolbox – Identifying Preconceptions”*

### Key Terminology and Vocabulary

Illuminate- يضيء

Light- الضوء

Lesson 1: Light Performance Standards			
Lesson Objectives	Approaching level	On level	Beyond level
Students will make observations and construct explanations to observe what causes objects to be seen when illuminated.	Identifies whether an object can be seen in light or darkness and states what was noticed without explaining that illumination is required to see the object.	Explains that objects can be seen because they are illuminated by a light source and uses observations from the classroom investigation to describe the cause-and-effect relationship between illumination and visibility.	Describes how light reflects off an illuminated object and enters the eyes and applies this explanation to new examples to show a deeper understanding of why illumination allows objects to be seen.
Inquiry Activity			
<b>Hands on:</b> Observe Light (TE p. 10 till 11) <b>Demonstration:</b> Light Travels (TE p. 16 till 17)			

Lesson 1: Light Differentiation of Learning		
Based on the student's level, the teacher can select and implement the appropriate differentiated activities shown in the table below.		
Lesson Objective (LO)	Differentiated Instructions (DI)	English Language Support (EL)
Students will make observations and construct explanations to observe what causes objects to be seen when illuminated.	<p><b>Differentiated Instruction (DI)1</b> (TE p. 15) DI1 is related to <b>Light Sources</b></p> <ul style="list-style-type: none"> <li>• <b>Approaching Level:</b> Have students create a list of things that give off light. Which ones require a power source? Which power source does each item use?</li> <li>• <b>On Level:</b> Have students explain why having headlights on a car is so important. What would happen if cars did not have headlights?</li> <li>• <b>Beyond Level:</b> Have students research the word root <i>lumin</i>. Have them write its meaning and a few words, such as <i>illuminate</i>, having that root. Then have them identify which object on page 12 is <i>bioluminescent</i>.</li> </ul>	<p><b>EL Support 1</b> (TE p. 13) <b>ENTERING and EMERGING</b> Begin a discussion of when students had trouble seeing something because it was too dark and what they did to see better. Ask questions that allow students to respond with words and phrases. <b>ASK:</b> <i>Was it day or night?</i> <b>Sample answer:</b> <i>night.</i> <b>ASK:</b> <i>Could you see?</i> <b>Sample answer:</b> <i>no.</i></p> <p><b>DEVELOPING and EXPANDING</b> Ask questions that allow students to add details. <b>ASK:</b> <i>Where were you? What time of day was it? What did you do?</i></p> <p><b>BRIDGING and REACHING</b></p>

	<p><b>Differentiated Instruction (DI)2</b> (TE p. 19) DI2 is related to <b>Light and Illumination</b></p> <ul style="list-style-type: none"> <li>• <b>Approaching Level:</b> ASK: <i>If you are taking a walk, why would you need a flashlight at night but not during the day?</i> Students should be able to identify that objects are illuminated by the Sun during the day.</li> <li>• <b>On Level:</b> ASK: <i>If you are taking a walk at night, when might you NOT need to take a flashlight?</i> Students may respond that there are streetlights or that there is a full moon.</li> <li>• <b>Beyond Level:</b> Have students explain why there might be enough light for a walk without the aid of a light if the moon is full, especially since the moon does not make its own light.</li> </ul>	<p>Ask questions that prompt students to elaborate. <i>ASK: Why do you think you could not see? What did you do? How did this help you solve your problem?</i></p> <p><b>EL Support 2</b> (TE p. 18) <b>ENTERING and EMERGING</b> Model writing the sample answer on chart paper. Elicit input from students, such as <i>light</i> and <i>objects</i> in the first sentence, <i>mystery object</i> and <i>lights were off</i> in the second sentence, and <i>parts of the stage</i> and <i>illuminated</i> in the third sentence.</p> <p><b>DEVELOPING and EXPANDING</b> Following the sample answer, collaboratively write the summary with students on chart paper. Invite students to come forward and add details. Point out the use of <i>I know</i> to express something we are certain about.</p> <p><b>BRIDGING and REACHING</b> Have students review and refine their notes in small groups. Then have them write a group summary. Ask them to use <i>We know</i> to describe the things they are certain about in their writing.</p>
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<b>Lesson 1: Light Assessment Criteria</b>	
<b>Lesson Objective (LO)</b>	<b>Assessment Criteria</b>
<p>Students will make observations and construct explanations to observe what causes objects to be seen when illuminated.</p>	<p><b>Pre-Assessment</b>  <b>Page Keely Science Probes:</b> Light and Sound (TE p. 7)</p> <p><b>Formative Assessment</b></p> <ul style="list-style-type: none"> <li>• <b>REVISIT Page Keely Science Probes</b> (TE p. 14 and 18)</li> <li>• <b>Inquiry Activities</b> Refer to the above “Inquire Activity” section.</li> <li>• <b>Talk About It</b>            Discover the Phenomenon – Why can you see some objects in the photo and not others? (TE p. 9)            Inquiry Activity- Observe Light (TE p. 11)            Inquiry Activity – Light Travels (TE p. 16)</li> <li>• <b>Claim Evidence Reasoning</b> Can you see an object without light? (TE p. 13)</li> <li>• <b>Three-Dimensional Thinking Questions</b> (TE p. 17 and 19)</li> <li>• <b>Quick Check</b> (TE p. 15) Use this formative assessment to determine whether students are ready to move on.</li> </ul> <p><i>Please note that all sub-activities within each main activity should be covered. This includes components such as 'Talk About It', DCI-related questions, SEPs, CCC, 3D Thinking, etc.</i></p> <p><b>Summative Assessment (Online Resources)</b>            Use the Lesson Review pages as a summative assessment of student learning. Assign students the vocabulary check and lesson check, based on the DCIs for the lesson. Use the customization tool to create a tailor-made lesson check.</p> <p><b>STEM Module Project</b>            Refer to Module Project Rubric (TE p. 57) and download the rubric through Inspire Science “STEM Module Project” online resources.</p>
<b>Lesson 1: Light STEM Module Project</b>	
<p><b>What to Expect:</b>            During Lesson 1, students will be able to construct explanations about how light illuminates objects.</p>	

## Lesson 2: Light and Materials

### Inquiry Activity Planner (TE p. 2G)

This is used to preview and prepare for the labs and investigations in this lesson.

*To ensure effective instructional delivery and enhance learning experience, inquiry activities should be seamlessly integrated into the teaching of the lesson, allowing students to make direct connections between theory and practice.*

### Lesson at Glance (TE p. 22C)

- This is used to facilitate the integration of the **5E instructional** module and incorporation of the inquiry-based and phenomenon-based activities into each lesson.
- Additionally, it highlights the **cross-curricular connections** used to further integrate students' understanding of science in the natural world when applicable

### Possible pre/misconceptions

#### Students may think that:

- Light interacts with all objects in the same way. They may not realize that reflections we see in mirrors are really light bouncing back into our eyes. Students may think that light only passes through objects that are perfectly clear, but it also passes through colorful objects that are transparent or translucent.
- Light must be entirely absorbed or entirely reflected and that partial reflection is not possible. Students may think that light is an object. They may not understand that light is energy rather than matter.

