Comprehensive Assessment of Mathematics Strategies (CAMS) is a diagnostic mathematics series that gives students practice and self-assessment in 12 mathematics strategies within 4 curriculum strands (8 strategies in Book 1). *CAMS* allows you to identify and assess a student's level of mastery in each of these strategies. This eight-level program is designed for students in years 2 to 9.

In *CAMS Book 6,* students practise the following strategies:
- number sense
- estimation
- addition
- subtraction
- multiplication
- division
- time and money
- working with measurements
- algebra
- shape
- probability and averages
- interpreting data.

What is in the student book?
Each student book contains
- ten lessons
- two self-assessment forms for students
- two teacher assessment forms
- an answer form

What is in the teacher guide?
Each teacher guide contains
- suggestions and instruction for using *CAMS* effectively in the classroom
- *Understanding the strategies,* an instructional sheet for use with students in the classroom
- copies of the student assessments and teacher assessments in the student book
- a class performance chart for recording class results
- a completed answer form.

Where do students record their answers?
Students must record their answers on the answer form.

What is the correction procedure?
For the best results, correct each lesson orally with students immediately following its completion.

What forms of assessment are featured in the *CAMS Series* and how do I use them?
In addition to the mathematics applications and the strategy-based problems, *CAMS* contains student and teacher assessments.

Student assessments
Students become more successful in mathematics after they have assessed their own performance against known standards. Student self-assessment also helps teachers gain insight into a student's measure of performance. Difficulties that a student experiences are often revealed through self-assessment.

SELF-ASSESSMENT 1
After completing lessons 1–5, students complete their first self-assessment. The questions are designed to help students
- analyse their performance
- determine areas where they may be experiencing difficulty
- describe any difficulty they may be having
- set a goal for completing the remaining five lessons
- rate their performance for completing lessons 1–5.

Review student responses to the self-assessments before instructing students to proceed to the remaining lessons in the book. Help students identify their strengths and weaknesses, and provide instruction for a specific strategy, if needed.

SELF-ASSESSMENT 2
After completing lessons 6–10, students complete their second self-assessment. Before students begin, have them review their responses to Self-assessment 1, to help them focus on their performance for the first 5 lessons and to remind them of the goals they set for completing lessons 6–10.

Self-assessment 2 contains questions that are designed to help students
- analyse their performance
- determine areas where they may be experiencing difficulty
- compare and contrast any difficulties with those they may have had in lessons 1–5
- assess how well they met the goal they set in Self-assessment 1
- rate their performance for completing lessons 6–10.

Teacher assessments
Complete the teacher assessments after students have finished all ten lessons and you have corrected the answer forms.

TEACHER ASSESSMENT 1
Teacher assessment 1 assesses a student's

performance for each of the mathematics strategies practised in lessons 1–10. Use the student's finished and corrected answer form to complete this assessment.

TEACHER ASSESSMENT 2
Teacher assessment 2 compares a student's level of mastery for each of the mathematics strategies. Use the completed chart in Teacher assessment 1 to complete this assessment. Teacher assessment 2 has two parts.

Part one: Complete a bar on the graph to show the number of correct responses for a given strategy.

Part two: Answer the questions and write an analysis of a student's strengths, where the student needs improvement, what action will be taken and progress notes on the student's performance after the action plan has been instituted.

When should I begin using the *CAMS Series* in the classroom?
Comprehensive Assessment of Mathematics Strategies is a diagnostic tool for identifying mathematics strategies that need further study and reinforcement. It is appropriate for use at any time during the school year to build mathematics skills and understanding. However, since the strategies practised in each level of **CAMS** appear on most standardised tests and achievement tests, the beginning of the school year, before any testing begins, is the most helpful time to introduce the program.

How do I use the *CAMS Series* effectively in the classroom?
Comprehensive Assessment of Mathematics Strategies is designed for flexibility in the classroom and can be used effectively in several ways.

You may choose to have students complete one lesson each week for five weeks and then complete Self-assessment 1. Provide individual conferencing before students complete the remaining lessons and Self-assessment 2. You may space out the lessons in any manner you choose; however, students should complete their self-assessment for lessons 1–5 and lessons 6–10 within one to two days of completion of Lesson 5 and Lesson 10, respectively.

You may also choose to have students complete two lessons each week and then complete Self-assessment 1. Again, provide individual conferencing, if necessary, before students complete the remaining lessons and Self-assessment 2.

What should I do if students are having difficulty understanding specific strategy problems?
You may want to pause and focus on the question types and strategies before students move to the next lesson. *Understanding the strategies* is a useful tool for instructing students on how to answer a strategy-based question.

How should I use the results of *Comprehensive Assessment of Mathematics Strategies* to establish a student's mathematics needs?
Because **CAMS** is a diagnostic tool, you can determine areas where an individual student needs improvement. You can then use the results to provide targeted remediation to specific areas of need.

How do I record results for the entire class on the Class performance chart?
You may record the number of correct responses to the strategy-based problems for your entire class on the Class performance chart in the teacher guide. For each student, record the number of correct responses for each strategy. Then total the responses to determine the overall number of correct responses for each student.

Number

- **Number sense**
  Numeration includes strategies involving number concepts, number sense, place value, counting, and the writing and reading of numbers in word form, standard form and expanded form. Numeration also includes ordinal numbers (*first, second* etc.) and basic fractional and decimal concepts.

- **Estimation**
  Estimation includes strategies involving rounding, determining ranges, regrouping, clustering and using compatible numbers. Estimation is the approximation of the exact value of a number, and it is used with whole numbers, fractions and decimals. Estimation can be used for determining if exact answers are reasonable.

- **Addition**
  Addition is the mathematical operation that establishes the total number of items when two sets are put together. The numbers to be added are *addends,* and the answer is the *sum.* Addition is an operation that can be used with whole numbers, fractions and decimals. The inverse of addition is subtraction. Addition has several properties:
  A. Associative property: $(1 + 2) + 3 = 1 + (2 + 3)$
  B. Commutative property: $1 + 2 = 2 + 1$
  C. Zero property: $1 + 0 = 1$ (Zero plus any number is that number.)

- **Subtraction**
  Subtraction is the mathematical operation that establishes how much remains when one number is taken away from another. Subtraction is a binary operation, because it is performed on two numbers. In the problem $10 - 3 = 7$, 10 is the *minuend,* 3 is the s*ubtrahend* and the answer is the *difference.* Subtraction is used with whole numbers, fractions and decimals. Subtraction is the inverse operation of addition, and is often used to check addition.

- **Multiplication**
  Multiplication is a mathematical operation that can be thought of as repeated addition. For example, in the problem 2×3, the 2×3 can be interpreted to mean two 3s or $3 + 3 = 6$. Consider the problem 11×11 and the names of the solution parts.

11	multiplicand
×11	multiplier
11	partial product
11	partial product
121	product

- **Division**
  Division is the mathematical operation in which one number is separated into a group of equal numbers. In the problem $24 \div 8 = 3$, 24 is the *dividend,* 8 is the *divisor* and the answer is the *quotient.* Division is the inverse of multiplication. If $24 \div 8 = 3$, then $3 \times 8 = 24$. Multiplication is a check for division. Division can also be considered as repeated subtraction. Another way to think of $24 \div 8$ is 8 subtracted repeatedly until the last difference is 0. For example, $24 - 8 = 16$; $16 - 8 = 8$; $8 - 8 = 0$. Since 3 groups of 8 were subtracted, $24 \div 8 = 3$. Division is an operation that can be used with whole numbers, fractions and decimals. To complete long division, the student must estimate, multiply, subtract, bring down and repeat the steps if necessary.