

# Numeracy Policy

## RATIONALE

*RAKAAG is committed to raising the standards of numeracy of all its students, so that they develop the ability to use numeracy skills effectively in all areas of the curriculum and the skills necessary to cope confidently with the demands of further education, employment, and adult life.*

## INTRODUCTION

This policy statement outlines the purpose, nature and management of the numeracy taught and learnt in the school. The implementation of this policy is the responsibility of all teaching staff.

Numeracy is a way of communicating. It is a language through which ideas can be explained, explored and developed and one through which relationships can be expressed, hypotheses made and tested and patterns identified.

Numeracy is a proficiency that involves confidence and competence with numbers and measures. It requires an understanding of the number system, a repertoire of computational skills and an inclination and ability to solve number problems in a variety of contexts. Numeracy also demands practical understanding of the ways in which information is gathered by counting and measuring, and is presented in graphs, diagrams, charts and tables.

### Contextual Information:

The development of the concept of “numeracy”:

- 1959 – (Crowther report) - Numeracy is defined as a word to represent the mirror image of literacy.
- 1982 – (Cockcroft report) - A numerate pupil is one who can cope confidently with the mathematical needs of adult life. There was an emphasis on the wider aspects of numeracy and not purely the skills of computation.
- 1995 (OED) – numerate means acquainted with the basic principles of Mathematics

### AIMS:

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Our aim in teaching numeracy is that all students will:

- Become numerate and tackle mathematical problems with confidence and enjoyment
- Develop the skills which are needed to meet the demands of adult life
- Develop the need to think logically and clearly
- Use mathematical language effectively and confidently
- Develop positive attitudes to numeracy, recognizing that numeracy can be both useful and enjoyable
- Learn to work both independently and collaboratively
- Have a sense of achievement in math and make progress at each stage of their schooling
- Become confident in the appropriate use of IT to enhance their skills in mathematics
- Be able to use and apply the skills in other curricular areas.

### Monitoring and Evaluating

Monitoring and evaluating will be carried out by:

- Lead Teacher
- HOD
- Vice Principal
- Principal

### This exercise will entail:

- Scrutiny of medium and short-term planning and feedback by the Math Lead teacher/HOD initially on a termly basis
- Classroom observation and feedback
- Reviewing student's work
- Analysis of test data and papers
- Monitoring of assessment and record keeping, marking and data analysis to set a bench mark

### Organization of Teaching and Learning/Mental Math

As an integral part of the math curriculum, the development of mental skills and strategies will be emphasized at all levels. Every Mathematics lesson will start with a 2-5 minute mental math starter, the main activity and then the plenary. Grades 1-5 will have a greater focus on mental math with weekly Mental Math Tests. Other grades will be incorporating it into their lessons. Basic facts (addition, subtraction, multiplication, and division), without IT aids, should be fluent in every student by the time they are in Grade 5.

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Students are placed in mixed ability classes so teachers will endeavor to cater for the needs of individual student by matching tasks to ability. Additional resources will be made available to cater for students of above or below average ability.

- Teaching strategies will be varied and will encourage a high level of interaction
- Teachers place strong emphasis on the development of mental calculation skills
- Students are asked to explain their methods and to check for reasonableness
- There is a strong emphasis on mathematical vocabulary
- Key words are displayed and teachers ensure that they model the correct use of mathematical words
- Teachers value students' oral contributions and create an ethos in which all student feel they can contribute
- Activities are planned to encourage the full and active participation of all students and teachers differentiate tasks during all parts of the lesson to meet the needs of all abilities
- The use of ICT activities and interactive whiteboards is encouraged as much as possible

### **Environment**

The school aims to provide a mathematically stimulating environment both inside and outside of the classroom:

- Through displays that promote mathematical thinking and discussion
- Through display of pupil's work that celebrate achievement
- By providing a good range of resources for teachers and students to use.

In every classroom, resources such as number lines, hundred square, place value charts and multiplication squares are displayed as appropriate and used as resources for whole class or individual work, for student to become confident in their use and understanding of the number system

### **Planning – In Math and Other subjects**

Planning will be done collaboratively with other math teachers according to grade levels.

- Unit wise planning is completed on the school template available on Atlas Rubicon
- All GLE's must be covered
- 21<sup>st</sup> Century skills must be incorporated in lessons

Teachers will provide opportunities to utilize and develop appropriate links between math and other subject areas within the curriculum ensuring a common approach to the teaching of key numeracy ideas and processes, e.g.:

- Science – data handling and measures
- Art – patterns and shape
- P.E. – work on movement, direction and angles
- English – vocabulary

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### Whole school Policy on the use of calculators

The school expects all students of grade 10,11 and 12 to bring their own scientific calculator to lessons when required. Grade 9 can use calculators only in Trigonometry/Geometry lessons.

In deciding when students use a calculator in lessons we should ensure that:

- Students' first resort should be mental methods;
- Students have sufficient understanding of the calculation to decide the most appropriate method: mental, pencil and paper or calculator;
- Students have the technical skills required to use the basic facilities of a calculator constructively and efficiently, the order in which to use keys, how to enter numbers as money, measures, fractions, etc.;
- Students understand the four arithmetical operations and recognize which to use to solve a problem;
- when using a calculator, pupils are aware of the processes required and can say whether their answer is reasonable;
- Students can interpret the calculator display in context (e.g. 5.3 is AED 5.30 in money calculations);
- Students can set the calculator on the desired mode, say degrees or radians/Math or complex etc.
- We help students, where necessary, to use the correct order of operations – especially in multi-step calculations, such as  $(3.2 - 1.65) \times (15.6 - 5.77)$

### Math Vocabulary

The following are all important aspects of helping pupils with the technical vocabulary of Mathematics:

- Use of Word walls
- Using a variety of words that have the same meaning e.g. add, plus, sum
- Encouraging students to be less dependent on simple words e.g. exposing them to the word multiply as a replacement for times
- Discussion about words that have different meanings in Mathematics from everyday life e.g. take away, volume, product etc
- Highlighting word sources e.g. quad means 4, lateral means side so that pupils can use them to help remember meanings. This applies to both prefixes and suffixes to words.

