Student Books

Student Books are available as either individual soft cover non-consumable books or hard-bound by grade level. The soft cover Student Books are three-hole punched for convenient storage in binders.

Letter to the Student introduces the contexts and mathematical concepts for each unit.

Dear Student,

Welcome to *Expressions and Formulas*.

Imagine you are shopping for a new bike. How do you determine the size frame that fits your body best? Bicycle manufacturers have a formula that uses leg length to find the right size bike for each rider. In this unit, you will use this formula as well as many others. You will devise your own formulas by studying the data and processes in the story. Then you will apply your own formula to solve new problems.

In this unit, you will also learn new forms of mathematical writing. You will use arrow strings, arithmetic trees, and parentheses. These new tools will help you interpret problems as well as apply formulas to find problem solutions.

As you study this unit, look for additional formulas in your daily life outside the mathematics classroom, such as the formula for sales tax or cab rates. Formulas are all around us!

Sincerely,

The Mathematics in Context Development Team

Sections Units contain four to eight sections. Each section takes between two and five days to complete. Sections include short descriptions of problem scenarios and related problems for students to solve. Within a section, mathematical concepts are developed but may not be stated explicitly.

Reflect questions ask students to apply higher-order thinking to concepts in the lesson. **Summary** and **Check Your Work** problems allow students to assess their own understanding of the material in the section and to integrate and consolidate what they have learned. Answers to the **Check Your Work** problems are found in the back of the Student Book. This section is also a valuable way to involve families in that the answers allow parents to discuss with their child progress through the unit.

A Arrow Language

Summary

Arrow language can be helpful to represent calculations.

Each calculation can be described with an arrow.

starting number $\xrightarrow{\text{action}}$ resulting number

A series of calculations can be described by an **arrow string**.

$10 \xrightarrow{+6} 16 \xrightarrow{+3} 19 \xrightarrow{+3} 22 \xrightarrow{-4} 18$

Check Your Work

Airline Reservations

There are 375 seats on a flight to Atlanta, Georgia, that departs on March 16. By March 11, 233 of the seats were reserved. The airline continues to take reservations and cancellations until the plane departs. If the number of reserved seats is higher than the number of actual seats on the plane, the airline places the passenger names on a waiting list.

The table shows the changes over the five days before the flight.

Date	Seats Requested	Cancellations	Total Seats Reserved
3/11			233
3/12	47	0	
3/13	51	1	
3/14	53	0	
3/15	5	12	
3/16	16	2	

1. Copy and complete the table.
2. Write an arrow string to represent the calculations you made to complete the table.
3. On which date does the airline need to form a waiting list?
4. To find the total number of reserved seats, Toni, a reservations agent, suggests adding all of the new reservations and then subtracting all of the cancellations at one time instead of using arrow strings. What are the advantages and disadvantages of her suggestion?
5. a. Find the result of this arrow string.

   $12.30 \xrightarrow{+1.40} \_\_\_ \xrightarrow{-0.62} \_\_\_ \xrightarrow{+5.83} \_\_\_ \xrightarrow{-1.40} \_\_\_$

   b. Write a story that could be represented by the arrow string.
6. Write a problem that you can solve using arrow language. Then solve the problem.
7. Why is arrow language useful?

For Further Reflection

Juan says that it is easier to write 15 + 3 = 18 − 6 = 12 + 2 =14 than to make an arrow string. Tell what is wrong with the string that Juan wrote and show the arrow string he has tried to represent.

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For Further Reflection is the last problem in each section. These problems summarize and discuss important concepts from the section. They ask students to reflect on what they have learned and apply that knowledge to a new situation.

Additional Practice The main concepts of the unit are reinforced by the Additional Practice activities, provided for each section of the unit. They may be used as in-class activities, homework assignments, informal assessment tools, or extra credit.

Additional Practice

Section A Arrow Language

1. Here is a record for Mr. Kamarov's bank account.

Date	Deposit	Withdrawal	Total
10/15			\$210.24
10/22	\$523.65	\$140.00	
10/29	\$75.00	\$40.00	

   a. Find the totals for October 22 and October 29.

   b. Write arrow strings to show how you found the totals.

   c. When does Mr. Kamarov first have a minimum of \$600 in his account?