*Refer to the TE Pages 21 and 28, of the “Teacher Toolbox – Identifying Preconceptions”*

### Key Terminology and Vocabulary

Materials- المواد

Opaque- معتم

Shadow- الظل

Translucent- شبه شفاف

Transparent- شفاف

## Lesson 2: Light and Materials Performance Standards

Lesson Objectives	Approaching level	On level	Beyond level
Students will carry out investigations to determine the effect of placing objects in the path of a beam of light.	Carries out simple tests by placing objects in a beam of light and states basic observations such as ‘the light went through’ or ‘a shadow appeared’ but does not yet use material properties like	Carries out investigations accurately by testing several materials and clearly describes the effect each one has on the beam of light, explaining whether the light passes through, passes through partially, or is blocked using	Carries out investigations systematically and explains why light behaves differently with each material by connecting observations to specific material properties, for example ‘this object is opaque, so it blocks light

	transparent, translucent, or opaque to explain why the light behaved that way.	correct terminology such as transparent, translucent, and opaque. Also explains how these effects create lighter or darker shadows.	completely and creates a dark shadow.' Applies this understanding to new situations by predicting how unfamiliar materials will affect light and the shadows they produce.
<b>Inquiry Activity</b>			
<b>Demonstration:</b> Explore Light (TE p. 24 till 27)			
<b>Hands on:</b> Trace a Shadow (TE p. 32 till 33)			

<b>Lesson 2: Light and Materials</b>		
<b>Differentiation of Learning</b>		
Based on the student's level, the teacher can select and implement the appropriate differentiated activities shown in the table below.		
Lesson Objective (LO)	Differentiated Instructions (DI)	English Language Support (EL)
Students will carry out investigations to determine the effect of placing objects in the path of a beam of light.	<p><b>Differentiated Instruction (DI)1</b> (TE p. 23) DI1 is related to <b>Shadows</b></p> <ul style="list-style-type: none"> <li>• <b>Approaching Level:</b> Have students work in pairs to explore how to use a light to create a shadow. Then have them describe to each other how the shadow is created.</li> <li>• <b>On Level:</b> Have partners discuss when they see a shadow most often. Then have them describe the light source and what blocks the light to cast that shadow.</li> <li>• <b>Beyond Level:</b> Have students explain why they might not see shadows when they are outside during the day. <i>Sample answer: There are clouds, so the sun is blocked. It is noon.</i></li> </ul> <p><b>Differentiated Instruction (DI)2</b> (TE p. 30) DI2 is related to <b>Light Interaction with Different Materials</b></p> <ul style="list-style-type: none"> <li>• <b>Approaching Level:</b> <b>ASK:</b> What material is a window made from? <b>Sample answer:</b> glass Shine a light through glass. <b>ASK:</b> Is it transparent? <b>Sample answer:</b> yes Tell</li> </ul>	<p><b>EL Support 1</b> (TE p. 27) <b>ENTERING and EMERGING</b> Using pictures or items in the classroom, have students point to or name things that make light. Repeat for shadow.</p> <p><b>DEVELOPING and EXPANDING</b> Ask students to describe how shadows are created using a sentence frame: The lamp shines on a desk. The desk makes a shadow.</p> <p><b>BRIDGING and REACHING</b> Have students use complete sentences to describe how shadows are made.</p> <p><b>EL Support 2</b> (TE p. 29) <b>ENTERING and EMERGING</b> Point to an opaque object. <b>ASK:</b> Is this transparent or opaque? <b>opaque.</b> If students are confident with</p>

	<p>students that if the material is transparent, an object made with it is too.</p> <ul style="list-style-type: none"> <li>• <b>On Level:</b> Have partners make a three-column chart and categorize different liquids as transparent, translucent, or opaque. (e.g., Coffee is opaque. Water is transparent.)</li> <li>• <b>Beyond Level:</b> <b>ASK: Does a transparent object cast a shadow? Sample answer: Light travels through a transparent item, so it does not cast a shadow.</b> Have students explain why or why not.</li> </ul> <p><b>Differentiated Instruction (DI)3</b> (TE p. 35) DI3 is related to <b>Light Transmission</b></p> <ul style="list-style-type: none"> <li>• <b>Approaching Level:</b> Have students imagine that they will build a house. Help them determine which rooms will have a lot of light, a little light, and no light.</li> <li>• <b>On Level:</b> Challenge students to think about the materials they would use to build a house. Which materials will help let light in? Which will help keep it out?</li> <li>• <b>Beyond Level:</b> Have students browse the Internet to find a photo of a house that has lots of natural light and one that does not. What are the reasons for the differences?</li> </ul>	<p>one-word answers, model a complete sentence: <b>It is opaque.</b> Have students repeat.</p> <p><b>DEVELOPING and EXPANDING</b> Model the sentence frame for students: If the chair is made of ____, it is ____.</p> <p><b>BRIDGING and REACHING</b> Have students use this sentence frame to respond: The ____ is made from ____ materials. I know this because ____.</p> <p><b>EL Support 3</b> (TE p. 34) <b>ENTERING and EMERGING</b> Ask students to label where a plane would be above the shadow and the Sun above that. Then support students in explaining why the plane makes a shadow using the sentence frame: The plane makes a shadow because it is made of <b>opaque materials.</b></p> <p><b>DEVELOPING and EXPANDING</b> Have students use the photo to explain why the plane makes a shadow using because to give a reason. Then guide them in adding another sentence. The sunlight cannot go through opaque material.</p> <p><b>BRIDGING and REACHING</b> Have students explain why the plane makes a shadow using the words because and so. The plane makes a shadow because it is made of opaque materials. Sunlight does not penetrate opaque materials, so this creates the shadow of the plane.</p>
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Lesson 2: Light and Materials Assessment Criteria	
Lesson Objective (LO)	Assessment Criteria
Students will carry out investigations to determine the effect of placing objects in the path of a beam of light.	<p><b>Pre-Assessment</b> <i>Page Keely Science Probes:</i> Properties of Light (TE p. 21)</p> <p><b>Formative Assessment</b></p> <ul style="list-style-type: none"> <li>• <b>REVISIT Page Keely Science Probes</b> (TE p. 31 and 34)</li> <li>• <b>Inquiry Activities</b> Refer to the above “Inquire Activity” section.</li> <li>• <b>Talk About It</b> Discover the Phenomenon – Where is the plane? (TE p. 23) Inquiry Activity – Explore Light (TE p. 24 till 27) Inquiry Activity- Trace a Shadow (TE p. 32 and 33) Make Connection (TE p. 31)</li> <li>• <b>Three-Dimensional Thinking Questions</b> (TE p. 33 and 35)</li> <li>• <b>Quick Check</b> (TE p. 31) Use this formative assessment to determine whether students are ready to move on.</li> </ul> <p><i>Please note that all sub-activities within each main activity should be covered. This includes components such as 'Talk About It', DCI-related questions, SEPs, CCC, 3D Thinking, etc.</i></p> <p><b>Summative Assessment (Online Resources)</b> Use the Lesson Review pages as a summative assessment of student learning. Assign students the vocabulary check and lesson check, based on the DCIs for the lesson. Use the customization tool to create a tailor-made lesson check.</p> <p><b>STEM Module Project</b> Refer to Module Project Rubric (TE p. 57) and download the rubric through Inspire Science “STEM Module Project” online resources.</p>
Lesson 2: Light and Materials STEM Module Project	
<b>What to Expect:</b> During Lesson 2, students will carry out investigations to learn how light travels and how it affects different materials.	

### Lesson 3: Light Uses

#### Inquiry Activity Planner (TE p. 2G)

This is used to preview and prepare for the labs and investigations in this lesson.

*To ensure effective instructional delivery and enhance learning experience, inquiry activities should be seamlessly integrated into the teaching of the lesson, allowing students to make direct connections between theory and practice.*

#### Lesson at Glance (TE p. 38C)

- This is used to facilitate the integration of the **5E instructional** module and incorporation of the inquiry-based and phenomenon-based activities into each lesson.
- Additionally, it highlights the **cross-curricular connections** used to further integrate students' understanding of science in the natural world when applicable.

#### Possible pre/misconceptions

##### Students may think that:

- Communication only happens through speaking. Students may not realize that light can also be used to communicate and send messages.

*Refer to the TE Pages 37 of the “Teacher Toolbox – Identifying Preconceptions”*

#### Key Terminology and Vocabulary

Mirror- مرآة

Reflect- يعكس

### Lesson 3: Light Uses Performance Standards

Lesson Objectives	Approaching level	On level	Beyond level
Students will begin to construct explanations and design solutions for people who use modern technology to communicate over a distance.	Identifies examples of modern technologies that use light to send messages over a distance, such as traffic lights, flashlights, warning lights, or lighthouses, and states what each message means. Students are not yet able to explain how the light signal communicates the message or create a light signal of their own.	Explains how people use light in modern technology to send messages over a distance (such as flashing a light, showing a color, or using a mirror to change direction) and creates a light signal to send a message to another person. Students describe how their light signal works and how it will be seen.	Describes in detail how modern technologies use light to send messages by explaining how light travels, reflects, or changes direction, and designs a light-based communication system that uses patterns, colors, or reflections to send a message. Students justify why their light signal would work over a distance and explain how it is similar to real devices that communicate using light.

