Science in

The National Curriculum

Key Stage 1- Grade 1

Revised

NATIONAL
INSTITUTE OF
EDUCATION

Science in the National Curriculum

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Introduction

Science in the National Curriculum

Science in the National Curriculum along with other subjects contributes to the development of the student in all aspects outlined in the National Curriculum. The following highlight briefly how the science curriculum paves the road in developing students in various aspects outline in the National Curriculum.

The Vision

The Science curriculum is designed to facilitate to achieve the vision of the National Curriculum. Students are required to ask questions, explore, use and create knowledge in many concepts included in the syllabus. The syllabus gives ample opportunities where students are required to take actions relating to family, local community and contribute to global society with respect to sustainable use of resources, conserving and preserving the natural resources and other related aspects throughout. The syllabus also stresses upon skills, values and attitudes which enables students to become confident and competent citizens.

The Principles

The Science syllabus emphasizes linking Science with eight fundamental principles identified in the National Curriculum. The skills, values and attitudes such as being fair, just, having Islamic faith, appreciating the culture, uphold the traditions are some of the aspects that are integrated in the content and skills in the syllabus.

Likewise, the syllabus design has taken considerations in taking into account, various learning styles and differentiation such that every student has the opportunity to reach to personal excellence.

Similarly, in-depth understanding of scientific concepts and processes ensures that students develop holistically, and relating these concepts and processes to their real life context ensuring relevance to students and preparing them for life.

Values

The science syllabus is designed to integrate values in the four categories mentioned in the National Curriculum. The content and processes facilitate and promote the development of values mentioned in the National Curriculum to greater extent. A special focus is sought out to develop the values relating environment stewardships in the syllabus.

The Key Competencies

The Science curriculum provides a rich context in which the key competencies outlined in the National Curriculum can be developed. The eight key competencies included in the National Curriculum encompasses knowledge, skills, values and attitudes and dispositions to be explicitly taught in various key learning areas and through various school activities. The following highlights some of the opportunities where each key competency can be developed:

- **Creative and critical thinking**

  The syllabus involves a lot of opportunities for students to explore their surroundings, ask questions, use high order thinking to analyse and solve issues. In addition, the curriculum allows students to design and invent new things based on their prior knowledge and using their creative thinking. It asks students to understand abstract concepts which require high level of cognition.

- **Using Sustainable Practices**

  Using sustainable practices is very much part and parcel of the science curriculum. It encompasses many aspects to explore how human activities impact the environment and identify ways to take care of the environment. In addition, the syllabus includes many opportunities to understand issues from both developmental as well as environmental perspectives so that students are encouraged to develop stewardship towards the environment.

- **Using Media and Technology**

  The science curriculum provides many opportunities for students to relate with the technological advancement in various fields and how science has contributed to these advancements. In addition, student need to use technology in their learning and identify best sources to gather information; question the authenticity of the information gathered and also analyses, synthesises and evaluates the information.

- **Relating to people**

  The science curriculum requires students to carry out several investigations throughout the years and these investigations and other activities are required to do in a group. Hence, there would be many opportunities to develop the key competency, relating to people.

- **Understanding and managing self**

  The science curriculum requires students to carry out several investigations throughout the years and these investigations give ample opportunities for students to develop the key competency, understanding and managing self as they have to be carried out in a systematic and organised manner.

- **Living a healthy life.**

  Healthy life aspects are a big component in the science curriculum. Understanding of how the human body functions and how to take care of body etc. are some of the concepts covered which relates to human health. Taking care of equipment and precautionary measures in using chemicals and various equipment are some concepts explored in the curriculum. Hence opportunities are there in the science curriculum to develop the key competency, living a healthy life.

- **Making Meaning**

  Science curriculum requires students to engage in collaborative action-based scientific inquires rooted in issues that are of great importance to the students. Science curriculum also offers opportunities for students to engage in various context relevant to the concepts that they study such that making meaning is made.

- **Practicing Islam**

  The science curriculum provides a rich context to develop the key competency, practicing Islam. The process skills such as observation, inference, experimental knowledge are skills with which humanity can achieve goals laid out in the Quran and Sunnah. The modern Science has been developed by Muslims by highlighting the repeated calls of the Quran to observe and reflect upon the natural phenomena. The content, skills and values included in the science curriculum are very much aligned with this notion and hence many opportunities for developing the key competency.

