UNIT 3

Relations and Functions

General Outcome

Develop algebraic and graphical reasoning through the study of relations.

Specific Outcomes

RF1 Interpret and explain the relationships among data, graphs and situations.

RF2 Demonstrate an understanding of relations and functions.

RF3 Demonstrate an understanding of slope with respect to:
- rise and run
- line segments and lines
- rate of change
- parallel lines
- perpendicular lines.

RF4 Describe and represent linear relations, using:
- words
- ordered pairs
- tables of values
- graphs
- equations.

RF8 Represent a linear function, using function notation.

General Outcome

Develop algebraic reasoning and number sense.

Specific Outcomes

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

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.

***Mathematics 10*, pages 262–265**

Suggested Timing

30–40 min

Blackline Masters

BLM U3–1 Unit 3 Project
BLM U3–2 Unit 3 Project Checklist

What's Ahead

In Unit 3, students graph functions and relations in a variety of ways, including with technology. They learn to distinguish between a function and a relation and how to determine the domain and range. They also study the concept of the slope of a line. This unit also introduces students to three different forms of writing linear equations: slope-intercept form, general form, and slope-point form. Students explore y-intercepts, slopes, and x-intercepts, and use them to graph linear equations. They convert linear equations among the three forms presented and use the slope-point form to write the equation of a line given a graph. Finally, students determine the equation of a line that is parallel or perpendicular to a given line using a specified point that lies on the line.

Planning Notes

Introduce Unit 3 by pointing out the relations and functions organizer on page 262 of the student resource. This organizer shows how the topics in this unit—relations and functions, linear relations, and linear equations and graphs—are related. The organizer 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 263 identifies the types of problems students will solve throughout the unit. You may wish to reactivate students' knowledge of these topics.

Unit 3 Project

The Unit 3 project focuses on the application of relations and funtions to forensic archaeology. The project is continuous in nature and is divided between Chapters 6 and 7.

Introduce the Unit 3 project by reading and discussing the introductory notes on page 264 of the student resource as a class. The project is related to a fictional occurrence during the Klondike Gold Rush. When discussing the gold rush with students, please point out that, as any economic boom, there were advantages and disadvantages for all groups of people.

Consider distributing **BLM U3–1 Unit 3 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 3 project.

You may wish to point out the questions related to the Unit 3 project that are indicated throughout Chapters 6 and 7 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 3 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 U3–2 Unit 3 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 3 project in a portfolio.

Career Connection

Direct a discussion about careers that are related to relations and functions. You may wish to have students read the Unit 3 introduction on page 262 to give them some ideas. Invite them to speculate in which careers it would be beneficial to have an understanding of relationships between quantities. Also, have them discuss in which jobs it might be helpful to use graphs. An example might be a city planner, who works with community groups, government agencies, and others to make plans for the growth and development of a city. These plans may include schools, housing, roads, malls, and office buildings. A city planner must consider factors such as noise, traffic congestion, environmental protection, and local laws and regulations. Being a city planner requires the ability to consider many variables in order to best meet the projected needs of a growing population. You may wish make a list of all career ideas that students contribute and then add to the list as you work through the unit.