KEMENTERIAN PENDIDIKAN

# KURIKULUM STANDARD SEKOLAH RENDAH (SEMAKAN 2017)

## Dokumen Penjajaran Kurikulum

# SAINS

## TAHAP I

VERSI BAHASA INGGERIS

**EDISI 3**

## INTRODUCTION

The preparation of the 3rd edition Aligned Document for Standard-Based Primary School Curriculum (KSSR) (Semakan 2017) is part of an effort to improve the effectiveness of curriculum implementation. This curriculum alignment involves updating and restructuring the content of existing Level I Science subject.

This document is available as an option for teachers in the implementation of the primary school curriculum. Science teachers can use the existing Standard-Based Curriculum and Assessment Document (DSKP) or this aligned document. Any of these documents can be used conjointly with the Guide Module (MOBIM) or various support materials according to pupil's ability.

## CONTENT ORGANISATION

This aligned document covers the following aspects:

i) Changes in the content implementation of Scientific Skills and Science Room Rules;
ii) Use of easier verbs in the writing of the Learning Standards; and
iii) Combination of several Learning Standards

The content of this document is organized into three main columns which are Content Standard (CS), Learning Standard (LS) and Notes. CS and LS in this document starts with 3.1 and 3.1.1 respectively to facilitate teachers' reference to the existing DSKP. The Notes column contains descriptions and goals for specific content in the curriculum. The column also contains guides for teachers in the implementation of teaching and learning which emphasises content mastery and promotes thinking skills. Project-based learning methods are also proposed in the Notes column to help pupils learn certain topics.

## CLASSROOM-BASED ASSESSMENT

Classroom-Based Assessment (PBD) is the process of gathering information about pupil's progress. It is planned, implemented, recorded, and reported by the teacher. The assessment of pupil's Performance Level should be referred to the Performance Standards provided in the DSKP.

# SCIENCE
# YEAR 1

**THEME: LIFE SCIENCE**

**TITLE: LIVING THINGS AND NON LIVING-THINGS**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 3.1 Living things and non-living things | 3.1.1 Compare and contrast living things and non-living things based on the following characteristics:<br>i) breathe;<br>ii) need food and water;<br>iii) move;<br>iv) grow; and<br>v) reproduce | Emphasis is on observing and communicating skills.<br><br>Comparing and contrasting are done through the observation of real objects, animals and plants and presented in written or oral form. |
| 3.2 Basic needs of living things | 3.2.1 State the basic needs of living things i.e. food, water and air.<br><br>3.2.2 State human and animals also need shelters.<br><br>3.2.3 Explain human, animals and plants need food, water and air in different ways.<br><br>3.2.4 Give reasons on the importance of food, water, air and shelter to human and animals. | Emphasis is on observing and communicating skills.<br><br>Use appropriate questioning techniques to help pupils provide reasoning on the importance of food, water, air and shelter to humans and animals.<br>Example:<br>Food gives people energy to carry out daily activities. |

**THEME: LIFE SCIENCE**

**TOPIC: HUMAN**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 4.1 Human senses | 4.1.1 Identify parts of human body which are related to senses.<br><br>4.1.2 Use senses to identify objects through investigation.<br><br>4.1.3 Explain with examples, the use of other senses if one of the senses is not functioning. | Emphasis is on observing and communicating skills.<br><br>Suggested activity:<br>Guess objects in a black box using the sense of hearing, smell, taste and touch. |

**TOPIC: ANIMALS**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 5.1 Parts of animals | 5.1.1 Identify the parts of animals e.g. beak, scales, fins, fine hair, feathers, horn, feelers, hard skin, shell, wings, head, body, tail and webbed feet.<br><br>5.1.2 Explain through examples the parts of animals. | Emphasis is on observing and communicating skills.<br><br>Use suitable supporting materials such as toy animal models, animal pictures that clearly show the body parts of animals, or real animals.<br><br>Promote pupil's thinking towards:<br>• The importance of body parts to animals.<br>Example:<br>Horns help animals to defend themselves. |

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| | | • Make generalisation that different animals have the same body parts.<br>Example:<br>Cows, horses and goats are different animals, but all of them have tails. |

**TOPIC: PLANTS**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 6.1 Parts of plants | 6.1.1 Compare and contrast parts of plant i.e.:<br>i) leaf: types of vein;<br>ii) flower: flowering, non-flowering;<br>iii) stem: woody, non-woody; and<br>iv) root: tap root, fibre root. | Emphasis is on observing and communicating skills.<br><br>Comparing and contrasting are done through the observation of real plants.<br><br>Identify parts of plants and understand:<br>• The importance of the parts of plant to itself.<br>Example:<br>Roots absorb water.<br>• Different plants have the same parts.<br>Example:<br>Hibiscus, rose and chrysanthemum are different plants but all of them have flowers. |