Considerations for Planning, Teaching and Assessing Science

The Planning

Focus for Learning

The National Curriculum highly recommends that the focus for learning should promotes holistic approach to education, placing equal emphasis on the development of knowledge, understanding, skills, values and attitudes. Therefore, careful and systematic planning is essential for the success of Science teaching. To begin with, in order to ensure that children receive a rich learning experience, it is important that Science teachers become familiar with the outcomes and indicators at each level and have an understanding of how these are translated and implemented in the classroom. The following are some key features to consider in planning science education:

Content Selection

It is important to note that children should experience a broad and balanced programme. The science curriculum highly encourages to teach science concepts in content strand with the scientific processes. Thus, the strands 'Science and technology' and 'Scientific Inquiry Skills' need to be integrated with the content strands in order to maximize the learning of skills and values. Therefore, teachers should draw content from the four content areas and two process strands:

- Life and Living
- Earth and Beyond
- Matter and Materials
- Energy and Change
- Science and Technology
- Science Inquiry Skills

In situations, where the selected topic or theme can incorporate other content areas, it is advisable to do so.

For example, teachers may select our surrounding as a unit topic, where outcomes from the content areas of Life and Living and Earth and Beyond can be taken together

In selecting a theme or topic teachers should account for student needs, their local environment and familiarity. It should also ensure continuity and progression in student's learning. For smooth transition from each level requires teachers to be aware of the students past learning experiences.

Although it is encouraged that a thematic approach be used in teaching science, it needs to be understood that to achieve certain outcome may require specific teaching related to the selected outcomes and indicators.

In general, effective planning thus requires the teachers to initially identify the big ideas/concepts behind each of the outcomes and identify ways to collate outcomes and indicators together to ensure that students receive meaningful learning.

Development of Skills, Values and Attitudes

The NCF places great emphasis on encouraging children and young people to adopt deeply held values shared within our society. It identifies four main categories of shared values and schools need to adopt an integrated approach that allows children to apply general skills across the curriculum. Opportunities must be provided for students to apply these skills in a variety of active learning experiences where they learn through various tasks that allow them to move from concrete to more abstract levels of learning.

Literacy and Numeracy

Numeracy is about students having the confidence to choose and use mathematics skills they learn at school in everyday life, as well as the classroom and literacy is essential to a student's ability to learn and succeed in school and beyond.

Literacy capabilities need to be explicitly built as students' progress throughout the years in all the key learning areas. Teaching and learning in environment, Science and Technology, students may need to write science reports after undertaking investigations or experiments. This requires specialised text and language structures, vocabulary and graphics that are specific to constructing knowledge in Science and that may not be learnt in other areas of learning. If these literacy demands are not addressed in teaching and learning, it would hinder student learning in science.

In this regard, every classroom teacher needs to address in explicit teaching of numeracy skills in all the curriculum areas. In science class when students interpret a graph, in woodwork when they confidently measure a piece of wood, or in cooking when a student halves a recipe without being given specific instructions on what to do. So every classroom teacher has a role to play in helping students develop numeracy skills.

Consequently, all the teachers need to ensure that literacy and numeracy teaching and learning becomes part of their daily routine.

Integration

The use of well-planned integrated approaches, both within Science and between Science and other curricular areas plays an important role in the teaching/learning of Science at all levels.

Systematically planned integrated topics can provide contexts in which knowledge and skills may be developed in a range of areas. In this regard, the environments of the child, particularly those of a local nature, provide ideal contexts and an effective ground for the integration of learning.

Likewise, many elements from the Social studies, Mathematics and Language curricula may be explored in parallel with Science, and much of the work involved will contribute to the development of the child's oral language, literacy, numeracy and communication skills. Science is best approached in a holistic manner with younger children as this respect the wholeness of their view of the world.

As children grow old they begin to recognise that there are different ways or modes of looking at the world and of organising human knowledge, so teaching strategies may vary to include a holistic approach, some cross-curricular integration and a subject-centered focus. Such an approach utilises teaching and learning time efficiently and acknowledges that the social, emotional, attitudinal and moral development of the child is interwoven with the acquisition of knowledge and skills. It needs to be understood that each subject offers a distinctive perspective on the world and equips children with a particular range of skills; however, these divisions must not reverse the effective implementation of an integrated curriculum.

Teaching Approaches

The instructional approaches and learning activities need to be drawn in a way that reflects the five pedagogical dimensions mentioned in the National Curriculum:

- Creating a positive Learning Environment
- Connecting Prior Learning to New Learning
- Making Learning Meaningful
- Fostering Reflective Practices
- Catering to Individual differences

These dimensions are not stand alone dimensions. They are interwoven in nature and teachers need to carefully develop the lessons in a manner that these dimensions are addressed. Some of the ways these dimensions can be addressed are highlighted below:

When the activities in the lesson plans

- Are drawn on students' prior knowledge, capture their interest, encourage meaningful practice in various contexts, allows for students to construct their own learning.

