

Primary School Curriculum

Mathematics (MT)



MINISTRY OF EDUCATION

Bermuda
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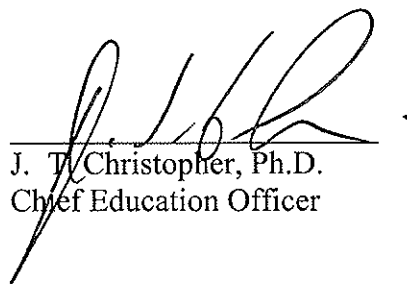
FOREWORD

Quality curriculum is basic to any educational programme. The written curriculum must provide the structure and substance of what is taught to all students. The written curriculum is a guide to teachers to ensure that the knowledge, skills, competencies and resources students need in order to learn are provided during instruction.

In particular, it is acknowledged that knowledge is virtually infinite in that it is continually changing and expanding as “new” knowledge is developed and “old” knowledge is refined. In addition the skills and competencies that students need change as the environment in the total community changes. It is important therefore that a school system has a structure for the instructional programme that provides direction, focus, flexibility and state-of-the-art thinking about each content area.

Because of its strategic geographical position, Bermuda has been influenced continuously by the changes in the relationship between the continents bordering the Atlantic -- North and South America, Africa and Europe. The current interest in the globalization of the world community allows Bermuda to build on its strength in international relations. It is essential that our students become accustomed to viewing the entire world as the area in which they must live and grow. They must integrate knowledge across all subjects in preparation for their adult life. Our curriculum guides must be viewed from this perspective.

A team of teachers, education officers and other persons within the school system and community, drawing from their collective experience in working with young people, has developed this curriculum guide. Input from community representatives on each Curriculum Advisory Committee has assisted us in Bermudianizing the curriculum. All of the contributors share both the pride and the responsibilities of authorship. This guide represents the essential elements of education in Bermuda’s primary schools.



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OVERVIEW

The aim of the primary school is to provide for the academic achievement, personal development and group citizenship of early adolescents. In keeping with this aim, the organizational patterns appropriate to the developmental needs of five to twelve year-old students need to be provided.

The curriculum is composed of a common body of knowledge with emphasis placed on mastery skills and achievement measured according to each student's abilities. The development of positive attitudes toward learning, self and others is a basic component of Bermuda's primary school programme. The programme is based on the belief that all students make every effort to succeed when in an environment that fosters and encourages success, regardless of their background or previous level of achievement. Educational development at the primary level should provide adequate preparation for continued experiences. To create an atmosphere of accomplishment in which each student has opportunities for growth, emphasis is placed on:

- opportunities for sharing enriching experiences, creative expressions and exposure to ideas
- enhancement of personal abilities with opportunities to pursue and express them through diversity and supportive activities
- development of a growing sense of responsibility, integrity, self-discipline, reliable judgement and self-respect in each student
- encouragement of acceptance of their roles and responsibilities in the educational process with confidence, enthusiasm and appropriate social and academic behaviours
- provisions of time and opportunity for ethical growth and for the development of responsible values and character

The curriculum guide contains three (3) sections beginning with the Introduction. The cited twelve goals of education direct instructional outcomes in all primary school subjects. Specifically, a curriculum framework has been approved for each subject and is to be used as the basis for the subject specific philosophy, goals and subgoals, performance indicators and scope and sequence. Effective utilization of this framework will establish continuity and progression of instruction throughout all year levels.

The second section of this guide delineates the primary school programme of instruction and contains an overview for Phase A and B that includes: primary rationale, year level requirements, adopted materials of instruction, phase outline, correlation matrix and modules. It is expected that all teachers will focus instruction on the established curriculum objectives outlined in the modules. The final section of this guide contains resources of valuable support for teachers.

GOALS OF EDUCATION

In Bermuda, the Goals of Education provide the direction for primary level education. These twelve (12) goals enable primary level students to:

- develop responsiveness to the dynamic process of learning
- develop resourcefulness, adaptability and creativity in learning and living
- acquire the basic knowledge and skills needed to comprehend and express ideas through words, numbers and other symbols
- develop a wellness approach to life
- gain satisfaction from participating in and appreciating the various forms of artistic expression
- develop a feeling of self-worth
- develop values related to personal and ethical beliefs and to the common welfare of society
- develop an understanding of the role of the individual within a family unit, the role of the family within society and the role of our society in a global context
- develop a sense of personal responsibility in society at the national and international levels
- acquire skills that contribute to self-reliance in solving practical problems in everyday life
- acquire skills and attitudes that will lead to satisfaction and productivity in a career
- develop respect for the environment and a commitment to the wise use of resources.

CURRICULUM AND INSTRUCTION FOR ALL STUDENTS

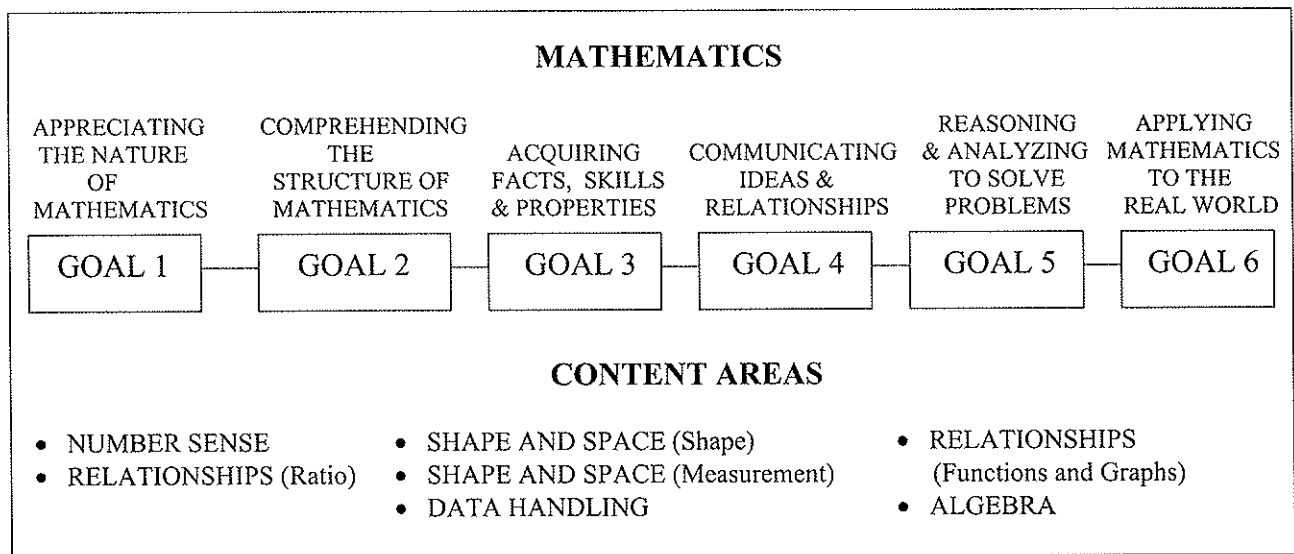
All primary schools will have common programmes designed to offer nine subjects to all students and to give them a knowledge base which will equip them with a foundation that will prepare them to move to the middle school level. There will be a basic core curriculum that will include English language arts, mathematics, science and social studies. These subjects will be supported by a variety of encore subjects, such as health education, physical education, information technology, music and visual arts. Information technology will also be integrated into all subject areas. An integrated curriculum is a meaningful approach to primary instruction that assists students to transfer knowledge within and across all subjects and apply skills and processes developed in subjects to real life Bermuda issues.

It is expected that the implemented curriculum will be based on the premise that all students can learn and that instruction should be differentiated to meet the unique needs of the learner. Further, it is expected that the primary school curriculum will be implemented from a Bermudianized and multicultural perspective as much as is feasible.

MATHEMATICS PHILOSOPHY

Mathematics is an interrelated body of knowledge consisting of patterns, multiple representations and abstract concepts. It is a sequential discipline that builds on accumulated knowledge. Therefore, the mathematics curriculum is designed to foster meaningful classroom communication, explore important mathematical concepts, develop rich environments for teaching and learning, and promote technology as an educational tool.

Through the use of developmentally appropriate tasks, manipulatives and real world issues, the students will be empowered to transition from concrete experiences to the development of abstract mathematical ideas. They will be encouraged to construct their own meaning of mathematical ideas, to apply effective problem-solving processes and to appreciate the importance of mathematics in their world and the global society in which we live.



**MATHEMATICS
GOALS AND SUBGOALS**

GOAL 1 **APPRECIATING THE NATURE OF MATHEMATICS**

STUDENTS WILL APPRECIATE THE NATURE OF MATHEMATICS.

- Subgoal 1.1** Apply mathematics as an interrelated body of knowledge.
- Subgoal 1.2** Display confidence through successful experiences in mathematics.
- Subgoal 1.3** Appraise the significance of mathematics in history, culture and our changing society.

GOAL 2 **COMPREHENDING THE STRUCTURE OF MATHEMATICS**

STUDENTS WILL COMPREHEND THE STRUCTURE OF MATHEMATICS.

- Subgoal 2.1** Analyze the structure of the real number system.
- Subgoal 2.2** Appreciate the similarity of number systems.
- Subgoal 2.3** Evaluate concepts, processes and patterns.
- Subgoal 2.4** Analyze mathematical theorems.
- Subgoal 2.5** Interpret the logic and purpose of algebraic procedures.

GOAL 3 **ACQUIRING FACTS, SKILLS AND PROPERTIES**

STUDENTS WILL ACQUIRE MATHEMATICAL FACTS, SKILLS, CONCEPTS AND PROPERTIES.

- Subgoal 3.1** Evaluate applications of numbers and number theory concepts in mathematical and real world situations.
- Subgoal 3.2** Evaluate a mathematical solution by using estimation.
- Subgoal 3.3** Evaluate mathematical representations numerically, algebraically and geometrically.
- Subgoal 3.4** Evaluate data appropriately.

Subgoal 3.5 Evaluate the application of geometric and measurement properties to real world situations.

Subgoal 3.6 Apply algebraic procedures to solve a variety of problems.

Subgoal 3.7 Evaluate the interrelationships among mathematics, media and technology.

GOAL 4 **COMMUNICATING IDEAS AND RELATIONSHIPS**

STUDENTS WILL COMMUNICATE MATHEMATICAL IDEAS AND RELATIONSHIPS.

Subgoal 4.1 Justify their mathematical ideas and relationships.

Subgoal 4.2 Evaluate the use of mathematical symbols, formulas and terminology.

Subgoal 4.3 Reorganize mathematical ideas in oral and written form.

Subgoal 4.4 Communicate algebraical generalizations discovered through investigations.

Subgoal 4.5 Value the role of symbolic notations in mathematics.

Subgoal 4.6 Demonstrate skillful use of manipulatives and technology.

Subgoal 4.7 Evaluate the use of appropriate manipulatives and technology to display mathematical ideas and relationships.

GOAL 5 **REASONING AND ANALYSING TO SOLVE PROBLEMS**

STUDENTS WILL REASON AND ANALYZE MATHEMATICALLY TO SOLVE PROBLEMS AND MAKE DECISIONS.

Subgoal 5.1 Display confidence in solving problems independently.

Subgoal 5.2 Evaluate information to reason, solve problems and generalize.

Subgoal 5.3 Confidently use manipulatives and technology in problem solving.

Subgoal 5.4 Apply skillful mathematical thinking and modelling to problems that arise in mathematics and other disciplines.

Subgoal 5.5 Evaluate solutions for reasonableness and accuracy.

Subgoal 5.6 Evaluate applications of mathematical modelling processes to real world problems.

GOAL 6 **APPLYING MATHEMATICS TO THE REAL WORLD**

**STUDENTS WILL APPLY MATHEMATICS IN PERSONAL,
CAREER AND SOCIETAL SETTINGS.**

Subgoal 6.1 Adapt the use of mathematical processes and problem solving strategies.

Subgoal 6.2 Design a new application of mathematical tools and techniques.

Subgoal 6.3 Use mathematics to solve real world issues.

Subgoal 6.4 Justify the application of mathematical ideas as a lifelong process.

GOAL 1	Students will appreciate the nature of mathematics.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
1.1 Apply mathematics as an interrelated body of knowledge.	recognize mathematical ideas	use mathematical ideas to understand higher level mathematics	apply mathematical ideas, not isolated facts to solve everyday problems	apply mathematics as an interrelated body of knowledge
1.2 Display confidence through successful experiences in mathematics.	demonstrate awareness of the importance of successful experiences in mathematics	appreciate successful experiences in mathematics	appreciate the need for successful experiences in mathematics	display confidence through successful experiences in mathematics
1.3 Appraise the significance of mathematics in history, culture and our changing society.	accept the role of mathematics in history, culture and our changing society	explain the role of mathematics in history, culture and our changing society	value the significance of mathematics in history, culture and our changing society	appraise the significance of mathematics in history, culture and our changing society

GOAL 2	Students will comprehend the structure of mathematics.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
2.1 Analyze the structure of the real number system.	identify the structure of a number system	recognize the structure of a number system	compare and contrast the structure of the real number system	analyze the structure of the real number system
2.2 Appreciate the similarity of number systems.	display awareness of number systems	enjoy working with number systems	initiate working with number systems	appreciate the similarity of number systems
2.3 Evaluate concepts, processes and patterns.	create a variety of patterns	extend the creation of a variety of patterns	analyze a variety of patterns	evaluate concepts, processes and patterns
2.4 Analyze mathematical theorems.	describe mathematical relationships	apply mathematical relationships to new situations	formulate mathematical theorems	analyze mathematical theorems
2.5 Interpret the logic and purpose of algebraic procedures.	N/A	identify algebraic procedures	apply algebraic procedures	interpret the logic and purpose of algebraic procedures

GOAL 3	Students will acquire mathematical facts, skills, concepts and properties.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
3.1 Evaluate applications of numbers and number theory concepts in mathematical and real world situations.	develop number sense through everyday experiences	recognize relationships among counting, grouping, place value and number systems concepts	apply numbers and number theory concepts in mathematical and real world situations	evaluate applications of numbers and number theory concepts in mathematical and real world situations
3.2 Evaluate a mathematical solution by using estimation.	apply guess and check techniques	apply strategies for rounding and sampling	formulate a mathematical solution by using estimation	evaluate a mathematical solution by using estimation
3.3 Evaluate mathematical representations numerically, algebraically and geometrically.	identify simple patterns and relationships	create mathematical relationships numerically and geometrically	illustrate mathematical representations numerically, algebraically and geometrically	evaluate mathematical representations numerically, algebraically and geometrically
3.4 Evaluate data appropriately.	represent simple data	apply data appropriately	analyze data appropriately	evaluate data appropriately

GOAL 3 Cont'd.	Students will acquire mathematical facts, skills, concepts and properties.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
3.5 Evaluate the application of geometric and measurement properties to real world situations.	classify shapes	develop spatial sense and relate geometric ideas to number and measurement	apply geometric and measurement properties to real world situations	evaluate the application of geometric and measurement properties to real world situations
3.6 Apply algebraic procedures to solve a variety of problems.	N/A	identify the concept of a variable	apply the concepts of variables, expressions and equations	apply algebraic procedures to solve a variety of problems
3.7 Evaluate the interrelationships among mathematics, media and technology.	identify how to use media and technology to explore mathematics	recognize applications of media and technology in exploring mathematics	analyze the interrelationships among mathematics, media and technology	evaluate the interrelationships among mathematics, media and technology

GOAL 4		Students will communicate mathematical ideas and relationships.			
MATHEMATICS		PERFORMANCE INDICATORS			
Sub Goals		PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
4.1	Justify their mathematical ideas and relationships.	describe mathematical ideas and relationships	illustrate mathematical ideas and relationships	justify their mathematical ideas and relationships	justify their mathematical ideas and relationships
4.2	Evaluate the use of mathematical symbols, formulas and terminology.	match symbols with concepts	apply mathematical symbols, formulas and terminology	analyze the use of mathematical symbols, formulas and terminology	evaluate the use of mathematical symbols, formulas and terminology
4.3	Reorganize mathematical ideas in oral and written form.	describe mathematical ideas in oral and written form	explain mathematical ideas in oral and written form	construct mathematical ideas in oral and written form	reorganize mathematical ideas in oral and written form
4.4	Communicate algebraical generalizations discovered through investigations.	N/A	formulate definitions to express generalizations discovered through investigations	express algebraically, generalizations discovered through investigations	communicate algebraical generalizations discovered through investigations

GOAL 4 Cont'd.	Students will communicate mathematical ideas and relationships.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
4.5 Value the role of symbolic notations in mathematics.	display interest in the role of symbolic notation in mathematics	enhance awareness of the role of symbolic notation in mathematics	appreciate the role of symbolic notation in mathematics	value the role of symbolic notations in mathematics
4.6 Demonstrate skillful use of manipulatives and technology.	use manipulatives and technology as demonstrated	display appropriate use of manipulatives and technology	demonstrate skillful use of manipulatives and technology	demonstrate skillful use of manipulatives and technology
4.7 Evaluate the use of appropriate manipulatives and technology to display mathematical ideas and relationships.	use manipulatives to display mathematical ideas and relationships	use appropriate manipulatives and technology to display mathematical ideas and relationships	use appropriate manipulatives and technology to display mathematical ideas and relationships	evaluate the use of appropriate manipulatives and technology to display mathematical ideas and relationships

GOAL 5	Students will reason and analyze mathematically to solve problems and make decisions.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
5.1 Display confidence in solving problems independently.	solve problems with increasing confidence	demonstrate a problem solving attitude	demonstrate self-reliance when solving problems independently	display confidence in solving problems independently
5.2 Evaluate information to reason, solve problems and generalize.	demonstrate reasoning skills	organize information and identify problem solving strategies	apply deductive and inductive reasoning skills to evaluate information	evaluate information to reason, solve problems and generalize
5.3 Confidently use manipulatives and technology in problem solving.	use manipulatives to assist in problem solving	select appropriate manipulatives and technology to assist in problem solving	confidently use manipulatives and technology to solve problems	confidently use manipulatives and technology in problem solving

GOAL 5 Cont'd.	Students will reason and analyze mathematically to solve problems and make decisions.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
5.4 Apply skillful mathematical thinking and modelling to problems that arise in mathematics and other disciplines.	use mathematical thinking to solve simple problems	demonstrate basic mathematical thinking and modelling when solving problems that arise in mathematics and other disciplines	apply mathematical thinking and modelling to problems that arise in mathematics and other disciplines	apply skillful mathematical thinking and modelling to problems that arise in mathematics and other disciplines
5.5 Evaluate solutions for reasonableness and accuracy.	describe how to verify results with respect to the original problems	recognize the reasonableness and accuracy of a solution	analyze solutions for reasonableness and accuracy	evaluate solutions for reasonableness and accuracy
5.6 Evaluate applications of mathematical modelling processes to real world problems.	N/A	apply mathematical modelling processes to real world problems	analyze applications of mathematical modelling processes to real world problems	evaluate applications of mathematical modelling processes to real world problems

GOAL 6	Students will apply mathematics in personal, career and societal settings.			
MATHEMATICS	PERFORMANCE INDICATORS			
Sub Goals	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
6.1 Adapt the use of mathematical processes and problem solving strategies.	describe mathematical processes and problem solving strategies	apply mathematical processes and problem solving strategies	display the use of mathematical processes and problem solving strategies	adapt the use of mathematical processes and problem solving strategies
6.2 Design a new application of mathematical tools and techniques.	use mathematical tools	demonstrate simple applications of mathematical tools and techniques	demonstrate skillful applications of mathematical tools and techniques	design a new application of mathematical tools and techniques
6.3 Use mathematics to solve real world issues.	create simple mathematical problems from real life situations	create complex problems from real life situations	use problem solving strategies to examine real world issues	use mathematics to solve real world issues
6.4 Justify the application of mathematical ideas as a lifelong process.	N/A	explain the application of mathematical ideas as a lifelong process	illustrate the application of mathematical ideas as a lifelong process	justify the application of mathematical ideas as a lifelong process

NUMBER SENSE	MATHEMATICS SCOPE AND SEQUENCE			
	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
Number Sense	• whole number • magnitude • place value • order • fractions	• whole number • fractions • decimals • place value • order • comparison • classification	• whole number • fractions • decimals • place value • order • comparison • classification	• advanced applications
Symbolic Representation	• addition • subtraction • equality	• addition • subtraction • multiplication • division • comparison	• scientific notation • square roots • exponents	• advanced applications
Estimation	• quantity	• quantity • approximate value • basic operations	• approximate value • basic operations • reasonableness of results	• approximate value • basic operations • reasonableness of results
Computation	• whole number • addition • subtraction	• whole number • fractions • decimals • addition • multiplication • division	• all basic operations • whole numbers • fractions • decimals • percent • order of operations • expanded notation • proportion	• advanced application

RELATIONSHIPS (RATIO)	MATHEMATICS SCOPE AND SEQUENCE			
	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
Rate	N/A	unit	- rate of exchange - speed/distance/time	- application - speed/distance/time
Ratio/Proportion	N/A	- comparison - notation	- unknown quantities - applications (direct and inverse proportions) - equivalent calculation - scales	algebraic variations

SHAPE AND SPACE (SHAPE)	MATHEMATICS SCOPE AND SEQUENCE			
	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
Perimeter	• measurement (non-standard)	• measurement • concept • estimation • computation • applications	• formulas • applications	• formulas • applications
Area	• measurement (non-standard)	• concept • measurement • estimation • applications	• formulas • applications	• formulas • applications
Volume	• measurement (non-standard)	• concept • measurement • estimation • applications	• formulas • applications	• formulas • applications
Shapes	• spatial sense • plane/solid symmetry • congruence • corners	• spatial sense • plane/solid symmetry • congruence • angles • classification • nets	• spatial sense • plane/solid symmetry • similarity • transformations	• spatial sense • plane/solid symmetry • similarity • transformations • vectors • trigonometry • ratios • identities • 2 and 3 dimensions

SHAPE AND SPACE (MEASUREMENT)	MATHEMATICS SCOPE AND SEQUENCE			
	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
Length, Mass and Capacity	• estimation • comparison • measurement (non-standard)	• estimation • comparison • measurement • metric and customary	• estimation & conversion within and between systems	• applications
Time	• gross divisions • time sequence • estimation • calendar	• calendar • standard and digital clocks • elapsed time • conversion of units • timetables	• unit conversion • estimation • elapsed time • time zones	• applications
Money	• identification and comparison of coins	• identification and comparison of coins • computation	• computation	• applications
Temperature	• thermometer • temperature words	• measurement • estimation	• Celsius and Fahrenheit (comparison)	• applications

DATA HANDLING	MATHEMATICS SCOPE AND SEQUENCE			
	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
Probability	• predictions	• predictions • experiments	• predictions • experiments	• applications • experiments
Statistics	• tally charts	• central tendency	• central tendency • data analysis	• sampling and simulation • inferences
Graphs	• pictographs • bar charts	• bar charts • line • circle • coordinate	• bar charts • line • circle • coordinate • stem and leaf • box and whisker • scattergrams	• all graphs
Tables	N/A	• analysis	• analysis • spreadsheets • matrices • set theory	• analysis • spreadsheets • matrices • set theory

RELATIONSHIPS (FUNCTIONS AND GRAPHS)	MATHEMATICS SCOPE AND SEQUENCE			
	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
Patterns	• number • attributes • geometric	• number • attributes • geometric	• sequences • generalizations	• generalizations including algebraic statements
Functions	N/A	N/A	• notation • rules • graphs	• notations • simple • inverse • graphs • gradients • precalculus

ALGEBRA	MATHEMATICS SCOPE AND SEQUENCE			
	PS - P2 Learning Phase A	P3 - P6 Learning Phase B	M1 - M3 Learning Phase C	S1 - S4 Learning Phase D
Symbolic Representation	N/A	- variables - missing factors - ordered pairs	- algebraic expressions - variables - formulas - substitution	- algebraic expressions - variables - substitution - formulas
Polynomials and Factors	N/A	N/A	- addition - subtraction - multiplication - factors	- addition - subtraction - multiplication - factors
Equations	missing numbers	missing terms	- linear and non-linear - algebraic and graphical representation	- linear and non-linear - algebraic and graphical representation
Inequalities	N/A	- concepts - symbols	algebraic and graphical representation	algebraic and graphical representation

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INTRODUCTION TO PRIMARY SCHOOL CURRICULUM

The primary school level continues to provide learning experiences that satisfy the natural curiosity of young children, stimulate their imagination and enhance their appetite for learning. The most important function of the primary level of education is the mastery of the fundamental skills necessary for the continued pursuit of learning.

Primary school education helps all children to:

- acquire permanent literacy and numeracy skills
- communicate effectively
- think scientifically and logically
- develop manipulative skills, artistic talents and physical skills
- cultivate good health habits
- develop spiritual, ethical and social values

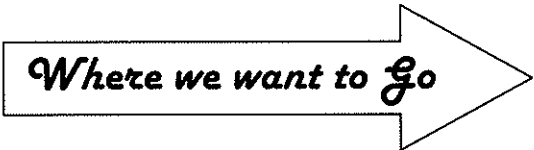
The primary school curriculum is a written guide that identifies the goals and curriculum objectives that teachers establish for students to achieve. It makes visible the articulation necessary for preschool through senior level programmes so that students do not have large gaps in their understanding, skills and competencies. Its scope and sequence also allows teachers to plan linkages across the curriculum so those cross-curricular connections can be made more easily between and among various subjects.

Given the above characteristics, the primary school curriculum is intended to provide students opportunities to:

- discuss, explore, investigate and hypothesize
- find solutions to real problems
- utilize both concrete and abstract reasoning skills
- process information at formal operations level

The following section outlines the curriculum to be taught in the following areas in Bermuda's primary schools.

- English Language Arts
- Mathematics
- Science
- Social Studies
- Health Education
- Information Technology
- Physical Education
- Music
- Visual Arts

BELIEFS ABOUT STUDENT LEARNING	
	
CAUSES	
External Luck Task	Internal Ability Effort
BELIEFS	
Ability defines achievements Ability is limited Intelligence cannot change Intelligence has one dimension Teachers transmit knowledge	Effort improves performance Ability can be acquired Intelligence can be learned There are many intelligent behaviours Learners construct their knowledge
SELF-EFFICACY	
I can not do that I can not learn that	I can learn to do it I can learn the things that I need to know to enable me to do it
CONCEPTS	
Other – referenced They are better than me	Self-referenced I am good at Mathematics
EMOTION	
Negative or Neutral I hate school I do not care	Positive I like to do this Learning makes me happy
OUTCOME	
     	

CURRICULUM TIME ALLOTMENTS

Carroll's (1989) definition of instruction time is "opportunity to learn."

*"The amount of time spent on schoolwork influences school learning."
(Evans-Ardriss, 2000; Berliner, 1990)*

*Instructional time and quality together are one of the three main factors that influences students' educational outcomes.
(Young et. al., 1996)*

The Ministry of Education recognizes the importance of learning time and specifies the number of instructional days that government schools must provide. In addition to the number of days the Ministry also specifies the number of hours of instruction that should occur each school day. In order to determine the best way to apportion these hours, a review of literature was conducted to find exemplars, instances of learning times during school weeks in quality school systems. An assessment of current practices was also taken into consideration.

The Ministry of Education has four goals: literacy, numeracy, infusion of technology and staff development. As the Bermuda government schools introduce new curricula for primary education to support these goals, the curriculum allotment chart will provide guidance as to the optimum time that should be spent delivering each area of learning and also the optimum number of instructional hours that will best promote student literacy and numeracy.

The curriculum time allotment chart outlines the total of contact time between teachers and students at Learning Phase A summing to 1335. This figure is composed of 1300 contact minutes and 35 transition minutes. At Learning Phase B 1465 contact minutes plus 35 transition minutes sums to 1500 minutes per week.

Transition time is defined as the non-instructional time before and after some learning activity (Berliner, 1990). Recess and lunch allow for transitions that do not cut into instructional time. Other transitions occurs between subjects. The allocation of transitional time has been included to provide practical expectations.

It is important to note that transition minutes do not constitute lost time. The best-run classrooms require a short period of time to allow students to conclude their work, change their mind sets, put materials away and to prepare for the coming activity.

CURRICULUM TIME ALLOTMENT CHART

LEARNING PHASE A: PRESCHOOL- PRIMARY TWO* AND LEARNING PHASE B: PRIMARY THREE-PRIMARY SIX**

Subject	Learning Phase A PS-P2*		Learning Phase B P3-P6**	
	Minutes/Week (min/wk)	% Percentage of Time/Week	Minutes/Week (min/wk)	% Percentage of Time/Week
English Language Arts	450	34	450	30
Mathematics	330	24	330	22
Science	120	9	150	10
Social Studies	120	9	150	10
Health Education	60	4.5	60	4
Information Technology	60	4.5	90	6
Physical Education	90	7	120	8
Music	90/2	7	120/2	8
Visual Arts				
Transition Time	15	1	30	2
Totals	1335	100%	1500	100%

All subjects have been written with consideration of the allocated time for each discipline. Each subject is to be delivered as specified for the following duration:

Delivery Weeks/year: 34 weeks
 Optional Weeks: 4 weeks (school events and special projects)
 Total Weeks/year: 38 weeks
 =====

NB: For the purpose of this document, time allocations have not been assigned to subjects at the PreSchool level.

Mathematics - PS

Level Code: PS MT



MINISTRY OF EDUCATION

Bermuda
2001

**PRIMARY SCHOOL
PHASE A OVERVIEW**

Subject Title: Mathematics

Subject Code: PS MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRESCHOOL SCHOOL (PS) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Teacher observations - e.g. in small groups/large groups - play centres - circle time - Problem solving situations - Questioning	50%
• Product Assessment - Portfolio - work samples, examples	50%
• Written Assessment	N/A
Total	100%

MATERIALS OF INSTRUCTION (Adopted Text)

Schiller, Pam; Peterson, Lynne. The DLM Early Childhood Program. Mc Graw-Hill Companies, 1999.

PHASE A OUTLINE

PS Module Titles A – E	P1 Modules Titles A – E	P2 Modules Titles A – E
A. Number Sense - matching - recognition of numerals - grouping (sets) - manipulation (members)	A. Number Sense 12 - number systems - ordinal numbers - money - odd and even	A. Number Sense 14 - skip counting - ordering - place value - multiplication - division
B. Patterns and Relationships - sorting - classifying - rhythmic patterns - thinking process - explaining patterns	B. Patterns and Relationships 12 - cause and effect relationships - sorting - classifying - pattern explorations - pictorial addition and subtraction sentences - number sentences - oral story problems	B. Patterns and Relationships 6 - rhythmic patterns - pattern rules - addition and subtraction patterns - problem solving strategies (looking for a pattern)
C. Shape and Space (Shape) - identification - description - exploration - drawing shapes	C. Shape and Space (Shape) 2 - circles, square, rectangles, triangles - sizes (small, medium, large) - left to right progression - construction - movement of figures	C. Shape and Space (Shape) 4 - 2 dimensional shapes (including hexagon and rhombus) - solids (cone, pyramid, cylinder, sphere) - congruency - symmetry - grid (intersecting line)
D. Shape and Space (Measurement) - representation using concrete materials - exploration of the calendar - exploration of money through play - ordering different measures	D. Shape and Space (Measurement) 5 - long-short - height - heavy-light - more-less/most-least - first, next, last - before, after - temperature vocabulary - exploration of money	D. Shape and Space (Measurement) 6 - measurement tools - liquid and dry measure - scales - types of measure - thermometer - money value (all coins)

E. Data Handling

- collection of data
- organization based on attributes
- graphing
- matching

E. Data Handling 3

- one-to-one correspondence
- conducting surveys
- counting objects
- sorting

E. Data Handling 4

- more, less
- compare
- title, label
- data (information)

Subtotal
Optional Weeks
Total Weeks

Subtotal 34
Optional Weeks 4
Total Weeks 38

Subtotal 34
Optional Weeks 4
Total Weeks 38

PRIMARY SCHOOL

check one: PS ☒ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☐

Mathematics

GOALS		SUBGOALS		MODULE & CURRICULUM CORRELATION MATRIX				
1	Appreciation	1.1	Interrelationships	x	x	x	x	x
		1.2	Successful Experiences	x	x	x	x	x
		1.3	Significance	x	x	x	x	x
2	Structure	2.1	Comparison		x	x	x	x
		2.2	Appreciation	x	x	x	x	x
		2.3	Evaluation	x	x	x		x
		2.4	Generalization	x	x	x	x	x
		2.5	Interpretation		x	x		x
3	Acquisition	3.1	Application of Number Concepts	x	x		x	x
		3.2	Estimation	x			x	x
		3.3	Multiple Representations	x	x	x	x	
		3.4	Data Handling	x				x
		3.5	Geometric and Measurement Properties	x		x	x	
		3.6	Algebraic Procedures		x			
		3.7	Technology		x	x		
4	Communication	4.1	Ideas and Concepts	x	x		x	x
		4.2	Formulae and Terminology	x	x			
		4.3	Oral/Written	x	x		x	x
		4.4	Generalization		x			
		4.5	Symbolic notation		x			
		4.6	Manipulatives and Technology	x	x	x	x	
		4.7	Evaluation	x	x			
5	Cognition	5.1	Confidence in Problem Solving	x	x			x
		5.2	Evaluation	x	x			x
		5.3	Technology	x	x		x	x
		5.4	Application	x				x
		5.5	Evaluation of Reasonableness					
		5.6	Modelling					x
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
B - Patterns and Relationships
C - Shape and Space (Shape)

D - Shape and Space (Measurement)
E - Data Handling

PRIMARY SCHOOL

check one: PS ☒ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☐

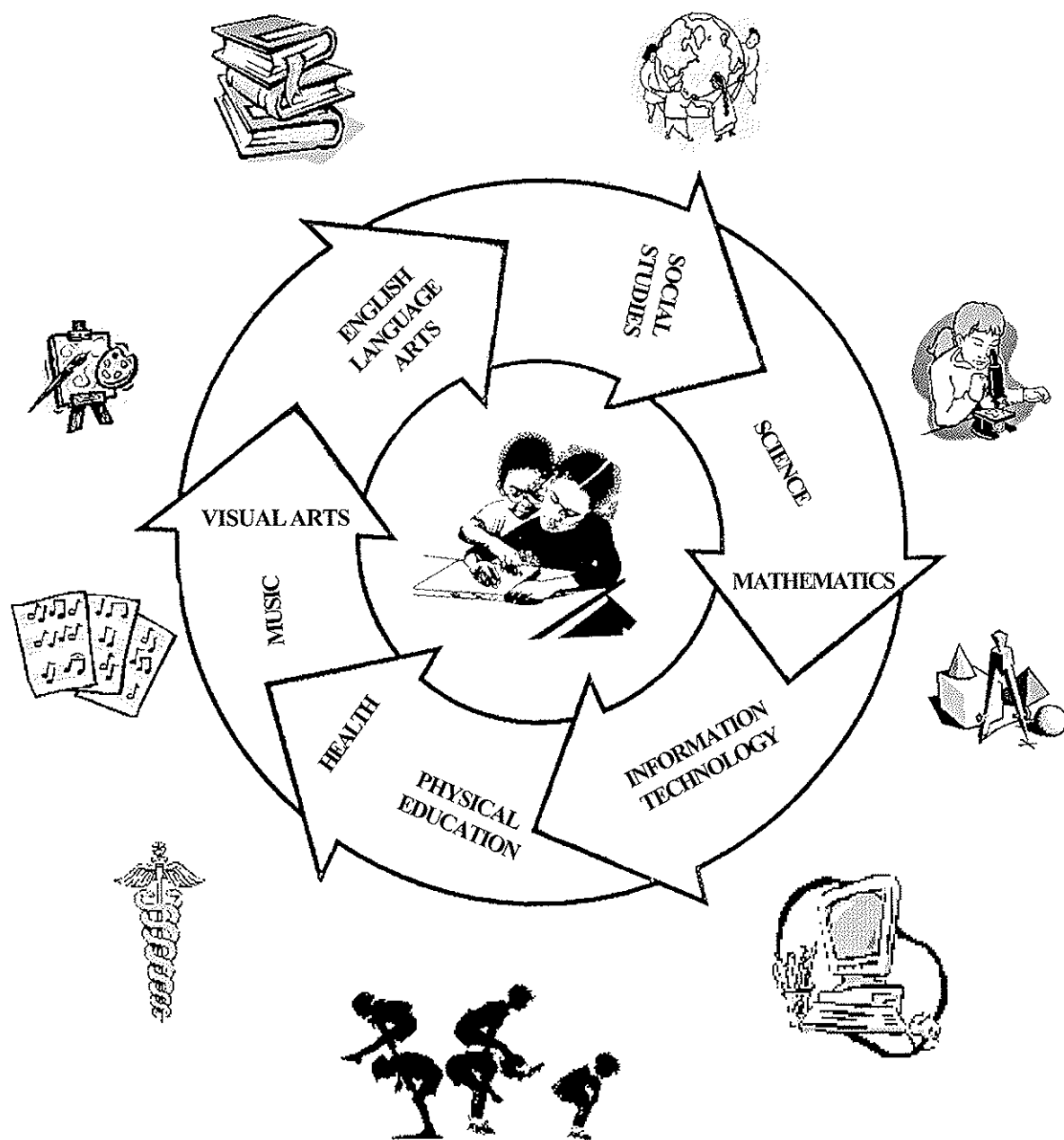
Mathematics

6	Application	6.1	Problem Solving Strategies	x	x	x		
		6.2	Decision Making	x	x	x	x	x
		6.3	Real World Issues				x	x
		6.4	Lifelong Skills				x	x
CONTENT STRUCTURE		Number Sense		x	x	x	x	x
		Patterns and Relationships			x	x	x	
		Shape and Space (Shape)						
		Shape and Space (Measurement)						x
		Data Handling						x
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
 B - Patterns and Relationship
 C - Shape and Space (Shape)

D - Shape and Space (Measurement)
 E - Data Handling



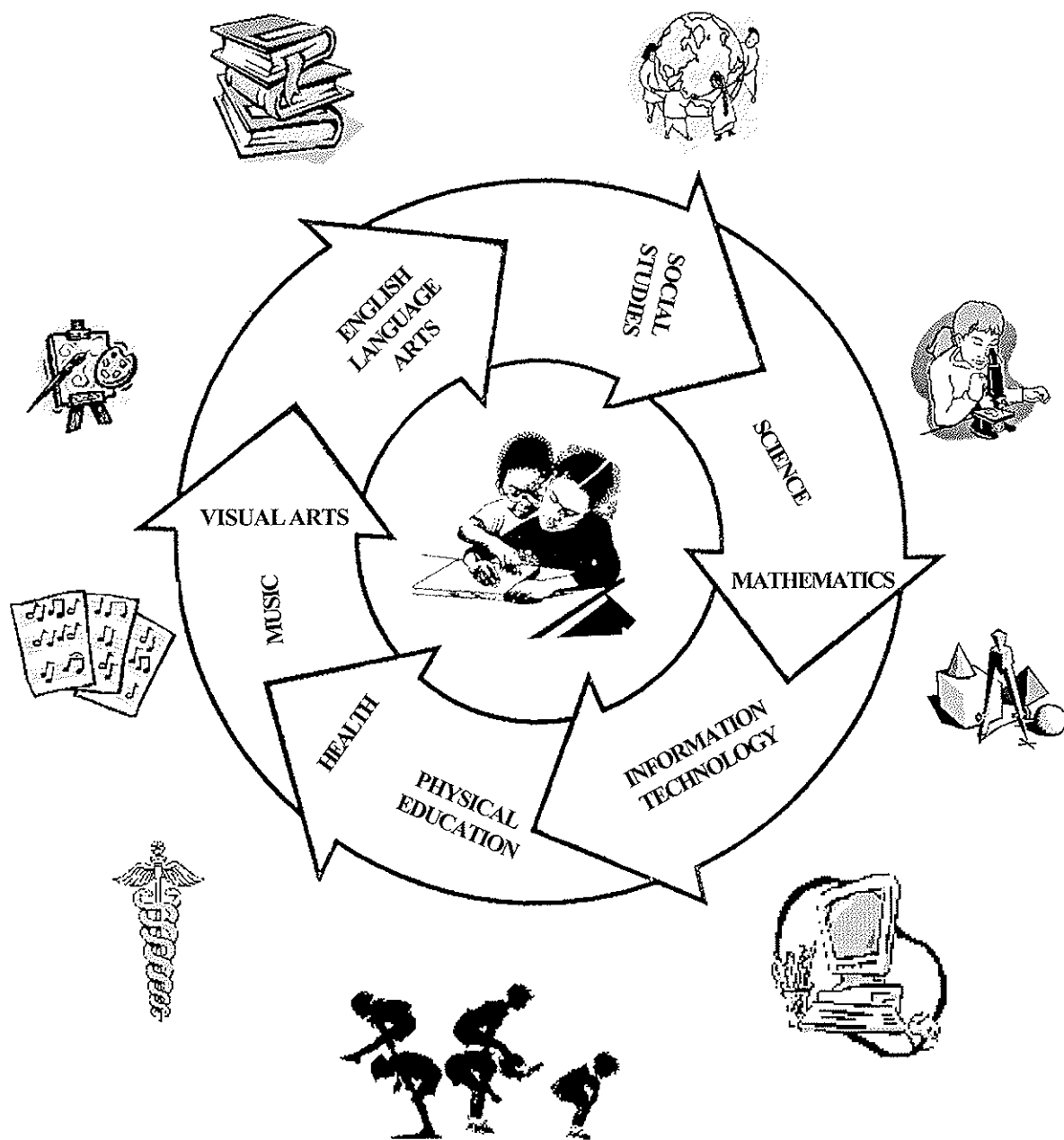
Module A

MATHEMATICS

Module Title: Number Sense Time allotted:	Sequence Reference: PS MT-A						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☒	☐	☐	☐	☐	☐	☐
Subgoal Emphasis: 1.1 - 1.3 Appreciation 2.2 - 2.4 Structure 3.1 - 3.5 Acquisition 4.1, 4.2, 4.3, 4.6, 4.7 Communication 5.1 - 5.4 Cognition 6.1, 6.2 Application	Content Focus: - Number - Number Systems - Number Operations						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - explore the connection of numbers and there relationship to the real world - count objects with one to one correspondence - count orally to 20 by ones - recognize numerals 1 to 10 (up to 5 reliably) - count sequentially up to 10 (everyday objects) - rote count backwards from 5 - build sets of objects (1-10) - explore numbers up to 10 using manipulatives and technology - find one more or one less from a group up to 5 using concrete materials - compare sets of objects – more or less; greater or smaller; first or last - manipulate numbers to the value of 5 - explore simple patterns using concrete materials - explore appropriate problem solving approaches - combine two groups of objects - explore addition through practical activity and discussion - explore subtraction through practical activity and discussion - explore halves using everyday objects - use appropriate terminology when referring to money - formulate problems from everyday and mathematical situations				- one to one correspondence - recognition of numerals - groups (sets) - patterns - problem solving - mathematical reasoning - parts of a whole - communication - addition - subtraction - fractions - money			

Module Title: Number Sense	Sequence Reference: PS MT-A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • assessing prior knowledge (can include intervention lessons or practice activities) • math journals • portfolios • diagnostic assessment • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense	Sequence Reference: PS MT-A
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. - Portfolio assessment - Final project (show'n tell)	
Special Resources: (materials, equipment & community involvement)	
- manipulatives - technology (computer, calculator etc.) - field trips (e.g. grocery store, aquarium) - overhead projector - transparencies - people (parents, community workers, etc) - school environment	- flash cards - flip charts - flip chutes - number cards - familiar storybooks - classroom items - small musical instruments
References - Teacher:	References - Student:
<u>Mathematics in the Early Years</u>, NCTM <u>Math Advantage</u>, Grade K - Learning Centre Supplements <u>Math Advantage</u> Grade K Integrated Software - Internet - Under Construction	<u>Math Advantage</u> Grade K Integrated Software - Mighty Math Carnival Countdown - Mighty Math 200 Millions <u>Pattern Maker</u> - Stanley's Sticker Stories - Harcourt Brace Math Grade K <u>Read Aloud Anthology</u> - Internet
Glossary:	
refer to text	



Module B

MATHEMATICS

Module Title: Patterns and Relationships

Sequence Reference: PS MT-B

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

Time allotted:



Subgoal Emphasis:

- 1.1 – 1.3 Appreciation
- 2.1 – 2.5 Structure
- 3.1, 3.3, 3.6, 3.7 Acquisition
- 4.1 – 4.7 Communication
- 5.1 – 5.3 Cognition
- 6.1, 6.2 Application

Content Focus:

- Relationships
- Patterns
- Algebraic Thinking

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- explore simple patterns using concrete materials
- examine objects for sameness, similarity and difference
- sort objects by colour, shape, size, texture or number
- classify objects by identifying various attributes
- create and extend patterns using actions, manipulatives, diagrams and spoken terms
- model addition of whole numbers, using objects and pictures

- sorting
- classifying
- circles, squares, rectangles, triangles
- sizes - small, medium, large
- left to right progression
- rhythmic patterns
- shape and colour patterns
- pattern exploration
- patterns
 - copying, creating, extending
- types of patterns
- thinking processes

Module Title: Patterns and Relationships	Sequence Reference: PS MT-B
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • parent/teacher relations • developmentally appropriate materials • learning centres • meaningful, relevant content	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • assessing prior knowledge (can include intervention lessons or practice activities) • math journals • portfolios • diagnostic assessment • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Patterns and Relationships

Sequence Reference: PS MT-B

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Portfolio assessment
- Final project (show'n tell)

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- cooking utensils
- kitchen
- school environment (inside and out)
- coloured beads
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

