



KEMENTERIAN PENDIDIKAN MALAYSIA

KURIKULUM STANDARD SEKOLAH RENDAH

MATEMATIK

Dokumen Standard Kurikulum dan Pentaksiran

TAHUN 1
(EDISI BAHASA INGGERIS)



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Bahagian Pembangunan Kurikulum

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RUKUN NEGARA

BAHAWASANYA Negara kita Malaysia mendukung cita-cita hendak:
Mencapai perpaduan yang lebih erat dalam kalangan seluruh masyarakatnya;
Memelihara satu cara hidup demokratik;
Mencipta satu masyarakat yang adil di mana kemakmuran negara
akan dapat dinikmati bersama secara adil dan saksama;
Menjamin satu cara yang liberal terhadap tradisi-tradisi
kebudayaannya yang kaya dan berbagai corak;
Membina satu masyarakat progresif yang akan menggunakan sains
dan teknologi moden;

MAKA KAMI, rakyat Malaysia, berikrar akan menumpukan seluruh tenaga dan usaha kami untuk mencapai cita-cita tersebut berdasarkan prinsip-prinsip yang berikut:

**KEPERCAYAAN KEPADA TUHAN
KESETIAAN KEPADA RAJA DAN NEGARA
KELUHURAN PERLEMBAGAAN
KEDAULATAN UNDANG-UNDANG
KESOPANAN DAN KESUSILAN**

FALSAFAH PENDIDIKAN KEBANGSAAN

“Pendidikan di Malaysia adalah suatu usaha berterusan ke arah lebih memperkembangkan potensi individu secara menyeluruh dan bersepadu untuk melahirkan insan yang seimbang dan harmonis dari segi intelek, rohani, emosi dan jasmani, berdasarkan kepercayaan dan kepatuhan kepada Tuhan. Usaha ini adalah bertujuan untuk melahirkan warganegara Malaysia yang berilmu pengetahuan, berketerampilan, berakhlak mulia, bertanggungjawab dan berkeupayaan mencapai kesejahteraan diri serta memberikan sumbangan terhadap keharmonian dan kemakmuran keluarga, masyarakat dan negara”

Sumber: Akta Pendidikan 1996 (Akta 550)

KATA PENGANTAR

Kurikulum Standard Sekolah Rendah (KSSR) yang dilaksanakan secara berperingkat mulai tahun 2011 telah disemak semula bagi memenuhi dasar baharu di bawah Pelan Pembangunan Pendidikan Malaysia (PPPM) 2013-2025 supaya kualiti kurikulum yang dilaksanakan di sekolah rendah setanding dengan standard antarabangsa. Kurikulum berasaskan standard yang menjadi amalan antarabangsa telah dijemakan dalam KSSR menerusi penggubalan Dokumen Standard Kurikulum dan Pentaksiran (DSKP) untuk semua mata pelajaran yang mengandungi Standard Kandungan, Standard Pembelajaran dan Standard Prestasi.

Usaha memasukkan Standard Prestasi di dalam dokumen kurikulum telah mengubah landskap sejarah sejak Kurikulum Kebangsaan dilaksanakan di bawah Sistem Pendidikan Kebangsaan. Menerusinya murid dapat ditaksir secara berterusan untuk mengenalpasti tahap penguasaannya dalam sesuatu mata pelajaran, serta membolehkan guru membuat tindakan susulan bagi mempertingkatkan pencapaian murid.

DSKP yang dihasilkan juga telah menyepadukan enam tunjang Kerangka KSSR, mengintegrasikan pengetahuan, kemahiran dan nilai, serta memasukkan secara eksplisit Kemahiran Abad Ke-21

Kemahiran Berfikir Aras Tinggi (KBAT). Penyepaduan tersebut dilakukan untuk melahirkan insan seimbang dan harmonis dari segi intelek, rohani, emosi dan jasmani sebagaimana tuntutan Falsafah Pendidikan Kebangsaan.

Bagi menjayakan pelaksanaan KSSR, pengajaran dan pembelajaran guru perlu memberi penekanan kepada KBAT dengan memberi fokus kepada pendekatan Pembelajaran Berasaskan Inkuiri dan Pembelajaran Berasaskan Projek, supaya murid dapat menguasai kemahiran yang diperlukan dalam abad ke-21.

Kementerian Pendidikan Malaysia merakamkan setinggi-tinggi penghargaan dan ucapan terima kasih kepada semua pihak yang terlibat dalam penggubalan KSSR. Semoga pelaksanaan KSSR akan mencapai hasrat dan matlamat Sistem Pendidikan Kebangsaan.

Dr. SARIAH BINTI ABD. JALIL
Pengarah
Bahagian Pembangunan Kurikulum.

INTRODUCTION

The purpose of education in Malaysia is to develop individual potential through quality education by preparing committed citizens and a generation that has the ability to think. The Malaysian Ministry of Education continuously reviews the curriculum to ensure the implementation of the curriculum in schools, equip pupils with knowledge, skills and values to face current and future challenges.

Each pupil in Malaysia has the opportunity to go through at least six years of basic education in primary schools and five years in secondary schools. Mathematics is a core subject that every pupil has to go through in the national educational system.

Mathematics is a discipline that trains the mind to think logically and systematically in problem solving and decision making. Inherently mathematical nature promotes meaningful learning and challenge the mind. Therefore, mathematics is one of the most important disciplines that strives for human development. Based on the National Philosophy of Education and the relevancy of the curriculum, the Primary School Standard Curriculum for Mathematics is adapted and restructured.

This restructuring takes into account the ongoing continuity to the next level. Measures taken are consistent with the need to provide the knowledge and mathematics skills to pupils from various background and abilities. With the knowledge and skills, they are able to explore the content, make adaptations, modifications and innovations in facing and dealing with future changes and challenges.

Learning of Mathematics provides opportunities for pupils to perform creative task and experience the fun and excitement in learning something new. Such experiences increase the interest and curiosity of the pupils to learn mathematics outside the classroom and at a higher learning education level.

AIMS

The aim of the Standard Based Primary School Curriculum for Mathematics is to develop pupils' understanding on the concept of numbers, basic calculation skills, understanding simple mathematical ideas and competent in applying mathematical knowledge and skills effectively and responsibly, to solve problem and make decisions, based on attitude and values in order to overcome challenges faced in daily life, in line with science and technology development and 21st century challenges.

OBJECTIVES

The Standard Based Primary School Curriculum for Mathematics is to enable the pupils to achieve the following objectives:

1. Develop the ability of mathematical thinking.
2. Develop understanding and applying the concepts and mathematical skills in various contexts.
3. Expand the usage of basic operation skills; addition, subtraction, multiplication and division related to Numbers and Operations, Measurement and Geometry, Relationship and Algebra, and Statistics and Probability.
4. Identify and use relationship within the mathematical ideas, between the field of mathematics and other fields, and with daily life.
5. Communicate using mathematical ideas clearly with the correct usage of symbols and terms;
6. Use mathematical knowledge and skills to apply and make adjustments to various strategies in solving problems;
7. Develop higher order thinking, critical, creative, innovative, reasoning, and explore daily life in mathematical ways.
8. Use various representations to present mathematical ideas and relationships;
9. Appreciate and value the beauty of mathematics.
10. Use various mathematical tools effectively including ICT to build conceptual understanding and apply mathematical knowledge.

THE FRAMEWORK OF STANDARD BASED PRIMARY SCHOOL CURRICULUM

The Standard-Based Curriculum and Assessment for Primary Schools (KSSR) Framework is based on the six pillars namely Communication; Spiritual, Attitude & Values; Humanities; Personal Competence; Physical Development & Aesthetics; and Science & Technology.

The six pillars are the main domain that support each other and are integrated with critical, creative and innovative thinking. This integration aims to develop a balanced, knowledgeable and competent human capital as shown in **Figure 1**.