### Inquiry Activity

**Hands On:** Light and Mirrors (TE p. 40 till 43)

**Research:** Objects that Communicate (TE p. 52 till 53)

### Lesson 3: Light Uses Differentiation of Learning

Based on the student's level, the teacher can select and implement the appropriate differentiated activities shown in the table below.

Lesson Objective (LO)	Differentiated Instructions (DI)	English Language Support (EL)
<p>Students will begin to construct explanations and design solutions for people who use modern technology to communicate over a distance.</p>	<p><b>Differentiated Instruction (DI)1</b> (TE p. 40) DI1 is related to <b>Light Reflection</b></p> <ul style="list-style-type: none"> <li>• <b>Approaching Level:</b> Have students think about how many mirrors are in their home. What is the purpose of each one?</li> <li>• <b>On Level:</b> Have partners discuss the purpose of mirrors in a car. <b>ASK: How is using a mirror during nighttime driving different than using it during the day?</b></li> <li>• <b>Beyond Level:</b> Have students research a disco ball. Have them draw a diagram of how the effect of a disco ball is created. Make sure they include the light source.</li> </ul> <p><b>Differentiated Instruction (DI)2</b> (TE p. 55) DI2 is related to <b>Use of Light for Communication and Signals</b></p> <ul style="list-style-type: none"> <li>• <b>Approaching Level:</b> Help students brainstorm other ways light is used to alert people to dangers or emergency situations. (e.g., lights on police cars, traffic warning signs, ambulances)</li> </ul>	<p><b>EL Support 1</b> (TE p. 42) <b>ENTERING and EMERGING</b> Review or teach the words: <i>light, bounce, mirror,</i> and <i>block</i>. Prompt students to use precise language while describing the effects of shining a light on different objects. <b>ASK: Does the light bounce? Yes.</b> Model, then elicit: It bounces. <b>DEVELOPING and EXPANDING</b> Model and prompt sentences using the words <i>mirror, light, bounce,</i> and <i>block</i>. For example, <b>The wall blocks light.</b> <b>BRIDGING and REACHING</b> Have students describe the effects using the sentence frames: The light bounced because _____. The light did not bounce because _____.</p> <p><b>EL Support 2</b> (TE p. 50) <b>ENTERING and EMERGING</b> Ask students to label the things they know in the photos. Teach <i>solar panel</i>, if needed. Support students with words, phrases, and pantomiming to use the labeled photos to present to the class what an electrician does.</p>

	<ul style="list-style-type: none"> <li>• <b>On Level:</b> Have partners discuss lighting used for a theatrical production. In what ways is it used? How could they use lighting to show the difference between daytime and nighttime? Tell students what “house lights” are (the lighting over the audience). <b>ASK: Why are house lights turned off during a play? Have partners discuss.</b> Have partners discuss.</li> <li>• <b>Beyond Level:</b> Have students research the lights that are used at sea and the purposes for each. What do red and green lights mean on a vessel or on channel markers? What is the purpose of a lighthouse?</li> </ul>	<p><b>DEVELOPING and EXPANDING</b> Help students to find key roles of an electrician in the text and list them in the form of phrases: work with wires and switches, learn about different kinds of energy, etc. Allow students to use their notes when they give an oral presentation.</p> <p><b>BRIDGING and REACHING</b> Ask students to list the different roles of an electrician and how those roles are important to us. Using their list, have them plan and give an oral presentation to the class. Electricians work with energy. Many devices we need use energy. So electricians are important to us.</p> <p><b>EL Support 3 (TE p. 54)</b> <b>ENTERING and EMERGING</b> Have students repeat the appropriate word: changed/same. Encourage them to extend to a full sentence: <b>My thinking changed/stayed the same.</b></p> <p><b>DEVELOPING and EXPANDING</b> Use sentence prompts to help students explain how their thinking has changed. Before I thought _____, but now I think _____.</p> <p><b>BRIDGING and REACHING</b> Have students explain why the characters in the Page Keeley Science Probe were correct or incorrect.</p>
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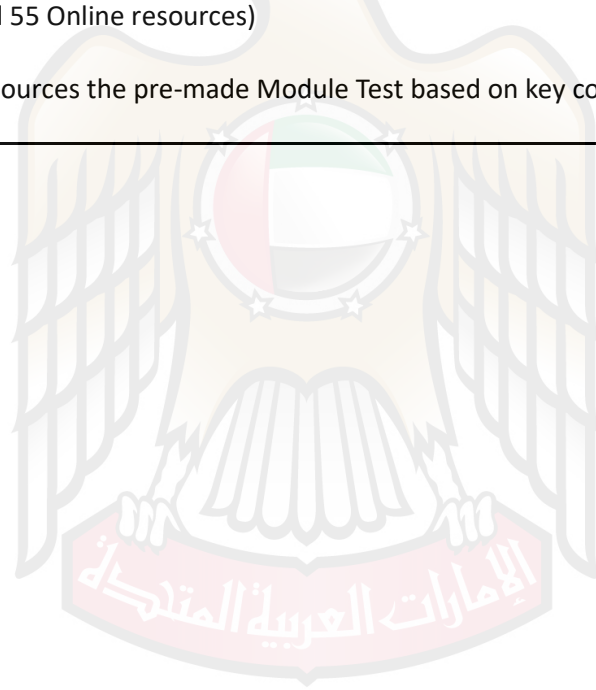
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<b>Lesson 3: Light Uses Assessment Criteria</b>	
<b>Lesson Objective (LO)</b>	<b>Assessment Criteria</b>
<p>Students will begin to construct explanations and design solutions for people who use modern technology to communicate over a distance.</p>	<p><b>Pre-Assessment</b> <i>Page Keely Science Probes: Rescue at Sea</i> (TE p. 37)</p> <p><b>Formative Assessment</b></p> <ul style="list-style-type: none"> <li>• <b>REVISIT Page Keely Science Probes</b> (TE p. 47 and 54)</li> <li>• <b>Inquiry Activities</b> Refer to the above “Inquire Activity” section.</li> <li>• <b>Talk About It</b> Discover the Phenomenon – What message are these lights sending? (TE p. 39) Inquiry Activity – Light and Mirrors (TE p. 42 and 43) Inquiry Activity - Objects that Communicate (TE p. 52 and 53)</li> <li>• <b>Three-Dimensional Thinking Questions</b> (TE p. 45 and 55)</li> <li>• <b>Quick Check</b> (TE p. 47) Use this formative assessment to determine whether students are ready to move on.</li> </ul> <p><i>Please note that all sub-activities within each main activity should be covered. This includes components such as 'Talk About It', DCI-related questions, SEPs, CCC, 3D Thinking, etc.</i></p> <p><b>Summative Assessment (Online Resources)</b> Use the Lesson Review pages as a summative assessment of student learning. Assign students the vocabulary check and lesson check, based on the DCIs for the lesson. Use the customization tool to create a tailor-made lesson check.</p> <p><b>STEM Module Project</b> Refer to Module Project Rubric (TE p. 57) and download the rubric through Inspire Science “STEM Module Project” online resources.</p>
<b>Lesson 3: Light Uses STEM Module Project</b>	
<p><b>What to Expect:</b> During Lesson 3, students will construct explanations of how light can be used to communicate.</p>	

### Module Summative Assessment

- Module Vocabulary Practice (TE p. 19, 35 and 55 Online resources)
- Module Test (TE p. 59, Online resources)

You might want to assign from the Additional Resources the pre-made Module Test based on key concepts and disciplinary core ideas, or you can customize your own using the customization tool



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## Assessment Guidance

### 7.1. Science Assessment Overview and Implementation

Assessment is a key pillar of effective science instruction, providing clear evidence of student learning, informing instructional decisions, and supporting curriculum goals. This guide is designed to help Cycle 1 science teachers plan and implement assessment with clarity and consistency. It outlines the various assessment types, weightings, tools, and procedures to be used throughout instruction. In addition, it provides detailed guidance on the development and application of rubrics and observation sheets to support valid and reliable evaluation of student performance. When integrated appropriately, the components of this guide enable teachers to monitor student progress systematically, respond to diverse learning needs, and support continuous improvement toward achieving the intended learning outcomes.