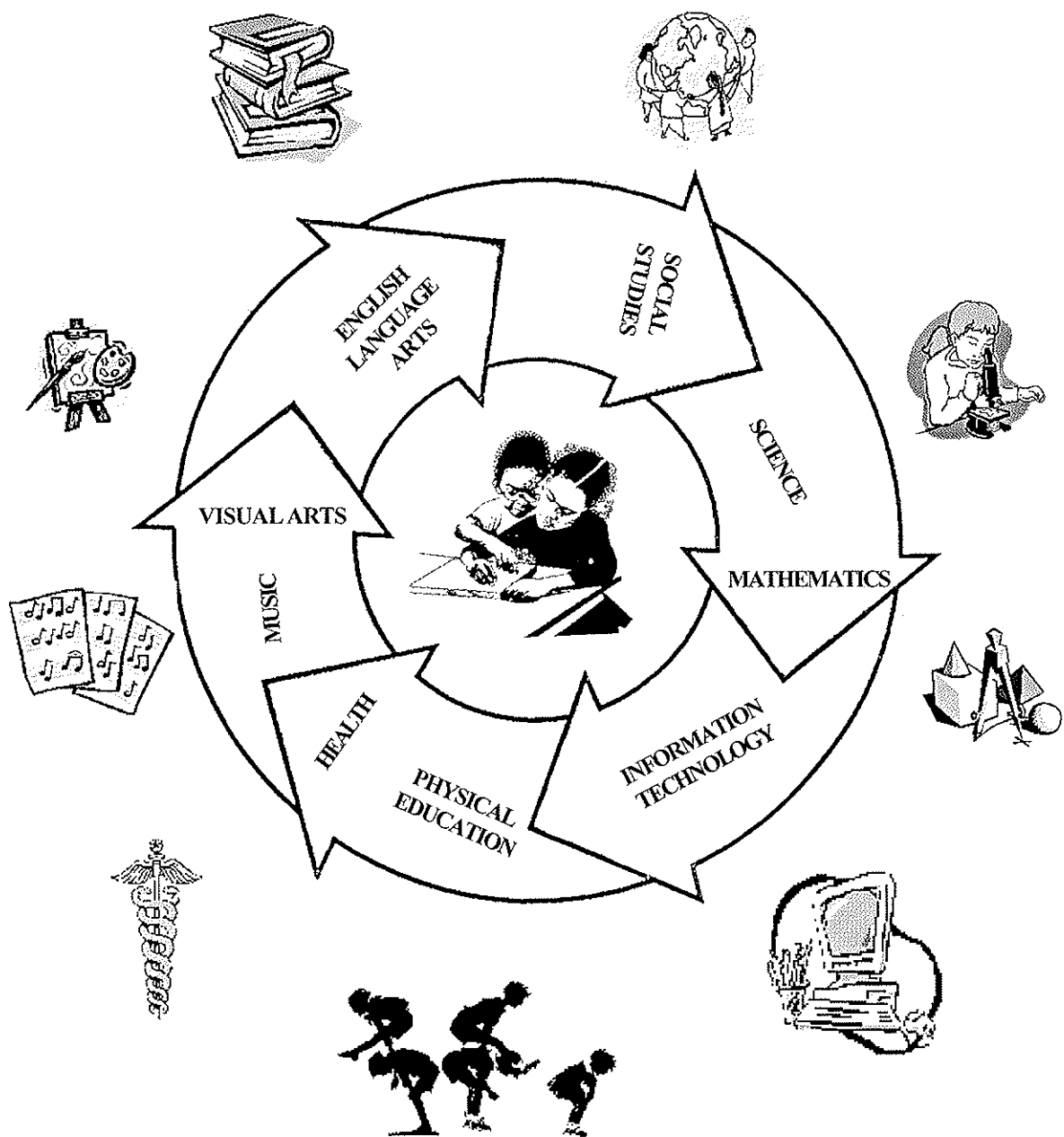
- Mathematics in the Early Years, NCTM
- Math Advantage, Grade K
- Learning Centre Supplements
- Math Advantage Grade K Integrated Software
- Internet
- Under Construction

References - Student:

- Math Advantage Grade K Integrated Software
- Mighty Math Carnival Countdown
- Mighty Math 200 Millions
- Pattern Maker
- Stanley's Sticker Stories
- Read Aloud Anthology Harcourt Brace Math Grade K
- Internet

Glossary:

- refer to text



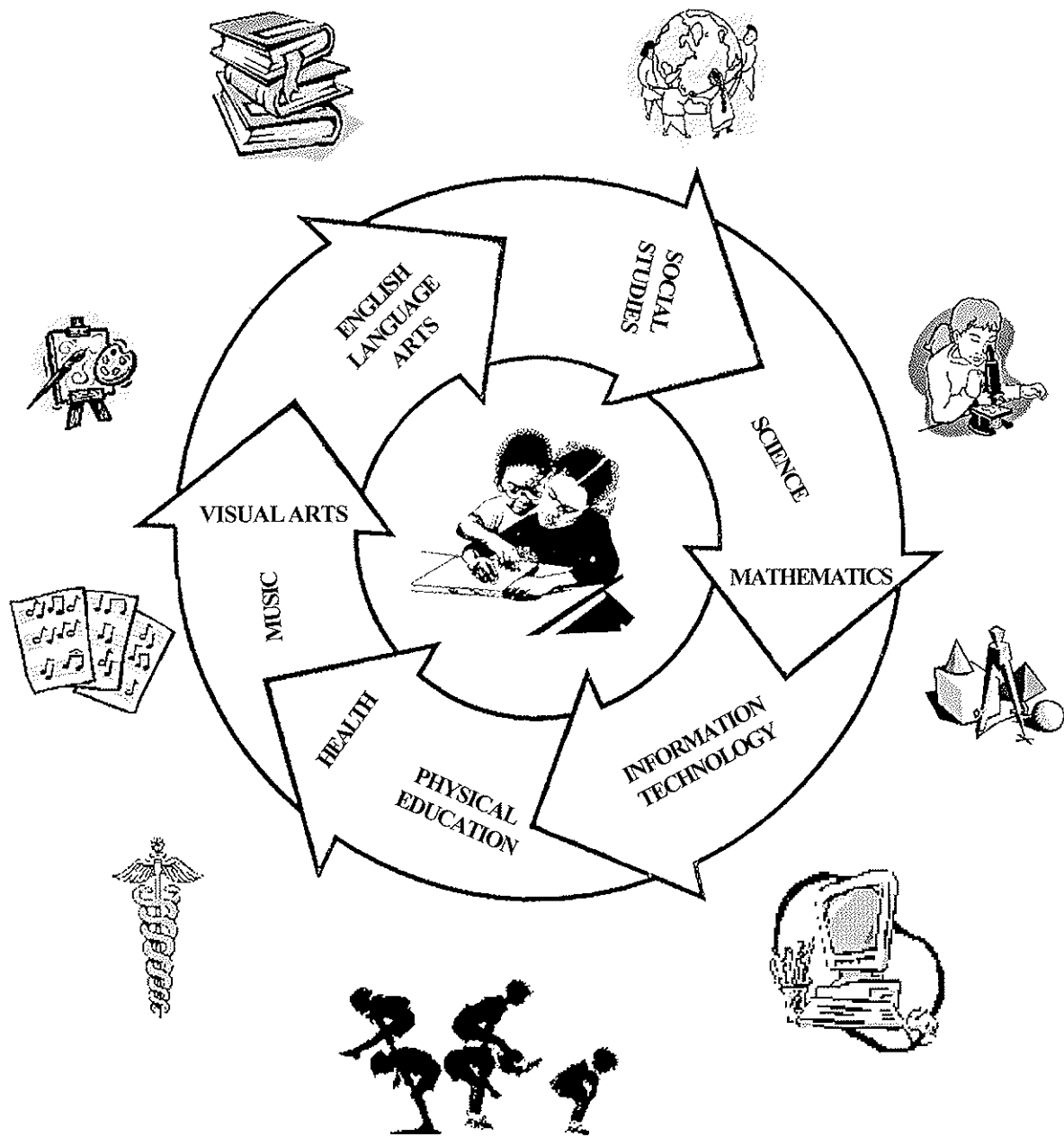
Module C

MATHEMATICS

Module Title: Shape and Space (shape) Time allotted:	Sequence Reference PS MT-C						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☒	☐	☐	☐	☐	☐	☐
Subgoal Emphasis: 1.1 - 1.3 Appreciation 2.1 - 2.5 Structure 3.3, 3.5, 3.7 Acquisition 4.6 Communication 5.1 – 5.4 Cognition 6.1 – 6.2 Application	Content Focus: - Geometry - Patterning						
Curriculum Objectives: At the end of this module, students will: - explore real world and three dimensional objects - match three dimensional objects and two dimensional shapes - describe real world and three dimensional objects using the attributes size, shape and colour - construct three-dimensional objects using materials such as modelling materials, blocks, boxes, multilinks and pattern blocks - identify and name specific two dimensional shapes circle, square, triangle and rectangle - sort and classify three dimensional objects and two dimensional shapes by various attributes (size, shape, colour) - draw shapes such as circle, square, triangle and rectangle - explore shapes using technology				Content Detail: - sorting - classifying - circles, squares, rectangles, triangles - sizes – small, medium, large - left to right progression - patterns, shape and colour - movement of figures – roll, slide, stack			

Module Title: Shape and Space (Shape)	Sequence Reference: PS MT-C
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. - Portfolio assessment - Final project (show'n tell)	
Special Resources: (materials, equipment & community involvement)	
- manipulatives - technology (computer, calculator, TV, VCR) - field trips - overhead projector - transparencies - people (parents, community workers, etc.) - classroom items	- familiar storybooks - number cards - flash cards - flip chutes - flip charts - school environment
References - Teacher:	References - Student:
<u>Mathematics in the Early Years</u>, NCTM <u>Math Advantage</u>, Grade K - Learning Centre Supplements <u>Math Advantage</u> Grade K Integrated Software - Internet <u>Under Construction</u>	<u>Math Advantage</u> Grade K Integrated Software - Mighty Math Carnival Countdown - Mighty Math 200 Millions <u>Pattern Maker</u> - Stanley's Sticker Stories <u>Read Aloud Anthology</u> Grade K - Internet
Glossary:	
refer to text	

Module Title: Shape and Space (Shape)	Sequence Reference: PS MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking - create pictures using two dimensional shapes. - create patterns using three dimensional objects and two dimensional shapes whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • assessing prior knowledge (can include intervention lessons or practice activities) • math journals • portfolios • diagnostic assessment • investigations • teacher/student conferencing • observations • visual presentations



Module D

MATHEMATICS

Module Title: Shape and Space (Measurement)

Sequence Reference PS MT-D

Time allotted:

PHASE A				PHASE B		
PS	P1	P2	P3	P4	P5	P6
☒	☐	☐	☐	☐	☐	☐

Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1, 2.2, 2.4 Structure
- 3.1, 3.2, 3.3, 3.5 Acquisition
- 4.1, 4.3, 4.6 Communication
- 5.3 Cognition
- 6.2 - 6.4 Application

Content Focus:

- Measurement

Curriculum Objectives:

At the end of this module, students will:

- begin to understand the concept of length
- use vocabulary to describe measurement
- construct objects based on a non standard unit of measure
- estimate using non standard units of measure
- measure using non standard units of measure
- represent the results of measurement activities using concrete materials
- pose and solve routine and non routine problems in measurement
- explore using different measures
- compare using different measures
- arrange/order using different measures
- explore empty and full
- explore sequencing events
- compare events according to the duration of time
- explore the calendar
- relate temperature to daily activities and seasons
- explore money through play

Content Detail:

- measuring instruments
 - ruler, measuring tape, yardstick, metre stick, height chart, balance scale, bathroom scale
- comparison
 - long/short; longer/shorter; longest/shortest
 - heavy/light; heavier/lighter; heaviest/lightest
- weight
 - balance scales
 - empty/full; more/less
 - liquid and dry measures
 - capacity
- time
 - clock
 - first, next, last, slow/fast
 - morning, afternoon, night
- the calendar: vocabulary such as
 - day, week, month, year, seasons
- temperature
 - warm, hot, cold, cool, icy
- money
 - coins

**Recommended
Instructional Strategies:**

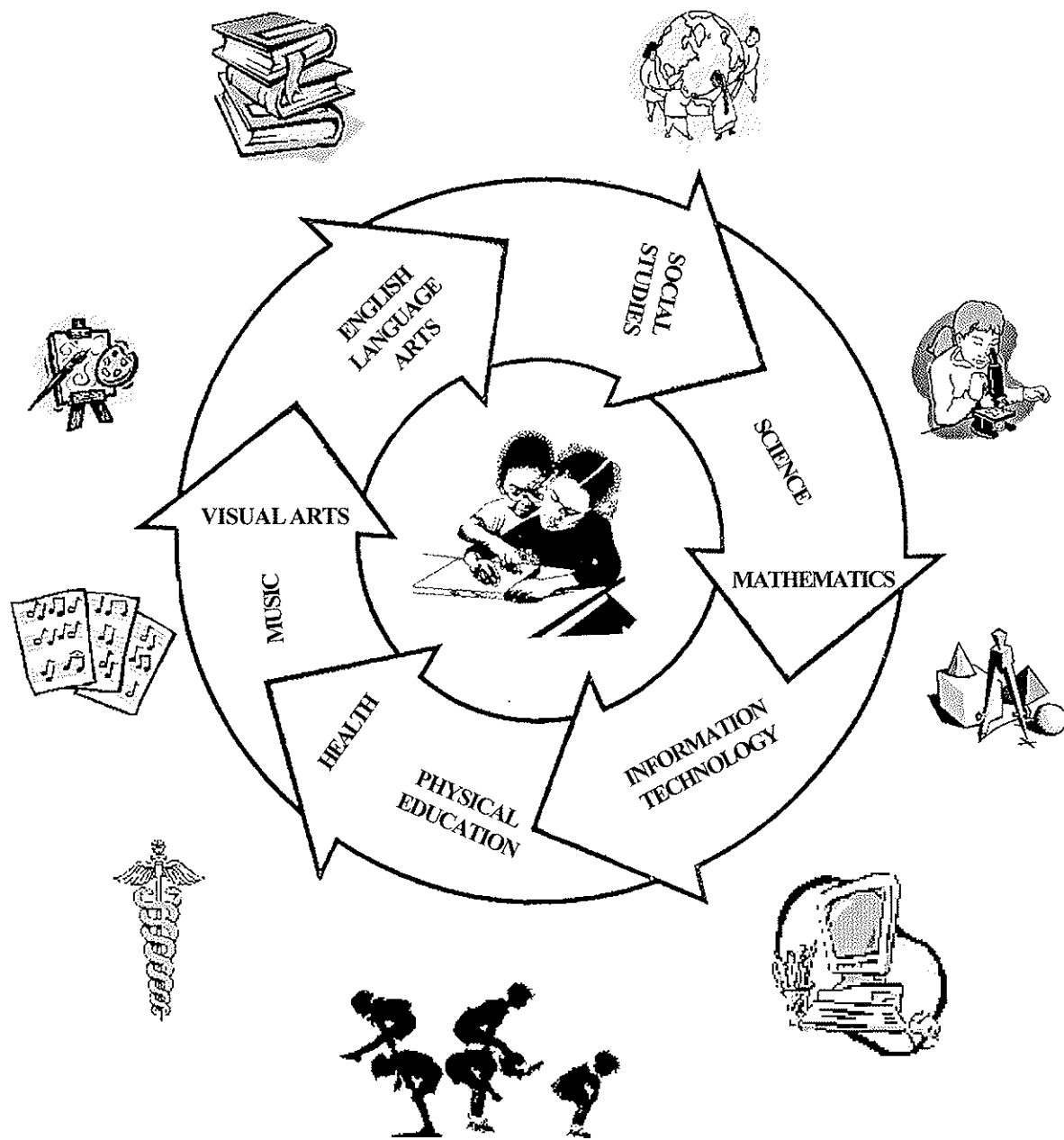
- individualizing
- problem solving
- differentiating instruction
- critical thinking
- whole class
- cooperative work
- computer assisted instruction
- peer coaching
- use of manipulatives
- discussion of mathematics
- questioning
- writing or drawing pictures
- content integration
- developmentally appropriate materials
- learning centres
- meaningful, relevant content
- parent/teacher relations

**Recommended Formative
Assessment Strategies:**

Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding.

- assessing prior knowledge (can include intervention lessons or practice activities)
- math journals
- portfolios
- diagnostic assessment
- investigations
- teacher/student conferencing
- visual presentations
- observations

Module Title: Shape and Space (Measurement)	Sequence Reference: PS MT-D
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. - Portfolio assessment - Final projects (show'n tell)	
Special Resources:	
(materials, equipment & community involvement)	
References - Teacher:	
<u>Mathematics in the Early Years</u>, NCTM <u>Math Advantage</u>, Grade K - Learning Centre Supplements <u>Math Advantage</u> Grade K Integrated Software - Internet <u>Under Construction</u>	References - Student: <u>Math Advantage</u> Grade K Integrated Software - Mighty Math Carnival Countdown - Mighty Math 200 Millions <u>Pattern Maker</u> - Stanley's Sticker Stories - Read Aloud Anthology Grade K - Internet
Glossary:	
refer to text	



Module E

MATHEMATICS

Module Title: Data Handling

Sequence Reference: PS MT-E

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

Time allotted:



Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.5 Structure
- 3.1, 3.2, 3.4 Acquisition
- 4.1, 4.3 Communication
- 5.1, 5.2, 5.3, 5.4, 5.6 Cognition
- 6.2 - 6.4 Application

Content Focus:

- Probability
- Data Handling

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- identify data about themselves or their surroundings
- organize data about themselves
- display data using concrete objects or pictures
- describe data
- discuss an event as likely according to experiences

- surveys
- graphs
 - human, concrete objects, picture, symbolic
- one-to-one correspondence
- probability
- data collection, organization, comparison

Module Title: Data Handling	Sequence Reference: PS MT-E
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • assessing prior knowledge(can include intervention lessons or practice activities) • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations • visual presentations

Module Title: Data Handling	Sequence Reference: PS MT–E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. - Portfolio assessment - Final project (show’n tell)	
Special Resources: (materials, equipment & community involvement)	
- manipulatives - technology (computer, TV, VCR) - field trips - overhead projector - transparencies - people (parents, community workers, etc.) - classroom items	- familiar storybooks - number cards - flash cards - flip chutes - flip charts - school environment
References - Teacher:	References - Student:
<u>Mathematics in the Early Years</u>, NCTM <u>Math Advantage</u>, Grade K - Learning Centre Supplements - Math Advantage Grade K Integrated Software - Internet <u>Under Construction</u>	<u>Math Advantage</u> Grade K Integrated Software - Mighty Math Carnival Countdown - Mighty Math 200 Millions <u>Pattern Maker</u> - Stanley’s Sticker Stories <u>Read Aloud Anthology</u> Grade K - Internet
Glossary:	
refer to text	

Mathematics - P1

Level Code: P1 MT



MINISTRY OF EDUCATION

Bermuda
2001

**PRIMARY SCHOOL
PHASE A OVERVIEW**

Subject Title: Mathematics

Subject Code: P1 MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRIMARY ONE (P1) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Problem solving tasks - Reteach, practical, enrichment worksheet - Discussions - Oral presentations - Cooperative group work	30%
• Product Assessment - Portfolio work sample* - Chapter tests - Review tests - Module tests - Cumulative tests	50%
• Written Assessment - Journal writing - Project (group, individual) - Assignments (home, school) - Formative assignment (inventory test)	20%
Total	100%

*could also include family response sheet

MATERIALS OF INSTRUCTION (Adopted Text)

Burton Grace M., Maletsky, Evan M. Math Advantage, Orlando, FL., Harcourt International, 1999.

PHASE A OUTLINE

P1 Module Titles A - E	P2 Modules Titles A - E	P3 Modules Titles A - E
A. Number Sense 12 - number systems - ordinal numbers - money - odd and even	A. Number Sense 8 - skip counting - ordering - place value - multiplication - division	A. Number Sense 14 - estimation - rounding - decimals - basic operations - mathematical reasoning
B. Patterns and Relationships 12 - cause and effect relationships - sorting - classifying - pattern explorations - pictorial addition and subtraction sentences - number sentences - oral story problems	B. Patterns and Relationships 14 - rhythmic patterns - pattern rules - addition and subtraction patterns - problem solving strategies (looking for a pattern)	B. Patterns and Relationships 6 - predicting number patterns - multiplication - practical application of division
C. Shape and Space (Shape) 2 - circles, squares, rectangles, triangles - sizes (small, medium, large) - left to right progression - construction - movement of figures	C. Shape and Space (Shape) 2 - 2 dimensional shapes (including hexagon and rhombus) - solids (cone, pyramid, cylinder, sphere) - congruency - symmetry - grid (intersecting line)	C. Shape and Space (Shape) 4 - 3 dimensional figures (cone, pyramid, cylinder and sphere) - lines of symmetry - transformations - lines (vertical horizontal, diagonal and intersecting)
D. Shape and Space (Measurement) 5 - long-short - height - heavy-light - more-less/most-least - first, next, last - before, after - temperature vocabulary - exploration of money	D. Shape and Space (Measurement) 6 - measurement tools - liquid and dry measure - scales - types of measure - thermometer - money value (all coins)	D. Shape and Space (Measurement) 6 - mass (g, kg, m, oz, lb) - time (minute, hr, day) - square measurement - time (intervals) - increments - degrees - money (bills)

PRIMARY SCHOOL

check one: PS ☐ P1 ☒ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☐

Mathematics

GOALS		SUBGOALS		MODULE & CURRICULUM CORRELATION MATRIX				
1	Appreciation	1.1	Interrelationships	x	x	x	x	x
		1.2	Successful Experiences	x	x	x	x	x
		1.3	Significance	x	x	x	x	x
2	Structure	2.1	Comparison		x	x	x	x
		2.2	Appreciation	x	x	x	x	x
		2.3	Evaluation	x	x			x
		2.4	Generalization	x	x	x	x	x
		2.5	Interpretation		x	x		
3	Acquisition	3.1	Application of Number Concepts	x	x		x	x
		3.2	Estimation	x			x	x
		3.3	Multiple Representations	x	x	x	x	x
		3.4	Data Handling	x				x
		3.5	Geometric and Measurement Properties	x		x	x	x
		3.6	Algebraic Procedures	x	x			x
		3.7	Technology		x	x		
4	Communication	4.1	Ideas and Concepts	x	x	x	x	x
		4.2	Formulae and Terminology	x	x		x	x
		4.3	Oral/Written	x	x	x	x	x
		4.4	Generalization		x	x		
		4.5	Symbolic notation	x	x			x
		4.6	Manipulatives and Technology	x	x	x	x	
		4.7	Evaluation	x	x	x		
5	Cognition	5.1	Confidence in Problem Solving	x	x			
		5.2	Evaluation	x	x			
		5.3	Technology	x	x	x	x	x
		5.4	Application	x				x
		5.5	Evaluation of Reasonableness					
		5.6	Modelling	x	x	x		x
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
B - Patterns and Relationships
C - Shape and Space (Space)

D - Shape and Space (Measurement)
E - Data Handling

PRIMARY SCHOOL

check one: PS ☐ P1 ☒ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☐

Mathematics

6	Application	6.1	Problem Solving Strategies	x	x	x		x
		6.2	Decision Making	x	x	x	x	x
		6.3	Real World Issues	x			x	x
		6.4	Lifelong Skills	x			x	x
CONTENT STRUCTURE		Number Sense		x	x	x	x	x
		Patterns and Relationships			x	x	x	
		Shape and Space (Shape)						
		Shape and Space (Measurement)					x	
		Data Handling					x	
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense

B - Patterns and Relationship

C - Shape and Space (Shape)

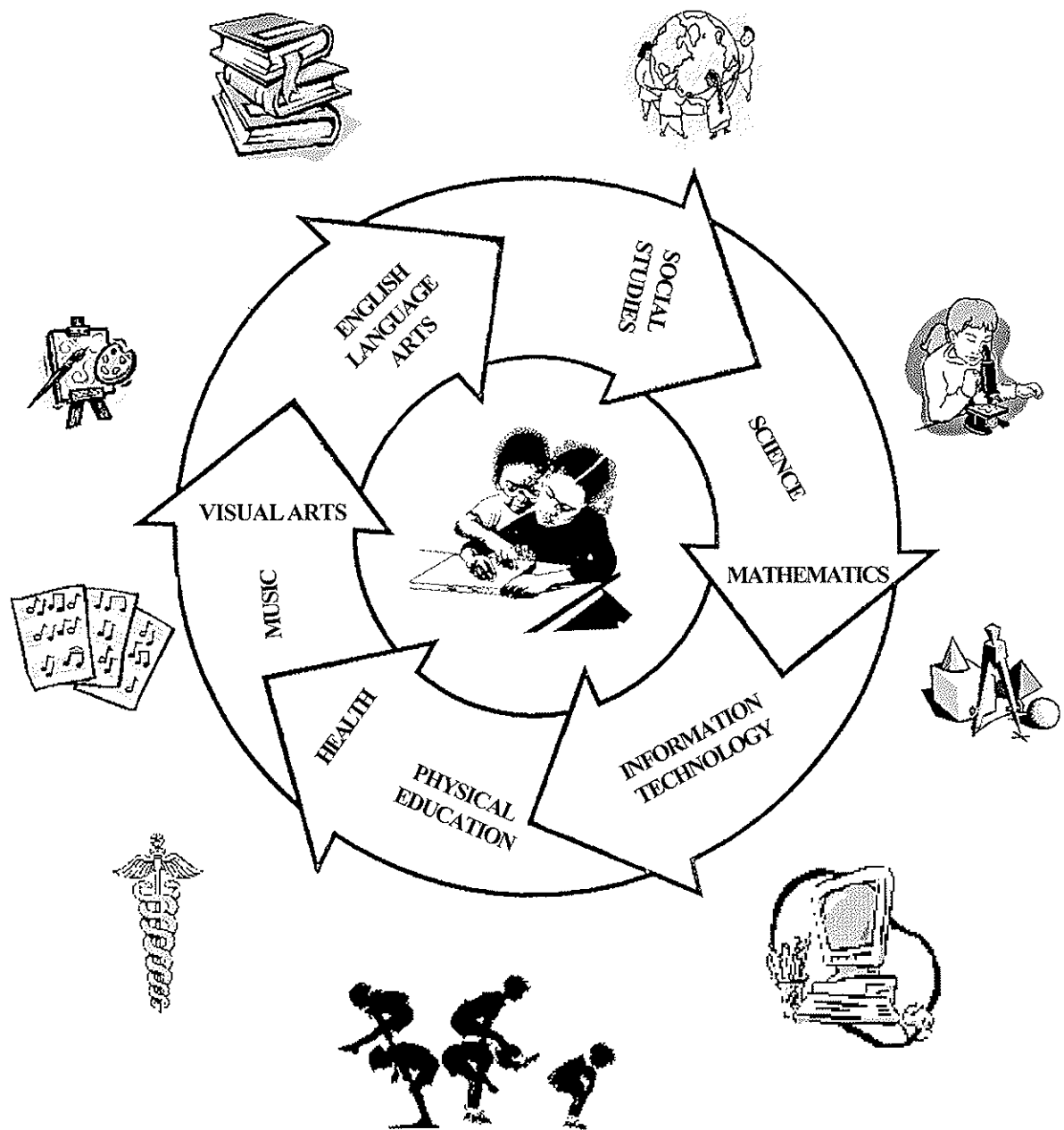
D - Shape and Space (Measurement)

E - Data Handling

(page 2 of 2)

E. Data Handling 3	E. Data Handling 4	E. Data Handling 4
- one-to-one correspondence	- more, less	- tallies (charts, tables, bar
- conducting surveys	- compare	graphs, pictographs, Venn
- counting objects	- title, label	diagrams)
- sorting	- data (information)	- never, sometimes, always

Subtotal 34	Subtotal 34	Subtotal 34
Optional Weeks <u>4</u>	Optional Weeks <u>4</u>	Optional Weeks <u>4</u>
Total Weeks 38	Total Weeks 38	Total Weeks 38



Module A

MATHEMATICS

Module Title: Number Sense

Sequence Reference: P1 MT-A

Time allotted: 12 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

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Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.2 - 2.4 Structure
- 3.1 - 3.6 Acquisition
- 4.1 - 4.7 Communication
- 5.1, 5.2, 5.3, 5.4, 5.6 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Number
- Number Systems
- Number Operations

Curriculum Objectives:

At the end of this module, students will:

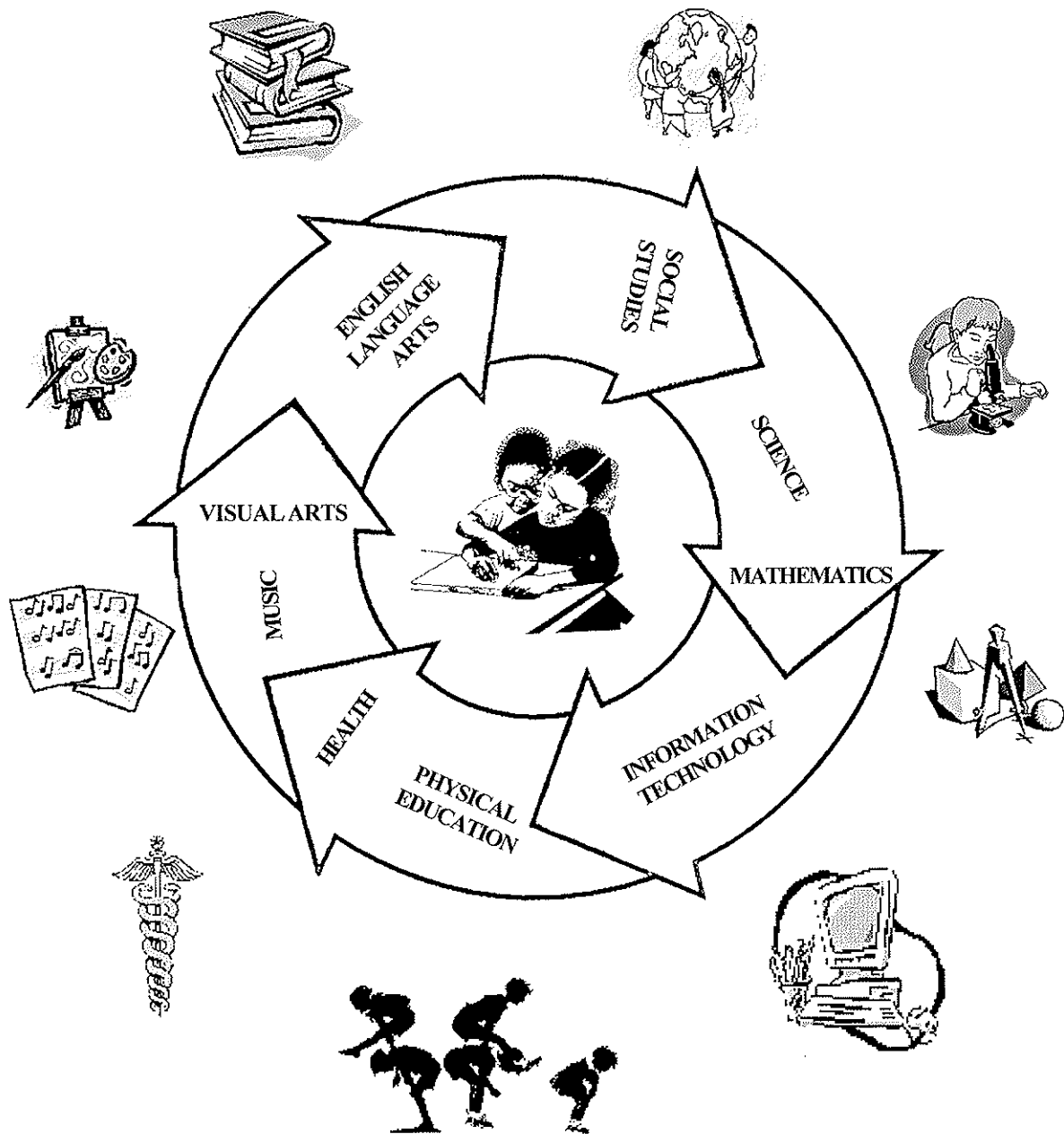
- count objects with one to one correspondence
- match objects with one to one correspondence
- count orally to 50 by ones, twos and tens
- recognize numerals 1 to 20
- count sequentially up to 20 everyday objects
- count backwards from 10
- build and describe sets of objects (1 to 20)
- explore numbers up to 50 using manipulatives and technology (this includes the calculator)
- find one more or one less than any number from 1 to 10
- name the ordinal position in a sequence up to tenth
- manipulate numbers to the value of 10
- explore and discuss simple patterns to make predictions
- use problem solving approaches
- know number facts up to 5
- understand the concept and operation of addition using concrete materials
- understand the concept and operation of subtraction using concrete materials
- explain observations and thinking using diagrams, pictures, charts or words
- explain why a given part is half or quarter
- make general statements about odd or even numbers
- explore and describe fractions as equal parts of a whole ($\frac{1}{2}$ and $\frac{1}{4}$)
- identify Bermuda money – 1, 5, 10, 25 cents and \$1 coins
- identify the effects of zero in addition and subtraction
- pose and solve problems related to number sense

Content Detail:

- whole numbers
- ordinal numbers
- comparisons
- place value
- money - identification and value
- fractions
- addition and subtraction
- communication
- money
- problem solving
- patterns
- mathematical reasoning

Module Title: Number Sense	Sequence Reference: P1 MT-A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instructions • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense	Sequence Reference: P1 MT–A
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade K • Internet	• <u>Math Advantage</u> Grade K • Mighty Math Carnival Countdown
Glossary:	
• refer to text	



Module B

MATHEMATICS

Module Title: Patterns and Relationships

Sequence Reference: P1 MT-B

Time allotted: 12 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

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Subgoal Emphasis:

- 1.1 – 1.3 Appreciation
- 2.1 – 2.5 Structure
- 3.1, 3.3, 3.6, 3.7 Acquisition
- 4.1 – 4.7 Communication
- 5.1 – 5.3 Cognition
- 6.1 – 6.2 Application

Content Focus:

- Relationships
- Patterns
- Algebraic Thinking

Curriculum Objectives:

Content Detail:

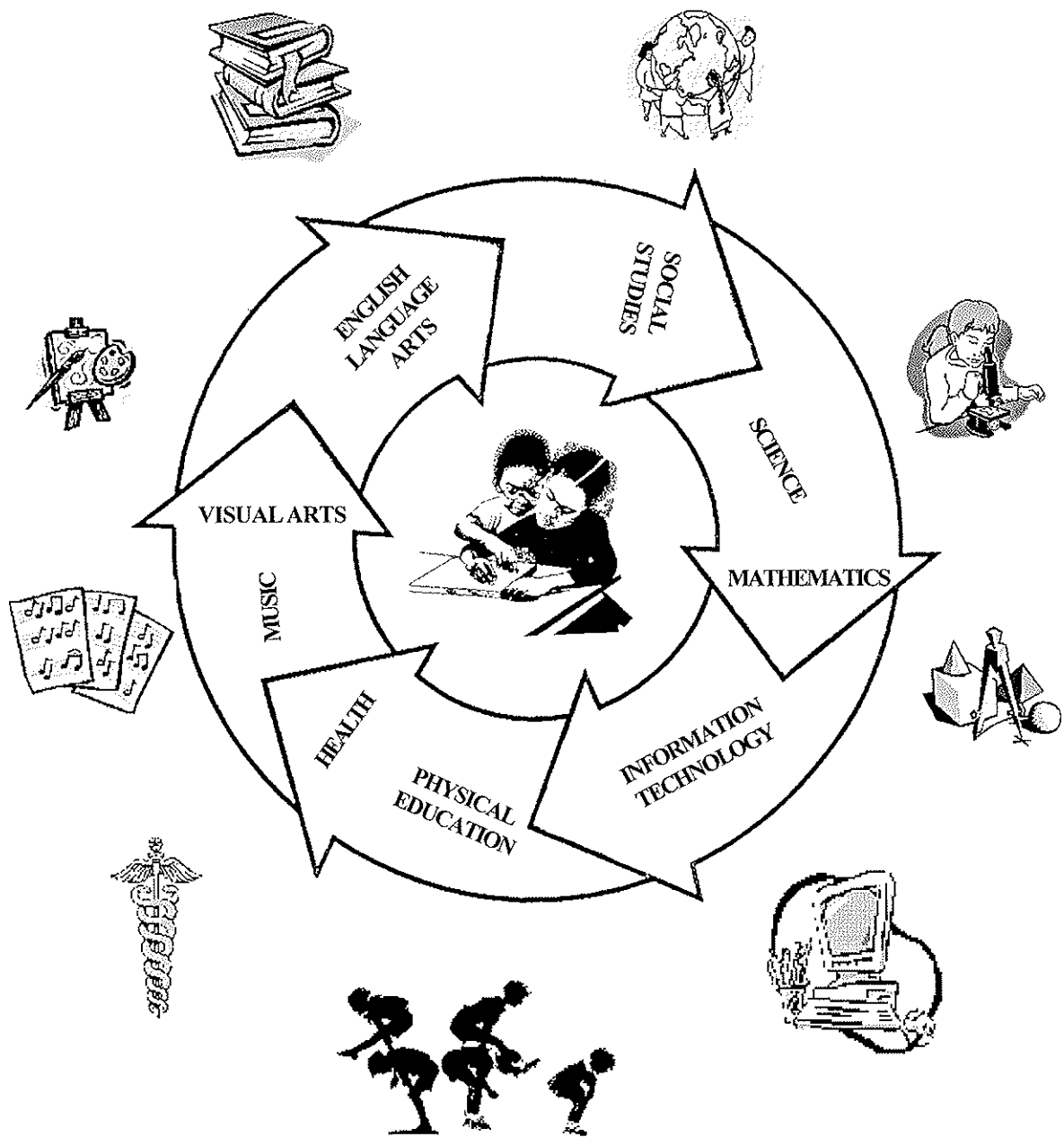
At the end of this module, students will:

- explore and discuss simple patterns to make predictions (what comes next?)
- sort objects by colour, shape, size, texture or number
- classify objects by identifying various attributes
- copy patterns using shapes, objects, pictures and numbers
- write number sentences to represent mathematical patterns and relationships
- create and extend patterns using actions, manipulatives, diagrams and spoken terms
- model subtraction of whole numbers, using objects, pictures and symbols

- cause and effect relationships
- sorting
- classifying
- pattern exploration
- rhythmic patterns
- pictorial
- shape and colour patterns
- patterns
 - copying, creating, extending
- number sentences
 - addition and subtraction
- story problems (orally)

Module Title: Patterns and Relationships	Sequence Reference: P1 MT-B
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Patterns and Relationships	Sequence Reference: P1 MT-B
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Cumulative test • Portfolios • Projects • Module test	
Special Resources:	
(materials, equipment & community involvement) • manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items • familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment	
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade K • Internet	• <u>Math Advantage</u> Grade K • Mighty Math Carnival Countdown
Glossary:	
• refer to text	



Module C

MATHEMATICS

Module Title: Shape and Space (Shape)	Sequence Reference: P1 MT-C						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☒	☐	☐	☐	☐	☐
Time allotted: 2 weeks							
Subgoal Emphasis: 1.1 - 1.3 Appreciation 2.1, 2.2, 2.4, 2.5 Structure 3.3, 3.5, 3.7 Acquisition 4.1, 4.3, 4.4, 4.6, 4.7 Communication 5.3, 5.6 Cognition 6.1 - 6.2 Application	Content Focus: - Geometry - Patterning						

Curriculum Objectives:	Content Detail:
At the end of this module, students will: - explore and describe the attributes of size, shape and colour - match three dimensional objects and two dimensional shapes - identify and classify attributes and properties of solids - compare geometric figures to real world objects - identify and describe specific two dimensional shapes - sort and classify three dimensional objects and two dimensional shapes - construct three-dimensional objects using materials (modelling materials, blocks, boxes, multilinks, pattern blocks) - draw shapes - explore geometric figures in various positions - use technology to explore shapes	- construction of three dimensional objects - can, ball, box, cone - sizes – small, medium, large - left to right progression - patterns, shape and colour - communication - exploration of shapes and objects - movement of figures – roll, slide, stack - identification of plane figures - circle, square, rectangle, triangle

Module Title: Shape and Space (Shape)	Sequence Reference: P1 MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking - create pictures using two dimensional shapes - create patterns using three dimensional objects and two dimensional shapes • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Shape)

Sequence Reference: P1 MT-C

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Cumulative test
- Projects
- Portfolios
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

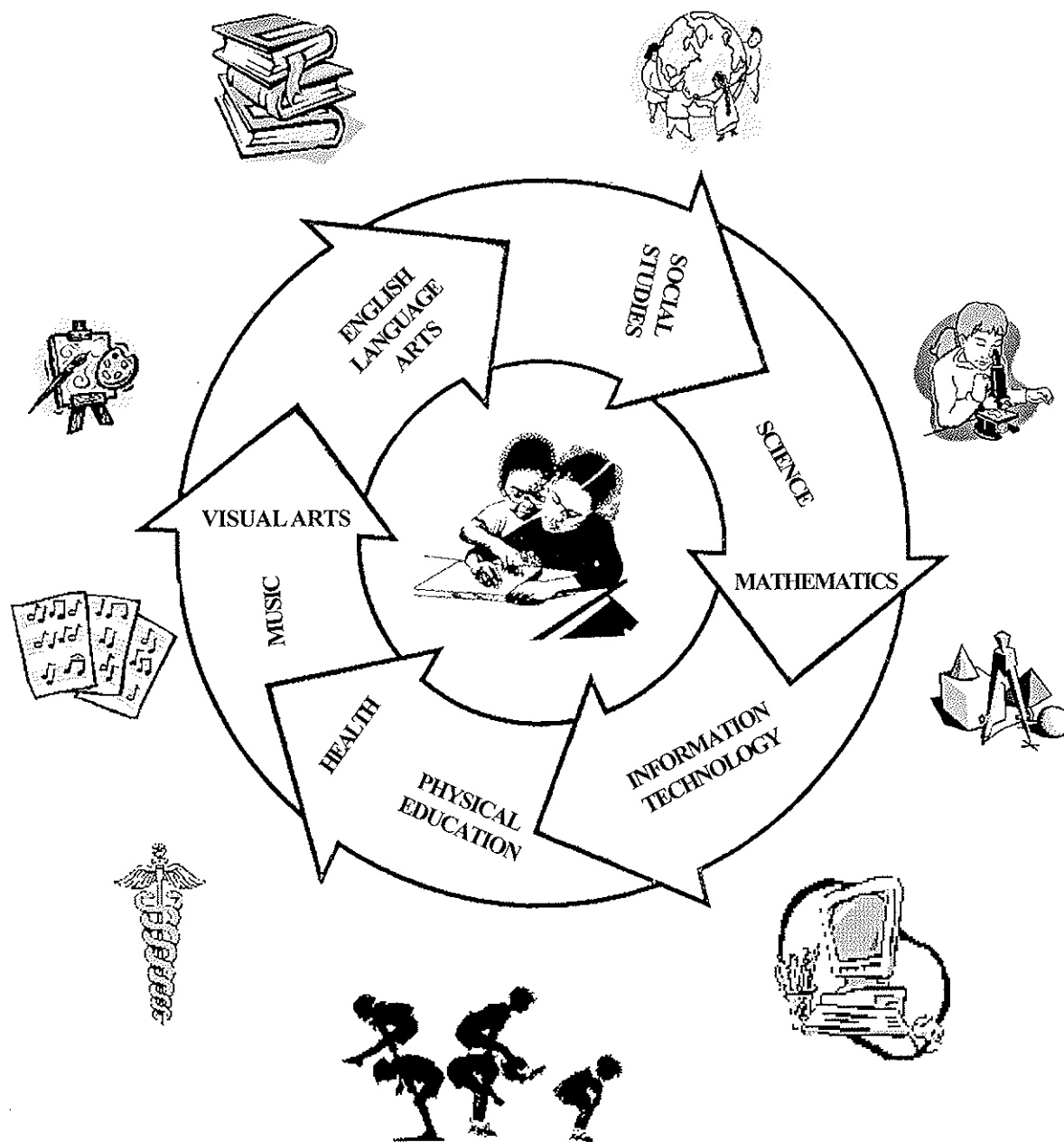
- Math Advantage Teacher Resource Kit, Grade K
- Internet

References - Student:

- Math Advantage Grade K
- Mighty Math Carnival Countdown

Glossary:

- refer to text



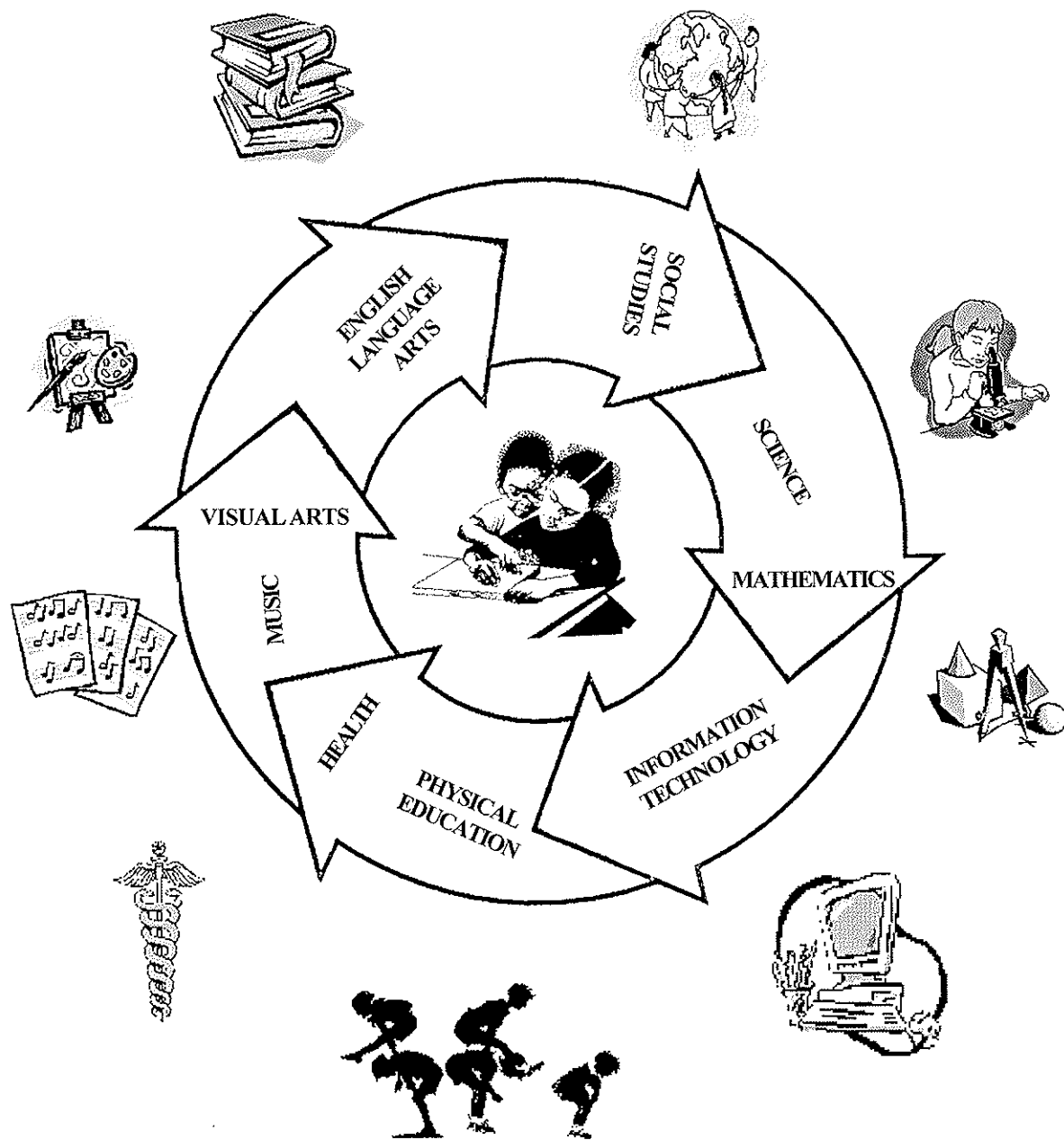
Module D

MATHEMATICS

Module Title: Shape and Space (Measurement) Time allotted: 5 weeks	Sequence Reference: P1 MT-D						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☒	☐	☐	☐	☐	☐
Subgoal Emphasis: 1.1 - 1.3 Appreciation 2.1, 2.2, 2.4 Structure 3.1, 3.2, 3.3, 3.5 Acquisition 4.1, 4.2, 4.3, 4.6 Communication 5.3 Cognition 6.2 - 6.4 Application	Content Focus: Measurement						
Curriculum Objectives: At the end of this module, students will: - use appropriate vocabulary to describe measurement - recognize the attributes of length - make objects using non standard measure - estimate using non standard units of measure - measure using multiple copies of a familiar classroom object (paper clips) - explore sequencing of events - compare events according to the duration of time - explore calendar - relate temperature to daily activities and seasons - pose and solve real life problems based on measures - explore money through play				Content Detail: - comparisons - long/short - longer/shorter - longest/shortest - heavy/light; heavier/lighter; heaviest/lightest - empty/full - more, less/most, least - measuring instruments - ruler - height chart - area - sequencing of events - first, next, last - time - morning, afternoon, night - day, week, month, year, season - before, after - o'clock, hour, minute - clock, digital, analog - temperature - warm, hot, cold, cool, icy - money - dime, nickel, penny, dollar			

Module Title: Shape and Space (Measurement)	Sequence Reference: P1 MT-D
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking: - explore using different measures - compare using different measures - sort and classify using a variety of measures - arrange/order using different measures - cover a surface using a variety of objects - explore empty and full • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Measurement)	Sequence Reference: P1 MT-D
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades.	
• Chapter test • Review test • Portfolios • Cumulative test • Projects • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items • objects to be measured (e.g. rocks, sand etc.)	• familiar storybooks • number cards • flash cards • flip charts • flip chutes • school environment • carpenters (craftsmen) • visit to weather station
References - Teacher:	
• <u>Math Advantage</u> Teacher Resource Kit, Grade K • Internet	References - Student:
• <u>Math Advantage</u> Grade K • Mighty Math Carnival Countdown	
Glossary:	
• refer to text	



Module E

MATHEMATICS

Module Title: Data Handling

Sequence Reference: P1 MT-E

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

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Time allotted: 3 weeks

Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.4 Structure
- 3.1 - 3.6 Acquisition
- 4.1, 4.2, 4.3, 4.5 Communication
- 5.3, 5.4, 5.6 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Data Handling

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- gather data about themselves and their surroundings
- organize data based on one attribute chosen by teacher or students
- display data using concrete objects, pictures or graphs
- compare data using appropriate language

- one-to-one correspondence
- surveys
- data collection, comparison
- graphs
 - human, concrete objects, pictures, symbols

Module Title: Data Handling	Sequence Reference: P1 MT-E
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journal • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Data Handling	Sequence Reference: P1 MT-E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	
• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment	
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, K • Internet	• <u>Math Advantage</u> K • Mighty Math Carnival Countdown
Glossary:	
• refer to text	

Mathematics - P2

Level Code: P2 MT



MINISTRY OF EDUCATION

Bermuda

2001

**PRIMARY SCHOOL
PHASE A OVERVIEW**

Subject Title: Mathematics

Subject Code: P2 MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRIMARY TWO (P2) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Problem solving tasks - Reteach, practical, enrichment worksheet - Discussions - Oral presentations - Cooperative group work	30%
• Product Assessment - Portfolio work sample* - Chapter tests - Review tests - Module tests - Cumulative tests	50%
• Written Assessment - Journal writing - Project (group, individual) - Assignments (home, school) - Formative assignment (inventory test)	20%
Total	100%

*could also include family response sheet

MATERIALS OF INSTRUCTION (Adopted Text)

Burton Grace M., Maletsky, Evan M. Math Advantage, Orlando, FL., Harcourt International, 1999.