2. Find the results for these arrow strings.

   a. $15 \xrightarrow{-3} \_\_\_ \xrightarrow{+11} \_\_\_$

   b. $3.7 \xrightarrow{+1.9} \_\_\_ \xrightarrow{+8.8} \_\_\_ \xrightarrow{-1.6} \_\_\_$

   c. $3{,}000 \xrightarrow{-1{,}520} \_\_\_ \xrightarrow{-600} \_\_\_ \xrightarrow{+5{,}200} \_\_\_$

Section B Smart Calculations

1. For each shopping problem, write an arrow string to show the change the clerk should give the customer. Be sure to use the small-coins-and-bills-first method. Then write another arrow string that has only one arrow to show the total change.

   a. A customer gives \$20.00 for a \$9.59 purchase.

   b. A customer gives \$5.00 for a \$2.26 purchase.

   c. A customer gives \$16.00 for a \$15.64 purchase.

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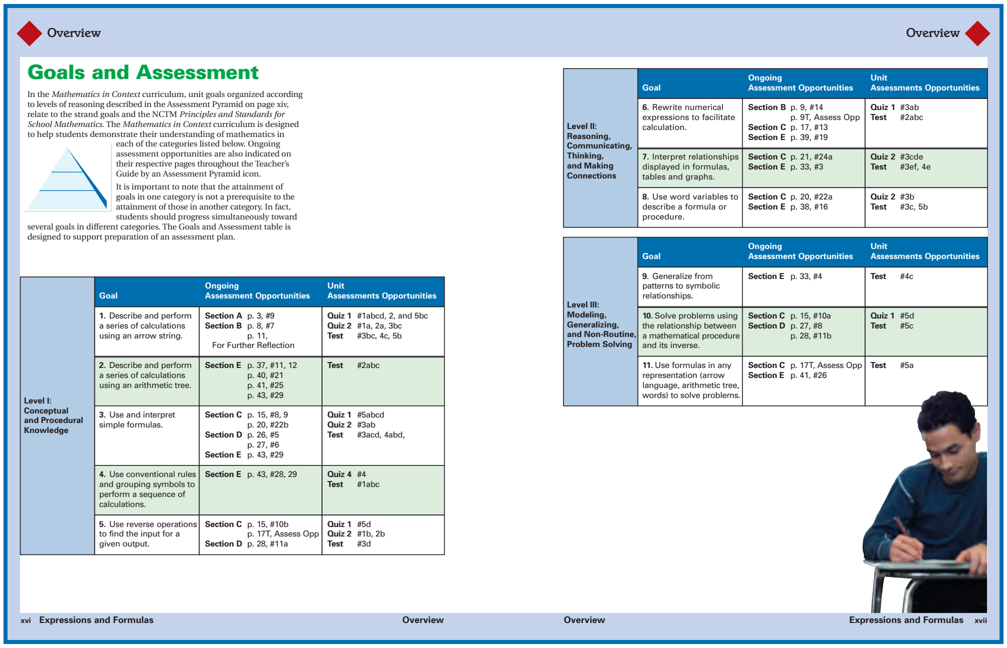
Teacher's Guide

These soft cover books are spiral-bound so that they lay flat when open. Teaching ideas and solutions are conveniently provided adjacent to reduced-sized reproductions of corresponding Student Book pages.

In the Front of the Teacher's Guide

Overview General information about the curriculum as well as unit-specific planning information introduces each unit.

- **Correlation** of the content of the unit with the content standards and expectations of the NCTM Principles and Standards for School Mathematics.
- **Math in the Unit** describes the mathematical content of the unit as well as prior knowledge required of students and student learning expectations.
- **Strand Overview** offers teachers a guide to the development of concepts throughout the strand across all levels.
- **Student Assessment in *Mathematics in Context*** describes the design of the assessment program for MiC. It also explains the important levels of assessment items based on the Assessment Pyramid.
- **Goals and Assessment** specific to a unit. These assessment goals correspond to the levels of reasoning on the Assessment Pyramid. Included are formative and summative assessment items, their location within the text or written assessment, and the level of each item.


Overview

Goals and Assessment

In the *Mathematics in Context* curriculum, unit goals organized according to levels of reasoning described in the Assessment Pyramid on page xiv, relate to the strand goals and the NCTM *Principles and Standards for School Mathematics*. The *Mathematics in Context* curriculum is designed to help students demonstrate their understanding of mathematics in each of the categories listed below. Ongoing assessment opportunities are also indicated on their respective pages throughout the Teacher's Guide by an Assessment Pyramid icon.