**THEME: PHYSICAL SCIENCE**

**TOPIC: MAGNET**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 7.1 Magnet | 7.1.1 Give examples the uses of magnets in daily life. | Emphasis is on observing, communicating and manipulative skills.<br><br>Rules and safety measures must be obeyed. |
| | 7.1.2 Identify the reactions of magnets to various objects by carrying out activities. | Promote pupil's thinking towards making a conclusion based on the activities carried out.<br>Example:<br>Some objects can be attracted to magnets and some cannot be attracted to magnets. |
| | 7.1.3 Conclude that magnet attracts or repels between two poles through investigation. | |

**THEME: MATERIAL SCIENCE**

**TOPIC: ABSORPTION**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 8.1 The ability of materials to absorb water | 8.1.1 Identify objects that absorb water and cannot absorb water through investigation.<br><br>8.1.2 Describe the ability of objects to absorb water based on types of materials through investigation.<br><br>8.1.3 State the importance of objects that absorb water and cannot absorb water in daily life.<br><br>8.1.4 Design an object based on the ability to absorb water. | Emphasis is on observing, communicating and manipulative skills.<br><br>Rules and safety measures must be obeyed.<br><br>Encourage pupils to classify objects that can and cannot absorb water by carrying out activities.<br><br>Suggested activities:<br>Simple projects such as producing a mini mop based on knowledge of the material's ability to absorb water. |

**THEME: EARTH AND SPACE**

**TOPIC: EARTH**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 9.1 Surface of the Earth | 9.1.1 State the surface of the Earth e.g. mountain, beach, hill, valley, river, pond, lake and sea. | Emphasis is on observing and communicating skills.<br><br>Rules and safety measures must be obeyed.<br><br>Suggested activities:<br>Watching a video or building a model of the surface of the Earth using clay. |
| 9.2 Soil | 9.2.1 State the types of soils e.g. garden soil, clay and sand.<br><br>9.2.2 Compare and contrast the contents of different types of soils through investigation. | Emphasis is on observing, communicating and manipulative skills.<br><br>Rules and safety measures must be obeyed.<br><br>Comparing and contrasting are done through the observation of the types of soils in the surroundings. |

**THEME: TECHNOLOGY AND SUSTAINABILITY OF LIFE**

**TOPIC: BASIC OF BUILDING**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 10.1 Construction of basic shape blocks | 10.1.1 Identify basic shapes i.e. triangle, square, rectangle and circle. | Emphasis is on observing, communicating and manipulative skills. |
| | 10.1.2 Identify basic shape blocks i.e. cube, cuboid, pyramid, prism, cone, cylinder and sphere. | Identify basic shapes and basic shape blocks through observation of realia, videos or pictures. |
| | 10.1.3 Design an object or structure using basic shape blocks. | Suggested activites:<br>Simple projects such as producing a house model using basic shape blocks. |

# SCIENCE
# YEAR 2

**THEME: LIFE SCIENCE**

**TOPIC: HUMAN**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 3.1 Reproduction and growth in human | 3.1.1 State how humans reproduce. | Emphasis is on observing, measuring and using numbers as well as communicating skills. |
| | 3.1.2 Describe changes in size, height and weight in an individual since birth. | Promote pupil's thinking towards making a conclusion that growths among individuals are different. Example:<br>We are 8 years old, but we have different heights. |
| | 3.1.3 State that offsprings inherit features from their parents or ancestors. | Inherited traits are limited to skin colour, iris colour and hair type. |

**THEME: LIFE SCIENCE**

**TOPIC: ANIMALS**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 4.1 Reproduction and growth in animals | 4.1.1 State how animals reproduce.<br><br>4.1.2 State changes in animal's growth by observing their life cycles.<br><br>4.1.3 Explain with examples young animals that look like their parents and animals that do not look like their parents. | Emphasis is on observing, classifying and communicating skills.<br><br>Encourage pupils to classify animals according to the way they reproduce.<br><br>Emphasise that there are animals that lay many eggs and lay a few eggs, as well as animals that give birth to many young and a few young. |

**TOPIC: PLANT**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 5.1 Growth of plants | 5.1.1 State the basic needs for seeds to germinate.<br><br>5.1.2 Record changes in plant's growth by observing the actual seeds from germination stage.<br><br>5.1.3 Conclude the basic needs for a plant's growth by carrying out investigations. | Emphasis is on observing, measuring and using numbers as well as manipulative skills.<br><br>Encourage pupils to arrange the stages of a plant's growth.<br><br>Rules and safety measures must be obeyed. |