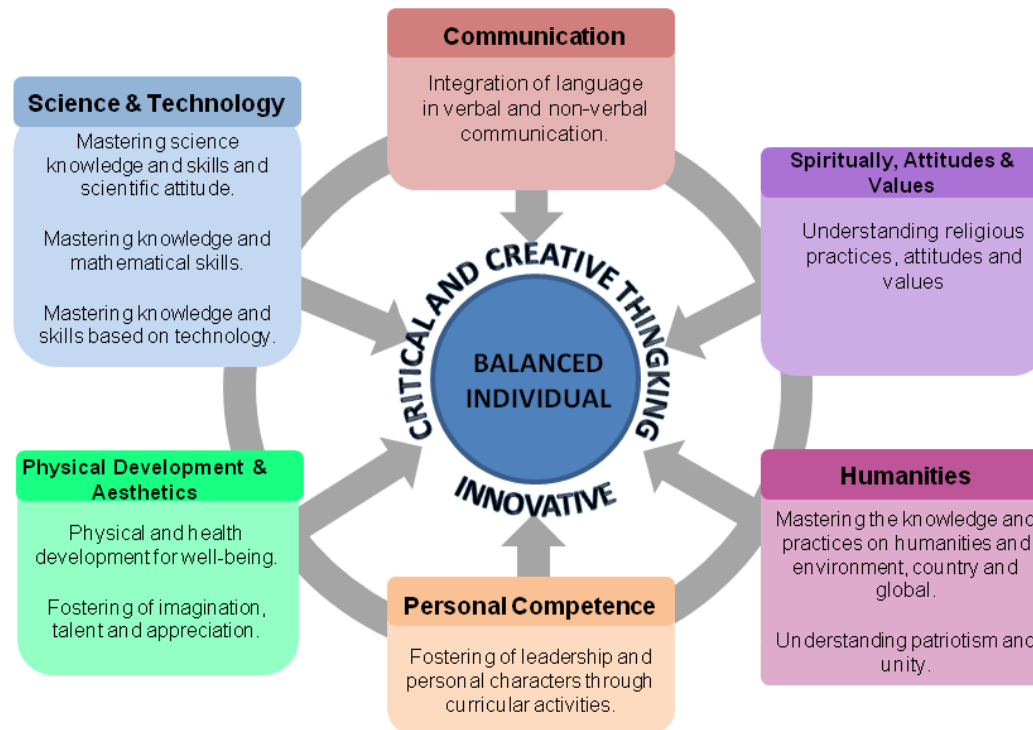


Figure 1: The Framework for Standard Based Primary School Curriculum

FOCUS

Teaching and learning process of mathematics gives priority to the mastery of knowledge and understanding which enables pupils to apply concepts, principles and the mathematical processes learnt.

Emphasis on the development of mathematical thinking is built and developed through the teaching and learning in the classroom based on the following principles which are: problem solving, communication, reasoning, relationship, make representations and use of technology in mathematics.

Mathematics curriculum framework as in figure 2, is the fundamental aspect to the implementation of the Mathematics curriculum in the classroom. The four important elements that contribute to the “fikrah” (thoughtful learning) human development are:

1. Learning Area;
2. Attitude and Value;
3. Mathematical Skills; and
4. Mathematical Process.

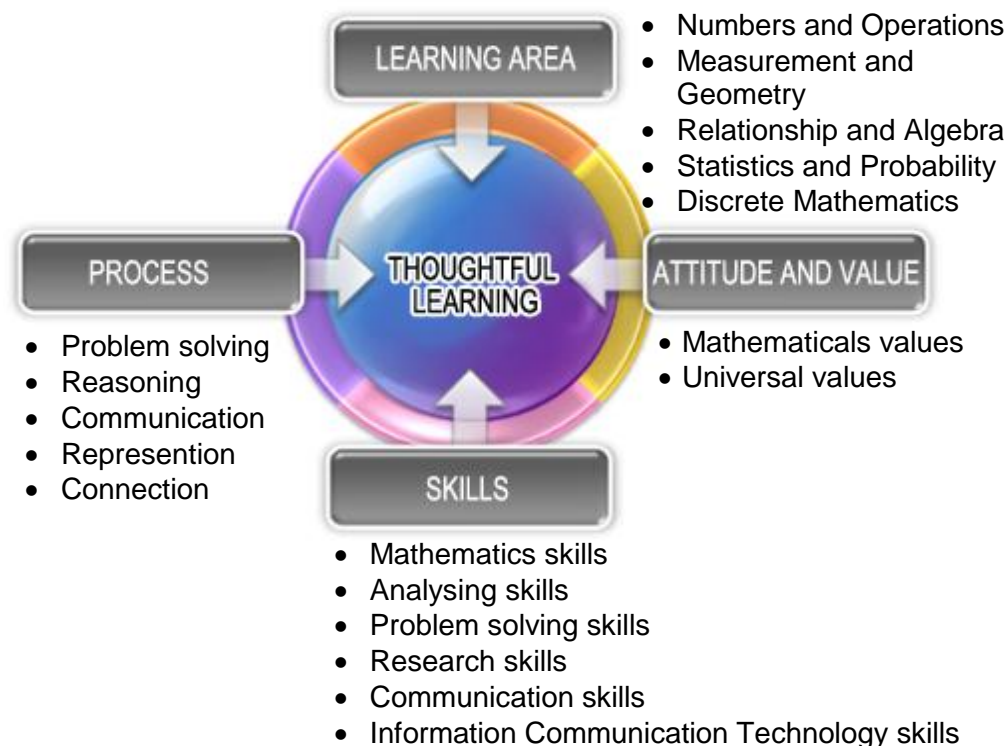


Figure 2 : Primary School Standard Curriculum Framework

Mathematical Thoughtful Learning

Thoughtful learning refers to the thinking and the force behind it. In the context of mathematics education, thoughtful learning refers to the desired quality of pupils to be produced through the national mathematics education system. Pupils who are mathematically inclined are those who are capable of doing mathematics and understanding the mathematical

ideas, and responsibly applying the mathematical knowledge and skills in daily life based on attitudes and values of mathematics.

Mathematics thoughtful learning aims to produce creative and innovative individuals as well as fulfill the requirements of the 21st century. The nation's ability depends on its human capital who would be able to think and generate ideas.

Learning Area

The Mathematics Curriculum encompasses five learning areas:

- Numbers and Operations;
- Measurement and Geometry;
- Relationship and Algebra;
- Statistics and Probability; and
- Discrete Mathematics

Mathematical Process

Mathematical processes which support the effective and thoughtful learning of mathematics are:

- problem solving;
- reasoning;
- communication;
- connection; and
- representation

These five mathematical processes are interrelated and need to be implemented intergradedly across the curriculum.

1. **Problem solving** is the main focus in the teaching and learning of mathematics. Thus, teaching and learning need to involve problem solving skills comprehensively and across the whole curriculum. The development of problem solving skills needs to be given proper emphasis so that pupils are able to solve various problems effectively. These skills involve the following steps:

- (i) Understand and interpret problems;
- (ii) Planning solutions strategies;
- (iii) Implement strategies; and
- (iv) Review the answers.

The various uses of general strategies in problem solving, including the steps in solving problems, need to be expanded . Some of the problem solving strategies that can be considered are drawing diagrams, identifying patterns, making tables/charts or lists systematically; using algebra, trying simpler case, logical reasoning, trial and error, simulation, working backwards and using analogy.

Reviewing answers is an important step in problem solving. Pupils should be trained to review answers to a

problem. By reviewing the answers, pupils see, understand and appreciate the perspective of mathematics from different angles as well as consolidate their understanding of a concept learnt.

2. **Reasoning** is fundamental in understanding mathematics effectively and making the understanding of mathematics meaningful. The development of mathematical reasoning is closely related to the intellectual development and communication of the pupils. Reasoning has the ability to expand not only the capacity of logical thinking but also increase the capacity of critical thinking, which is also the basis of understanding mathematics in depth and meaningful. To achieve this objective, pupils should be trained and guided to make a conjecture, proving the conjecture, provide a logical explanation, analyse, consider, evaluate, and justify all mathematics activities. In addition, teachers need to provide space and opportunities for the discussion of mathematics which is not only engaging but also allow each pupil to be involved well.

Reasoning can be done inductively through mathematics activities that involve the identification of mathematical patterns and making conclusions based on the patterns.

Reasoning element in teaching and learning prevents pupils from assuming mathematics as only one set of procedures or algorithms that need to be followed to obtain a solution, without actually understanding the true concepts of mathematics. Reasoning does not only change the paradigm of pupils from just learning to thinking, but also give an intellectual empowerment when pupils are guided and trained to make a conjecture, prove the conjecture, provide a logical explanation, analyse, evaluate and justify all mathematics activities. This process will produce pupils who are self-confident and resilient in line with the aspiration to cultivate mathematical thinkers with high capabilities.

3. **Communication** can help pupils to clarify and strengthen their mathematical understanding. By sharing understanding of mathematics through writing and oral with classmates, teachers and parents, pupils will be able to increase their confidence and lighten the task of the teachers in monitoring the progress of their mathematical skills.