It is important to note that the attainment of goals in one category is not a prerequisite to the attainment of those in another category. In fact, students should progress simultaneously toward several goals in different categories. The Goals and Assessment table is designed to support preparation of an assessment plan.

	Goal	Ongoing Assessment Opportunities	Unit Assessments Opportunities
Level I: Conceptual and Procedural Knowledge	**1.** Describe and perform a series of calculations using an arrow string.	**Section A** p. 3, #9 **Section B** p. 8, #7 p. 11, For Further Reflection	**Quiz 1** #1abcd, 2, and 5bc **Quiz 2** #1a, 2a, 3bc **Test** #3bc, 4c, 5b
	2. Describe and perform a series of calculations using an arithmetic tree.	**Section E** p. 37, #11, 12 p. 40, #21 p. 41, #25 p. 43, #29	**Test** #2abc
	3. Use and interpret simple formulas.	**Section C** p. 15, #8, 9 p. 20, #22b **Section D** p. 26, #5 p. 27, #6 **Section E** p. 43, #29	**Quiz 1** #5abcd **Quiz 2** #3ab **Test** #3acd, 4abd,
	4. Use conventional rules and grouping symbols to perform a sequence of calculations.	**Section E** p. 43, #28, 29	**Quiz 4** #4 **Test** #1abc
	5. Use reverse operations to find the input for a given output.	**Section C** p. 15, #10b p. 17T, Assess Opp **Section D** p. 28, #11a	**Quiz 1** #5d **Quiz 2** #1b, 2b **Test** #3d

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Overview

	Goal	Ongoing Assessment Opportunities	Unit Assessments Opportunities
Level II: Reasoning, Communicating, Thinking, and Making Connections	**6.** Rewrite numerical expressions to facilitate calculation.	**Section B** p. 9, #14 p. 9T, Assess Opp **Section C** p. 17, #13 **Section E** p. 39, #19	**Quiz 1** #3ab **Test** #2abc
	7. Interpret relationships displayed in formulas, tables and graphs.	**Section C** p. 21, #24a **Section E** p. 33, #3	**Quiz 2** #3cde **Test** #3ef, 4e
	8. Use word variables to describe a formula or procedure.	**Section C** p. 20, #22a **Section E** p. 38, #16	**Quiz 2** #3b **Test** #3c, 5b

	Goal	Ongoing Assessment Opportunities	Unit Assessments Opportunities
Level III: Modeling, Generalizing, and Non-Routine, Problem Solving	**9.** Generalize from patterns to symbolic relationships.	**Section E** p. 33, #4	**Test** #4c
	10. Solve problems using the relationship between a mathematical procedure and its inverse.	**Section C** p. 15, #10a **Section D** p. 27, #8 p. 28, #11b	**Quiz 1** #5d **Test** #5c
	11. Use formulas in any representation (arrow language, arithmetic tree, words) to solve problems.	**Section C** p. 17T, Assess Opp **Section E** p. 41, #26	**Test** #5a

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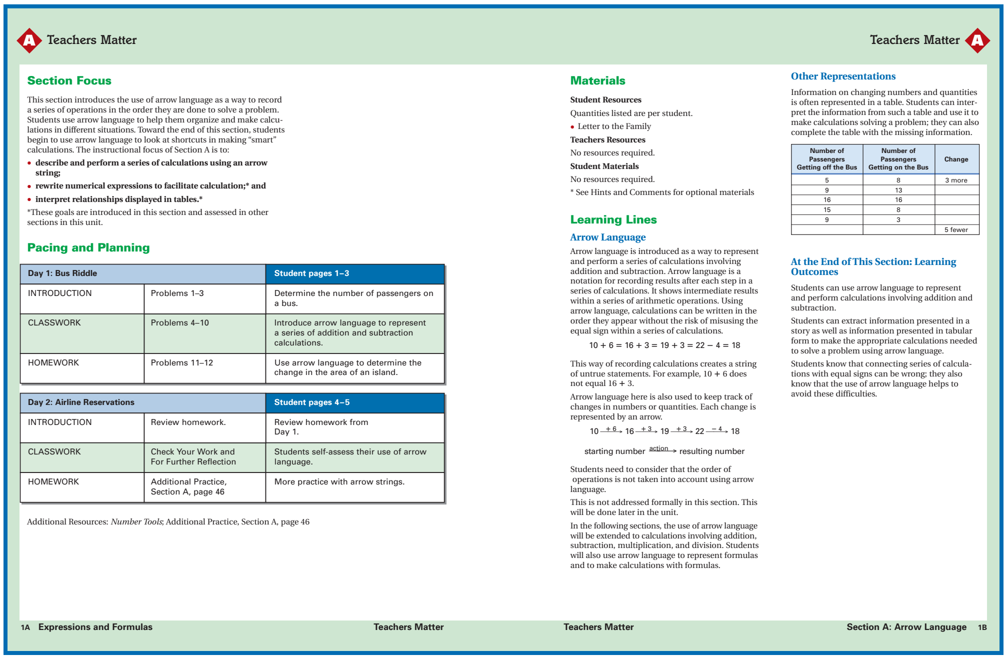
- **Materials Preparation** This helps the teacher to organize materials for the entire unit.