PHASE A OUTLINE

P1 Module Titles A - E	P2 Modules Titles A - E	P3 Modules Titles A - E
A. Number Sense 12 - number systems - ordinal numbers - money - odd and even	A. Number Sense 8 - skip counting - ordering - place value - multiplication - division	A. Number Sense 14 - estimation - rounding - decimals - basic operations - mathematical reasoning
B. Patterns and Relationships 12 - cause and effect relationships - sorting - classifying - pattern explorations - pictorial addition and subtraction sentences - number sentences - oral story problems	B. Patterns and Relationships 14 - rhythmic patterns - pattern rules - addition and subtraction patterns - problem solving strategies (looking for a pattern)	B. Patterns and Relationships 6 - predicting number patterns - multiplication - practical application of division
C. Shape and Space (Shape) 2 - circles, squares, rectangles, triangles - sizes (small, medium, large) - left to right progression - construction - movement of figures	C. Shape and Space (Shape) 2 - 2 dimensional shapes (including hexagon and rhombus) - solids (cone, pyramid, cylinder, sphere) - congruency - symmetry - grid (intersecting line)	C. Shape and Space (Shape) 4 - 3 dimensional figures (cone, pyramid, cylinder and sphere) - lines of symmetry - transformations - lines (vertical horizontal, diagonal and intersecting)
D. Shape and Space (Measurement) 5 - long-short - height - heavy-light - more-less/most-least - first, next, last - before, after - temperature vocabulary - exploration of money	D. Shape and Space (Measurement) 6 - measurement tools - liquid and dry measure - scales - types of measure - thermometer - money value (all coins)	D. Shape and Space (Measurement) 6 - mass (g, kg, m, oz, lb) - time (minute, hr, day) - square measurement - time (intervals) - increments - degrees - money (bills)

E. Data Handling 3	E. Data Handling 4	E. Data Handling 4
- one-to-one correspondence	- more, less	- tallies (charts, tables, bar
- conducting surveys	- compare	graphs, pictographs, Venn
- counting objects	- title, label	diagrams)
- sorting	- data (information)	- never, sometimes, always

Subtotal 34	Subtotal 34	Subtotal 34
Optional Weeks <u>4</u>	Optional Weeks <u>4</u>	Optional Weeks <u>4</u>
Total Weeks 38	Total Weeks 38	Total Weeks 38

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☒ P3 ☐ P4 ☐ P5 ☐ P6 ☐

Mathematics

GOALS		SUBGOALS		MODULE & CURRICULUM CORRELATION MATRIX				
1	Appreciation	1.1	Interrelationships	x	x	x	x	x
		1.2	Successful Experiences	x	x	x	x	x
		1.3	Significance	x	x	x	x	x
2	Structure	2.1	Comparison		x	x	x	x
		2.2	Appreciation	x	x	x	x	x
		2.3	Evaluation	x	x	x		x
		2.4	Generalization	x	x	x	x	x
		2.5	Interpretation		x	x		x
3	Acquisition	3.1	Application of Number Concepts	x	x		x	x
		3.2	Estimation	x			x	x
		3.3	Multiple Representations	x	x		x	x
		3.4	Data Handling	x				x
		3.5	Geometric and Measurement Properties	x	x	x	x	x
		3.6	Algebraic Procedures		x		x	x
		3.7	Technology	x	x	x		
4	Communication	4.1	Ideas and Concepts	x	x	x	x	x
		4.2	Formulae and Terminology	x			x	x
		4.3	Oral/Written	x	x	x	x	x
		4.4	Generalization		x	x		
		4.5	Symbolic notation	x	x		x	x
		4.6	Manipulatives and Technology	x	x	x	x	x
		4.7	Evaluation	x	x	x		x
5	Cognition	5.1	Confidence in Problem Solving	x				x
		5.2	Evaluation	x	x	x		x
		5.3	Technology	x	x	x	x	x
		5.4	Application	x				x
		5.5	Evaluation of Reasonableness		x			
		5.6	Modelling	x		x		
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
 B - Patterns and Relationships
 C - Shape and Space (Shape)

D - Shape and Space (Measurement)
 E - Data Handling

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☒ P3 ☐ P4 ☐ P5 ☐ P6 ☐

Mathematics

6	Application	6.1	Problem Solving Strategies	x	x	x		x
		6.2	Decision Making	x	x	x	x	x
		6.3	Real World Issues	x			x	x
		6.4	Lifelong Skills	x			x	x
CONTENT STRUCTURE		Number Sense		x	x	x	x	x
		Patterns and Relationships			x	x	x	
		Shape and Space (Shape)						x
		Shape and Space (Measurement)						
		Data Handling						x
		MODULES		A	B	C	D	E

MODULE KEY

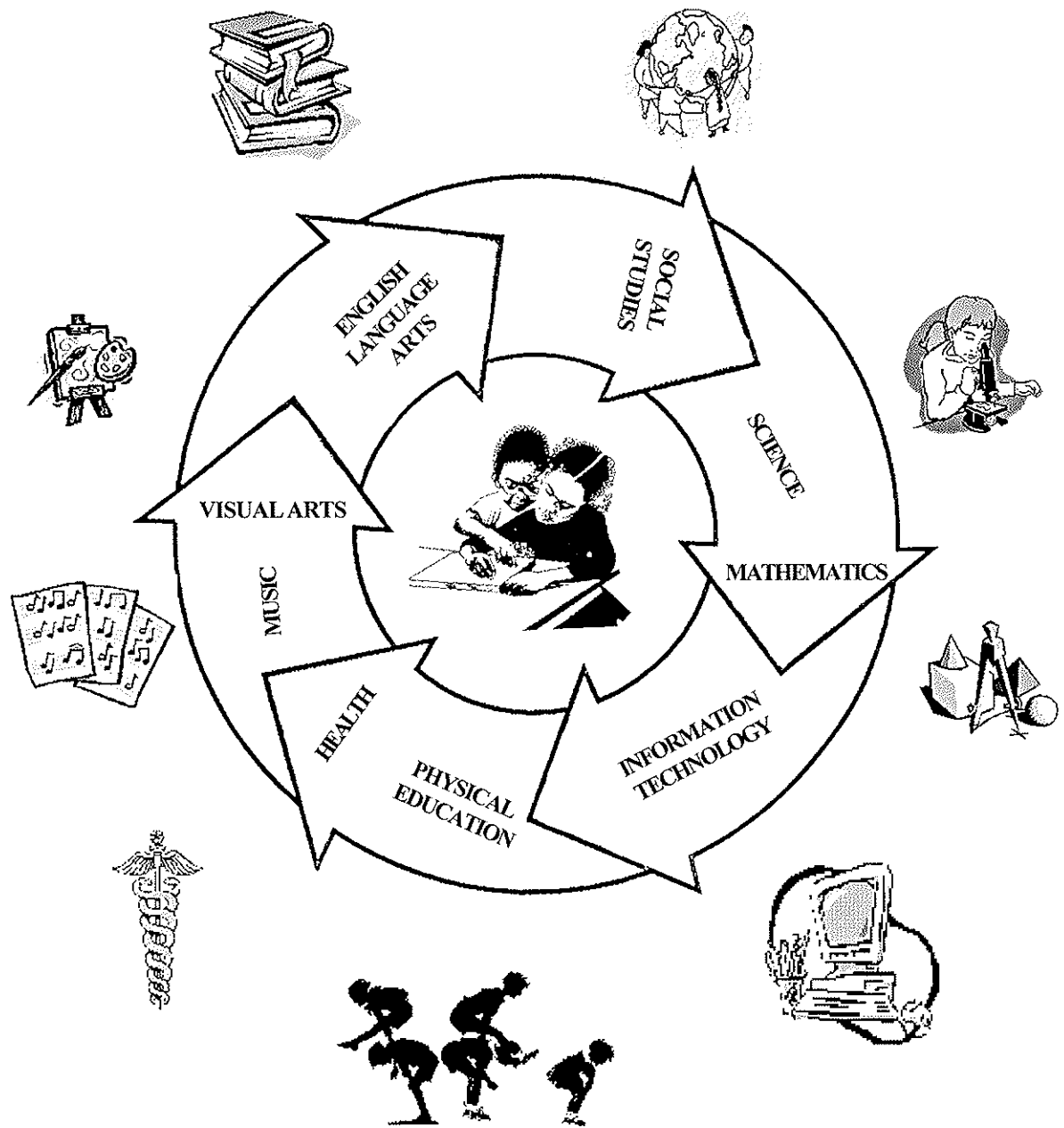
A - Number Sense

B - Patterns and Relationship

C - Shape and Space (Shape)

D – Shape and Space (Measurement)

E - Data Handling



Module A

MATHEMATICS

Module Title: Number Sense

Sequence Reference: P2 MT-A

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

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Time allotted: 8 weeks

Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.2 - 2.4 Structure
- 3.1, 3.2, 3.3, 3.4, 3.5, 3.7 Acquisition
- 4.1, 4.2, 4.3, 4.5, 4.6, 4.7 Communication
- 5.1, 5.2, 5.3, 5.4, 5.6 Cognition
- 6.1 - 6.4 Applications

Content Focus:

- Number
- Number Systems
- Number Operations

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- construct meaning of whole numbers
- count orally to 100 by ones, twos, fives and tens
- recognize numerals up to 100
- count backwards in ones from 20 and tens from 100
- build and describe sets of objects (1 to 50)
- explore numbers up to 100 using manipulatives and the computer or calculator
- find one more/one less than any number from 1 to 100
- recognize, build, compare and order sets of objects using ordinal numbers up to tenth
- manipulate numbers to the value of 20
- explore and discuss patterns using mathematical terms such as odd and even and relationships such as $2 + 3 = 5$, $3 + 2 = 5$, $5 - 2 = 3$, $5 - 3 = 2$
- apply problem solving approaches
- know number facts up to 10
- add and subtract 2-digit numbers
- explain their thinking using diagrams, pictures, charts, words or symbols
- understand multiplication as repeated addition by describing an array (2 sets of 4)
- understand division as repeated equal subtraction
- share equally a whole and describe the separate parts
- recognize and use odd and even numbers
- experiment with situations that show division as grouping or sharing
- explain the results of mathematical explorations using diagrams, pictures, charts or words
- interpret information and results in context
- pose and solve problems related to number sense
- make up and tell stories
- identify Bermuda money and recognize relationships amongst coins

- whole numbers
- ordinal numbers
- skip counting
- comparisons
- ordering
- even/odd
- place value
- estimation
- money – identification, value and equivalent amounts
 - addition
 - subtraction
- multiplication – equal groups/ sets
- division – equal groups
- patterns
- problem solving
- mathematical reasoning
- communication

Module Title: Number Sense	Sequence Reference: P2 MT-A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense

Sequence Reference: P2 MT-A

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Cumulative test
- Portfolios
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

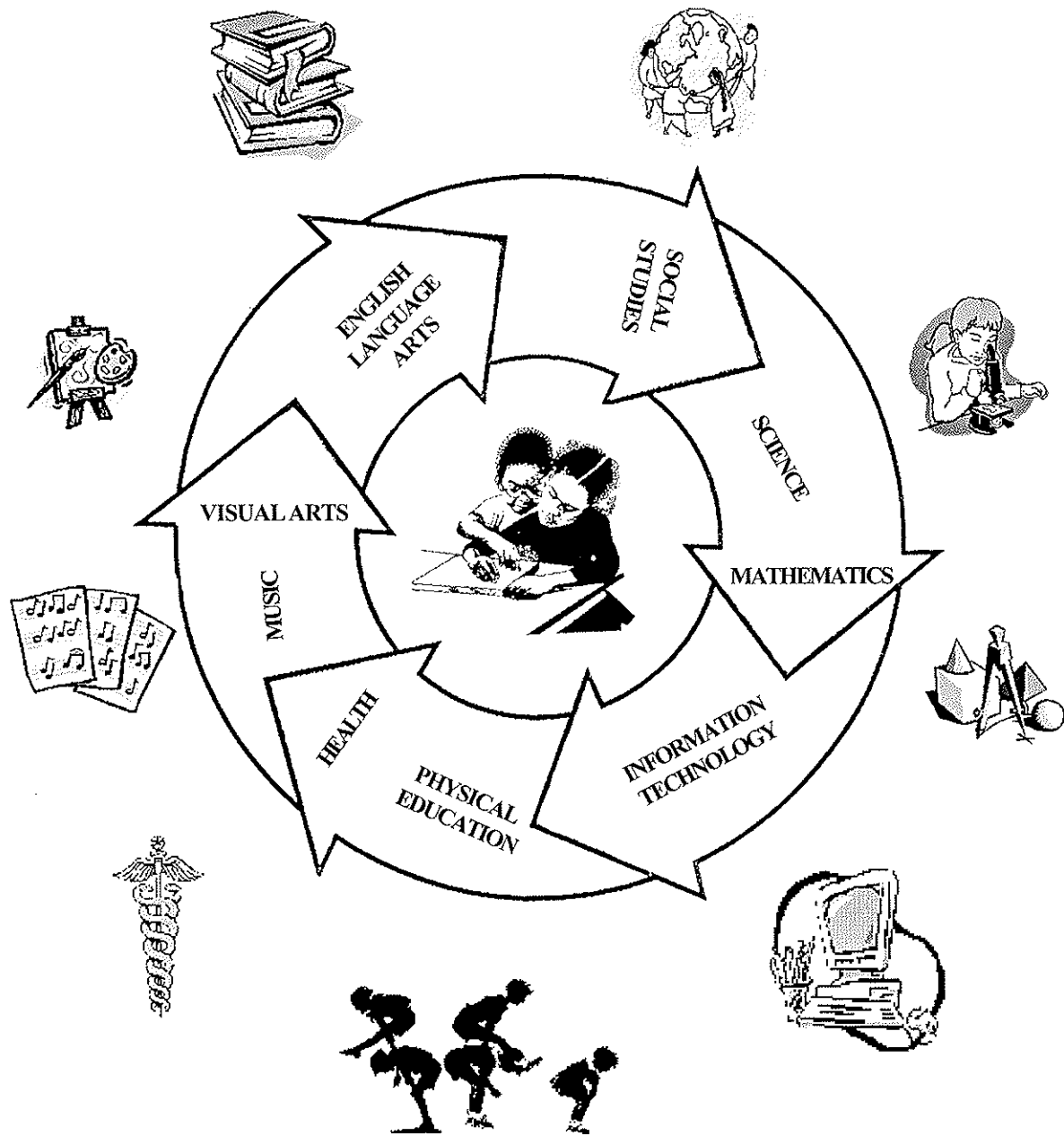
- Math Advantage Teacher Resource Kit, Grade 2
- Internet

References - Student:

- Math Advantage Grade 2
- Mighty Math Carnival Countdown

Glossary:

- refer to text



Module B

MATHEMATICS

Module Title: Patterns and Relationships Time allotted: 14 weeks	Sequence Reference: P2 MT-B						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☒	☐	☐	☐	☐
Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.5 Structure 3.1, 3.3, 3.5, 3.6, 3.7 Acquisition 4.1, 4.3 - 4.7 Communication 5.2, 5.3, 5.5 Cognition 6.1 – 6.2 Application	Content Focus: - Relationships - Patterns - Algebraic Thinking						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - sort objects by colour, shape, size and/or number - classify objects by identifying various attributes - describe and make predictions about concrete and pictorial patterns - identify patterns in related addition and subtraction sentences e.g. fact families for sums to 20 - discover patterns and relationships between and amongst numbers, objects and pictures - create and extend patterns using actions, manipulatives, diagrams, numbers and spoken terms - model addition and subtraction using symbols - describe qualitative change				- cause and effect relationships - sorting - classifying - pattern exploration - rhythmic patterns - shape and colour patterns - pattern rules - patterns - copying, creating, extending - addition and subtraction - problem solving strategies (looking for a pattern)			

Module Title: Patterns and Relationships	Sequence Reference: P2 MT-B
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics - students growing taller • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge(can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Patterns and Relationships

Sequence Reference: P2 MT-B

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Portfolios
- Projects
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

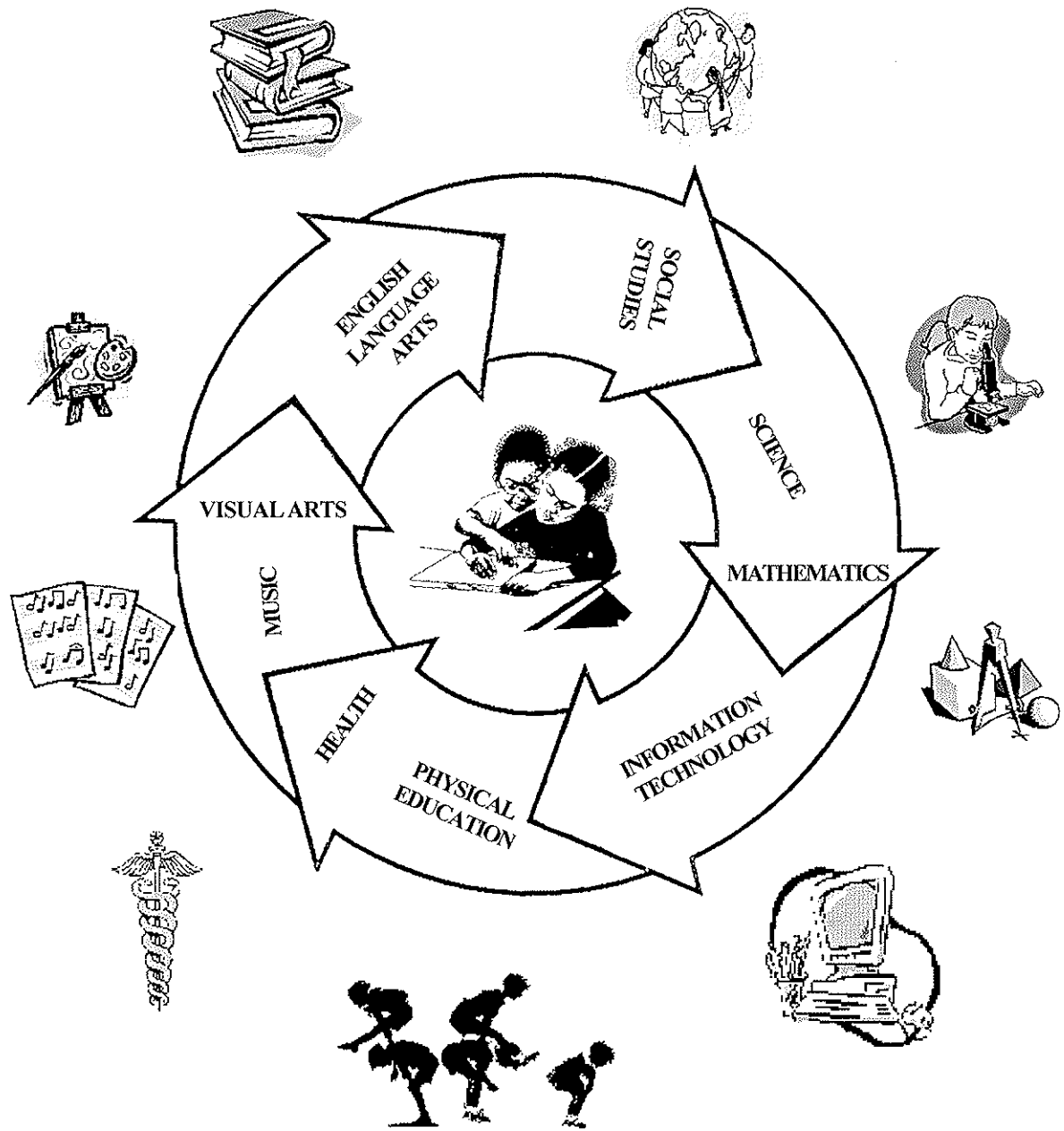
- Math Advantage Teacher Resource Kit, Grade 1
- Internet

References - Student:

- Math Advantage Grade 1
- Mighty Math Carnival Countdown

Glossary:

- refer to text



Module C

MATHEMATICS

Module Title: Shape and Space (Shape)

Sequence Reference: P2 MT-C

Time allotted: 2 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6



Subgoal Emphasis:

- 1.1 – 1.3 Appreciation
- 2.1 – 2.5 Structure
- 3.5, 3.7 Acquisition
- 4.1, 4.3, 4.4, 4.6, 4.7 Communication
- 5.2, 5.3, 5.6 Cognition
- 6.1 – 6.2 Application

Content Focus:

- Geometry
- Patterning

Curriculum Objectives:

Content Detail:

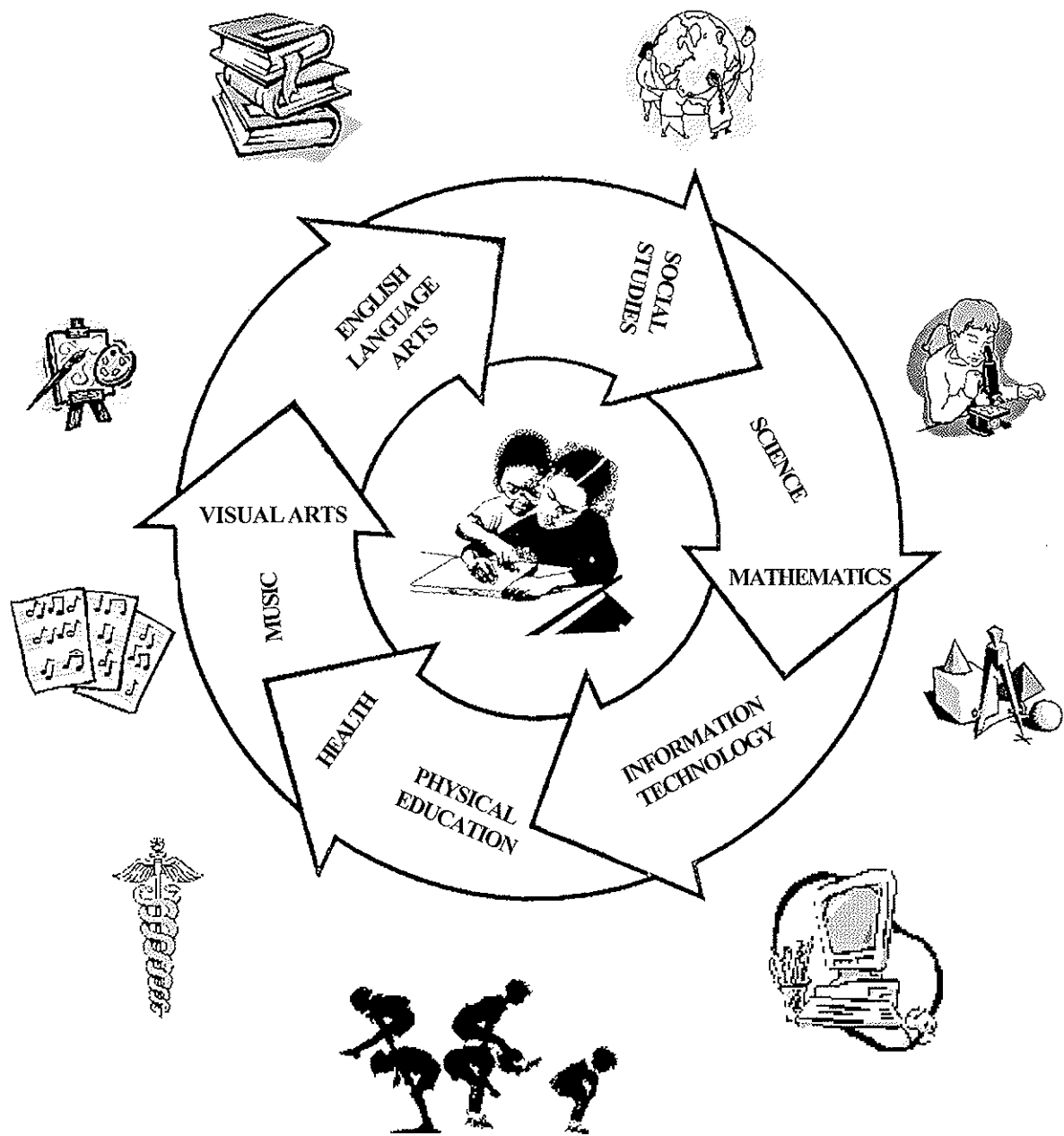
At the end of this module, students will:

- explore real world and three dimensional objects
- match three dimensional objects and two dimensional shapes
- describe the attributes of real world and three dimensional objects using descriptive attributes
- identify lines
- examine attributes of solids
- compare geometric figures to real world objects
- construct three-dimensional objects using concrete materials (modelling materials, blocks, boxes, multilinks, pattern blocks, construction sets)
- sort and classify three dimensional objects and two dimensional shapes by properties
- combine two dimensional shapes to make pictures
- predict the result of putting shapes together and taking them apart
- recognize congruent shapes
- recognize symmetry in the environment
- explore turns, slides and flips
- explore geometric figures in various positions
- explore shapes using technology

- 2 dimensional shapes
 - circle, square, rectangle, triangle, hexagon, rhombus
- solid shapes
 - cone, pyramid, cylinder, sphere
- sizes – small, medium, large
- patterns, shape and colour
- construction of three dimensional objects
- communication
- congruency of shapes
- symmetry
- movability - turn, slide, flip
- side, face, line, edge
- grid – intersecting line
- positions
 - right, up

Module Title: Shape and Space (Shape)	Sequence Reference: P2 MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking - two dimensional shapes - create patterns using three dimensional objects and two dimensional shapes - create pictures of objects in the environment using cooperative work • whole class • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Shape)	Sequence Reference: P2 MT-C
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 1 • Internet	• <u>Math Advantage</u> Grade 1 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	



Module D

MATHEMATICS

Module Title: Shape and Space (Measurement)

Sequence Reference: P2 MT-D

Time allotted: 6 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6



Subgoal Emphasis:

- 1.1 – 1.3 Appreciation
- 2.1, 2.2, 2.4 Structure
- 3.1, 3.2, 3.3, 3.5, 3.6 Acquisition
- 4.1, 4.2, 4.3, 4.5, 4.6 Communication
- 5.3 Cognition
- 6.2 – 6.4 Application

Content Focus:

- Measurement

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- use appropriate vocabulary to describe measurement attributes of objects
- explore measurement attributes of length, weight and time
- examine objects using non standard units of measure
- estimate using non standard units of measure
- represent the results of measurement activities using concrete materials
- explore and order events in oral and pictorial form
- tell time by the hour and half hour on the analog and digital clock
- explore the calendar
- compare temperature of different countries
- read a thermometer
- explore money through play
- recognizes coins 1¢, 5¢, 10¢, 25¢, \$1
- demonstrate understanding of the value of coins to \$1
- create equivalent sets of coins up to \$1 using different coin combinations
- represents money in symbol and written form
- pose and solve real life problems based on money or measures

- measuring instruments
 - ruler, measuring tape, yardstick, metre stick, height chart, centimetre cubes, learning links, trundle wheel
- liquid and dry measure
 - cups, metric and customary containers
 - balance scale, spring scale, bathroom scale
- clock
- comparisons
 - long/short; longer/shorter; longest/shortest
 - thick/thin etc.; nearer/farther etc.
 - heavy/light; heavier/lighter; heaviest/lightest
 - empty/full
 - more/less; most/least
- units of measure
 - centimetre, metre, inch
- area
- first, next, last
- morning, afternoon, night
- day, week, month, year
- season
- time
 - before-after
- o'clock, hour, minute, hand
- clock, digital, analog
- temperature
 - warm, hot, cold, cool, icy
- thermometer
- coins:-dime, nickel, penny, quarter, dollar

Module Title: Shape and Space (Measurement)	Sequence Reference: P2 MT-D
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • explore using different measures • compare using different measures • sort and classify using a variety of measures • arrange/order using different measures • cover a surface using a variety of objects • explore empty and full • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Measurement)

Sequence Reference: P2 MT-D

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Portfolios
- Projects
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- objects to be measured (e.g. rocks, sand etc)
- visit to weather station
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment
- carpenters (craftsmen)
- architects

References - Teacher:

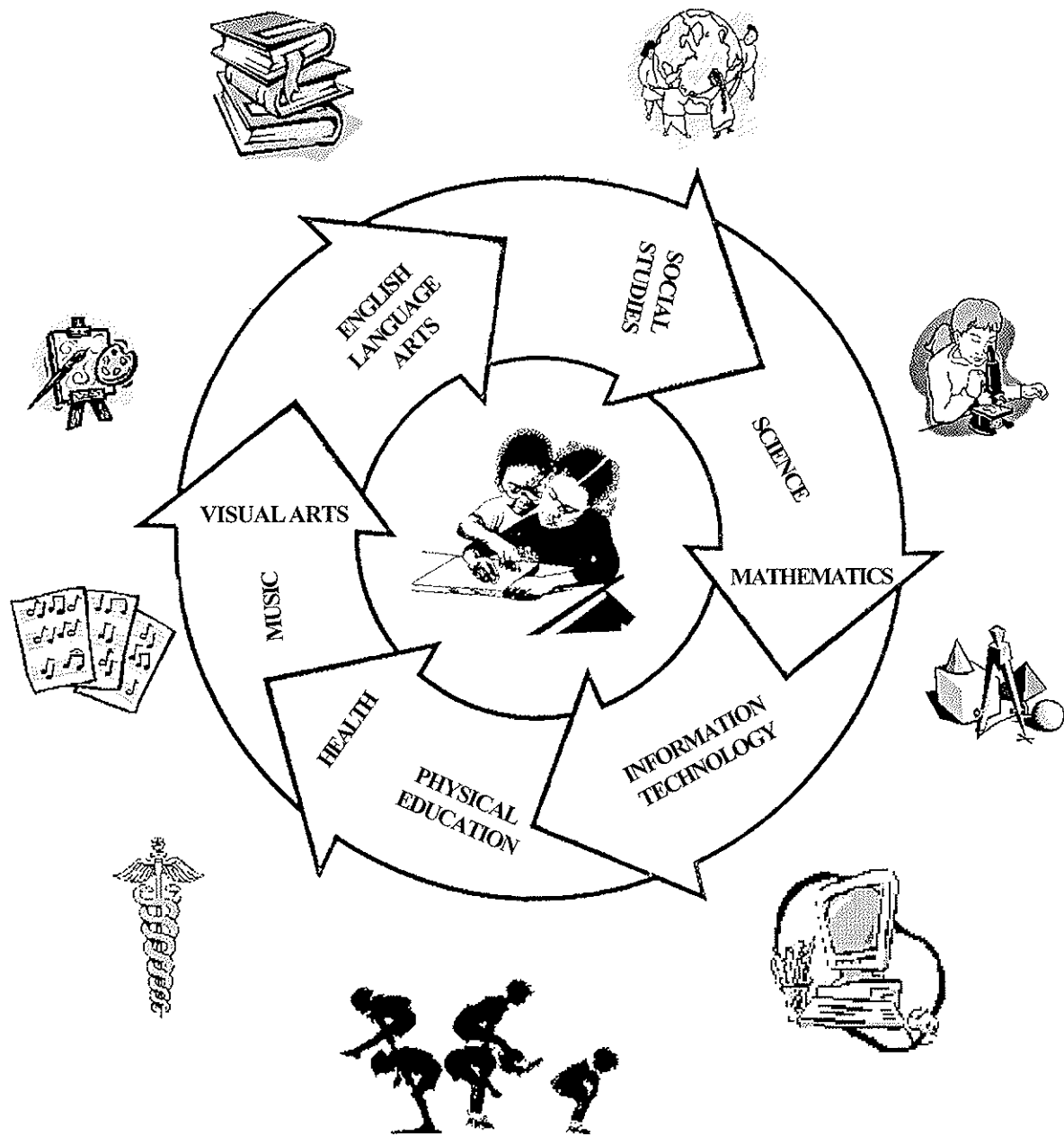
- Math Advantage Teacher Resource Kit, Grade 1
- Internet

References - Student:

- Math Advantage Grade 1
- Mighty Math Carnival Countdown

Glossary:

- refer to text



Module E

MATHEMATICS

Module Title: Data Handling

Sequence Reference: P2 MT-E

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

☐
☐
☒
☐
☐
☐
☐

Time allotted: 3 weeks

Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.5 Structure
- 3.1 - 3.6 Acquisition
- 4.1, 4.2, 4.3, 4.5, 4.6, 4.7 Communication
- 5.1 - 5.4 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Probability
- Data Handling

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- collect data about themselves and their surroundings
- organize data based on one attribute chosen by teacher or students
- display data using concrete objects or pictures
- compare data using appropriate language
- explore concepts of chance and risk

- one-to-one correspondence
- surveys
- data collection, comparison
- graphs – human, concrete object, pictorial, symbolic
- probability

Module Title: Data Handling	Sequence Reference: P2 MT-E
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Data Handling	Sequence Reference: P2 MT–E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 1 • Internet	• <u>Math Advantage</u> Grade 1 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	

Mathematics - P3

Level Code: P3 MT



MINISTRY OF EDUCATION

Bermuda
2001

**PRIMARY SCHOOL
PHASE A OVERVIEW**

Subject Title: Mathematics

Subject Code: P3 MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRIMARY THREE (P3) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Problem solving tasks - Reteach, practical, enrichment worksheet - Discussions - Oral presentations - Cooperative group work	30%
• Product Assessment - Portfolio work sample* - Chapter tests - Review tests - Module tests - Cumulative tests	50%
• Written Assessment - Journal writing - Project (group, individual) - Assignments (home, school) - Formative assignment (inventory test)	20%
Total	100%

*could also include family response sheet

MATERIALS OF INSTRUCTION (Adopted Text)

Burton Grace M., Maletsky, Evan M. Math Advantage, Orlando, FL., Harcourt International, 1999.

PHASE A OUTLINE

P1 Module Titles A - E	P2 Modules Titles A - E	P3 Modules Titles A - E
A. Number Sense 12 - number systems - ordinal numbers - money - odd and even	A. Number Sense 8 - skip counting - ordering - place value - multiplication - division	A. Number Sense 14 - estimation - rounding - decimals - basic operations - mathematical reasoning
B. Patterns and Relationships 12 - cause and effect relationships - sorting - classifying - pattern explorations - pictorial addition and subtraction sentences - number sentences - oral story problems	B. Patterns and Relationships 14 - rhythmic patterns - pattern rules - addition and subtraction patterns - problem solving strategies (looking for a pattern)	B. Patterns and Relationships 6 - predicting number patterns - multiplication - practical application of division
C. Shape and Space (Shape) 2 - circles, squares, rectangles, triangles - sizes (small, medium, large) - left to right progression - construction - movement of figures	C. Shape and Space (Shape) 2 - 2 dimensional shapes (including hexagon and rhombus) - solids (cone, pyramid, cylinder, sphere) - congruency - symmetry - grid (intersecting line)	C. Shape and Space (Shape) 4 - 3 dimensional figures (cone, pyramid, cylinder and sphere) - lines of symmetry - transformations - lines (vertical horizontal, diagonal and intersecting)
D. Shape and Space (Measurement) 5 - long-short - height - heavy-light - more-less/most-least - first, next, last - before, after - temperature vocabulary - exploration of money	D. Shape and Space (Measurement) 6 - measurement tools - liquid and dry measure - scales - types of measure - thermometer - money value (all coins)	D. Shape and Space (Measurement) 6 - mass (g, kg, m, oz, lb) - time (minute, hr, day) - square measurement - time (intervals) - increments - degrees - money (bills)

E. Data Handling	3	E. Data Handling	4	E. Data Handling	4
- one-to-one correspondence		- more, less		- tallies (charts, tables, bar	
- conducting surveys		- compare		graphs, pictographs, Venn	
- counting objects		- title, label		diagrams)	
- sorting		- data (information)		- never, sometimes, always	

Subtotal	34	Subtotal	34	Subtotal	34
Optional Weeks	<u>4</u>	Optional Weeks	<u>4</u>	Optional Weeks	<u>4</u>
Total Weeks	38	Total Weeks	38	Total Weeks	38

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☒ P4 ☐ P5 ☐ P6 ☐

Mathematics

GOALS		SUBGOALS		MODULE & CURRICULUM CORRELATION MATRIX				
1	Appreciation	1.1	Interrelationships	x	x	x	x	x
		1.2	Successful Experiences	x	x	x	x	x
		1.3	Significance	x	x	x	x	x
2	Structure	2.1	Comparison		x	x	x	x
		2.2	Appreciation	x	x	x	x	x
		2.3	Evaluation	x	x	x		x
		2.4	Generalization	x	x	x	x	x
		2.5	Interpretation	x	x	x		x
3	Acquisition	3.1	Application of Number Concepts	x	x		x	
		3.2	Estimation	x				
		3.3	Multiple Representations	x	x		x	x
		3.4	Data Handling	x		x		x
		3.5	Geometric and Measurement Properties	x	x	x	x	x
		3.6	Algebraic Procedures	x	x		x	
		3.7	Technology		x	x		
4	Communication	4.1	Ideas and Concepts	x	x		x	
		4.2	Formulae and Terminology	x	x		x	
		4.3	Oral/Written	x	x	x	x	
		4.4	Generalization	x	x	x	x	x
		4.5	Symbolic notation	x	x		x	
		4.6	Manipulatives and Technology	x	x	x	x	
		4.7	Evaluation	x				
5	Cognition	5.1	Confidence in Problem Solving	x				
		5.2	Evaluation	x	x	x		x
		5.3	Technology	x	x	x	x	x
		5.4	Application	x		x	x	x
		5.5	Evaluation of Reasonableness		x	x	x	
		5.6	Modelling			x	x	
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
B - Patterns and Relationship
C - Shape and Space (Shape)

D - Shape and Space (Measurement)
E - Data Handling

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☒ P4 ☐ P5 ☐ P6 ☐

Mathematics

6	Application	6.1	Problem Solving Strategies	x	x			
		6.2	Decision Making	x	x		x	x
		6.3	Real World Issues				x	x
		6.4	Lifelong Skills				x	x
CONTENT STRUCTURE		Number Sense		x	x	x	x	x
		Patterns and Relationships			x	x	x	
		Shape and Space (Shape)						x
		Shape and Space (Measurement)						
		Data Handling						x
		MODULES		A	B	C	D	E

MODULE KEY

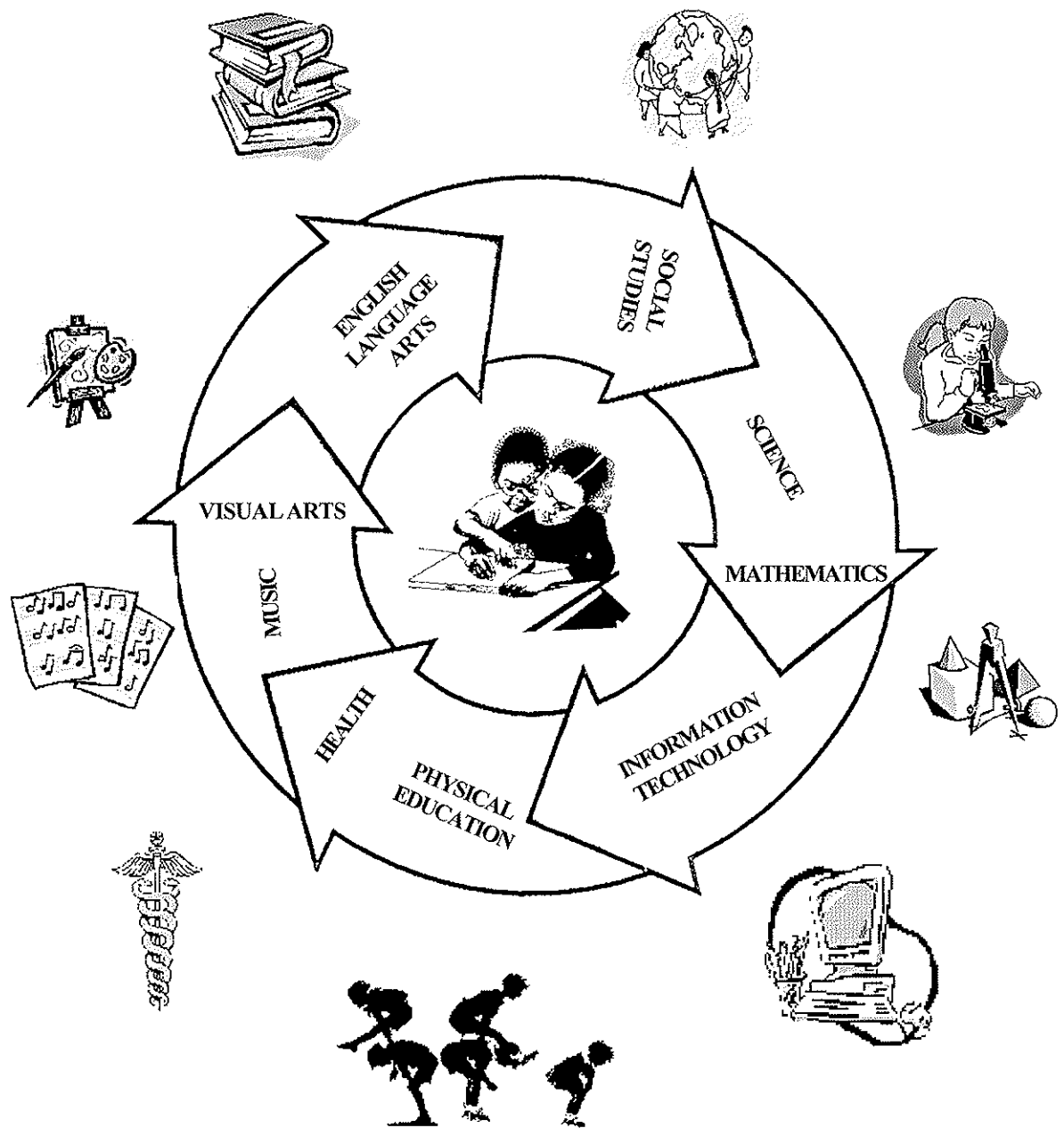
A - Number Sense

B - Patterns and Relationship

C - Shape and Space (Shape)

D - Shape and Space (Measurement)