Communication plays a vital role in ensuring the meaningful learning of mathematics. Through communication, mathematical ideas can be expressed and understood better. Mathematical communication,

whether oral, written, or with the use of symbols and visual representations (using charts, graphs, diagrams etc), enables pupils to understand and apply mathematics effectively.

Communicating among themselves or with peers, parents, adults and teachers can help pupils to describe, clarify and strengthen their ideas and understanding of mathematics. To ensure the process of generating, sharing and increasing understanding take place, pupils should be given the opportunity to debate their mathematical ideas analytically and systematically. Communication which involves a variety of perspectives and points of view, can help pupils to improve their understanding of mathematics.

An important aspect of effective communication in mathematics is the ability to provide information effectively, understand and apply the correct mathematical notation. Pupils need to use mathematical language and symbols correctly to ensure that mathematical ideas can be explained accurately. Mathematical communication also involves the use of various media such as charts, graphs, manipulatives, calculators, computers and others. Pupils should be able to use various media to explain mathematical ideas and solve mathematical problems.

Effective communication requires an environment that can suit the needs of the pupils to feel comfortable during a conversation like asking questions, answering questions and explaining the statements to classmates and teachers. Pupils should be given the opportunities to communicate actively in various situations, for example, communicating during activities in pairs, groups or provide explanation to the entire class.

Assessment on the ability of pupils to communicate effectively in mathematics should show the evidence that they are able to generate, explain and share their mathematical ideas through various forms of communication in various environments. Pupils, who are always given opportunities and encouragement to speak, read, write and listen during the teaching and learning of mathematics will be able to communicate to learn mathematics and learn to communicate mathematically.

4. **Representation** is often used to represent the world that we live in. Therefore, there must be similarities between aspects of the represented world and aspects that are represented by the world. The abstract relationship between these two worlds can be depicted as follows:

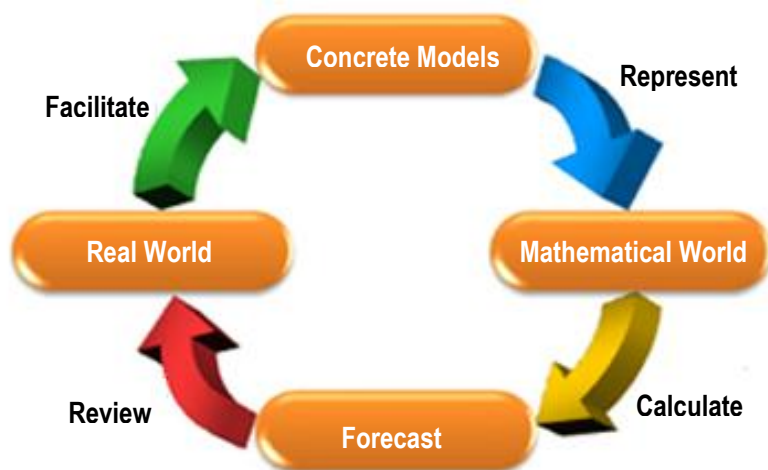


Figure 3: Representation Process

Representation can be regarded as a facilitator that allows the relationship between the real world and the world of mathematics. Formulas, tables, graphs, equations etc are used to represent various notions and real world relationships. Representation can be defined as any configuration of letters, images or concrete objects that can reflect or represent other things. The representation system is naturally divided into internal and external. The internal representation of the system exists in the mind of individual, whereas the external representation is easily shared and viewed by others. Internal representation consists of ideas that help in describing the human process of learning and solving problems in mathematics, while external representation consists of items

such as diagrams, the formal language, and notational symbols. Using multiple representations in order to show a concept not only helps to develop better understanding but also strengthens one's ability in solving problems.

Representation is necessary for pupils' understanding in mathematical concept and relationship. It allows pupils to communicate approaches, debates and understanding of mathematics to themselves and others. It also allows pupils to recognize the relationships between related concepts and apply mathematics to realistic problems.

Representation is an important component in the development of mathematical understanding and quantitative thinking. As a whole, without representation, mathematics is abstract, mostly philosophic, and unapproachable by most of the population. With the representation, ideas can be formed into a mathematical model, important relationship can be elaborated, understanding can be stimulated through construction and sequencing of suitable experiences and observations.

Pupils should shape and explore mathematical ideas in depth through opportunities and various learning experiences. Awareness should be nurtured and developed among pupils that mathematical ideas are interrelated and mathematics is a

comprehensive knowledge; not fragmented knowledge. With that understanding and awareness, the meaning of mathematical ideas is more significant and is able to enhance pupils' ability to apply mathematics.

Opportunities and various learning experiences provided should make sure the pupils involve actively in the learning of mathematics, help pupils to form deep understanding about mathematical concepts, and create better meaning for various mathematical ideas. Based on the understanding and meaning formed, pupils are able to relate and apply mathematical ideas, thus, enabling them to be more confident to explore and apply mathematics. The usage of teaching aids, technology tools and implementation of task/practical/project work should be encompassed in learning experiences for the pupils.

5. **Connection** needs to be established so that pupils can link conceptual and procedural knowledge as well as be able to connect to topics in mathematics particularly and mathematics with other areas generally. This will enhance the pupils' understanding and makes mathematics clearer, meaningful and interesting to them.

Mathematics curriculum generally consists of several discrete areas such as calculation, geometry, algebra, measurement and problem solving. Without relating these areas, pupils will have to learn and remember too many concepts and skills separately. Instead, by recognizing how the concepts or skills in different fields relate to each other, mathematics will be seen and studied as a holistic discipline and easily understood. When these mathematical ideas are related with everyday experience inside and outside the school, pupils will be more aware of the use, importance, strength and the beauty of mathematics.

Mathematical Process Standard

The standards of process that need to be achieved by the pupils throughout this implementations are as follow :

Table 1: Process Standard

Problem Solving	Reasoning	Communication	Representation	Connection
<ul style="list-style-type: none"> • Understanding the problem. • Extracting relevant information in the given situation and arrange it systematically. • Making review and reflection for the solution and strategy used. • Planning various strategies to solve problem. • Implementing the strategies according to the prescribed plan. • Producing solutions which fulfil the requirements of the problem. • Interpreting solutions. 	<ul style="list-style-type: none"> • Recognizing mathematical reasoning and proof as the basis of mathematics. • Identifying pattern, structure and similarity in real world situation and symbolic representation. • Choosing and using various reasoning and proving techniques. • Making and investigate mathematical conjectures. • Constructing and evaluating mathematical argument and evidence. • Making decision and justifying them. 	<ul style="list-style-type: none"> • Organizing and combining mathematical thought through communication to clarify and strengthen mathematical understanding. • Communicating mathematical thoughts and ideas clearly and confidently. • Using mathematical language to state mathematical ideas accurately. • Analysing and evaluating mathematical thought and strategies of others. 	<ul style="list-style-type: none"> • Describing mathematical ideas using various representations. • Making interpretation from given representation. • Choosing the suitable representations. • Using various mathematical representation to : <ul style="list-style-type: none"> ○ simplify complex mathematical ideas. ○ helping in problem solving. ○ making a model and interpreting mathematical phenomena. ○ creating connection between various representations. 	<ul style="list-style-type: none"> • Identifying and using connection between mathematical ideas. • Understanding how mathematical ideas are interconnected and arranged to become solid unities. • Relating mathematical ideas with daily life and other areas.

Skills

Mathematical skills should be developed and built among pupils including numeration, measure and construct, handle and interpret data, manipulate arithmetic, manipulate algebra, use algorithm and mathematic tools, and Information and Communications Technology (ICT).

Mathematical tools that support effective and thoughtful learning mathematics are:

- Mathematical skill
- Analysing skill
- Problem solving skill
- Research skill
- Communication skill
- Technology using skill

1. **Mathematical skills** refer to the following abilities:

- (i) Using correct standard mathematical language and applying logical reasoning.
- (ii) Stating mathematical ideas concisely.
- (iii) Creating, testing, and proving conjecture.
- (iv) Extracting meaning from a mathematical writing; and
- (v) Using mathematics to explain physical world.

2. **Analysing skill** refers to the following abilities:

Thinking clearly;

- (i) Giving attention and examining each aspect.
- (ii) Manipulating precise, concise and detailed ideas.
- (iii) Understanding complex mathematical reasoning.
- (iv) Constructing and defending logical arguments; and
- (v) Debating illogical arguments.