Teachers Matter

For each section of the Student Book, a two-page overview is provided in the Teacher's Guide.

- **Section Focus** describes the mathematical content of the section.
- **Pacing and Planning** delineates daily suggestions for introduction, classwork, and homework
- **Materials** for this specific section includes student and teacher resources
- **Learning Lines** describes the flow of the section mathematically



A Teachers Matter

Teachers Matter A

Section Focus

This section introduces the use of arrow language as a way to record a series of operations in the order they are done to solve a problem. Students use arrow language to help them organize and make calculations in different situations. Toward the end of this section, students begin to use arrow language to look at shortcuts in making "smart" calculations. The instructional focus of Section A is to:

- **describe and perform a series of calculations using an arrow string;**
- **rewrite numerical expressions to facilitate calculation;* and**
- **interpret relationships displayed in tables.***

*These goals are introduced in this section and assessed in other sections in this unit.

Pacing and Planning

Day 1: Bus Riddle		Student pages 1–3
INTRODUCTION	Problems 1–3	Determine the number of passengers on a bus.
CLASSWORK	Problems 4–10	Introduce arrow language to represent a series of addition and subtraction calculations.
HOMEWORK	Problems 11–12	Use arrow language to determine the change in the area of an island.

Day 2: Airline Reservations		Student pages 4–5
INTRODUCTION	Review homework.	Review homework from Day 1.
CLASSWORK	Check Your Work and For Further Reflection	Students self-assess their use of arrow language.
HOMEWORK	Additional Practice, Section A, page 46	More practice with arrow strings.

Additional Resources: *Number Tools*; Additional Practice, Section A, page 46

Materials

Student Resources

Quantities listed are per student.

- Letter to the Family

Teachers Resources

No resources required.

Student Materials

No resources required.

* See Hints and Comments for optional materials

Learning Lines

Arrow Language

Arrow language is introduced as a way to represent and perform a series of calculations involving addition and subtraction. Arrow language is a notation for recording results after each step in a series of calculations. It shows intermediate results within a series of arithmetic operations. Using arrow language, calculations can be written in the order they appear without the risk of misusing the equal sign within a series of calculations.

$$10 + 6 = 16 + 3 = 19 + 3 = 22 - 4 = 18$$

This way of recording calculations creates a string of untrue statements. For example, 10 + 6 does not equal 16 + 3.

Arrow language here is also used to keep track of changes in numbers or quantities. Each change is represented by an arrow.

$$10 \xrightarrow{+6} 16 \xrightarrow{+3} 19 \xrightarrow{+3} 22 \xrightarrow{-4} 18$$

$$\text{starting number} \xrightarrow{\text{action}} \text{resulting number}$$

Students need to consider that the order of operations is not taken into account using arrow language.

This is not addressed formally in this section. This will be done later in the unit.

In the following sections, the use of arrow language will be extended to calculations involving addition, subtraction, multiplication, and division. Students will also use arrow language to represent formulas and to make calculations with formulas.

Other Representations

Information on changing numbers and quantities is often represented in a table. Students can interpret the information from such a table and use it to make calculations solving a problem; they can also complete the table with the missing information.

Number of Passengers Getting off the Bus	Number of Passengers Getting on the Bus	Change
5	8	3 more
9	13	
16	16	
15	8	
9	3	
		5 fewer

At the End of This Section: Learning Outcomes

Students can use arrow language to represent and perform calculations involving addition and subtraction.

Students can extract information presented in a story as well as information presented in tabular form to make the appropriate calculations needed to solve a problem using arrow language.

