Multiply High

Purpose

Students will solve problems by choosing strategies, explaining their reasoning, making calculations, and checking results.

Materials

For the teacher: chalkboard, chalk
For each student: paper, pencil

Activity

A. Introducing the Problem

1. With the whole class, choose five digits (e.g., 7, 2, 3, 5, 9).
2. Form a three-digit number and a two-digit number using these digits (e.g., 253, 79) and find the product of the two numbers.
3. Form another three-digit number and two-digit number using the same digits (e.g., 259, 37) and find the product of these two numbers.
4. Note that the first product is larger than the second, and ask students if they think they could make a larger product using these five digits.
5. Take several student ideas and check their products.

B. Solving the Original Problem

1. Place students in groups of three or four and ask the groups to find the largest product they can using 7, 2, 3, 5, and 9.
2. Ask each student group to record the numbers they try, as well as the product, in each case.
3. As groups produce answers, give them other sets of five digits to work with.
4. When they have tried four or five cases, ask students to look for patterns in their answers.

C. Solving Related Problems

1. As groups finish part B, ask them to make the smallest possible product with five digits.
2. Again ask each student group to record its examples and results and to look for patterns in answers.
3. Ask students to look for connections between the problems.

(continued)

MEETING INDIVIDUAL NEEDS

For students who complete the activity early, ask them to form two fractions from a set of four non-zero whole numbers (e.g., 2, 5, 7, 9). Have them multiply the fractions to find the highest and lowest possible products.

INCORPORATING TECHNOLOGY

Have students use calculators to test their rules on numbers with four, five, or more digits.

Standards Links
5.1.3, 5.2.1

Activity (continued)

D. Discussion

1. With the whole class, discuss the rules they found for making the largest and smallest product with five digits.
2. Ask students to tell you why their rules work.

Questions for Review

Basic Concepts and Processes

During the activity, discuss the following questions with your students to gauge their understanding of the Standard Indicators:

📖 Which of these products [*indicate products on student's paper*] is larger?

💡 Can you tell me why that one comes out larger?

📖 How have you arranged the digits to make the product as large as possible?

💡 Why does that work?