E - Data Handling



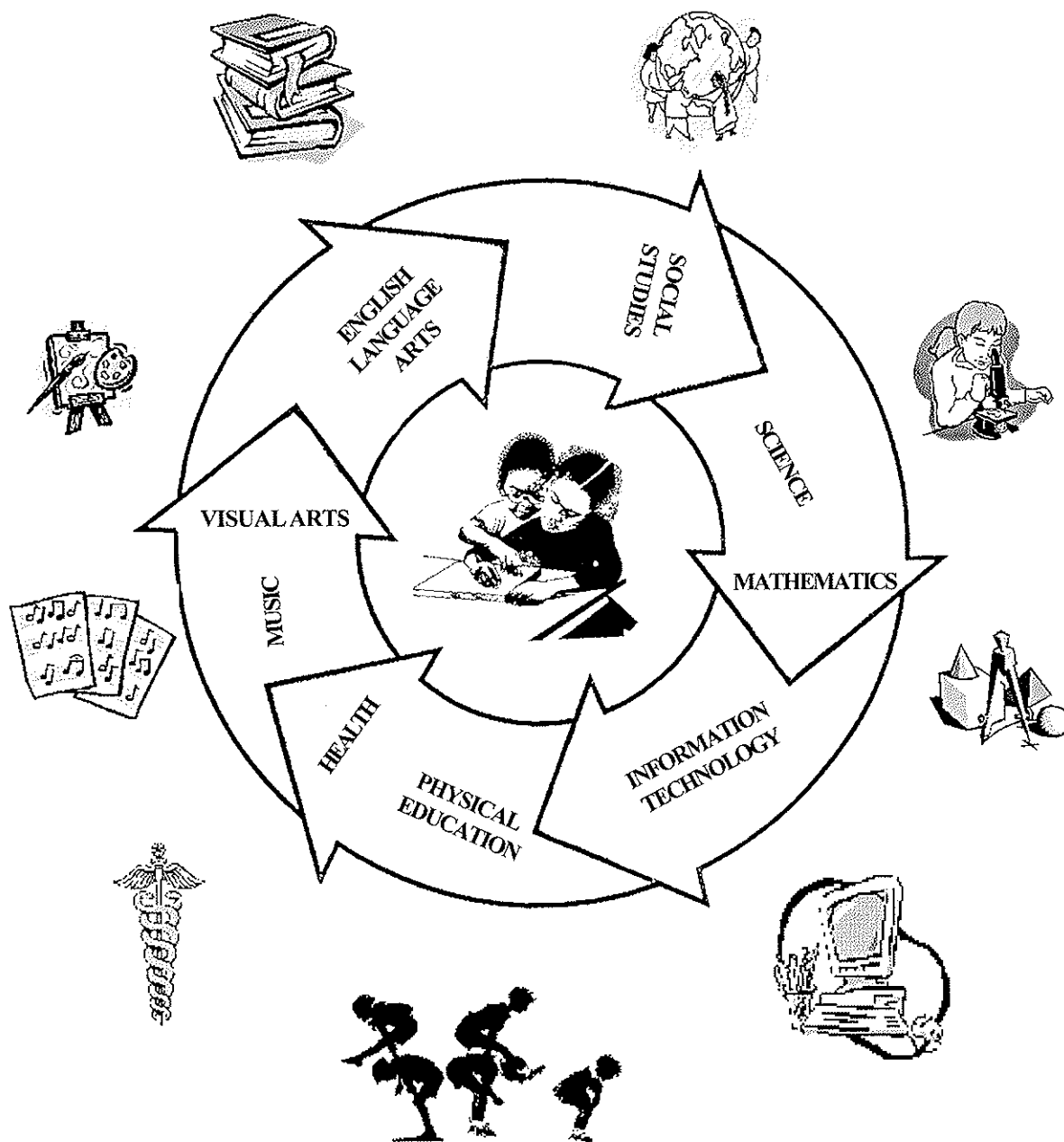
Module A

MATHEMATICS

Module Title: Number Sense	Sequence Reference: P3 MT-A						
Time allotted: 14 weeks	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☐	☒	☐	☐	☐
Subgoal Emphasis: 1.1 - 1.3 Appreciation 2.2 - 2.5 Structure 3.1 - 3.6 Acquisition 4.1 - 4.7 Communication 5.1 - 5.4 Cognition 6.1 - 6.2 Application				Content Focus: - Number - Number Systems - Number Operations			
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - construct meaning of whole numbers - count orally by ones, twos, fives and tens up to 1000 - recognize numerals up to 1000 - count/group numbers up to 1000 - explore number operations using a variety of tools - find one more/one less than numbers from 1 to 1000 - compare and order sets of objects using ordinal numbers up to thirty-first - demonstrate the conservation of numbers - identify and discuss patterns in relationship to numerical, spatial or practical - apply appropriate problem solving strategies - check for reasonableness of solutions - know number facts up to 18 - add 2-digit numbers with regrouping and know the terms related to addition (sum, total, altogether) - subtract 2 digit numbers with regrouping and using zero as place holder; know the terms related to subtraction - understand and apply the concept of multiplication; - know multiplication facts for 2s, 5s, 10s - model, create and describe division situations in which a set of objects is separated into equivalent sets - explore fact families - use words such as more than, fewer than and difference to write number sentences - know division facts relating to 2s, 5s, and 10s; know and use tests of divisibility for 2s, 5s, and 10s - represent and apply common fractions, including tenths, using concrete materials - name a fractional part of a set and recognize this operation as sharing (dividing) - determine the value of a collection of coins to \$1 - explain the results of mathematical explorations				- whole numbers - whole numbers – read, write, order and compare - skip counting - odd/even - comparisons - ordering - place value - money – identification & value & equivalent amounts - fractions - basic operations : +, −, x - patterns - problem solving - mathematical reasoning - communication			

Module Title: Number Sense	Sequence Reference: P3 MT-A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense	Sequence Reference: P3 MT-A
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades.	
• Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources:	
(materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items)	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit Grade 2 • Internet	• <u>Math Advantage</u> Grade 2 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	



Module B

MATHEMATICS

Module Title: Patterns and Relationships Time allotted: 6 weeks	Sequence Reference: P3 MT-B						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☐	☒	☐	☐	☐
Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.5 Structure 3.1, 3.3, 3.5, 3.6, 3.7 Acquisition 4.1 – 4.6 Communication 5.2, 5.3, 5.5 Cognition 6.1, 6.2 Application	Content Focus: - Relationships - Patterns - Algebraic Thinking						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - sort objects by colour, shape, size or number - classify objects by identifying various attributes - explore relationships between addition and subtraction - identify number relationships and number patterns - write number sentences to represent mathematical patterns and relationships (addition and multiplication) - make predictions, form generalizations and communicate ideas about patterns e.g. odd and even; (counting in fives, tens etc.) - create number and non number patterns - solve problems related to patterns and relationships - create and extend patterns using actions, manipulatives, diagrams and spoken terms - describe quantitative change				- cause and effect relationships - predictions - number patterns - rhythmic patterns - shape and colour patterns - pattern rules - patterns - creating, extending - addition, subtraction and multiplication patterns - practical application of division - number sentences - problem solving strategies (looking for a pattern) - Venn diagrams			

Module Title: Patterns and Relationships

Sequence Reference: P3 MT-B

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Portfolios
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

- Math Advantage Teacher Resource Kit, Grade 2
- Internet

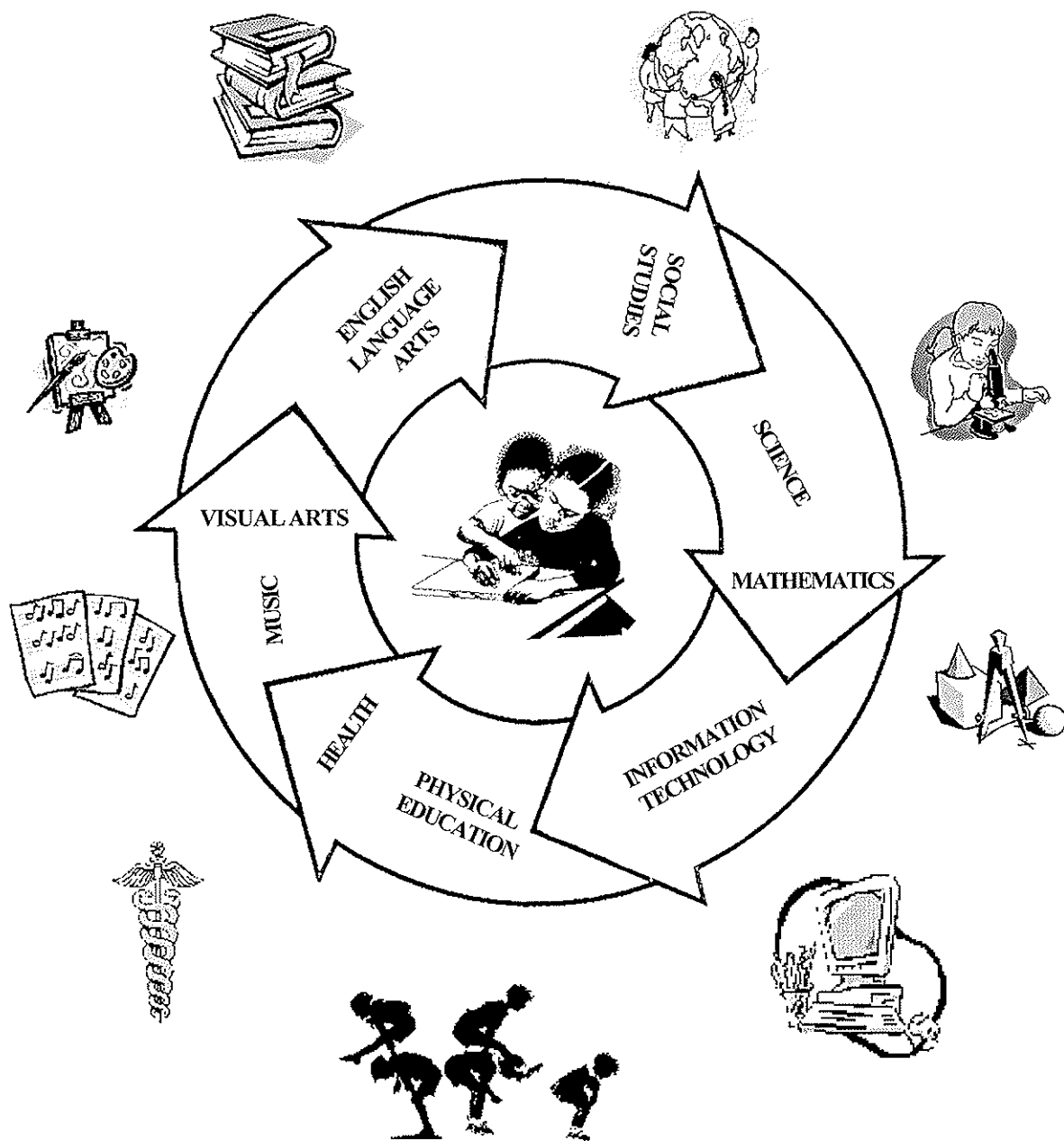
References - Student:

- Math Advantage Grade 2
- Mighty Math Carnival Countdown

Glossary:

- refer to text

Module Title: Patterns and Relationships	Sequence Reference: P3 MT-B
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • students growing taller by 2 inches • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations



Module C

MATHEMATICS

Module Title: Shape and Space (Shape)

Sequence Reference: P3 MT-C

Time allotted: 4 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6



Subgoal Emphasis:

- 1.1 – 1.3 Appreciation
- 2.1 – 2.5 Structure
- 3.4, 3.5, 3.7 Acquisition
- 4.3, 4.4, 4.6 Communication
- 5.2 – 5.6 Cognition

Content Focus:

- Geometry
- Patterning

Curriculum Objectives:

Content Detail:

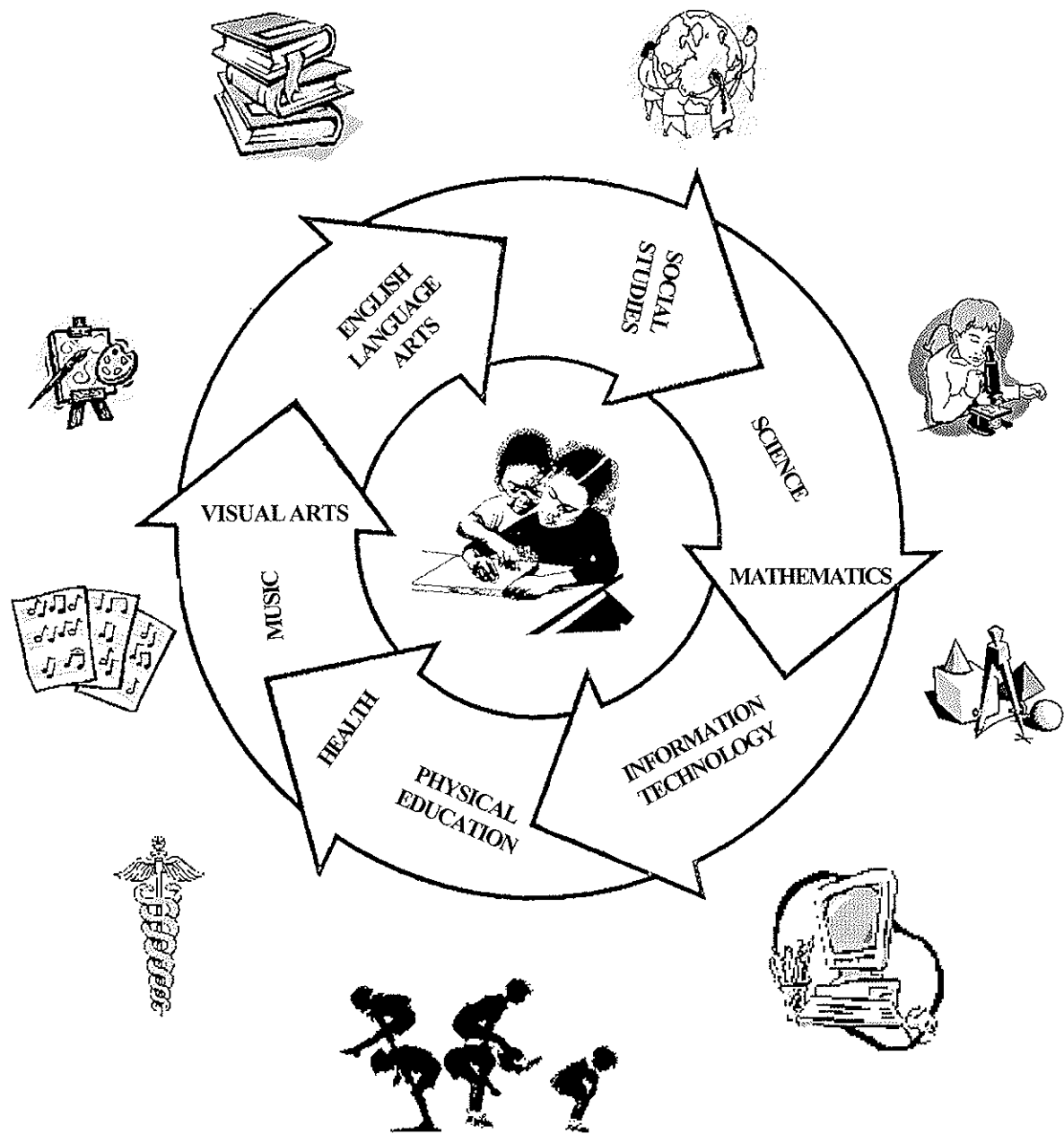
At the end of this module, students will:

- explore and describe the attributes of real world and three dimensional objects
- identify lines and angles
- compare geometric figures to real world objects
- construct three-dimensional objects using concrete materials (modelling materials, blocks, boxes, multi-links, pattern blocks, construction sets)
- identify and describe two dimensional shapes
- sort and classify three dimensional objects and two dimensional shapes by properties.
- know the properties of and construct congruent shapes (geoboards, dot paper)
- recognize symmetry in the environment
- identify geometric figures in various positions and orientations
- recognize and apply slides, flips and turns
- pose and solve problems related to shape and space
- explore shapes using technology

- two dimensional shapes
 - circle, square, rectangle, triangle
- three dimensional figures – cone, pyramid, cylinder, sphere
- sizes – small, medium, large
- patterns, shape and colour
- construction
- communication
- congruency
- symmetrical figures
- lines of symmetry
- side, face, line, edge, angle
- lines- vertical, horizontal, diagonal, intersecting
- grid – intersecting lines, positions-right, up

Module Title: Shape and Space (Shape)	Sequence Reference: P3 MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking - create pictures of objects in the environment using two - dimensional shapes - create patterns using three dimensional objects and - two dimensional shapes - combine two dimensional shapes to make pictures • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Shape)	Sequence Reference: P3 MT-C
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 2 • Internet	• <u>Math Advantage</u> Grade 2 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	



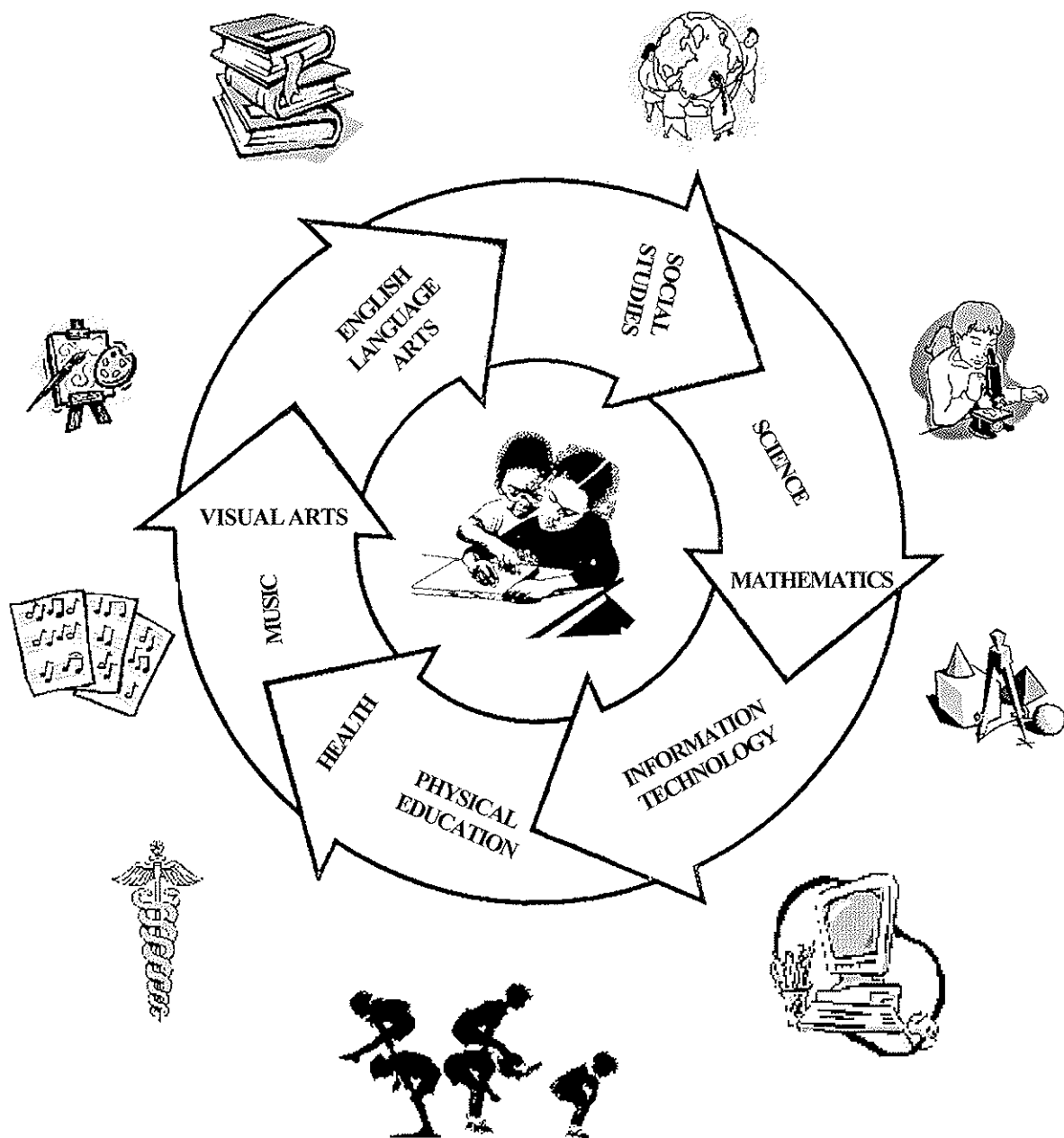
Module D

MATHEMATICS

Module Title: Shape and Space (Measurement) Time allotted: 6 weeks	Sequence Reference: P3 MT-D						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☐	☒	☐	☐	☐
Subgoal Emphasis: 1.1 - 1.3 Appreciation 2.1, 2.2, 2.4 Structure 3.1, 3.3, 3.5, 3.6 Acquisition 4.1 - 4.6 Communication 5.3 - 5.6 Cognition 6.2 - 6.4 Application	Content Focus: Measurement						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - use appropriate vocabulary to describe measurement attributes of objects - recognize the attributes of length, weight, area and time - identify instruments used in standard and non standard measurement - explore objects using non standard and standard units of measure - select the most appropriate standard unit for measuring length - use repetition of a single unit to measure something larger than the unit - describe relationship among various standard units for measuring length - explore measurement concepts using manipulatives, diagrams, spoken terms and written symbols - explore and order events in oral and pictorial form - explore perimeter - relate temperature to seasons and daily activities - understand the use of a thermometer - explore money through play - recognize coins 1¢, 5¢, 10¢, 25¢, \$1 - demonstrate an understanding of the value of coins to \$1 and bills to \$20 - create equivalent sets of coins up to \$1 using different coin combinations - create equivalent sets of bills up to \$20 using different combinations				- measuring instruments - ruler, measuring tape, yardstick, metre stick, height chart, centimetre cubes, learning links, trundle wheel - liquid and dry measure - cups, metric and customary containers - balance scale, spring scale, bathroom scale - types of measures - length (centimetre, metre, kilometre, inch, foot, mile) - mass (gramme, kilogramme, ounce, pound) - volume (litre, pint, cube, cup, quart) - time (minute, hour, day) - clock - before, after - o'clock, hour, minute, hand, second - comparisons - long/short; longer/shorter; longest/shortest - thick/thin; nearer/farther - empty/full; more/less; most/least - heavy/light; heavier/lighter; heaviest/lightest - perimeter area - square centimetre; square metre; square inch, square foot - first, next, last - morning, afternoon, night - calendar - day, week, month, year - seasons			

Module Title: Shape and Space (Measurement)	Sequence Reference: P3 MT-D
Curriculum Objectives:	Content Detail:
At the end of this module, students will: • represent money in symbolic and written form • tell time to the nearest five (5) minute interval using analog/digital clock • understand and use the calendar • read and write the day, date, month and year • solve real life problems based on money or measures	• clock, digital, analog • intervals • warm, hot, cold, cool, icy • money - dime, nickel, penny, quarter, dollar
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • represent the results of measurement activities using oral and written form; concrete materials and drawings • explore using different measures • compare using different measures • sort and classify using a variety of measures • arrange/order using different measures • explore empty and full • whole class • cooperative work • computer assisted instructions • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Measurement)	Sequence Reference: P3 MT-D
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolio • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items • objects to be measured (e.g. rocks, sand etc) • visit to weather station	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment • carpenters (craftsmen) • architects
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 2 • Internet	• <u>Math Advantage</u> Grade 2 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	



Module E

MATHEMATICS

Module Title: Data Handling

Sequence Reference: P3 MT-E

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

Time allotted: 3 weeks

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Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.5 Structure
- 3.1 - 3.6 Acquisition
- 4.1, 4.2, 4.3, 4.5, 4.6, 4.7 Communication
- 5.1, 5.2, 5.3, 5.4, 5.6 Cognition
- 6.2 - 6.4 Application

Content Focus:

- Probability
- Data Handling

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- pose questions and collect data based on first hand information
- organize data based on one attribute chosen by teacher or students
- construct data representations using concrete objects, pictures and graphs
- interpret data using appropriate language
- propose and communicate appropriate conclusions
- make inferences to solve problems
- understand how data is used in real situations to make predictions

- one-to-one correspondence
- comparisons
- surveys
- data interpretation
- graphs – human, concrete object, picture, symbols tallies, charts, tables, bar graphs, pictographs,
- probability

Module Title: Data Handling	Sequence Reference: P3 MT-E
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Data Handling	Sequence Reference: P3 MT–E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 2 • Internet	• <u>Math Advantage</u> Grade 2 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	

**PRIMARY SCHOOL
PHASE A OVERVIEW**

Subject Title: Mathematics

Subject Code: P3 MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRIMARY THREE (P3) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Problem solving tasks - Reteach, practical, enrichment worksheet - Discussions - Oral presentations - Cooperative group work	30%
• Product Assessment - Portfolio work sample* - Chapter tests - Review tests - Module tests - Cumulative tests	50%
• Written Assessment - Journal writing - Project (group, individual) - Assignments (home, school) - Formative assignment (inventory test)	20%
Total	100%

*could also include family response sheet

MATERIALS OF INSTRUCTION (Adopted Text)

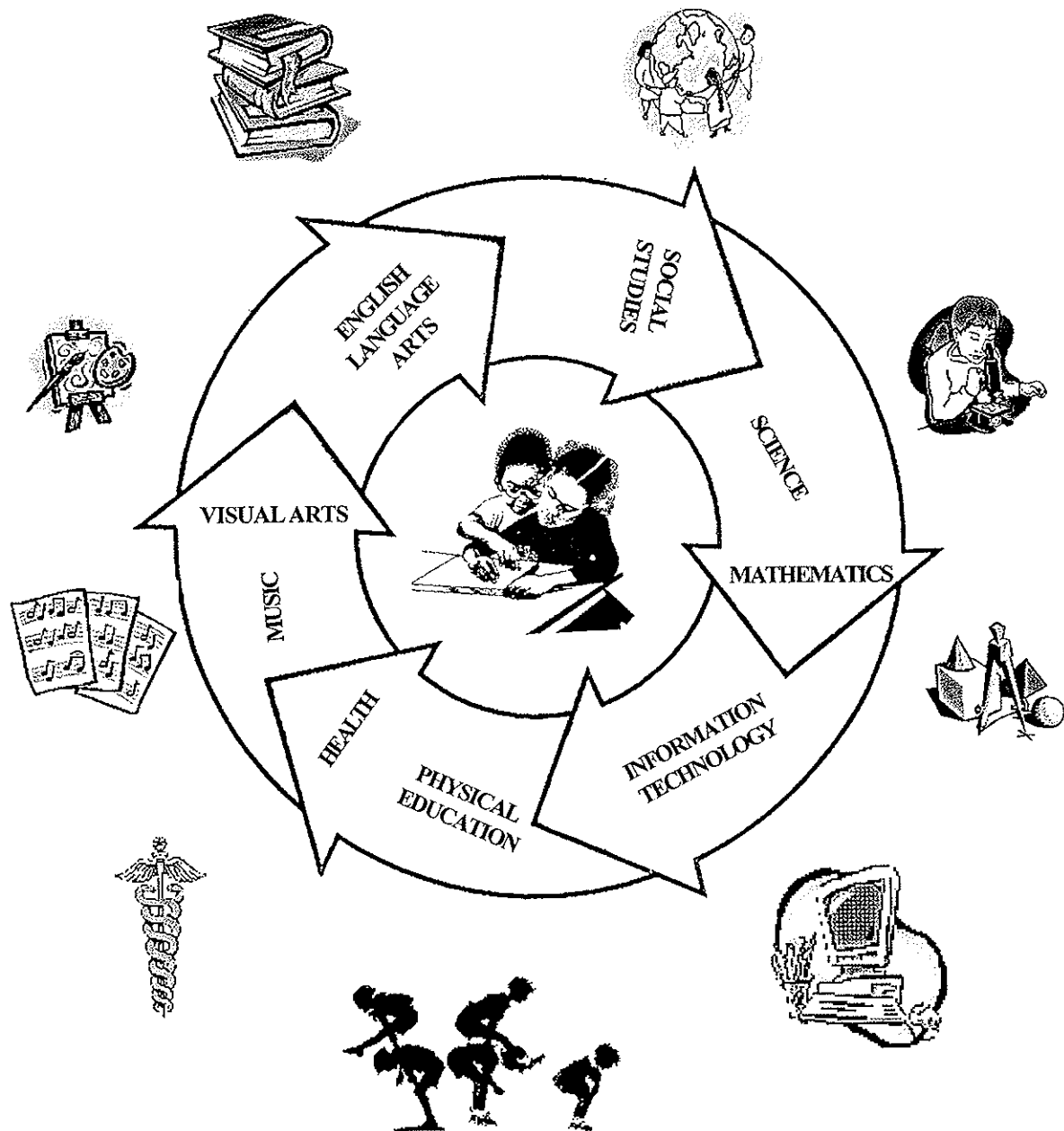
Burton Grace M., Maletsky, Evan M. Math Advantage, Orlando, FL., Harcourt International, 1999.

PHASE A OUTLINE

P1 Module Titles A - E	P2 Modules Titles A - E	P3 Modules Titles A - E
A. Number Sense 12 - number systems - ordinal numbers - money - odd and even	A. Number Sense 8 - skip counting - ordering - place value - multiplication - division	A. Number Sense 14 - estimation - rounding - decimals - basic operations - mathematical reasoning
B. Patterns and Relationships 12 - cause and effect relationships - sorting - classifying - pattern explorations - pictorial addition and subtraction sentences - number sentences - oral story problems	B. Patterns and Relationships 14 - rhythmic patterns - pattern rules - addition and subtraction patterns - problem solving strategies (looking for a pattern)	B. Patterns and Relationships 6 - predicting number patterns - multiplication - practical application of division
C. Shape and Space (Shape) 2 - circles, squares, rectangles, triangles - sizes (small, medium, large) - left to right progression - construction - movement of figures	C. Shape and Space (Shape) 2 - 2 dimensional shapes (including hexagon and rhombus) - solids (cone, pyramid, cylinder, sphere) - congruency - symmetry - grid (intersecting line)	C. Shape and Space (Shape) 4 - 3 dimensional figures (cone, pyramid, cylinder and sphere) - lines of symmetry - transformations - lines (vertical horizontal, diagonal and intersecting)
D. Shape and Space (Measurement) 5 - long-short - height - heavy-light - more-less/most-least - first, next, last - before, after - temperature vocabulary - exploration of money	D. Shape and Space (Measurement) 6 - measurement tools - liquid and dry measure - scales - types of measure - thermometer - money value (all coins)	D. Shape and Space (Measurement) 6 - mass (g, kg, m, oz, lb) - time (minute, hr, day) - square measurement - time (intervals) - increments - degrees - money (bills)

E. Data Handling 3	E. Data Handling 4	E. Data Handling 4
- one-to-one correspondence	- more, less	- tallies (charts, tables, bar
- conducting surveys	- compare	graphs, pictographs, Venn
- counting objects	- title, label	diagrams)
- sorting	- data (information)	- never, sometimes, always

Subtotal 34	Subtotal 34	Subtotal 34
Optional Weeks <u>4</u>	Optional Weeks <u>4</u>	Optional Weeks <u>4</u>
Total Weeks 38	Total Weeks 38	Total Weeks 38



Module A

MATHEMATICS

Module Title: Number Sense

Sequence Reference: P3 MT-A

Time allotted: 14 weeks

PHASE A

PHASE B

PS

P1

P2

P3

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Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.2 - 2.5 Structure
- 3.1 - 3.6 Acquisition
- 4.1 - 4.7 Communication
- 5.1 - 5.4 Cognition
- 6.1 - 6.2 Application

Content Focus:

- Number
- Number Systems
- Number Operations

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- construct meaning of whole numbers
- count orally by ones, twos, fives and tens up to 1000
- recognize numerals up to 1000
- count/group numbers up to 1000
- explore number operations using a variety of tools
- find one more/one less than numbers from 1 to 1000
- compare and order sets of objects using ordinal numbers up to thirty-first
- demonstrate the conservation of numbers
- identify and discuss patterns in relationship to numerical, spatial or practical
- apply appropriate problem solving strategies
- check for reasonableness of solutions
- know number facts up to 18
- add 2-digit numbers with regrouping and know the terms related to addition (sum, total, altogether)
- subtract 2 digit numbers with regrouping and using zero as place holder; know the terms related to subtraction
- understand and apply the concept of multiplication;
- know multiplication facts for 2s, 5s, 10s
- model, create and describe division situations in which a set of objects is separated into equivalent sets
- explore fact families
- use words such as more than, fewer than and difference to write number sentences
- know division facts relating to 2s, 5s, and 10s; know and use tests of divisibility for 2s, 5s, and 10s
- represent and apply common fractions, including tenths, using concrete materials
- name a fractional part of a set and recognize this operation as sharing (dividing)
- determine the value of a collection of coins to \$1
- explain the results of mathematical explorations

- whole numbers
- whole numbers -- read, write, order and compare
- skip counting
- odd/even
- comparisons
- ordering
- place value
- money – identification & value & equivalent amounts
- fractions
- basic operations : +, -, x
- patterns
- problem solving
- mathematical reasoning
- communication

Module Title: Number Sense	Sequence Reference: P3 MT-A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense

Sequence Reference: P3 MT-A

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Portfolios
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items)
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

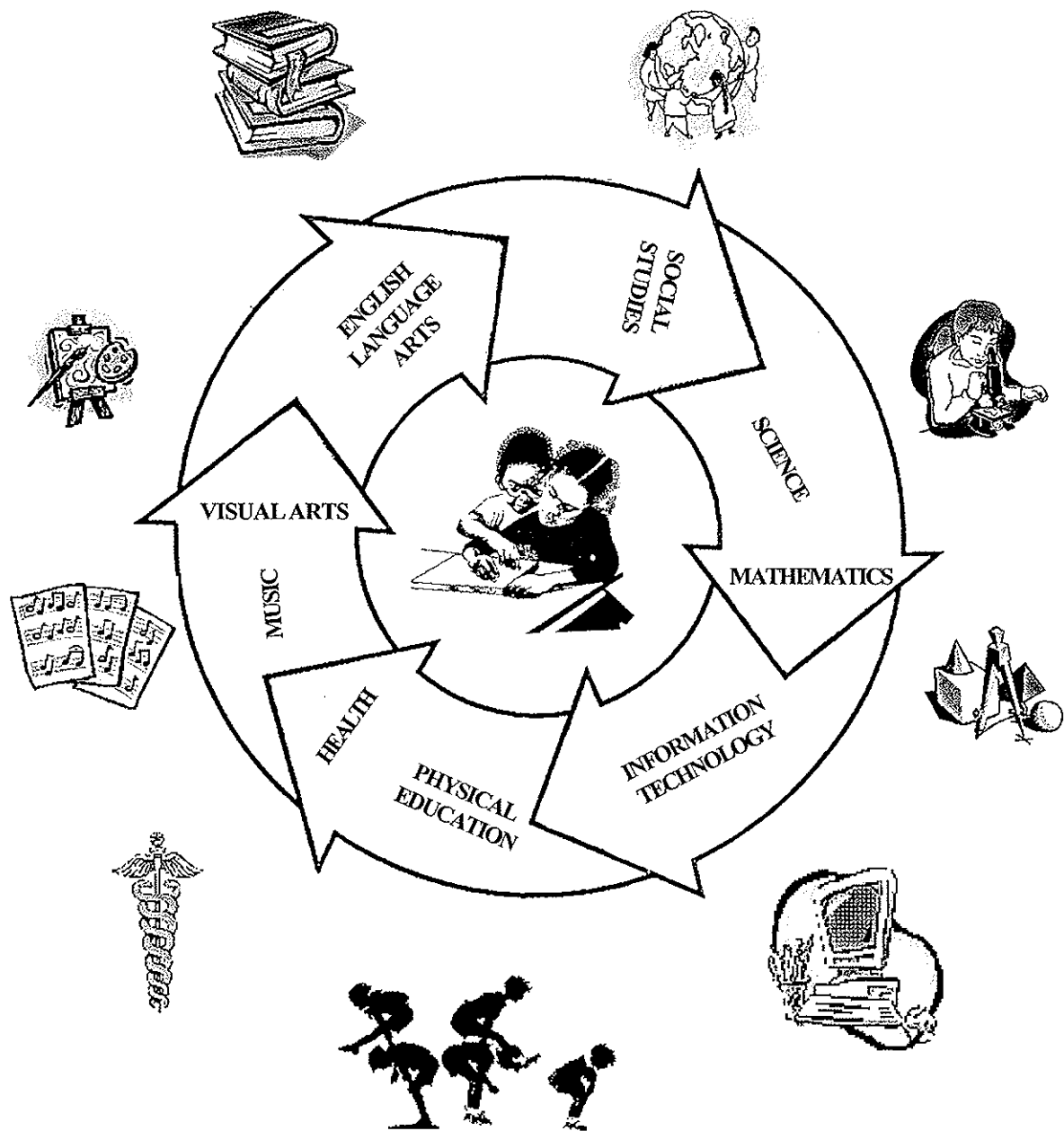
- Math Advantage Teacher Resource Kit Grade 2
- Internet

References - Student:

- Math Advantage Grade 2
- Mighty Math Carnival Countdown

Glossary:

- refer to text



Module B

MATHEMATICS

Module Title: Patterns and Relationships

Sequence Reference: P3 MT-B

Time allotted: 6 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

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Subgoal Emphasis:

- 1.1 – 1.3 Appreciation
- 2.1 – 2.5 Structure
- 3.1, 3.3, 3.5, 3.6, 3.7 Acquisition
- 4.1 – 4.6 Communication
- 5.2, 5.3, 5.5 Cognition
- 6.1, 6.2 Application

Content Focus:

- Relationships
- Patterns
- Algebraic Thinking

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- sort objects by colour, shape, size or number
- classify objects by identifying various attributes
- explore relationships between addition and subtraction
- identify number relationships and number patterns
- write number sentences to represent mathematical patterns and relationships (addition and multiplication)
- make predictions, form generalizations and communicate ideas about patterns e.g. odd and even; (counting in fives, tens etc.)
- create number and non number patterns
- solve problems related to patterns and relationships
- create and extend patterns using actions, manipulatives, diagrams and spoken terms
- describe quantitative change

- cause and effect relationships
- predictions
 - number patterns
- rhythmic patterns
- shape and colour patterns
- pattern rules
- patterns
 - creating, extending
- addition, subtraction and multiplication patterns
- practical application of division
- number sentences
- problem solving strategies (looking for a pattern)
- Venn diagrams

Module Title: Patterns and Relationships

Sequence Reference: P3 MT-B

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Portfolios
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

- Math Advantage Teacher Resource Kit, Grade 2
- Internet

References - Student:

- Math Advantage Grade 2
- Mighty Math Carnival Countdown

Glossary:

- refer to text

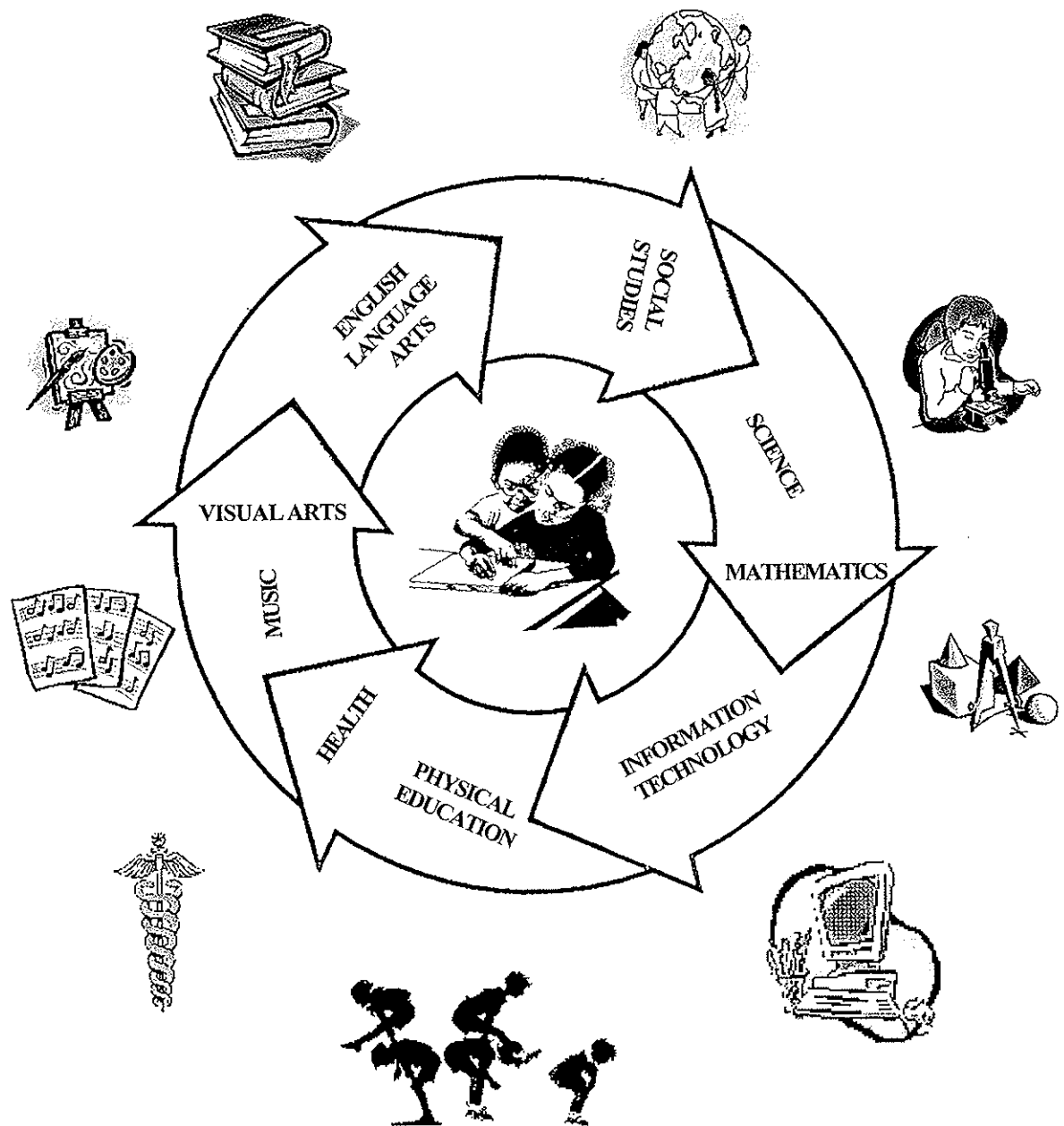
**Recommended
Instructional Strategies:**

- individualizing
- problem solving
- differentiating instruction
- critical thinking
- whole class
- cooperative work
- computer assisted instruction
- peer coaching
- use of manipulatives
- discussion of mathematics
- students growing taller by 2 inches
- questioning
- writing or drawing pictures
- content integration
- developmentally appropriate materials
- learning centres
- meaningful, relevant content
- parent/teacher relations

**Recommended Formative
Assessment Strategies:**

Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding.