Students know that connecting series of calculations with equal signs can be wrong; they also know that the use of arrow language helps to avoid these difficulties.

1A Expressions and Formulas   Teachers Matter   Teachers Matter   Section A: Arrow Language 1B

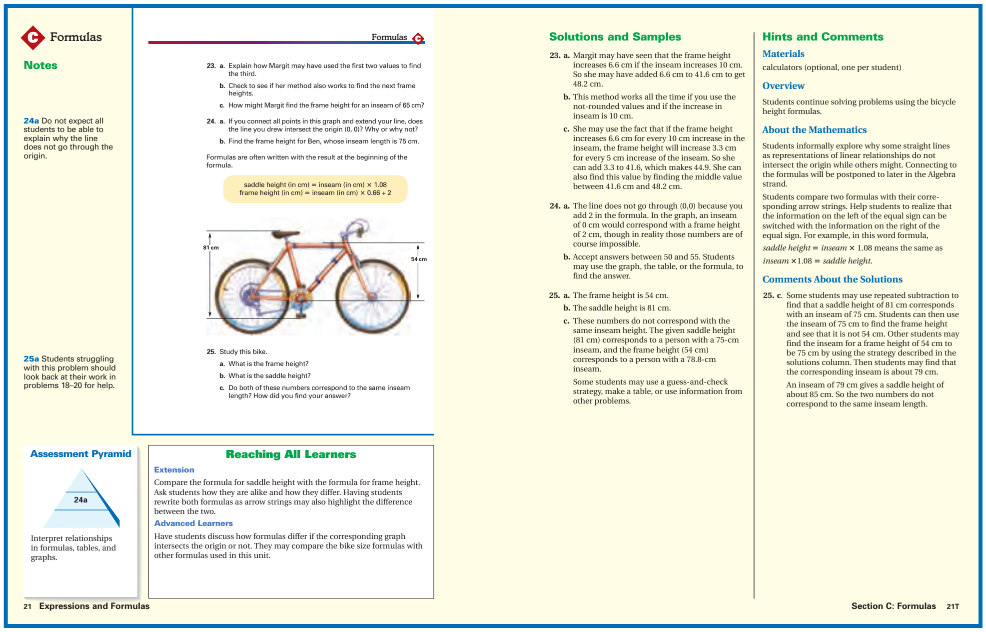
- **Learning Outcomes** helps the teacher to understand what students should know and be able to do at the end of the section.

Teacher's Guide Pages for Instruction

Each Student Book page is reproduced in reduced size on the left page of the Teacher's Guide. In the wrap around the student page, specific teaching tools are included at point of use:

- **Notes** These teaching suggestions were written by experienced MiC teachers and are specific to the problem or context at hand.
- **Assessment Pyramid** This icon identifies problems that can be used for formative assessment. The three layers of the pyramid reflect the three levels of reasoning described on pages xiv and xv of each Teacher's Guide.

- **Reaching All Learners** This section contains alternative approaches for a variety of student needs:
  - **Intervention** provides for students who are having difficulty.
  - **Advanced Learners** offers extension activities for deepening students' understanding.
  - **Writing Opportunity** includes specific writing suggestions associated with the problems.
  - **Extensions** offers additional problems that build from the problems on the page.
  - **Vocabulary Building** highlights words that students need to understand
  - **English Language Learners** suggests strategies for working with students for whom English is a second language.
  - **Parent Involvement** highlights activities with which students can engage their families in mathematical discussions and problem-solving.
  - **Accommodations** offers ideas to address specific student needs.
  - **Hands-On Learning** suggests activities to actively engage students.
- Opposite each student page, **Solutions and Samples** of student work as well as a **Hints and Comments** column are provided. Included in the **Hints and Comments** column on most of the pages are:



C Formulas

Notes

24a Do not expect all students to be able to explain why the line does not go through the origin.

25a Students struggling with this problem should look back at their work in problems 18–20 for help.

Formulas C

23. a. Explain how Margit may have used the first two values to find the third.
b. Check to see if her method also works to find the next frame heights.
c. How might Margit find the frame height for an inseam of 65 cm?

24. a. If you connect all points in this graph and extend your line, does the line you drew intersect the origin (0, 0)? Why or why not?
b. Find the frame height for Ben, whose inseam length is 75 cm.

