

# What a Difference!

## Purpose

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

## Materials

*For the teacher:* chalkboard or overhead projector

*For each student:* paper, pencil

## Activity

### A. Introducing the Problem

1. With the whole class, choose six digits: e.g., 2, 7, 5, 3, 1, and 9.
2. Form two three-digit numbers using these digits (e.g., 532 and 179) and find the difference between the two numbers.
3. Form set of two three-digit numbers using the same digits (e.g., 259 and 371) and find the difference between these two numbers.
4. Note that the first difference is larger than the second and ask students if they think they could make a larger difference using these six digits.
5. Take several student ideas and check their differences.

### B. Solving the Original Problem

1. Place students in groups of three or four and ask the groups to find the largest difference they can, using 2, 7, 5, 3, 1, and 9.
2. Ask each student group to record the numbers they try, as well as the difference in each case.
3. As groups produce answers, give them other sets of six 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 difference with six digits.
2. Again ask each student group to record its examples and results, and to look for patterns in their answers.
3. Also ask students to look for connections between the problems.

(continued)

### MEETING INDIVIDUAL



### NEEDS

Check that all students are able to subtract with regrouping and help those who are having difficulties.

### INCORPORATING



### TECHNOLOGY

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

**Standards Links**  
4.1.1, 4.1.2, 4.1.4, 4.2.1

## Activity (continued)

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### D. Discussion

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

## Questions for Review

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### Basic Concepts and Processes

During the activity, discuss the following questions with students to gauge their understanding of the indicators:



Which of these differences is larger?



Can you tell me why that one comes out larger?



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



Why does that work?

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