- inventory test
- assessing prior knowledge (can include intervention lessons or practice activities)
- multiple – choice
- free - response
- math journals
- portfolios
- diagnostic assessment
- oral presentations
- investigations
- teacher/student conferencing
- visual presentations
- observations



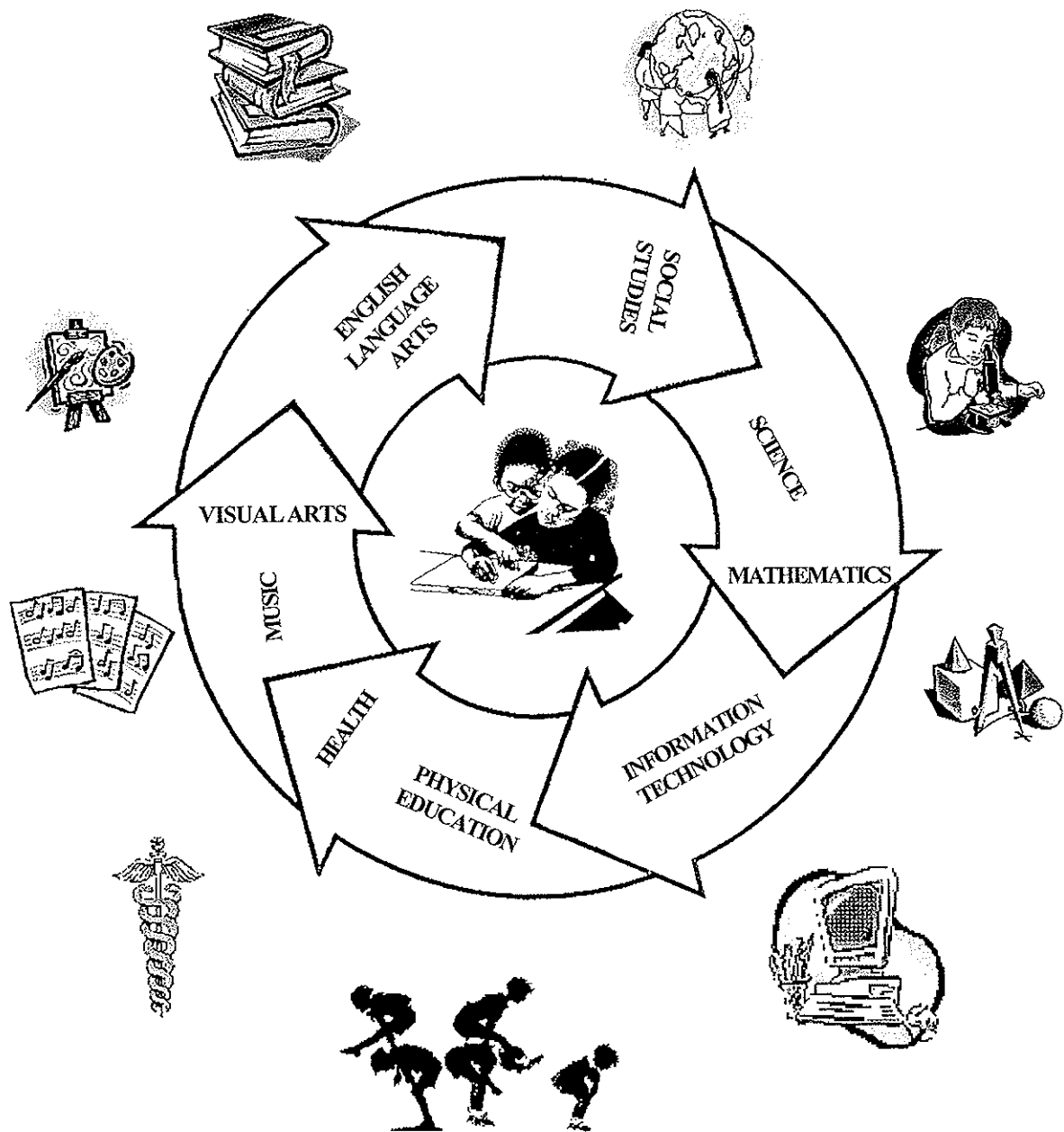
Module C

MATHEMATICS

Module Title: Shape and Space (Shape) Time allotted: 4 weeks	Sequence Reference: P3 MT-C						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☐	☒	☐	☐	☐
Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.5 Structure 3.4, 3.5, 3.7 Acquisition 4.3, 4.4, 4.6 Communication 5.2 – 5.6 Cognition	Content Focus: - Geometry - Patterning						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - explore and describe the attributes of real world and three dimensional objects - identify lines and angles - compare geometric figures to real world objects - construct three-dimensional objects using concrete materials (modelling materials, blocks, boxes, multi-links, pattern blocks, construction sets) - identify and describe two dimensional shapes - sort and classify three dimensional objects and two dimensional shapes by properties. - know the properties of and construct congruent shapes (geoboards, dot paper) - recognize symmetry in the environment - identify geometric figures in various positions and orientations - recognize and apply slides, flips and turns - pose and solve problems related to shape and space - explore shapes using technology				- two dimensional shapes - circle, square, rectangle, triangle - three dimensional figures – cone, pyramid, cylinder, sphere - sizes – small, medium, large - patterns, shape and colour - construction - communication - congruency - symmetrical figures - lines of symmetry - side, face, line, edge, angle - lines- vertical, horizontal, diagonal, intersecting - grid – intersecting lines, positions-right, up			

Module Title: Shape and Space (Shape)	Sequence Reference: P3 MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking - create pictures of objects in the environment using two - dimensional shapes - create patterns using three dimensional objects and - two dimensional shapes - combine two dimensional shapes to make pictures • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Shape)	Sequence Reference: P3 MT-C
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 2 • Internet	• <u>Math Advantage</u> Grade 2 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	



Module D

MATHEMATICS

Module Title: Shape and Space (Measurement)

Sequence Reference: P3 MT-D

Time allotted: 6 weeks

PHASE A

PHASE B

PS

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P2

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Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1, 2.2, 2.4 Structure
- 3.1, 3.3, 3.5, 3.6 Acquisition
- 4.1 - 4.6 Communication
- 5.3 - 5.6 Cognition
- 6.2 - 6.4 Application

Content Focus:

- Measurement

Curriculum Objectives:

At the end of this module, students will:

- use appropriate vocabulary to describe measurement attributes of objects
- recognize the attributes of length, weight, area and time
- identify instruments used in standard and non standard measurement
- explore objects using non standard and standard units of measure
- select the most appropriate standard unit for measuring length
- use repetition of a single unit to measure something larger than the unit
- describe relationship among various standard units for measuring length
- explore measurement concepts using manipulatives, diagrams, spoken terms and written symbols
- explore and order events in oral and pictorial form
- explore perimeter
- relate temperature to seasons and daily activities
- understand the use of a thermometer
- explore money through play
- recognize coins 1¢, 5¢, 10¢, 25¢, \$1
- demonstrate an understanding of the value of coins to \$1 and bills to \$20
- create equivalent sets of coins up to \$1 using different coin combinations
- create equivalent sets of bills up to \$20 using different combinations
-

Content Detail:

- measuring instruments
 - ruler, measuring tape, yardstick, metre stick, height chart, centimetre cubes, learning links, trundle wheel
- liquid and dry measure
 - cups, metric and customary containers
 - balance scale, spring scale, bathroom scale
- types of measures
 - length (centimetre, metre, kilometre, inch, foot, mile)
 - mass (gramme, kilogramme, ounce, pound)
 - volume (litre, pint, cube, cup, quart)
- time
 - (minute, hour, day)
- clock
- before, after
- o'clock, hour, minute, hand, second
- comparisons
 - long/short; longer/shorter; longest/shortest
 - thick/thin; nearer/farther
 - empty/full; more/less; most/least
 - heavy/light; heavier/lighter; heaviest/lightest
- perimeter area
 - square centimetre; square metre; square inch, square foot
- first, next, last
- morning, afternoon, night
- calendar
 - day, week, month, year
 - seasons

Module Title: Shape and Space (Measurement)	Sequence Reference: P3 MT-D
Curriculum Objectives:	Content Detail:
At the end of this module, students will: • represent money in symbolic and written form • tell time to the nearest five (5) minute interval using analog/digital clock • understand and use the calendar • read and write the day, date, month and year • solve real life problems based on money or measures	• clock, digital, analog • intervals • warm, hot, cold, cool, icy • money - dime, nickel, penny, quarter, dollar
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • represent the results of measurement activities using oral and written form; concrete materials and drawings • explore using different measures • compare using different measures • sort and classify using a variety of measures • arrange/order using different measures • explore empty and full • whole class • cooperative work • computer assisted instructions • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Measurement)

Sequence Reference: P3 MT-D

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Portfolio
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- | | |
|---|--------------------------|
| • manipulatives | • familiar storybooks |
| • technology (computer, calculator, TV, VCR) | • number cards |
| • field trips | • flash cards |
| • overhead projector | • flip chutes |
| • transparencies | • flip charts |
| • people (parents, community workers, etc.) | • school environment |
| • classroom items | • carpenters (craftsmen) |
| • objects to be measured (e.g. rocks, sand etc) | • architects |
| • visit to weather station | |

References - Teacher:

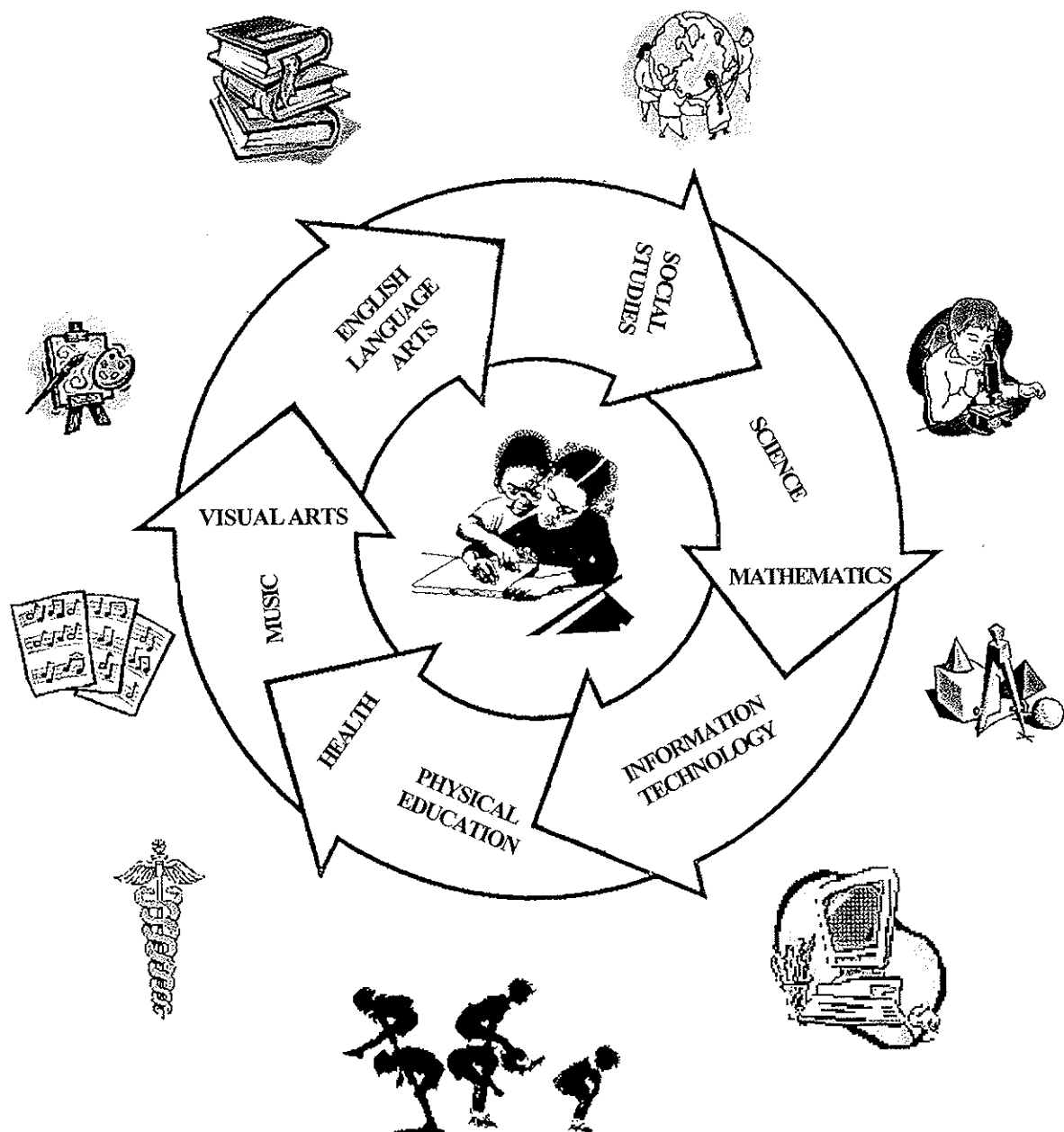
- Math Advantage Teacher Resource Kit, Grade 2
- Internet

References - Student:

- Math Advantage Grade 2
- Mighty Math Carnival Countdown

Glossary:

- refer to text



Module E

MATHEMATICS

Module Title: Data Handling

Sequence Reference: P3 MT-E

Time allotted: 3 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

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P6

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Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.5 Structure
- 3.1 - 3.6 Acquisition
- 4.1, 4.2, 4.3, 4.5, 4.6, 4.7 Communication
- 5.1, 5.2, 5.3, 5.4, 5.6 Cognition
- 6.2 - 6.4 Application

Content Focus:

- Probability
- Data Handling

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- pose questions and collect data based on first hand information
- organize data based on one attribute chosen by teacher or students
- construct data representations using concrete objects, pictures and graphs
- interpret data using appropriate language
- propose and communicate appropriate conclusions
- make inferences to solve problems
- understand how data is used in real situations to make predictions

- one-to-one correspondence
- comparisons
- surveys
- data interpretation
- graphs – human, concrete object, picture, symbols
- tallies, charts, tables, bar graphs, pictographs,
- probability

Module Title: Data Handling

Sequence Reference: P3 MT-E

Recommended Instructional Strategies:

- individualizing
- problem solving
- differentiating instruction
- critical thinking
- whole class
- cooperative work
- computer assisted instruction
- peer coaching
- use of manipulatives
- discussion of mathematics
- questioning
- writing or drawing pictures
- content integration
- developmentally appropriate materials
- learning centres
- meaningful, relevant content
- parent/teacher relations

Recommended Formative Assessment Strategies:

Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding.

- inventory test
- assessing prior knowledge (can include intervention lessons or practice activities)
- multiple – choice
- free - response
- math journals
- portfolios
- diagnostic assessment
- oral presentations
- investigations
- teacher/student conferencing
- visual presentations
- observations

Module Title: Data Handling	Sequence Reference: P3 MT-E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades.	
• Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 2 • Internet	• <u>Math Advantage</u> Grade 2 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	

Mathematics - P4

Level Code: P4 MT



MINISTRY OF EDUCATION

Bermuda
2001

**PRIMARY SCHOOL
PHASE B OVERVIEW**

Subject Title: Mathematics

Subject Code: P4 MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRIMARY FOUR (P4) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Problem solving tasks - Reteach, practical, enrichment worksheet - Discussions - Oral presentations - Cooperative group work	30%
• Product Assessment - Portfolio work sample* - Chapter tests - Review tests - Module tests - Cumulative tests	50%
• Written Assessment - Journal writing - Project (group, individual) - Assignments (home, school) - Formative assignment (inventory test)	20%
Total	100%

*could also include family response sheet

MATERIALS OF INSTRUCTION (Adopted Text)

Burton Grace M., Maletsky, Evan M. Math Advantage, Orlando, FL., Harcourt International, 1999.

PHASE B OUTLINE

P4 Module Titles A - E	P5 Modules Titles A - E	P6 Modules Titles A - E
A. Number Sense 15 - whole numbers - place value - decimals - fractions - mathematical reasoning	A. Number Sense 17 - properties (associative, distributive, commutative) - ratios - percent	A. Number Sense 20 - whole numbers through millions - comparisons - multiples - divisibilities - prime and composite numbers - greatest common factor
B. Patterns and Relationships 4 - identification - predictions - problem solving strategies	B. Patterns and Relationships 2 - generalizations - exploration - extension - creating	B. Patterns and Relationships 2 - communication - construction - summarization
C. Shape and Space (Shape) 5 - lines (parallel, perpendicular, arc, ray) - coordinates (grid, ordered pairs, point)	C. Shape and Space (Shape) 5 - dimensions - closed and open figures - creation of pictures and plane figures	C. Shape and Space (Shape) 5 - use of descriptive attributes - classifying attributes and properties - construction of shapes - use of technology to explore geometric concepts
D. Shape and Space (Measurement) 6 - area - thermometer - digital, analog - representation	D. Shape and Space (Measurement) 5 - degrees - intervals - volume - comparison	D. Shape and Space (Measurement) 3 - elapsed time - increments - mass - conversion
E. Data Handling 4 - conducting surveys - labelling - collection of data	E. Data Handling 5 - chance - probability - communicating - conclusions	E. Data Handling 4 - questioning based on displayed data - validation - making predictions
Subtotal 34 Optional Weeks 4 Total Weeks 38	Subtotal 34 Optional Weeks 4 Total Weeks 38	Subtotal 34 Optional Weeks 4 Total Weeks 38

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☒ P5 ☐ P6 ☐

Mathematics

GOALS		SUBGOALS		MODULE & CURRICULUM CORRELATION MATRIX				
1	Appreciation	1.1	Interrelationships	x	x	x	x	x
		1.2	Successful Experiences	x	x	x	x	x
		1.3	Significance	x	x	x	x	x
2	Structure	2.1	Comparison	x	x	x	x	
		2.2	Appreciation	x	x	x	x	x
		2.3	Evaluation	x	x	x		x
		2.4	Generalization	x	x	x	x	x
		2.5	Interpretation	x		x		
3	Acquisition	3.1	Application of Number Concepts	x	x		x	x
		3.2	Estimation	x			x	x
		3.3	Multiple Representations	x	x		x	x
		3.4	Data Handling	x		x		x
		3.5	Geometric and Measurement Properties	x	x	x	x	x
		3.6	Algebraic Procedures	x	x		x	x
		3.7	Technology	x	x	x	x	
4	Communication	4.1	Ideas and Concepts	x	x		x	x
		4.2	Formulae and Terminology	x	x		x	x
		4.3	Oral/Written	x	x	x	x	x
		4.4	Generalization	x	x	x		
		4.5	Symbolic notation	x	x		x	x
		4.6	Manipulatives and Technology	x		x	x	x
		4.7	Evaluation	x		x		x
5	Cognition	5.1	Confidence in Problem Solving	x				x
		5.2	Evaluation	x	x	x		x
		5.3	Technology	x	x	x	x	x
		5.4	Application	x	x			x
		5.5	Evaluation of Reasonableness	x	x			x
		5.6	Modelling	x	x	x		x
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
 B - Patterns and Relationships
 C - Shape and Space (Shape)

D - Shape and Space (Measurement)
 E - Data Handling

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☒ P5 ☐ P6 ☐

Mathematics

6	Application	6.1	Problem Solving Strategies	x	x	x		x
		6.2	Decision Making	x	x	x	x	x
		6.3	Real World Issues	x				x
		6.4	Lifelong Skills	x			x	x
CONTENT STRUCTURE		Number Sense		x	x	x	x	x
		Patterns and Relationships			x	x	x	
		Shape and Space (Shape)						x
		Shape and Space (Measurement)						
		Data Handling						x
		MODULES		A	B	C	D	E

MODULE KEY

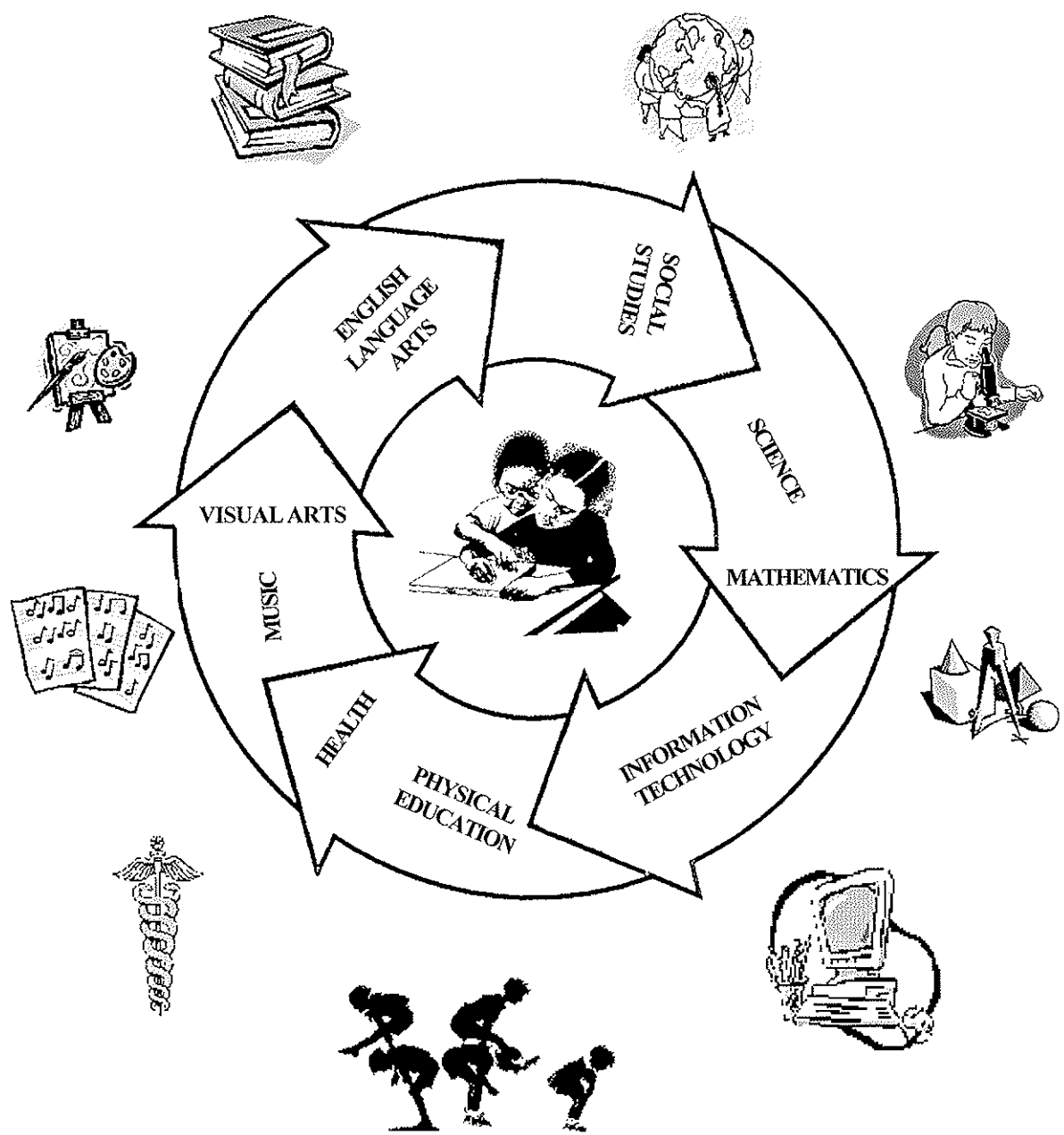
A - Number Sense

B - Patterns and Relationships

C - Shape and Space (Shape)

D - Shape and Space (Measurement)

E - Data Handling



Module A

MATHEMATICS

Module Title: Number Sense

Sequence Reference: P4 MT-A

Time allotted: 15 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6



Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.5 Structure
- 3.1 - 3.7 Acquisition
- 4.1 - 4.7 Communication
- 5.1 - 5.6 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Number
- Number Systems
- Number Operations

Curriculum Objectives:

At the end of this module, students will:

- recognize the comparative value of place (1000 equals 100 tens)
- recognize, read and compare numbers from 0.1 to 10,000
- relate counting, grouping and place-value concepts up to 10,000
- develop proficiency in mental mathematics
- recognize patterns, identify relationships and make generalizations
- use critical thinking skills to create and solve complex problems
- add any 4 digit numbers
- subtract any 4 digit numbers
- check for reasonableness of answers by a variety of means including estimation
- know multiplication facts up to 9x9; multiply by multiples of 10 and two-digit by two-digit numbers
- understand mathematical terms – division, quotient, divisor, factors, multiples
- know division facts up to 9x9; divide by 10
- know and apply tests for divisibility for 2, 5 and 10
- add and subtract simple fractions and decimals using concrete objects, pictures and written terms
- show, read and write fractions
- model, create and describe division situations in which a set of objects is separated into equivalent sets (sharing)
- (identify and use Bermuda money) measurement
- identify the effects of zero in multiplication
- explain the results of mathematical explorations using diagrams, pictures, charts or words

Content Detail:

- whole numbers
- place value
- decimals
- fractions
- patterns
- estimation
- rounding
- money
- basic operations: +, -, x, ÷
- reasoning
- mathematical reasoning
- communications
- problem solving

Module Title: Number Sense	Sequence Reference: P4 MT-A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense

Sequence Reference: P4 MT-A

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Module test
- Portfolios
- Cumulative test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

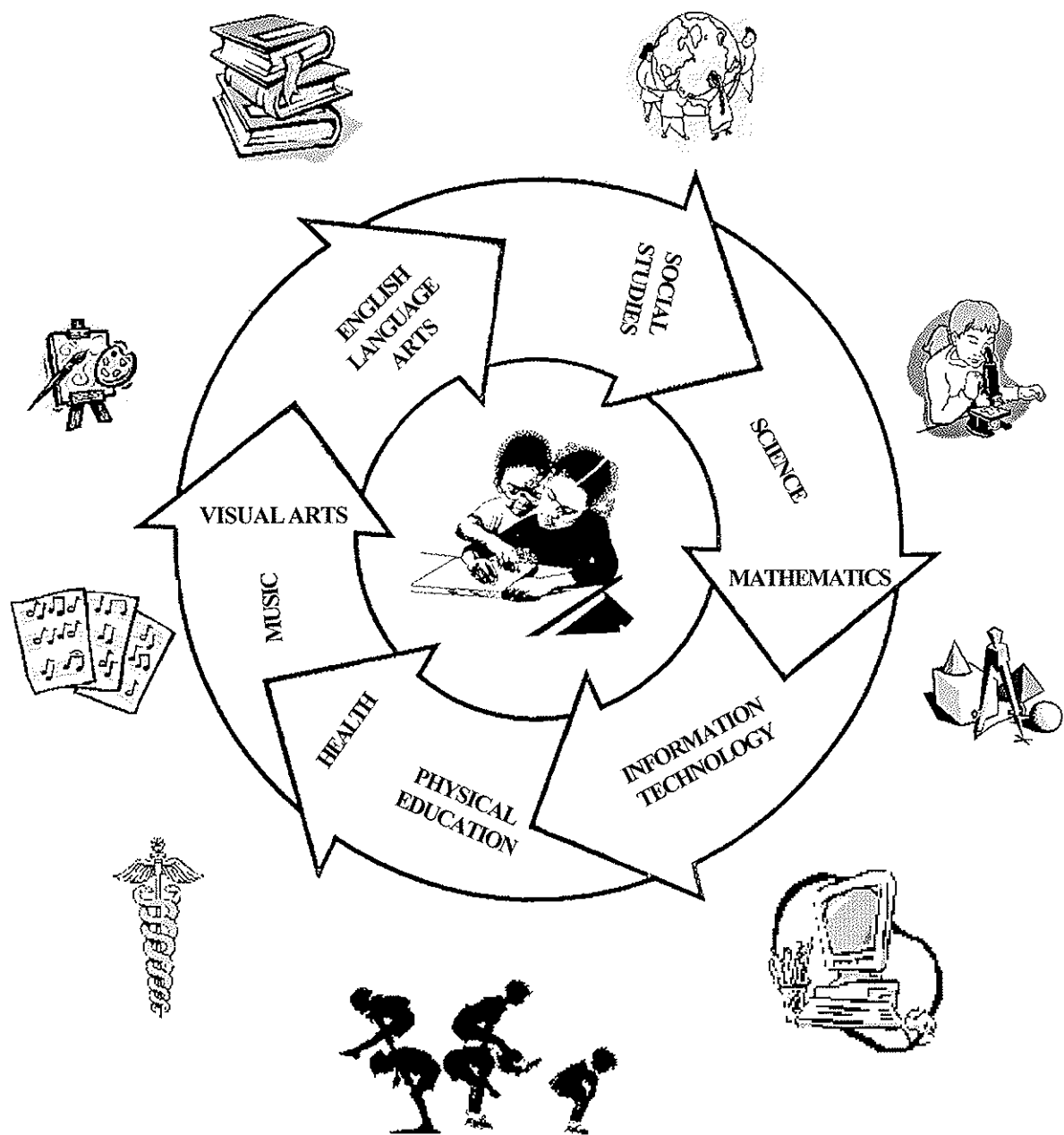
- Math Advantage Teacher Resource Kit, Grade 3
- Internet

References - Student:

- Math Advantage Grade 4
- Mighty Math Carnival Countdown
- Mighty Math Number Heroes

Glossary:

- refer to text



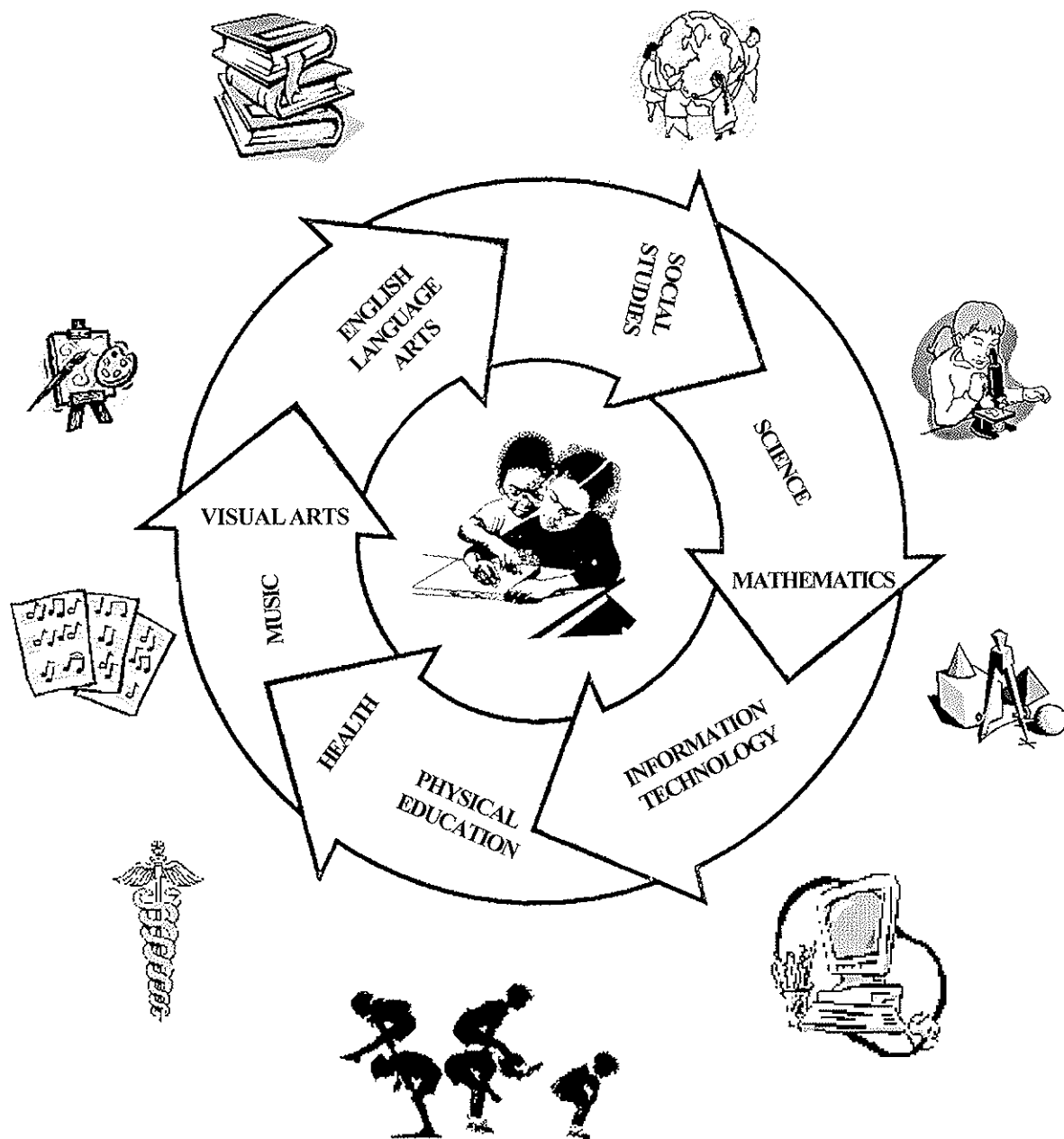
Module B

MATHEMATICS

Module Title: Patterns and Relationships Time allotted: 4 weeks	Sequence Reference: P4 MT-B						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
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Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.4 Structure 3.1, 3.3, 3.5, 3.6, 3.7 Acquisition 4.1 – 4.5 Communication 5.2 – 5.6 Cognition 6.1 – 6.2 Application	Content Focus: - Relationships - Patterns - Algebraic Thinking						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - compare objects according to colour, shape, size and/or number - classify objects by identifying various attributes - explore the relationship addition and subtraction, addition and multiplication, multiplication and division, division and subtraction - identify patterns and relationships between and amongst numbers using concrete objects, pictorial models or technology - write number sentences to represent mathematical patterns and relationships addition, subtraction, multiplication, division - construct open number sentences to express relationships e.g. $7 \times 7 = 49$ - make predictions and present generalizations about patterns e.g. odd and even; multiples of whole numbers etc. - solve problems related to patterns and relationships - create and extend geometric and numeric patterns				- cause and effect relationships - prediction about number patterns - rhythmic patterns - shape and colour patterns - pattern rules - patterns:-creating - extending - addition - subtraction - multiplication - division - number sentences - problem solving strategies (looking for a pattern)			

Module Title: Patterns and Relationships	Sequence Reference: P4 MT-B
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Patterns and Relationships	Sequence Reference: P4 MT-B
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Portfolios • Projects • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 3 • Internet	• <u>Math Advantage</u> Grade 3 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



Module C

MATHEMATICS

Module Title: Shape and Space (Shape)

Sequence Reference: P4 MT-C

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

Time allotted: 5 weeks

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Subgoal Emphasis:

- 1.1 – 1.3 Appreciation
- 2.1 – 2.5 Structure
- 3.4, 3.5, 3.7 Acquisition
- 4.3, 4.4, 4.6, 4.7 Communication
- 5.2, 5.3, 5.6 Cognition
- 6.1 – 6.2 Application

Content Focus:

- Geometry
- Patterning

Curriculum Objectives:

Content Detail:

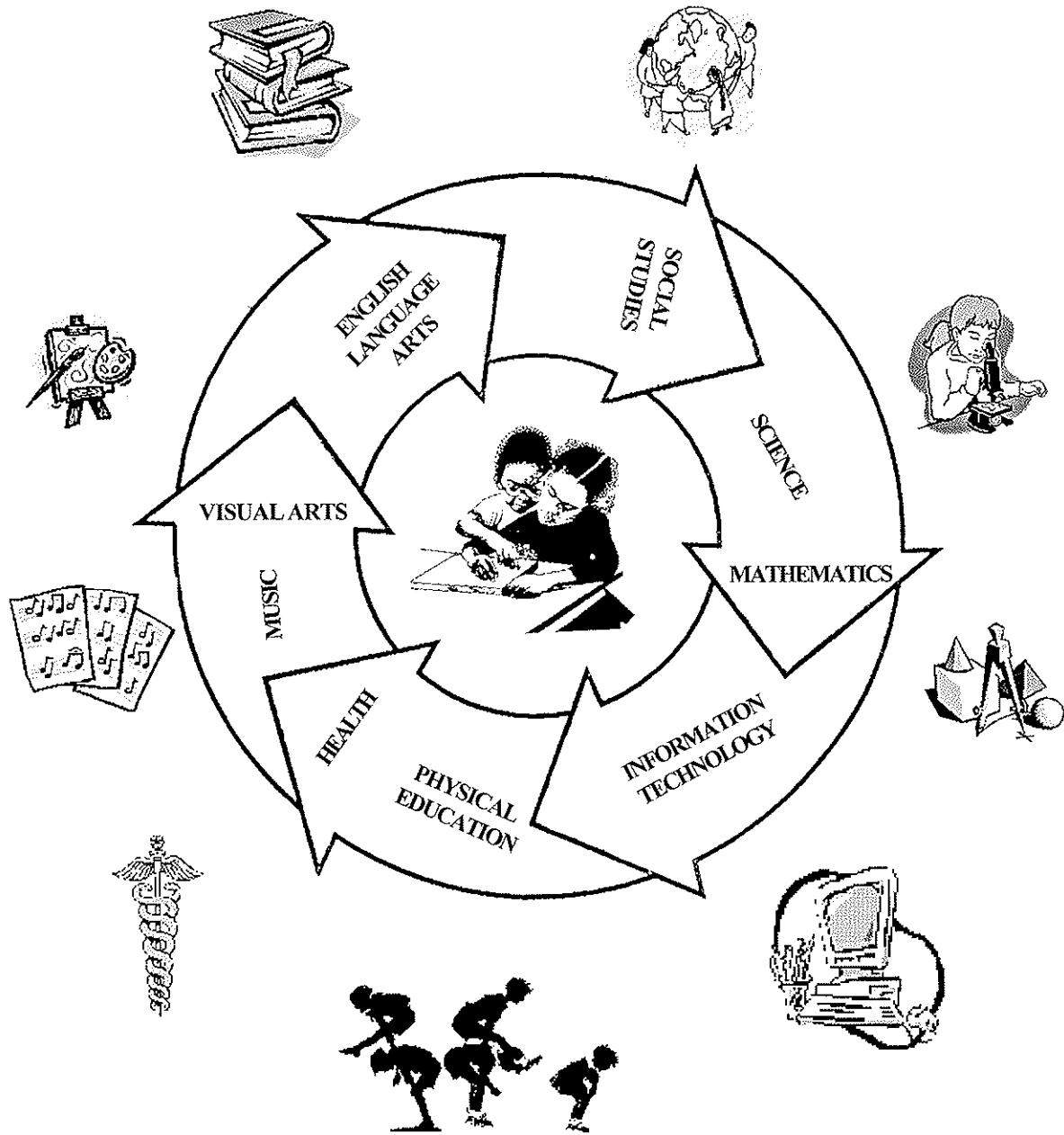
At the end of this module, students will:

- describe the attributes of real world and three dimensional objects
- identify lines, line segments and angles
- identify the attributes of solids
- examine three dimensional objects and two dimensional shapes by properties
- construct three-dimensional objects using concrete materials
- create pictures of objects in the environment using two dimensional shapes
- create patterns using three dimensional objects and two dimensional shapes
- combine two dimensional shapes to make pictures
- examine congruent shapes and solids
- examine pictures and plane figures to identify lines of symmetry
- identify geometric figures in various positions and orientations including translations (slides)
- pose and solve problems related to shape and space
- use technology to explore geometric concepts

- two dimensional shapes -circle, square, rectangle, triangle, /pattern blocks /trapezoid, parallelogram, rhombus, quadrilateral, pentagon, hexagon, heptagon, octagon, polygon
- three dimensional figures – cone, pyramid, cylinder, sphere
- sizes – small, medium, large
- patterns
 - shape and colour
- construction
- communication
- congruency
- symmetry
- lines of symmetry
- transformations - slide
- side, face, line, edge, corner, angle
- lines – parallel, perpendicular, horizontal, vertical, diagonal, intersecting, arc, ray
- angles – straight, acute, obtuse, right

Module Title: Shape and Space (Shape)	Sequence Reference: P4 MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Shape)	Sequence Reference: P4 MT-C
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 3 • Internet	• <u>Math Advantage</u> Grade 3 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



Module D

MATHEMATICS

Module Title: Shape and Space (Measurement)

Sequence Reference: P4 MT-D

Time allotted: 6 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6



Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1, 2.2, 2.4 Structure
- 3.1, 3.2, 3.3, 3.5 Acquisition
- 4.1, 4.2, 4.3, 4.6 Communication
- 5.3 Cognition
- 6.2 - 6.4 Application

Content Focus:

- Measurement

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- use appropriate language to describe and compare measurement attributes of objects
- explore using various measures
- select the most appropriate standard unit for measuring length and weight
- measure using non standard and standard units
- investigate relationships among various standard units
- estimate and compare measures using non standard and standard units
- show measurement ideas using manipulatives, diagrams, spoken terms and written symbols
- explore surface area using a variety of objects
- compare and order events according to the duration of time
- tell time to the minute using analog/digital clocks
- use the calendar to solve routine and non routine problems
- read a thermometer
- demonstrate an understanding of the value of coins to \$1 and bills to \$100
- use money in real life situations to estimate, count, record collections, and make change up to \$10
- create equivalent sets of coins and bills using different coin combinations
- represent money in symbolic and written form
- solve real life problems based on money or measures

- measuring instruments
 - rulers, measuring tapes, yardsticks, metre stick, height
 - chart, centimetre cubes, learning links, trundle wheel
 - liquid and dry measure cups, metric and customary
 - containers, volume relationship containers
 - balance scales, spring scales, bathroom scales
- length (centimetre, metre, kilometre, inch, yard, foot, mile)
- mass (gramme, kilogramme, ounce, pound)
- volume (litre, millilitre, litre, pint, quart, pound, ounce)
- duration of time:- (minute, hour, day)
- comparisons
 - long/short; longer/shorter; longest/shortest
 - thick/thin; nearer/farther
 - heavy/light; heavier/lighter; heaviest/lightest
 - empty/full; more/less; most/least
- area – square centimetre; square metre; square inch; square foot
- types of clocks
 - digital, analog
- intervals
- temperature Reading
 - warm, hot, cold, cool, icy
 - thermometer
 - increments
 - degrees
- money
 - dime, nickel, penny, quarter, dollar

Module Title: Shape and Space (Measurement)

Sequence Reference: P4 MT-D

Recommended Instructional Strategies:

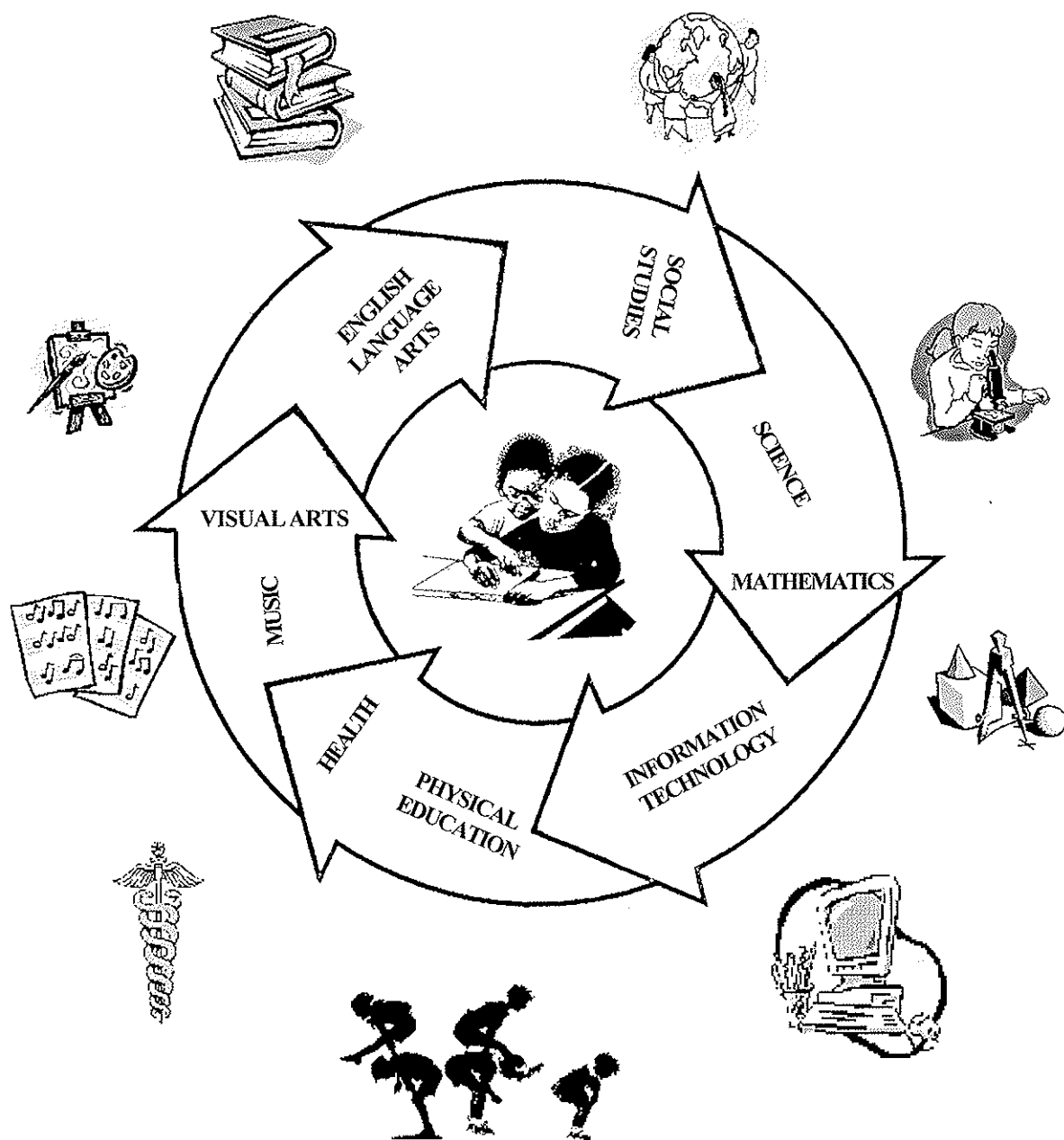
- individualizing
- problem solving
- differentiating instruction
- critical thinking
 - order events in oral, pictorial and written form
 - show measurement ideas using manipulatives, diagrams, spoken terms and written symbols
 - represent the results of measurement activities using oral and written form; concrete materials and drawings whole class
- cooperative work
- computer assisted instruction
- peer coaching
- use of manipulatives
- discussion of mathematics
- questioning
- writing or drawing pictures
- order events in oral, pictorial and written form
- represent the results of measurement activities using oral and written form; concrete materials and drawings
- content integration
- use of calculators
- developmentally appropriate materials
- learning centres
- meaningful, relevant content
- parent/teacher relations

Recommended Formative Assessment Strategies:

Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding.

- inventory test
- assessing prior knowledge (can include intervention lessons or practice activities)
- multiple – choice
- free - response
- math journals
- portfolios
- diagnostic assessment
- oral presentations
- investigations
- teacher/student conferencing
- visual presentations
- observations

Module Title: Shape and Space (Measurement)	Sequence Reference: P4 MT-D
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items • objects to be measured (e.g. rocks, sand etc) • visit to weather station	• familiar storybooks • flash cards • number cards • flip chutes • flip charts • school environment • carpenters (craftsmen) • architects
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 3 • Internet	• <u>Math Advantage</u> Grade 3 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



Module E

MATHEMATICS

Module Title: Data Handling

Sequence Reference: P4 MT-E

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

Time allotted: 4 weeks

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Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.2 - 2.4 Structure
- 3.1 - 3.6 Acquisition
- 4.1, 4.2, 4.3, 4.5, 4.6, 4.7 Communication
- 5.1 - 5.6 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Probability
- Data Handling

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- collect data based on first and second-hand information
- organize data based on one or more attribute chosen by teacher or students
- construct and label graphs
- display data in a variety of forms
- describe data using appropriate language
- propose and communicate appropriate conclusions
- make predictions
- conduct simple probability experiments to test predictions
- make inferences to solve problems

- one-to-one correspondence
- comparisons
- conducting surveys
- data interpretation
- graphs – human, concrete object, pictorial, symbolic
- tallies, charts, tables, bar graphs, pictographs
- probability experiments: using terms such as
- most likely, least likely, equal chance, probable, expected, fair, unfair
- problem solving strategy – make a list

Module Title: Data Handling	Sequence Reference: P4 MT -E
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Data Handling	Sequence Reference: P4 MT–E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• school environment • flip charts • flip chutes • flash cards • number cards • familiar storybooks
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 3 • Internet	• <u>Math Advantage</u> Grade 3 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	

Mathematics - P5

Level Code: P5 MT



MINISTRY OF EDUCATION

Bermuda
2001

PRIMARY SCHOOL PHASE B OVERVIEW

Subject Title: Mathematics

Subject Code: P5 MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRIMARY FIVE (P5) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Problem solving tasks - Reteach, practical, enrichment worksheet - Discussions - Oral presentations - Cooperative group work	30%
• Product Assessment - Portfolio work sample* - Chapter tests - Review tests - Module tests - Cumulative tests	50%
• Written Assessment - Journal writing - Project (group, individual) - Assignments (home, school) - Formative assignment (inventory test)	20%
Total	100%

*could also include family response sheet

MATERIALS OF INSTRUCTION (Adopted Text)

Burton Grace M., Maletsky, Evan M. Math Advantage, Orlando, FL., Harcourt International, 1999.