Formulas are often written with the result at the beginning of the formula.

saddle height (in cm) = inseam (in cm) × 1.08
frame height (in cm) = inseam (in cm) × 0.66 + 2

25. Study this bike.
a. What is the frame height?
b. What is the saddle height?
c. Do both of these numbers correspond to the same inseam length? How did you find your answer?

Assessment Pyramid

24a

Interpret relationships in formulas, tables, and graphs.

Reaching All Learners

Extension

Compare the formula for saddle height with the formula for frame height. Ask students how they are alike and how they differ. Having students rewrite both formulas as arrow strings may also highlight the difference between the two.

Advanced Learners

Have students discuss how formulas differ if the corresponding graph intersects the origin or not. They may compare the bike size formulas with other formulas used in this unit.

Solutions and Samples

23. a. Margit may have seen that the frame height increases 6.6 cm if the inseam increases 10 cm. So she may have added 6.6 cm to 41.6 cm to get 48.2 cm.
b. This method works all the time if you use the not-rounded values and if the increase in inseam is 10 cm.
c. She may use the fact that if the frame height increases 6.6 cm for every 10 cm increase in the inseam, the frame height will increase 3.3 cm for every 5 cm increase of the inseam. So she can add 3.3 to 41.6, which makes 44.9. She can also find this value by finding the middle value between 41.6 cm and 48.2 cm.

24. a. The line does not go through (0,0) because you add 2 in the formula. In the graph, an inseam of 0 cm would correspond with a frame height of 2 cm, though in reality those numbers are of course impossible.
b. Accept answers between 50 and 55. Students may use the graph, the table, or the formula, to find the answer.

25. a. The frame height is 54 cm.
b. The saddle height is 81 cm.
c. These numbers do not correspond with the same inseam height. The given saddle height (81 cm) corresponds to a person with a 75-cm inseam, and the frame height (54 cm) corresponds to a person with a 78.8-cm inseam.
Some students may use a guess-and-check strategy, make a table, or use information from other problems.

Hints and Comments

Materials

calculators (optional, one per student)

Overview

Students continue solving problems using the bicycle height formulas.

About the Mathematics

Students informally explore why some straight lines as representations of linear relationships do not intersect the origin while others might. Connecting to the formulas will be postponed to later in the Algebra strand.

Students compare two formulas with their corresponding arrow strings. Help students to realize that the information on the left of the equal sign can be switched with the information on the right of the equal sign. For example, in this word formula,

saddle height = *inseam* × 1.08 means the same as

inseam ×1.08 = *saddle height*.

Comments About the Solutions

25. c. Some students may use repeated subtraction to find that a saddle height of 81 cm corresponds with an inseam of 75 cm. Students can then use the inseam of 75 cm to find the frame height and see that it is not 54 cm. Other students may find the inseam for a frame height of 54 cm to be 75 cm by using the strategy described in the solutions column. Then students may find that the corresponding inseam is about 79 cm.
An inseam of 79 cm gives a saddle height of about 85 cm. So the two numbers do not correspond to the same inseam length.

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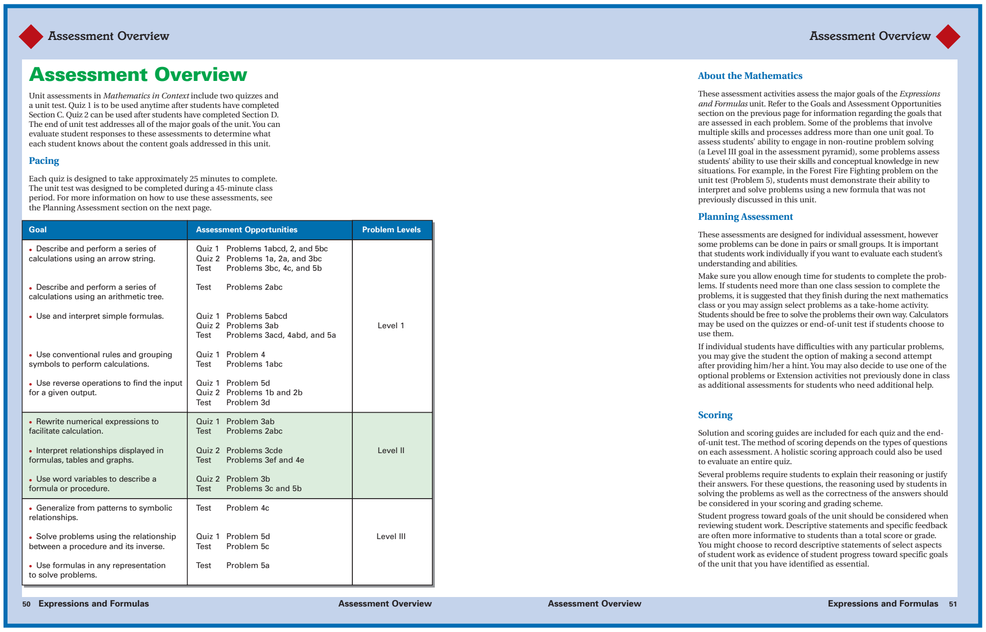
Section C: Formulas 21T