Students should become confident that they know what a word means so that they can follow the instructions in each question or interpret a mathematical problem. For example, a student reading a question including the word perimeter should immediately recall what that is and start to think about the concept rather than struggling with the word and then wondering what it means and losing confidence in his / her ability to answer the question. The instant recall of vocabulary and meanings can be improved through flash card activities in starters.

## RAK AAG NUMERACY POLICY – MATH DEPARTMENT (SY -2020/21)

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### Differentiation

Teachers plan a core activity for the ability range of students in the class and continuously adjust the activity to make it appropriate for the gifted and less able students by the use of:

- Additional resources
- Re- teach resources
- Connecting math and English
- Targeting questions
- Peer to peer activities
- Open questions
- Investigating/problem solving
- Advanced research
- Extension activities

### Special Education Needs

- All students take part in the daily numeracy lesson and any cross-curricula numeracy activities
- Teachers plan lessons so that all students are included and make progress in the lesson
- In oral work teachers plan a range of differentiated questions to meet the needs of all students
- Teachers ask open ended questions whenever possible to ensure all student take part and engage at their level
- Teachers use a wide variety of visual and ICT resources to engage students and to explore a concept
- During whole class teaching, discreet help is given to the less able student by the teaching assistants
- During activities, students are supported by teaching assistant where ever necessary

### Intervention

Intervention will be provided for students who are underachieving to ensure they make at least expected progress, for example: one on one and small group work. The student will be supported and encouraged to own their learning at every stage and celebrate every step of progress they make.

### Marking of Written Work

- All assessments and tests to be marked by the teacher
- Some work can be marked/self-marked by the pupil (Peer assessment) and reviewed by the teacher
- Constructive written feedback should be given to the students for guidance on how to improve their work

## RAK AAG NUMERACY POLICY – MATH DEPARTMENT (SY -2020/21)

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### ICT in Numeracy lessons

Teachers incorporate the use of ICT in their Numeracy lessons whenever possible.

- Computers are used by groups of student working independently within the classroom on programs relating to the mathematical objectives being addressed that day
- Classes have Numeracy lessons through the medium of ICT where programs are used. For example: to consolidate number skills, explore patterns in data
- Students are taught the basic functions of a calculator in High School and are allowed to use them in every lesson only starting in Grade 10. Grade 9 can use calculators only in Trigonometry/Geometry lessons.
- Calculators are not used for basic calculations where a mental or written method is more appropriate but are used for calculations where numbers are long and difficult and where it enables student to concentrate on the problem and not the calculation
- Calculators are only allowed in assessment and tests from Grade 9 – 12. Grade 9 can use it only for Trigonometry and geometry for trigonometric ratios.

### Homework

RAKAAG recognizes the importance of making links between home and school and encourages parental support with the learning of Numeracy. This particularly applies to the retention of Times Tables and Number Facts which can be learnt through repetition as a game in the car or over breakfast. Homework will be set by the homeroom and or subject teacher as a means of reinforcing work done in class. Homework can provide opportunities for students:

- To practice and consolidate their skills and knowledge
- To develop and extend their techniques and strategies
- To share their mathematical work with their families
- To prepare for future learning

### Assessment

Assessment is carried out:

- Orally through questioning
- By observation of student at work
- Formatively to ensure student's understanding
- Marking of student's work
- Through planning and assessment activities linked to the DOK's and the GLE's
- Moderation takes place to ensure the consistency of teacher assessments
- Diagnostic test in Term 1 and then again at the beginning of Term 3 from KG 2
- Samples of work will be placed in student files kept by each teacher

See Assessment policy for further details

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### **Data Analysis**

Each teacher fills in their data in the school management system and the KG, 1 & 2 on their data tracking sheets. (Red, Amber, Green, RAG). This is ongoing with a termly deadline set on the calendar. This then highlights any student requiring intervention.

- Progress is monitored by HOD, Lead Teacher and teacher, and weekly group meetings are used to identify students that might not have made expected progress
- In – school programs for students can then be put into place in to ensure that every student works to the best of their ability and has intervention when needed

### **Reporting Procedures**

There will be a parent/teacher meeting each term. Termly reports to parents will include:

- Pupil progress
- Pupil effort and attitude
- Students strengths and area for development

### **HOD and Lead Teacher Responsibilities**

- Ensure teachers are familiar with the Common core curriculum, the GLE's and help plan lessons if required
- Lead by example in the way they teach in their own classrooms
- Carry out an annual audit and action plan
- Work co-operatively with the SEN (Head of Student Support) in providing advice and support for staff
- Discuss regularly with the Principal the progress of improving the quality of Numeracy provision across the school from KG to Grade 12

### **Annual Policy Review**

Each document will be reviewed on an annual basis by the HOD who report to Principal & Vice Principal and/or if any significant changes in mathematical practice or pedagogy occur. This policy will be available to all Math and for parents on the school portal.