**THEME: PHYSICAL SCIENCE**

**TOPIC: LIGHT AND DARK**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 6.1 Light and dark | 6.1.1 State sources of light.<br><br>6.1.2 Demonstrate how shadows are formed through an activity.<br><br>6.1.3 Create a shadow game. | Emphasis is on observing and communicating skills.<br><br>Encourage pupils to think about the importance of light in daily life.<br>Example:<br>Activities can be done easily in bright conditions.<br><br>Encourage pupils to explore the clarity of shadows when light is blocked by different objects. |

**THEME: PHYSICAL SCIENCE**

**TOPIC: ELECTRIC**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 7.1 Electric circuit | 7.1.1 Identify components in an electric circuit i.e. dry cell, bulb and switch.<br><br>7.1.2 State the functions of the components in a complete electric circuit.<br><br>7.1.3 Build a complete electric circuit using dry cell, bulb, switch and connecting wires.<br><br>7.1.4 Predict the reason why bulb does not light up in a circuit. | Emphasis is on observing, classifying and communicating skills.<br><br>Rules and safety measures must be obeyed.<br><br>Encourage pupils to explore whether a bulb will light up when the switch is replaced with other objects.<br><br>Promote pupil's thinking towards making a conclusion based on the activities carried out.<br>Example:<br>Objects that can light up the bulb in the circuit are conductors and objects that cannot light up the bulb are insulators.<br><br>Suggested activities:<br>Simple projects such as producing a mini lamp based on knowledge of electrical circuits. |

**THEME: MATERIAL SCIENCE**

**TOPIC: MIXTURE**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 8.1 Mixture | 8.1.1 Describe methods to separate a mixture of various materials or objects.<br><br>8.1.2 Identify materials that can dissolve and materials that cannot dissolve in water by carrying out investigations.<br><br>8.1.3 Summarize how materials can be dissolved quickly by carrying out investigations. | Emphasis is on observing, classifying and communicating skills.<br><br>Rules and safety measures must be obeyed.<br><br>Promote pupil's thinking towards stating the reason for the method used to separate a mixture of various materials or objects.<br>Example:<br>The mixture of sand and paper clips is separated using magnets because paper clips can be attracted to magnets. |

**THEME: EARTH AND SPACE**

**TOPIC: EARTH**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 9.1 Water | 9.1.1 State natural sources of water such as rain, rivers, lakes, seas and springs.<br><br>9.1.2 State the natural direction of water flow such as Rivers and waterfalls through observation using various media.<br><br>9.1.3 Arrange in sequence the natural water cycle. | Emphasis is on observing and communicating skills. |
| 9.2 Air | 9.2.1 State that air is around us.<br><br>9.2.2 State that moving air is wind.<br><br>9.2.3 Generate ideas on the effects of air movement in human's life.<br><br>9.2.4 Create a tool or model by applying knowledge that demonstrates use of air movement. | Emphasis is on observing and communicating skills.<br><br>Encourage pupils to explore air composition and state that air consists of gases such as oxygen and carbon dioxide. |

**THEME: TECHNOLOGY AND SUSTAINABILITY OF LIFE**

**TITLE: TECHNOLOGY**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 10.1 Building set | 10.1.1 Choose a structure to build from the building set.<br><br>10.1.2 Identify the building components according to the illustrated manual.<br><br>10.1.3 Assemble the building components according to the illustrated manual.<br><br>10.1.4 Create a new structure that is not in the illustrated manual.<br><br>10.1.5 Disassemble the built structure in sequence and store the components into a storage container. | Emphasis is on observing and communicating skills. |

# SCIENCE
# YEAR 3

**THEME: LIFE SCIENCE**

**TOPIC: HUMAN**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 3.1 Teeth | 3.1.1 State types of teeth and their functions.<br><br>3.1.2 Label the structure of a tooth.<br><br>3.1.3 Compare and contrast sets of milk teeth and permanent teeth. | Emphasis is on communicating skills.<br><br>Promote pupil's thinking towards relating the importance of dental care to the structure of a tooth.<br>Example:<br>Brush your teeth at least twice a day to remove food stuck between the teeth, which can cause enamel damage due to the germs. |
| 3.2 Classes of food | 3.2.1 Give examples of food for each class of food.<br><br>3.2.2 State the importance of food according to its class for the human body.<br><br>3.2.3 Explain with examples, a balanced diet based on the food pyramid.<br><br>3.2.4 Give reasons on the effects of imbalanced food intake. | Emphasis is on observing, communicating and classifying skills.<br><br>Promote pupil's thinking towards making conclusion on the importance of food according to its class for the human body.<br>Example:<br>Rice is an important source of carbohydrates that provide energy to humans.<br><br>Use appropriate questioning techniques to help pupils reason on the effects of imbalanced food intake.<br>Example:<br>An imbalanced diet such as not eating vegetables can cause constipation. |

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 3.3 Digestion | 3.3.1 Explain the digestion process.<br><br>3.3.2 Conclude on the digested food that is not required by the body. | Emphasis is on observing and communicating skills.<br><br>Promote pupil's thinking towards arranging in sequence the food flow in the digestion process. |