**Table 1: Science assessment overview for Cycle 1.**

	Types	Weight	Tools	Main Rules	Application Procedures
Continuous Assessments	Performance Tasks	40%	<ul style="list-style-type: none"> <li>Inquiry Activities</li> <li>Quick check</li> <li>STEM module project</li> <li>Other</li> </ul>	<ul style="list-style-type: none"> <li>At least one performance task and one lab experiment per module.</li> <li>Dedicate 60–80% of teaching, learning and assessment to power and 20–40% to support outcomes (Basic and supplementary).</li> </ul>	<ul style="list-style-type: none"> <li>Develop rubrics and observation sheets following the exemplar provided.</li> <li>Ensure safety protocols.</li> <li>Use tasks from lesson-specific assessments and other relevant teacher-selected tasks.</li> <li>Encourage diversity of task types across modules.</li> <li>Support students with resources and materials.</li> <li>Review results and provide feedback for improvement.</li> </ul> <p>Refer to the for the "Science Labs Experiment Guides" for more details and guidance.</p>

	<b>Writing Activities</b>	30%	<ul style="list-style-type: none"> <li>• Page keely science probes</li> <li>• Claim-Evidence-Reasoning</li> <li>• Three-Dimensional Thinking questions</li> </ul>	<ul style="list-style-type: none"> <li>• Students complete a variety of writing tasks (e.g., reports, research) across chapters.</li> <li>• At least one writing task per module.</li> <li>• Done independently outside class time.</li> <li>• Includes both individual and group assessments.</li> <li>• Dedicate 60–80% of teaching, learning and assessment to power and 20–40% to support outcomes (Basic and supplementary).</li> </ul>	<ul style="list-style-type: none"> <li>• Develop rubrics and observation sheets following the exemplar provided.</li> <li>• Use activities from lesson-specific assessments and other relevant teacher-selected activities.</li> <li>• Encourage diversity of activity types across modules.</li> <li>• Guide students through LMS, the MH open learning platform -Inspire science, and other learning resources.</li> <li>• Review results and provide feedback for improvement.</li> </ul>
	<b>Quizzes</b>	30%	<ul style="list-style-type: none"> <li>• Lesson review</li> <li>• McGraw-Hill Lesson checks</li> <li>• Module test</li> <li>• Vocabulary check</li> </ul>	<ul style="list-style-type: none"> <li>• Conducted during class time.</li> <li>• At least two per semester.</li> <li>• 20–25 minutes in length.</li> <li>• Dedicate 60–80% of teaching, learning and assessment to power and 20–40% to support outcomes (Basic and supplementary).</li> </ul>	<ul style="list-style-type: none"> <li>• Use quizzes from lesson-specific assessments and other relevant teacher-selected quizzes.</li> <li>• Review results and provide feedback for improvement.</li> </ul>
<b>Centralized Exam</b>	<b>End of Term (EoT) Exam</b>	100%		<ul style="list-style-type: none"> <li>• Centrally prepared by the Ministry of Education.</li> <li>• Based on 60–80% power and 20–40% supporting outcomes.</li> </ul>	Refer to the "Ministry of Education Assessment Policy" for more details.

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## 7.2. Assessing Science Performance: Tools, Strategies, and Classroom Applications

### 7.2.1. Science performance rubric

The science performance rubric is a structured assessment tool designed to evaluate student learning following science tasks/activities such as experiments, projects, scientific reports, and presentations. It defines clear performance levels and assessment criteria, allowing teachers to assess multiple aspects of student performance with consistency and transparency.

The rubric includes both **analytic** and **holistic** formats (Figure 1). The analytic rubric breaks down student performance into specific criteria, providing detailed criterion-by-criterion evaluation (Table 2). In contrast, the holistic rubric offers an overall score of student performance based on general descriptors (Table 4).

In addition to guiding formal assessment, the rubric provides measurable indicators that support scoring consistency (Tables 3 and 5), facilitate targeted feedback, and inform instructional planning aligned with the intended learning outcomes.

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## DEVELOPING SCIENCE PERFORMANCE RUBRIC

**Purpose and Use of a Science Performance Rubric**

- To assess student performance against defined criteria and levels.
- Typically used after a task for grading, reflection, and communication.

- ### 1 DEFINE PURPOSE

Clarify what the rubric is intended to assess, such as practical experiments, scientific reports, STEM projects, or oral presentations. Specify whether it focuses on skills, knowledge, behaviors, or a combination of these elements.
- ### 2 ALIGN WITH THE LEARNING OBJECTIVES

Ensure the rubric reflects the key skills, knowledge, and processes students are expected to demonstrate.
- ### 3 CHOOSE RUBRIC TYPE

Select a structure:

  - Analytic: Breaks performance into multiple criteria, each scored separately (Table 2).
  - Holistic: Gives one overall score based on general performance (Table 4).
- ### 4 SELECT KEY CRITERIA

For an analytic rubric, identify 4 to 6 measurable and relevant criteria (e.g., planning, data recording, tool use, conclusion).
- ### 5 DEFINE PERFORMANCE LEVEL

Use a level-based scoring format—performance levels—and write specific, objective descriptors for each level.
- ### 6 REVIEW, USE, ADJUST

Pilot the rubric with a sample task. Use it in class, reflect on its clarity and fairness, and revise as needed based on student outcomes and your experience.

**Figure 1: Teacher guide to develop science performance rubric**

**7.2.1.1. Instructions for use — Example: Analytic rubric in table 2**

- Use the sample rubric in Table 2 as a flexible reference; adapt it to suit your specific lesson or activity.
- Choose only the criteria that apply to the activity; not all need to be used at once.
- Adjust the language or expectations based on age level, task type, or lesson goals.
- Use the “score” and “notes” sections to document observations and student growth.
- Plan ahead by integrating the rubric into your lesson objectives and success criteria.
- Share a simplified version with students for peer or self-assessment, where appropriate.
- Focus on guiding improvement - not just assigning a score.

**Table 2: Sample of analytic science performance rubric (3-Level Scale)**

#	Criteria	Approaching Level (1)	On Level (2)	Beyond Level (3)	Score	Teacher Notes	Targeted Skills, Values, and Attitudes*
1	<b>Asking scientific questions</b>	Asks simple or prompted questions	Asks questions related to the task	Asks deeper “why” or “how” questions about what they are doing			<b>Scientific inquiry, Curiosity, Critical thinking</b>
2	<b>Scientific engagement</b>	Joins the task only after reminders	Participates in the task and stays focused	Shows excitement and curiosity throughout the task			<b>Engagement, Scientific interest, Responsibility</b>
3	<b>Investigation planning</b>	Needs help to say what to do and what to use	Can list steps and tools with little help	Plans steps and tools independently and in order			<b>Planning, Organization, Problem solving</b>
4	<b>Hypothesis (initial idea)</b>	Gives an idea not connected to the task	Suggests a simple idea related to the task	Gives a thoughtful idea that fits the task			<b>Prediction, Reasoning, Creativity</b>
5	<b>Experiment steps</b>	Follows steps with frequent help or skips parts	Follows most steps with few mistakes	Follows all steps in the right order without help			<b>Procedure following, Attention to detail, Independence</b>

