Lattice multiplication has been traced to India, where it was in use before A.D. 1100. It derives its name from the lattice within which the person using the algorithm writes each partial product (see facing page). The problem solver finds the final product by adding all the numerals along each of the diagonals within the lattice.

Many Everyday Mathematics® students find this particular multiplication algorithm to be one of their favorites. It helps them keep track of all the partial products without having to write extra zeros—and it helps them practice their multiplication facts.

Build Understanding

Introduce the lattice algorithm for multiplication by saying that this is a multiplication method in which the numbers are placed around and within a lattice—a special kind of grid in which the dotted-line “rails” within the cells help form diagonals. Invite students to speculate about why a lattice might be a good way to organize a multiplication problem. Help students realize that a lattice can help the problem solver keep track of the many digits that result from the multiplication of two multidigit factors.

Using page 53, explain that with this method of multiplying, students will be multiplying one digit of each factor by one digit of the other factor and recording each partial product within a cell in the grid. Use questions like the following to guide students through the example (and through other examples you provide):

- Which two numbers are being multiplied? (The numbers written along the top of the lattice and the outer right side of the lattice. In the example, the two numbers being multiplied are 26 and 35.)
- Which two-digit number is written in the upper right-hand cell? (The number that is the product of the two digits along both sides of the right-hand corner of the lattice. In the example, the two-digit number in the upper right-hand cell is 18—the product of 3 and 6.)
- Where do you start when adding the numbers inside the lattice? (You begin with the bottom right-hand corner and add along each diagonal, moving toward the upper left-hand corner.)

Error Alert

Be sure that students enter 0 in the top half of a cell when the product is less than 10. (See the digits written in the top left-hand corner of the lattice.) And, as students add the numbers within each diagonal, be certain that they are regrouping correctly: They must regroup each tens digit up to the top of the next diagonal.

Check Understanding

Have a few volunteers demonstrate this algorithm on the board. Guide their descriptions when necessary and demonstrate a couple of extra problems yourself. When you are reasonably certain that most of your students understand the algorithm, assign the “Check Your Understanding” exercises at the bottom of page 53. (See answers in margin.)
Lattice Multiplication

Write one factor along the top of the grid. Write the other factor along the right side of the grid. Begin with the first digit from the side factor, and multiply each digit in the top factor by each digit in the side factor. Record each answer in its own cell, placing the tens digit in the upper half of the cell and the ones digit in the bottom half of the cell. Then add along each diagonal and record any regroupings as shown below.

Example

Multiply $3 \times 6$. Record the product in the upper right-hand cell.

Multiply $3 \times 2$. Record the product in the upper left-hand cell.

Multiply $5 \times 6$. Record the product in the lower right-hand cell.

Multiply $5 \times 2$. Record the product in the lower left-hand cell.

Add along each diagonal beginning with the bottom right diagonal. Work toward the upper left diagonal. Regroup each tens digit to the top of the next diagonal (to help you remember to add that digit).

The product of 26 and 35 is 910.

Check Your Understanding

Solve the following problems.

1. $14 \times 22$
2. $44 \times 18$
3. $65 \times 36$
4. $82 \times 41$
5. $73 \times 52$
6. $96 \times 28$
7. $391 \times 45$
8. $624 \times 783$

Write your answers on a separate sheet of paper.