**TOPIC: ANIMALS**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 4.1 Eating Habits | 4.1.1 Classify animals according to their eating habits.<br><br>4.1.2 Explain with examples the eating habits of herbivore, carnivore and omnivore.<br><br>4.1.3 Make inferences about the animal groupings based on their eating habits.<br><br>4.1.4 Compare and contrast the dentition of herbivore, carnivore and omnivore. | Emphasis is on observing, communicating, classifying and making inference skills.<br><br>Use appropriate questioning techniques to help pupils figure out animal groupings based on their eating habits.<br>Example:<br>Tigers are carnivores because they eat other animals only. |

**TOPIC: PLANTS**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 5.1 Plant Reproduction | 5.1.1 Give examples of plants for each way of reproduction. | Emphasis is on observing, communicating and classifying skills. |
| | 5.1.2 State that a plant can reproduce through various ways by carrying out projects. | Promote pupil's thinking towards making a conclusion that a plant can reproduce through various ways. |
| | 5.1.3 Give reasons on the importance of plant reproduction to living things. | Use questioning techniques to encourage pupils to reason about the importance of plant reproduction to living things.<br>Example:<br>Plant reproduction is important to ensure that plants continue to exist and supply oxygen to humans and animals. |

**THEME: PHYSICAL SCIENCE**

**TOPIC: MEASUREMENT**

| CONTENT STANDARD | | LEARNING STANDARD | | NOTES |
|---|---|---|---|---|
| 6.1 | Measurement of area and volume | 6.1.1 | State the units that are used to measure area and volume. | Emphasis is on measuring and using numbers, observing and communicating skills.<br><br>Rules and safety measures must be obeyed.<br><br>Encourage pupils to find out how to:<br>• estimate the area of irregular surfaces.<br>• measure the volume of irregular-shaped solid using water displacement method. |
| | | 6.1.2 | Measure the area of regular surfaces using 1cm x 1cm square. | |
| | | 6.1.3 | Measure the volume of hollow boxes using 1cm x 1cm x 1cm cubes. | |
| | | 6.1.4 | Measure the volume of liquid using correct tools and techniques. | |

**THEME: PHYSICAL SCIENCE**

**TOPIC: DENSITY**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 7.1 Objects or materials which are more or less dense than water | 7.1.1 Make inferences about objects or materials that float or sink by carrying out activities. | Emphasis is on observing, communicating, classifying, making inferences and manipulative skills.<br><br>Rules and safety measures must be obeyed.<br><br>Use appropriate questioning techniques to help pupils state:<br>• Objects float because they are less dense than water.<br>• Objects sink because they are more dense than water. |
| | 7.1.2 Solve problems to identify methods to make water more dense. | Suggested activity:<br>Dissolve sugar or salt to increase the density of water so that objects or materials that initially sink can float. |

**THEME: MATERIAL SCIENCE**

**TOPIC: ACID AND ALKALI**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 8.1 Acid and alkali | 8.1.1 Test acidic, alkaline and neutral substances through changes in colour of litmus paper by carrying out investigation. | Emphasis is on observing, communicating, classifying and manipulative skills.<br><br>Rules and safety measures must be obeyed. |
| | 8.1.2 Explain acidic, alkaline and neutral substances through taste and touch by testing a few substances. | Promote pupil's thinking towards making a conclusion that acidic, alkaline and neutral substances can be identified through taste and touch based on the activity carried out.<br>Example:<br>Most alkaline substances taste bitter and slippery when touched.<br><br>Encourage pupils to explore other materials that can test acidic, alkaline and neutral substances. |

**THEME: EARTH AND SPACE**

**TOPIC: SOLAR SYSTEM**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 9.1 Solar System | 9.1.1 List members of the Solar System using observation through various media.<br><br>9.1.2 Explain the planets that revolve around the Sun on their orbits.<br><br>9.1.3 Relate the positions of the planets from the Sun with the time taken for the planets to revolve around the Sun. | Emphasis is on observing and communicating skills.<br><br>Encourage pupils to explore the planets' temperature based on their sequence in the Solar System.<br><br>Promote pupil's thinking towards making a conclusion that planets revolve according to their orbits around the Sun. |

**THEME: TECHNOLOGY AND SUSTAINABILITY OF LIFE**

**TOPIC : MACHINE**

| CONTENT STANDARD | LEARNING STANDARD | NOTES |
|---|---|---|
| 10.1 Pulley | 10.1.1 State the meaning and the uses of pulleys.<br><br>10.1.2 Describe how a fixed pulley works using a model.<br><br>10.1.3 Give examples of the application of pulleys in life. | Emphasis is on observing, communicating and predicting skills.<br><br>Suggested activity:<br>Simple projects such as a flag poles or a crane model. |

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