- Engage students in a way that they make the connection between the scientific and technological concepts they are learning and their application in the world around them and in real-life situations.

- Offer opportunity for students to make sense of the world around them by critically reflecting and making sense and meaning of their experiences.

- Address the growing diversity of students in classrooms. The use of the one-size-fits-all lessons no longer meets the needs of the majority of learners and teachers need to adopt differentiated learning activities.

Thus the role of students would be active learners who construct their own learning and teacher in such teaching would act as facilitators in teaching. The teacher need to:

- creating a classroom environment to support and challenge the learning and teaching of science
- designing effective learning experiences that help students to achieve designated outcomes
- stimulate and managing classroom discourse in support of student learning
- use student's motivations, interests, abilities and learning styles to improve learning and teaching

- analyze student learning, the scientific tasks and activities involved, and the learning environment to make ongoing instructional decisions
- select teaching strategies from a wide repertoire.

In addition to the above, the science curriculum emphasizes the need to get involved in practical activities such as field outings, projects, experiments and investigations. One of the main purposes of these is to provide rich context for students to develop Science Inquiry skills.

Research on successful classroom practice have shown that an inquiry approach, with emphasis on learning through concrete, hands-on experiences, best enables students to develop the conceptual understanding required. In such instructional settings and strategies, learning occurs not by passive absorption, but rather as students actively constructs their own meaning and assimilates new information to develop new understandings in terms of knowledge, skills and values and attitudes

Likewise, the development of scientific literacy in students is a function of the kinds of tasks they engage in, the discussions in which they participate, and the settings in which these activities occur. Students' disposition towards science is also shaped by these factors.

Consequently, the aim of developing scientific literacy requires careful attention to all of these facets of curriculum and instruction. Learning experiences in science education should vary and include opportunities for group and individual work, discussion among students, as well as between teacher and students, and hands-on/minds-on activities that allow students to construct and evaluate explanations for the phenomena under investigation. Such investigations, and the evaluation of the evidence accumulated, provide opportunities for students to develop their understanding of the nature of science and the nature and status of scientific knowledge.

Environmental Awareness and Care

The curriculum area of science is specifically founded on the student's relationship and interaction with the world around them. The environment, in its broadest sense, is the context for learning, and student's classroom experience will be deepened and extended by direct experience of their surroundings. The locality will provide the starting points for environmental education, and as student's knowledge and understanding grow and develop they will encompass other places and direct pupils to other global dimensions.

One of the key aims of Science education should be to inculcate the necessary skills and values to understand environmental vulnerabilities locally as well as globally, and be informed decision makers in deciding responsible actions in maintaining and protecting the environment.

The four content strands provide a rich context to include concepts related about the environment, and in the environment that provide a rich learning experiences in active manner and promote a love for learning and appreciation for the dynamic interactions. The positive and negative consequences, both intended and unintended, of the interactions between human-created and natural systems

The future of our country lies hand-in-hand with the future of our young people. They deserve a first-class education on the environmental challenges ahead, on the innovations and creativity where solutions can be found, and to understand the skills they will need to succeed in the low-impact and low-carbon industries of the future.

With an innovative and creative approach to sustainable development and environmental stewardship, schools can be a breeding ground of ideas and pathways to a sustainable future. This has become even more imperative in 2020.

Assessment Practices

The Science Syllabus outcomes contribute to a developmental sequence in which students are challenged to acquire new knowledge, understanding and skills.

Assessment is an integral part of teaching and learning. Assessment is the ongoing systematic process of gathering and using evidence of student learning to make informed decisions regarding student achievement. Thus, the main purpose of assessment is to improve student learning.

Three major types of assessment used in conjunction can be used to support student achievement: The Key stage 1 Science Syllabus particularly promote Assessment for Learning as an important component of good teaching.

Assessment for Learning (Formative Assessment)

It is used for purposes of greater achievement. Classroom assessment should provide opportunities for students to become actively involved in their learning and achievement. In this type of assessment student know what they need to do in order to be successful and know what is considered as 'good work'.

Assessment for learning is criterion referenced where students compare their work with a criterion. The criteria are based on the outcomes and indicators mentioned in the Science Syllabi.

In addition to this, students, peers and teachers provide appropriate and ongoing feedback. Through feedback students identify their strengths and areas for improvement. This helps students to redirect their efforts and energy in making plans on ways to improve learning.