PHASE B OUTLINE

P4 Module Titles A - E	P5 Modules Titles A - E	P6 Modules Titles A - E
A. Number Sense 15 - whole numbers - place value - decimals - fractions - mathematical reasoning	A. Number Sense 17 - properties (associative, distributive, commutative) - ratios - percent	A. Number Sense 20 - whole numbers through millions - comparisons - multiples - divisibilities - prime and composite numbers - greatest common factor
B. Patterns and Relationships 4 - identification - predictions - problem solving strategies	B. Patterns and Relationships 2 - generalizations - exploration - extension - creating	B. Patterns and Relationships 2 - communication - construction - summarization
C. Shape and Space (Shape) 5 - lines (parallel, perpendicular, arc, ray) - coordinates (grid, ordered pairs, point)	C. Shape and Space (Shape) 5 - dimensions - closed and open figures - creation of pictures and plane figures	C. Shape and Space (Shape) 5 - use of descriptive attributes - classifying attributes and properties - construction of shapes - use of technology to explore geometric concepts
D. Shape and Space (Measurement) 6 - area - thermometer - digital, analog - representation	D. Shape and Space (Measurement) 5 - degrees - intervals - volume - comparison	D. Shape and Space (Measurement) 3 - elapsed time - increments - mass - conversion
E. Data Handling 4 - conducting surveys - labelling - collection of data	E. Data Handling 5 - chance - probability - communicating - conclusions	E. Data Handling 4 - questioning based on displayed data - validation - making predictions

Subtotal 34	Subtotal 34	Subtotal 34
Optional Weeks 4	Optional Weeks 4	Optional Weeks 4
Total Weeks 38	Total Weeks 38	Total Weeks 38

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☒ P6 ☐

Mathematics

GOALS		SUBGOALS		MODULE & CURRICULUM CORRELATION MATRIX				
1	Appreciation	1.1	Interrelationships	x	x	x	x	x
		1.2	Successful Experiences	x	x	x	x	x
		1.3	Significance	x	x	x	x	x
2	Structure	2.1	Comparison	x	x	x	x	
		2.2	Appreciation	x	x	x	x	x
		2.3	Evaluation	x	x	x	x	x
		2.4	Generalization	x	x	x	x	x
		2.5	Interpretation	x			x	
3	Acquisition	3.1	Application of Number Concepts	x	x		x	x
		3.2	Estimation	x			x	x
		3.3	Multiple Representations	x	x		x	x
		3.4	Data Handling	x	x	x		x
		3.5	Geometric and Measurement Properties	x	x	x	x	x
		3.6	Algebraic Procedures	x	x			x
		3.7	Technology	x	x	x	x	
4	Communication	4.1	Ideas and Concepts	x	x	x	x	x
		4.2	Formulae and Terminology	x	x		x	x
		4.3	Oral/Written	x	x	x	x	x
		4.4	Generalization		x	x	x	
		4.5	Symbolic notation		x		x	x
		4.6	Manipulatives and Technology	x	x	x	x	x
		4.7	Evaluation	x	x	x	x	x
5	Cognition	5.1	Confidence in Problem Solving	x	x		x	x
		5.2	Evaluation	x	x	x	x	x
		5.3	Technology	x	x	x	x	x
		5.4	Application	x	x		x	x
		5.5	Evaluation of Reasonableness	x			x	
		5.6	Modelling	x	x	x	x	x
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
B - Patterns and Relationships
C - Shape and Space (Shape)

D - Shape and Space (Measurement)
E - Data Handling

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☒ P6 ☐

Mathematics

6	Application	6.1	Problem Solving Strategies	x	x	x	x	x
		6.2	Decision Making	x	x	x	x	x
		6.3	Real World Issues	x			x	x
		6.4	Lifelong Skills	x			x	x
CONTENT STRUCTURE		Number Sense		x	x	x	x	x
		Geometry and Measurement			x	x	x	
		Trigonometry						x
		Data Handling						
		Algebra						x
		MODULES		A	B	C	D	E

MODULE KEY

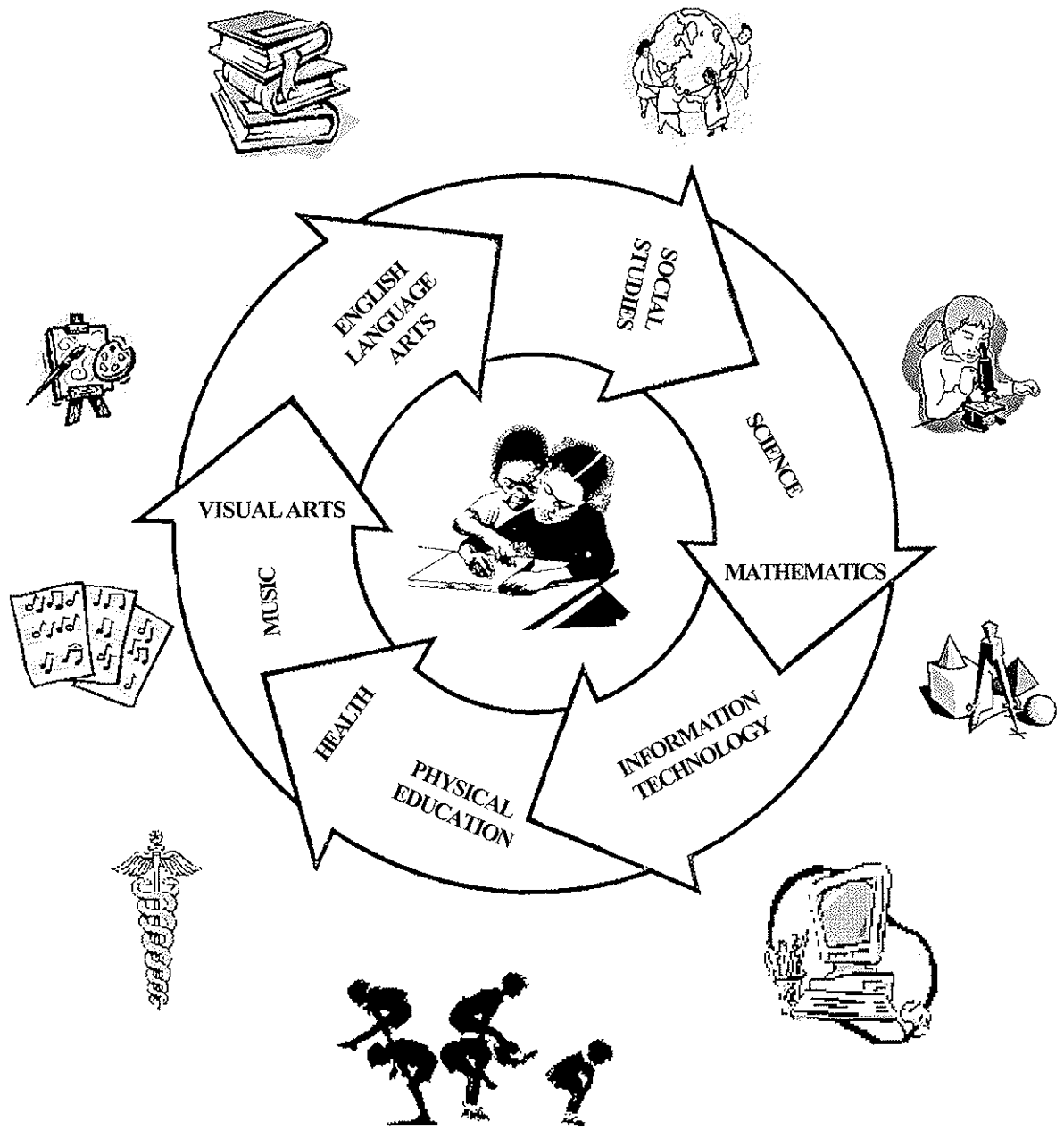
A - Number Sense

B - Patterns and Relationship

C - Shape and Space (Shape)

D - Shape and Space (Measurement)

E - Data Handling



Module A

MATHEMATICS

Module Title: Number Sense

Sequence Reference: P5 MT-A

Time allotted: 17 weeks

Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.5 Structure
- 3.1 - 3.7 Acquisition
- 4.1, 4.2, 4.3, 4.6, 4.7 Communication
- 5.1 - 5.6 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Number
- Number Systems
- Number Operations

Curriculum Objectives:

At the end of this module, students will:

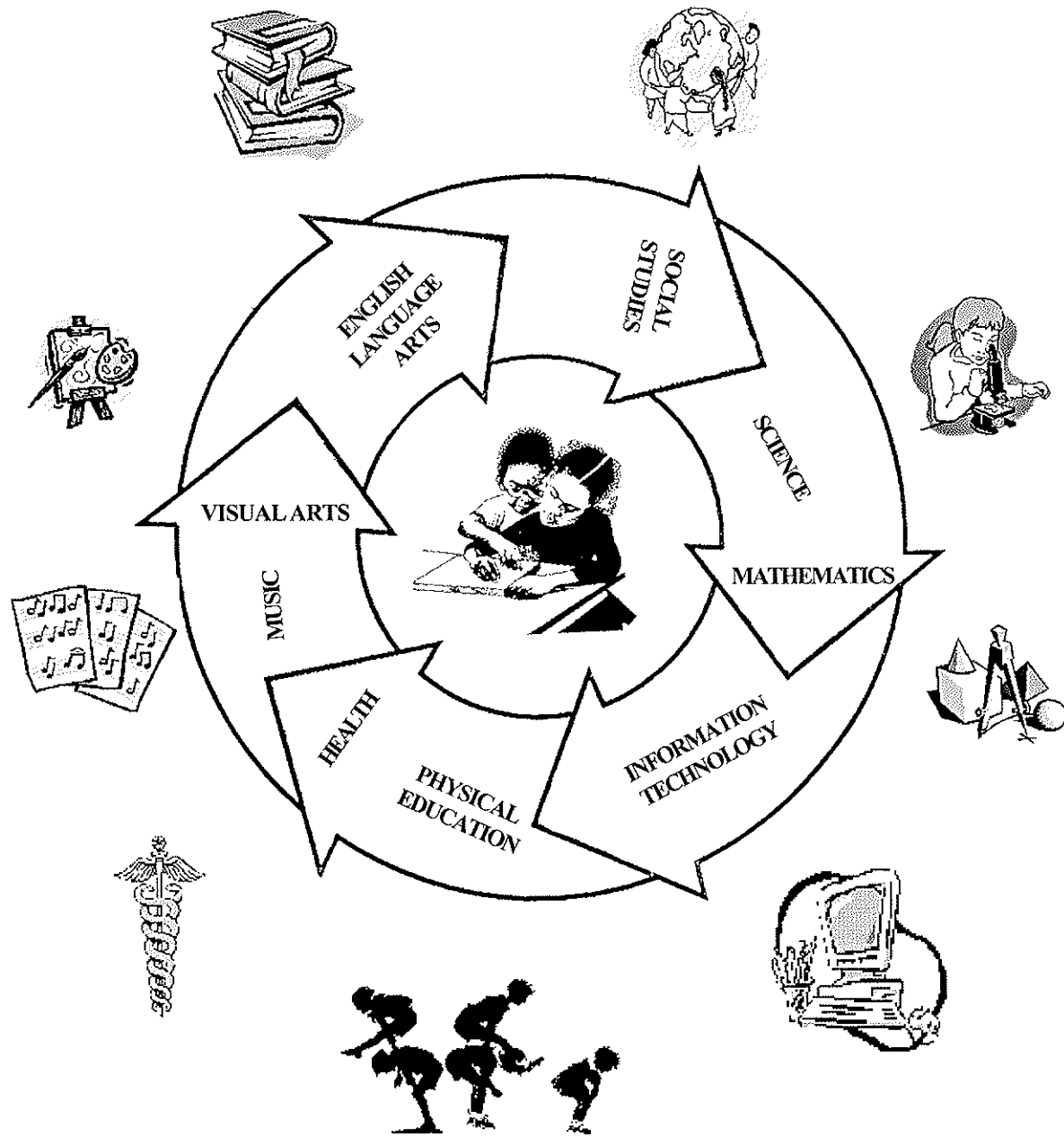
- recognize the comparative value of place (10,000 equals 10 thousands)
- recognize, read and compare numbers from 0.01 to 100,000
- identify place value for each digit in a number from 0.01 to 100,000
- use a variety of mental methods of computation with whole numbers up to 100
- recognize patterns, identify relationships and make generalizations
- create and solve complex problems using logical reasoning and clear explanations
- add any combination of numbers and understand the principles of the commutative and associative properties of addition
- subtract any two numbers
- estimate, compute and verify the sum and difference of any combination of numbers
- know multiplication facts to 12x12 and apply
- multiply 2,3 and 4 digit numbers by a 2 digit number
- recall division facts to 144
- divide three-digit by one digit numbers with remainders
- divide by multiples of 10
- know and apply tests for divisibility for 3, 6 and 9
- show the relationship between fractions and decimals
- add and subtract decimals
- add and subtract fractions
- multiply fractions, using pictures and models
- identify and represent equivalent fractions; relate fractions to ratios; and compare common fractions with decimals using concrete objects
- perform basic calculations with proficiency
- identify the use of numbers in everyday situations and in various careers
- use words and symbols to describe and generalize patterns
- appreciate the use of numbers in the media

Content Detail:

- whole numbers
- comparisons
- ordering
- place value
- estimation
- rounding
- properties (associative, distributive, commutative)
- addition
- multiplication
- subtraction
- division
- decimals
- fractions
- ratios
- money

Module Title: Number Sense	Sequence Reference: P5 MT–A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense	Sequence Reference: P5 MT-A
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Module test • Cumulative test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 4 • Internet	• <u>Math Advantage</u> Grade 4 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



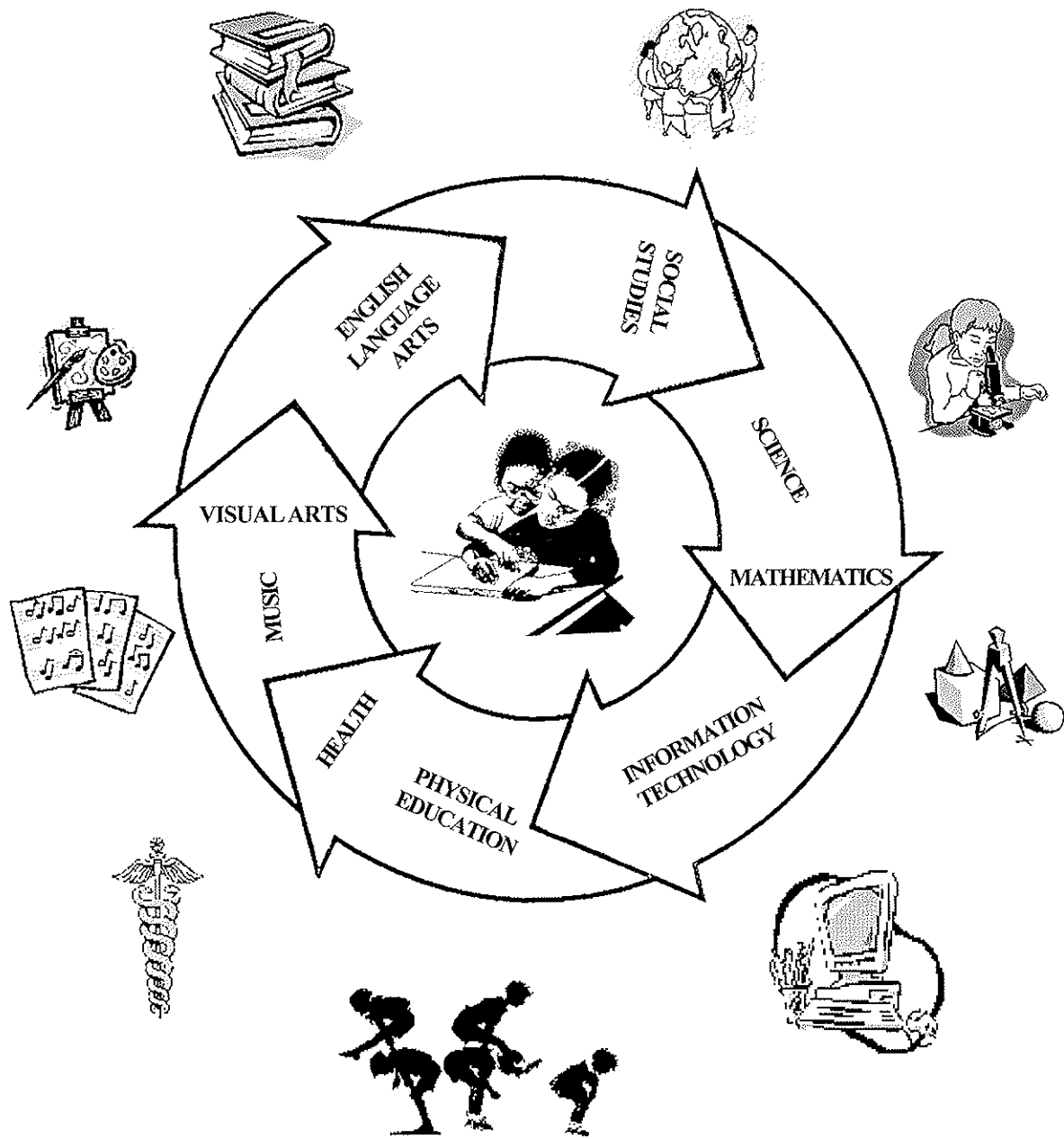
Module B

MATHEMATICS

Module Title: Patterns and Relationships Time allotted: 2 weeks	Sequence Reference: P5 MT-B						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☐	☐	☐	☒	☐
Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.4 Structure 3.1 3.3, 3.4, 3.5, 3.6, 3.7 Acquisition 4.1 – 4.7 Communication 5.1, 5.2, 5.3, 5.4, 5.6 Cognition 6.1 – 6.2 Application	Content Focus: - Relationships - Patterns - Algebraic Thinking						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - classify objects by using various attributes - identify the relationship between addition and subtraction, addition and multiplication, multiplication and division, division and subtraction - analyze number and non number patterns using concrete objects, grids, tables, charts, diagrams, number line, models and technology - write number sentences to represent mathematical patterns and relationships - formulate, justify and communicate predictions using numerical and non numerical patterns - pose and solve problems by applying a patterning strategy e.g. solve an area problem by extending a geometric grid pattern - create and extend numeric and non numeric patterns using manipulatives, diagrams, written and mathematical terminology				- cause and effect relationships - number pattern prediction - rhythmic patterns - shape and colour patterns - pattern rules - analysis of patterns - patterns - creating, extending - addition and subtraction - multiplication and division - number sentences - problem solving strategies (looking for a pattern)			

Module Title: Patterns and Relationships	Sequence Reference: P5 MT-B
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Patterns and Relationships	Sequence Reference: P5 MT-B
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Module test • Cumulative test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 4 • Internet	• <u>Math Advantage</u> Grade 4 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



Module C

MATHEMATICS

Module Title: Shape and Space (Shape)

Sequence Reference: P5 MT-C

Time allotted: 5 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6



Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.4 Structure
- 3.4, 3.5, 3.7 Acquisition
- 4.1, 4.3, 4.4, 4.6, 4.7 Communication
- 5.2, 5.3, 5.6 Cognition
- 6.1 - 6.2 Application

Content Focus:

- Geometry
- Patterning

Curriculum Objectives:

Content Detail:

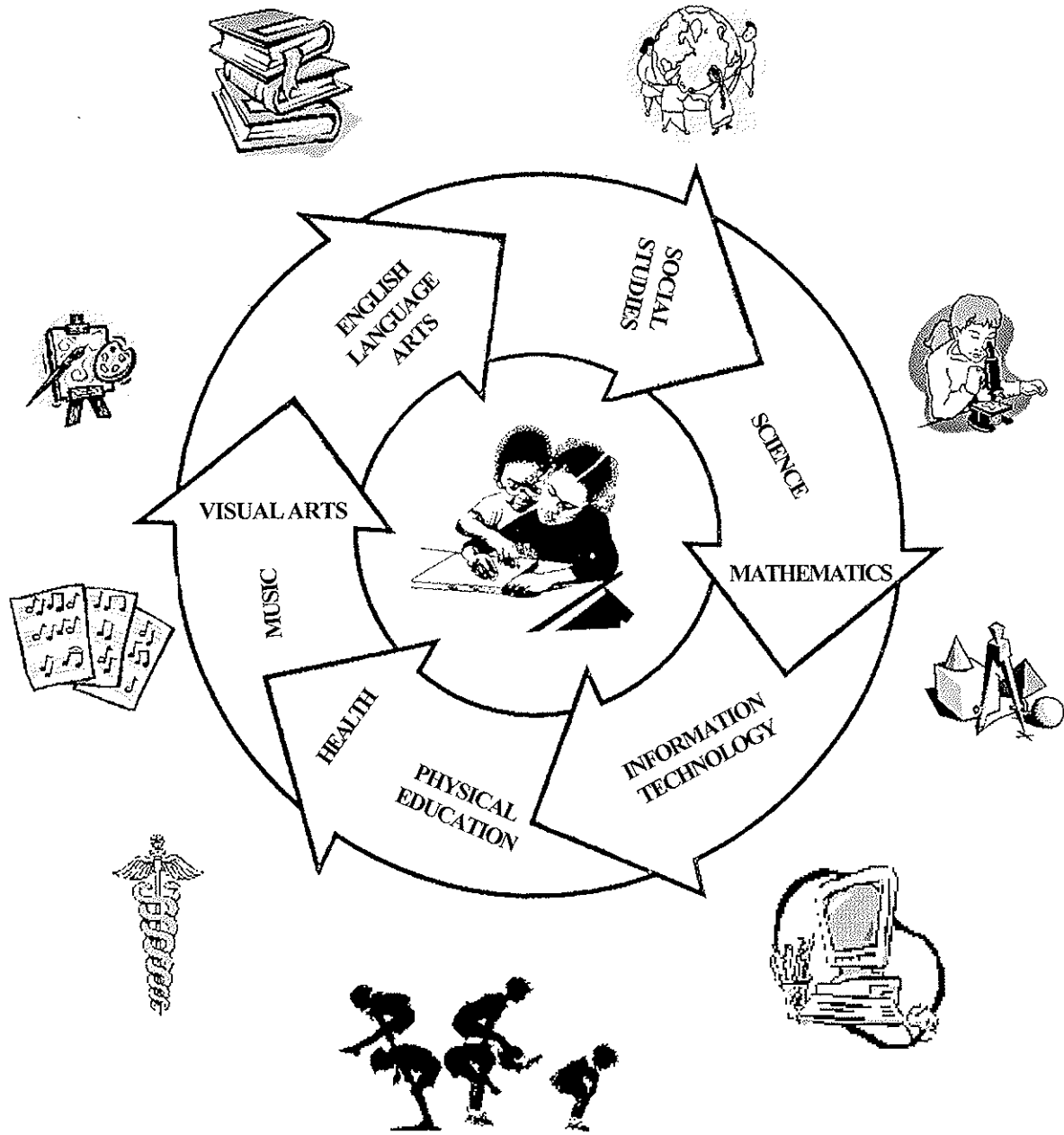
At the end of this module, students will:

- describe real world two and three dimensional figures using descriptive attributes
- investigate relationships between, lines, line, segments and angles
- classify the attributes of planes and solids
- compare three dimensional objects and two dimensional shapes by properties
- construct three-dimensional objects using concrete materials
- create patterns using three dimensional objects and two dimensional shapes
- construct triangles, quadrilaterals, and polygons using a variety of materials
- identify congruent shapes and solids
- identify and describe line symmetry
- identify geometric figures in various positions and orientations including translations (slides) and reflections(flips)
- pose and solve problems related to shape and space
- use technology to explore geometric concepts

- vocabulary related to the circle
 - radius, diameter, circumference, chord
- types of shapes
 - quadrilateral, square, rectangle, trapezoid, parallelogram
 - rhombus, polygon, pentagon, hexagon, heptagon, octagon
- triangle properties
- three dimensional figures
 - cone, pyramid, cylinder, sphere
- patterns
- construction of
 - circle, triangle, quadrilateral
- communication
- congruency
- symmetry
- transformations – turn, slide, flip, rotation, reflection, translation, nets
- side, face, line, edge, corner, angle, vertices
- lines – parallel, perpendicular, horizontal, vertical, diagonal, intersecting, arc, ray
- angles – straight, acute, obtuse, right
- dimensions
- closed and open figures

Module Title: Shape and Space (Shape)	Sequence Reference: P5 MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Shape)	Sequence Reference: P5 MT-C
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades.	
• Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources:	
(materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc) • classroom items • familiar storybooks	• number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 4 • Internet	• <u>Math Advantage</u> Grade 4 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



Module D

MATHEMATICS

Module Title: Shape and Space (Measurement)

Sequence Reference: P5 MT-D

Time allotted: 5 weeks

Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.1 - 2.5 Structure
- 3.1, 3.2, 3.3, 3.5, 3.7 Acquisition
- 4.1 - 4.7 Communication
- 5.1 - 5.6 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Measurement

Curriculum Objectives:

At the end of this module, students will:

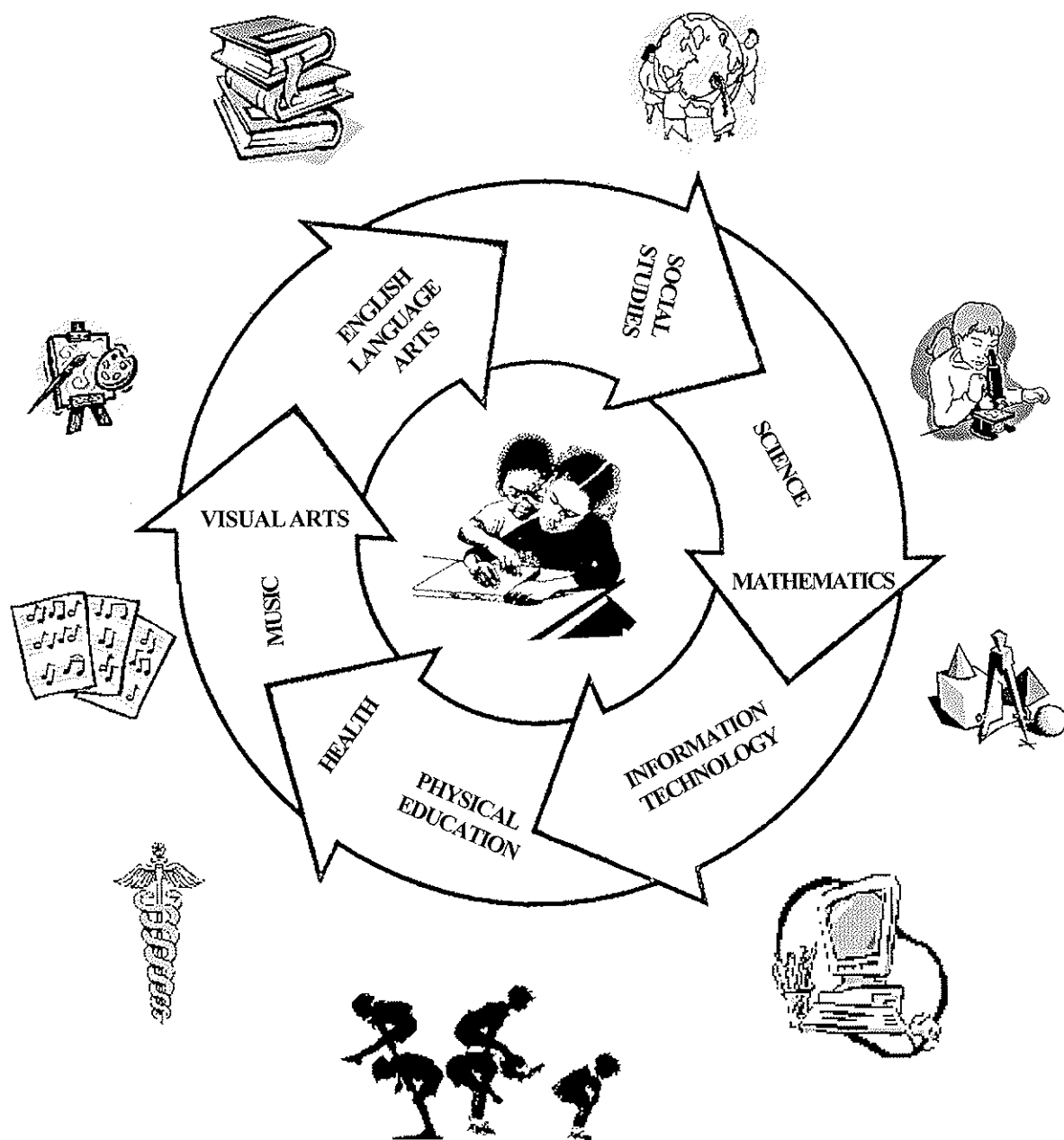
- use measurement to describe and compare attributes of objects
- identify instruments used in standard and non standard measurement
- explore and compare systems of measurement
- construct diagrams using non standard and standard units of measure
- select and apply the most appropriate standard unit for measuring length, weight, time and temperature
- select and apply appropriate tools to measure length, perimeter, weight, time and temperature
- examine the relationship between perimeter and area of a rectangle
- investigate relationships among standard units used for measuring length and weight
- estimate using non standard and standard units of measure
- represent measurement ideas using manipulatives, diagrams, spoken terms and written symbols
- understand the concept of perimeter and area
- estimate length, height, perimeter, and circumference using standard unit, customary and metric
- examine the attributes of objects by length, height, perimeter, and circumference using standard units (mm, cm., m, km)
- compare and construct shapes by area using standard units
- compare events according to the duration of time
- read and write time to the minute using analog and digital clock
- use the calendar to solve routine and non routine problems
- relate years, decades, centuries and millenniums
- read a thermometer
- create and solve real life problems based on money or measures

Content Detail:

- the history of measurement
- measuring instruments
 - rulers, measuring tapes, yardstick, metre stick, height chart, centimetre cubes, learning links, trundle wheel
- liquid and dry measure cups, metric & customary containers, volume relationship containers
- balance scales, spring scales, bathroom scales
- length (centimetre, metre, kilometre, inch yard, foot, mile)
- mass (gramme, kilogramme, ounce, pound)
- volume (litre, milliliter litre, pint, quart, pound, ounce)
- duration of time
 - (min., hr, day)
- comparisons
 - long/short; longer/shorter; longest/shortest
 - thick/thin; nearer/farther
- heavy/light; heavier/lighter; heaviest/lightest
- empty/full; more/less; most/least
- area – square centimetre; square metre; square inch; square foot
- o'clock, hour, minute, hand, second
- types of clocks
 - digital, analog
- intervals
- temperature
 - thermometer reading
 - warm, hot, cold, cool, icy
- increments
- degrees
- money
 - dime, nickel, penny, quarter, dollar

Module Title: Shape and Space (Measurement)	Sequence Reference: P5 MT-D
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • estimate shapes by area using standard units • measure shapes by area using standard units • record shapes by area using standard units • problem solving • differentiating instruction • critical thinking • use money in real life situations to estimate, count, and record collections of coins and bills up to \$100 • make purchases and change up to \$100 • recognize bills:- \$2, \$5, \$10, \$20, \$50, \$100 • demonstrate an understanding of the value of coins to \$1 and bills to \$100 • create equivalent sets of bills up to \$100 using different combinations • represent money in symbolic and written form • represent the results of measurement activities using oral and written form; concrete materials and drawings • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Measurement)	Sequence Reference: P5 MT-D
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items • objects to be measured (e.g. rocks, sand etc) • visit to weather station	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment • carpenters (craftsmen) • architects
References - Teacher:	
• <u>Math Advantage</u> Teacher Resource Kit, Grade 4 • Internet	References - Student: • <u>Math Advantage</u> Grade 4 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



Module E

MATHEMATICS

Module Title: Data Handling

Sequence Reference: P5 MT-E

Time allotted: 5 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6



Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.2 - 2.4 Structure
- 3.1 - 3.6 Acquisition
- 4.1, 4.2, 4.3, 4.5, 4.6, 4.7 Communication
- 5.1, 5.2, 5.3, 5.4, 5.6 Cognition
- 6.1 - 6.4 Application

Content Focus:

- Probability
- Data Handling

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- collect data to address a question
- organize data based on the data set
- construct and label graphs
- display data in a variety of forms
- interpret data using appropriate language
- propose and communicate appropriate conclusions
- make predictions conduct simple probability experiments to test prediction
- assess and validate the data collection process

- one-to-one correspondence
- comparisons
- surveys
- data (interpretation)
- graphs – human, concrete object, pictorial, symbolic
- tallies, charts, tables, bar graphs, pictographs, Venn diagrams
- probability experiments: using terms such as
 - more likely, less likely, unlikely, equal chance, probable, expected possible, impossible, certain, uncertain, equally likely,

Module Title: Data Handling	Sequence Reference: P5 MT-E
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration - Mr. Hart owns a water trucking business. He wishes to visit Canada but not during his busiest month. Which month should he remain at home? • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations • investigations - favourite sport personality - most popular make of a car - favourite subject - team most likely to win the league cup	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Data Handling	Sequence Reference: P5 MT-E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Module test • Cumulative test	
Special Resources:	
(materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 4 • Internet	• <u>Math Advantage</u> Grade 4 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	

Mathematics - P6

Level Code: P6 MT



MINISTRY OF EDUCATION

Bermuda
2001

PRIMARY SCHOOL PHASE B OVERVIEW

Subject Title: Mathematics

Subject Code: P6 MT

Time Allotted: 330 min/wk

RATIONALE

Bermuda's students require developmentally appropriate and challenging programmes. The restructured primary school mathematics curriculum will offer a hands-on, problem-centred approach that will capture their interest, reflect their needs and prepare them for success in a global technological society. In developing mathematics literacy through this active and engaging approach, students will communicate, explore and apply mathematical ideas.

PRIMARY SIX (P6) REQUIREMENTS

The requirements for this level are as follows:

• Performance Assessment - Problem solving tasks - Reteach, practical, enrichment worksheet - Discussions - Oral presentations - Cooperative group work	30%
• Product Assessment - Portfolio work sample* - Chapter tests - Review tests - Module tests - Cumulative tests	50%
• Written Assessment - Journal writing - Project (group, individual) - Assignments (home, school) - Formative assignment (inventory test)	20%
Total	100%

*could also include family response sheet

MATERIALS OF INSTRUCTION (Adopted Text)

Burton Grace M., Maletsky, Evan M. Math Advantage, Orlando, FL., Harcourt International, 1999.

PHASE B OUTLINE

P4 Module Titles A - E	P5 Modules Titles A - E	P6 Modules Titles A - E
A. Number Sense 15 - whole numbers - place value - decimals - fractions - mathematical reasoning	A. Number Sense 17 - properties (associative, distributive, commutative) - ratios - percent	A. Number Sense 20 - whole numbers through millions - comparisons - multiples - divisibilities - prime and composite numbers - greatest common factor
B. Patterns and Relationships 4 - identification - predictions - problem solving strategies	B. Patterns and Relationships 2 - generalizations - exploration - extension - creating	B. Patterns and Relationships 2 - communication - construction - summarization
C. Shape and Space (Shape) 5 - lines (parallel, perpendicular, arc, ray) - coordinates (grid, ordered pairs, point)	C. Shape and Space (Shape) 5 - dimensions - closed and open figures - creation of pictures and plane figures	C. Shape and Space (Shape) 5 - use of descriptive attributes - classifying attributes and properties - construction of shapes - use of technology to explore geometric concepts
D. Shape and Space (Measurement) 6 - area - thermometer - digital, analog - representation	D. Shape and Space (Measurement) 5 - degrees - intervals - volume - comparison	D. Shape and Space (Measurement) 3 - elapsed time - increments - mass - conversion
E. Data Handling 4 - conducting surveys - labelling - collection of data	E. Data Handling 5 - chance - probability - communicating - conclusions	E. Data Handling 4 - questioning based on displayed data - validation - making predictions
Subtotal 34 Optional Weeks 4 Total Weeks 38	Subtotal 34 Optional Weeks 4 Total Weeks 38	Subtotal 34 Optional Weeks 4 Total Weeks 38

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☒

Mathematics

GOALS		SUBGOALS		MODULE & CURRICULUM CORRELATION MATRIX				
1	Appreciation	1.1	Interrelationships	x	x	x	x	x
		1.2	Successful Experiences	x	x	x	x	x
		1.3	Significance	x	x	x	x	x
2	Structure	2.1	Comparison		x	x	x	
		2.2	Appreciation	x	x	x	x	x
		2.3	Evaluation	x	x	x	x	x
		2.4	Generalization	x	x	x	x	x
		2.5	Interpretation			x	x	
3	Acquisition	3.1	Application of Number Concepts	x	x		x	x
		3.2	Estimation	x			x	x
		3.3	Multiple Representations	x	x		x	x
		3.4	Data Handling	x	x	x		x
		3.5	Geometric and Measurement Properties	x	x	x	x	x
		3.6	Algebraic Procedures		x			x
		3.7	Technology		x	x	x	
4	Communication	4.1	Ideas and Concepts	x	x		x	x
		4.2	Formulae and Terminology	x	x		x	x
		4.3	Oral/Written	x	x	x	x	x
		4.4	Generalization		x	x	x	x
		4.5	Symbolic notation		x		x	x
		4.6	Manipulatives and Technology	x	x	x	x	x
		4.7	Evaluation	x	x		x	x
5	Cognition	5.1	Confidence in Problem Solving	x	x		x	x
		5.2	Evaluation	x	x	x	x	x
		5.3	Technology	x	x	x	x	x
		5.4	Application	x	x	x	x	x
		5.5	Evaluation of Reasonableness		x		x	
		5.6	Modelling		x	x	x	x
		MODULES		A	B	C	D	E

MODULE KEY

A - Number Sense
B - Patterns and Relationships
C - Shape and Space (Shape)

D - Shape and Space (Measurement)
E - Data Handling

PRIMARY SCHOOL

check one: PS ☐ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☒

Mathematics

6	Application	6.1	Problem Solving Strategies	x	x	x	x	x
		6.2	Decision Making	x	x	x	x	x
		6.3	Real World Issues				x	x
		6.4	Lifelong Skills				x	x
CONTENT STRUCTURE		Number Sense		x	x	x	x	x
		Patterns and Relationships			x	x	x	
		Shape and Space (Shape)						x
		Shape and Space (Measurement)						
		Data Handling						x
		MODULES		A	B	C	D	E

MODULE KEY

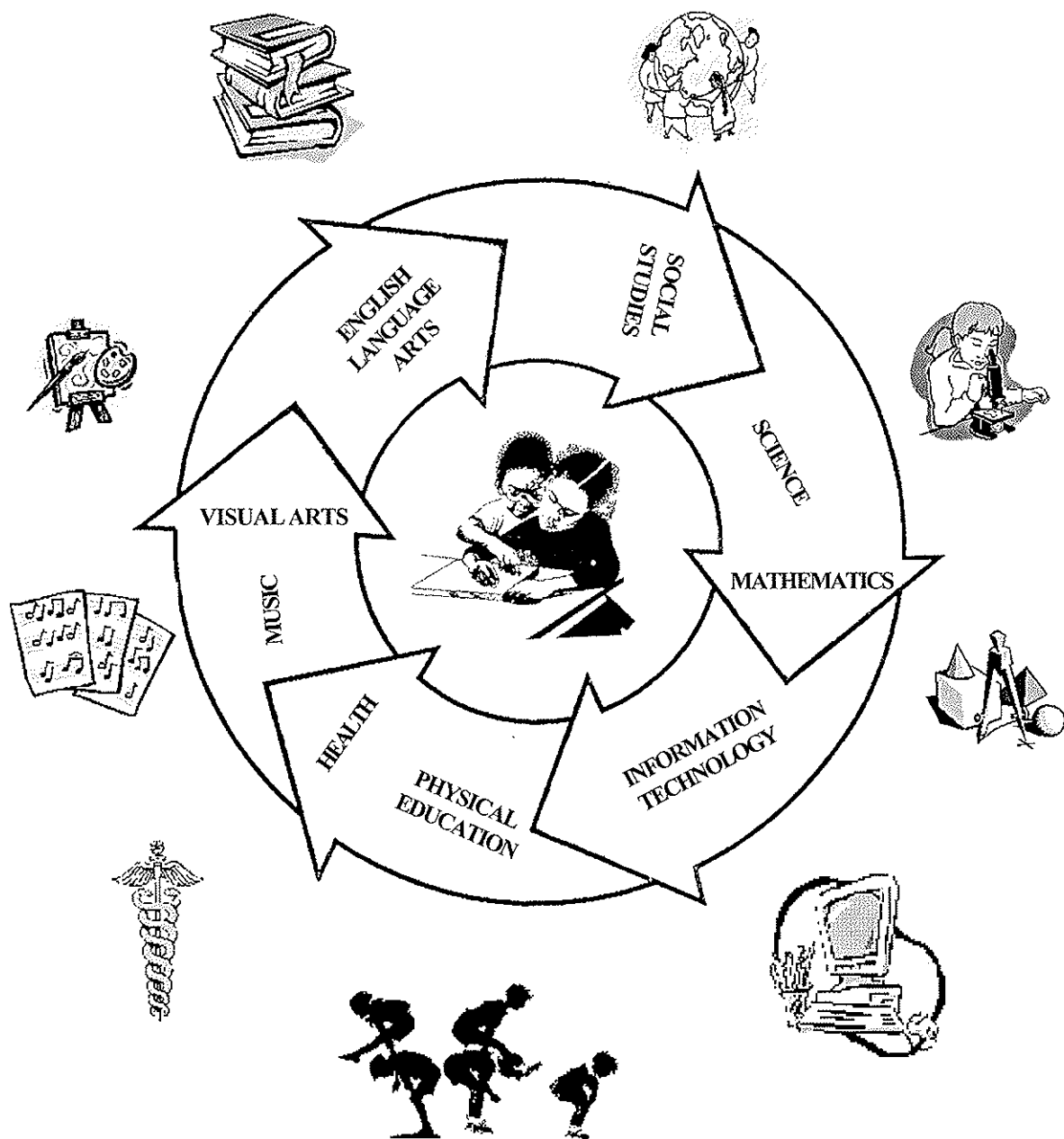
A - Number Sense

B - Patterns and Relationship

C - Shape and Space (Shape)

D - Shape and Space (Measurement)

E - Data Handling



Module A

MATHEMATICS

Module Title: Number Sense

Sequence Reference: P6 MT-A

Time allotted: 20 weeks

PHASE A

PHASE B

PS

P1

P2

P3

P4

P5

P6

☐
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Subgoal Emphasis:

- 1.1 - 1.3 Appreciation
- 2.2 - 2.4 Structure
- 3.1 - 3.5 Acquisition
- 4.1, 4.2, 4.3, 4.6, 4.7 Communication
- 5.1 - 5.4 Cognition
- 6.1 - 6.2 Application

Content Focus:

- Number
- Number Systems
- Number Operations

Curriculum Objectives:

Content Detail:

At the end of this module, students will:

- recognize the comparative value of place (100,000 equals 100 thousands)
- recognize, read and compare numbers from 0.001 to 1,000,000
- identify place value for each digit in a number from 0.001 to 1,000,000
- apply mental mathematical skills with proficiency
- recognize patterns, identify relationships and make generalizations
- create and solve complex problems using logical reasoning and clear explanations
- extend understanding of the operation of addition and how it relates to multiplication and subtraction
- extend understanding of the operation of subtraction to how it relates to addition and division
- recall multiplication facts and apply concepts to problem solving
- understand multiples and factors
- recognize and use primes and composites
- recall division facts; use test of divisibility for 4 and 8
- understand percent as number of parts in every 100 and find the percent of a small number
- represent, order and compare common, proper and decimal fractions, ratio and percent equivalents
- use a fraction as an operator to find fractions of numbers or quantities
(investigate the use of numbers in everyday situations and in various careers)
- interpret the use of numbers in media

- whole numbers through millions
- addition, multiplication, division and subtraction
- comparison and ordering of whole numbers
- place value
- estimation of quantities
- rounding
- multiples
- divisibility
- prime and composite numbers
- greatest common factor
- decimals
 - read, write and round
 - add, subtract, multiply and divide
 - compare and order as fractions
- fractions
 - comparing
 - ordering
 - equivalent
 - simplest form
- properties (associative, distributive, commutative, etc.)
- ratio

Module Title: Number Sense	Sequence Reference: P6 MT-A
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Number Sense

Sequence Reference: P6 MT-A

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Portfolios
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

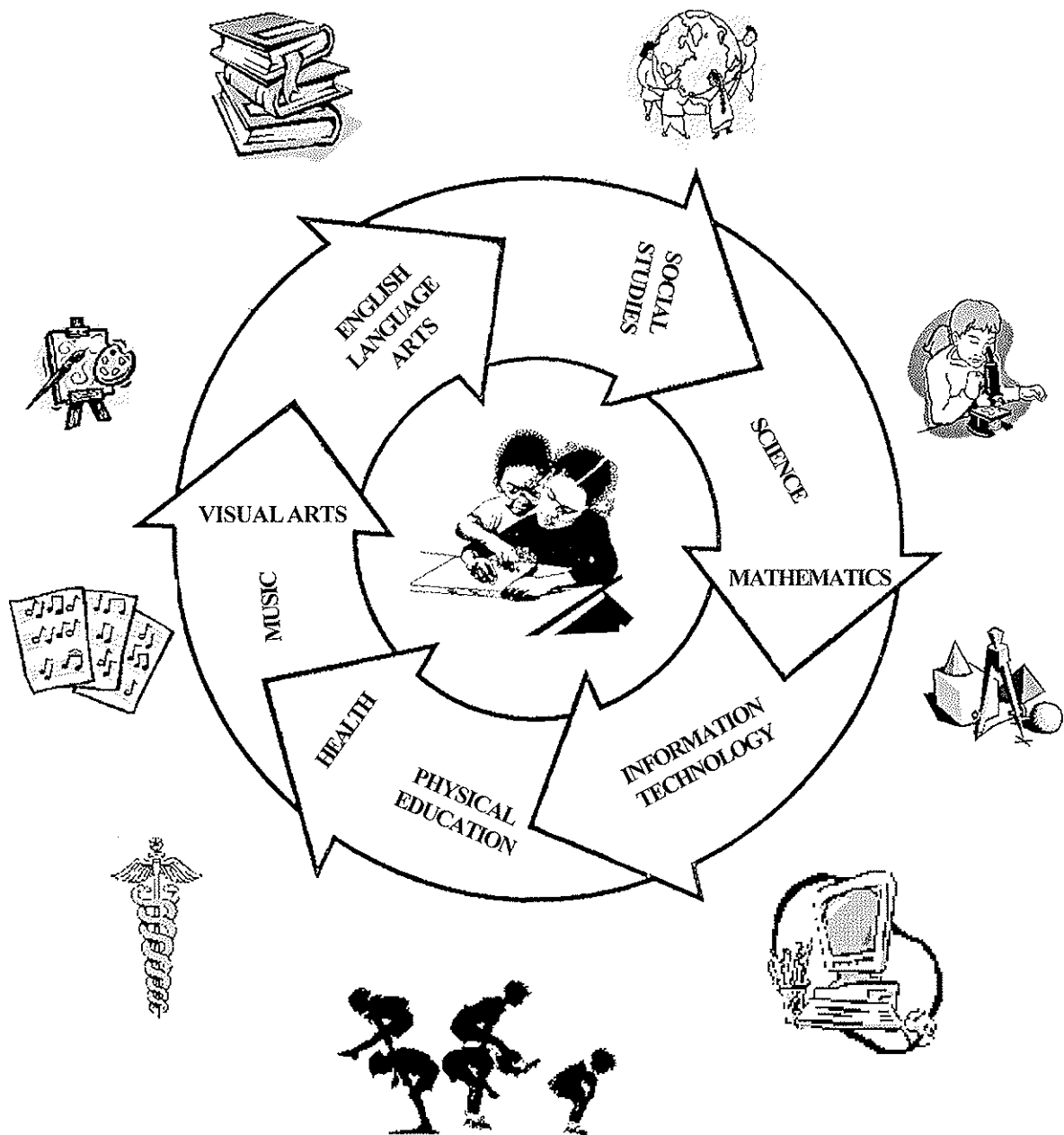
- Math Advantage Teacher Resource Kit, Grade 5
- Internet

References - Student:

- Math Advantage Grade 5
- Mighty Math Carnival Countdown
- Mighty Math Number Heroes

Glossary:

- refer to text



MATHEMATICS

Module Title: Patterns and Relationships Time allotted: 2 weeks	Sequence Reference: P6 MT-B						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.4 Structure 3.1, 3.3, 3.4, 3.5, 3.6, 3.7 Acquisition 4.1 – 4.7 Communication 5.1 – 5.6 Cognition 6.1 – 6.2 Application	Content Focus: - Relationships - Patterns - Algebraic Thinking						
	☐	☐	☐	☐	☐	☐	☒
Curriculum Objectives: At the end of this module, students will: - justify the relationship between addition and subtraction, addition and multiplication, multiplication and division, division and subtraction - analyze number and non number patterns, using concrete objects, grids, tables, charts, diagrams, number line models and technology - write number sentences to represent mathematical patterns and relationships - create and extend geometric and numeric patterns including growing and shrinking patterns - describe strategies for solving number sentences and linear equations using concrete models, tables, graphs and paper-pencil methods - formulate, justify and communicate predictions about numerical and non numerical patterns - pose and solve problems by applying a patterning strategy e.g. solve an area problem by extending a geometric grid pattern				Content Detail: - cause and effect relationships - prediction number pattern - rhythmic patterns - shape and colour patterns - pattern rules - analysis of patterns - patterns:- creating - extending patterns - growing and shrinking - addition and subtraction - multiplication and division - number sentences - problem solving strategies (looking for a pattern)			

Module Title: Patterns and Relationships	Sequence Reference: P6 MT-B
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Patterns and Relationships

Sequence Reference: P6 MT-B

Summative Assessment:

Assessments given at the end of a module where the data is used to generate grades.