  - **Materials** A list of required and optional materials is provided.
  - **Overview** The work students do is briefly described.
  - **About the Mathematics** This section provides background information about the mathematics in the problems and cites other sections and units in which the mathematics is formally introduced or expanded. It offers a quick refresher for teachers about the mathematics.
  - **Planning** Provided here are suggestions for introducing the context or the mathematical concepts; the identification of optional problems and problems that can be used as informal assessment or homework; and suggestions for grouping students—individuals, pairs, small groups, or whole class.

- **Comments About the Solutions** Discussion questions and comments about student strategies, models, and responses are included for selected problems, offering additional insights into student thinking.
- **Technology** Opportunities to use computer applets or other technology to enhance student understanding are located here.
- **Writing Opportunities** Specific suggestions for related writing activities that students may enter in their journals are included.
- **Did You Know?** This section offers historical or other interesting information about the context or the mathematics.
- **Assessment Opportunity** Extra problems that can be used to assess student understanding are included in this section.


Assessment Overview

Assessment Overview

Unit assessments in *Mathematics in Context* include two quizzes and a unit test. Quiz 1 is to be used anytime after students have completed Section C. Quiz 2 can be used after students have completed Section D. The end of unit test addresses all of the major goals of the unit. You can evaluate student responses to these assessments to determine what each student knows about the content goals addressed in this unit.

Pacing

Each quiz is designed to take approximately 25 minutes to complete. The unit test was designed to be completed during a 45-minute class period. For more information on how to use these assessments, see the Planning Assessment section on the next page.

Goal	Assessment Opportunities	Problem Levels
• Describe and perform a series of calculations using an arrow string.	Quiz 1 Problems 1abcd, 2, and 5bc Quiz 2 Problems 1a, 2a, and 3bc Test Problems 3bc, 4c, and 5b	Level 1
• Describe and perform a series of calculations using an arithmetic tree.	Test Problems 2abc	
• Use and interpret simple formulas.	Quiz 1 Problems 5abcd Quiz 2 Problems 3ab Test Problems 3acd, 4abd, and 5a	
• Use conventional rules and grouping symbols to perform calculations.	Quiz 1 Problem 4 Test Problems 1abc	
• Use reverse operations to find the input for a given output.	Quiz 1 Problem 5d Quiz 2 Problems 1b and 2b Test Problem 3d	
• Rewrite numerical expressions to facilitate calculation.	Quiz 1 Problem 3ab Test Problems 2abc	Level II
• Interpret relationships displayed in formulas, tables and graphs.	Quiz 2 Problems 3cde Test Problems 3ef and 4e	
• Use word variables to describe a formula or procedure.	Quiz 2 Problem 3b Test Problems 3c and 5b	
• Generalize from patterns to symbolic relationships.	Test Problem 4c	Level III
• Solve problems using the relationship between a procedure and its inverse.	Quiz 1 Problem 5d Test Problem 5c	
• Use formulas in any representation to solve problems.	Test Problem 5a	

50 Expressions and Formulas Assessment Overview

Assessment Overview

About the Mathematics

These assessment activities assess the major goals of the *Expressions and Formulas* unit. Refer to the Goals and Assessment Opportunities section on the previous page for information regarding the goals that are assessed in each problem. Some of the problems that involve multiple skills and processes address more than one unit goal. To assess students' ability to engage in non-routine problem solving (a Level III goal in the assessment pyramid), some problems assess students' ability to use their skills and conceptual knowledge in new situations. For example, in the Forest Fire Fighting problem on the unit test (Problem 5), students must demonstrate their ability to interpret and solve problems using a new formula that was not previously discussed in this unit.