6	<b>Using tools and equipment</b>	Needs help to use tools safely	Uses most tools with reminders	Uses all tools properly and safely on their own			<b>Tool use, Safety, Independence</b>
7	<b>Safety rules</b>	Forgets safety rules often	Follows most safety rules with reminders	Follows all safety rules carefully			<b>Safety awareness, Responsibility, Respect</b>
8	<b>Measurement reading</b>	Needs help to read measurements	Reads most measurements with few mistakes	Reads all measurements accurately			<b>Measurement accuracy, Observation, Numeracy</b>
9	<b>Recording data</b>	Record data with missing or incorrect parts	Records most data correctly	Records all data clearly and in the correct place			<b>Data recording, Neatness, Accuracy</b>
10	<b>Showing results</b>	Draws or shows results with mistakes	Shows results with some labels and structure	Shows results clearly with labels and structure			<b>Data presentation, Visual communication, Clarity</b>
11	<b>Calculations or sorting</b>	Needs support to count or group items	Counts or sorts with few errors	Counts or sorts correctly without help			<b>Numeracy, Classification, Thinking skills</b>
12	<b>Explaining results</b>	Says what happened without linking to what they did	Gives a simple explanation based on what they did	Explains what happened and why it happened			<b>Interpretation, Cause-effect reasoning, Logic</b>
13	<b>Data interpretation</b>	Has trouble linking data to results	Makes basic links between data and results	Uses data to explain patterns, results, or trends			<b>Data analysis, Reasoning, Pattern recognition</b>
14	<b>Using evidence</b>	Explains using guesses or general ideas	Refers to what they saw or measured	Uses specific results to explain their thinking			<b>Evidence-based thinking, Justification, Logic</b>
15	<b>Error recognition</b>	Doesn't notice mistakes or problems	Notices some problems or mistakes	Identifies what went wrong and how it affected results			<b>Self-reflection, Accuracy, Error identification</b>

16	<b>Drawing conclusions</b>	Makes a conclusion not linked to results	Makes a reasonable conclusion based on results	Makes a strong conclusion based on evidence and task			<b>Conclusion making, Reasoning, Scientific logic</b>
17	<b>Scientific vocabulary</b>	Uses few or unclear science words	Uses some correct science words	Uses accurate science vocabulary to explain			<b>Science communication, Vocabulary, Clarity</b>
18	<b>Communicating findings</b>	Shares work with little detail or structure	Shares results with some visuals or explanation	Clearly presents results using visuals and explanations			<b>Communication, Explanation, Presentation skills</b>
19	<b>Applying learning</b>	Has difficulty linking learning to other ideas	Can relate learning to simple real-life examples	Applies learning to new ideas or situations			<b>Real-world connection, Application, Innovation</b>
20	<b>Team collaboration</b>	Needs reminders to work with others	Takes part and shares with group	Helps the group, shares, and encourages others			<b>Teamwork, Cooperation, Shared responsibility</b>
21	<b>Learning attitudes</b>	Needs reminders to stay focused and use materials properly	Works responsibly and respects others	Shows responsibility, curiosity, and care for materials			<b>Respect, Curiosity, Responsibility</b>
22	<b>Honesty and fairness</b>	Needs reminders to report honestly or share fairly	Usually fair and honest in work and reporting	Always honest, fair, and responsible in tasks			<b>Fairness, Honesty, Integrity</b>
23	<b>Organization and cleanliness</b>	Leaves space untidy or disorganized	Keeps space mostly clean and organized	Keeps materials organized and workspace clean throughout			<b>Cleanliness, Organization, Professional behavior</b>

*\*The column titled "Targeted Skills, Values & Attitudes" is included for your reference. It highlights the key skills and dispositions that each rubric criterion supports. This information is intended to inform instructional planning and skill development. It is **not** part of the formal assessment rubric and should not be used for grading purposes.*

**Table 3:** Student scores for science performance used for analytic rubric.

Level	Score	Total score	Student Score (converted to 20-point scale)
Approaching Level	1	Number of criteria × 3	$\frac{\sum \text{score per criteria}}{\text{Total Score}} \times 20$
On Level	2		
Beyond Level	3		

**Table 4:** Sample of a holistic science performance rubric.

Level	Overall Description of Student Performance	Score (/3)	Teacher Notes
Approaching level (1)	The student needs frequent support to stay engaged and complete the task. They ask questions only when prompted and may skip steps or use tools incorrectly. Their results are incomplete or unclear, and they need help to explain what happened. They rarely use science words and struggle to link the activity to what they are learning. The student needs reminders to stay organized, follow safety rules, or work cooperatively.		
On level (2)	The student takes part in the science task with some guidance and reminders. They ask simple questions, follow most steps, and use tools with support. They record some of their results correctly and give simple explanations. They try to use science words and make basic connections to the task. The student shows a responsible attitude sometimes, shares with others, and shows interest in learning.		
Beyond level (3)	The student actively participates in the science task, shows curiosity, and works independently most of the time. They ask thoughtful questions, follow steps accurately, use tools and materials safely, and record and show their results clearly. The student explains what happened using science words, gives logical conclusions, and applies what they learned to new ideas. They show honesty, take care of materials, and work well with others.		

**Table 5: Scoring process based on a holistic science performance rubric**

Step	What the Teacher Does
<b>1. Observe the Whole Task</b>	Watch the student during the investigation and/or review the final product (data table, explanation, presentation, etc.).
<b>2. Consider All Key Aspects</b>	Mentally review how the student performed in planning, execution, data handling, reasoning, behavior, and communication.
<b>3. Match with a Rubric Level</b>	Read the holistic rubric descriptions and select the one that best matches the student's overall performance.
<b>4. Assign a score</b>	Use the scoring key (e.g., 3 = Beyond level, 2 = On level...) to assign a score.
<b>5. Justify with Notes</b>	Write a brief note in the comments column to explain the score (e.g., "Well-structured plan, accurate measurements, confident presentation").

#### 7.2.1.2. Samples of analytic science performance rubrics

The sample rubrics below are provided to support the assessment of various student activities during science instruction. Teachers are encouraged to use, adapt, or modify them as needed to suit the classroom context, the type of activity, and the diverse needs of their students. The sample rubrics include: writing a scientific report (Table 6), creating and delivering a presentation (Table 7), and designing a poster presentation (Table 8).

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**Table 6: Analytic science performance rubric for a scientific report.**

#	Criteria	Approaching Level	On Level	Beyond Level	Score ( /3)	Teacher Notes
1	<b>Report Structure</b>	The report is not in order and is hard to follow.	The report has some order, but parts are missing or unclear.	The report is well-organized with a clear beginning, middle, and end.		
2	<b>Introduction</b>	The purpose of the report is unclear or missing.	The purpose of the report is mentioned, but some parts are missing or unclear.	The introduction clearly presents the topic and purpose of the report.		
3	<b>Research Content</b>	Very little information is used or only copied from one place.	Some information is used from one or two places.	Uses clear and helpful information from more than one good source.		
4	<b>Clarity of Ideas</b>	Hard to understand the writer's ideas.	Some ideas are clear, others are not well explained.	All ideas are very clear, well explained, and easy to understand.		
5	<b>Data Collection &amp; Presentation</b>	No pictures, numbers, or charts are shown.	Some data is shown, but it's messy or not explained clearly.	Data is clearly shown using charts or pictures and is explained well.		
6	<b>Documentation</b>	Does not say where the information came from.	Mentions one or two places the information came from.	Lists three or more reliable sources in a clear way.		
7	<b>Report Format</b>	Messy and hard to read; fonts or sizes are different.	Mostly neat and readable, but fonts or titles may not match.	Very neat and easy to read, with matching titles and font styles.		
Total Score ( <i>Number of criteria</i> × 3)					e.g., 7×3=21	
Student Total Score ( $\sum$ score per criteria)						
Student Score converted to 20-point scale ( $\frac{\sum \text{score per criteria}}{\text{Total Score}} \times 20$ )						