3. **Problem solving skill** refers to the following abilities:

- (i) Construct problem statement precisely and identify the main issues.
- (ii) Present solutions clearly and explicate the developed assumptions.
- (iii) Solving complex problems by analysing simple and specific problems.
- (iv) Open-minded and using different approaches in solving the same problem.
- (v) Solving problems confidently even though the solutions are not evident; and
- (vi) Asking for help if needed.

4. **Research Skills** refers to the following abilities:

- (i) Referring notes, textbooks and other sources.
- (ii) Accessing books in the library.
- (iii) Using database.
- (iv) Getting information from various individuals; and
- (v) Thinking

5. **Communication Skill** refers to the following abilities:

- (i) Listen effectively.
- (ii) Writing mathematical ideas clearly and precisely.
- (iii) Writing essays and reports; and
- (iv) Doing presentations.

6. **Information Communication Technology Skills** refers to the abilities in using and handling mathematical instruments such as abacus, calculators, computers, educational software, websites and educational packages for:

- (i) Developing and having a deeper understanding of mathematical concepts.
- (ii) Creating, testing and proving conjecture.
- (iii) Exploring mathematical ideas.
- (iv) Solving problems.

Values

Values are affective qualities built through the teaching and learning of mathematics using appropriate context. They are instilled implicitly through learning experiences. Instilling the values and attitudes in teaching and learning of mathematics is to produce individuals who are balanced in knowledge and skills as well as being courteous.

The purpose of applying values in the teaching and learning mathematics is to produce competent and well mannered role model. The appreciation of attitudes and values can shape a well mannered and noble younger generation.

Value as referred to the curriculum can be defined as:

1. Values of mathematical education; refers to values in teaching and learning mathematics.
2. Mathematical values; refer to the mathematical values that stress on mathematical knowledge such as rational, objectives, mastery, progress, openness and mystery.
3. Fundamental values; global values emphasized across all subjects.

The formation of values through teaching and learning mathematics should also involve an element of divinity, beliefs, interests, appreciation, confidence, efficiency and endurance. Belief in the power of God can basically be nurtured by contents in this curriculum. The relationship between the content learnt and the real world is to show and validate the greatness and power of the creator of the universe.

Elements of history and patriotism should also be incorporated in appropriate topics to enable pupils to appreciate mathematics and encourage pupils' interest and confidence in mathematics. The historical elements could be a particular event on a mathematician or a brief history about a concept or symbol.

21st CENTURY SKILLS

One of the aspirations of Primary School Standard Curriculum is to produce pupils with the 21st century skills by focusing on thinking skills as well as living skills and career that is based on practical moral values. The purpose of 21st century skills is to produce pupils with the characteristics as stated in table 2 who are able to compete globally. The mastering of CS and LS in the primary school mathematical curriculum contributes towards 21st century skills among pupils.

Table 2: Pupil Profile

PUPIL PROFILE	DESCRIPTION
Resistant	They are able to face and overcome difficulties, challenges with wisdom, confidence, tolerance and empathy.
Communication skill	They consistently voice and express their thoughts, ideas and information. Their thoughts and ideas are conveyed verbally, in written form or using various media and technology in a creative manner.

PUPIL PROFILE	DESCRIPTION
Thinker	They think critically, creatively and innovatively; able to handle complex problems and make ethical decisions. They think about learning and themselves as pupils. They produce questions and are open to perspective, values and individual traditions and societal traditions. They are confident and creative in handling new learning fields.
Teamwork	They can work together effectively and harmoniously with others. They take on responsibility while respecting and appreciating the contributions given by all team members. They obtain interpersonal skills through collaborative activities, and make them better leaders and team mates.
Curious	They develop natural curiosity to explore strategies and new ideas. They learn skills that are needed to carry out inquiry and research, as well as behave independently in learning. They enjoy continuous lifelong learning experiences.
Principled	They are honest and have integrity, equality, fair and respect individual, group and community dignity. They are responsible for their actions, consequences and decisions.

PUPIL PROFILE	DESCRIPTION
Informative	They gain knowledge and form wide and balanced understanding across various knowledge disciplines. They explore knowledge effectively and efficiently in the context of local and global issues. They understand ethical issues/laws related to the information that was gained.
Attentive/Caring	They show empathy, compassion and respect towards needs and feelings of others. They are committed to the country and ensure the sustainability of nature.
Patriotism	They portray love, support and respect towards the country.

HIGHER ORDER THINKING SKILLS

Higher Order Thinking Skills (HOTS) is stated explicitly in the curriculum so that the teachers can translate them in teaching and learning to stimulate structured and focused thinking among pupils. HOTS description is focused on four levels of thinking as shown in **Table 3**.

Table 3: Thinking levels in HOTS

Thinking level	Description
Application	<ul style="list-style-type: none"> Using knowledge, skills and values in different situations to accomplish a task.
Analysis	<ul style="list-style-type: none"> Ability to break down information into smaller parts in order to understand and make connections between these parts.
Evaluation	<ul style="list-style-type: none"> Ability to consider, make decisions using knowledge, experience, skills, values and justify decisions made.
Creation	<ul style="list-style-type: none"> Produce an idea or product or method creatively and innovatively.

HOTS is the ability to apply knowledge, skills and value in reasoning and reflecting to solve problems, make decisions, be innovative and capable in inventing something. HOTS includes critical and creative thinking, reasoning and thinking strategies.

Critical thinking is the ability to evaluate ideas logically and rationally in making sensible judgements using reasons and logical evidence.

Creative thinking is the capacity to produce or create something new and valuable using genuine imagination and unconventional thinking.

Reasoning skill is the individual capability to consider and evaluate logically and rationally.

Thinking strategy is a way of thinking that is structured and focused to solve problems.

HOTS can be applied in classroom through reasoning based activities, inquiry learning, problem solving and projects. Teachers and pupils need to use thinking tools such as

thinking maps and mind maps and also higher level questions to encourage pupils to think.

STRATEGIES IN TEACHING AND LEARNING

Good teaching and learning of mathematics encourages teachers to plan the activities meticulously and integrate various strategies that allow pupils to understand the contents in depth, and motivate pupils to think on a higher level.

Mathematics is a science based on concepts, facts, properties, rules, patterns and processes. Therefore, the strategies used in teaching and learning of mathematics require diversity and balance. Traditional strategies are still required to teach procedure based contents. Some contents require teachers to prepare learning activities which enable pupils to discover concepts on their own.

Hence, structured questioning technique is needed to enable pupils to discover rules, patterns or the nature of mathematical concepts.

Opportunities and a variety of learning experiences, integrating the use of ICT, and problem solving that involves a balance of

both routine and non-routine questions are emphasized in the teaching and learning of Mathematics. Non-routine questions requiring higher order thinking is emphasized to produce human capital who are thoughtful, creative and innovative, able to compete in the era of globalisation and to meet the 21st century challenges.

Mathematics Standard Curriculum emphasizes deep conceptual understanding, competence in the manipulation, the ability to reason and communicate mathematically. Thus, teaching and learning should be based on learning strategies containing elements such as inquiry, exploration and investigation of mathematics. Teacher needs to design teaching and learning that provides opportunities for pupils to make conjectures, reason, ask questions, reflect and then form concepts and self-knowledge.

The use of teaching aids and the implementation of tasks in the form of a presentation or project work need to be summarized in the learning experiences provided for pupils to produce pupils who are competent to apply knowledge and mathematical skills in solving problems involving everyday situations as well as to develop soft skills.

The use of technologies such as dynamic software, graphing calculators, the Internet and so on need to be integrated in the

teaching and learning of mathematics to help pupils form a deep understanding of a particular concept that involves abstract concepts. In addition, teachers need to use a diversity of approaches and teaching and learning strategies such as cooperative learning, mastery learning, contextual learning, constructivism, project-based learning and so forth.

Thoughtful learning in mathematics needs to be materialised in the teaching and learning practices. Thus, teaching and learning strategies should be pupil-centred allowing them to interact and master learning skills through their own experience. Approaches and strategies, such as inquiry-discovery, exploration and mathematical investigation and pupil-centred activities with the aid of mathematical tools that are appropriate, thorough and effective can make learning of mathematics fun, meaningful, useful and challenging which in turn, will form deep understanding of concepts.

Teachers need to diversify the methods and strategies of teaching and learning to meet the needs of pupils with diverse abilities, interests and preferences as well as the active involvement of pupils in meaningful and challenging activities designed specifically for their needs. Every pupil should have an equal chance in the form of understanding of concepts and procedural competence. Therefore, teachers should be careful

in providing environment of learning and intellectual discussions that require pupils to collaborate in solving meaningful and challenging assignments.