- Chapter test
- Review test
- Projects
- Portfolios
- Cumulative test
- Module test

Special Resources:

(materials, equipment & community involvement)

- manipulatives
- technology (computer, calculator, TV, VCR)
- field trips
- overhead projector
- transparencies
- people (parents, community workers, etc.)
- classroom items
- familiar storybooks
- number cards
- flash cards
- flip chutes
- flip charts
- school environment

References - Teacher:

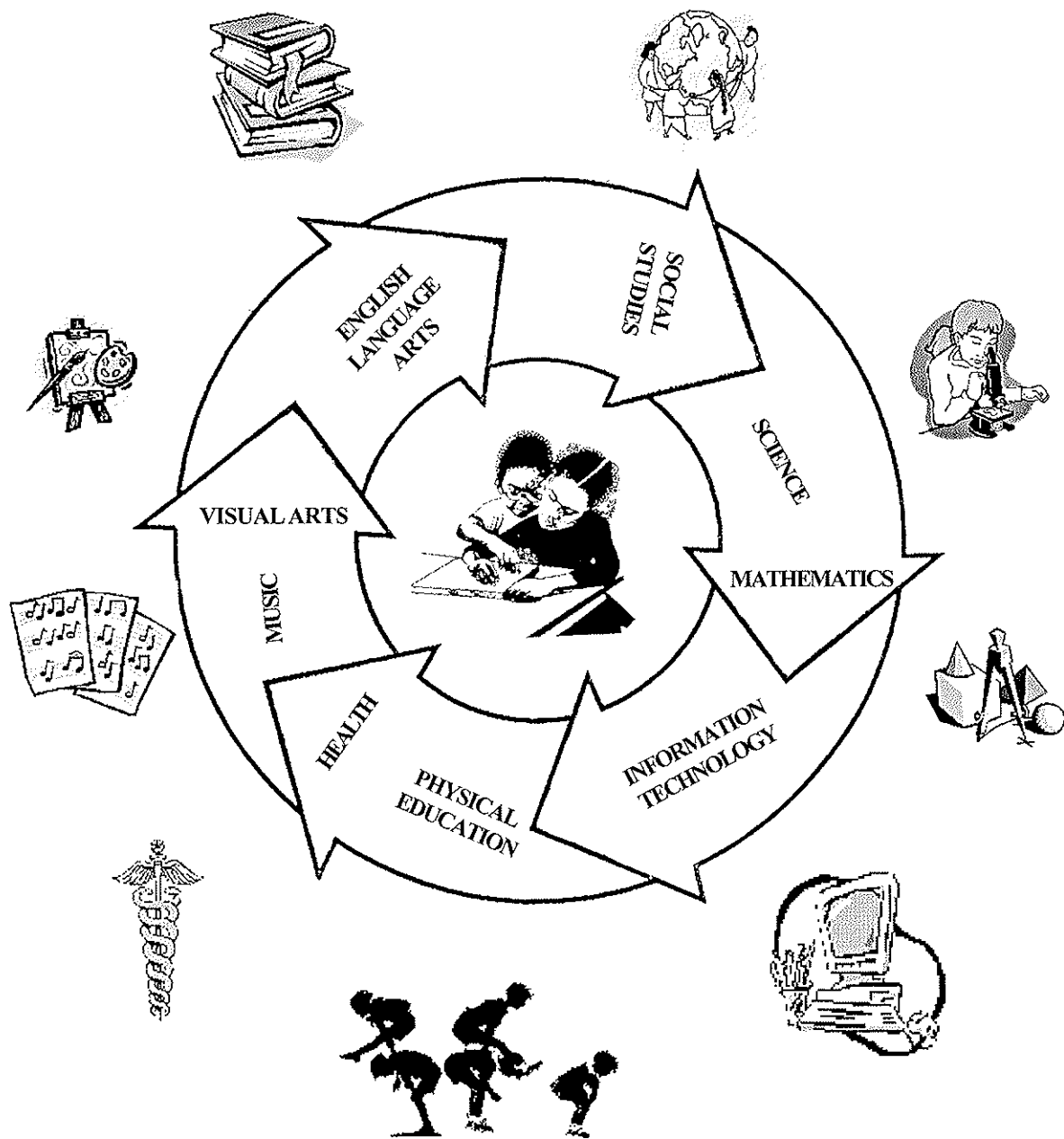
- Math Advantage Teacher Resource Kit, Grade 5
- Internet

References - Student:

- Math Advantage Grade 5
- Mighty Math Carnival Countdown
- Mighty Math Number Heroes

Glossary:

- refer to text



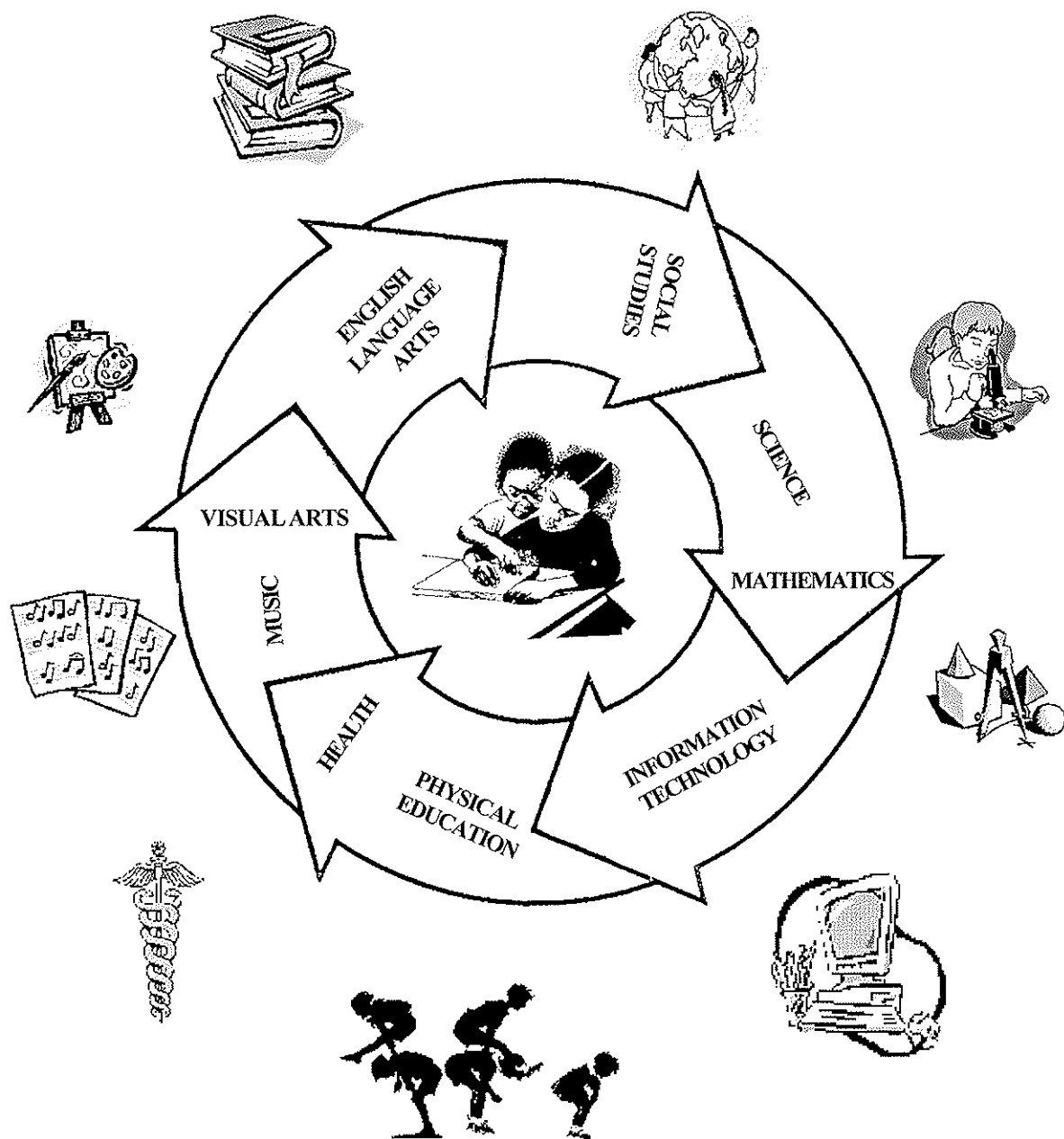
Module C

MATHEMATICS

Module Title: Shape and Space (Shape) Time allotted: 5 weeks	Sequence Reference: P6 MT-C						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☐	☐	☐	☐	☒
Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.5 Structure 3.4, 3.5, 3.7 Acquisition 4.3, 4.4, 4.6 Communication 5.2, 5.3, 5.4, 5.6 Cognition 6.1 – 6.2 Application	Content Focus: - Geometry - Patterning						
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - describe two and three dimensional figures using descriptive attributes - examine planes - investigate and describe relationships between lines, line segments and angles - classify and describe the attributes of planes and solids - compare three dimensional objects and their two dimensional representations (nets) - investigate the properties of a circle - construct circles - classify triangles by the relationship between the relationship between the lengths of their sides - construct triangles, quadrilaterals, and other polygons using a variety of materials - examine and describe congruent shapes and solids - create pictures and plane figures which have lines of symmetry - identify and draw geometric figures in various positions and orientations - predict and describe the results of translations (slides), rotations (turns) and reflections (flips) - pose and solve problems related to shape and space - use technology to explore geometric concepts				- vocabulary related to the circle - radius, diameter, circumference, chord - types of shapes - quadrilateral, square, rectangle, trapezoid, parallelogram, rhombus, polygon, pentagon, hexagon, heptagon, octagon - types of triangles - isosceles, scalene, equilateral, right-angled - three dimensional figures - cone, pyramid, cylinder, sphere - patterns - construction of - circle, triangle, quadrilateral - communication - congruency - transformations - turn, slide, flip, rotation, reflection, translation, nets - side, face, line, edge, corner, angle, vertices - lines - parallel, perpendicular, horizontal, vertical, diagonal, intersecting, arc, ray - angles - straight, acute, obtuse, right - coordinates - grid, ordered pairs, point - dimensions - closed and open figures			

Module Title: Shape and Space (Shape)	Sequence Reference: P6 MT-C
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking - construct three-dimensional objects using concrete materials - create patterns using three dimensional objects and two dimensional shapes • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics • questioning • writing or drawing pictures • create patterns using three dimensional objects and two dimensional shapes • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content in context • parent/teacher relations	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Shape)	Sequence Reference: P6 MT-C
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 5 • Internet	• <u>Math Advantage</u> Grade 5 • Mighty Math Number Heroes
Glossary:	
• refer to text	



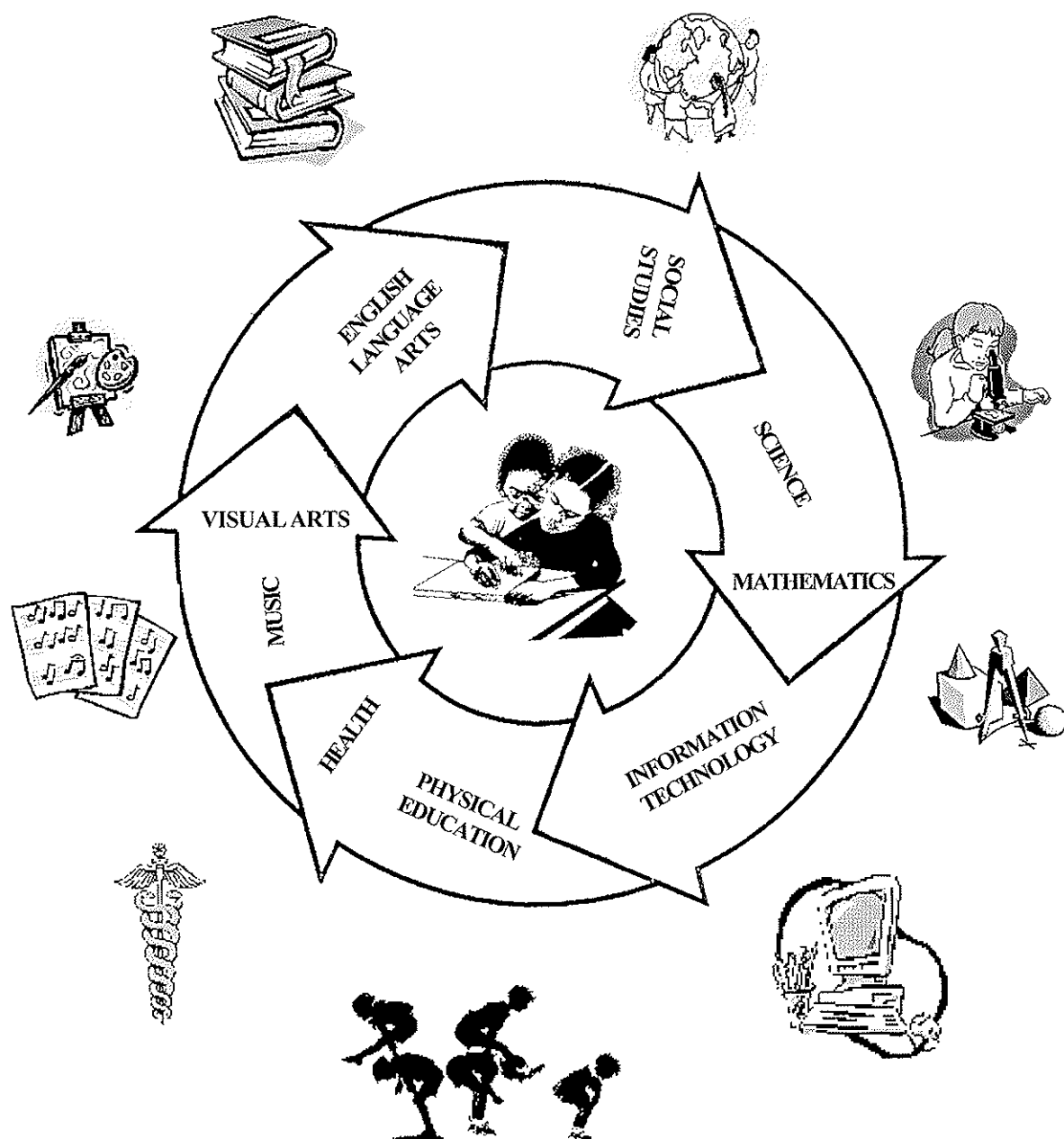
Module D

MATHEMATICS

Module Title: Shape and Space (Measurement) Time allotted: 3 weeks	Sequence Reference: P6 MT-D						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
	☐	☐	☐	☐	☐	☐	☒
Subgoal Emphasis: 1.1 – 1.3 Appreciation 2.1 – 2.5 Structure 3.1, 3.2, 3.3, 3.5, 3.7 Acquisition 4.1 – 4.7 Communication 5.1 – 5.6 Cognition 6.1 – 6.4 Application	Content Focus: Measurement						
Curriculum Objectives: At the end of this module, students will: - use measurement to describe and compare attributes of objects - construct scale drawings - select and apply the most appropriate standard unit for measuring circumference, area and volume - select and apply appropriate tools to measure circumference, area and volume - estimate using non standard and standard units of measure - appreciate the importance of accuracy in measurement - calculate unit conversions within a system of measurement - represent area using manipulatives, diagrams, spoken terms and written symbols - explore what happens to the perimeter and area when a two dimensional shape is changed - calculate the area of regular shapes using standard units (rectangle and triangle) - compare and order area using standard units - construct a number of shapes given a specific area - estimate and find the area of irregular shapes dividing them into parts - compare events according to the duration of time - use the calendar to solve routine and non routine problems - relate years, decades, centuries and millenniums				Content Detail: - measuring instruments - rulers, measuring tapes, yardsticks, metre stick, height chart, centimetre cubes, learning links, trundle wheel - liquid and dry measure cups, metric & customary containers, volume relationship containers - balance scales, spring scales, bathroom scales - length (centimetre, metre, kilometre, inch, foot, yard, mile) - mass (gramme, kilogramme, ounce, pound) - capacity (millilitre, litre, pint, quart, cup) - duration of time (minute, hour, day) - comparisons - long/short, longer/shorter, longest/shortest - thick/thin; nearer/farther - heavy/light, heavier/lighter, heaviest/lightest - empty/full, more/less, most/least - cube - area - square centimetre, square metre, square inch, square foot - elapsed time - before, after - types of clock: digital, analog - o'clock, hour, minute, hand, second - intervals - temperature - warm, hot, cold, cool, icy - thermometer reading - increments - degrees - dime, nickel, penny, quarter, dollar - time zones			

Module Title: Shape and Space (Measurement)	Sequence Reference: P6 MT-D
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving - demonstrate an understanding of the value of coins etc. • differentiating instruction • critical thinking - compare objects by length, height, perimeter and area using standard units • demonstrate an understanding of the value of coins to \$1 and bills to \$100 • create equivalent sets of coins using different coin combinations • create equivalent sets of bills up to \$100 using different combinations • represent the results of measurement activities using oral and written form; concrete materials and drawings - compare objects by length, height, and perimeter using standard units (mm, cm, m, km) • whole class • cooperative work • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics - represent the results of measurement activities using oral and written form; concrete material and drawings • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate materials • learning centres • meaningful, relevant content • parent/teacher relations • use multiple representations of mathematical concepts including manipulatives, diagrams and symbols	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

Module Title: Shape and Space (Measurement)	Sequence Reference: P6 MT-D
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, etc.) • classroom items • objects to be measured (e.g. rocks, sand etc) • visit to weather station	• familiar storybooks • number cards • flash cards • flip chutes • flip charts • school environment • carpenters (craftsmen) • architects
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade 5 • Internet	• <u>Math Advantage</u> Grade 5 • Mighty Math Carnival Countdown • Mighty Math Number Heroes
Glossary:	
• refer to text	



Module E

MATHEMATICS

Module Title: Data Handling Time allotted: 4 weeks	Sequence Reference: P6 MT-E						
	PHASE A				PHASE B		
	PS	P1	P2	P3	P4	P5	P6
Subgoal Emphasis: 1.1 - 1.3 Appreciation 2.2 - 2.4 Structure 3.1 - 3.6 Acquisition 4.1 - 4.7 Communication 5.1, 5.2, 5.3, 5.4, 5.6 Cognition 6.1 - 6.4 Application	Content Focus: - Probability - Data Handling						
	☐	☐	☐	☐	☐	☐	☒
Curriculum Objectives:				Content Detail:			
At the end of this module, students will: - design an investigation to answer a question - compare different representations of the same data - organize data based on the data set - display and interpret data in a variety of forms - interpret data using appropriate language including the meaning - communicate appropriate conclusions - predict the outcome simple experiments - assess and validate the data collection process - test the outcome of probability experiments				- comparisons - data interpretation - graphs – human, concrete object, pictorial, symbolic - tallies, charts, tables, bar graphs, pictographs, Venn diagrams - probability terms - more likely, less likely, unlikely, equal chance, probable, improbable, expected, unexpected - possible, impossible, certain, uncertain, equally likely, - event, outcome, frequency, best, worst, even chance, frequency			

Module Title: Data Handling	Sequence Reference: P6 MT-E
Recommended Instructional Strategies:	Recommended Formative Assessment Strategies:
• individualizing • problem solving • differentiating instruction • critical thinking - investigate the conclusions of data analysis • whole class • cooperative work - investigate predictions • computer assisted instruction • peer coaching • use of manipulatives • discussion of mathematics - probability of events as certain, equally likely and impossible • questioning • writing or drawing pictures • content integration • use of calculators • developmentally appropriate activities • learning centres • meaningful, and relevant context • parent/teacher relations? • investigations - develop a plan - collect data using, observation, surveys and experiments	Assessments that are part of regular teaching and learning in classrooms. Teachers and students use this data to promote student learning and conceptual understanding. • inventory test • assessing prior knowledge (can include intervention lessons or practice activities) • multiple – choice • free - response • math journals • portfolios • diagnostic assessment • oral presentations • investigations • teacher/student conferencing • visual presentations • observations

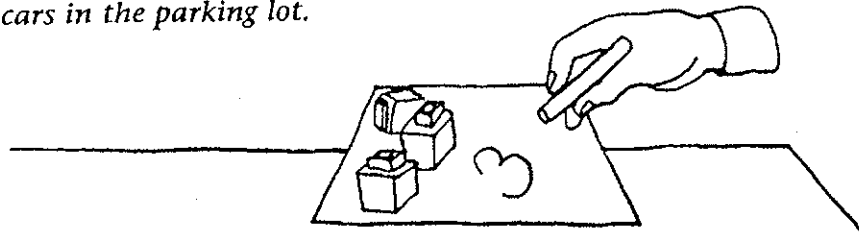
Module Title: Data Handling	Sequence Reference: P6 MT-E
Summative Assessment:	
Assessments given at the end of a module where the data is used to generate grades. • Chapter test • Review test • Projects • Portfolios • Cumulative test • Module test	
Special Resources: (materials, equipment & community involvement)	
• manipulatives • technology (computer, calculator, TV, VCR) • field trips • overhead projector • transparencies • people (parents, community workers, insurance brokers etc.) • classroom items	• flip chutes • flip charts • school environment • flash cards • number cards • familiar storybooks
References - Teacher:	References - Student:
• <u>Math Advantage</u> Teacher Resource Kit, Grade P5 • Internet	• <u>Math Advantage</u> Grade P5 • Mighty Math Carnival Countdown
Glossary:	
• refer to text	

MATHEMATICS APPENDIX
Number Sense
(PreSchool-PS MT-A)

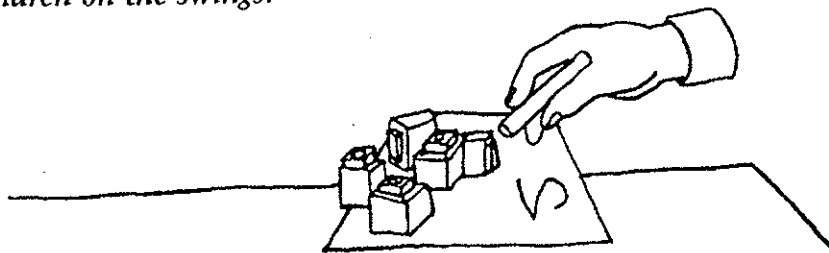
Curriculum Objective: recognize numbers 1-10 (up to 5 reliably)

ACTIVITY 1

There were three cars in the parking lot.



There were five children on the swings.



Large groups – Teacher directed – counting stories
Materials – stories with number themes e.g.

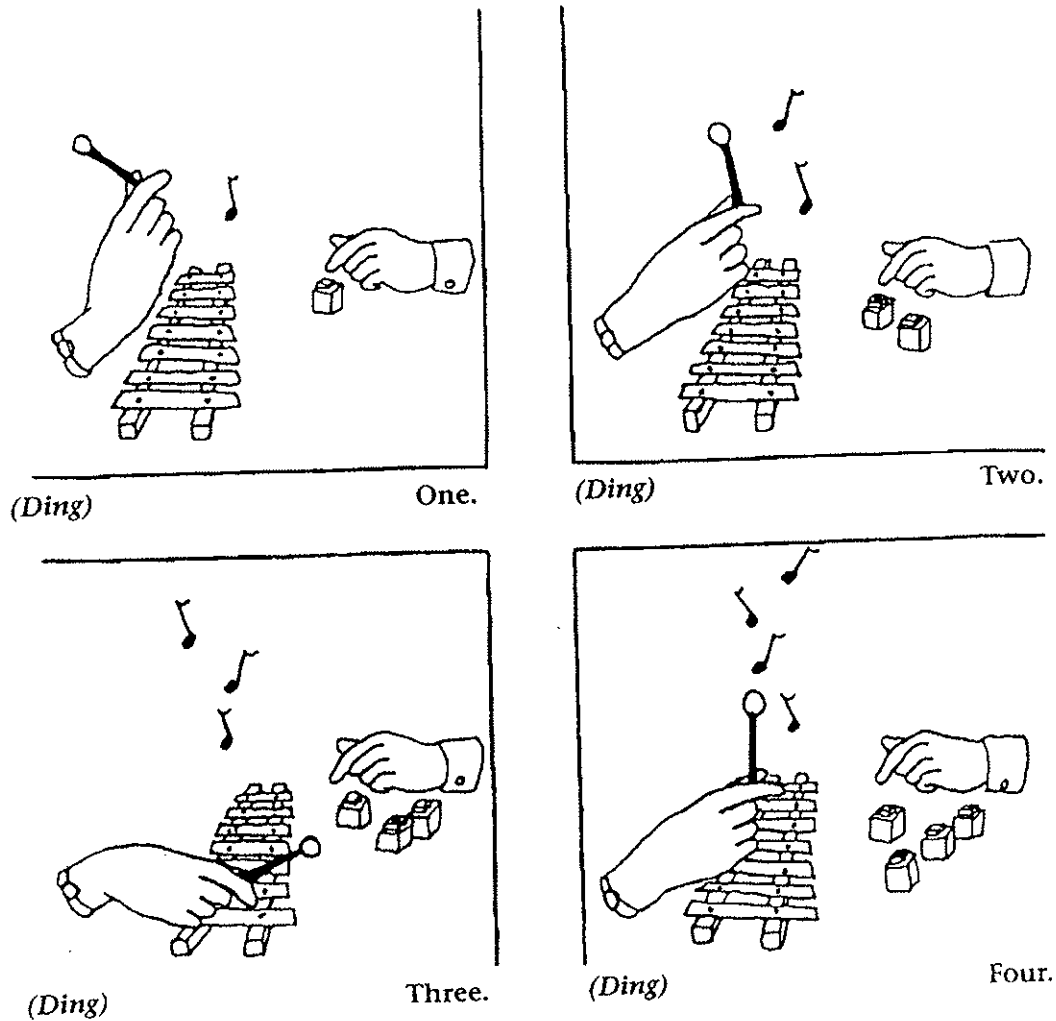
The Three Bears (or students created stories) Students will learn to associate numerals with amounts they represent; the teacher writes the numerals as the stories are told. The children act out the stories while the teacher records the numbers on blank paper or the board. When the children become familiar with the numerical symbols, write the numeral without saying it aloud to the students. See if they can remember it. This is a teaching (not testing) situation. Students who are unsure will need further practice.

Given a story, students will point to the number that the teacher calls e.g. There were five children engaged in water play this morning. Two children did not have aprons. One of the children was very wet. Students can also use their fingers to show the numbers.

ACTIVITY 2 (PreSchool-PS MT-A)

Curriculum Objective: count objectives with one to one correspondence.

We are going to practice counting to four.



Small group activity – Teacher directed “Slide and Check”

Materials – musical instrument objects

Students will focus on one to one correspondence as the teacher counts with them. Place a pile of theme-related objects (or other) in the centre of the student’s workspace. Have students take an object from the pile and “slide” it towards themselves one at a time as they practice counting with the teacher over and over to a designated number. On each count strike one beat (or note). After the designated number is reached say “check” and have the children recount. Have a signal that indicates when objects are to be put back. Repeat several times. Using the musical instrument strike the notes of the designated number. Have the children draw that particular number from a pile of counters.

MATHEMATICS APPENDIX
Patterns and Relationships
(Preschool-PS MT-B)

Curriculum Objective: Explore simple patterns using concrete materials

ACTIVITY

Given manipulatives of two shapes and a started pattern, students **complete** the pattern at least 3 times correctly.

Given beads of varying colours and shapes, students **create** their own pattern.

Complexity of pattern will vary and students must be encouraged to increase difficulty of their patterns.

Given a row of items arranged in a pattern, students can observe and recognize the pattern.

MATHEMATICS APPENDIX

Number Sense

(Primary One-P1 MT-A)

Curriculum Objective: Understand the concept and operation of subtraction using concrete materials.

ACTIVITY

Children are not expected to write number sentences at this level. Rather, they need to learn the sense of story that goes with adding and subtracting. For this, the teacher should provide many stories with meaningful contexts, and encourage the children to tell similar stories.

Explore addition and subtraction

Make use of classroom opportunities to model stories (real and imaginative) that are examples of addition and subtraction.

Examples:

“There are 2 of you at the computer station and now Jana has joined you. How many does that make?”

“Four children are allowed to play in the house center. If 2 are there now, how many more will be allowed?”

“If all the easel spaces are being used for painting, how many children would be painting?”

Encourage children to act out addition and subtraction stories (real or imagined), using classroom materials as props.

MATHEMATICS APPENDIX
Patterns and Relationships
(Primary One-P1 MT-B)

Curriculum Objective: Write number sentences to represent mathematical patterns and relationships.

ACTIVITY: Simon says Finger Patterning

Motivator:

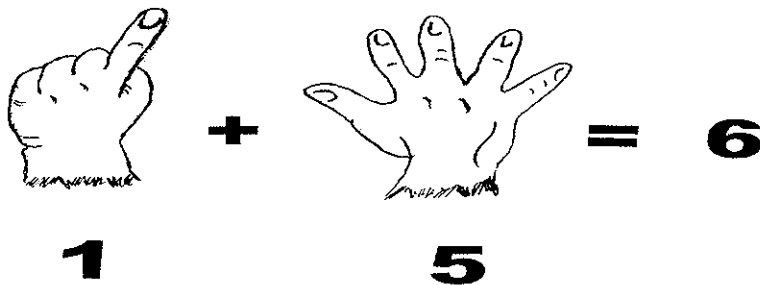
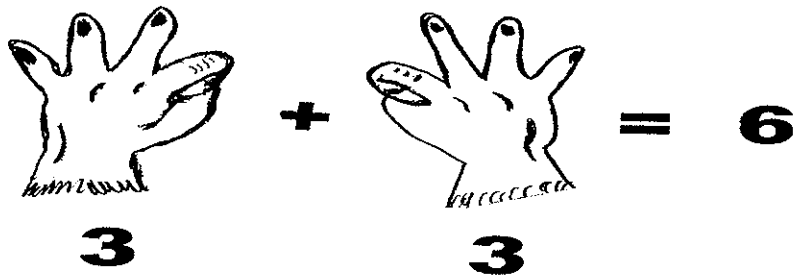
The teacher asks the students to show certain “numbers of fingers using both hands. As sequence progresses students are required to make a pattern then change the pattern. e.g. Put up addition fingers to make 8 or put down fingers to leave 3. Alternatively students may be asked to show the same number of fingers in a different way.

Written activity

Given hands, students will show different number sentences

Enrichment

Students can write number sentences



Eliminate the hand and ask how many fingers you need to represent that number

MATHEMATICS APPENDIX

Number Sense

(Primary Two – P2 MT-A)

Curriculum Objective: Explore and discuss patterns using mathematical terms such as **ODD** and **EVEN** and relationships such as:

$$2 + 3 = 5 \qquad 5 - 2 = 3$$

$$3 + 2 = 5 \qquad 5 - 3 = 2$$

ACTIVITY

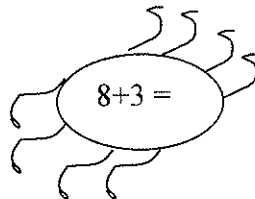
1. Make and hang two spider webs. (use wire or yarn stiffened by soaking in white glue.)
2. Label one web EVEN and the other web ODD.
3. Cut spiders and attach thread or string to each one. Place them in an envelope that hangs from the ceiling on a piece of yarn.
4. On each spider write an odd or even phrase, numeral or problem such as:
When you add 2 ODD numbers the sum is _____.
(odd, even)
When you add 2 EVEN numbers the sum is _____.
(odd, even)

or

7 + 5 is _____ (odd, even)

6 + 9 is _____ (odd, even)

5. Students identify the phrase, numeral or problem by hanging each spider from the correct web.



MATHEMATICS APPENDIX
Patterns and Relationships
(Primary Two-P2 MT-B)

Curriculum Objective: Discover patterns and relationship between and amongst numbers, objects and pictures.

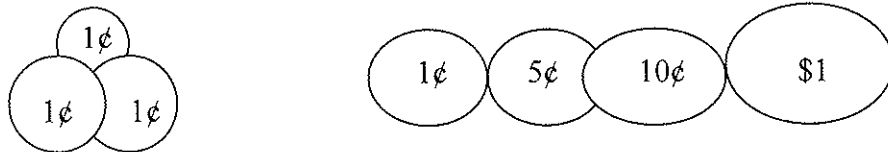
ACTIVITY

Cooperative Activity

Motivator

Students will be given a bag of coins. Students will sort the coins in any way they choose. Discuss what patterns look like.

Students will be given a bag of coins. Students will make a pattern with their coins.
e.g.



Students can compose rhythmic songs to patterns chosen. Students can then count the coins to lower values.

MATHEMATICS APPENDIX

Number Sense

(Primary Three – P3 MT-A)

Curriculum Objective: Understand and apply the concept of multiplication, know multiplication facts for 2s, 5s, 10s; use the terms product, factor, how many times, etc.

ACTIVITY

1. Students use objects to show multiplication facts (blocks, counters, etc or plastic-pack soda rings)

3 Sets of 2 / 3×2

2 Sets of 3 / 2×3

Students are given opportunities to explore multiplication using various manipulatives before writing equations.

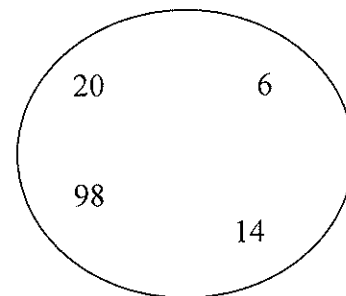
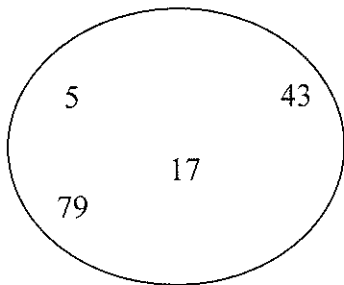
MATHEMATICS APPENDIX
Patterns and Relationships
(Primary Three-P3 MT-B)

Curriculum Objective: Classify objects by various attributes

ACTIVITY: Game-What's My Rule

The teacher will sort 10 students into 2 groups (e.g. laced shoes, not laced shoes), without telling the students how they are being sorted. One at a time, the rest of the students go to the group, to which they think they belong. The teacher will not tell them whether or not they are in the correct group. When all the students are in the appropriate groups the teacher will ask: "What's my rule?"

What's My Rule



Number Bank

100,	9,	3,	52,	15,	66,	8
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Written response

MATHEMATICS APPENDIX
Number Sense
(Primary Four-P4 MT-A)

Curriculum Objective: Mental Maths-develop proficiency in mental maths

ACTIVITY

Darren says he knows that 6 with 7 more make 13 because he always uses doubling to help his thinking.

$$6 + 7 \text{ is ?}$$

$$6 + 6 + 1 = 13$$

How would Darren solve these problems?

$8 + 9$

$6 + 8$

$11 + 10$

Tina says she knows that 6 with 7 more is 13 because she uses sums of 10 (compatible nos.)

$$6 + 7 \text{ is ?}$$

$$6 + 4 + 3 = 13$$

How would Tina solve the following?

$8 + 9$

$6 + 8$

$7 + 12$

Write a letter convincing a friend which method is best to use.

MATHEMATICS APPENDIX
Patterns and Relationships
(Primary Four-P4 MT-B)

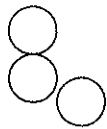
Curriculum Objective: Solve problems related to patterns and relationships.

ACTIVITY

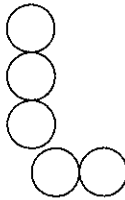
Students use counters, colour tiles, multilink cubes, etc to solve the following



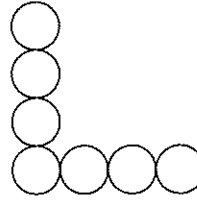
1



2



3



4

5

How many counters will there be in the 12th shape? The 15th shape?
Explain your thinking.

Note: This activity can be used as a formative assessment strategy using a rubric.

MATHEMATICS APPENDIX
Number Sense
(Primary Five-P5 MT-A)

Curriculum Objective: Show relationship between fractions and decimals.

ACTIVITY

Have students cut centimeter grid paper in 10 x 10 square. Using 100 square, demonstrate a variety of fractions and their decimal equivalents by shading in the appropriate number of squares. Use fractions that are seen most commonly such as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{3}{4}$, $\frac{2}{10}$ etc. Write the equivalents on the back of the square.

e.g. $\frac{1}{4} = .25$

Show and discuss how coins are related to fractions and decimals. Then have them make a chart similar to the one below in order to make comparison.

Coins	Decimal fraction of a dollar	Common Fraction of a dollar
1 penny	.01	$\frac{1}{100}$
2 pennies	.02	$\frac{2}{100} = \frac{1}{50}$
3 pennies	.03	$\frac{3}{100}$
.		
.		
.		
2 dimes		
.		
.		
.		
1 quarter		

“Performed Based”

MATHEMATICS APPENDIX
Patterns and Relationships
(Primary Five-P5 MT-B)

Curriculum Objective: Identify and explain mathematical patterns through the use of grids, tables, charts, diagrams, number lines, calculators and technology.

ACTIVITY

Students use hundreds charts and coloured pencils or crayons to investigate and describe the patterns found in multiples of 3 and 6. Students colour all multiples of three with one colour e.g. red; then colour all multiples of 6 with a different colour e.g. blue. Students then record which squares have one colour and which have been coloured twice and present their findings on a table or chart.

MATHEMATICS APPENDIX
Number Sense
(Primary Six-P6 MT-A)

Curriculum Objective: Place value of whole number

ACTIVITY

Have students play “digit roll” in groups of four. The object is to write the largest number. Each player has five boxes. Taking turns each player places a digit determined by the roll of a die into one of the five boxes. When each of the boxes has a digit, players read the numbers and decide who has the largest number. The winner rolls the die.

Cooperative

Divide the class into three groups of 6 or more. Give each group a set of the same six numbers.

The teacher will call out commands:

e.g. “Form the largest possible number.” “Make the smallest possible number with 2 in the thousands place.”

* For bonus points you may have the students state whether the responses are greater than, less than or equal to.

Independent

For independent assessment, the teacher may manipulate the six numbers on the board. The teacher will give statements and the students will write true/false. For the false statements students will supply the correct response.

e.g. 6 7 9 1 3 2

Teacher: “This: 9 6 7 3 1 2 is the largest number that can be formed.

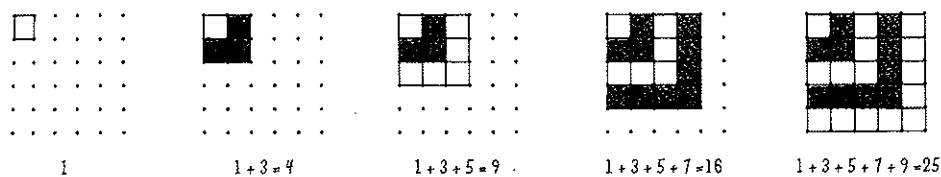
Student: false: 976,321

MATHEMATICS APPENDIX
Patterns and Relationships
(Primary Six-P6 MT-B)

Curriculum Objective: Understand patterns, relations, and functions.

ACTIVITY

Ask students to describe patterns they see in the “growing squares” display and express the patterns in mathematical sentences. Students should be encouraged to explain these patterns verbally and to make predictions about what will happen if the sequence is continued.



**PRESCHOOL (PS) MATHEMATICS
CURRICULUM OBJECTIVES AT A GLANCE
PACING GUIDE**

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
A. NUMBER SENSE ☐ explore the connection numbers and then the relationship to the real world ☐ count objects with one to one correspondence ☐ count orally to 20 by ones ☐ recognize numerals 1 to 10 (up to 5 reliably) ☐ count sequentially up to 10 (everyday objects) ☐ rote count backwards from 5 ☐ build sets of objects (1-10) ☐ explore numbers up to 10 using manipulatives and technology ☐ find one more or one less from a group up to 5 using concrete materials ☐ compare sets of objects – more or less; greater or smaller; first or last ☐ manipulate numbers to the value of 5 ☐ explore simple patterns using concrete materials ☐ explore appropriate problem solving approaches ☐ combine two groups of objects ☐ explore addition through practical activity and discussion ☐ explore subtraction through practical activity and discussion ☐ explore halves using everyday objects ☐ use appropriate terminology when referring to money ☐ formulate problems from everyday and mathematical situations			B. PATTERNS AND RELATIONSHIPS ☐ explore simple patterns using concrete materials ☐ examine objects for sameness, similarity and difference ☐ sort objects by colour, shape, size, texture or number ☐ classify objects by identifying various attributes ☐ create and extend patterns using actions, manipulatives, diagrams and spoken terms ☐ model addition of whole numbers, using objects and pictures C. SHAPE AND SPACE (Shape) ☐ explore real world and three dimensional objects ☐ match three dimensional objects and two dimensional shapes ☐ describe real world and three dimensional objects using the attributes size, shape and colour ☐ construct three-dimensional objects using materials such as modelling materials, blocks, boxes, multilinks and pattern blocks ☐ identify and name specific two dimensional shapes circle, square, triangle and rectangle ☐ sort and classify three dimensional objects and two dimensional shapes by various attributes (size, shape, colour) ☐ draw shapes such as circle, square, triangle and rectangle ☐ explore shapes using technology		

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
D. SHAPE AND SPACE (Measurements) ☐ begin to understand the concept of length ☐ use vocabulary to describe measurement ☐ construct objects based on a non standard unit of measure ☐ estimate using non standard units of measure ☐ measure using non standard units of measure ☐ represent the results of measurement activities using concrete materials ☐ pose and solve routine and non routine problems in measurement ☐ explore using different measures ☐ compare using different measures ☐ arrange/order using different measures ☐ explore empty and full ☐ explore sequencing events ☐ compare events according to the duration of time ☐ explore the calendar ☐ relate temperature to daily activities and seasons ☐ explore money through play			E. DATA HANDLING ☐ identify data about themselves or their surroundings ☐ organize data about themselves ☐ display data using concrete objects or pictures ☐ describe data ☐ discuss an event as likely according to experiences		
2 of 2					

**PRIMARY ONE (P1) MATHEMATICS
CURRICULUM OBJECTIVES AT A GLANCE
PACING GUIDE**

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
A. NUMBER SENSE ☐ count objects with one to one correspondence ☐ match objects with one to one correspondence ☐ count orally to 50 by ones, twos and tens ☐ recognize numerals 1 to 20 ☐ count sequentially up to 20 everyday objects ☐ count backwards from 10 ☐ build and describe sets of objects (1 to 20) ☐ explore numbers up to 50 using manipulatives and technology (this includes the calculator) ☐ find one more or one less than any number from 1 to 10 ☐ name the ordinal position in a sequence up to tenth ☐ manipulate numbers to the value of 10 ☐ explore and discuss simple patterns to make predictions ☐ use problem solving approaches ☐ know number facts up to 5 ☐ understand the concept and operation of addition using concrete materials ☐ understand the concept and operation of subtraction using concrete materials ☐ explain observations and thinking using diagrams, pictures, charts or words ☐ explain why a given part is half or quarter ☐ make general statements about odd or even numbers ☐ explore and describe fractions as equal parts of a whole ($\frac{1}{2}$ and $\frac{1}{4}$) ☐ identify Bermuda money – 1, 5, 10, 25 cents and \$1 coins ☐ identify the effects of zero in addition and subtraction ☐ pose and solve problems related to number sense			B. PATTERNS AND RELATIONSHIPS ☐ explore and discuss simple patterns to make predictions (what comes next?) ☐ sort objects by colour, shape, size, texture or number ☐ classify objects by identifying various attributes ☐ copy patterns using shapes, objects, pictures and numbers ☐ write number sentences to represent mathematical patterns and relationships ☐ create and extend patterns using actions, manipulatives, diagrams and spoken terms ☐ model subtraction of whole numbers, using objects, pictures and symbols C. SHAPE AND SPACE (Shape) ☐ explore and describe the attributes of size, shape and colour ☐ match three dimensional objects and two dimensional shapes ☐ identify and classify attributes and properties of solids ☐ compare geometric figures to real world objects ☐ identify and describe specific two dimensional shapes ☐ sort and classify three dimensional objects and two dimensional shapes ☐ construct three-dimensional objects using materials (modelling materials, blocks, boxes, multilinks, pattern blocks) ☐ draw shapes ☐ explore geometric figures in various positions ☐ use technology to explore shapes		

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
D. SHAPE AND SPACE (Measurement) ☐ use appropriate vocabulary to describe measurement ☐ recognize the attributes of length ☐ make objects using non standard measure ☐ estimate using non standard units of measure ☐ measure using multiple copies of a familiar classroom object (paper clips) ☐ explore sequencing of events ☐ compare events according to the duration of time ☐ explore calendar ☐ relate temperature to daily activities and seasons ☐ pose and solve real life problems based on measures ☐ explore money through play			E. DATA HANDLING ☐ gather data about themselves and their surroundings ☐ organize data based on one attribute chosen by teacher or students ☐ display data using concrete objects, pictures or graphs ☐ compare data using appropriate language		
			2 of 2		

**PRIMARY TWO (P2) MATHEMATICS
CURRICULUM OBJECTIVES AT A GLANCE
PACING GUIDE**

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
A. NUMBER SENSE ☐ construct meaning of whole numbers (10 <i>ones equals one 10</i>) ☐ count orally to 100 by ones, twos, fives and tens ☐ recognize numerals up to 100 ☐ count reliably up to 100 ☐ count backwards in ones from 20 and tens from 100 ☐ build and describe sets of objects (1 to 50) ☐ explore numbers up to 100 using manipulatives and the computer or calculator ☐ find one more or one less than any number from 1 to 100 ☐ recognize, build, compare and order sets of objects using ordinal numbers up to tenth ☐ manipulate numbers to the value of 20 ☐ explore and discuss patterns using mathematical terms such as odd and even and relationships such as ☐ $2 + 3 = 5$, $3 + 2 = 5$, ☐ $5 - 2 = 3$, $5 - 3 = 2$ ☐ apply problem solving approaches ☐ know number facts up to 10 ☐ add 2-digit numbers ☐ subtract 2 digit numbers ☐ explain their thinking using diagrams, pictures, charts, words or symbols ☐ understand multiplication as repeated addition by describing an array (2 sets of 4) ☐ understand division as repeated equal subtraction ☐ share equally a whole and describe the separate parts ☐ recognize and use odd and even numbers ☐ experiment with situations that show division as grouping or sharing			A. NUMBER SENSE (Cont'd) ☐ explain the results of mathematical explorations using diagrams, pictures, charts or words ☐ interpret information and results in context ☐ pose and solve problems related to number sense ☐ make up and tell stories ☐ identify Bermuda money and recognize relationships amongst coins B. PATTERNS AND RELATIONSHIPS ☐ sort objects by colour, shape, size and/or number ☐ classify objects by identifying various attributes ☐ describe and make predictions about concrete and pictorial patterns ☐ identify patterns in related addition and subtraction sentences e.g. fact families for sums to 20 ☐ discover patterns and relationships between and amongst numbers, objects and pictures ☐ create and extend patterns using actions, manipulatives, diagrams, numbers and spoken terms ☐ model addition and subtraction using symbols ☐ describe qualitative change		