**Table 7: Analytic science performance rubric for creating and delivering a presentation.**

#	Criteria	Approaching Level (1)	On Level (2)	Beyond Level (3)	Score ( /3)	Teacher Notes
1	<b>Language</b>	Uses unclear words, hard to understand, or uses words that are too difficult.	Uses mostly clear and simple words that the class can understand.	Speaks clearly using simple and correct words that are easy to understand.		
2	<b>Communication</b>	Speaks very quietly or mumbles; doesn't use gestures or look at the audience.	Speaks clearly so we can hear, but no excited most of the time with some gestures or looking at the class.	Uses a strong voice with good gestures and looks at the audience often.		
3	<b>Presentation Structure</b>	Talks without a clear beginning, middle, or end.	Has some order, a clear beginning and middle; ending may be missing or unclear.	Has a well-organized beginning, middle, and ending that are easy to follow.		
4	<b>Introduction &amp; Purpose</b>	Doesn't say what the presentation is about or why it matters.	Tells us what the topic is and gives some ideas but not in an exciting way	Clearly says what the presentation is about and starts in an engaging way.		
5	<b>Presenting Ideas</b>	Ideas are hard to follow or not explained clearly.	Ideas are clear but need more explanation or examples.	Ideas are very clear, well explained, and supported with examples.		
6	<b>Clarifying Concepts</b>	Doesn't explain what things mean or give any examples.	Explains some ideas, but not all are clear or complete.	Explains ideas well and gives examples or a short summary.		
7	<b>Answering Questions</b>	Does not try to answer questions or answers are confusing.	Answers more than 50 % of the questions clearly and in a correct way, but with a few mistakes.	Answers all questions clearly, correctly, and with confidence.		
8	<b>Visual Aids</b>	No pictures or drawings, or they don't match what is being said.	Pictures or drawings help explain, serve the purpose of the presentation, but are not always clear (not easy to see or too big in size).	Pictures or drawings are clear, neat, and help explain the topic.		

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9	<b>Sounds &amp; Videos</b>	Sounds or videos don't work well or are hard to hear or see.	Sounds or videos mostly work and beneficial for the presentation.	Sounds or videos work well and match the topic clearly.		
10	<b>Time Management</b>	Presentation is too short or too long and misses important parts.	Misses timing a little, may spend too much or too little time on some parts. Or/and talks fast or slow.	Great use of time with balanced and complete parts.		
Total Score ( <i>Number of criteria</i> × 3)					e.g., 10×3=30	
Student Total Score ( $\sum$ score per criteria)						
Student Score converted to 20-point scale ( $\frac{\sum \text{score per criteria}}{\text{Total Score}} \times 20$ )						

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**Table 8: Analytic science performance rubric for designing a science poster.**

#	Criteria	Approaching (1)	On Level (2)	Beyond (3)	Score (/3)	Teacher Notes
1	<b>Poster Organization and Overview</b>	Poster is messy and hard to read; some parts are missing or unclear.	Poster has most parts and is a bit organized, but it could be clearer.	Poster is neat, clear, and easy to understand; all parts are included.		
2	<b>Presenting Ideas</b>	Main ideas are hard to understand or missing.	Main ideas are there but not clearly explained or but need more support or order.	Main ideas are clear, well explained, and easy to follow.		
3	<b>Data Presentation</b>	Only words are used; no clear pictures or graphs.	Some pictures or graphs are used but are not clearly presented	Pictures, graphs, or tables are used clearly to show data and information		
4	<b>Use of Visual Aids, Audio, and Video</b>	No or few pictures/videos used; they do not help explain the topic.	Some pictures/videos are used but don't fully explain the topic or are not in the right place.	Pictures or videos are well placed and make the topic easy to understand.		
5	<b>Poster Design</b>	Poster looks plain or messy and doesn't attract attention.	Poster is okay and fits the topic but could be more fun or neat, and eye-catching.	Poster is colorful, neat, well-organized, and makes people want to look at it.		
Total Score ( <i>Number of criteria</i> × 3)					e.g., 5×3=15	
Student Total Score ( $\sum$ score per criteria)						
Student Score converted to 20-point scale ( $\frac{\sum \text{score per criteria}}{\text{Total Score}} \times 20$ )						

### 7.2.2. Science observation sheet

The Science Observation Sheet is an informal assessment tool designed to help teachers keep track of student learning during science activities. It allows real-time evidence to be recorded using a clear and easy-to-use format. By supporting continuous observation, the sheet helps teachers

track student progress over time, identify misconceptions as they arise, and make timely instructional adjustments. It also complements formative assessment by offering valuable qualitative insights that complement more formal evaluation tools (see Figure 2).

**DEVELOPING SCIENCE  
OBSERVATION SHEET**

*Purpose and Use of a Science Observation sheet:*  
Gather real-time evidence of student behavior and learning.  
Use during or immediately after an activity to document observation for feedback and planning support.

**01 Define Purpose**  
Determine what you want to observe in real-time during an activity including observing skills, behaviors, participation, scientific thinking,....

**02 Select Criteria**  
Choose 4 to 6 key students actions relevant to the activity and learning objective.

**03 Choose Format**  
Decide on a layout such as a checklist or grid with notes \_  
Keep it quick and easy for live recording during class.

**04 Prepare in advance**  
Include student names, activity details, selected criteria and space for notes (Figure 3).  
Make a student-by-criteria grid for efficient tracking (e.g. Rows=students,column=criteria)

**05 Use during the Activity**  
Test it during a science activity. Observe if it's practical, covers the right behaviors, and allows smooth documentation without interrupting the flow.

**06 Refine**  
Adjust wording, number of criteria, or layout based on what worked well and what didn't. Keep the sheet flexible and user-friendly.

Figure 2: Teacher guide to develop science observation sheet

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### 7.2.2.1. Instructions for Use

- Select 4–6 observable behaviors or skills that are most relevant to the specific science task. These can be practical, cognitive, collaborative, or behavioral (e.g., "Uses tools correctly," "Follows procedure," "Demonstrates curiosity").
- Customize the sheet (Figure 3) by replacing the observation criteria based on your grade, lesson, objectives.
- For each criterion, mark the level of performance—such as Always, Sometimes, or Never—to indicate how consistently the behavior or skill was observed.
- Use the Teacher Notes column to record specific evidence, feedback or follow-up.
- Keep the format simple and quick to use during the activity, allowing for effective observation.


 <b>Science Activity Observation Sheet</b>						
Grade: _____		Class: _____		Date: _____		Activity Title: _____
Student Name	Uses tools and equipment correctly	Follows safety procedures	Records data accurately	Collaborates with group	Demonstrates curiosity	Teacher Notes
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	
	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	
	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	

Figure 3: Sample of a science observation sheet

### 7.2.2.2. Samples of Science Observation sheets

Teachers are encouraged to utilize the sample observation sheets provided for activities such as concept mapping (Table 9), model creation (Table 10), and debating (Table 11). Teachers may modify the sheets as needed to align with their specific classroom contexts and instructional objectives.

**Table 9: Sample of a concept mapping observation sheet**

Student Name	Identifies Main Concept Clearly	Connects Ideas Logically	Uses Accurate Vocabulary	Organizes Layout Clearly	Shows Concept Relationships	Uses Linking Words	Teacher Notes
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	
	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	
	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	

**Table 10: Sample of a model creation observation sheet**

Student Name	Plans before building	Chooses appropriate materials	Demonstrates creativity	Follows instructions	Builds a functional model	Explains how the model works	Teacher Notes
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	
	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	
	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	

**Table 11: Sample of a debating observation sheet**

Student Name	States position clearly	Supports arguments with evidence	Listens and responds respectfully	Uses appropriate language and tone	Speaks clearly and confidently	Stays on topic	Teacher Notes
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	

	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	
	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	<input type="checkbox"/> Always	
	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Sometimes	
	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	<input type="checkbox"/> Never	