Creativity and innovation are key elements in the development of the knowledgeable society of the 21st century. Both of these elements will significantly contribute to the social and individual prosperity of a country. Countries are in dire need of creative and innovative human capital in order to compete in an increasingly competitive and dynamic world. Education is seen as a means to the formation and assimilation of creative and innovative skills among the citizens.

Creativity and innovation are interrelated. In general, the idea of creativity refers to generation of new ideas, approaches or new actions. Innovation is also the process of generating creative ideas in certain contexts. Creativity and innovation are skills that can be developed, honed and nurtured in pupils through teaching and learning in the classroom. Mathematics is the science of pattern and relevance of which are closely related to natural phenomena. Therefore, mathematics is the platform and catalyst to develop pupils' creative and innovative skills through appropriate tasks and activities.

Teachers need to design teaching and learning that encourages and fosters creativity and innovation. Among the strategies that can be used is to involve pupils in complex cognitive activities such as:

- (i) The implementation of tasks involving non-routine questions requiring various problem solving strategies and higher level thinking.
- (ii) The use of technology in the exploration, build conceptual understanding and problem solving.
- (iii) Acculturalise pupils to showcase creativity and innovation in a variety of forms.
- (iv) To design teaching and learning that provide space and opportunities for pupils to do mathematics and establish understanding through exploration and inquiry-based investigations.

The diversity of approaches and strategies for teaching and learning such as mastery learning, contextual learning, constructivism, project-based learning, problem-based learning and so forth should be implemented when necessary and appropriate.

ELEMENTS ACROSS THE CURRICULUM

Elements Across the Curriculum (EMK) is a value-added element applied in the teaching and learning process other than those specified in the standard content. The application of these elements is aimed at strengthening the human capital skills and competency as well as intended to prepare pupils for the challenges of the present and the future. The elements are explained below:

1. Language

- The accuracy of the medium of instruction should be a priority in all subjects.
- During the teaching and learning of each subject, emphasis is given on the aspects of pronunciation, sentence structure, grammar and the terminology of the language in order to assist pupils to organise ideas as well as communicate effectively.

2. Environmental Sustainability

- Awareness towards the love of the environment in the pupils' lives needs to be nurtured through the teaching and learning process in all subjects.

- Knowledge and awareness on the importance of the environment would help to shape pupils' ethics in appreciating nature.

3. Values

- Values are emphasised in all subjects to ensure that pupils are aware of the importance of these good principles and practise these values in their lives.
- Values encompass the aspects of spirituality, humanity and citizenship become the practice in pupils' daily life.

4. Science and Technology

- Promoting interest in science and technology will improve scientific and technological literacy amongst pupils.
- The use of technology in teaching can help and contribute to efficient and effective learning.
- The integration of science and technology in the teaching and learning process covers four areas, namely:
 - The knowledge of science and technology (facts, principles, concepts related to science and technology);
 - Scientific skills (thinking process and specific manipulative skills);
 - Scientific attitudes (such as accuracy, honesty, security); and
 - Use of technology in teaching and learning activities.

5. Patriotism

- Patriotism can be nurtured through all subjects, co-curricular activities and community services.
- Patriotism develops the spirit of love for the country and proud to be Malaysians amongst pupils.

6. Creativity and Innovation

- Creativity is the ability to use imagination in gathering, extracting and generating ideas or creating new or original ideas or through inspiration or combination of ideas.
- Innovation is the application of creativity through the modification, improvement and practice of ideas.
- Creativity and innovation are always inter-connected. Therefore, there is a need to ensure that human capital development is able to meet the challenges of the 21st century.
- Elements of creativity and innovation should be integrated in teaching and learning.

7. Entrepreneurship

- The incorporation of entrepreneurship elements aims at developing attributes and entrepreneurial mind-set that will become a culture amongst pupils.
- Entrepreneurial attributes can be ingrained during lessons through fostering attitude such as diligence, honesty, trustworthiness and responsibility as well as

developing creative and innovative mind-set to spur the ideas into the market.

8. Information and Communication Technology (ICT)

- Information and communication technology elements are incorporated in the lessons to ensure pupils are able to apply and strengthen their basic knowledge and skills in ICT.
- The application of ICT in the lesson does not only motivate pupils to be creative but stimulates interesting and fun teaching and learning as well as improve the quality of learning.
- ICT should be integrated in the lessons based on appropriate topics to be taught to further enhance pupils' understanding of the subject content.

ASSESSMENT

Assessment or evaluation is the process of collecting information from various sources such as homework, presentations, project work, tests and so on. Assessment is intended as a yardstick for assessing pupils' achievement in obtaining knowledge, skills and practice as well as assessing the effectiveness of teaching and learning.

Assessment also supports pupils' learning and provide useful feedback to stakeholders such as administrators, teachers, pupils and parents / guardians about pupils' progress. Therefore, it is important for teachers to design assessment instruments which are valid, reliable and authentic. The information gathered through assessments should help teachers identify pupils' strengths and weaknesses in achieving a content standard. The information collected should help teachers adapt teaching and learning based on the needs and weaknesses of their pupils. A thorough assessment should be designed and carried out continuously as part of the activities in the classroom. Efforts taken by teachers in implementing a holistic assessment and help to correct weaknesses in pupils' learning will form a balanced learning ecosystem.

In order to ensure that formative assessment helps to enhance pupils' ability and achievement, teachers must use assessment strategies which have the following characteristics:

1. Taking into account the knowledge and skills learnt by the pupils and assess how far they understand;
2. In various forms, such as observations of the activities carried out, tests, presentations, projects, folios, etc;
3. Designed to enable pupils to exhibit a variety of learning abilities;
4. Fair to all pupils; and
5. Taking into account the various cognitive levels.

All the elements contained in the Mathematics Curriculum Framework which contribute to the formation of which thoughtful learning pupils is assessed either directly or indirectly. Curriculum and Assessment Standards document outlines three elements that must be taken into account in assessing and reporting pupils' achievement with the aim of producing individuals who are thoughtful mathematical learners:

- 1. Assessment of content** is generally assessed on topical basis and should integrate mathematical processes and skills. Topical assessment and integration of processes and skills aim to see how the pupils understand the specific content standards comprehensively and holistically. The curriculum sets out content standards prepared according to specific learning areas. The topics listed are organized in a hierarchy and displaying development in terms of the area of study. Teachers must assess pupils holistically and taking into account the diversity of elements that are emphasized. Topical assessment rubric is positioned at the end of a topic to help teachers.
- 2. Skills and Processes** - Elements of skills and processes that should be displayed and practiced by the pupils are assessed on an ongoing basis through a variety of media such as observation, training, presentation, pupils' oral responses, group work and so on. Achievement report of these elements can be done at mid-year and year-end to see the development of pupils and help them improve their skills. Skills and mathematical processes are part of the content. Thus, skills and mathematical processes are integrated into the statement of achievement either in the form of topical or overall achievement.
- 3. Assessment of values** – Elements of attitudes and values that should be displayed and practiced by pupils are also continuously assessed through a variety of media such as observation, training, presentation, pupils' verbal responses, group work and so on. Achievement report of these elements can be done at mid-year and year-end to see the development of the pupils and help them improve their practices of good values.

Framework of Performance Standard

Assessment is a technique used in the process of learning to determine that the learning objective is achieved. This achievement is recorded in the *MS Excel* template provided (**Diagram 4**). The process of recording pupils' achievement is made based on Performance Level described in the *Dokumen Standard Kurikulum dan Pentaksiran* (DSKP).

Through this template, the reporting process to communicate the learning and achievement of pupils from time to time on their progress and development in terms of knowledge, skills and values as envisaged in the curriculum can be implemented to stakeholders.

BIL	NAMA MURID	NO. SURAT BERANAK	JANTINA (L/P)	PENGETAHUAN MATEMATIK								KEMAHIRAN DAN PROSES					SIKAP & NILAI	TAHAP PENGUSAHAAN KESELURUHAN MATEMATIK TAHUN 1
				T1	T2	T3	T4	T6	T8	T7	T8	PENYELESAIAN MASALAH	PENAAKULAN	KOMUNIKASI	PERKAITAN	PERWAKILAN		
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Figure 4: *MS Excel* Template

Interpretation of Performance Level

Performance level is a table used to indicate certain benchmarks that are arranged hierarchically for the purpose of individual reporting.

