FOR THE TEACHER

Comprehensive Assessment of Mathematics Strategies II (CAMS II) is a mathematics series that assesses student proficiency in 12 mathematics strategies (8 strategies in Book 1), the same strategies that are practised in the *Comprehensive Assessment of Mathematics Strategies* diagnostic mathematics series. *CAMS II* allows teachers to identify a student's level of mastery with each of the mathematics strategies. *CAMS II* is for use after students have been diagnosed with *CAMS* and have been instructed with *STAMS*, or with any other remediation materials.

In *CAMS II Book 2,* students practise the following mathematics strategies:
- number sense
- estimation
- addition
- subtraction
- multiplication
- division
- algebra
- time and money
- working with measurements
- shape
- probability and averages
- interpreting data.

What is in the student book?
Each student book contains
- five lessons, each lesson focusing on a theme and providing selected-response questions
- one self-assessment form for students, which they complete after Lesson 5
- two assessment forms for teachers, which they complete after Lesson 5 has been corrected
- an answer form on which students record their answers.

What is in the teacher guide?
Each teacher guide contains
- suggestions and instruction for using *CAMS II* effectively in the classroom
- Understanding the strategies, an instructional sheet for use with students in the classroom
- copies of the student assessment and the two teacher assessments that appear 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 in the student book. Ask students to detach the form and fill in the personal-information section. Once you have a student's completed answer form, total the number of correct responses for each strategy.

Then transfer these totals to Teacher assessment 1 to begin the assessment process.

What is the correction procedure?
For the best results, correct each lesson orally with students immediately following its completion. Explain concepts that students may not fully understand. Discuss why correct answer choices are correct and why the remaining choices are not correct. If possible, elicit from students their reasoning for choosing an incorrect answer.

Incorrect answer choices often include a variety of misunderstandings about the problem. Discussing why choices are correct and incorrect will help students review and clarify how they approach a particular strategy.

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

Student assessment
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. Some difficulties that a student experiences are often revealed through self-assessment.

Self-assessment focuses students on the process of performance rather than an end result. For example, in *CAMS II,* students see how well they recognise and apply mathematics strategies, rather than on how many responses they got correct or incorrect. Therefore, the self-assessment becomes a valuable tool for both student and teacher.

SELF-ASSESSMENT
After students complete lessons 1–5, they complete the self-assessment by answering questions that require thoughtful written responses. 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
- rate their performance for completing lessons 1–5.

Review responses to the self-assessments before completing the teacher assessments. You might also review the self-assessment for *CAMS II* with the two self-assessments that each student completed for *Comprehensive Assessment of Mathematics Strategies*.

By comparing the assessments, you can gain further insight into a student's overall improvement, as well as the student's level of confidence in his or her mathematics abilities over time. Arrange one-on-one conferencing after students have completed their *CAMS II* assessment and after you have had the opportunity to compare assessments from both series. Use this conferencing time to help students identify their strengths, weaknesses, and areas of improvement.

Teacher assessments

Complete the teacher assessments after students have completed lessons 1–5 and the answer forms have been corrected. The purposes of the teacher assessments are to:

- identify an individual student's areas of strength and weakness when applying a mathematics strategy
- determine in which specific areas, if any, remediation is needed
- determine in which specific areas, if any, students have improved since completing *Comprehensive Assessment of Mathematics Strategies*
- compare levels of mastery for instituting an effective action plan.

TEACHER ASSESSMENT 1

Teacher assessment 1 assesses a student's performance for each of the mathematics strategies practised in lessons 1–5. Use the student's completed and corrected answer form to complete this assessment.

Teacher assessment 1 is a chart of a student's performance for each specific strategy. Record the number of correct responses in ratio form, and then convert to a percentage. For example, if a student correctly answers four out of five making predictions questions, record '4 out of 5'under 'Number of correct responses' and '80%' under 'Percentage correct'.

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: You complete a bar on the graph to show the number of correct responses for a given strategy. A completed graph provides a visual comparison of a student's strengths and weaknesses for the mathematics strategies practised.

Part two: You answer 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 use *CAMS II* in the classroom?