Planning Assessment

These assessments are designed for individual assessment, however some problems can be done in pairs or small groups. It is important that students work individually if you want to evaluate each student's understanding and abilities.

Make sure you allow enough time for students to complete the problems. If students need more than one class session to complete the problems, it is suggested that they finish during the next mathematics class or you may assign select problems as a take-home activity. Students should be free to solve the problems their own way. Calculators may be used on the quizzes or end-of-unit test if students choose to use them.

If individual students have difficulties with any particular problems, you may give the student the option of making a second attempt after providing him/her a hint. You may also decide to use one of the optional problems or Extension activities not previously done in class as additional assessments for students who need additional help.

Scoring

Solution and scoring guides are included for each quiz and the end-of-unit test. The method of scoring depends on the types of questions on each assessment. A holistic scoring approach could also be used to evaluate an entire quiz.

Several problems require students to explain their reasoning or justify their answers. For these questions, the reasoning used by students in solving the problems as well as the correctness of the answers should be considered in your scoring and grading scheme.

Student progress toward goals of the unit should be considered when reviewing student work. Descriptive statements and specific feedback are often more informative to students than a total score or grade. You might choose to record descriptive statements of select aspects of student work as evidence of student progress toward specific goals of the unit that you have identified as essential.

Assessment Overview Expressions and Formulas 51

In the Back of the Teacher's Guide

Additional Practice This section contains additional problems and solutions for each section. Additional Practice is also a part of the Student Books.

Assessment Overview correlates the assessment problems of the quizzes and tests with the goals of the unit. The level for each problem is also included. **About the Mathematics**, **Planning Assessment**, and **Scoring** offer additional hints for the teacher to inform assessment.

Unit Assessments include two quizzes (25 minutes each) and a Unit Test (45 minutes). A Solution and Scoring Guide is included for each assessment.

Glossary Definitions of the vocabulary words indicated in the unit appear here. It includes the mathematical terms that are new to students, as well as words having to do with the contexts introduced in the unit. The Glossary is not in the Student Book, so students can construct their own definitions based on their personal understanding of the unit activities.

Blackline Masters Reproducible blackline masters can be found in this section; these include a Letter to the Family introducing the unit's mathematics and **Student Activity Sheets (SAS)** used for selected problems in the Student Book.

Mathematics in the Middle!

What elementary program best leads in to *Mathematics in Context*?

The program or curriculum that is used in elementary schools should have little or no effect on the choice of *Mathematics in Context* for the middle grades. NSF-funded programs at the elementary school may make a transition easier since students will be more accustomed to explaining, justifying, investigating, and strategizing. Regardless of the program used, it is expected that students will have experience with whole number computation and ordering, understand the concept of a fraction as a ratio, recognize basic geometric shapes, understand the decimal number system as it relates to money, and have some experiences with problem solving. These are the only assumptions made for beginning Level 1 in *Mathematics in Context*.

The Algebra Questions

Will students be ready for Algebra 1 in grade 8?

The flexibility of the MiC curriculum allows districts to tailor the program to meet local algebra preparation goals. MiC has a strong focus on algebraic thinking beginning with the Level 1 units. Students develop a deep conceptual understanding of the principles of algebra in Levels 2 and 3 units. Some schools may choose to use MiC Levels 1 and 2 as preparation for algebra in grade 8. Students who successfully complete all three levels of MiC will be well-prepared for algebra in grade 9. Exceptional students who complete two years of MiC will be ready for algebra in grade 8.

Will the students have the equivalent of an Algebra 1 course at the end of Level 3?

This is a more difficult question. There are four Algebra strand units at Level 3; the topics covered include (but are not limited to) linear functions, factoring, exponential functions, recursive and direct formulas, slope, quadratics, sequences, tangent ratio, and so on. Many of these are topics found in Algebra 1. Some topics are even more advanced! However, MiC students have less experience with symbolic manipulation than in a traditional Algebra 1 course. *Algebra Rules!*, one of the new units in the revision, was specifically added to enhance the formalization of algebraic concepts. *Algebra Tools* also provides additional practice with algebraic topics. Districts and schools may need to look at the standards for algebra within their local area to make this decision.

What high school program best follows MiC?

The high school mathematics program selected to follow MiC may be either NSF-funded or traditional. Students completing MiC have been successful using either type of program. They have a strong background in mathematical reasoning, a deep understanding of algebraic thinking, and are confident problem solvers. These qualities usually lead to a successful performance in high school mathematics.