Standard is a statement about a domain which refers to certain benchmarks and generics to give a holistic overview about an individual.

Performance standard framework is shown in Table 4.

Table 4: Performance Standard Framework

PERFORMANCE LEVEL	INTERPRETATION
1	Know.
2	Know and understand.
3	Know understand and able to do.
4	Know understand and able to do with good manners.
5	Know understand and able to do with admirable manners.
6	Know understand and able to do with exemplary manners.

Table 5 explains the General Interpretation of Performance Level.

Table 5: General Interpretation Of Performance Level.

PERFORMANCE LEVEL	INTERPRETATION
1	Pupil knows basic matter or able to perform basic skills or respond to basic matter.
2	Pupil shows understanding to convert the form of communication or translate or explain the content learnt.
3	Pupil uses knowledge to apply a skill in a given situation.
4	Pupil applies skill with good manners by following procedures or systematically.
5	Pupil applies skill in a new situation by following procedures or systematically in a consistent and positive way.
6	Pupil able to use knowledge and existing skill in a new situation systematically, positively, creatively and innovatively and can be emulated.

Interpretation of Performance Level for Mathematics

The 3 groups that should be assessed to determine pupils' performance level are as follows:

1. Knowledge

There are 8 topics for Year 1 Mathematics. Each topic has its own description of performance level (Refer DSKP Year 1 Mathematics, page 32 to 57). In General, the description of performance level for mathematical knowledge as a whole is based on Table 6.

Table 6: General Interpretation of Performance Level of Mathematical Knowledge

PERFORMANCE LEVEL	DESCRIPTOR
1	Know basic knowledge of mathematics.
2	Know and understand the basic knowledge of mathematics.
3	Know basic knowledge of mathematics to perform basic operations of mathematics and basic conversion.
4	Know and understand the basic knowledge of mathematics to perform calculation steps in solving daily routine problems.
5	Master and apply knowledge and skills of mathematics in solving daily routine problems using various strategies.
6	Master and apply knowledge and skills of mathematics in solving daily non routine problems creatively and innovatively.

2. Mathematical Skills and Process

There 5 skills and processes that require teachers' consideration to determine the performance level for skill and process are

- Problem Solving;
- Reasoning;
- Communication;
- Connection; and
- Representation.

Table 7: Problem Solving

PERFORMANCE LEVEL	DESCRIPTOR
1	Able to state the steps of problem solving without performing the process.
2	Able to solve routine problems with guidance.
3	Able to solve routine problems involving one step calculation without guidance.
4	Able to solve complex routine problems.
5	Able to solve complex routine problems using various strategies.
6	Able to solve non routine problems creatively and innovatively

Table 8: Reasoning

PERFORMANCE LEVEL	DESCRIPTOR
1	Able to give justification for mathematics activity logically and with guidance.
2	Able to give justification for mathematics activity logically without guidance.
3	Able to show the accurate justification for mathematics activity involving one calculation.
4	Able to show the accurate justification for mathematics activity involving more than one calculation.
5	Able to show the accurate justification for mathematics activity involving routine problem solving.
6	Able to explain the accurate justification for mathematics activity involving non routine problem solving creatively and innovatively.

Table 9: Communication

PERFORMANCE LEVEL	DESCRIPTOR
1	Able to state mathematical idea verbally or in written using mathematical symbol or visual representation.
2	Able to explain mathematical idea verbally or in written using mathematical symbol or visual representation.
3	Able to use correct mathematical language, symbol or visual representation.
4	Able to explain mathematical idea systematically using correct mathematical language, symbol or visual representation.
5	Able to explain mathematical idea systematically using correct mathematical language, symbol or visual representation to solve routine problems.
6	Able to explain mathematical idea systematically using correct mathematical language, symbol or visual representation to solve non routine problems creatively and innovatively.

Table 10: Connection

PERFORMANCE LEVEL	DESCRIPTOR
1	Able to connect skills learnt in other topics and daily life with guidance.
2	Able to connect skills learnt in other topics and daily life without guidance.
3	Able to connect concept and procedure to solve mathematical sentence.
4	Able to connect concept and procedure to solve daily routine problems.
5	Able to connect concept and procedure to solve daily routine problems using various strategies.
6	Able to connect concept and procedure to solve daily non routine problems creatively and innovatively.

Table 11: Representation

PERFORMANCE LEVEL	DESCRIPTOR
1	Able to use representation with guidance.
2	Able to use representation to show mathematical understanding without guidance.
3	Able to explain mathematical concept and procedures using representation.
4	Use representation to solve daily routine problems.
5	Use various representation to solve daily routine problems using various strategies.
6	Use representation to solve daily non routine problems creatively and innovatively.

3. Attitude and Value in Mathematics

Table 12: Attitude and Values

PERFORMANCE LEVEL	DESCRIPTOR
1	Pupils able to state one of the items of attitude and values in mathematics with teacher's guidance.
2	Pupils able to explain one of the items of attitude and values in mathematics by giving reasonable example.
3	Pupils able to show attitude and values in mathematics for a given situation with teacher's guidance.
4	Pupils able to demonstrate attitude and values related to mathematics in various situation.
5	Pupils always practice attitude and values related to mathematics in teaching and learning process.
6	Pupils always practice positive attitude and values related to mathematics in daily life and become mentor and role model to their peers.

Overall Report

The overall report is needed to determine pupils' performance level at the end of school session. This report includes the content, skills and mathematical processes to be emphasized in the curriculum, including higher order thinking skills. Therefore, teachers should assess pupils collectively, overall, holistic, taking into account all pupils' activities on an ongoing basis through a variety of media such as achievement in topical test, observation, training, simulation, pupils verbal responses, group work projects and so on. Therefore, teachers' reliance on their professional wisdom is also required in determining the pupils' final grade. In addition, a variety of tasks that contain elements that are emphasized in this common interpretation has to be developed in the pupils through integrated and cross-learning activities.

Jadual 13: Overall Report

PERFORMANCE LEVEL	DESCRIPTOR
1	<p>Pupil can:</p> <ol style="list-style-type: none"> 1. Recall the basic knowledge of mathematics. 2. Use mathematical process skills to recall the basic knowledge of mathematics with guidance. 3. Show one of the items of attitude and values in mathematics with teacher's guidance.
2	<p>Pupil can:</p> <ol style="list-style-type: none"> 1. Explain basic knowledge of mathematics. 2. Use mathematical process skills to explain basic knowledge of mathematics. 3. Show one of the items of attitude and values in mathematics.
3	<p>Pupils able to:</p> <ol style="list-style-type: none"> 1. Apply basic knowledge of mathematics. 2. Use mathematical process skills to apply basic knowledge of mathematics. 3. Show attitude and values in mathematics for a given situation.

4	<p>Pupils able to:</p> <ol style="list-style-type: none"> 1. Solve routine problems in daily life. 2. Use mathematical process skills to solve routine problems. 3. Demonstrate attitude and values related to mathematics in various situation.
5	<p>Pupils able to:</p> <ol style="list-style-type: none"> 1. Solve complex routine problems using various strategies of problem solving. 2. Use mathematical process skills to solve complex routine problems. 3. Always practice attitude and values related to mathematics in teaching and learning process.
6	<p>Pupils able to:</p> <ol style="list-style-type: none"> 1. Solve non routine problems in daily life. 2. Use mathematical process skills to solve non routine problems 3. Always practice attitude and values related to mathematics in daily life and become mentor and example to other peers.

ORGANISATION OF CONTENT

Primary School Mathematics Curriculum Standard is drafted with the emphasis on Content Standard and Learning Standard that need to be known and can be done by pupils. This standard is presented in modular form, divided into titles based on learning fields. Performance Standard is the level of pupils' learning development measured based on the standard and indicating the position of the pupil in the development or progress of learning.

The content of KSSR Primary School Mathematics is based on learning fields as follow:

Table 14: List of Topics in Primary School Level.

Numbers and Operations	Measurement and Geometry
<ul style="list-style-type: none"> • Whole Numbers • Addition • Subtraction • Multiplication • Division • Mixed Operation • Fraction • Decimal • Percent • Money 	<ul style="list-style-type: none"> • Time • Measurement of Length • Mass • Volume of Liquid • Space
Statistics and Probability	Relationship and Algebra
<ul style="list-style-type: none"> • Data Handling • Probability 	<ul style="list-style-type: none"> • Coordinate • Ratio and Proportion
	Discrete Mathematics
	Not at primary level.

