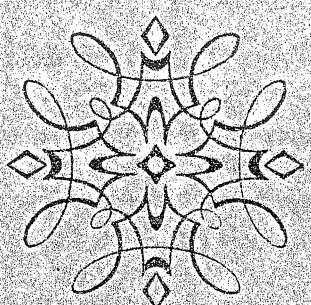
MINISTRY OF EDUCATION

MATHEMATICS PRESCRIPTION

CLASS 8/FORM 2



Curriculum Development Unit
1997

(f) in the pupils' favourable attitudes towards, and a continuing interest in mathematics

(g) in the pupils the ability to recognise and appreciate the mathematics in everyday situations

(h) the pupils' confidence in their ability to do mathematics.

2.2 OBJECTIVES

On completing the Class 8/Form II course, the pupils should have

2.2.1 acquired the knowledge and understanding required to

(a) use problem-solving approaches to learn mathematics

(b) develop and apply a variety of strategies to solve mathematical problems

(c) show competence in their ability to compute mentally and on paper using a variety of methods

(d) develop competence in their ability to estimate and approximate, and to judge whether results and measurements seem reasonable

(e) recognise and use patterns and relationships in mathematics and be able to generalise from these

(f) use models, known facts, properties and relationships to explain and justify their thinking in solving problems

(g) relate materials, pictures and diagrams to Mathematical ideas

(h) make connections with other topics within Mathematics, with other subjects and with the outside world

(i) apply mathematics to every day life

(j) show competence in using instruments and measuring devices.

2.2.2 acquired the skills and understanding of the processes involved in

(a) applying mathematical ideas, rules, techniques and strategies to solve mathematical problems

(b) devising, using and modifying strategies to solve a variety of problems

(c) appreciating that mathematics is a creative, relevant and useful activity
(d) gaining confidence in their ability to do mathematics
(e) showing confidence in using their own language and the language of mathematics to express mathematical ideas.
(f) being resourceful, self-reliant and persevering in doing mathematical activities
(g) working co-operatively with others and participating in discussions
(h) exercising self-discipline
(I) achieving a sense of self-worth through success in doing mathematics
(j) learning to learn and developing self-assessment skills.

3.0 COURSE CONTENT: OUTLINE

3.1 The Class 8/Form II content is divided into the following 10 units.

Unit 1. Number Patterns II
Unit 2. Problems and Equations
Unit 3. Polygons
Unit 4. Area II
Unit 5. Volume
Unit 6. Circles
Unit 7. Statistics
Unit 8. Symmetry
Unit 9. Communications
Unit 10. Sets

3.2 The processes that will be emphasised throughout are

1. Problem-solving
2. Logical reasoning
3. Communication
4. Making connections
5. Using mathematical tools/instruments

4.3 UNIT 2: PROBLEMS AND EQUATIONS

CONCEPTS	SKILLS & PROCESSES
Open and closed statements	* Distinguish between open and closed statements
Pronumeral	* Recognise equations as open statements with the equality sign
Operations	* Given an operation, be able to state and perform its opposite operation
Equations	* Solve simple equations
Word Problems Problem-solving	* Transform a word problem into an equation * Solve the equation * Interpret what the solution means * Use simple problem-solving strategies to solve problems

4.4 UNIT 3: POLYGONS

CONCEPTS	SKILLS & PROCESSES
Polygons	* Describe a polygon. * Distinguish polygons from non-polygons * Draw simple polygons
Regular and Irregular Polygons	* Calculate the size of the angles in a quadrilateral * Calculate the sum of the angles in a given polygon * Calculate the angles of a regular polygon * Measure the lengths of the sides of a polygon * Distinguish between a regular and an irregular polygon by their angles and sides * Construct regular polygons such as an equilateral triangle, a square and hexagon
Tesselations	* Design tesselations (tiling patterns) using polygons
Problem-solving	* Solve problems on polygons and tesselations