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
C. SHAPE AND SPACE (Shape) ☐ explore real world and three dimensional objects ☐ match three dimensional objects and two dimensional shapes ☐ describe the attributes of real world and three dimensional objects using descriptive attributes ☐ identify lines ☐ examine attributes of solids ☐ compare geometric figures to real world objects ☐ construct three-dimensional objects using concrete materials (modelling materials, blocks, boxes, multilinks, pattern blocks, construction sets) ☐ sort and classify three dimensional objects and two dimensional shapes by properties ☐ combine two dimensional shapes to make pictures ☐ predict the result of putting shapes together and taking them apart ☐ recognize congruent shapes ☐ recognize symmetry in the environment ☐ explore turns, slides and flips ☐ explore geometric figures in various positions ☐ explore shapes using technology			D. SHAPE AND SPACE (Measurements) Cont'd ☐ use appropriate vocabulary to describe measurement attributes of objects ☐ explore measurement attributes of length, weight and time ☐ examine objects using non standard units of measure ☐ estimate using non standard units of measure ☐ represent the results of measurement activities using concrete materials ☐ explore and order events in oral and pictorial form ☐ tell time by the hour and half hour on the analog and digital clock ☐ explore the calendar ☐ compare temperature of different countries ☐ read a thermometer ☐ explore money through play ☐ recognizes coins 1¢, 5¢, 10¢, 25¢, \$1 ☐ demonstrate understanding of the value of coins to \$1 ☐ create equivalent sets of coins up to \$1 using different coin combinations ☐ represents money in symbol and written form ☐ pose and solve real life problems based on money or measures E. DATA HANDLING ☐ collect data about themselves and their surroundings ☐ organize data based on one attribute chosen by teacher or students ☐ display data using concrete objects or pictures ☐ compare data using appropriate language ☐ explore concepts of chance and risk		

**PRIMARY THREE (P3) MATHEMATICS
CURRICULUM OBJECTIVES AT A GLANCE
PACING GUIDE**

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
A. NUMBER SENSE ☐ construct meaning of whole numbers (100 <i>equals</i> 10 tens) ☐ count orally by ones, twos, fives and tens up to 1000 ☐ recognize numerals up to 1000 ☐ relate counting, grouping and place-value concepts up to 1000 ☐ explore number operations using manipulatives and technology tools ☐ find one more or one less than any number from 1 to 1000 ☐ compare and order sets of objects using ordinal numbers up to thirty-first ☐ demonstrate the conservation of numbers ☐ identify and discuss patterns in relationship to numerical, spatial or practical situations (e.g. patterns in a 100's chart) ☐ apply appropriate problem solving strategies ☐ know number facts up to 18 ☐ add 2-digit numbers with regrouping and know the terms related to addition (sum, total, altogether) ☐ subtract 2 digit numbers with regrouping and using zero as place holder; know the terms related to subtraction (difference, more than, how many more, take away) ☐ check for reasonableness of solutions when solving problems ☐ understand and apply the concept of multiplication; know multiplication facts for 2s, 5s, 10s; use the terms-product, how many times ☐ model, create and describe division situations in which a set of objects is separated into equivalent sets (sharing) ☐ explore fact families			A. NUMBER SENSE (Cont'd) ☐ use words such as more than, fewer than and difference to write number sentences ☐ know division facts relating to 2s, 5s, and 10s; know and use tests of divisibility for 2s, 5s, and 10s ☐ represent and apply common fractions, including tenths, using concrete materials ☐ name a fractional part of a set and recognize this operation as sharing (dividing) ☐ determine the value of a collection of coins to \$1 ☐ explain the results of mathematical explorations using diagrams, pictures, charts or words B. PATTERNS AND RELATIONSHIPS ☐ sort objects by colour, shape, size or number ☐ classify objects by identifying various attributes ☐ explore relationships between addition and subtraction ☐ identify number relationships and number patterns ☐ write number sentences to represent mathematical patterns and relationships (addition and multiplication) ☐ make predictions, form generalizations and communicate ideas about patterns e.g. odd and even; (counting in fives, tens etc.) ☐ create number and non number patterns ☐ solve problems related to patterns and relationships ☐ create and extend patterns using actions, manipulatives, diagrams and spoken terms ☐ describe quantitative change		

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
C. SHAPE AND SPACE (Shape) ☐ explore and describe the attributes of real world and three dimensional objects ☐ identify lines and angles ☐ compare geometric figures to real world objects ☐ construct three-dimensional objects using concrete materials (modelling materials, blocks, boxes, multi-links, pattern blocks, construction sets) ☐ identify and describe two dimensional shapes ☐ sort and classify three dimensional objects and two dimensional shapes by properties. ☐ know the properties of and construct congruent shapes (geoboards, dot paper) ☐ recognize symmetry in the environment ☐ identify geometric figures in various positions and orientations ☐ recognize and apply slides, flips and turns ☐ pose and solve problems related to shape and space ☐ explore shapes using technology			D. SHAPE AND SPACE (Measurements) ☐ use appropriate vocabulary to describe measurement attributes of objects ☐ recognize the attributes of length, weight, area and time ☐ identify instruments used in standard and non standard measurement ☐ explore objects using non standard and standard units of measure ☐ select the most appropriate standard unit for measuring length ☐ use repetition of a single unit to measure something larger than the unit ☐ describe relationship among various standard units for measuring length ☐ explore measurement concepts using manipulatives, diagrams, spoken terms and written symbols ☐ explore and order events in oral and pictorial form ☐ explore perimeter E. DATA HANDLING ☐ pose questions and collect data based on first hand information ☐ organize data based on one attribute chosen by teacher or students ☐ construct data representations using concrete objects, pictures and graphs ☐ interpret data using appropriate language ☐ propose and communicate appropriate conclusions ☐ make inferences to solve problems ☐ understand how data is used in real situations to make predictions		

**PRIMARY FOUR (P4) MATHEMATICS
CURRICULUM OBJECTIVES AT A GLANCE
PACING GUIDE**

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
A. NUMBER SENSE ☐ recognize the comparative value of place (1000 equals 100 tens) ☐ recognize, read and compare numbers from 0.1 to 10,000 ☐ relate counting, grouping and place-value concepts up to 10,000 ☐ develop proficiency in mental mathematics ☐ recognize patterns, identify relationships and make generalizations ☐ use critical thinking skills to create and solve complex problems ☐ add any 4 digit numbers ☐ subtract any 4 digit numbers ☐ check for reasonableness of answers by a variety of means including estimation ☐ know multiplication facts up to 9×9; multiply by multiples of 10 and two-digit by two-digit numbers ☐ understand mathematical terms – division, quotient, divisor, factors, multiples ☐ know division facts up to 9×9; divide by 10 ☐ know and apply tests for divisibility for 2, 5 and 10 ☐ add and subtract simple fractions and decimals using concrete objects, pictures and written terms ☐ show, read and write fractions ☐ model, create and describe division situations in which a set of objects is separated into equivalent sets (sharing) ☐ (identify and use Bermuda money) measurement ☐ identify the effects of zero in multiplication ☐ explain the results of mathematical explorations using diagrams, pictures, charts or words			B. PATTERNS AND RELATIONSHIPS ☐ compare objects according to colour, shape, size and/or number ☐ classify objects by identifying various attributes ☐ explore the relationship addition and subtraction, addition and multiplication, multiplication and division, division and subtraction ☐ identify patterns and relationships between and amongst numbers using concrete objects, pictorial models or technology ☐ write number sentences to represent mathematical patterns and relationships addition, subtraction, multiplication, division ☐ construct open number sentences to express relationships e.g. $7 \times 7 = 49$ ☐ make predictions and present generalizations about patterns e.g. odd and even; multiples of whole numbers etc. ☐ solve problems related to patterns and relationships ☐ create and extend geometric and numeric patterns		

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
C. SHAPE AND SPACE (Shape) ☐ describe the attributes of real world and three dimensional objects ☐ identify lines, line segments and angles ☐ identify the attributes of solids ☐ examine three dimensional objects and two dimensional shapes by properties ☐ construct three-dimensional objects using concrete materials ☐ create pictures of objects in the environment using two dimensional shapes ☐ create patterns using three dimensional objects and two dimensional shapes ☐ combine two dimensional shapes to make pictures ☐ examine congruent shapes and solids ☐ examine pictures and plane figures to identify lines of symmetry ☐ identify geometric figures in various positions and orientations including translations (slides) ☐ pose and solve problems related to shape and space ☐ use technology to explore geometric concepts D. SHAPE AND SPACE (Measurements) ☐ explore using various measures ☐ select the most appropriate standard unit for measuring length and weight ☐ measure using non standard and standard units ☐ investigate relationships among various standard units ☐ estimate and compare measures using non standard and standard units ☐ show measurement ideas using manipulatives, diagrams, spoken terms and written symbols			D. SHAPE AND SPACE (Measurements) Cont'd ☐ explore surface area using a variety of objects ☐ compare and order events according to the duration of time ☐ tell time to the minute using analog/digital clocks ☐ use the calendar to solve routine and non routine problems ☐ read a thermometer ☐ demonstrate an understanding of the value of coins to \$1 and bills to \$100 ☐ use money in real life situations to estimate, count, record collections, and make change up to \$10 ☐ create equivalent sets of coins and bills using different coin combinations ☐ represent money in symbolic and written form ☐ solve real life problems based on money or measures E. DATA HANDLING ☐ collect data based on first and second-hand information ☐ organize data based on one or more attribute chosen by teacher or students ☐ construct and label graphs ☐ display data in a variety of forms ☐ describe data using appropriate language ☐ propose and communicate appropriate conclusions ☐ make predictions ☐ conduct simple probability experiments to test predictions ☐ make inferences to solve problems		

**PRIMARY FIVE (P5) MATHEMATICS
CURRICULUM OBJECTIVES AT A GLANCE
PACING GUIDE**

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
A. NUMBER SENSE ☐ recognize the comparative value of place (10,000 equals 10 thousands) ☐ recognize, read and compare numbers from 0.01 to 100,000 ☐ identify place value for each digit in a number from 0.01 to 100,000 ☐ use a variety of mental methods of computation with whole numbers up to 100 ☐ recognize patterns, identify relationships and make generalizations ☐ create and solve complex problems using logical reasoning and clear explanations ☐ add any combination of numbers and understand the principles of the commutative and associative properties of addition ☐ subtract any two numbers ☐ estimate, compute and verify the sum and difference of any combination of numbers ☐ know multiplication facts to 12x12 and apply ☐ multiply 2,3 and 4 digit numbers by a 2 digit number ☐ recall division facts to 144 ☐ divide three-digit by one digit numbers with remainders ☐ divide by multiples of 10 ☐ know and apply tests for divisibility for 3, 6 and 9 ☐ show the relationship between fractions and decimals ☐ show the relationship between decimals and fractions ☐ add and subtract decimals ☐ add and subtract fractions ☐ multiply fractions, using pictures and models ☐ identify and represent equivalent fractions; relate fractions to ratios; and compare common fractions with decimals using concrete objects ☐ perform basic calculations with proficiency ☐ identify the use of numbers in everyday situations and in various careers ☐ use words and symbols to describe and generalize patterns ☐ appreciate the use of numbers in the media			B. PATTERNS AND RELATIONSHIPS ☐ classify objects by using various attributes ☐ identify the relationship between addition and subtraction, addition and multiplication, multiplication and division, division and subtraction ☐ analyze number and non number patterns using concrete objects, grids, tables, charts, diagrams, number line, models and technology ☐ write number sentences to represent mathematical patterns and relationships ☐ formulate, justify and communicate predictions using numerical and non numerical patterns ☐ pose and solve problems by applying a patterning strategy e.g. solve an area problem by extending a geometric grid pattern ☐ create and extend numeric and non numeric patterns using manipulatives, diagrams, written and mathematical terminology C. SHAPE AND SPACE (Shape) ☐ describe real world two and three dimensional figures using descriptive attributes ☐ investigate relationships between, lines, line, segments and angles ☐ classify the attributes of planes and solids ☐ compare three dimensional objects and two dimensional shapes by properties ☐ construct three-dimensional objects using concrete materials ☐ create patterns using three dimensional objects and two dimensional shapes		

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
C. SHAPE AND SPACE (Shape) Cont'd ☐ construct triangles, quadrilaterals, and polygons using a variety of materials ☐ identify congruent shapes and solids ☐ identify and describe line symmetry ☐ identify geometric figures in various positions and orientations including translations (slides) and reflections(flips) ☐ pose and solve problems related to shape and space ☐ use technology to explore geometric concepts D. SHAPE AND SPACE (Measurements) ☐ use measurement to describe and compare attributes of objects ☐ identify instruments used in standard and non standard measurement ☐ explore and compare systems of measurement ☐ construct diagrams using non standard and standard units of measure ☐ select and apply the most appropriate standard unit for measuring length, weight, time and temperature ☐ select and apply appropriate tools to measure length, perimeter, weight, time and temperature ☐ examine the relationship between perimeter and area of a rectangle ☐ investigate relationships among standard units used for measuring length and weight ☐ estimate using non standard and standard units of measure ☐ represent measurement ideas using manipulatives, diagrams, spoken terms and written symbols ☐ understand the concept of perimeter and area ☐ estimate length, height, perimeter, and circumference using standard unit, customary and metric			D. SHAPE AND SPACE (Measurements) Cont'd ☐ examine the attributes of objects by length, height, perimeter, and circumference using standard units (mm, cm., m, km) ☐ compare and construct shapes by area using standard units ☐ compare events according to the duration of time ☐ read and write time to the minute using analog and digital clock E. DATA HANDLING ☐ collect data to address a question ☐ organize data based on the data set ☐ construct and label graphs ☐ display data in a variety of forms ☐ interpret data using appropriate language ☐ propose and communicate appropriate conclusions ☐ make predictions conduct simple probability experiments to test prediction ☐ assess and validate the data collection process		

**PRIMARY SIX (P6) MATHEMATICS
CURRICULUM OBJECTIVES AT A GLANCE
PACING GUIDE**

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
A. NUMBER SENSE ☐ recognize the comparative value of place (100,000 equals 100 thousands) ☐ recognize, read and compare numbers from 0.001 to 1,000,000 ☐ identify place value for each digit in a number from 0.001 to 1,000,000 ☐ apply mental mathematical skills with proficiency ☐ recognize patterns, identify relationships and make generalizations ☐ create and solve complex problems using logical reasoning and clear explanations ☐ extend understanding of the operation of addition and how it relates to multiplication and subtraction ☐ extend understanding of the operation of subtraction to how it relates to addition and division ☐ recall multiplication facts and apply concepts to problem solving ☐ understand multiples and factors ☐ recognize and use primes and composites ☐ recall division facts; use test of divisibility for 4 and 8 ☐ understand percent as number of parts in every 100 and find the percent of a small number ☐ represent, order and compare common, proper and decimal fractions, ratio and percent equivalents ☐ use a fraction as an operator to find fractions of numbers or quantities ☐ (investigate the use of numbers in everyday situations and in various careers) ☐ interpret the use of numbers in media			B. PATTERNS AND RELATIONSHIPS ☐ justify the relationship between addition and subtraction, addition and multiplication, multiplication and division, division and subtraction ☐ analyze number and non number patterns, using concrete objects, grids, tables, charts, diagrams, number line models and technology ☐ write number sentences to represent mathematical patterns and relationships ☐ create and extend geometric and numeric patterns including growing and shrinking patterns ☐ describe strategies for solving number sentences and linear equations using concrete models, tables, graphs and paper-pencil methods ☐ formulate, justify and communicate predictions about numerical and non numerical patterns ☐ pose and solve problems by applying a patterning strategy e.g. solve an area problem by extending a geometric grid pattern C. SHAPE AND SPACE (Shape) ☐ describe two and three dimensional figures using descriptive attributes ☐ examine planes ☐ investigate and describe relationships between lines, line segments and angles ☐ classify and describe the attributes of planes and solids ☐ compare three dimensional objects and their two dimensional representations (nets) ☐ investigate the properties of a circle ☐ construct circles		

Objectives	Time/ Minutes	Date Completed	Objectives	Time/ Minutes	Date Completed
C. SHAPE AND SPACE (Shape) Cont'd ☐ classify triangles by the relationship between the relationship between the lengths of their sides ☐ construct triangles, quadrilaterals, and other polygons using a variety of materials ☐ examine and describe congruent shapes and solids ☐ create pictures and plane figures which have lines of symmetry ☐ identify and draw geometric figures in various positions and orientations ☐ predict and describe the results of translations (slides), rotations (turns) and reflections (flips) ☐ pose and solve problems related to shape and space ☐ use technology to explore geometric concepts D. SHAPE AND SPACE (Measurements) ☐ use measurement to describe and compare attributes of objects ☐ construct scale drawings ☐ select and apply the most appropriate standard unit for measuring circumference, area and volume ☐ select and apply appropriate tools to measure circumference, area and volume ☐ estimate using non standard and standard units of measure ☐ appreciate the importance of accuracy in measurement ☐ calculate unit conversions within a system of measurement ☐ represent area using manipulatives, diagrams, spoken terms and written symbols ☐ explore what happens to the perimeter and area when a two dimensional shape is changed ☐ calculate the area of regular shapes using standard units (rectangle and triangle)			D. SHAPE AND SPACE (Measurements) Cont'd ☐ compare and order area using standard units ☐ construct a number of shapes given a specific area ☐ estimate and find the area of irregular shapes dividing them into parts ☐ compare events according to the duration of time ☐ use the calendar to solve routine and non routine problems ☐ relate years, decades, centuries and millenniums E. DATA HANDLING ☐ design an investigation to answer a question ☐ compare different representations of the same data ☐ organize data based on the data set ☐ display and interpret data in a variety of forms ☐ interpret data using appropriate language including the meaning ☐ communicate appropriate conclusions ☐ predict the outcome simple experiments ☐ assess and validate the data collection process ☐ test the outcome of probability experiments		

ASSESSMENT

SUPPORTS LEARNING

IN

BERMUDA SCHOOLS

CURRICULUM, INSTRUCTION & EVALUATION
Department of Education

BERMUDA

BERMUDA ASSESSMENT PLAN

The Ministry of Education provides schools with several types of tests to monitor students' progress towards becoming life-long learners and good citizens. Different measures are used to collect a full range of assessment evidence about students' capabilities to analyze information, to evaluate charts and graphs, and to devise solutions to problems.

People who can communicate well and have the ability to interpret complex problems will be highly valued in the future workplace. Testing results are one of the ways that the Ministry informs young learners and their parents about their progress towards developing the capabilities that will enable them to succeed.

Annual Assessment Schedule

Each June students write *TerraNova* Assessments for Primary School students in year 3 through 6. These measures include a full range of achievement tests covering Reading, Language and Mathematics. School principals evaluate the results as part of their School Improvement Plans looking for year-level and school wide weakness to guide curriculum plans for the year and identify areas of focus for staff development.

In June the Ministry requires schools to administer the Bermuda Educational Assessment Programme for P3 and P5 as a performance indicator for Mathematics and English Language Arts achievement. These tests are all developed in Bermuda by curriculum specialists with the assistance of classroom teachers. In Language Arts, students write an essay and take a spelling test. In Mathematics, students solve problems and answer sets of questions that ask them to calculate and apply mathematical concepts.

OUR BELIEFS ABOUT ASSESSMENT

Assessment strategies are the plans that teachers use to collect evidence about students' achievement in school. When teachers have a good understanding of how far students have come, then teachers are in a better position to guide them, as they become more able learners.

When teachers collect assessment information they may have different purposes in mind, but learning is the primary focus. There are seven basic assessment guidelines for educators:

1. The primary purpose of assessment is to improve student learning.
2. Assessment practices and policies are fair to all students.
3. Assessment supports learning even when it is designed for other purposes, such as accountability.
4. Teachers support learning by working together to improve assessment.
5. Community representatives participate in developing assessments.
6. There is a schedule to communicate clear assessment information.
7. Educators review progress toward assessment goals along with community people.

DEFINITIONS

Educators use the term, “assessment” to describe any plans and activities they use to monitor student achievement. Measuring, evaluating, and reporting are three components of assessment.

Assessment

For our system we define assessment to mean gathering information systematically to determine:

- What students know,
- What they are able to do,
- and what goals they are working toward.

Evaluation

We define evaluation to mean judging information systematically to determine student progress toward intended curriculum objectives. When teachers evaluate, they interpret assessment evidence compared to the intended curriculum and to the taught curriculum, so they may judge student progress. Evaluation helps students improve their learning when educators show learners their strengths and direct them in ways that develop their competencies.

Reporting

We define reporting to mean communicating information on student progress, especially to parents. In order to support student learning, parents need regular assessment updates on what their children have learned, what they can do, and what they are working toward. This communication may be verbal in personal interviews or in telephone conversations, but some reports must be in writing. Parents can be effective learning guides when educators give them clear information about student progress.

EXEMPLAR SCORING GUIDE*
Primary Levels 3-6
(0 - 4 Scale)

		EQUIVALENT	
Level	Definition	Letter	% mark
4	A very good performance • focuses on the purpose of the task • meets or exceeds all the requirements of the task • organizes content and ideas in a logical way • presents information clearly • includes appropriate detail to support ideas or conclusions • demonstrates creativity, originality and/or initiative	A (VG)	80-100
3	A good performance • focuses on purpose of the task • meets all the requirements of the task • organizes content and ideas in a logical way • presents information clearly • includes some detail to support ideas or conclusions	B (G)	70-79
2	A satisfactory performance • has some awareness of the purpose of the task • meets most of the requirements of the task • organizes content and ideas in a logical way • presents information in an understandable way • may not include significant details to support ideas or conclusions	C (S)	60-69
1 (R)	A fair performance • does not fit the purpose of the task • does not meet the requirements of the task • presents information in an unorganized or confused way • does not include details to support ideas or conclusions • Remediation required	D (NI)	50-59
0 (R)	An unscorable performance • does not demonstrate the required knowledge, skills or capabilities • is not understandable, is incomplete or 'defiant' (e.g. "I won't do this"). • Extensive remediation is required.	F (NI)	Below 50

'R' – Extensive Remediation required: student may need to repeat or restart work, or teaching method may need to be altered.

An '0' student may be one who refuses to work or needs specialist help.

* Adapted from British Columbia

This new perspective on assessment implies a **shift** in our practice

Decreasing emphasis on ----->Increasing emphasis on	
<i>Delivering curriculum</i>	<i>Enhancing learning</i>
Summative assessment which discounts further learning	Formative assessment which supports further learning
The assumption that learning can be represented or demonstrated in one way	The assumption that learning can and should be represented in a variety of ways
Teachers directing all curriculum planning and assessment	Learners participating in assessing their own progress and learning
Quantitative assessment and reporting (e.g., letter grades, test scores)	Qualitative assessment and reporting (e.g., conferences, systematic observations, conferences)
Comparing learners to each other and/or in relation to a pre-determined norm or standard	Learner's individual progress is based on pre-determined and explicit criteria

ASSESSMENT IN THE CLASSROOM

Assessment drives instruction. We must devise procedures and instruments which are "intelligence-fair" and which allow us to look directly at the kinds of learning in which we are interested.

- Howard Gardner

A. Developing and Choosing Appropriate Assessment Methods

Valid assessments provide students with achievement information that enables them to monitor their own progress toward learning objectives. Experienced educators develop their assessment plans at the same time that they plan how to teach. This coordinated planning helps ensure that the assessment methods chosen match both the instruction and the purpose.

- **Assessment methods selected should connect directly to students' knowledge, skills, behaviour, and attitudes.**
- **Assessments should be clearly related to the goals and objectives of instruction, and be compatible with instructional strategies.**
- **Teachers consider possible consequences when they choose or develop an assessment.**
- **Differentiating instruction means that teachers use more than one assessment method to indicate student progress.**
- **Assessment methods match students' heritage, their learning style, and learning experiences.**
- **Assessments chosen avoid language and content that express bias.**
- **When teachers borrow a method from some other context or location they have evidence that the assessment will be valid for Bermudian students.**

B. Collecting Assessment Information

Before assessment information is collected, students need sufficient opportunity to experience the activities designed for the curriculum objectives. They also need to be informed of how they will be expected to demonstrate the knowledge, skills, behaviours, and attitudes to be assessed.

- **Students should be told why teachers are assessing and how teachers and the Ministry will use that information.**
- **Assessment conditions should suit both the purpose and the style.**
- **When using observations, checklists, or rating scales only a few characteristics should be assessed at one time. Each characteristic should be clearly defined.**
- **Directions given to students should be clear, complete, and phrased correctly for their age and grade level.**
- **There should be no penalty for guessing.**
- **While collecting assessment information, teacher-student interactions should be consistent.**
- **Keep written records of all unanticipated assessment circumstances.**
- **Decisions about alternative practices for special needs students should be guided by a written policy.**

*“If tests determine what teachers actually teach
and what students will study for
-- and they do --
then test those capacities and habits we think are essential
and test them in context”*

-- Grant Wiggins

C. Evaluating and Scoring Student Performance

Procedures to evaluate and score student performance should match the assessment method and educators should monitor these procedures to ensure that they are applied consistently. The best way to ensure students will feel that they have been treated fairly and consistently is to integrate assessment planning with instructional strategies. This plan will detail procedures for how the evidence will be scored so that students are aware of the contribution that each portion of their work will make towards a final grade.

- **Scoring procedures should be developed before the assessment method is used.**
- **Students should be told about how the scoring will proceed to allow them to prepare for the assessment.**
- **Relevant factors are included in scoring.**
- **Students need to be able to understand any comments included as feedback.**
- **Scoring procedures should be changed when faults are detected in the initial system.**
- **A written appeal process should be explained to students at the start of each year.**

*“I want to be evaluated on what
I can do,
not on what someone else
can do better”*

-- Middle School Student

D. Summarizing and Interpreting Results

Summarizing and interpreting are the procedures used to combine assessment results into grades that will appear on report cards. This includes comments about performance as well as letter or number grades. Any procedures used should accurately represent the student's performance and be connected to the planned instructional objectives.

- **A written policy guides teachers at each school in their plans to summarize and interpret results.**
- **Explain to parents and students the procedures that teachers will use to generate and interpret grades.**
- **Describe the process used to derive summary comments and grades.**
- **Different results should be combined carefully.**
- **A broad sample of learning outcomes requires more than one assessment.**
- **Combine assessment results according to their weight of the taught curriculum.**
- **Describe and justify the basis for each interpretation.**
- **Differentiate interpretations according to the student's background and learning experiences.**
- **Create accurate records and store assessment information in a secure place.**
- **Consider how an assessment method might limit the way you interpret the work a student has achieved.**

*"Whenever people are classified on the basis of cutoff scores
misclassifications are bound to occur.
The solution is --to avoid making decisions
about anyone's future solely on the basis of
one imperfect instrument"*

-- Bernard Gifford

E. Reporting Assessment Findings

Clarity and accuracy are necessary for quality assessment reports, but educators who write these documents should also think how the reader will use the information. Consider the audience for the assessment report, so that these people can use your report to guide their interpretations of student learning. Since the primary purpose of assessment is to improve student achievement, the primary audience for the report is the student. Students, and their parents interpret the information in their report to make decisions about themselves, their capabilities, their achievements, and their potential achievements.

- **Write a school assessment policy that guides reporting.**
- **Describe instructional objectives used as standards for reports, written and oral.**
- **Describe strengths and weaknesses completely in reports.**
- **Provide conferences for parents.**
- **Define and describe appeal procedures to students and parents each year.**
- **Ensure that appropriate people have access to assessment information.**
- **Ensure that reports are secure when transferred.**

*“The key question is -
What information provides the
most accurate depiction of students’
learning at this time?”
-- Tom Guskey*

F. Promotion and Retention

Children enter school with other learners approximately their own age. They are expected to make reasonable learning progress and advance along with their peers. In the first few levels of primary school students should not repeat a year, but as they get into the higher grades there may be instances where students are asked to repeat a grade or course. The principal makes these decisions after consulting with teachers, counsellors, and the parents.

Whenever students are retained, every effort is made to differentiate instructional strategies to provide learners with opportunities they need to advance.

Some factors considered when students might be retained.

- Repeating a grade is no guarantee that students will be more successful with the same material.
- Students' attitude to school may become more negative if they are retained.
- Retained students may develop social and personal problems.
- Students who are retained are less likely to complete school.

There is always a concern that students need to be accountable for their achievements, or lack of achievements. When weighing these concerns it is worthwhile to consider how far the student's responsibility extends. If the learner has not had appropriate opportunities that enable learning to occur, then it would not be fair to hold the child fully accountable for the outcome. In addition to learning opportunities, it is also worthwhile to consider assessment opportunities. Is it possible that an alternate assessment strategy may have permitted the student to show what they really know?

*"School is a complex experience;
by breaking apart
all of the ways we
learn, rehearse, and assess
we can uncover how to do
a better job."
-- Eric Jensen*

Assessment Activity	Description
Records over time: • Journals • Diaries • Learning Logs	• Recordings that reflect students' perceptions of their progress, difficulties, understanding and feelings
Computer Assisted Learning	• Using carefully selected software to lead students from one level of difficulty to another, building on what they know and as they are tested.
Demonstrations • Live • Video • Multimedia	• Opportunities for students to display knowledge, skills and attitudes
Discussions • Small or large group • Panel	• Oral representations
Conversations and Conferences • Teacher/Student • Student/other person	• Verbal exchanges to uncover/clarify what a student has learned or understands that might not have been demonstrated through other means of assessment.
Pictorial Displays • Posters • Photographs • Collages, picture collections, scrap-books	• Visual presentations
Laboratory • Application • Laboratory Projects • Experimental	• Hands-on experiences that allow students to experiment, replicate, produce, and/or create.

Use the table below to plan your assessment programme for your subject. Under the column Curriculum objective, decide which objectives will be tested and then decide how best to assess each of these objectives. At the end of this exercise you should be able to group the various objectives under the assessment types.

CURRICULUM OBJECTIVE NO./NAME	TYPE OF ASSESSMENT				
	M/C TEST	SHORT ANSWER	ESSAY	PRACTICAL TEST	PROJECT/ PRESENTATION
TOTAL					

Self/Peer Checklist for Students **HUMAN AND SOCIAL DEVELOPMENT STUDENT PROFILE**

PROFILE OF: _____

COMPILED BY: _____ DATE: _____

1. Never	2. Seldom	3. Occasionally	4. Usually	5. Frequently	6. Always	1	2	3	4	5	6
1. I am able to form an opinion about what I am asked to consider.											
2. I am able to express my opinion about what I am asked to consider.											
3. I can interpret and appreciate what I know in different ways.											
4. I want to learn more about things and issues that I don't know.											
5. I accept and appreciate other people's ideas.											
6. I am able to make connections between ideas and things that contribute to larger issues.											
7. I am able to see my personal strengths and work toward increasing them.											
8. I am able to see my personal weaknesses and work toward decreasing them.											
9. I am able to evaluate objectively and accurately.											
10. I am able to take an unpopular stand without fear of ridicule by my peers.											
11. I am able to balance the demands of my life and school without feeling overwhelmed.											
12. I am able to identify and understand other students' situations.											
13. I am able to actively support others.											
14. I am able to accept and appreciate other students' values, expression and capabilities.											
15. I am able to function as a contributing member of a working group.											
16. I am able to make and maintain friendships without difficulty.											
17. I am able to take responsibility for my actions.											
18. I am able to see the consequences of my actions.											
19. I am able to approach problems calmly and realistically.											
20. I am able to handle conflicts in a mature and responsible manner.											
21. I am able to consult with others when I need help or support.											
22. I am able to function effectively as a member of a democratic society.											
23. I am able to see how my actions affect our environment and our world.											
24. I am able to see how the actions of others affect our environment and our world.											
25. I am able to apply my knowledge and understandings to my life away from school.											
26. I am curious about and willing to use new technologies when searching for information.											
27. I am able to consider and weigh the implications of potential change.											
28. I am flexible and able to adapt to change.											
29. I am an open-minded listener.											
30. I am a good citizen.											

PLANNING FOR INTEGRATED CURRICULUM IN THE PRIMARY SCHOOLS

When you walk through the Botanical Gardens, you don't hear kiskadees for ten minutes, then the wind rustling for five minutes, and then smell the flowers for three minutes. All of this impact on you at once and you make the experience into a meaningful whole.

"Young people are interested in the entire world around them - it doesn't make sense to them to say, 'Mathematics', 'Science' or 'Social Studies'. When instruction jumps from one discipline to another every 45 minutes, learning is fragmented unnecessarily."

*By Susan Krog,
Professor of Education
Western Washington University*

Where Are We Now?

If we consider a continuum from parallel connections across each discipline to a blending of all subject areas, teachers may be at different stages of integrating curriculum.

Simplest Stage: Parallel teachers realign content so that related topics are taught concurrently.

More Ambitious Stage: Teachers begin to link subjects by scrutinizing what they teach, reinforcing overlapping concepts and avoiding needless repetition.

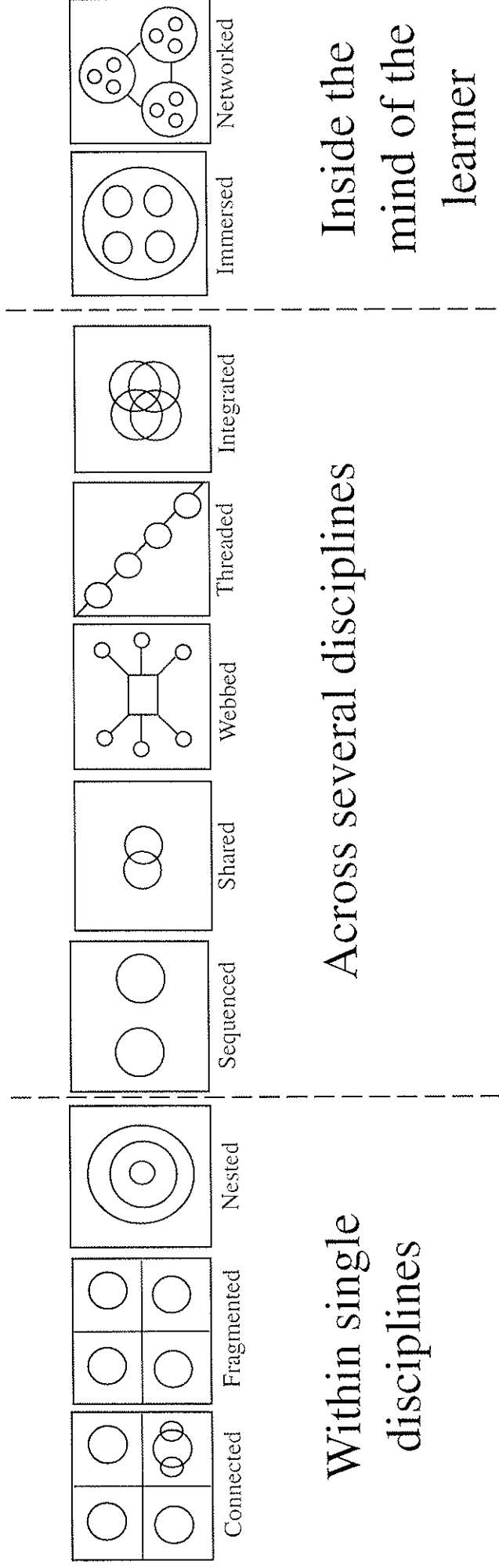
Most Ambitious Stage: Teachers create interdisciplinary modules that focus on a theme or project.

The process of collaboration at the building level will strengthen integrated curriculum and give a vital tool for professional growth of teachers. Appropriate and meaningful staff development; perusal of professional literature, and/or university training on approaches to integrating curriculum is vital to any significant change in education practice. Teachers should find ways to naturally integrate subjects and develop meaningful instruction.

Design Options (see next page)

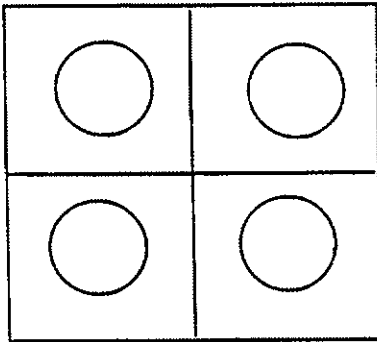
Techniques for designing an integrated curriculum include mapping the curriculum and planning an integrated module. To design an integrated curriculum, teachers need to know what is taught in other subject areas and at other grade levels - information that is traditionally not shared.

How to Integrate the Curriculum



Design options for curriculum might include:

Disciplined-based

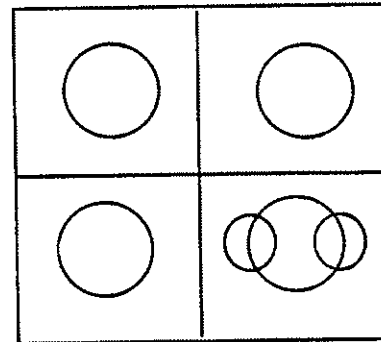


Description

The traditional model of separate and distinct disciplines which fragments the subject areas.

Example

Teacher applies this view in mathematics, science and social studies, etc.



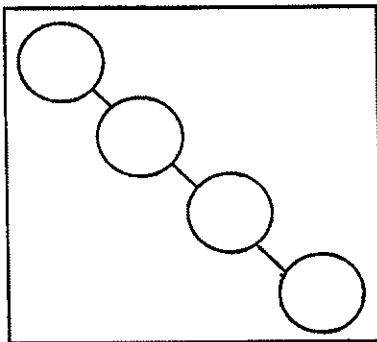
Description

Within each subject area, course content is connected topic to topic, concept to concept, one year's work to the next and relates idea(s) explicitly.

Example

Teacher relates the concept of fractions to decimals, which in turn relates to money, grades, etc.

Parallel Disciplines

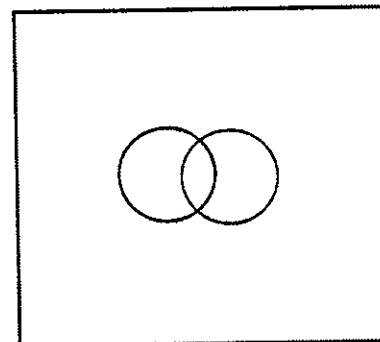


Description

The metacurricular approach threads thinking skills, multiple technology and study skills through various disciplines.

Example

Teaching staff targets prediction in reading, mathematics and science experiments while teaching social studies the teacher targets forecasting current events and thus threads the skill (prediction) across all disciplines.



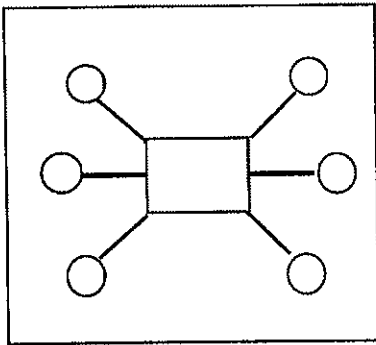
Description

Shared planning and teaching take place in two disciplines in which over-lapping concepts or ideas emerge as organizing elements.

Example

Science and mathematics teachers use data collection, charting and graphing as shared concepts that can be team-taught.

Multidisciplinary



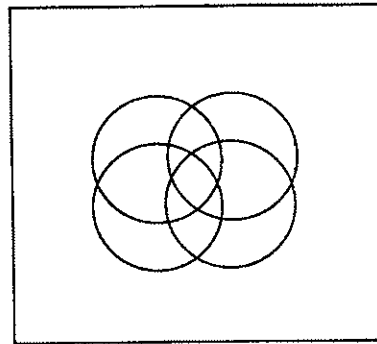
Description

The fertile theme is webbed to curriculum contents and disciplines; use the theme to sift out appropriate concepts, topics and ideas.

Example

Teacher presents a simple topical theme, such as the circus and webs it into the subject areas. A conceptual theme, such as conflict, can be for more depth in the theme approach.

Interdisciplinary



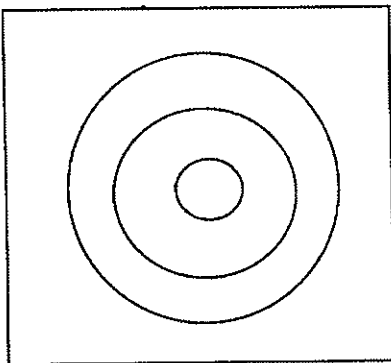
Description

This interdisciplinary approach matches subjects for overlaps in topics and concepts with some team teaching in an authentic integrated model.

Example

In science, music, visual arts and health education, teachers look for patterning models and approach content through these patterns.

Disciplined-based



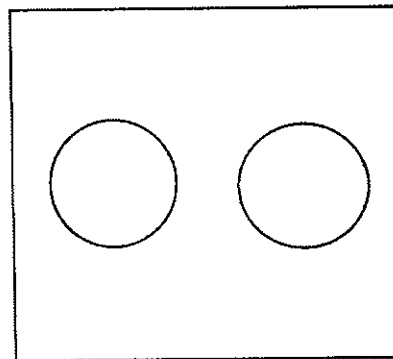
Description

Within each subject area, the teacher targets multiple skills: a social skill, a thinking skill and a concept-specific skill.

Example

Teacher designs the unit on photosynthesis to simultaneously target consensus seeking (social skill), sequencing (thinking skill) and plant life cycle (science skill).

Parallel-based



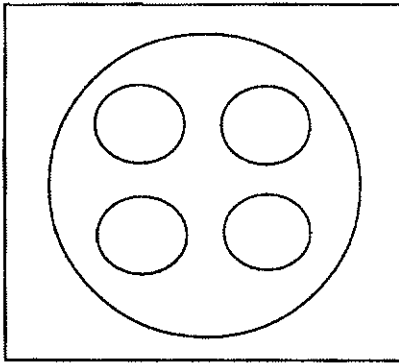
Description

Topics or units of study are rearranged and sequenced to coincide with one another. Similar ideas are taught in concert while remaining separate subjects.

Example

In English language arts the teacher will teach an historical novel depicting a particular period while in social studies the teacher could cover the same period.

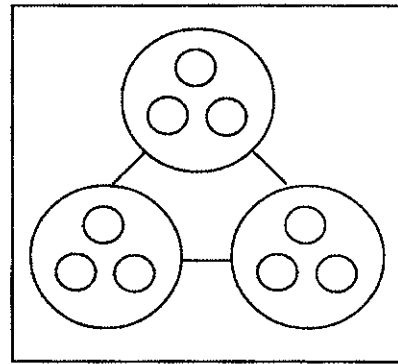
Immersed



Description

The disciplines become part of the learner's lens of expertise: the learner filters all content through this lens and becomes immersed in his or her own experience.

Networked



Description

Learner filters all learning through the expert's eye and makes internal connections that lead to external networks of experts in related fields.

Choosing a Theme

In the initial development of primary schools, four disciplines have been identified as core subjects:

- English Language
- Mathematics
- Science
- Social Studies

Year level teachers, along with teachers of other discipline areas should utilize related materials located in their professional library, modifying these as appropriate to their students' needs and interests.

It is important that primary school teachers keep abreast of current research and trends on integrating curriculum. Teachers are encouraged to take part in related staff development workshops, read professional literature and/or take university courses.

Teachers should:

- take inventory of what is already being done - writing across the curriculum, etc.
- design a curriculum map by listing the content of all subjects and then identify a theme or umbrella
- design an integrated module and develop related lesson plans
- decide on the length of time for completion and an appropriate title
- discover student interest - ask them what they want to know!
- decide whether the theme has substance and application to the real world
- display student work
- celebrate success!

PROFESSIONAL ASSOCIATIONS

MATHEMATICS

Name: National Council of Teachers of Mathematics (NCTM)

Address: 1906 Association Drive
Reston, VA 20191-1593
U.S.A.

Telephone: (703) 620 9840 Ext. 104

Fax: (703) 476 2970 on demand: (880) 220-8483

e-mail: aginfo@nctm.org

Website: <http://www.nctm.org>

Regional representatives:

(Southern 1A Region)
John J. Brady III, (615) 297-4071
4017 Albert Drive,
Nashville, TN 47204

Cindy Boyd, (915) 672-2654
2502 Rountree,
Abilene, TX 79601
cjboyd@tenet.edu

National Council of Teachers of Mathematics Conference Dates

2001	April 5 - 8	Orlando, FL
2002	April 22 - 24	Las Vegas, NV
2003	April 10 - 12	San Antonio, TX
2004	April 7 - 9	Anaheim, CA

Name: The Bermuda Council of Teachers of Mathematics (BCTM)

Contact: Marva Allen

Telephone: (441) 292-6799

Fax: (441) 295-6921

e-mail: bdaedcie@ibl.bm

Name: National Council of Supervisors of Mathematics (NCSM)

Address: P.O. Box 10667
Golden, CO 80401
U.S.A.

Phone/Fax: (303) 274-5932

Curriculum Framework & Course Abbreviations

Philosophy	PHL
Goals & Sub Goals	GLS
Performance Indicators	PI
Scope & Sequence	SAS
References	REF
Course Overview	OVW
Correlation Matrix	MTX
Modules	MDL
Teacher Resources	TRS
Student Resources	SRS
Exemplar Scoring Guide	SCO
Rubrics	RUB
Objectives at a Glance	OBJ
Infusing Across the Curriculum	INF
Glossary	GRY
Health and Safety	HAS
Professional Association Directory	PAD
Curriculum Abbreviations	ABR
Appendix	APX

Programme Abbreviations

Advisory Programme	ADV
Career Education Programme	CED
Functional Skills Programme	FUN
Guidance and Counselling Programme	GUI
Library Information Programme	LIB

CURRICULUM ABBREVIATIONS

School Level Abbreviations

Preschool	PS
Primary School	P1-P6
Middle School	M1-M3
Senior School	S1-S4

Subject Area Abbreviations

Business Studies	BS
Dance	DN
Design & Technology	DT
English Language Arts	EL
Family Studies	FM
Foreign Languages	FL
Health Education	HE
Information Technology	IT
Mathematics	MT
Music	MU
Physical Education	PE
Science	SC
Social Studies	SS
Theatre	TH
Visual Arts	VR

Subject Code

e.g. PreSchool English Language Arts
PS EL-B

Year Level	Subject Area	Module Sequence
(PS-P6) representing PreSchool to Primary Six	abbreviated subject area	(A-G) representing sequence of module at any level
PS	EL	B
PreSchool	English Language Arts	(2 nd module in the sequence of 7 modules)



Ministry of Education
P.O. Box HM 1185
Hamilton HM EX
Bermuda
September 2001