Primary School Mathematics Curriculum Standard focuses on the mastery of knowledge, skills and values that correspond to the pupils' abilities based on Content Standard, Learning Standard and Performance Standard arranged in three columns side by side as shown in **Table 15**.

Table 15: Organisation of DSKP

Content Standard	Learning Standard	Performance Standard
Specific statements about what pupils should know and can do in a period of schooling that comprise knowledge, skills and values.	A designation of criteria or indicators of the quality of learning and achievement that can be measured for each content standard.	A set of common criteria which shows the levels of achievement that should be exhibited by pupils as a sign that the matter has been mastered (indicator of success).

Learning Standard does not show the steps of teaching and learning. It aims to provide a space and opportunity for teachers to use creativity in providing a conducive learning environment for pupils to form concepts and develop skills, attitudes and values in mathematics.

Notes

There is also a note column that gives details of:

- Limitations and scope of the Content Standard and Learning Standard
- The recommendation of teaching and learning activities
- Information and related notes for supporting teachers' understanding of mathematics.

LEARNING AREA:

NUMBERS AND OPERATIONS

TOPIC:

1.0 WHOLE NUMBERS UP TO 100

Objectives:

Enable pupils to:

- Know, understand and apply whole numbers up to 100.
- Give mathematical reasoning, connection, representation, communication and use technology in learning whole numbers up to 100.

NUMBERS AND OPERATIONS

1.0 WHOLE NUMBERS UP TO 100

CONTENT STANDARD	LEARNING STANDARD	NOTES
1.1 Quantity intuitively.	1.1.1 State the quantity by comparing.	<p>“many or few”, “equal or not equal” and “more or less” by:</p> <ul style="list-style-type: none"> • groups of objects, • one-to-one matching, • patterns.
1.2 Number value.	<p>1.2.1 Name the numbers up to 100:</p> <p>(i) count objects in groups.</p> <p>(ii) name the number for a group of objects to represent its quantity.</p> <p>(iii) compare quantity of two groups of objects.</p> <p>1.2.2 Determine the number values up to 100:</p> <p>(i) show the quantity of the given number.</p> <p>(ii) match group of objects with its number.</p> <p>(iii) compare the value of two numbers.</p> <p>(iv) arrange group of objects in ascending and descending order.</p>	<p>Zero is introduced after introducing one digit numbers. Numbers 11 to 19 are introduced as '10 and 1' up to '10 and 9'.</p> <p>Determine the group which is one until nine more than or less than.</p> <p>Use real objects, pictures, number lines and abacus 4:1.</p> <p>State the relationship “more than” and “less than”.</p> <p>Any number placed in between, before and after.</p>
1.3 Write numbers.	1.3.1 Write numbers in numerals and words.	Train pupils to write numbers in numerals and words correctly.

NUMBERS AND OPERATIONS

1.0 WHOLE NUMBERS UP TO 100

CONTENT STANDARD	LEARNING STANDARD	NOTES
1.4 Combination of numbers.	1.4.1 State combinations of one digit numbers.	8 is '7 and 1', '6 and 2', '5 and 3', '4 and 4'. Combination involving two numbers.
1.5 Number sequence.	1.5.1 Count numbers. 1.5.2 Complete any number sequence.	Count in ones, twos, fives, tens and fours in ascending and descending order by using various objects, pictures and number lines.
1.6 Place value.	1.6.1 State the place value and digit value of any number.	Use various representations of place value and abacus 4:1 to state the place value and the digit value.
1.7 Estimate.	1.7.1 Give reasonable estimation for the quantity of objects.	Estimation is made by stating the quantity based on a reference set and using "approximate", "less than" and "more than".
1.8 Round off numbers.	1.8.1 Round off whole numbers to the nearest ten.	Round off can be done by using a number line.
1.9 Number patterns.	1.9.1 Identify pattern for a given number series. 1.9.2 Complete various simple number patterns.	
1.10 Problem solving.	1.10.1 Solve problems involving daily situations.	

NUMBERS AND OPERATIONS

1.0 WHOLE NUMBERS UP TO 100

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	State any number up to 100.
2	Determine the number values and arrange numbers in order.
3	Estimate and round off any number. Complete number sequence and number pattern.
4	Solve daily routine problems involving any number.
5	Solve daily routine problems involving any number using various strategies.
6	Solve daily non-routine problems involving any number creatively and innovatively.

LEARNING AREA:
NUMBERS AND OPERATIONS

TOPIC:
2.0 BASIC OPERATIONS

Objectives:

Enable pupils to:

- Understand and apply concepts and procedural skills in addition and subtraction.
- Use mathematical knowledge and skills to solve problems.
- Give mathematical reasoning, connection, representation, communication and use technology in learning basic operations.
- Use mathematical terms correctly when doing addition and subtraction processes.

NUMBERS AND OPERATIONS

2.0 BASIC OPERATIONS

CONTENT STANDARD	LEARNING STANDARD	NOTES
2.1 Concepts of addition and subtraction.	2.1.1 Use and vary the relevant vocabulary in context of addition and subtraction. 2.1.2 Introduce the symbol of addition, subtraction and 'equal to'. 2.1.3 Use the symbol of addition, subtraction and 'equal to', to write number sentence based on the given situation.	Create situation that show addition, subtraction and 'equal to'. Say the total of two numbers such as '6 and 3' is 9, '1 and 4' is 5.
2.2 Add within 100.	2.2.1 Add in the range of basic facts. 2.2.2 Add two numbers with the sum within 100.	State spontaneously basic facts in addition. Use various strategies to construct and state basic facts in addition. Use objects, pictures, number lines, abacus 4:1 and mental calculation to represent calculation in addition.
2.3 Subtract within 100.	2.3.1 Subtract in the range of basic facts. 2.3.2 Subtract two numbers within 100.	State spontaneously basic facts in subtraction. Use various strategies to construct and state basic facts in subtraction. Use objects, pictures, number lines, abacus 4:1 and mental calculation to represent calculation in subtraction.

NUMBERS AND OPERATIONS

2.0 BASIC OPERATIONS

CONTENT STANDARD	LEARNING STANDARD	NOTES
2.4 Problem solving. 2.5 Repeated addition. 2.6 Repeated subtraction.	2.4.1 Create stories involving addition and subtraction within 100. 2.4.2 Solve problems involving addition and subtraction in daily life situations.	Problem-solving skill involves the following steps: <ul style="list-style-type: none"> • Understand and interpret the problem. • Plan a solving strategy. • Carry out the strategy. • Look back. Use simulations or situation model.
	2.5.1 Write number sentence of repeated addition in twos, fives, tens and fours.	Use objects, pictures and number lines. Understand repeated addition as concept of multiplication.
	2.6.1 Write number sentence of repeated subtraction in twos, fives, tens and fours.	Use objects, pictures and number lines. Understand repeated subtraction as concept of division.

NUMBERS AND OPERATIONS

2.0 BASIC OPERATIONS

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	State the vocabulary and symbols in context of addition, subtraction and 'equal to'.
2	State spontaneously basic facts in addition and subtraction.
3	Add and subtract up to two numbers within 100, write number sentence of repeated addition and repeated subtraction and justify the answers.
4	Solve daily routine problems involving addition and subtraction of two numbers.
5	Solve daily routine problems involving addition and subtraction of two numbers using various strategies.
6	Solve daily non-routine problems involving addition and subtraction of two numbers creatively and innovatively.

LEARNING AREA:

NUMBERS AND OPERATIONS

TOPIC:

3.0 FRACTIONS

Objectives:

Enable pupils to:

- Use representation, give mathematical reasoning and explore in understanding the concept of fractions.
- Relate fractions in real life situation.

NUMBERS AND OPERATIONS

3.0 FRACTIONS

CONTENT STANDARD	LEARNING STANDARD	NOTES
<p>3.1 Concept of one over two and one over four in proper fractions.</p> <p>3.2 Problem solving.</p>	<p>3.1.1 Identify one over two, one over four, two over four and three over four.</p> <p>3.2.1 Solve problems involving daily life situations.</p>	<p>Understand fraction as equal parts and define one over two and one over four of one whole object. Use vocabulary of 'half', 'quarter' and 'three quarters' by using objects, folded papers and pictures.</p> <p>Forming one over four with multiple variations should be emphasized.</p>

NUMBERS AND OPERATIONS**3.0 FRACTIONS**

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	State one over two, one over four, two over four and three over four.
2	Shade one over two, one over four, two over four and three over four.
3	Form one over two, one over four, two over four and three over four using objects and folded papers.
4	Solve daily routine problems involving fractions.
5	Solve daily routine problems involving fractions using various strategies.
6	Solve daily non-routine problems involving fractions creatively and innovatively.