**Table 12: Guide to selecting and applying assessment tools in science classroom**

Assessment Tool	Best Used For	Purpose	When to Apply
<b>Analytic Rubric</b>	Complex tasks with multiple performance criteria.	Evaluate each criterion separately for detailed feedback.	<ul style="list-style-type: none"> <li>- After students complete full projects or investigations.</li> <li>- When assessing final products or formal assignments.</li> <li>- When giving detailed feedback for improvement.</li> </ul>
<b>Holistic Rubric</b>	Quick, overall evaluation of student work.	Provide a single score reflecting overall quality.	<ul style="list-style-type: none"> <li>- During short performance tasks.</li> <li>- When giving quick feedback.</li> <li>- For classwork not requiring detailed scoring.</li> <li>- For peer or self-assessment activities.</li> </ul>
<b>Observation Sheet</b>	Real-time monitoring of student behaviors and skills.	Collect evidence of participation, process skills, and engagement.	<ul style="list-style-type: none"> <li>- While students work on activities, labs, or group tasks.</li> <li>- To monitor behaviors and skills.</li> </ul>

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## 8. Unified Science Lesson Plan

### 8.1 Science Daily/Weekly Lesson Plan - Template

#### Daily/Weekly/ Lesson Planning

**Subject:**                      **Grade/Class:**                      **Week Beginning/Date:**                      **Teacher:**                      **Nb of Session(s):**

<b>Module Title</b>		<b>Group Demographic (numbers)</b>	<b>On Role:</b> <b>Special Educational Needs (SEN):</b> <b>Gifted &amp; Talented (G&amp;T):</b>
<b>Lesson(s) Title</b>		<b>Resources</b>	<i>(e.g. textbook pages, manipulatives, digital tools, etc)</i>
		<b>Materials</b>	
<b>Module Performance Expectations (PEs)</b>			
<b>Module Prior Knowledge</b>			

<b>Lesson Objective(s)</b>	
<b>Lesson Possible Misconception(s)</b>	
<b>Lesson Key Vocabulary</b>	
<b>Module Science &amp; Engineering Practices (SEPs)</b>	<p><b>Please highlight all that apply:</b></p> <p>1-Asking Questions and Defining Problems, 2- Developing and Using Models, 3- Planning and Carrying Out Investigations, 4- Analyzing and Interpreting Data, 5-Using Mathematics and Computational Thinking, 6- Constructing Explanations and Designing Solutions, 7- Engaging in Argument from Evidence, 8- Obtaining, Evaluating, and Communicating Information.</p>
<b>Steps of the Scientific Methods</b>	<p><b>Please highlight all that apply:</b></p> <p>1-Make an observation, 2-Ask a research question, 3- Gather background information and do research , 4-Formulate a hypothesis, 5-Make a prediction, 6-Plan the experiment (Design the investigation and identify variables), 7-Conduct the experiment, 8-Collect and record data, 9- Analyze, interpret, and evaluate data, 10-Draw conclusion based on evidence, 11-Communicate findings and results, 12-Reflect and propose next steps or further investigations.</p>
<b>Higher-Order Thinking Focus</b>	<p><b>Please highlight all that apply:</b></p> <p>Analysis / Evaluation / Justification / Reasoning / Hypothesis generation / Making connections / Drawing conclusions / Synthesizing information / Designing solutions / Arguing a position / Constructing explanation / Other</p> <p>If 'Other' please specify:</p>

<b>21st Century Skills / Global Competencies</b>	<p><b>Please highlight all that apply:</b></p> <p>Critical thinking/ creativity/ Collaboration/ Communication/ Adaptability and flexibility / Creative thinking/ Innovation/ Entrepreneurship/ Productivity/ Accountability/ Leadership/ Responsibility/ Cultural identity Initiative and self-direction / Resilience and emotional regulation / social and cross-cultural skills/ Other.</p> <p>If 'Other' please specify:</p>
<b>Cross-Curricular Connections</b>	<p><b>Please highlight all that apply:</b></p> <p>Digital Literacy/ Numeracy/ Sustainability/ Literacy/ AI/ Social Studies/ Other.</p> <p>If 'Other' please specify:</p>
<b>UAE Links</b>	

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Session Plan		Time
<b>Essential Question(s)</b>		
<b>5E Model Phase</b> <i>(e.g. Engage/ Explore/ Explain/ Elaborate/ Evaluate)</i>	<b>Activities</b>	
	<b>Assessment</b> 1- <b>Performance task:</b> 2- <b>Writing activities:</b> 3- <b>Quizzes:</b>	
	<b>EL Support</b>	
	<b>Differentiated Instruction</b>	
<b>STEM Project</b>		
<b>Homework</b>		
<b>Targeted Students &amp; Support</b>	<b>SEN registered, G&amp;T, Learning Support (please specify):</b>	
<b>Seating Arrangements</b>	<p><b>Please highlight all that apply:</b></p> <p>Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other</p> <p>If 'Other' please specify:</p>	
<b>Self-Reflection &amp; Next step</b>	<p><b>Prompts</b></p> <ul style="list-style-type: none"> <li>How has formative data from previous lesson(s) informed this lesson?</li> <li>How will formative data from this lesson guide and inform your planning for the next lesson(s)?</li> </ul>	

	<ul style="list-style-type: none"> <li>What intervention / acceleration is required based on this formative data?</li> </ul>
--	--

Session (#) Plan (Applicable for Weekly/Lesson plan)		Time
<b>Essential Question(s)</b>		
<b>5E Model Phase</b> <i>(e.g. Engage/ Explore/ Explain/ Elaborate/ Evaluate)</i>	<b>Activities</b>	
	<b>Assessment</b>	
	1- <b>Performance task:</b> 2- <b>Writing activities:</b> 3- <b>Quizzes:</b>	
	<b>EL Support</b>	
	<b>Differentiated Instruction</b>	
<b>STEM Project</b>		
<b>Homework</b>		
<b>Targeted Students &amp; Support</b>	<b>SEN registered, G&amp;T, Learning Support (please specify):</b>	
<b>Seating Arrangements</b>	<b>Please highlight all that apply:</b> Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other If 'Other' please specify:	
<b>Self-Reflection &amp; Next step</b>	<b>Prompts</b> <ul style="list-style-type: none"> <li>How has formative data from previous lesson(s) informed this lesson?</li> <li>How will formative data from this lesson guide inform your planning for the next lesson(s)?</li> </ul>	

	<ul style="list-style-type: none"> <li>What intervention / acceleration is required based on this formative data?</li> </ul>
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Session (#) Plan (Applicable for Weekly/Lesson plan)		Time
<b>Essential Question(s)</b>		
<b>5E Model Phase</b> <i>(e.g. Engage/ Explore/ Explain/ Elaborate/ Evaluate)</i>	<b>Activities</b>	
	<b>Assessment</b> 1- <b>Performance task:</b> 2- <b>Writing activities:</b> 3- <b>Quizzes:</b>	
	<b>EL Support</b>	
	<b>Differentiated Instruction</b>	
<b>STEM Project</b>		
<b>Homework</b>		
<b>Targeted Students &amp; Support</b>	<b>SEN registered, G&amp;T, Learning Support (please specify):</b>	
<b>Seating Arrangements</b>	<b>Please highlight all that apply:</b> Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other If 'Other' please specify:	
<b>Self-Reflection &amp; Next step</b>	<b>Prompts</b> <ul style="list-style-type: none"> <li>How has formative data from previous lesson(s) informed this lesson?</li> <li>How will formative data from this lesson guide and inform your planning for the next lesson(s)?</li> </ul>	

- |  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>• What intervention / acceleration is required based on this formative data?</li> </ul> |
|--|--|

## 8.2 Science Daily/Weekly Lesson Plan – Example

### Daily/Weekly/ Lesson Planning

**Subject:** Science

**Grade/Class:** Grade1

**Week Beginning/Date:** 01/09/2025

**Teacher:** Muhammad

**Nb of Session(s):** 2

<b>Module Title</b>	U2M1: Animal Parents and Their Offspring	<b>Group Demographic (numbers)</b>	<b>On Role:</b> 25 <b>Special Educational Needs (SEN):</b> 3 <b>Gifted &amp; Talented (G&amp;T):</b> 5
<b>Lesson(s) Title</b>	Lesson 1: Animal Structures	<b>Resources</b>	<i>(e.g. textbook pages, manipulatives, digital tools, etc)</i>
		<b>Materials</b>	Foldables, butterfly larvae, cage, fish, aquarium, gravel and fish food.
<b>Module Performance Expectations (PEs)</b>	1-LS1-1 - Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.		
<b>Module Prior Knowledge</b>	<b>Animal Structure, Function, and Reproduction</b> <ul style="list-style-type: none"> <li>- Explain that all animals have body parts.</li> <li>- Understand that animal body parts help them grow and survive.</li> </ul>		