As for teachers, this provides the opportunity to change instruction in accordance with student's needs.

Assessment as Learning (Formative Assessment)

Assessment as learning is student driven whereby students actively involved in their own learning. This is done through continuous self-assessments whereby students identify areas to improve. Students are required to reflect and critically evaluate their work.

Assessment of Learning (Summative Assessment)

This is usually addressed through summative assessment. This includes topic assessment at the end of a topic and term exams. (Note: for the foundation and key stage one there will be NO term exams or tests). However, students' summative assessment can be done to check students' level of understanding. The information gathered through the summative process should be used formatively to enhance student progress.

In order to gather evidence of student learning the following are some of the methods that can be used:

Informal assessment- student and teachers make judgments about their learning based on discussions.

Formal assessment- students and teachers making judgments based on success criteria that are shared by students and the teacher before the learning task is carried out.

- Observation – use of checklists, rating scales and rubrics
- Self and peer assessment
- Quizzes
- Tests
- Sample student work
- Projects
- Reports
- Journals/Logs
- Performance reviews
- Portfolios

Detailed guidance and advice on effective pedagogy and appropriate assessment practice is provided in the Pedagogy and Assessment Guide (PAG) available on the NIE website.

Recommended Time

The following table shows the allocated time for teaching Science to Key Stage 1 (grades 1, 2 and 3) students:

Key Stage	Contact Time/Weeks	Minimum Contact Time/year
1 (Grades 1, 2 and 3	180 min (4 periods /week)	109 hrs (145 periods of 35 mins)

Place of the Science Syllabus in the K- 12 curriculum

Key stage 1-3 Science Compulsory

Key Stage 4	Key Stage 5
Science Stream- Optional **Core Subjects** • Biology • Chemistry • Physics **Elective** • Marine Science	**Science Stream-Optional** **Core Subjects** • Biology • Chemistry • Physics

Rationale

The aim of Science Education in Maldives is to develop scientific literacy. Scientific, Environmental and technological literacy is an evolving combination of the science-related attitudes, skills, and knowledge students need to develop inquiry, problem-solving, and decision-making abilities; to become lifelong learners; and to maintain a sense of wonder about the world around them.
To develop scientific, environment and technological literacy, students require diverse learning experiences which provide opportunity to explore, analyze, evaluate, synthesize, appreciate, and understand the interrelationships among science, technology, society, and the environment that will affect their personal lives, their careers, and their futures.

Aim

The purpose of this key learning area is for students to explore the natural world and its phenomena through systematic and organized inquiry. It provides the opportunity for students to question, investigate, predict and explain the events of the Earth and the universe.

The aims of Environment, Science and Technology are to:

- enable the student to acquire knowledge, skills and attitudes so as to develop an informed and critical understanding of, environment, science and technological issues
- reinforce and stimulate curiosity and imagination about local and wider environments
- enable the student to play a responsible role as an individual, as a family member and as a member of local, regional, national, global communities
- foster an understanding of, and concern for, the total interdependence of all humans, all living things and the Earth on which they live
- foster a sense of responsibility for the long-term care of the environment and a commitment to promote the sustainable use of the Earth's resources through personal life-style and participation in collective environmental decision-making
- Cultivate humane and responsible attitudes and an appreciation of the world in accordance with beliefs and values.

Structure of the Syllabus

The content of the Science key stage 1 syllabus is based on the outcomes and indicators in two broad areas. They are

- Knowledge and Understanding
- Skills

Outcomes

The outcomes are statements of knowledge, understanding, skills and values expected to be achieved by students at the end of a given stage. All outcomes are of equal importance. The presentation of the outcomes does not imply a sequence of teaching and learning activities.

Indicators

An indicator is an example of the behavior that students may display as they work towards the achievement of syllabus outcomes. Indicators reflect and describe aspects of knowledge, understanding, skills and values.

The outcome and indicators together make up the content. The indicators describe in more detail how the outcomes are to be interpreted and used, and the intended learning appropriate for the Stage. In considering the intended learning, teachers will make decisions about the sequence, the emphasis to be given to particular areas of content, and any adjustments required based on the needs, interests and abilities of their students.

The knowledge, understanding and skills described in the outcomes and indicators are organized into grades so that it provides a sound basis for students to successfully move to the next stage of learning.

Summaries of Strands

The knowledge and Understanding comprise of four content strands and Skills are presented in two process strands.