4.7 UNIT 6: CIRCLES

CONCEPTS	SKILLS & PROCESSES
Circle Radius Diameter Circumference Chords and Tangents Area	* Identify a circle, its radius and diameter * Draw a circle with a given radius and label the centre, radius, diameter * Measure the diameter of circular objects * Measure the circumference of circular objects * Derive formulae for calculating circumference, diameter and the radius of a circle * Calculate the circumference, diameter and the radius of a circle * Identify chords and tangents * Draw patterns using circles, arcs and concentric circles * Estimate area of circles by counting squares * Derive the formula for the area of circle * Calculate the area of circles
Surface Area and Volume Cylinder	* Derive the formula for the surface area of a cylinder * Calculate the surface area of a cylinder * Derive a formula for the volume of a cylinder. * Calculate the volume of a cylinder.
Cone Problem-solving	* Derive the formula for the volume of a cone * Calculate the volume of a cone * Solve problem relating to surface area and volumes

Rotational Symmetry	* Explain rotational symmetry using a model or a diagram, linking it to symmetry * Determine whether a shape has rotational symmetry * State the order of a shape's rotational symmetry * State the order of rotational symmetry for isosceles, equilateral and scalene triangles * State the order of rotational symmetry for a square, rectangle, parallelogram and other regular polygons

4.10 UNIT 9: COMMUNICATIONS

CONCEPTS	SKILLS & PROCESSES
Time	* Relate 12 hour clock time to 24 hour clock time (military time) * Convert the standard time of other countries to local time
Maps and Charts	* Read weather maps * Record sunrise and sunset chart. * Read and interpret the tide calendar * Determine times for high and low tides
Timetables	* Interpret flight, bus and shipping timetables
Scales	* Interpret scales and maps
Speed	* Calculate the speed of moving objects
Fares and Charges	* Calculate airfares for domestic and regional services * Calculate port and wharf charges

6.2.1 Formative Assessment is an integral part of the teaching and learning process. It provides the teacher with information on the strengths and weaknesses of pupils, and the pupils with the feedback about their learning.

"I TEST MYSELF" is given at the end of each unit to help assess pupils their own learning with the help of the teacher. The diagnosis of the errors pupils make enable teachers to plan further learning activities to meet the need of those pupils.
Informal assessment of pupils' achievement must be carried out all the time. It provides an opportunity for giving immediate feedback. Observing pupils and interacting with them as they go about their activities and conducting discussions and interviews are some ways through which pupils can be informally assessed. Self-assessment by pupils in other classroom activities must also be encouraged.

6.2.2 Summative assessment is formal and is carried out at the end of a period of study to provide an indication of the pupils' achievements. Thus tests and examinations could be given at selected points during the course of study eg. end of term, middle and end of the year.

6.3 School Student Profiles

All schools are encouraged to keep a profile for each student. The students' profiles will have records of achievements in each subject, records of test and examination results, as well as samples of the students' work (eg portfolios of art, essays, poems, etc.). The profile will contain the pupils' history of achievements during his or her school career.

(f) Developing mental computations including skills of estimation should be emphasised throughout the course. Estimation should be used in all computational activities and problem solving. Pupils should be able to always ask such questions as "Is my answer reasonable? Within what range of numbers must my answer lie?"

(g) Pupils must be taught to reflect on their experiences. It is when they reflect on the investigations they are engaged in, the processes they use, and the answers they get that they learn. Unless reflection takes place, they may be performing a routine which is learnt by rote and will be easily forgotten. Recalling an experience, relating it to other experiences and retelling are useful activities which should be promoted during mathematics lessons.

(h) Pupils should be encouraged to question the responses of their peers and teachers in order to seek further clarification, reassurance and approval as a means of extending mathematical thinking and understanding

8.0 RESOURCES

8.1 PRESCRIBED TEXTS FOR PUPILS

Mathematics for Class 8/Form II
Ministry of Education, FIJI

8.3 PRESCRIBED TEXTS FOR TEACHERS

Mathematics for Class 8/Form II Teachers' Guide
Ministry of Education, FIJI

8.3 TEACHING AIDS

The aids required for each unit are given in the Teachers' Guide.

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