<b>Lesson Objective(s)</b>	Students will construct explanations about the structure and function of animal body parts.
<b>Lesson Possible Misconception(s)</b>	<ol style="list-style-type: none"> <li>1- Students may think that animals behave the same way as humans. (TE p. 2)</li> <li>2- Students may not realize that all animals, including unfamiliar ones, have specific structures that help them survive and grow. (TE p.7)</li> <li>3- Students may fail to recognize similarities among animals or distinguish them clearly from non-living things. (TE p.13)</li> </ol>
<b>Lesson Key Vocabulary</b>	<ul style="list-style-type: none"> <li>- Amphibian – برمائي</li> <li>- Bird – طائر</li> <li>- Fish – سمكة</li> <li>- Insect – حشرة</li> <li>- Mammal – ثدييات</li> <li>- Reptile – الزواحف</li> </ul>
<b>Module Science &amp; Engineering Practices (SEPs)</b>	<p><b>Please highlight all that apply:</b></p> <p>1-Asking Questions and Defining Problems, 2- Developing and Using Models, 3- Planning and Carrying Out Investigations, 4- Analyzing and Interpreting Data, 5-Using Mathematics and Computational Thinking, 6- <b>Constructing Explanations and Designing Solutions</b>, 7- Engaging in Argument from Evidence, 8- Obtaining, Evaluating, and Communicating Information.</p>
<b>Steps of the Scientific Methods</b>	<p><b>Please highlight all that apply:</b></p> <p><b>1-Make an observation</b>, 2-Ask a research question, 3- Gather background information and do research , 4-Formulate a hypothesis, 5-Make a prediction, 6-Plan the experiment (Design the investigation and identify variables), <b>7-Conduct the experiment</b>, <b>8-Collect and record data</b>, <b>9- Analyze, interpret, and evaluate data</b>, <b>10-Draw conclusion based on evidence</b>, <b>11-Communicate findings and results</b>, 12-Reflect and propose next steps or further investigations.</p>
<b>Higher-Order Thinking Focus</b>	<p><b>Please highlight all that apply:</b></p> <p><b>Analysis / Evaluation</b> / Justification / Reasoning / Hypothesis generation / Making connections / <b>Drawing conclusions</b> / Synthesizing information / Designing solutions / Arguing a position / <b>Constructing explanation</b> / Other</p> <p>If 'Other' please specify:</p>

<b>21st Century Skills / Global Competencies</b>	<p><b>Please highlight all that apply:</b></p> <p>Critical thinking/ <b>Collaboration</b>/ <b>Communication</b>/ Adaptability and flexibility /Creative thinking/ Innovation/ Entrepreneurship/ Productivity/ Accountability/ Leadership/ Responsibility/ Cultural identity/ initiative and self-direction / Resilience and emotional regulation / <b>social and cross-cultural skills</b>/ Other.</p> <p>If 'Other' please specify:</p>
<b>Cross-Curricular Connections</b>	<p><b>Please highlight all that apply:</b></p> <p><b>Digital Literacy</b>/ Numeracy/ Sustainability/ <b>Literacy</b>/ AI/ Social Studies/ Other.</p> <p>If 'Other' please specify:</p> <p>Engineering</p>
<b>UAE Links</b>	<p>Link to local animals like falcons and oryx and how they use their body parts to survive in the desert, highlighting their role in Emirati heritage and conservation efforts.</p>

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Session (1) Plan		Time
<b>Essential Question(s)</b>	How do animals use their body parts to stay safe and find food?	
<b>5E Model Phase Engage</b>	<b>Activities</b> 1- Discover the phenomenon – What keeps these animals safe? (TE p. 3) (10 min) 2- STEM connection – What does a zoologist do? (TE p. 4) (10 min) 3- Module opener – Word wall (TE p. 6) (10 min)	30 min
	<b>Assessment</b> 1- <b>Performance task:</b> Talk about it (TE p. 3) 2- <b>Writing activities:</b> Page keeley science probes (TE p.7) 3- <b>Quizzes:</b> NA	
	<b>EL Support</b> - EL Support 1 (TE p. 4)	5 min
	<b>Differentiated Instruction</b> - DI is related to animals and their babies (TE p.3)	5 min
<b>STEM Project</b>	Looking ahead to the STEM module project (TE p. 5)	5 min
<b>Homework</b>	NA	
<b>Targeted Students &amp; Support</b>	<b>SEN registered, G&amp;T, Learning Support</b> - Ahmed usually finishes tasks quickly so will be provided with extension activities to deepen understanding and maintain engagement. - Additional time and support for Shamma: visual guides to be printed larger.	
<b>Seating Arrangements</b>	<b>Please highlight all that apply:</b> Individual / Pairs / Groups (same level) / <b>Groups (mixed levels)</b> / Workstations (rotations) / Flexible / U-shape / Other If 'Other' please specify:	
<b>Self-Reflection &amp; Next step</b>	<b>Were classroom resources used effectively?</b> - The visual aids were helpful, but I could've used more interactive tools. <b>What intervention / acceleration is required based on this formative data?</b> - Struggling students will receive scaffolded support through gap-fill tasks, while higher-ability students will engage in Animal parts.	

Session (2) Plan		Time
<b>Essential Question(s)</b>	How do scientists, like zoologists, study animal structures and their functions?	
<b>5E Model Phase</b> <i>Engage</i>	<b>Activities</b> 1. Assess prior knowledge: Do they have body parts? (TE p. 7) (10 min) 2. Discover the phenomena: Which structure will help this bird catch its food? (10 min)	20 min
	<b>Assessment</b> 1. <b>Performance task:</b> Talk about it (TE p.9) 2. <b>Writing activities:</b> Page keeley science probes (TE p.7) 3. <b>Quizzes:</b>	
	<b>EL Support</b> NA	
	<b>Differentiated Instruction</b> NA	
<b>5E Model Phase</b> <i>Explore</i>	<b>Activities:</b> 1. Hands-on - Animal parts (prep: 20 min, Class: 30 min)	25 min
	<b>Assessment</b> 1. <b>Performance task:</b> Inquiry activity (TE p.10-11), Quick Check (TE p.15) 2. <b>Writing activities:</b> NA 3. <b>Quizzes:</b> NA	
	<b>Differentiated Instruction</b> NA	
	<b>EL Support</b> NA	
<b>STEM Project</b>	During Lesson 1, students will observe common animal structures. They will compare similarities and differences among different types of animals, which will assist in their protective gear design (TE p. 5).	
<b>Homework</b>	NA	

<b>Targeted Students &amp; Support</b>	<p><b>SEN registered, G&amp;T, Learning Support</b></p> <ul style="list-style-type: none"> <li>- Abdullah has been absent for the previous three lessons and will receive targeted support to review key concepts and catch up with the class.</li> <li>- G&amp;T: Reem and Ahmed to proceed to the investigation sooner if needed – monitor every 10 min. If completed within lesson, create a PPT to present findings.</li> </ul>
<b>Seating Arrangements</b>	<p><b>Please highlight all that apply:</b></p> <p>Individual / Pairs / Groups (same level) / Groups (mixed levels) / Workstations (rotations) / Flexible / U-shape / Other</p> <p>If 'Other' please specify:</p>
<b>Self-Reflection &amp; Next step</b>	<p><b>What intervention / acceleration is required based on this formative data?</b></p> <ul style="list-style-type: none"> <li>- Further strategies to be finalized after the lesson upon review of student feedback and responses.</li> </ul>

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