LEARNING AREA:

NUMBERS AND OPERATIONS

TOPIC:

4.0 MONEY

Objectives:

Enable pupils to:

- Relate the usage of money in daily life.
- Think, give mathematical reasoning and make exploration in daily life for the benefit of the future.
- Communicate, make connection and solve problems involving finance.
- Apply financial education in real life situation.
- Instill entrepreneurship.

NUMBERS AND OPERATIONS

4.0 MONEY

CONTENT STANDARD	LEARNING STANDARD	NOTES
4.1 Notes and coins.	4.1.1 Identify coins and notes of Malaysian currency.	Use current money in real life situation.
	4.1.2 Represent the value of money in: (i) Sen up to RM1. (ii) Ringgit up to RM10.	Represent value of money using abacus 4:1.
	4.1.3 Convert money in: (i) Coins up to RM1. (ii) Notes up to RM10.	Use combination of money in the form of notes and coins.
4.2 Financial resources and savings.	4.2.1 Identify financial resources and savings. 4.2.2 Record savings and expenses from the financial resources.	Use suitable situations.
4.3 Problem solving.	4.3.1 Solve daily life problems involving addition and subtraction of money.	Before solving daily life problem, mechanical solving process can be done to explain addition and subtraction involving: (a) Sen up to RM1. (b) Ringgit up to RM10. Addition and subtraction involving money using abacus 4:1.

NUMBERS AND OPERATIONS**4.0 MONEY**

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	State: <ul style="list-style-type: none">• Malaysian currency in coins and notes.• Financial resources and savings.
2	Solve number sentence involving money.
3	Justify the answer for the solution of number sentences involving money. Record savings and expenses from the financial resources.
4	Solve daily routine problems involving money.
5	Solve daily routine problems involving money using various strategies.
6	Solve daily non-routine problems involving money creatively and innovatively.

LEARNING AREA:

MEASUREMENT AND GEOMETRY

TOPIC:

5.0 TIME

Objectives:

Enable pupils to:

- Communicate, generate ideas and convey a situation clearly.
- Think, give mathematical reasoning, do connection and representation, use technological skills to solve the problems.

MEASUREMENT AND GEOMETRY**5.0 TIME**

CONTENT STANDARD	LEARNING STANDARD	NOTES
<p>5.1 Days and months.</p> <p>5.2 Clock face.</p> <p>5.3 Problem solving.</p>	<p>5.1.1 State time in a day.</p> <p>5.1.2 State the sequence of events in a day.</p> <p>5.1.3 Name the days of a week.</p> <p>5.1.4 Name the months of a year.</p> <p>5.2.1 Identify the clock hands on the clock face.</p> <p>5.2.2 Identify and state "half", "quarter" and "three quarters" based on the clock face.</p> <p>5.2.3 Say and write time in hour, half an hour and a quarter hour using an analogue clock.</p> <p>5.3.1 Solve problems involving daily life situations.</p>	<p>Real life situation.</p> <p>Use vocabulary to indicate a specific day: "tomorrow", "today", "yesterday" and others.</p>

MEASUREMENT AND GEOMETRY**5.0 TIME**

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	State time and sequence of events in a day.
2	Name the days of a week and the months of a year.
3	Say and write time in hours and fractions of an hour.
4	Solve daily life routine problems involving time.
5	Solve daily routine problems involving time using various strategies.
6	Solve daily non-routine problems involving time creatively and innovatively.

LEARNING AREA:

MEASUREMENT AND GEOMETRY

TOPIC:

6.0 MEASUREMENT

Objectives:

Enable pupils to:

- Think, give mathematical reasoning, communicate and explore mathematically in real life situations.
- Use various concrete materials to build the understanding of the concept and apply mathematical knowledge in real life situations.

MEASUREMENT AND GEOMETRY

6.0 MEASUREMENT

CONTENT STANDARD	LEARNING STANDARD	NOTES
<p>6.1 Relative units to measure length, mass and volume of liquids.</p> <p>6.2 Problem solving.</p>	<p>6.1.1 Use and vary the vocabulary in the context of length, mass and volume of liquid..</p> <p>6.1.2 Measure length and mass of objects, and volume of liquid using non-standard units.</p> <p>6.1.3 Compare the length, mass, and volume of liquid of two or more objects using non-standard units.</p> <p>6.2.1 Solve problems involving daily life situations.</p>	<p>Use objects and pictures to measure and compare.</p>

MEASUREMENT AND GEOMETRY

6.0 MEASUREMENT

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	State the vocabulary in context of length, mass and volume of liquid.
2	Measure length, mass and volume of liquid..
3	Compare the length, mass and volume of liquid of two or more objects and justify the answer.
4	Solve daily routine problems involving measurement.
5	Solve daily routine problems involving measurement using various strategies.
6	Solve daily non-routine problems involving measurement creatively and innovatively.

LEARNING AREA:

MEASUREMENT AND GEOMETRY

TOPIC:

7.0 SPACE

Objectives:

Enable pupils to:

- Give mathematical reasoning, communicate, connect, represent, think and use technological skills to solve the problems.
- Understand and apply mathematical concepts and skills.
- Appreciate and admire the beauty of mathematics in various forms generated by two-dimensional and three-dimensional shapes.

MEASUREMENT AND GEOMETRY

7.0 SPACE

CONTENT STANDARD	LEARNING STANDARD	NOTES
7.1 Three-dimensional shapes.	7.1.1 Name the shape of cuboid, cube, cone, square-based pyramid, cylinder and sphere.	Use objects to understand three-dimensional shapes. Arrange three-dimensional shapes to create certain shapes such as robot, ship, house.
	7.1.2 Describe face, edge and vertex of three-dimensional shapes.	
	7.1.3 Arrange objects according to the pattern.	
	7.1.4 Create new models using combinations of three-dimensional shapes.	
7.2 Two-dimensional shapes.	7.2.1 Name the shape of square, rectangle, triangle and circle.	Arrange, paste and colour shapes to create patterns.
	7.2.2 Describe straight line, side, corner and curved line of two-dimensional shapes.	
	7.2.3 Arrange two-dimensional shapes according to the pattern.	
	7.2.4 Create pattern based on two-dimensional shapes.	
7.3 Problem solving.	7.3.1 Solve problems involving daily situations.	

MEASUREMENT AND GEOMETRY

7.0 SPACE

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	Name three-dimensional and two-dimensional shapes.
2	State the characteristic of three-dimensional and two-dimensional shapes, and arrange objects and shapes according to the pattern.
3	Create new model from the combination of three-dimensional shapes and pattern based on two-dimensional shapes, and justify the answers.
4	Solve daily routine problems involving space.
5	Solve daily routine problems involving space using various strategies.
6	Solve daily non-routine problems involving space creatively and innovatively.

LEARNING AREA:

STATISTICS AND PROBABILITY

TOPIC:

8.0 DATA MANAGEMENT

Objectives:

Enable pupils to:

- Communicate to explain the situation encountered in real life.
- Think, give mathematical reasoning, make decisions and deliver ideas.
- Use technology to build an understanding of mathematical concepts and apply the mathematical knowledge.

STATISTICS AND PROBABILITY**8.0 DATA MANAGEMENT**

CONTENT STANDARD	LEARNING STANDARD	NOTES
8.1 Collect, classify and arrange data.	8.1.1 Collect data based on real life situation.	Use tally in collecting simple data.
8.2 Pictograph.	8.2.1 Read and obtain information from a pictograph.	Indicator shows one unit of picture represents one value.
8.3 Problem solving.	8.3.1 Solve problems involving daily situation.	

STATISTICS AND PROBABILITY

8.0 DATA MANAGEMENT

PERFORMANCE STANDARD	
PERFORMANCE LEVEL	DESCRIPTOR
1	Name the pictograph.
2	Collect data based on daily situation.
3	Read and obtain information from pictograph.
4	Solve daily routine problems involving data management.
5	Solve daily routine problems involving data management using various strategies.
6	Solve daily non-routine problems involving data management creatively and innovatively.

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This curriculum document is published in Bahasa Melayu and English language. If there is any conflict or inconsistency between the Bahasa Melayu version and the English version, the Bahasa Melayu version shall, to the extent of the conflict or inconsistency, prevail.

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