A summary of each strand included in the Syllabus is outlined below:

Strand 1: Life and Living

Life and living strand explore the living things and their interactions. It looks in to structure, function of living things. It includes the importance of diversity of life and their interdependence. It also explores the impact of environment on life and the effects of human intervention on the environment.

Strand 2: Matter and Materials

Matter and materials strand explore matter and its interactions. It looks into the composition and properties of matter. It also explores the changes that matter undergoes and the energy involved. This strand also includes the study of wide range of materials and substances which people use. It explores how uses are determined by the properties and structure of materials. Furthermore, it looks in to the use and management of materials and the influence of these uses on the environment.

Strand 3: Energy and Change

Energy and change strand explore matter, energy their interactions and the changes associated with those interactions. It explores the movement of objects and forces acting on it. This strand also looks in to forms of energy, energy transformation, law of conservation of energy, harnessing and storing of energy. Furthermore, it looks in to social implications of energy use including the effects of use of natural resources, a range of alternative energy sources and the implications of their use.

Strand 4: Earth and Beyond

Earth and beyond strand explore Earth's processes and features. It looks into understanding patterns in nature and natural cycles. It also includes a study of various parts of the solar system and the universe. In addition to this, it looks into the relationships of Earth's systems and their effects on living things. Furthermore, it highlights the uniqueness of the planet Earth, and the importance of protecting and preserving resources of Earth and its environment.

Strand 5: Science and Technology

Science and technology strand provide students to develop inquiry, investigation skills and the ability to solve problems in students.

This strand will be integrated in to content strands to provide opportunities to apply thinking skills, seek solutions to problems through collaboration, investigation, critical thinking and creative problem-solving. Through this strand emphasis will be laid to develop skills in designing and making products, to develop an appreciation of the processes that can be applied to solve problems related to unfamiliar information and new ideas.

It will also enable students to participate responsibly in developing innovative ideas and solutions in response to questions and situations relevant to personal, social and environmental issues. Hence providing opportunities to make meaningful connections with the broader learnings through authentic application of relevant knowledge and acquired skills. Furthermore, this will also help to appreciate how science has contributed to the advancements in this world and to use technology wisely.

Strand 6: Science Inquiry Skills

Science Inquiry Skills Strand provide opportunities for applications of the processes, that are practised by the scientific community. It looks into ways of creating and nurturing students' natural curiosity and sense of wonder about their world.

This strand provides opportunities to pose questions, plan, conduct and critique investigations, collect, analyse and interpret evidence and communicate findings. Through this strand student will use evidence to make decisions and solve problems and recognise that scientific explanations change as new or different evidence becomes available.

Additionally, this strand gives ample opportunities for students to participate in discussions, inculcate intellectual honesty and skills to critically evaluate data. As students conduct scientific inquiries, through collaborative and individual work they learn to question, solve problems, draw logical, evidence-based conclusions, articulate ideas and work in ways that are ethical, fair and respectful.

Furthermore, this will also help students to appreciate the complexities of the world as they compare their current ideas and beliefs with those of scientists, and construct new understanding based on scientific thinking.

The Science Syllabus Key

The following codes are used in the Science KS 1-3 Syllabus.

Outcome Coding

Syllabus outcomes are coded in a consistent way. The code identifies the strand, grade, outcome number and the way the content is organized.

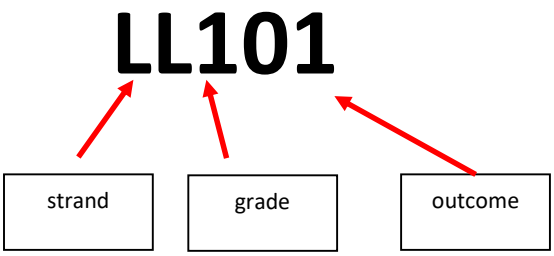
Strands are represented by the following codes:

Strands	Code
Life and Living	LL
Earth and Beyond	EB
Matter and Material	MM
Energy and Change	EC
Science Inquiry Skill	SIS
Science and technology	ST

Grade 1-3 outcomes are represented by the following codes:

Stage	Code
Grade 1	1
Grade 2	2
Grade 3	3

In the *Science KS1-3 Syllabus*, outcome codes indicate subject, strand, grade and outcome number, skill. For example:



Outcome code	Interpretation
LL101	Life and Living, Grade 1, Outcome 1

Scope and Sequence of content outcomes of each strand

Strands/Sub-strand	Grade 1	Grade 2	Grade 3
Life and Living			
Structure and function	LL101 Observe variety of living things to identify body shape, size and discuss the importance of diversity of living things	LL201Explore how each sense organ help us to gather information from the environment.	LL301Investigate observable characteristics of living things (living and nonliving)
	LL102Observe variety of living things and their external features and identify use of main external features	LL202Explore that living things grow and change	LL302Identify the importance of classification and classify living things using observable features
Interactions	LL103Identify that living things live in different places to meet their basics needs		LL303Identify that living things have external features which are used to meet their basic needs
Earth and Beyond			
Physical features of the Earth	EB101 Observe the changes that occur in the sky and land	EB201 Observe the changes that occur in the locality over time	EB301 Explore the changes that occur due to rotation of the Earth on its axis
Resources of the Earth		EB202 Recognise that living things use the resources of the Earth in a variety of ways	EB302 Identify that Earth's resources are limited and living things depend on them
Matter and Materials			
Matter and Materials	MM101 Identify that objects are made of particular material	MM201Classify objects according to their use and material types	MM301Identify that uses of materials are determined by their properties
	MM102Identify that materials have specific properties		
Changes in Matter		MM202Investigate that materials can be changed by different means	MM302Investigate that a change in state of material can happen by adding or removing heat
Energy and Change			
Force and Motion	EC101 Identify that push and pull can cause some objects to move		EC301Investigate that push and pull can change the movement of objects and their shape
Energy		EC201Identify that light can be produced by a range of sources and can be sensed	EC302Recognise that electricity needs to be used wisely
		EC202Identify that sound are produced by a range of sources and can be sensed	EC303Identify the safety measures that need to be taken while using electrical appliances

Scope and Sequence of process skills outcomes of each strand

Strands/Sub-strand	Grade 1	Grade 2	Grade 3
Science Inquiry Skills			
Formulating questions and making predictions	SIS101 Ask and respond to questions about familiar objects and events	SIS201 Ask questions and make predictions about familiar objects and events	SIS301 Formulate questions with guidance in familiar context that can be investigated and make and make predictions
Planning and conducting Investigations	SIS102Participate in guided investigations	SIS202 Follows instructions to carry out guided investigations	SIS302 Plan and carry out investigation with guidance, considering the safe use of equipment and materials
Recording and interpreting data and information	SIS103 Use non-standard measurements to collect data and make simple statements/generalisations based on the information	SIS203 Use non-standard /standard measurements to collect data, represent them and interpret data to find patterns	SIS303 Use standard measurements to collect, record data using tables/bar chart to interpret them to find trends and patterns
Evaluating and communicating	SSIS104 Talk about observations and share ideas in a variety of ways	SSIS204 Talk about the findings and share them in a variety of ways	SSIS304 Reflect on the procedure and discuss measures taken to make it a fair test
Science and Technology			
Science as a human endeavour	ST101 Recognise that science involves being curious, making observations, and asking questions about familiar objects and events	ST201 Recognise that science involves making observations, asking questions about events and describing them	ST301 Recognise that science involves making predictions, identifying and describing patterns
	ST102 Recognise that scientific inventions are used in our daily life	ST202 Identify that scientific knowledge helps people to make the right choices in daily life	ST302 Identify that scientific knowledge helps community to make the right decisions
Design and making	ST103 Discuss ideas and uses a range of objects and materials to make a product	ST203 Discuss ideas and present the design idea, select materials to make a product	ST303 Discuss ideas and present the design idea, select materials to make a product and evaluate the product

Grade 1 - Syllabus Details

Strand: Life and Living

Sub-strand: Structure and Function

Outcome	Indicators:
LL101 Observe variety of living things to identify body shape, size and discuss the importance of diversity of living things	a *Identifying that there are different kinds of living things, they differ in body shape, form and have different names and discuss the importance of variety of animals* b *Exploring how people use plants and animals for various purposes such as traditional medicine and recognizing the importance of them*
Outcome	**Indicators:**
LL102 Observe variety of living things and their external features and identify use of main external features	a *Observing to identify common features of animals such as head, arms, legs, tails and identifying use of these body parts* b *Exploring to identify common features of plants such as leaves, stems and roots, and identifying the use of these parts of a plant.*

Sub-strand: Interactions

Outcome	Indicators:
LL103 Identify that living things live in different places to meet their basics needs	a *Exploring the local environment to identify different places where living things live such as beach, garden* b *Identifying that living things fulfil their basic needs from their habitat* c *Discussing the effect of destruction of the habitat on the living things*