CAMS II is a follow-up series to *Comprehensive Assessment of Mathematics Strategies (CAMS),* a diagnostic mathematics series for identification and assessment of a student's level of mastery with each of the mathematics strategies. *CAMS II* is for use after students have received classroom remediation in any of the strategies for which they were diagnosed to have difficulty after using *CAMS*. If you used *Strategies to Achieve Mathematics Success (STAMS)* to provide remediation, it is recommended that you use *CAMS II* for the assessment.

Before beginning *CAMS II*, you may choose to review with students the information in Understanding the strategies. This sheet should be used and put aside before *CAMS II* lessons are undertaken.

How do I use *CAMS II* effectively in the classroom?

CAMS II is designed for flexibility in the classroom and can be used effectively in several ways.

Overall, *CAMS II* takes six class periods for completion of lessons, correction of lessons and completion of student assessment. Or, you may choose to have students complete one lesson each week for five weeks and then complete the self-assessment. Students should complete the self-assessment no more than one day or two days following completion of Lesson 5.

How should I use the results of *CAMS II* to establish a student's mathematics needs?

Because *CAMS II* is the follow-up series to *CAMS* and *STAMS*, the results can be used in two ways.

- Use the results to assess a student's progress since completing *CAMS* and the action plan. By comparing a student's results from *CAMS* with the student's results from *CAMS II*, you can determine the level of an individual student's progress.
- Use the results to determine where a student still needs improvement. You can then provide targeted remediation to specific areas.

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 from the teacher guide. For each student, record the number of correct responses for each strategy. Then add the responses for the total correct responses for each student.

UNDERSTANDING THE STRATEGIES

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 it is often used to check addition.

- **Multiplication**
  Multiplication is the 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
x11	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.

- **Algebra**
  Algebra includes strategies to determine the value of unknown numbers or missing items.
  An algebraic expression consists of one or more variables, one or more constants, and one or more operations. In the expression $x + 3$, x is the *variable*, 3 is the *constant*, and the plus sign indicates the operation. A variable or unknown number is usually represented by a letter.
  The letter x is often used as a variable. Algebra also includes strategies involving patterns and functions.

Measurement

- **Time and money**
  a. Time includes strategies for comprehending clock and calendar arithmetic. Students investigate and practise such measures as seconds, minutes, hours, days, months, years, decades and centuries.
  b. Money includes strategies for comprehending the monetary system, with particular emphasis on giving change. Students investigate and practise the mathematics of coins and notes.

- **Working with measurements**
  Measurement includes strategies for working with length, mass, capacity, area and volume.

  > **Measurements**
  > 1. length   (centimetre, metre, kilometre)
  > 2. mass   (gram, kilogram)
  > 3. capacity (millilitre, litre, kilolitre)
  > 4. area   (square centimetre, square metre)
  > 5. volume   (cubic centimetre, cubic metre)

Space

- **Shape**
  Geometry includes strategies involving plane figures (two-dimensional) and solid figures (three-dimensional).

  A plane figure lies entirely in one plane and has no thickness. Plane figures include triangles, rectangles and circles. Unlike the plane figure, a solid figure has a third dimension. Solid figures include cones, cubes, cylinders, prisms and spheres.

Chance and data

- **Probability and averages**
  Probability is the chance that a given event will occur. The study of probability includes strategies for determining the number of favourable outcomes compared to the total number of all possible outcomes. One way to state a probability is to state the odds. This may be expressed as the odds favouring an outcome or the odds against an outcome. For example, if the odds are 3 out of 4 in favour of a team winning a game, the team is expected to win 3 and lose 1 out of 4 games.

  Averages involve strategies to determine the arithmetic mean of a group of numbers. The average is determined by dividing the sum of the given numbers by the number of numbers that are added. For example, students asked to find the average of 4 + 5 + 9, add the numbers (18), divide by 3 and obtain an average of 6.

- **Interpreting data**
  The study of graphs and charts includes strategies for organising and interpreting data.
  A graph is a pictorial representation of a mathematical relationship. Graph representations include points on a number line, a point in a coordinate system and a line in a coordinate system. A chart is a pictorial representation of data, such as that in a schedule, table, menu or price list.