Algebra and Number

General Outcome

Develop algebraic reasoning and number sense.

Specific Outcomes

AN1 Demonstrate an understanding of factors of whole numbers by determining the:
- prime factors
- greatest common factor
- least common multiple
- square root
- cube root.

AN2 Demonstrate an understanding of irrational numbers by:
- representing, identifying and simplifying irrational numbers
- ordering irrational numbers.

AN3 Demonstrate an understanding of powers with integral and rational exponents.

AN4 Demonstrate an understanding of the multiplication of polynomial expressions (limited to monomials, binomials and trinomials), concretely, pictorially and symbolically.

AN5 Demonstrate an understanding of common factors and trinomial factoring, concretely, pictorially and symbolically.

What's Ahead

In Unit 2, students investigate and extend their knowledge of powers and exponents. Students solve problems involving square roots and cube roots and apply the exponent laws to expressions involving powers with integral and rational exponents. They learn how to represent, identify, and simplify irrational numbers and order irrational numbers. Students also learn how to multiply and factor polynomials. Students extend these skills to factor the difference of squares and perfect square trinomials.

Planning Notes

Introduce Unit 2 by pointing out the algebra and number organizer on page 156 of the student resource. This concept map shows how the topics in this unit—the real number system, including rational and irrational numbers, exponents, and polynomials—are related. The concept map is repeated at the beginning of each chapter and is shaded to show which topics are covered in that particular chapter.

The Looking Ahead box at the bottom of page 157 identifies the types of problems students will solve throughout the unit. You may wish to reactivate students' knowledge of these topics.

❨ Unit 2 Project ❩

The Unit 2 project focuses on the real-world application of mathematics in art. The project is continuous in nature and is explicitly divided by chapters.

Introduce the Unit 2 project by reading and discussing the introductory notes on page 158 of the student resource as a class. Consider distributing **BLM U2–1 Unit 2 Project** to inform students about how the project develops throughout the unit. This master provides an overview of the project as well as the requirements for completing the Unit 2 project.

You may wish to point out the questions related to the Unit 2 project that are indicated throughout Chapters 4 and 5 with a project logo. Note that these questions are not mandatory but are recommended because they provide some of the background and research needed to complete the Unit 2 project. The questions are also available on masters, one for each chapter. You may decide to use these masters to create a student booklet and have students record their finalized answers in the booklet either after they have completed their in-class work, during assigned project work time, or in conjunction with chapter assignments. Alternatively, you may wish to provide students with **BLM U2–2 Unit 2 Project Checklist**, which lists *all* of the related questions for each chapter. Students can use the checklist to monitor their progress and prepare their presentation and report. Have students store all the work for the Unit 2 project in a portfolio.

For additional information on the Unit 2 Project, see the Unit 2 Connections on page 256 in the student resource or TR pages 202–203.

Career Connection

Use the collage of photographs to direct a discussion about careers that are related to math. For example, students may mention how math is involved when architects design buildings, scientists monitor water quality, and accountants analyse financial performance. Give an example such as a builder who used the Pythagorean relationship to ensure that a deck she is building will have square corners. You might mention some other careers that involve math skills. For example, graphic designers create effective ways to get messages across in print, electronic, and film media using methods such as print and layout techniques, illustration, photography, and animation. Multimedia artists and animators create special effects and animation for film and video, advertising, and computer systems design. They draw by hand and use computers to create the sequence of pictures that form animated images or special effects. Ask students what they know about how each of these careers involve math.

@ Web Link

For information about careers related to math, training and qualifications, employment, and job outlook, go to www.mhrmath10.ca and follow the links.