Strand: Matter and Materials

Sub-strand: Materials and their Properties

Outcome	Indicators:
MM101 Identify that objects are made of particular material	a *Exploring objects in the school environment to identify that they are made of different materials* b *Describing that objects are made of different materials*
Outcome	**Indicators:**
MM102 Identify that materials have specific properties	a *Exploring objects in the school environment to describe the physical features of them using the words such as smooth, sticky, rough, shiny* b *Reasoning out why specific materials are used for specific purposes such as glass are used in windows*

Strand: Energy and Change
Sub-strand: Force and Motion

Outcome	Indicators:
EC101 Identify that push and pull can cause some objects to move	a *Identifying toys that use the force of pull and push* b *Exploring the push and pull movements of objects in the home and school* c *Observing and recording how push and pull affects the movement of objects*

Strand: Earth and Beyond
Sub-strand: Physical features of Earth

Outcome	Indicators:
EB101 Observe the patterns that occur in the sky and land	a *Observing familiar patterns of events that occur on the Earth and in the sky such as appearance of moon, day and night, monsoons* b *Observing to identify the changes in nearby environment such as, cut down of trees, new building, parks* c *Recognising the indigenous knowledge of daily and seasonal changes in weather patterns and how they are used in daily life* d *Discussing the effect of destroying the natural environment*

Strand: Science Inquiry Skills
Sub-strand: Formulating questions and making predictions

Outcome	Indicators:
SIS101 Ask and respond to questions about familiar objects and events	a *Discuss to ask "what will happen if" questions about daily events* b *Explore the immediate environment to pose questions and make predictions about familiar events and objects*

Sub-strand: Planning and conducting investigations

Outcome	Indicators: This is evident when the student
SIS102 Participate in guided investigations	a *Researching ideas to gather information* b *Exploring ways to solve science questions through guided discussions* c *Making observations in relation to familiar objects* d *Discussing what to measure and how to record observations*

Sub-strand: Recording and interpreting data and information

Outcome	Indicators:
SIS103 Use non-standard measurements to collect data and make simple statements/generalisations based on the information	a *Measuring using non-standard units* b *Discussing a suitable way to show the data collected using a given table* c *Discussing to identify similarities and differences among the data*

Sub-strand: Evaluating and Communicating

Outcome	Indicators:
SSIS104 Talk about observations and share ideas in a variety of ways	a *Sharing observations in groups* b *Discussing and sharing the information gathered in different ways*

Strand: Science and Technology
Sub-strand: Science as a human endeavour

Outcome	Indicators: This is evident when the student
ST101 Recognise that science involves being curious, making observations, and asking questions about familiar objects and events	a *Exploring the environment to observe using the senses and identifying the importance of observation* b *Recognising the importance of observation, asking questions in relation to events in nature such as occurrence of high tide and low tide and accretion and erosion of sand*

Outcome	Indicators: This is evident when the student
ST102 Recognise that scientific inventions are used in our daily life	a *Recognising inventions that contribute to quality of life such as various equipment, gadgets and machineries used by us.*

Sub-strand: Design and Making

Outcome	Indicators: This is evident when the student
ST103 Discuss ideas and uses a range of objects and materials to make a product	a *Discussing to identify objects and materials to make a product with a specific characteristic such as a movable product, a product that can float on water* b *Describing ideas and preferences relating to the product and the selection of materials*

Planning, Teaching and Assessment Example

Sample Lesson Plan

Subject: Science	Grade 1	Duration: 4-5 lessons of 25 mins.
Strand **(Life and Living)**	Sub-strand	
Key competencies Thinking critically and creatively	**Shared Values** Relating to the Environment	
Prior Knowledge	Materials needed Plain paper, one per group of students Coloured markers, crayons or pencils, scissors.	

Learning Outcomes and Indicators

Content Strand (Life and Living)

LL101 Observe a variety of living things to identify body shape, size and discuss the importance of diversity of living things Living things differ in body shape and form and they have different names

- Living things differ in body shape and form and they have different name

LL102 Observe a variety of living things and their external features and identify the use of main external features

- Observing to identify common features of animals such as head, arms, legs, tails and identifying the use of these body parts

The Process Strands (The Scientific Inquiry Skill)

SIS101 Ask and respond to questions about familiar objects and events

- Exploring the immediate environment to pose questions and make predictions about familiar events and objects

SIS102 Participate in guided investigations

- Making observations about familiar objects/events
- Recording observation

SIS104 Talk about observations and share ideas in a variety of ways

- Sharing observations in groups
- Discussing and sharing the information gathered in different ways

The Process Strand (Science and Technology)

ST103 Discuss ideas and use a range of objects and materials to make a product

- Discussing to identify objects and materials to make a product with a specific characteristic, such as a movable product or a product that can float on water
- Describing their ideas and preferences related to the product and the selection of materials

Suggested Sequence of Teaching Ideas

Duration	Teaching and Learning	Resources and Materials Needed	Differentiated Teaching
35 mins	**Minds on** **Introductory** The teacher could start the lesson by checking on students' prior knowledge about animals. Students must have seen cats, horses, elephants, birds, butterflies, fishes and turtles. Some common features that can be observed in most animals are limbs, eyes, mouth and nose.	video, or some books on animals.	The series of activities are structured to embed differentiation opportunities. The introductory activities focus on checking prior knowledge and students' readiness.
	Show pictures of an elephant, a deer, a parrot and a whale. Let students spot at least one difference in the features of the animals shown.		

	Ask students to do a think, pair and share. Then, the class can be divided into groups of five students each. Get each group to discuss these questions: • How do animals differ in body shape and size? • What are the common features of animals? Get each group to form a question that they would like to ask from the other groups. Let them present and discuss the answers given by students		
35 mins	**Action** **Developmental Activity 1** Explore students' understanding of this lesson further by letting them discuss the animals given in the Student's Book. Discuss the environment in which each animal lives. Identify the features of each of the animals. Get students to discuss and make links with the features of each animal and their environment. For example, fish lives in the sea. It has fins that help it to swim. Get students to do the Get Busy 1c and discuss, "Why do you think ducks have webbed feet?". Ask these questions to probe students' prior knowledge about ducks and the environment they live in:		The developmental activities are articulated to reflect various types of learning such as auditory, visual, and kinaesthetic (For example, discussion, drawing, observation, watching the video and presenting). Teachers should keep in mind that their planned activities must include a variety of strategies to cater to different learners'/learning abilities.

	• Have you seen ducks? • Where have you seen them? • How do they move? • Show students a bird that lives on land. Get students to compare the feet of both birds. Get them to a conclusion on the use of webbed feet.		
35 mins	**Developmental Activity 2** Discuss the features of a butterfly. Use probing questions for students to think about its features and their use. For example, Have you seen any butterflies? • Can you describe them? • How do they move? • What helps them to move? Encourage students to formulate questions that they would like to ask from the others. Show students a video clip of butterflies. Get students to discuss in groups the features of butterflies that help them to live. Get them to conclude that the features of butterflies are related to where they live. For example, wings. Get students to do the Get Busy 1d and discuss.		
35 mins	**Developmental Activity 3** Discuss the features of turtle and fish. Use probing questions for students to think about the features and their uses. For example, • Can you describe them? • How do they move? • What helps them to move? Let students observe a fish in a bowl/tank or show a video clip of		

	fishes/turtles. Get students to compare the features of fish and turtles. Identify the similarities and differences they observe. Get students to make links with the features of turtle and their way of living. Let them present their observations. Get students to do the Get Busy 1e and discuss		
35 mins	**Consolidation and Connection** **Follow-up Activity** Get students to complete the Get Busy 1e, 1f and 1g and discuss the answers. Also, discuss the uses of each of the parts identified in the animals given. Summarise the concept by discussing the features of a variety of animals. Get students to respond in groups to the following points on features of animals. • What is the most surprising feature? Are there any questions not answered? Record a rehearsed skit or podcast discussing the features of animals or get students to do a project work to design an animal with special features. Also, get students to fill the sheet, Animal Features (see Appendix 1-Bi) and Animals Features and Uses of Parts (see Appendix 1-Bii). Note: skit (Appendix 1-Biii) or podcast (Appendix 1-Biv) or project work to design an animal (Appendix 1-Bv)		

Assessment

The introductory 'Minds-on' activities are to elicit students' prior knowledge so that the teacher can take account of this when planning how the developmental activities in the lessons will be implemented. So, in this stage mostly diagnostic assessment takes place. So, the Think, Pair and Share activity done to check on prior knowledge would show students' understanding and their level of understanding and readiness.

Formative assessment takes place in the developmental activities. This enables the teacher to monitor students' understanding and provide feedback that can extend and deepen students' learning through various Get Busy activities.

The follow-up activities can be used for summative assessment of the students' achievement throughout the unit, can be used for formative purposes too. The follow up activities done at the consolidation phase would provide information about students' level of understanding and the filled sheet 'The Animal Features' can be used to assess them. The rehearsed skit if done by students can also be used to gather information about students' level of understanding.

Links to Other Key Learning Areas

Creative Arts, English, Dhivehi

Reflection